World Economic and Financial Surveys

World Economic Outlook

April 2017

Gaining Momentum?

INTERNATIONAL MONETARY FUND

Cover and Design: Luisa Menjivar and Jorge Salazar
Composition: AGS, An RR Donnelley Company

Cataloging-in-Publication Data

Joint Bank-Fund Library

Names: International Monetary Fund.
Title: World economic outlook (International Monetary Fund)
Other titles: WEO | Occasional paper (International Monetary Fund) | World economic and financial surveys.
Description: Washington, DC : International Monetary Fund, 1980- | Semiannual | Some issues also have thematic titles. | Began with issue for May 1980. | 1981-1984: Occasional paper / International Monetary Fund, 0251-6365 | 1986-: World economic and financial surveys, 0256-6877.
Identifiers: ISSN 0256-6877 (print) | ISSN 1564-5215 (online)
Subjects: LCSH: Economic development—Periodicals. | International economic relations—Periodicals. | Debts, External—Periodicals. | Balance of payments—Periodicals. | International finance—Periodicals. | Economic forecasting—Periodicals.
Classification: LCC HC10.W79

HC10.80

ISBN 978-1-47556-465-5 (paper)
978-1-47559-214-6 (Web PDF)
978-1-47559-211-5 (ePub)
978-1-47559-212-2 (Mobi)

The *World Economic Outlook* (WEO) is a survey by the IMF staff published twice a year, in the spring and fall. The WEO is prepared by the IMF staff and has benefited from comments and suggestions by Executive Directors following their discussion of the report on April 4, 2017. The views expressed in this publication are those of the IMF staff and do not necessarily represent the views of the IMF's Executive Directors or their national authorities.

Recommended citation: International Monetary Fund. 2017. *World Economic Outlook: Gaining Momentum?* Washington, April.

Publication orders may be placed online, by fax, or through the mail:
International Monetary Fund, Publication Services
P.O. Box 92780, Washington, DC 20090, U.S.A.
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ASSUMPTIONS AND CONVENTIONS

A number of assumptions have been adopted for the projections presented in the *World Economic Outlook* (WEO). It has been assumed that real effective exchange rates remained constant at their average levels during February 1 to March 1, 2017, except for those for the currencies participating in the European exchange rate mechanism II (ERM II), which are assumed to have remained constant in nominal terms relative to the euro; that established policies of national authorities will be maintained (for specific assumptions about fiscal and monetary policies for selected economies, see Box A1 in the Statistical Appendix); that the average price of oil will be $55.23 a barrel in 2017 and $55.06 a barrel in 2018 and will remain unchanged in real terms over the medium term; that the six-month London interbank offered rate (LIBOR) on U.S. dollar deposits will average 1.7 percent in 2017 and 2.8 percent in 2018; that the three-month euro deposit rate will average –0.3 percent in 2017 and –0.2 percent in 2018; and that the six-month Japanese yen deposit rate will yield on average 0.0 percent in 2017 and 2018. These are, of course, working hypotheses rather than forecasts, and the uncertainties surrounding them add to the margin of error that would in any event be involved in the projections. The estimates and projections are based on statistical information available through April 3, 2017.

The following conventions are used throughout the WEO:

. . . to indicate that data are not available or not applicable;

– between years or months (for example, 2016–17 or January–June) to indicate the years or months covered, including the beginning and ending years or months; and

/ between years or months (for example, 2016/17) to indicate a fiscal or financial year.

"Billion" means a thousand million; "trillion" means a thousand billion.

"Basis points" refers to hundredths of 1 percentage point (for example, 25 basis points are equivalent to ¼ of 1 percentage point).

Data refer to calendar years, except in the case of a few countries that use fiscal years. Please refer to Table F in the Statistical Appendix, which lists the economies with exceptional reporting periods for national accounts and government finance data for each country.

For some countries, the figures for 2016 and earlier are based on estimates rather than actual outturns. Please refer to Table G in the Statistical Appendix, which lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments indicators for each country.

- On October 1, 2016, the Chinese renminbi joined the U.S. dollar, euro, yen, and British pound in the IMF's SDR basket.
- Nauru is the latest country added to the WEO database, expanding it to a total of 192 countries.
- Belarus redenominated its currency by replacing 10,000 old Belarusian rubles with 1 new Belarusian ruble. Local currency data for Belarus are expressed in the new currency starting with the April 2017 WEO database.

In the tables and figures, the following conventions apply:

- If no source is listed on tables and figures, data are drawn from the WEO database.
- When countries are not listed alphabetically, they are ordered on the basis of economic size.
- Minor discrepancies between sums of constituent figures and totals shown reflect rounding.

As used in this report, the terms "country" and "economy" do not in all cases refer to a territorial entity that is a state as understood by international law and practice. As used here, the term also covers some territorial entities that are not states but for which statistical data are maintained on a separate and independent basis.

Composite data are provided for various groups of countries organized according to economic characteristics or region. Unless noted otherwise, country group composites represent calculations based on 90 percent or more of the weighted group data.

The boundaries, colors, denominations, and any other information shown on the maps do not imply, on the part of the International Monetary Fund, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

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The data appearing in the WEO are compiled by the IMF staff at the time of the WEO exercises. The historical data and projections are based on the information gathered by the IMF country desk officers in the context of their missions to IMF member countries and through their ongoing analysis of the evolving situation in each country. Historical data are updated on a continual basis as more information becomes available, and structural breaks in data are often adjusted to produce smooth series with the use of splicing and other techniques. IMF staff estimates continue to serve as proxies for historical series when complete information is unavailable. As a result, WEO data can differ from those in other sources with official data, including the IMF's International Financial Statistics.

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PREFACE

The analysis and projections contained in the *World Economic Outlook* are integral elements of the IMF's surveillance of economic developments and policies in its member countries, of developments in international financial markets, and of the global economic system. The survey of prospects and policies is the product of a comprehensive interdepartmental review of world economic developments, which draws primarily on information the IMF staff gathers through its consultations with member countries. These consultations are carried out in particular by the IMF's area departments—namely, the African Department, Asia and Pacific Department, European Department, Middle East and Central Asia Department, and Western Hemisphere Department—together with the Strategy, Policy, and Review Department; the Monetary and Capital Markets Department; and the Fiscal Affairs Department.

The analysis in this report was coordinated in the Research Department under the general direction of Maurice Obstfeld, Economic Counsellor and Director of Research. The project was directed by Gian Maria Milesi-Ferretti, Deputy Director, Research Department, and Oya Celasun, Division Chief, Research Department.

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Joseph Procopio from the Communications Department led the editorial team for the report, with production and editorial support from Michael Harrup, Christine Ebrahimzadeh, and Linda Kean and editorial assistance from Lucy Scott Morales, Sherrie Brown, and Vector Talent Resources.

The analysis has benefited from comments and suggestions by staff members from other IMF departments, as well as by Executive Directors following their discussion of the report on April 4, 2017. However, both projections and policy considerations are those of the IMF staff and should not be attributed to Executive Directors or to their national authorities.

FOREWORD

Consistently good economic news since summer 2016 is starting to add up to a brightening global outlook. The economic upswing that we have expected for some time seems to be materializing: indeed, the *World Economic Outlook* (WEO) raises its projection for 2017 global growth to 3.5 percent, up from our recently forecast 3.4 percent. Our 2018 forecast holds steady, with the world economy's growth set to rise to 3.6 percent next year. The expected growth improvements in 2017 and 2018 are broadly based, although growth remains tepid in many advanced economies, and commodity exporters continue to struggle.

At the same time, however, the upgrade to our 2017 forecast is modest, and longer-term potential growth rates remain subdued across the globe compared with past decades, especially in advanced economies. Moreover, while there is a chance growth will exceed expectations in the near term, significant downside risks continue to cloud the medium-term outlook, and indeed may have intensified since our last forecast. The gathering recovery remains vulnerable to a range of downside risks, which Chapter 1 of this WEO describes.

One salient threat is a turn toward protectionism, leading to trade warfare. Mainly in advanced economies, several factors—lower growth since the 2010–11 recovery from the global financial crisis, even slower growth of median incomes, and structural labor-market disruptions—have generated political support for zero-sum policy approaches that could undermine international trading relationships, along with multilateral cooperation more generally.

An approach to international economic policy based on collaboration among countries took root after World War II and has evolved in scope and geographic breadth. This evolution has not always been smooth, as a history of financial and currency crises in recent decades attests, but the global economy's coping mechanisms have until now proved resilient. One result has been a notable surge in growth in a number of emerging market and developing economies, some of which have reached high-income status. Chapter 2 of this report examines aspects of their convergence toward higher incomes.

Richer countries have continued to grow as well, but with less impressive income gains over the past 10 years when compared with previous decades, and certainly when compared with the more successful emerging market and developing economies. It is not surprising, therefore, that attitudes about international trade's effects on jobs and wages, as measured by leading surveys, tend to be more positive in poorer economies.

These findings may have less to do with the overall growth disparity between rich and poor countries than with the failure of growth gains in rich economies to substantially reach those in the lower parts of the income distribution in recent decades. Inequality remains substantial within poorer countries, but with more room for catch-up and higher growth under the right policies, they have been able to lift substantially the incomes of even their poorest citizens. International trade has been a key element in those success stories.

Global trends in inequality are related to trade, but owe much, and in many countries more, to technology changes—insofar as one can conceptually separate technological advance (which facilitates trade) from trade itself (which spreads technological know-how). Chapter 3 of this report explores how the forces of technology and trade have tended to lower labor's share of national income in many countries. A fall in labor's GDP share could, in theory, be a benign response to economic developments that raise workers' real incomes—for example, fast productivity growth that benefits capital even more than labor. However, where a fall in labor's share coincides with stagnant median incomes and a worsening income distribution, as has been the case in a number of advanced economies, political pressures to roll back economic integration with trading partners can follow.

Capitulating to those pressures would result in a self-inflicted wound, leading to higher prices for consumers and businesses, lower productivity, and therefore, lower overall real income for households.

Governments should instead follow trade policies consistent with maximum productivity, supplementing those with other policies that better distribute the gains from foreign trade internally, improve the skills and adaptability of their workforces, and smooth the process of adjustment for those adversely affected by the need for economic reallocation. Unfortunately, governments often find it harder to make such domestic improvements than to restrict trade. But they need to be aware that the gains that such an approach may yield for some at home come at the expense of others in the domestic economy in addition to foreign trade partners. Even the sectoral gains from curbing cross-border economic integration disappear, and losses worsen, when trade partners retaliate in kind.

Policymakers instead must do the hard work of investing in their economies, especially in people, to create greater resilience to a host of potential and ongoing structural changes—including the changing modalities of globalization. Useful reforms can focus on active labor market policies, greater tax progressivity where helpful, more effective investment in education, and changes to housing and credit markets that facilitate worker mobility.

Many of these policies not only ease economic adjustment, but they also raise potential output over the longer term. They are key components of the set of monetary, fiscal, structural, and financial sector policies that will strengthen and secure the recovery over time.

The global economy seems to be gaining momentum—we could be at a turning point. But even as things look up, the post–World War II system of international economic relations is under severe strain despite the aggregate benefits it has delivered—and precisely because growth and the resulting economic adjustments have too often entailed unequal rewards and costs within countries. Policy must address these disparities head-on to ensure the stability of an open, collaborative trading system that benefits all.

Maurice Obstfeld
Economic Counsellor

EXECUTIVE SUMMARY

With buoyant financial markets and a long-awaited cyclical recovery in manufacturing and trade under way, world growth is projected to rise from 3.1 percent in 2016 to 3.5 percent in 2017 and 3.6 percent in 2018, slightly above the October 2016 World Economic Outlook *(WEO) forecast. But binding structural impediments continue to hold back a stronger recovery, and the balance of risks remains tilted to the downside, especially over the medium term. With persistent structural problems—such as low productivity growth and high income inequality—pressures for inward-looking policies are increasing in advanced economies. These threaten global economic integration and the cooperative global economic order that has served the world economy, especially emerging market and developing economies, well. Against this backdrop, economic policies have an important role to play in staving off downside risks and securing the recovery. On the domestic front, policies should aim to support demand and repair balance sheets where necessary and feasible; boost productivity, labor supply, and investment through structural reforms and supply-friendly fiscal measures; upgrade the public infrastructure; and support those displaced by structural transformations such as technological change and globalization. At the same time, credible strategies are needed in many countries to place public debt on a sustainable path. Adjusting to lower commodity revenues and addressing financial vulnerabilities remain key challenges for many emerging market and developing economies. A renewed multilateral effort is also needed to tackle common challenges in an integrated global economy.*

The world economy gained speed in the fourth quarter of 2016 and the momentum is expected to persist. Global growth is projected to increase from an estimated 3.1 percent in 2016 to 3.5 percent in 2017 and 3.6 percent in 2018.

Activity is projected to pick up markedly in emerging market and developing economies because conditions in commodity exporters experiencing macroeconomic strains are gradually expected to improve, supported by the partial recovery in commodity prices, while growth is projected to remain strong in China and many other commodity importers. In advanced economies, the pickup is primarily driven by higher projected growth in the United States, where activity was held back in 2016 by inventory adjustment and weak investment.

Although changes to the global growth forecast for 2017 and 2018 since the October 2016 WEO are small, there have been meaningful changes to forecasts for country groups and individual countries. In line with stronger-than-expected momentum in the second half of 2016, the forecast envisages a stronger rebound in advanced economies. And while growth is still expected to pick up notably for the emerging market and developing economies group, weaker-than-expected activity in some large countries has led to small downward revisions to the group's growth prospects for 2017.

- For advanced economies, projected growth has been revised upward in the United States, reflecting the assumed fiscal policy easing and an uptick in confidence, especially after the November elections, which, if it persists, will reinforce the cyclical momentum. The outlook has also improved for Europe and Japan based on a cyclical recovery in global manufacturing and trade that started in the second half of 2016.
- The downward revisions to growth forecasts for emerging market and developing economies result from a weaker outlook in several large economies, especially in Latin America and the Middle East, reflecting continued adjustment to the decline in their terms of trade in recent years, oil production cuts, and idiosyncratic factors. The 2017 and 2018 growth forecasts have been marked up for China, reflecting stronger-than-expected policy support, as well as for Russia, where activity appears to have bottomed out and higher oil prices bolster the recovery.

Since the U.S. election, expectations of looser fiscal policy in the United States have contributed to a stronger dollar and higher U.S. Treasury interest rates, pushing up yields elsewhere as well. Market sentiment has generally been strong, with notable

gains in equity markets in both advanced and emerging market economies. Stronger activity and expectations of more robust global demand going forward, coupled with agreed restrictions on oil supply, have helped commodity prices recover from their troughs of early 2016.

Headline inflation has been picking up in advanced economies due to higher commodity prices, but core inflation dynamics remain subdued and heterogeneous (consistent with diversity in output gaps). Core inflation has improved little where it had been the weakest (for instance, in Japan and parts of the euro area). Headline inflation has also picked up in many emerging market and developing economies due to higher commodity prices, but in a number of cases it has receded as pass-through from the sharp currency depreciations in 2015 and early 2016 continues to fade.

Risks remain skewed to the downside, however, especially over the medium term, with pervasive uncertainty surrounding policies. Buoyant market sentiment implies that there is now more tangible upside potential for the near term, but in light of the sources of uncertainties discussed below, a sharp increase in risk aversion is possible. Risks to medium-term growth appear more clearly negative, also because policy support in the United States and China will have to be unwound or reversed down the road to avoid unsustainable fiscal dynamics. More generally, downside risks stem from several potential factors:

- An inward shift in policies, including toward protectionism, with lower global growth caused by reduced trade and cross-border investment flows
- A faster-than-expected pace of interest rate hikes in the United States, which could trigger a more rapid tightening in global financial conditions and a sharp dollar appreciation, with adverse repercussions for vulnerable economies
- An aggressive rollback of financial regulation, which could spur excessive risk taking and increase the likelihood of future financial crises
- Financial tightening in emerging market economies, made more likely by mounting vulnerabilities in China's financial system associated with fast credit growth and continued balance sheet weaknesses in other emerging market economies
- Adverse feedback loops among weak demand, low inflation, weak balance sheets, and anemic productivity growth in some advanced economies operating with high levels of excess capacity
- Noneconomic factors, including geopolitical tensions, domestic political discord, risks from weak governance and corruption, extreme weather events, and terrorism and security concerns

These risks are interconnected and can be mutually reinforcing. For example, an inward turn in policies could be associated with increased geopolitical tensions as well as with rising global risk aversion; noneconomic shocks can weigh directly on economic activity as well as harm confidence and market sentiment; and a faster-than-anticipated tightening of global financial conditions or a shift toward protectionism in advanced economies could exacerbate capital outflow pressures in China.

Policy choices will therefore be crucial in shaping the outlook and reducing risks. Priorities for macroeconomic demand management are increasingly differentiated, given the diversity in cyclical positions. In economies with slack and persistently weak core inflation, cyclical demand support remains necessary, including to stave off pernicious hysteresis effects. In economies where output is close to or above potential, fiscal policy should aim at strengthening safety nets and increasing potential output. At the same time, credible strategies are needed in many countries to place public debt on a sustainable path.

Following a lackluster recovery from the global financial crisis, and in the aftermath of the sharp adjustment of global commodity prices, many economies are seeking to enhance growth potential, inclusiveness, and resilience. Actions to bolster potential output are indeed urgent given persistent headwinds from population aging in advanced economies, the ongoing adjustment to lower terms of trade and the need to address financial vulnerabilities in emerging market and developing economies, as well as sluggish total factor productivity growth in both groups. Chapter 2 documents that trade openness, exchange rate flexibility, and strong institutions help emerging market and developing economies enhance the growth impulse from external conditions. Facing ever-present risks of global financial volatility, emerging market economies vulnerable to an adverse turn in external financial conditions would benefit from adopting stronger risk management practices and containing balance sheet mismatches.

Preserving the global economic expansion will also require policymakers to avoid protectionist measures

and to do more to ensure that gains from growth are shared more widely. Chapter 3 documents that wages have not kept up with productivity in many economies over much of the past three decades, leading to a decline in labor's share of national income. The chapter's analysis suggests that technological change and trade integration—both of which are drivers of medium- and long-term growth—have likely contributed to the decline. The chapter's findings suggest that technological change has been the dominant driver of the labor share in advanced economies whereas trade integration (and the attendant increase in the capital intensity of production) has been the dominant driver in the case of emerging market economies. These findings highlight the need to make growth more inclusive. Possible policy levers include more progressive taxation; investments in skills, lifelong learning, and high-quality education; and other efforts to enhance the occupational and geographical mobility of workers to ease and hasten labor market adjustments to structural transformations.

Many of the challenges that the global economy confronts call for individual country actions to be supported by multilateral cooperation. Key areas for collective action include preserving an open trading system, safeguarding global financial stability, achieving equitable tax systems, continuing to support low-income countries as they pursue their development goals, and mitigating and adapting to climate change.

CHAPTER 1

GLOBAL PROSPECTS AND POLICIES

Global economic activity is picking up with a long-awaited cyclical recovery in investment, manufacturing, and trade. World growth is expected to rise from 3.1 percent in 2016 to 3.5 percent in 2017 and 3.6 percent in 2018, slightly above the October 2016 World Economic Outlook *(WEO) forecast. Stronger activity and expectations of more robust global demand, coupled with agreed restrictions on oil supply, have helped commodity prices recover from their troughs in early 2016. Higher commodity prices have provided some relief to commodity exporters and helped lift global headline inflation and reduce deflationary pressures. Financial markets are buoyant and expect continued policy support in China and fiscal expansion and deregulation in the United States. If confidence and market sentiment remain strong, short-term growth could indeed surprise on the upside.*

But these positive developments should not distract from binding structural impediments to a stronger recovery and a balance of risks that remains tilted to the downside, especially over the medium term. Structural problems—such as low productivity growth and high income inequality—are likely to persist. Inward-looking policies threaten global economic integration and the cooperative global economic order, which have served the world economy, especially emerging market and developing economies, well. A faster-than-expected pace of interest rate hikes in the United States could tighten financial conditions elsewhere, with potential further U.S. dollar appreciation straining emerging market economies with exchange rate pegs to the dollar or with material balance sheet mismatches. More generally, a reversal in market sentiment and confidence could tighten financial conditions and exacerbate existing vulnerabilities in a number of emerging market economies, including China—which faces the daunting challenge of reducing its reliance on credit growth. A dilution of financial regulation may lead to stronger near-term growth but may imperil global financial stability and raise the risk of costly financial crises down the road. In addition, the threat of deepening geopolitical tensions persists, especially in the Middle East and North Africa.

Against this backdrop, economic policies have an important role to play in staving off downside risks and securing the recovery, as stressed in previous WEOs. On the domestic front, policies should support demand and balance sheet repair where necessary and feasible; boost productivity through structural reforms, well-targeted infrastructure spending, and other supply-friendly fiscal policy measures; and support those displaced by structural transformations, such as technological change and globalization. Credible strategies are needed in many countries to place public debt on a sustainable path. Adjusting to lower commodity revenues and addressing financial vulnerabilities remain key challenges for many emerging market and developing economies. The world also needs a renewed multilateral effort to tackle a number of common challenges in an integrated global economy.

Recent Developments and Prospects

World Economy Gaining Momentum

Economic activity gained some momentum in the second half of 2016, especially in advanced economies. Growth picked up in the United States as firms grew more confident about future demand, and inventories started contributing positively to growth (after five quarters of drag). Growth also remained solid in the United Kingdom, where spending proved resilient in the aftermath of the June 2016 referendum in favor of leaving the European Union (Brexit). Activity surprised on the upside in Japan thanks to strong net exports, as well as in euro area countries, such as Germany and Spain, as a result of strong domestic demand.

Economic performance across emerging market and developing economies has remained mixed. Whereas China's growth remained strong, reflecting continued policy support, activity has slowed in India because of the impact of the currency exchange initiative, as well as in Brazil, which has been mired in a deep recession. Activity remained weak in fuel and nonfuel commodity exporters more generally, while geopolitical factors held back growth in parts of the Middle East and Turkey.

Table 1.1. Overview of the *World Economic Outlook* Projections

(Percent change, unless noted otherwise)

		Projections		Difference from January 2017 *WEO Update*[1]		Difference from October 2016 WEO[1]	
	2016	2017	2018	2017	2018	2017	2018
World Output	**3.1**	**3.5**	**3.6**	**0.1**	**0.0**	**0.1**	**0.0**
Advanced Economies	**1.7**	**2.0**	**2.0**	**0.1**	**0.0**	**0.2**	**0.2**
United States	1.6	2.3	2.5	0.0	0.0	0.1	0.4
Euro Area	1.7	1.7	1.6	0.1	0.0	0.2	0.0
Germany	1.8	1.6	1.5	0.1	0.0	0.2	0.1
France	1.2	1.4	1.6	0.1	0.0	0.1	0.0
Italy	0.9	0.8	0.8	0.1	0.0	–0.1	–0.3
Spain	3.2	2.6	2.1	0.3	0.0	0.4	0.2
Japan[2]	1.0	1.2	0.6	0.4	0.1	0.6	0.1
United Kingdom	1.8	2.0	1.5	0.5	0.1	0.9	–0.2
Canada	1.4	1.9	2.0	0.0	0.0	0.0	0.1
Other Advanced Economies[3]	2.2	2.3	2.4	0.1	0.0	0.0	0.0
Emerging Market and Developing Economies	**4.1**	**4.5**	**4.8**	**0.0**	**0.0**	**–0.1**	**0.0**
Commonwealth of Independent States	0.3	1.7	2.1	0.2	0.3	0.3	0.4
Russia	–0.2	1.4	1.4	0.3	0.2	0.3	0.2
Excluding Russia	1.8	2.5	3.5	0.0	0.2	0.2	0.6
Emerging and Developing Asia	6.4	6.4	6.4	0.0	0.1	0.1	0.1
China	6.7	6.6	6.2	0.1	0.2	0.4	0.2
India[4]	6.8	7.2	7.7	0.0	0.0	–0.4	0.0
ASEAN-5[5]	4.9	5.0	5.2	0.1	0.0	–0.1	0.0
Emerging and Developing Europe	3.0	3.0	3.3	–0.1	0.1	–0.1	0.1
Latin America and the Caribbean	–1.0	1.1	2.0	–0.1	–0.1	–0.5	–0.2
Brazil	–3.6	0.2	1.7	0.0	0.2	–0.3	0.2
Mexico	2.3	1.7	2.0	0.0	0.0	–0.6	–0.6
Middle East, North Africa, Afghanistan, and Pakistan	3.9	2.6	3.4	–0.5	–0.1	–0.8	–0.2
Saudi Arabia	1.4	0.4	1.3	0.0	–1.0	–1.6	–1.3
Sub-Saharan Africa	1.4	2.6	3.5	–0.2	–0.2	–0.3	–0.1
Nigeria	–1.5	0.8	1.9	0.0	–0.4	0.2	0.3
South Africa	0.3	0.8	1.6	0.0	0.0	0.0	0.0
Memorandum							
European Union	2.0	2.0	1.8	0.2	0.0	0.3	0.0
Low-Income Developing Countries	3.6	4.7	5.3	0.0	–0.1	–0.2	0.1
Middle East and North Africa	3.8	2.3	3.2	–0.6	–0.1	–0.9	–0.2
World Growth Based on Market Exchange Rates	2.4	2.9	3.0	0.1	0.0	0.1	0.1
World Trade Volume (goods and services)	**2.2**	**3.8**	**3.9**	**0.0**	**–0.2**	**0.0**	**–0.3**
Imports							
Advanced Economies	2.4	4.0	4.0	0.2	–0.2	0.1	–0.2
Emerging Market and Developing Economies	1.9	4.5	4.3	0.3	–0.4	0.4	–0.2
Exports							
Advanced Economies	2.1	3.5	3.2	0.1	–0.2	0.0	–0.8
Emerging Market and Developing Economies	2.5	3.6	4.3	–0.1	–0.3	0.0	0.1
Commodity Prices (U.S. dollars)							
Oil[6]	–15.7	28.9	–0.3	9.0	–3.9	11.0	–5.1
Nonfuel (average based on world commodity export weights)	–1.9	8.5	–1.3	6.4	–0.4	7.6	–0.6
Consumer Prices							
Advanced Economies	0.8	2.0	1.9	0.3	0.0	0.3	0.0
Emerging Market and Developing Economies[7]	4.4	4.7	4.4	0.2	0.0	0.3	0.2
London Interbank Offered Rate (percent)							
On U.S. Dollar Deposits (six month)	1.1	1.7	2.8	0.0	0.0	0.4	0.7
On Euro Deposits (three month)	–0.3	–0.3	–0.2	0.0	0.0	0.1	0.2
On Japanese Yen Deposits (six month)	0.0	0.0	0.0	0.0	0.0	0.1	0.1

Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during February 1–March 1, 2017. Economies are listed on the basis of economic size. The aggregated quarterly data are seasonally adjusted.

[1]Difference based on rounded figures for the current, January 2017 *World Economic Outlook Update*, and October 2016 *World Economic Outlook* forecasts.

[2]Japan's historical national accounts figures reflect a comprehensive revision by the national authorities, released in December 2016. The main revisions are the switch from the System of National Accounts 1993 to the System of National Accounts 2008 and the updating of the benchmark year from 2005 to 2011.

[3]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[4]For India, data and forecasts are presented on a fiscal year basis and GDP from 2011 onward is based on GDP at market prices with FY2011/12 as a base year.

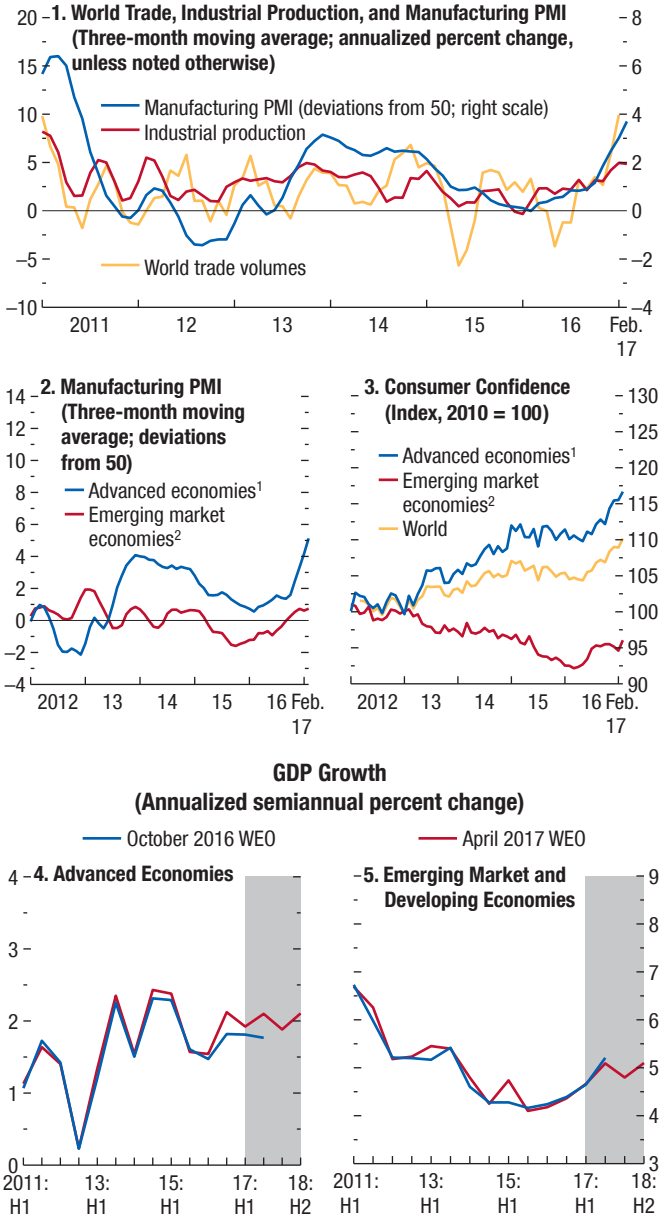
Table 1.1 *(continued)*

	Year-over-Year				Q4-over-Q4[8]			
			Projections				Projections	
	2015	2016	2017	2018	2015	2016	2017	2018
World Output	**3.4**	**3.1**	**3.5**	**3.6**	**3.2**	**3.2**	**3.5**	**3.6**
Advanced Economies	**2.1**	**1.7**	**2.0**	**2.0**	**1.8**	**2.0**	**2.0**	**2.0**
United States	2.6	1.6	2.3	2.5	1.9	2.0	2.3	2.5
Euro Area	2.0	1.7	1.7	1.6	2.0	1.7	1.7	1.5
Germany	1.5	1.8	1.6	1.5	1.3	1.8	1.7	1.5
France	1.3	1.2	1.4	1.6	1.2	1.2	1.9	1.4
Italy	0.8	0.9	0.8	0.8	1.0	1.0	0.8	0.8
Spain	3.2	3.2	2.6	2.1	3.5	3.0	2.3	2.1
Japan[2]	1.2	1.0	1.2	0.6	1.2	1.6	1.0	0.6
United Kingdom	2.2	1.8	2.0	1.5	1.7	1.9	1.7	1.5
Canada	0.9	1.4	1.9	2.0	0.4	1.9	1.7	2.0
Other Advanced Economies[3]	2.0	2.2	2.3	2.4	2.0	2.4	2.4	2.6
Emerging Market and Developing Economies	**4.2**	**4.1**	**4.5**	**4.8**	**4.4**	**4.4**	**4.8**	**5.0**
Commonwealth of Independent States	–2.2	0.3	1.7	2.1	–2.8	0.7	1.6	1.6
Russia	–2.8	–0.2	1.4	1.4	–3.0	0.4	1.6	1.3
Excluding Russia	–0.5	1.8	2.5	3.5	. . .	. . .	. . .	. . .
Emerging and Developing Asia	6.7	6.4	6.4	6.4	6.8	6.5	6.5	6.3
China	6.9	6.7	6.6	6.2	6.8	6.8	6.4	6.1
India[4]	7.9	6.8	7.2	7.7	8.5	6.9	7.8	7.6
ASEAN-5[5]	4.8	4.9	5.0	5.2	4.9	4.8	5.1	5.3
Emerging and Developing Europe	4.7	3.0	3.0	3.3	4.9	3.4	2.1	3.4
Latin America and the Caribbean	0.1	–1.0	1.1	2.0	–1.1	–1.1	1.6	2.1
Brazil	–3.8	–3.6	0.2	1.7	–5.8	–2.5	2.0	1.7
Mexico	2.6	2.3	1.7	2.0	2.4	2.4	0.9	3.0
Middle East, North Africa, Afghanistan, and Pakistan	2.7	3.9	2.6	3.4	. . .	. . .	. . .	. . .
Saudi Arabia	4.1	1.4	0.4	1.3	4.3	1.2	0.4	2.0
Sub-Saharan Africa	3.4	1.4	2.6	3.5	. . .	. . .	. . .	. . .
Nigeria	2.7	–1.5	0.8	1.9	. . .	. . .	. . .	. . .
South Africa	1.3	0.3	0.8	1.6	0.3	0.4	1.0	1.9
Memorandum								
European Union	2.4	2.0	2.0	1.8	2.3	2.0	1.9	1.8
Low-Income Developing Countries	4.6	3.6	4.7	5.3	. . .	. . .	. . .	. . .
Middle East and North Africa	2.6	3.8	2.3	3.2	. . .	. . .	. . .	. . .
World Growth Based on Market Exchange Rates	2.7	2.4	2.9	3.0	2.4	2.6	2.9	2.9
World Trade Volume (goods and services)	**2.7**	**2.2**	**3.8**	**3.9**	**. . .**	**. . .**	**. . .**	**. . .**
Imports								
Advanced Economies	4.4	2.4	4.0	4.0	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	–0.8	1.9	4.5	4.3	. . .	. . .	. . .	. . .
Exports								
Advanced Economies	3.7	2.1	3.5	3.2	. . .	. . .	. . .	. . .
Emerging Market and Developing Economies	1.4	2.5	3.6	4.3	. . .	. . .	. . .	. . .
Commodity Prices (U.S. dollars)								
Oil[6]	–47.2	–15.7	28.9	–0.3	–43.4	16.2	13.5	–2.0
Nonfuel (average based on world commodity export weights)	–17.4	–1.9	8.5	–1.3	–19.1	9.8	3.9	–1.0
Consumer Prices								
Advanced Economies	0.3	0.8	2.0	1.9	0.4	1.2	1.9	2.0
Emerging Market and Developing Economies[7]	4.7	4.4	4.7	4.4	4.7	4.0	4.1	3.9
London Interbank Offered Rate (percent)								
On U.S. Dollar Deposits (six month)	0.5	1.1	1.7	2.8	. . .	. . .	. . .	. . .
On Euro Deposits (three month)	0.0	–0.3	–0.3	–0.2	. . .	. . .	. . .	. . .
On Japanese Yen Deposits (six month)	0.1	0.0	0.0	0.0	. . .	. . .	. . .	. . .

[5]Indonesia, Malaysia, Philippines, Thailand, Vietnam.
[6]Simple average of prices of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars a barrel was $42.84 in 2016; the assumed price based on futures markets is $55.23 in 2017 and $55.06 in 2018.
[7]Excludes Argentina and Venezuela. See country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.
[8]For World Output, the quarterly estimates and projections account for approximately 90 percent of annual world output at purchasing-power-parity weights. For Emerging Market and Developing Economies, the quarterly estimates and projections account for approximately 80 percent of annual emerging market and developing economies' output at purchasing-power-parity weights.

Figure 1.1. Global Activity Indicators

Global economic activity gained momentum in the fourth quarter of 2016. Manufacturing PMIs and consumer confidence increased noticeably in advanced economies in the last few months of 2016 and early 2017. They also recovered to a more modest extent in emerging market economies.



Sources: CPB Netherlands Bureau for Economic Policy Analysis; Haver Analytics; Markit Economics; and IMF staff estimates.
Note: CC = consumer confidence; PMI = purchasing managers' index.
[1]Australia, Canada (PMI only), Czech Republic, Denmark, euro area, Hong Kong SAR (CC only), Israel, Japan, Korea, New Zealand (PMI only), Norway (CC only), Singapore (PMI only), Sweden (CC only), Switzerland, Taiwan Province of China, United Kingdom, United States.
[2]Argentina (CC only), Brazil, China, Colombia (CC only), Hungary, India (PMI only), Indonesia, Latvia (CC only), Malaysia (PMI only), Mexico (PMI only), Philippines (CC only), Poland, Russia, South Africa, Thailand (CC only), Turkey, Ukraine (CC only).

Indicators of Economic Activity

In the second half of 2016, the stronger global momentum in demand—investment in particular—resulted in marked improvements in manufacturing and trade, which were very weak in late 2015 and early 2016 (Figure 1.1, panel 1).

Production of both consumer durables and capital goods rebounded in the second half of 2016 (Figure 1.2). A number of factors contributed to these developments: a gradual global recovery in investment, supported by infrastructure and real estate investment in China, reduced drag from adjustment to lower commodity prices, and the end of an inventory cycle in United States. Forward-looking indicators, such as purchasing managers' indices, suggest continued strength in manufacturing activity into early 2017.

Consistent with indications of firming global manufacturing activity, global trade is showing some signs of recovery after a long period of weakness (Figure 1.3, panel 1). As discussed in Chapter 2 of the October 2016 WEO, trade growth—in particular, growth in imports—is strongly correlated with investment dynamics. This pattern is illustrated for a cross-section of advanced economies (Figure 1.3, panel 2) and emerging market economies (Figure 1.3, panel 3) for 2016. Panel 3, in particular, highlights the sharp contractions in trade and investment in several commodity exporters during 2016, a pattern similar to the one for the previous year. The gradual stabilization of macroeconomic conditions in these economies, also supported by some rebound in commodity prices, should lead to a gradual recovery in imports and investment in 2017 and beyond, as discussed in more detail in the section titled "The Forecast."

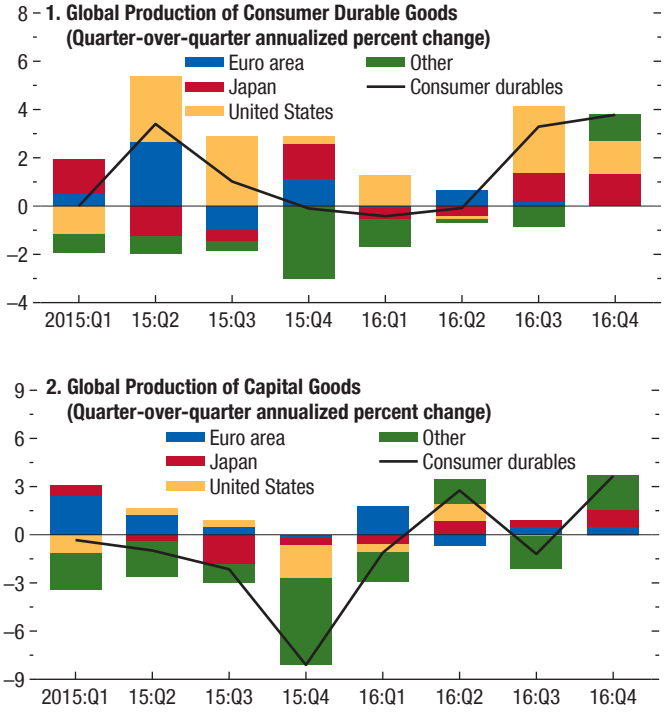
Commodity Prices and Markets

Alongside the pickup in economic activity, commodity prices have also strengthened (see the Commodity Special Feature for more details). The IMF's Primary Commodities Price Index increased by 15 percent between August 2016 and February 2017—that is, between the reference periods for the October 2016 and the current WEO reports (Figure 1.4). Some of the strongest price increases were for fuels:

- Oil prices increased by some 20 percent between August 2016 and February 2017, in part due to the agreement by the Organization of the Petroleum Exporting Countries (OPEC) and other producers to cut oil production. Stronger activity and expec-

Figure 1.2. Recent Trends in Global Production

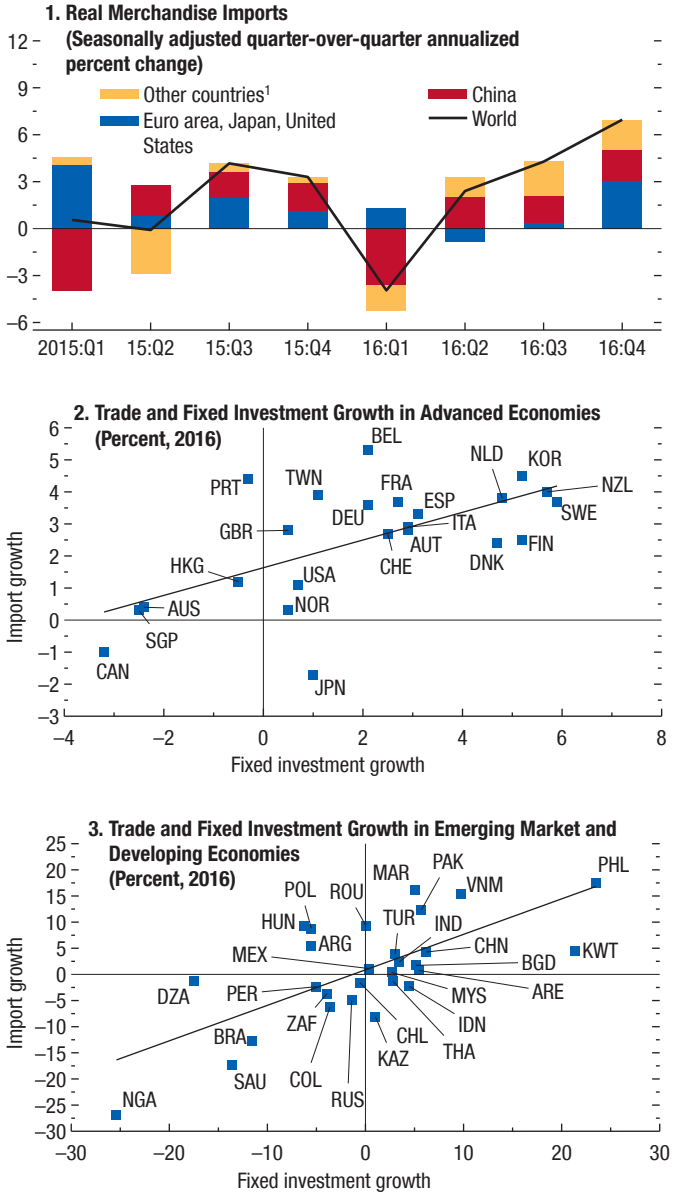
The production of both consumer durables and capital goods recovered in late 2016, after several quarters of lackluster growth or contraction.



Source: IMF staff estimates.
Note: Euro area data are through November 2016. Other = Brazil, India, Korea, Norway, Sweden, Switzerland, Taiwan Province of China, Turkey, United Kingdom.

Figure 1.3. Global Trade and Fixed Investment Growth

Real import growth picked up in the second half of 2016, consistent with the firming in investment.



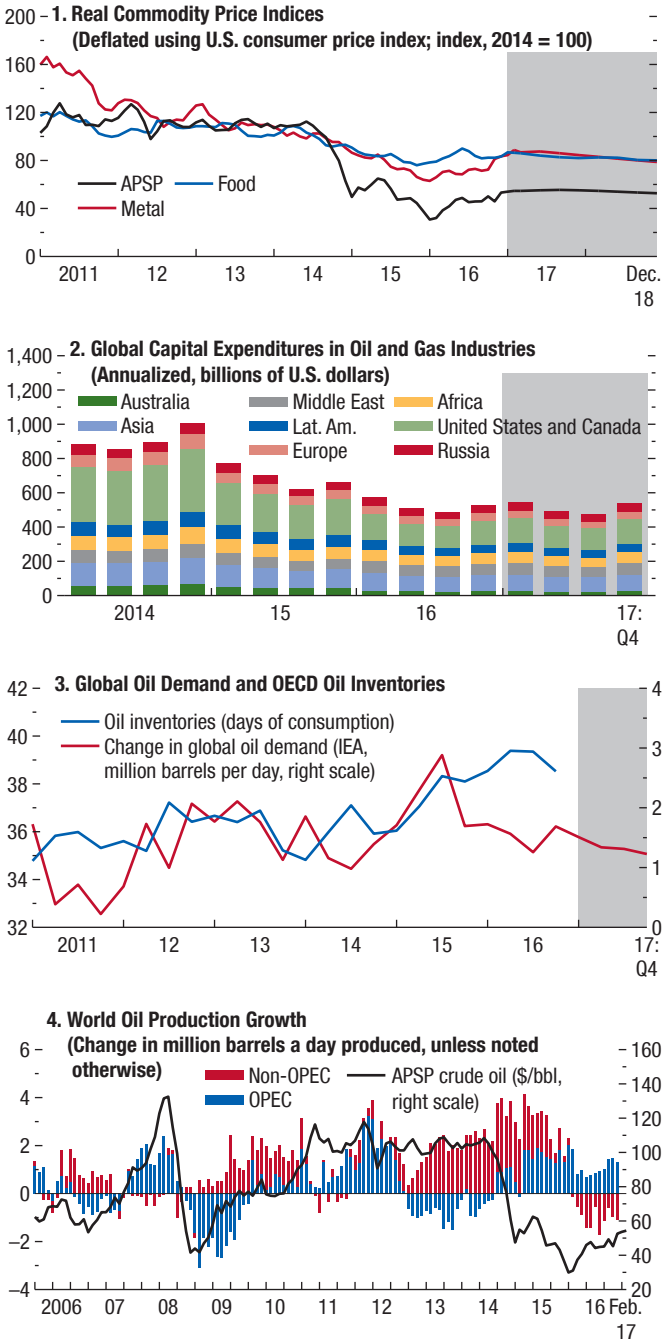
Source: IMF staff estimates.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Other countries = Brazil, Bulgaria, Canada, Czech Republic, Denmark, Hong Kong SAR, Korea, Malaysia, Mexico, Peru, Singapore, South Africa, Sweden, Switzerland, Taiwan Province of China, Thailand, Turkey, United Kingdom.

tations of more robust future global demand also contributed to strengthening oil prices since their troughs in early 2016. Following some weakening in recent weeks, oil prices stood at about $50 a barrel as of end-March, still some 12 percent stronger than in August 2016.

- Natural gas prices have increased—as of February 2017 the average price for Europe, Japan, and the United States was up by about 19 percent relative to August 2016. In Europe, natural gas prices have risen following higher oil prices. While prices in Asia and the United States initially rose because of expectations of strong winter demand, a fairly mild winter led to subdued demand for gas-fired power generation and helped contain gas prices.
- Coal prices have rallied, with the average of Australian and South African prices in February 2017 more than 20 percent higher than in August 2016. That rally has followed government-led reductions

Figure 1.4. Commodity and Oil Markets

Commodity prices have strengthened as global economic activity has gained momentum.



Sources: IMF, Primary Commodity Price System; International Energy Agency (IEA); Organisation for Economic Co-operation and Development; and IMF staff estimates.
Note: In panel 2, 2017 projections are based on investment plans. APSP = average petroleum spot price; bbl = barrel; Lat. Am. = Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay); OPEC = Organization of the Petroleum Exporting Countries.

in coal production in China and production and shipment outages in Australia.

Among nonfuel commodities, metal prices have increased by 23.6 percent and agricultural commodity prices by 4.3 percent.

- Metal prices have been supported by higher real estate investment and capacity reduction efforts in China and the anticipated fiscal policy easing in the United States.
- Among agricultural commodities, food prices rose by 4.9 percent as excess supply eased, especially for grains and vegetable oils. Prices have increased for most items, except for a few, including rice and cocoa beans.

Inflation Developments

The increase in commodity prices has contributed to a recovery in global inflation since August (Figure 1.5). The increase in global producer price inflation has been particularly marked, reflecting both the greater weight of commodities in producer price indices when compared with consumer price indices and their importance as intermediate inputs in production. Notably, China's producer prices have emerged from deflation after four years, reflecting higher raw material prices as well as efforts to reduce excess industrial capacity and recovering real estate investment.

Global consumer price inflation has also ticked up as the retail prices of gasoline and other energy-related products have increased. The uptick has been especially strong for advanced economies, where 12-month consumer price inflation in February stood slightly above 2 percent (more than double the average annual inflation rate of 0.8 percent in 2016). By contrast, core inflation has increased much less—if at all—and remains well below central bank targets in almost all advanced economies. In emerging market economies, the revival in headline consumer inflation is more recent, as the impact of higher fuel prices has only of late started to outweigh the downward pressure from the fading of earlier exchange rate depreciations.

Near- and longer-term inflation expectations also remain subdued. Survey-based consumer price inflation expectations for 2017 have only very recently stopped falling for advanced economies, and expected inflation for the next 10 years has only recently registered an increase after declining steadily in 2015 and 2016 (Figure 1.5, panels 5 and 6).

Financial Market Developments

Market sentiment has strengthened since August, reflecting generally positive data on the outlook as well as expectations of a fiscal stimulus, higher infrastructure investment, and deregulation in the United States.

With stronger future demand suggesting more inflation pressure and a less gradual normalization of U.S. monetary policy, long-term nominal and real interest rates have risen substantially since August, especially since the U.S. elections in November (Figure 1.6). As of end-March, nominal yields on 10-year U.S. Treasury bonds had increased by some 85 basis points compared with August and 55 basis points compared with just before the U.S. election. Long-term rates increased sharply in the United Kingdom as well, reflecting spillovers from higher U.S. rates and expectations of a less accommodative monetary policy stance going forward, given rising inflation pressure. The increase in core euro area long-term yields after August was more moderate—about 40 basis points in Germany—but Italian yields rose more sharply (about 120 basis points), reflecting elevated political and banking sector uncertainties. The U.S. Federal Reserve raised short-term interest rates in December 2016 and March 2017, as expected, with markets pricing in two additional rate increases by the end of 2017 or early 2018. In most other advanced economies, the monetary policy stance has remained broadly unchanged.

Equity markets in advanced economies have registered sizable gains in recent months, amid strengthening consumer confidence and positive macroeconomic data. As discussed in more detail in the April 2017 *Global Financial Stability Report* (GFSR), gains have been notable for sectors that are particularly exposed to potential fiscal stimulus measures as well as for financial stocks. Higher valuations of financial stocks reflect both welcome developments, such as the favorable impact of steepening yield curves and higher growth on expected profitability, as well as factors that could heighten downside risks, such as the possibility of some rollback in financial regulation in the United States.

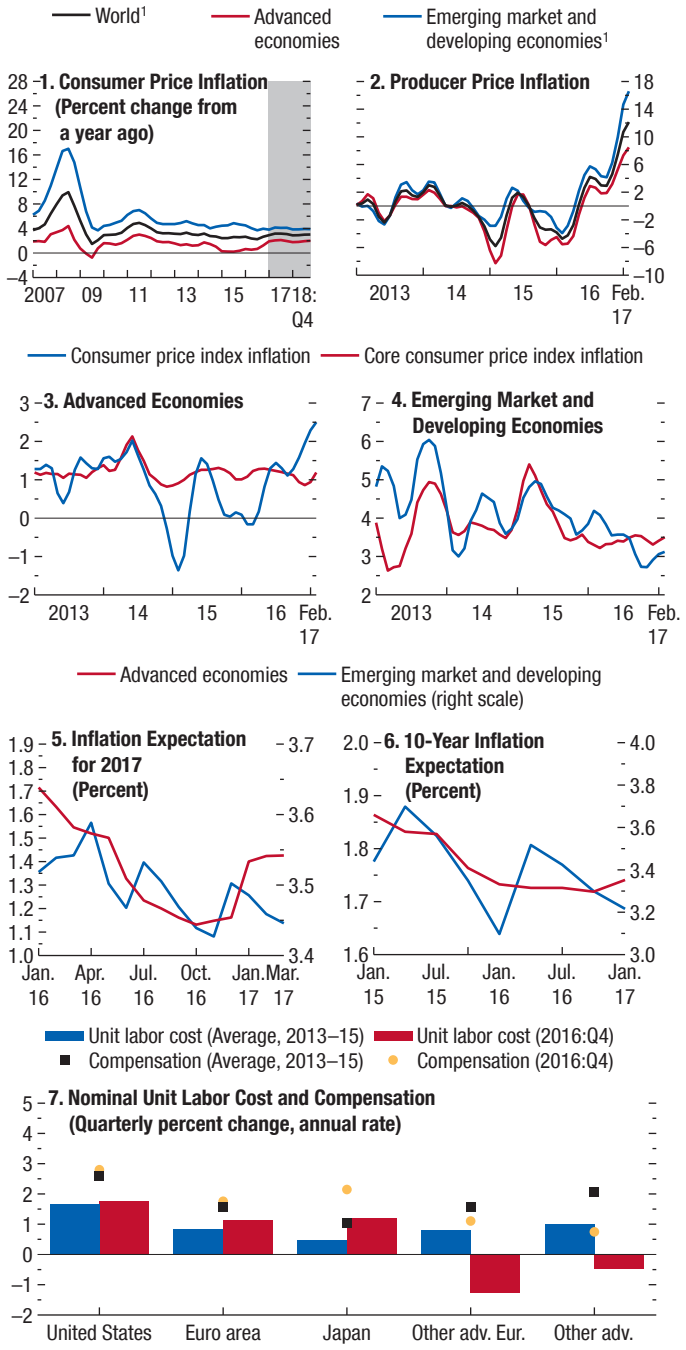
With widening interest differentials, the U.S. dollar has strengthened in real effective terms by about 3.5 percent between August 2016 and late March 2017 (Figure 1.7, panel 1), whereas the euro and especially the Japanese yen have weakened.

In emerging market economies, financial conditions have been diverse. Long-term interest rates on local-currency bonds rose in the aftermath of the U.S. elections,

Figure 1.5. Global Inflation

(Three-month moving average; annualized percent change, unless noted otherwise)

Higher commodity prices have pushed up global headline inflation. Core inflation remains subdued, especially in advanced economies.

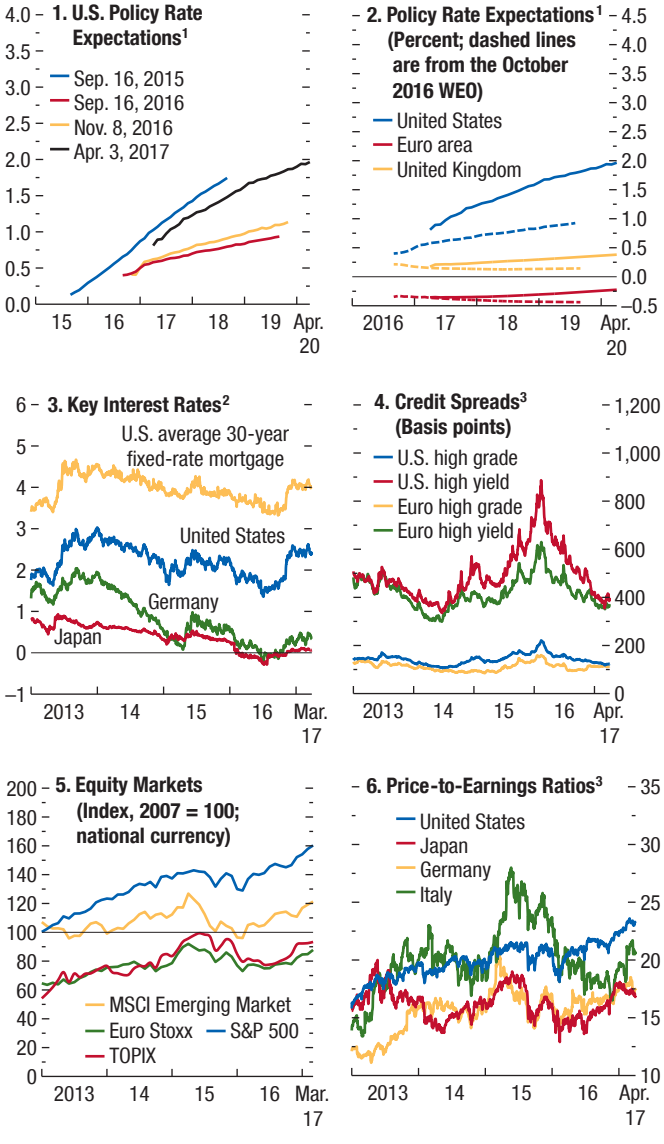


Sources: Consensus Economics; Haver Analytics; IMF, Primary Commodity Price System; and IMF staff estimates.
Note: Other adv. Eur. = other advanced Europe (Iceland, Norway, Sweden, Switzerland, United Kingdom); Other adv. = other advanced economies (Australia, Canada, New Zealand). All quarterly data are seasonally adjusted.
[1]Excludes Argentina and Venezuela.

Figure 1.6. Advanced Economies: Monetary and Financial Market Conditions

(Percent, unless noted otherwise)

With markets expecting a less gradual normalization of U.S. monetary policy, long-term nominal real rates have risen in the United States, pushing up longer-term rates elsewhere as well. Equity markets in advanced economies have registered strong gains in recent months.

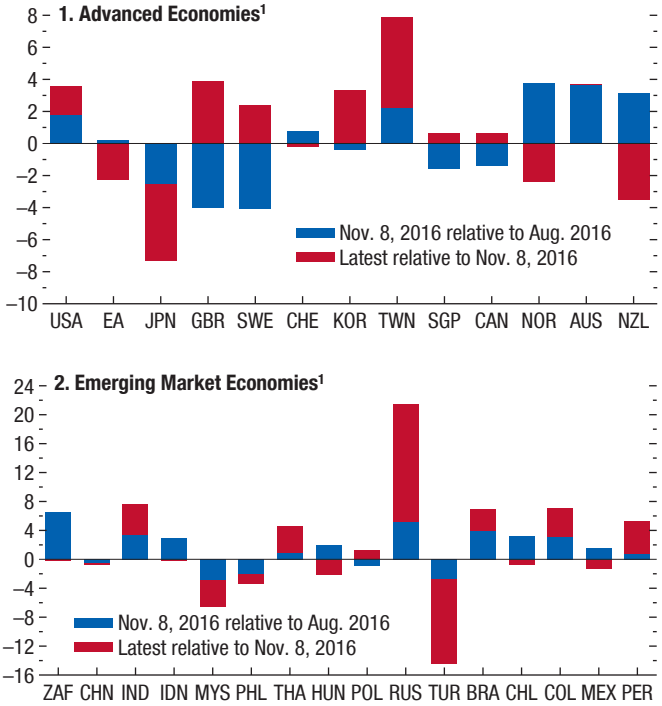


Sources: Bank of Spain; Bloomberg, L.P.; Haver Analytics; Thomson Reuters Datastream; and IMF staff calculations.
Note: MSCI = Morgan Stanley Capital International; S&P = Standard & Poor's; TOPIX = Tokyo Stock Price Index.
[1]Expectations are based on the federal funds rate futures for the United States, the sterling overnight interbank average rate for the United Kingdom, and the euro interbank offered forward rate for the euro area; updated April 3, 2017.
[2]Interest rates are 10-year government bond yields, unless noted otherwise. Data are through March 31, 2017.
[3]Data are through April 3, 2017.

Figure 1.7. Real Effective Exchange Rate Changes, August 2016–March 2017

(Percent)

The U.S. dollar, Korean won, Taiwanese dollar, and Australian dollar have strengthened in real effective terms since August, while the euro, and especially the Japanese yen, have weakened. The Turkish lira and the Malaysian ringgit have depreciated in real effective terms, while the Indian rupee and the currencies of commodity exporting emerging market economies—in particular the Russian ruble—have gained. The Mexican peso has also strengthened in recent weeks and now stands little changed relative to August.



Source: IMF staff calculations.
Note: EA = euro area. Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Latest data available are for March 31, 2017.

especially in emerging Europe, but have since declined (Figure 1.8). Policy rate changes since August also reflect this diversity—with rate hikes in Mexico and Turkey and cuts in Brazil, India, and Russia—as do changes in EMBI (Emerging Market Bond Index) spreads.

Equity markets in emerging market and developing economies have strengthened since August, staging a strong recovery so far this year after weakening in the immediate aftermath of the U.S. election (Figure 1.9). However, they generally remain below their post-financial-crisis peaks, reached in 2011.

A few emerging market currencies have depreciated substantially in recent months—most notably the

Turkish lira and, to a lesser extent, the Malaysian ringgit—while the currencies of some commodity exporters, especially Russia, have appreciated (Figure 1.7, panel 2). The Mexican peso, which had depreciated sharply in the aftermath of the U.S. election, has strengthened in recent weeks and now stands little changed relative to August. Preliminary data point to sharp nonresident portfolio outflows from emerging markets in the wake of the U.S. election, following a few months of solid inflows, but a turnaround in more recent weeks (Figure 1.10, panel 1).

Key Forces Shaping the Outlook

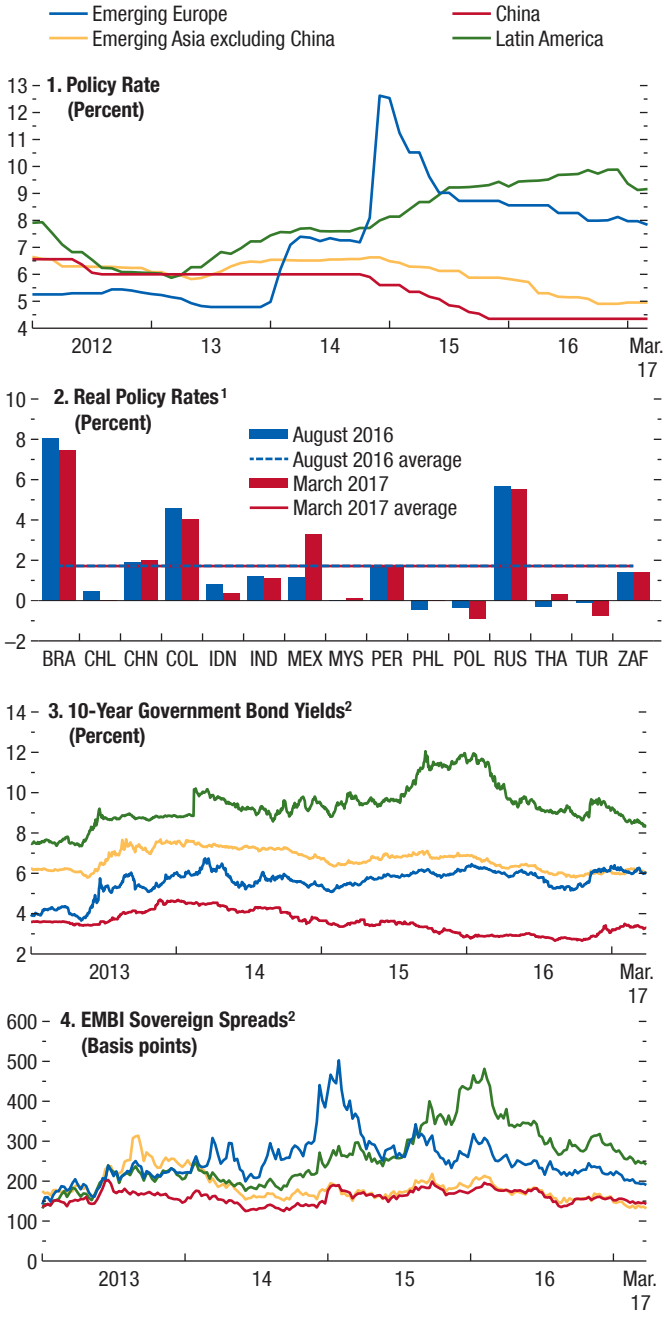
The main forces shaping the outlook differ, to some extent, between advanced economies and emerging market and developing economies. Among the advanced economies group, the U.S. economy is projected to gather steam as a result of expansionary fiscal policy. Elsewhere, especially in Europe, the cyclical recovery from the crises of 2008–09 and 2011–12 will help keep growth modestly above potential over the next few years. Looking to the medium term, however, demographic headwinds and weak trend productivity are likely to restrain growth, as discussed in the October 2016 WEO. Among emerging market and developing economies, especially those that rely heavily on energy or metal exports, the adjustment to lower commodity prices remains a key influence on the outlook, in both the short and medium term. The slowdown of productivity growth in the past few years is also a medium-term challenge for many emerging market and developing economies.

Continued Cyclical Recovery in Advanced Economies

As discussed in Chapter 1 of the October 2016 WEO, the recovery from the crises of 2008–09 and 2011–12 is ongoing in many advanced economies. Output is still below potential, and unemployment is above 2008 levels in many countries, especially in euro area economies with high borrowing spreads during the 2011–12 sovereign debt crisis. The cyclical rebound that normally follows deep recessions, supported by accommodative monetary policy, has been slow in many countries in a context of gradual repair of impaired balance sheets (through temporarily high private and public sector savings) and the associated weakening of the monetary policy transmission mechanism. The tightening in fiscal policy in many economies between 2011 and 2015 also put a brake on the postcrisis recovery.

Figure 1.8. Emerging Market Economies: Interest Rates

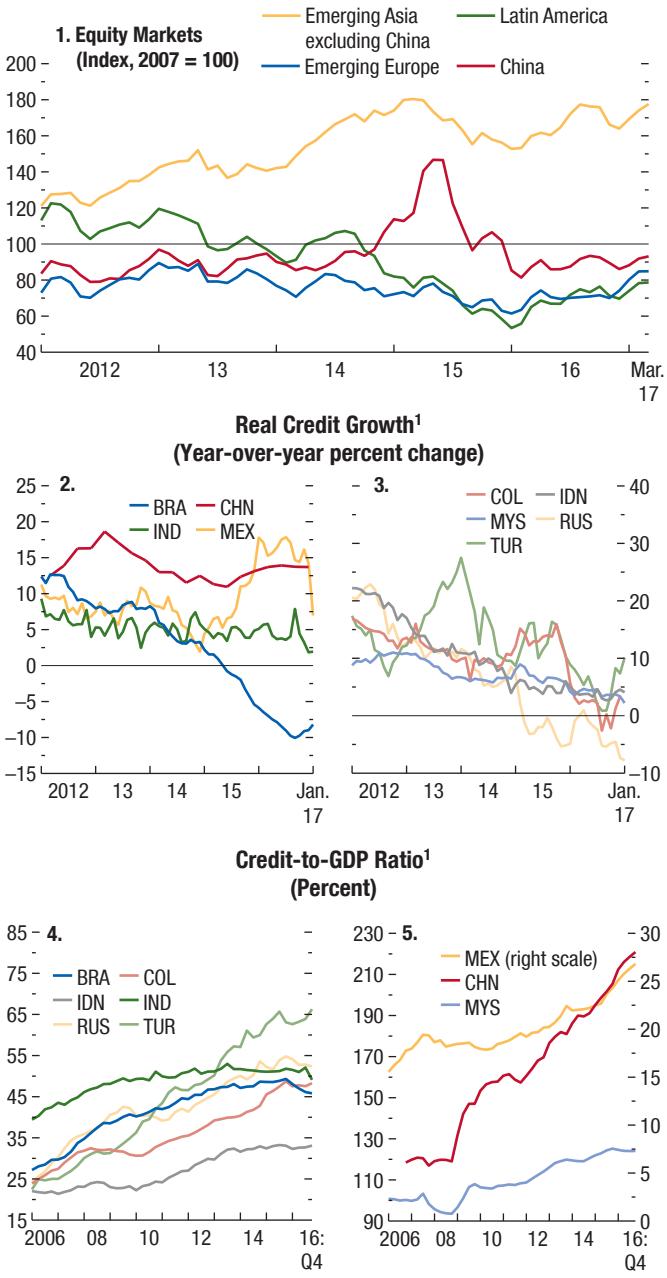
The evolution of financial market conditions has been diverse across emerging market economies. Long-term government bond yields in local currency rose together with bond yields in advanced economies after the U.S. election in November, but have since retreated in most countries.



Sources: Bloomberg L.P.; Haver Analytics; IMF, Balance of Payments and International Investment Position Statistics database; and IMF staff calculations.
Note: Emerging Asia excluding China comprises India, Indonesia, Malaysia, the Philippines, and Thailand; emerging Europe comprises Poland, Romania, Russia, and Turkey; Latin America comprises Brazil, Chile, Colombia, Mexico, and Peru. EMBI = J.P. Morgan Emerging Markets Bond Index. Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Deflated by two-year-ahead *World Economic Outlook* inflation projections.
[2]Data are through March 31, 2017.

Figure 1.9. Emerging Market Economies: Equity Markets and Credit

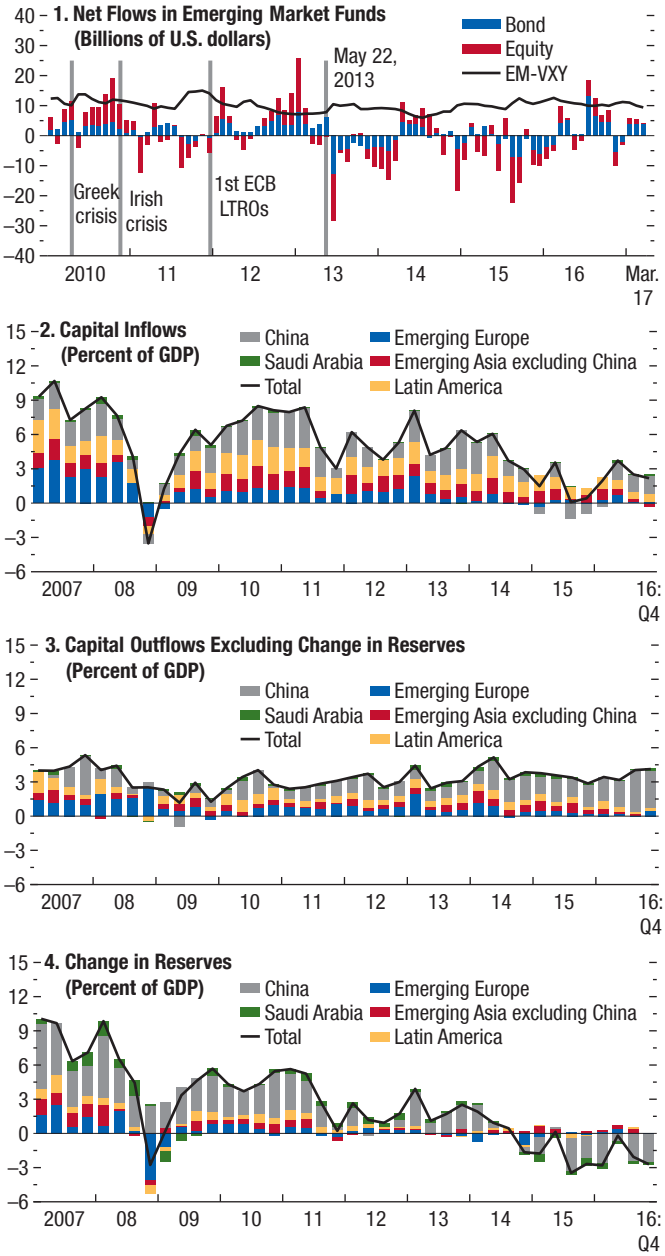
Equity prices are up, relative to August, in most emerging market economies. Credit dynamics are heterogeneous across emerging market economies.



Sources: Bloomberg L.P.; Haver Analytics; IMF, International Financial Statistics (IFS) database; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Credit is other depository corporations' claims on the private sector (from IFS), except in the case of Brazil, for which private sector credit is from the Monetary Policy and Financial System Credit Operations published by Banco Central do Brasil, and China, for which credit is total social financing after adjusting for local government debt swap.

Figure 1.10. Emerging Market Economies: Capital Flows

Net flows into emerging market funds turned negative in the immediate aftermath of the November 8 election in the United States, but were positive in the first three months of 2017. Capital inflows into emerging market economies declined somewhat in the third quarter of 2016 while capital outflows picked up modestly; both were little changed in the fourth quarter. Reserves continue to decline for the group, driven largely by continued reserve decumulation in China.



Sources: Bloomberg L.P.; EPFR Global; Haver Analytics; IMF, International Financial Statistics (IFS) database; and IMF staff calculations.
Note: Capital inflows are net purchases of domestic assets by nonresidents. Capital outflows are net purchases of foreign assets by domestic residents. Emerging Asia excluding China comprises India, Indonesia, Malaysia, the Philippines, and Thailand; emerging Europe comprises Poland, Romania, Russia, and Turkey; Latin America comprises Brazil, Chile, Colombia, Mexico, and Peru. ECB = European Central Bank; EM-VXY = J.P. Morgan Emerging Market Volatility Index; LTROs = longer-term refinancing operations.

Barring unforeseen developments, continued recovery and gradual closing of output gaps are projected to keep growth modestly above potential in many advanced economies over the next few years. The pattern of growth surprises for 2016 suggests that the cyclical recovery may be firming up. Indeed, growth in 2016 is estimated to have exceeded expectations to a greater extent in countries with deeper output gaps, especially in Europe (Figure 1.11). Policy actions to accelerate the cleanup of balance sheets and demand support would help entrench the recovery in countries operating with significant excess capacity, as discussed in the section titled "Policy Priorities."

Adjustment to Terms-of-Trade Changes in Emerging Market and Developing Economies

As discussed in a number of previous WEO reports, the slowdown in China—along with commodity price fluctuations—has been the key driver of economic performance in emerging market and developing economies, especially in commodity exporters.[1] Panel 1 of Figure 1.12 shows China's growth rate and the purchasing-power-parity GDP-weighted aggregate growth rates for commodity exporters and the remaining emerging market and developing economies. The growth profiles of commodity and noncommodity exporters are quite similar until 2011, when a growth downturn begins for commodity exporters against the backdrop of falling non-oil commodity prices. For emerging market and developing economies as a group, the decline in growth between 2011 and 2016 was 2.2 percentage points, with about two-thirds of this decline attributable to weaker growth in commodity exporters (Figure 1.12, panel 2)—the rest being accounted for by slower growth in China and in other emerging market and developing economies.[2] Commodity exporters account for most of the projected pickup in emerging market and developing economy growth in 2017–19, even though their projected growth recovery is relatively modest compared with the striking decline in their growth rates over the past five years.

A broadly similar picture holds for low-income developing countries (Figure 1.12, panel 3). The lion's share of the 1.6 percentage point decline in growth between 2011 and 2016 is attributable to the drastic slowdown in Nigeria, an oil exporter that in 2016 accounted for more than 20 percent of purchasing-power-parity GDP of low-income countries and about half of the GDP of commodity exporters in this country group. Panel 3 of Figure 1.12 also underscores the broad stability of growth in low-income countries that are not primarily commodity exporters—a group of countries in which Bangladesh and Vietnam have large weights—as well as the milder slowdown in low-income commodity exporters excluding Nigeria when compared with all commodity exporters.

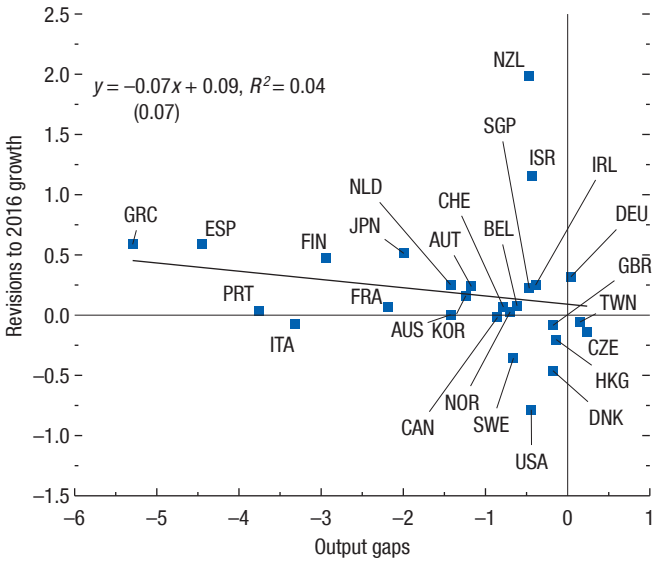
Panel 1 of Figure 1.13 illustrates the windfall gains and losses in emerging market and developing economies arising from commodity price fluctuations (see also the April 2016 WEO and the October 2016 WEO for related discussions). Commodity exporters suffered sizable income losses during 2015 and 2016.

[1]See, for instance, Chapter 4 of the April 2014 WEO, Chapter 2 of the October 2015 WEO, and Chapter 1 of the April 2016 WEO.

[2]The negative impact of the large decline in Chinese growth on aggregate growth in emerging market and developing economies is attenuated by China's rising weight in the group, which reflects a growth rate substantially above most of the rest of the group.

Figure 1.11. Revisions to 2016 Growth and Output Gaps in 2015
(Percent)

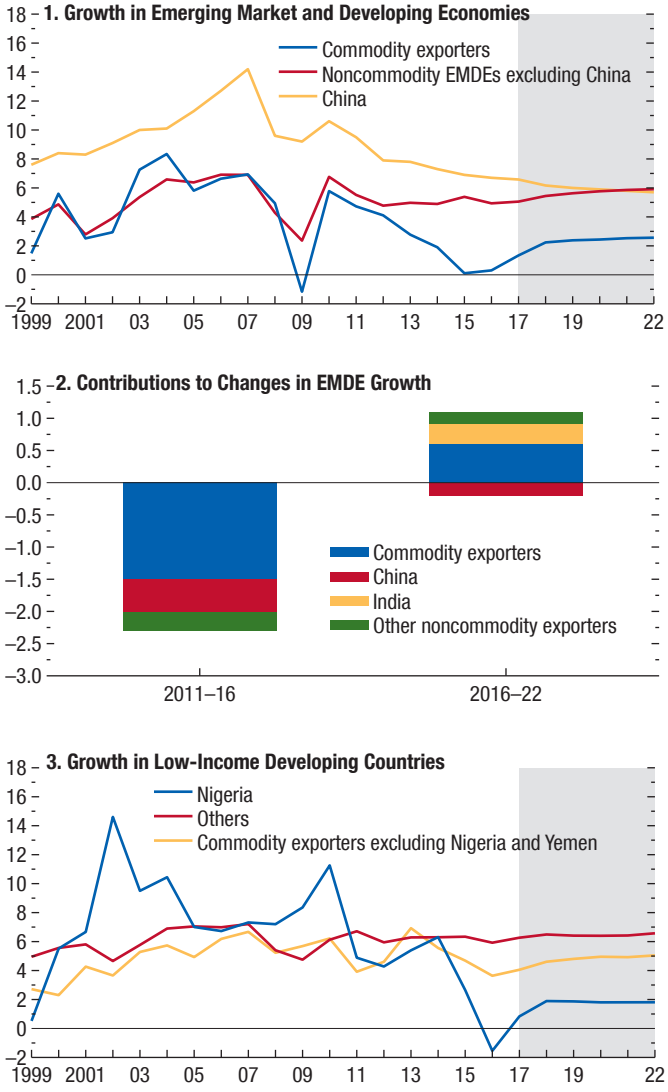
Growth surprises for 2016 tended to be larger in countries with greater excess capacity, suggesting that the cyclical recovery may be gaining momentum.



Source: IMF staff estimates.
Note: 2016 growth revisions are differences between current growth estimates for 2016 and projections in the April 2016 *World Economic Outlook*. Japan's latest figures reflect comprehensive methodological revisions adopted in December 2016. The number in parentheses in the regression equation is the standard error of the estimated coefficient on the output gap. Data labels in the figure use International Organization for Standardization (ISO) country codes.

Figure 1.12. GDP Growth, 1999–2021
(Percent)

Among emerging market and developing economies, growth rates have diverged markedly since 2011 between the commodity-exporter and -importer groups. Growth in exporters is projected to pick up over 2017–19, but to remain below the average growth rate for 2000–10. Growth in importers is projected to remain buoyant.



Source: IMF staff estimates.
Note: Commodity exporters includes fuel and nonfuel primary products exporters, as indicated in Table D of the Statistical Appendix, plus Brazil and Peru. EMDE = emerging market and developing economy.

Although commodity price forecasts suggest some recovery in prices during 2017 and beyond, the forecast gains are expected to be much more modest than the losses already incurred. This suggests that, for many of these countries, the period ahead will be one of protracted adjustment—particularly in those economies in which revenues from commodities account for an important fraction of government revenues (see the discussion in the April 2017 *Fiscal Monitor*). The need for a protracted period of fiscal consolidation is one important reason the recovery in commodity exporters is forecast to be subdued.

Productivity Headwinds

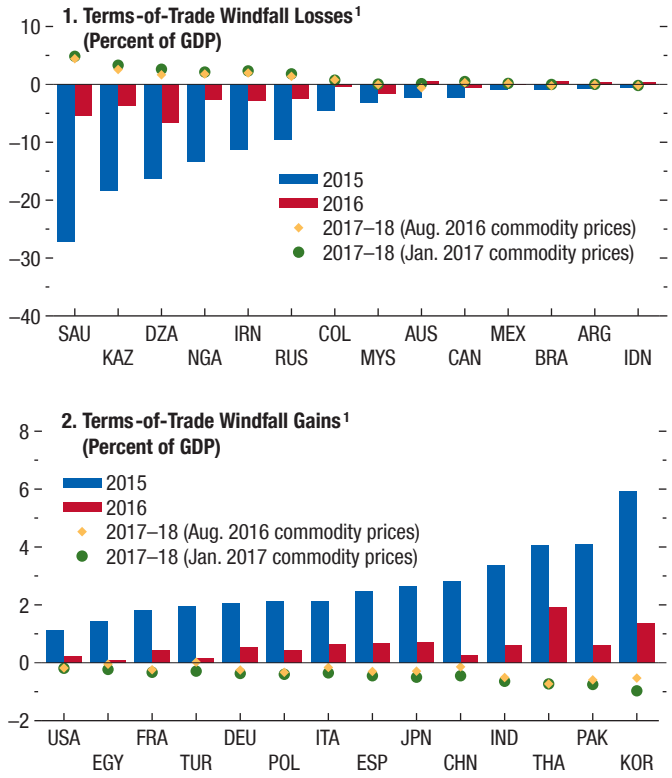
Medium-term growth rates in both advanced and emerging market economies will be shaped largely by the pace of total factor productivity (TFP) growth. GDP projections in the April 2017 WEO incorporate a gradual recovery in TFP growth rates from recent weak levels. Nonetheless, TFP growth is projected to stay below the pace registered before the global financial crisis, especially in emerging market economies (Figure 1.14, panel 1).

The persistent decline in TFP growth in recent years and its projected slow recovery, in part, reflect the legacies of the financial crisis. New evidence suggests that in advanced economies, notably in Europe, high levels of corporate debt and nonperforming bank loans have constrained investment in capital goods and intangible assets, slowing the pace of capital-embodied technological change (Figure 1.14, panels 2 and 3) (Adler and others 2017). In a number of advanced economies, the boom-bust cycle also appears to have increased the misallocation of capital within and across sectors, dragging down productivity growth.

Subdued TFP growth prospects also reflect unfavorable trends that started before the crisis. The broadly synchronized slowdown in productivity growth ahead of the global financial crisis can be traced to forces that weakened technological innovation or diffusion, including the waning effects of the earlier boom in the adoption of information and communications technologies (Fernald 2014), population aging (Feyrer 2007), decelerating global trade integration (Ahn and Duval, forthcoming), slowing human capital accumulation, and taxation policies (Chapter 2 of the April 2017 *Fiscal Monitor*). In emerging market economies, the fading effects of earlier structural reforms and structural transformation—whereby resources are real-

Figure 1.13. Emerging Markets: Terms-of-Trade Windfall Gains and Losses

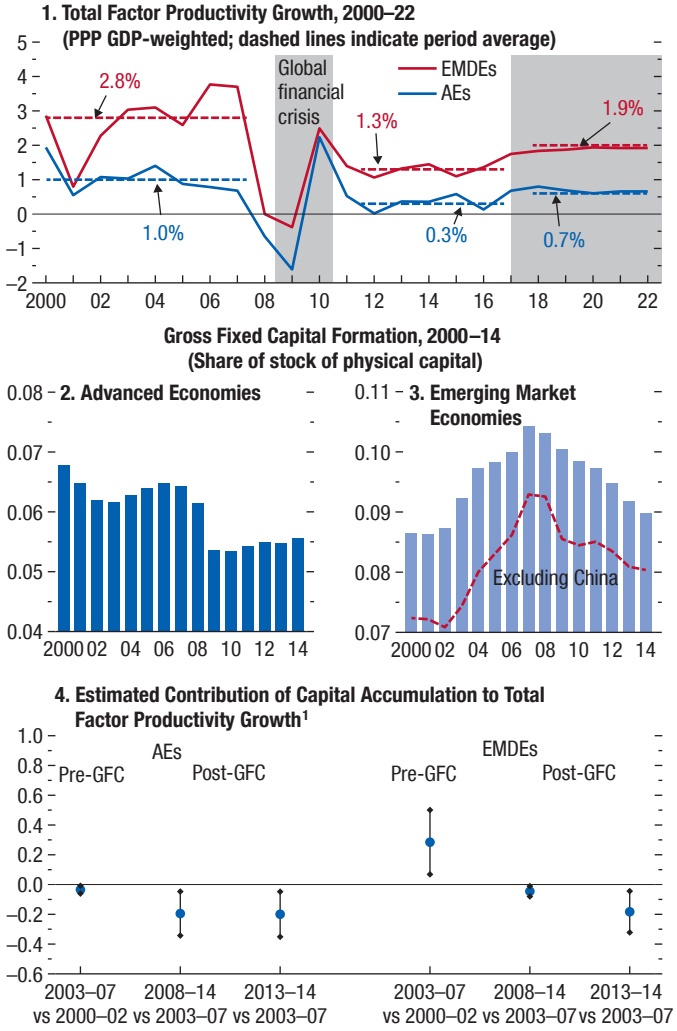
Commodity exporters are set to experience some windfall gains from higher commodity prices in 2017 and beyond, but these gains will be modest compared with the losses experienced in 2015–16.



Source: IMF staff estimates.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes.
[1]Gains (losses) for 2017–18 are simple averages of annual incremental gains (losses) for 2017 and 2018. The windfall is an estimate of the change in disposable income arising from commodity price changes. The windfall gain in year t for a country exporting x U.S. dollars of commodity A and importing m U.S. dollars of commodity B in year $t-1$ is defined as $(\Delta p_t^A x_{t-1} - \Delta p_t^B m_{t-1}) / Y_{t-1}$, in which Δp_t^A and Δp_t^B are the percentage changes in the prices of A and B between year $t-1$ and year t, and Y is GDP in year $t-1$ in U.S. dollars. See also Gruss (2014).

Figure 1.14. Total Factor Productivity
(Percent)

Total factor productivity slowed sharply following the 2008–09 crisis, both in advanced and emerging market economies. While some recovery is expected, productivity growth is not projected to return to its precrisis pace. A key factor behind the slowdown has been weak investment—and the associated slow pace of adoption of capital-embodied technologies. The drop in investment was abrupt and sustained in advanced economies, but more gradual in emerging market economies.



Sources: Penn World Table 9.0; and IMF staff estimates.
Note: Weighted averages are reported for each income group. AEs = advanced economies; EMDEs = emerging market and developing economies. GFC = global financial crisis; PPP = purchasing power parity. Advanced economies comprise Australia, Austria, Belgium, Canada, Denmark, France, Germany, Israel, Italy, Japan, Korea, the Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, Taiwan Province of China, the United Kingdom, and the United States. Emerging market and developing economies comprise Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Iran, Malaysia, Mexico, Pakistan, the Philippines, Poland, Russia, South Africa, Thailand, Turkey, and the United Arab Emirates. In panel 1, TFP growth data for 2015 and 2016 are estimates, and those for 2017–22 are forecasts based on projections in the *World Economic Outlook* for GDP, gross fixed capital formation, and employment.
[1]Panel 4 shows the estimated contribution of capital accumulation to the change in total factor productivity growth between stated periods. 90 percent confidence bands are reported. See details in Adler and others (2017).

located from low-productivity to high-productivity sectors and firms—seem to have accounted for part of the TFP slowdown.

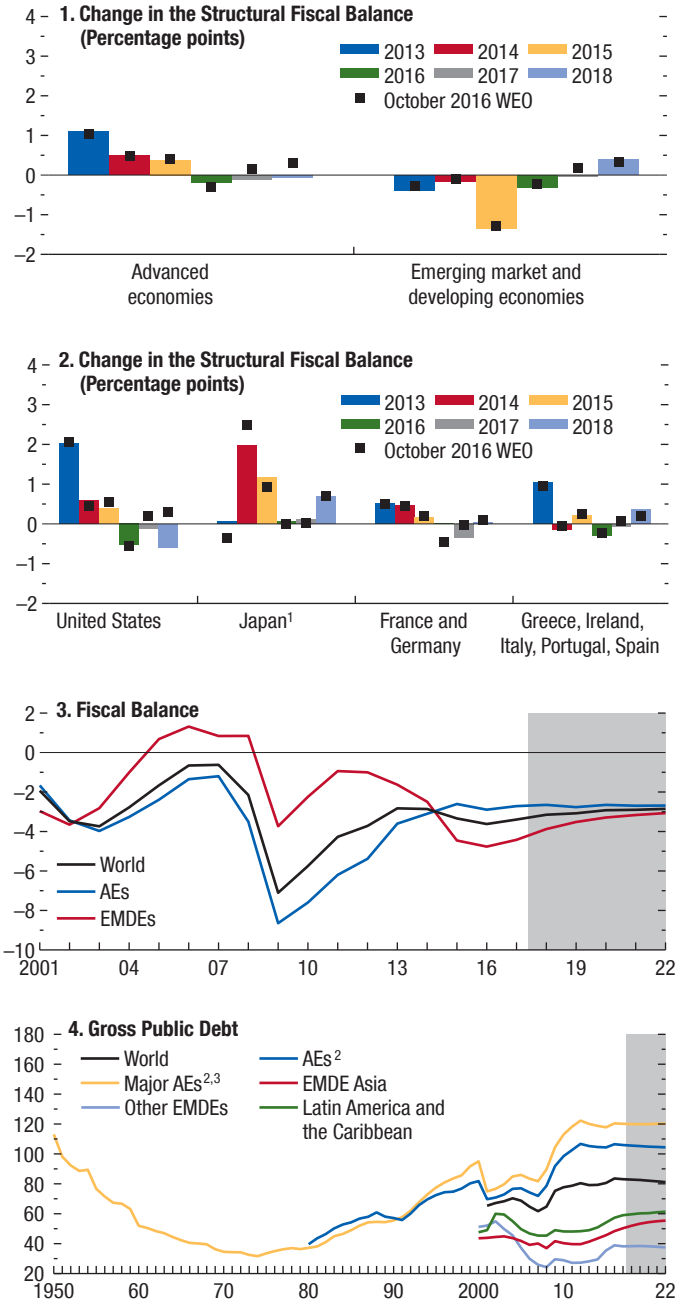
The Forecast

Policy Assumptions

After providing mild support to economic activity in 2016, fiscal policy at the global level is projected to be broadly neutral in 2017 and 2018. The overall neutral stance masks substantial variation across

Figure 1.15. Fiscal Indicators
(Percent of GDP, unless noted otherwise)

Fiscal policy is projected to be broadly neutral at the global level in 2017 and 2018, but this overall neutral stance masks considerable diversity across countries.



Source: IMF staff estimates.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.
[1]Japan's latest figures reflect comprehensive methodological revisions adopted in December 2016.
[2]Data through 2000 exclude the United States.
[3]Canada, France, Germany, Italy, Japan, United Kingdom, United States.

countries and important changes relative to the October 2016 WEO assumptions. Among advanced economies, the fiscal stance (measured by the fiscal impulse) in 2017 is forecast to be expansionary in Canada, France, and Germany; contractionary in Australia, Korea, and the United Kingdom; and broadly neutral in Japan and the United States (Figure 1.15).[3] For the advanced economies as a whole, and the United States in particular, the projected neutral fiscal stance in 2017 represents a slight easing relative to the October 2016 WEO assumptions. In 2018, the forecast assumes a sizable fiscal stimulus in the United States, reflecting the anticipated changes in U.S. federal government tax policy. The U.S. fiscal deficit is assumed to widen by 2 percentage points of GDP by 2019, which entails a fiscal impulse of 1 percent of GDP, with about equally sized decreases in the personal and corporate income tax burdens, concentrated in 2018 and 2019, and no change in infrastructure spending for the time being.[4] In emerging market and developing economies as a group, fiscal adjustment is expected to detract slightly from economic activity in 2017 and 2018, albeit with marked differences across countries and regions.

On the monetary policy front, the forecast assumes a less gradual normalization of policy interest rates in advanced economies than projected in the October 2016 WEO, particularly in the United Kingdom and the United States. With the anticipated widening of the U.S. fiscal deficit, monetary policy is projected to be moderately less accommodative than previously expected because of stronger demand and inflation pressure. The U.S. policy interest rate is projected to rise by 75 basis points in 2017 and 125 basis points in 2018, reaching a long-term equilibrium rate of just below 3 percent in 2019. In other advanced economies, the forecast assumes that monetary policy will remain very accommodative. Short-term rates are projected to remain negative in the euro area through 2018 and close to zero in Japan over the forecast horizon. The assumed monetary policy stances across emerging market economies vary, reflecting these economies' diverse cyclical positions.

[3]The fiscal impulse is defined as the change in the structural fiscal balance as a share of potential output.

[4]The projection for fiscal policy in the United States is the one IMF staff sees as the most likely among a wide range of possible scenarios.

Other Assumptions

Global financial conditions are assumed to remain accommodative, though somewhat tighter than forecast in the October 2016 WEO. As discussed in the April 2017 GFSR, an easing of lending conditions in major economies is expected to offset the anticipated rise in interest rates, while the normalization of monetary policy in the United States and the United Kingdom—even if faster than previously thought—is expected to proceed smoothly, without triggering large and protracted increases in financial market volatility. With the exception of several vulnerable economies, most emerging markets are expected to face generally accommodative financial conditions, with higher policy rates partially offset by a recovery in risk appetite, as reflected in the recent decline in sovereign bond spreads and the uptick in most equity markets. The forecast also incorporates a firming of commodity prices. Oil prices are expected to rise to an average of $55 a barrel in 2017–18, compared with an average of $43 a barrel in 2016. Nonfuel commodity prices, in particular for metals, are expected to strengthen in 2017 relative to their 2016 averages as a result of substantial infrastructure spending in China, expectations of fiscal easing in the United States, and a general pickup in global demand. Finally, negotiations on the future economic relations between the United Kingdom and the European Union are assumed to proceed without raising excessive uncertainty, and the arrangements are expected to eventually settle in a manner that avoids a very large increase in economic barriers.

Global Outlook for 2017–18

World growth, estimated as in the October 2016 WEO, at 3.1 percent in 2016, is projected to increase to 3.5 percent in 2017 and 3.6 percent in 2018—an upward revision of 0.1 percentage point for 2017 relative to October. Together with the modest change in the forecast for the overall global growth rate, projections of the strength of economic activity across country groups have also shifted. In line with the stronger-than-expected pickup in growth in advanced economies and weaker-than-expected activity in some emerging market economies in the latter half of 2016, the forecast for 2017–18 envisions a rebound in activity in advanced economies that is faster than previously expected, while growth in 2017 is forecast to be marginally weaker in emerging market and developing economies relative to the October 2016 WEO. These revisions notwithstanding, the broad story remains unchanged: over the near and medium term, most of the projected pickup in global growth will stem from stronger activity in emerging market and developing economies.

Economic activity in advanced economies as a group is now forecast to grow by 2.0 percent in 2017 and 2018, 0.2 percentage point higher than expected in October 2016. The stronger outlook in advanced economies reflects a projected cyclical recovery in global manufacturing, signs of which were already visible at the end of 2016, and an uptick in confidence, especially after the U.S. elections, which are expected to fuel the cyclical momentum. As also noted in the January 2017 *WEO Update*, this forecast is particularly uncertain in light of potential changes in the policy stance of the new U.S. administration and their global spillovers.

Growth in the group of emerging market and developing economies is forecast to rise to 4.5 percent and 4.8 percent, respectively, in 2017 and 2018, from an estimated outturn of 4.1 percent in 2016. This projected upturn reflects, to an important extent, a stabilization or recovery in a number of commodity exporters, some of which underwent painful adjustments following the drop in commodity prices, and strengthening growth in India, partially offset by a gradual slowdown of the Chinese economy. Nevertheless, as emphasized in previous WEOs, the outlook for emerging market and developing economies remains uneven and generally below these economies' average performance in 2000–15. A variety of factors weigh on their outlooks, including China's transition to a more sustainable pattern of growth that is less reliant on investment and commodity imports; a protracted adjustment to structurally lower commodity revenues in some commodity exporters; high debt levels everywhere; sluggish medium-term growth prospects in advanced economies; and domestic strife, political discord, and geopolitical tensions in a number of countries (see Box 1.1).

Growth Outlook for the Medium Term

Global growth is forecast to increase marginally beyond 2018, reaching 3.8 percent by 2022. This pickup in global activity comes entirely from developments in emerging market and developing economies, where growth is projected to increase to 5 percent by the end of the forecast period. These economies'

impact on global activity is further boosted by their rising world weight. This forecast assumes continued strengthening of growth in commodity exporters, albeit to rates much more modest than in 2000–15 (Figure 1.12); an acceleration of activity in India resulting from the implementation of important structural reforms; and a successful rebalancing of China's economy to lower, but still high, trend growth rates. Advanced economies' more modest medium-term growth rates reflect the structural headwinds they face once output gaps have closed: diminished growth of the labor force as populations age, and persistently low productivity growth, barring significant structural reform efforts (Adler and others 2017).

Growth Outlook for Individual Countries and Regions

Advanced Economies

- The *U.S.* economy is projected to expand at a faster pace in 2017 and 2018, with growth forecast at 2.3 and 2.5 percent, respectively, a cumulative increase in GDP of ½ percentage point relative to the October 2016 forecast. The stronger near-term outlook reflects the momentum from the second half of 2016, driven by a cyclical recovery in inventory accumulation, solid consumption growth, and the assumption of a looser fiscal policy stance. The anticipated shift in the policy mix so far has buoyed financial markets and strengthened business confidence, which could further fuel the current momentum. Over a longer horizon, however, the outlook for the U.S. economy is more subdued. Potential growth is estimated at only 1.8 percent, weighed down by an aging population and weaker TFP growth.
- The *euro area* recovery is expected to proceed at a broadly similar pace in 2017–18 as in 2016. The modest recovery is projected to be supported by a mildly expansionary fiscal stance, accommodative financial conditions, a weaker euro, and beneficial spillovers from a likely U.S. fiscal stimulus; political uncertainty as elections approach in several countries, coupled with uncertainty about the European Union's future relationship with the United Kingdom, is expected to weigh on activity. Output in the euro area is expected to grow by 1.7 percent in 2017 and 1.6 percent in 2018. Growth is forecast to soften in *Germany* (1.6 percent in 2017 and 1.5 percent in 2018), *Italy* (0.8 percent in 2017 and 2018), and *Spain* (2.6 percent in 2017 and 2.1 percent in 2018), but to increase modestly in *France* (1.4 percent in 2017 and 1.6 percent in 2018). The medium-term outlook for the euro area as a whole remains dim, as projected potential growth is held back by weak productivity, adverse demographics, and, in some countries, unresolved legacy problems of public and private debt overhang, with a high level of nonperforming loans.
- Growth in the *United Kingdom* is projected to be 2.0 percent in 2017, before declining to 1.5 percent in 2018. The 0.9 percentage point upward revision to the 2017 forecast and the 0.2 percentage point downward revision to the 2018 forecast reflect the stronger-than-expected performance of the U.K. economy since the June Brexit vote, which points to a more gradual materialization than previously anticipated of the negative effects of the United Kingdom's decision to leave the European Union. These effects include reduced consumer purchasing power following the pound's depreciation and its gradual pass-through to prices and the impact of uncertainty on private investment. Though highly uncertain, medium-term growth prospects have also diminished in the aftermath of the Brexit vote because of the expected increase in barriers to trade and migration, as well as a potential downsizing of the financial services sector amid possible barriers to cross-border financial activity.
- In *Japan*, a comprehensive revision of the national accounts led to an upward revision of historical growth rates and placed the 2016 growth estimate at 1.0 percent, significantly higher than projected in the October 2016 WEO. The growth momentum, fueled by stronger-than-expected net exports in 2016, is expected to continue into 2017, with growth forecast at 1.2 percent. The pace of expansion is expected to weaken thereafter, with the assumed withdrawal of fiscal support and a recovery of imports offsetting the impact of stronger anticipated foreign demand and Tokyo Olympics–related private investment. Over the medium term, a shrinking labor force will weigh on Japan's growth prospects, although its per capita income growth rates are projected to remain near the levels seen over the past several years.
- In most other advanced economies, the pace of activity is expected to accelerate.
  - In *Switzerland*, growth is projected to rise modestly to 1.4 percent in 2017 and 1.6 percent in 2018, supported by sustained external and

domestic demand and the waning effects of the past appreciation of the Swiss franc.
  - The pace of expansion of *Sweden*'s economy is expected to moderate to a still-robust 2.7 percent in 2017 and 2.4 percent in 2018. The slowdown from the very strong growth in 2015–16 is partly a result of normalization of public consumption and moderation of high investment growth, which outweigh some strengthening in private consumption.
  - Growth in commodity-exporting advanced economies is projected to recover. In 2017 it is forecast to rise to 1.2 percent in *Norway*, 1.9 percent in *Canada*, and 3.1 percent in *Australia*. The acceleration in activity will be supported by accommodative monetary policies, supportive fiscal policies or infrastructure investment, improving sentiment following the upturn in commodity prices, and less drag from declining investment in the commodity sector (Australia, Norway). Canada's economy also stands to benefit from the stronger U.S. outlook and the appreciation of the U.S. dollar.
  - Among other advanced economies in Asia, a pickup in growth for 2017 is projected in *Hong Kong Special Administrative Region* (to 2.4 percent), *Taiwan Province of China* (to 1.7 percent), and *Singapore* (to 2.2 percent), partly because of the expected recovery in China's import demand. By contrast, a marginal decline in growth is forecast in *Korea* (to 2.7 percent in 2017, 0.3 percentage point less than forecast in the October 2016 WEO), reflecting weaker private consumption growth due to the expiration of temporary supportive measures, ongoing political uncertainty, and high household debt.

Emerging Market and Developing Economies

- Growth in *China* is projected at 6.6 percent in 2017, slowing to 6.2 percent in 2018. The upward revision to near-term growth—the 2017 forecast is 0.4 percentage point higher than in the October 2016 WEO and the 2018 forecast is 0.2 percentage point higher—reflects the stronger-than-expected momentum in 2016 and the anticipation of continued policy support in the form of strong credit growth and reliance on public investment to achieve growth targets. The medium-term outlook, however, continues to be clouded by increasing resource misallocation and growing vulnerabilities associated with the reliance on near-term policy easing and credit-financed investment.
- Elsewhere in emerging and developing Asia, growth is projected to remain robust, even if somewhat lower than anticipated in the October 2016 WEO. In *India*, the growth forecast for 2017 has been trimmed by 0.4 percentage point to 7.2 percent, primarily because of the temporary negative consumption shock induced by cash shortages and payment disruptions from the recent currency exchange initiative. Medium-term growth prospects are favorable, with growth forecast to rise to about 8 percent over the medium term due to the implementation of key reforms, loosening of supply-side bottlenecks, and appropriate fiscal and monetary policies. Economic activity is forecast to accelerate slightly in 2017 in four ASEAN-5 economies (*Indonesia*, *Malaysia*, *Philippines*, *Vietnam*). The fifth, *Thailand*, is projected to recover from a temporary dip in tourism and consumption in late 2016. Growth in 2017 is projected to be 5.1 percent in *Indonesia*, 4.5 percent in *Malaysia*, 6.8 percent in the *Philippines*, and 6.5 percent in *Vietnam*. In these economies, the near-term pickup in growth is underpinned to a significant extent by stronger domestic demand and, in the *Philippines*, by higher public spending in particular.
- A weaker-than-previously-expected recovery is projected to take hold in *Latin America and the Caribbean*, with growth forecast at 1.1 percent in 2017 and 2.0 percent in 2018 (0.5 and 0.2 percentage point lower than in the October 2016 WEO). Within the region, the growth outlook differs substantially across countries. While activity in most commodity exporters is expected to be supported by the recovery in commodity prices, domestic fundamentals continue to play a key role in the outlook of some large countries. At the same time, the outlook for Mexico, one of the largest economies in the region, has weakened.
  - Growth in *Mexico* is projected to moderate to 1.7 percent in 2017 and 2.0 percent in 2018. The 1.2 percentage point cumulative growth downgrade over the two years reflects subdued prospects for investment and consumption in the face of tighter financial conditions and increased uncertainty about future U.S.–Mexico trade relations. These factors more than offset the positive impact of a stronger U.S. outlook and the depreciation of the currency. Continued imple-

mentation of structural reforms in the areas of energy, labor markets, competition, telecommunications, and the financial sector is projected to boost growth by about ½ percentage point over the medium term.

- Among commodity exporters, *Brazil* is expected to emerge from one of its deepest recessions, with growth forecast at 0.2 percent in 2017 and 1.7 percent in 2018 (0.3 percentage point lower and 0.2 percentage point higher, respectively, relative to the October 2016 WEO forecast). The gradual recovery will be supported by reduced political uncertainty, easing monetary policy, and further progress on the reform agenda. After a contraction last year, activity in *Argentina* is also set to expand by 2.2 percent in 2017, thanks to stronger consumption and public investment, and 2.3 percent in 2018, reflecting the gradual rebound of private investment and exports. *Venezuela* remains mired in a deep economic crisis, with output forecast to contract by 7.4 percent in 2017 and 4.1 percent in 2018, as monetization of fiscal deficits, extensive economic distortions, and severe restrictions on intermediate goods imports fuel rapidly rising inflation. Higher commodity prices will help strengthen growth in 2017 in *Chile* (1.7 percent) and *Colombia* (2.3 percent).

- The near-term outlook for the *Commonwealth of Independent States* has improved, with growth projected to rise to 1.7 percent in 2017 (0.3 percentage point higher than forecast in the October 2016 WEO). *Russia* is poised to exit recession, with growth reaching 1.4 percent in 2017 (following a cumulative contraction of about 3 percent in the previous two years). The pickup in activity reflects firming oil prices and a recovery in domestic demand attributable to easing financial conditions and improved confidence. At the same time, Russia's potential growth will remain subdued at about 1.5 percent barring reforms, slowing a convergence toward advanced economy per capita income levels. Higher oil prices and the improved outlook for Russia will support activity elsewhere in the region, given tight linkages through trade, investment, and remittances. Among oil exporters, growth in *Kazakhstan* is now projected to reach 2.5 percent in 2017, 1.9 percentage points higher than forecast in October, as a result of higher oil production and stronger external demand. In *Ukraine*, activity is supported by improved confidence and rising real incomes, including from a higher minimum wage, but growth is projected to soften slightly to 2 percent in 2017 due to the adverse impact on industrial production of the recent trade blockade in the eastern part of Ukraine.
- Economic prospects in *emerging and developing Europe* are relatively favorable, with the exception of Turkey. For the group as whole, growth is projected to remain at 3.0 percent in 2017 and strengthen to 3.3 percent in 2018. In *Turkey*, after a sharp slowdown in growth in the third quarter of 2016, a modest acceleration in activity is projected, with growth reaching 2.5 percent in 2017 based on stronger net exports and a moderate fiscal stimulus. The outlook is clouded by heightened political uncertainty, security concerns, and the rising burden of foreign-exchange-denominated debt caused by the lira depreciation. Growth in the rest of the region is expected to pick up after a temporary slowdown, as rising wages in some countries support strong domestic consumption growth.
- In *sub-Saharan Africa*, a modest recovery is foreseen in 2017. Growth is projected to rise to 2.6 percent in 2017 and 3.5 percent in 2018, largely driven by specific factors in the largest economies, which faced challenging macroeconomic conditions in 2016. After contracting by 1.5 percent in 2016 because of disruptions in the oil sector coupled with foreign exchange, power, and fuel shortages, output in *Nigeria* is projected to grow by 0.8 percent in 2017 as a result of a recovery in oil production, continued growth in agriculture, and higher public investment. In *South Africa*, a modest recovery is expected, with growth forecast at 0.8 percent in 2017 as commodity prices rebound, drought conditions ease, and electricity capacity expands. *Angola's* growth is also expected to turn positive in 2017 (to 1.3 percent), driven by an expansion in the non-oil sector because of higher public spending and better terms of trade. The outlook for the region, however, remains subdued: output growth is expected only moderately to exceed population growth over the forecast horizon, having fallen short in 2016. Many commodity exporters still need to adjust fully to structurally lower commodity revenues because commodity prices—the recent rebound notwithstanding—remain low (restraining stronger growth in Nigeria, Angola, and oil exporters within the Economic Community of Central African States). Many of the

largest non-resource-intensive countries will find it increasingly hard to sustain growth through higher public capital spending, as they have done in the past, in the face of rising public debt and a slowing credit cycle.

- The near-term outlook for the *Middle East, North Africa, Afghanistan, and Pakistan* region has weakened, with growth forecast to be 2.6 percent in 2017, 0.8 percentage point lower than projected in the October 2016 WEO. The subdued pace of expansion reflects lower headline growth in the region's oil exporters, driven by the November 2016 OPEC agreement to cut oil production, which masks the expected pickup in non-oil growth as the pace of fiscal adjustment to structurally lower oil revenues slows. Continued strife and conflict in many countries in the region also detract from economic activity. Growth in *Saudi Arabia*, the region's largest economy, is expected to slow to 0.4 percent in 2017 because of lower oil production and ongoing fiscal consolidation, before picking up to 1.3 percent in 2018. Growth rates in most other countries in the Cooperation Council of the Arab States of the Gulf are similarly projected to dip in 2017. By contrast, activity in most of the region's oil importers is expected to continue to accelerate, with growth rising from 3.7 percent in 2016 to 4.0 percent in 2017 and 4.4 percent in 2018. In *Pakistan*, a broad-based recovery is expected to continue at a healthy pace, with growth forecast at 5 percent in 2017 and 5.2 percent in 2018, supported by ramped-up infrastructure investment. In *Egypt*, comprehensive reforms are expected to deliver sizable growth dividends, lifting growth from 3.5 percent in 2017 to 4.5 percent in 2018.

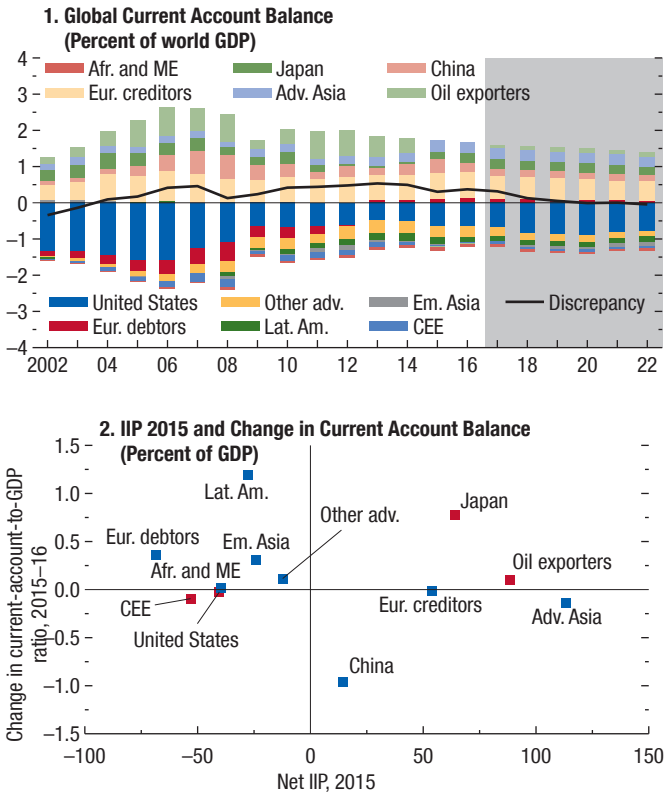
Inflation Outlook for 2017–18

With the uptick in commodity prices, a broad-based increase in headline inflation rates is projected in both advanced and emerging market and developing economies. In nearly all advanced economies, inflation rates are expected to be higher in 2017 than in 2016. For the advanced group as a whole, inflation is forecast to be 2.0 percent in 2017, up from 0.8 percent in 2016, and to stabilize at about that level over the next few years. Inflation in emerging market and developing economies (excluding Argentina and Venezuela) is projected to rise to 4.7 percent in 2017 from 4.4 percent last year, mostly reflecting higher commodity prices.

- In the United States, consumer price inflation is picking up relatively strongly with the recovery in energy prices, from 1.3 percent in 2016 to a projected 2.7 percent in 2017. Core inflation, however, remains relatively subdued and is forecast to rise more gradually, reaching its medium-term objective of 2 percent personal consumption expenditure inflation targeted by the Federal Reserve by 2018, as economic slack diminishes and wage growth strengthens.
- Inflation is also picking up in the euro area, to about 1.7 percent in 2017 from 0.2 last year, partly reflecting base effects from energy and food prices. But core inflation remains subdued and the output gap is still negative; as such, headline inflation will only gradually approach the European Central Bank's objective of below but close to 2 percent over the next few years, reaching 1.9 percent in 2022. Higher energy prices, the recent weakening in the yen, and slowly building wage-price pressures are expected to lift inflation in Japan as well. However, with inflation expectations rising only slowly, the increase in inflation is projected to be quite subdued, with inflation rates staying well below the Bank of Japan's target throughout the forecast horizon.
- In all remaining advanced economies, except Norway, consumer price inflation rates are expected to rise in 2017. In the United Kingdom, the pound's depreciation and the increase in energy prices are projected to push inflation up to 2.5 percent in 2017, before it gradually subsides to the Bank of England's target of 2 percent in the next few years. Average headline inflation is expected to return to positive territory in Singapore and Switzerland in 2017.
- The projected path of inflation rates among emerging market and developing economies shows considerable diversity. Inflation in China is expected to pick up to 2.4 percent in 2017 and to 3 percent over the medium term as slack in the industrial sector and downward pressure on goods prices diminish. A pickup in inflation is also forecast in Mexico and Turkey in 2017, reflecting mostly the liberalization of gasoline prices in Mexico as well as the significant depreciation of both countries' currencies. By contrast, inflation rates in Brazil and Russia are expected to continue to decline, reflecting a combination of negative output gaps and the

Figure 1.16. Global Current Account Balances

Global current account imbalances narrowed marginally in 2016. In general, current account balances tended to increase in debtor countries but decline in creditors—changes that would help stabilize the international investment positions. Imbalances are projected to remain stable in 2017 but widen again from 2018 onward.



Source: IMF staff estimates.
Note: Adv. Asia = advanced Asia (Hong Kong SAR, Korea, Singapore, Taiwan Province of China); Afr. and ME = Africa and the Middle East (Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Jordan, Kenya, Lebanon, Morocco, South Africa, Sudan, Tanzania, Tunisia); CEE = central and eastern Europe (Belarus, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Turkey, Ukraine); Em. Asia = emerging Asia (India, Indonesia, Pakistan, Philippines, Thailand, Vietnam); Eur. creditors = European creditors (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, Netherlands, Norway, Sweden, Switzerland); Eur. debtors = European debtors (Cyprus, Greece, Ireland, Italy, Portugal, Spain, Slovenia); IIP = international investment position; Lat. Am. = Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay); Other adv. = other advanced economies (Australia, Canada, France, Iceland, New Zealand, United Kingdom); Oil exporters = Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Russia, Saudi Arabia, United Arab Emirates, Venezuela.

dissipation of the effects of past currency depreciations, supply shocks, and/or administrative price increases. Inflation in 2017 is expected to remain at double-digit levels in a few large economies in sub-Saharan Africa (for example, Nigeria, Angola, Ghana), reflecting, among other factors, the pass-through of large depreciations.

External Sector Outlook

Global trade is estimated to have grown by 2.2 percent in 2016 in volume terms, the slowest pace since 2009, and below the 2.4 growth rate of world GDP at market exchange rates. The further slowdown is attributable to developments in advanced economies, whose exports and imports slowed substantially relative to 2015. Weaker trade growth was related to an investment slowdown and inventory adjustment, especially during the first part of the year. At the same time, there are signs of recovery, as discussed earlier, which should lead to a pickup in trade growth in 2017–18, as demand and especially capital spending recover.

After declining to about ¼ percent in 2015, trade growth in emerging market and developing economies showed some signs of recovery, rising to an estimated 2.2 percent in 2016. This recovery was underpinned by stronger trade growth in China and India as well as in Russia and the Commonwealth of Independent States, where the contraction in imports moderated from the dramatic pace in 2015. Trade growth is projected to increase further in 2017–18, as a gradual recovery in investment by commodity exporters boosts import growth. As a result, global trade is projected to grow at a rate of close to 4 percent in 2017–18 (close to 1 percentage point above world growth at market exchange rates).

Preliminary data suggest that global current account imbalances in 2016 narrowed marginally (Figure 1.16, panel 1). Among creditor countries, the current account balance in fuel exporters worsened slightly, reflecting the further decline in oil prices, and the surplus in China contracted. These developments more than offset the increase in the current account surplus in Japan, which was driven primarily by a sharp decline in the volume and price of energy imports.

Among debtor countries, current account balances strengthened in nonfuel-exporting Latin American countries, reflecting the impact of weak domestic demand on imports, as well as in emerging Asia and in euro area debtor countries, also helped by further terms-of-trade gains.

While there is, of course, no normative presumption that current account deficits and surpluses should be compressed, the IMF's 2016 *External Sector Report* highlights how, in 2015, current account imbalances in some of the world's largest economies were too large in relation to country-specific norms consistent with underlying fundamentals and desirable policies. The forthcoming 2017 *External Sector Report* will update

those assessments. Current account balances in 2016 generally tended to increase in debtor countries and decrease in creditor countries, thereby moving in a stabilizing direction (Figure 1.16, panel 2). The global current account forecasts indicate broad stability of imbalances in 2017 but a widening of deficits starting in 2018, as a projected fiscal expansion would lead to stronger domestic demand in the United States and a higher current account deficit (Figure 1.16, panel 1).

Despite the narrowing of flow imbalances, creditor and debtor positions are estimated to have widened in 2016 and are projected to widen further over the medium term in relation to world GDP (Figure 1.17, panel 1).[5] On the debtor side, the increase is explained entirely by rising net external liabilities in the United States, where the current account deficit is projected to widen over the next few years. In contrast, net external liabilities are projected to shrink further in euro area debtor countries. Among creditor countries, the increase in net external claims reflects primarily the projected continuation of large current account surpluses in European creditor countries (such as Germany and the Netherlands) and in advanced Asian economies.

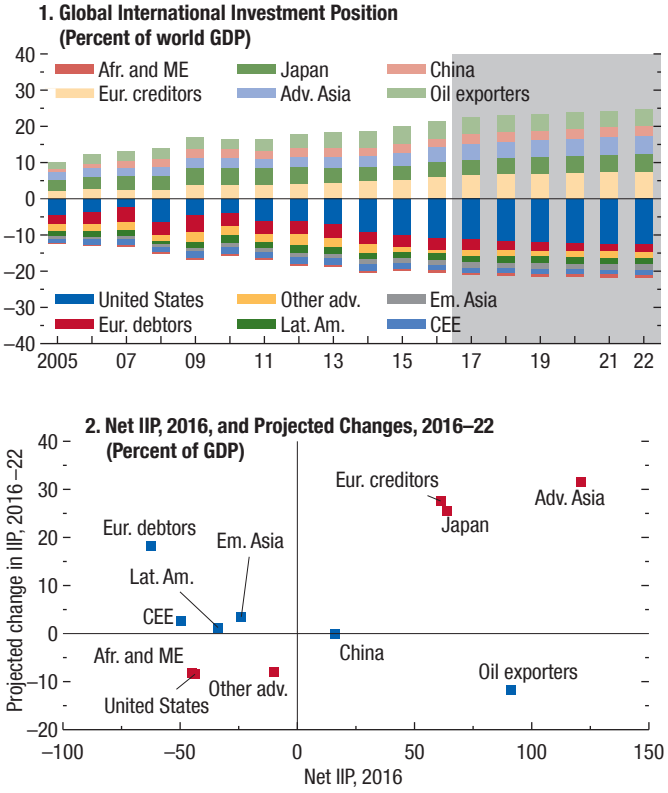
The assessment of net international investment positions is becoming increasingly complex as these positions—alongside national accounts figures—can be affected by financial decisions related to the corporate structure of large multinational companies, with no clear repercussions for external sustainability (or any tangible effects on employment and living standards). A case in point is Ireland, where the relocation of entire balance sheets by multinational companies, and in particular intellectual property products, led to a very large upward revision in the stock of intangible capital in the country in 2015 (about €300 billion, larger than Irish GDP). There was a corresponding increase in Irish net external liabilities, which thus exceeded 200 percent of GDP, as well as a sharp upward revision to growth. Box 1.2 discusses the repercussions of these financial operations for domestic and external accounts in Ireland and the measurement challenges they pose.

Panel 2 of Figure 1.17 shows how creditor and debtor positions are projected to evolve over 2016–22 as a share of domestic GDP. It highlights further growth in creditor positions among both European creditor countries and advanced economies in Asia in the range of 25–30 percentage points of GDP;

[5]Predicting the evolution of the net international investment position is particularly difficult given the importanct role of valuation changes arising from movements in exchange rates and other asset prices. These changes have contributed to a sharp widening in the U.S. net liability position in recent years, as the appreciation of the U.S. dollar has reduced the dollar value of U.S. external assets, and to corresponding improvements in countries experiencing sharp exchange rate depreciations and holding dollar assets. Valuation changes have also been notable in the United Kingdom, where the depreciation of the pound has turned the country into a net creditor as of 2016, by boosting the domestic-currency value of foreign-currency assets.

Figure 1.17. Net International Investment Position

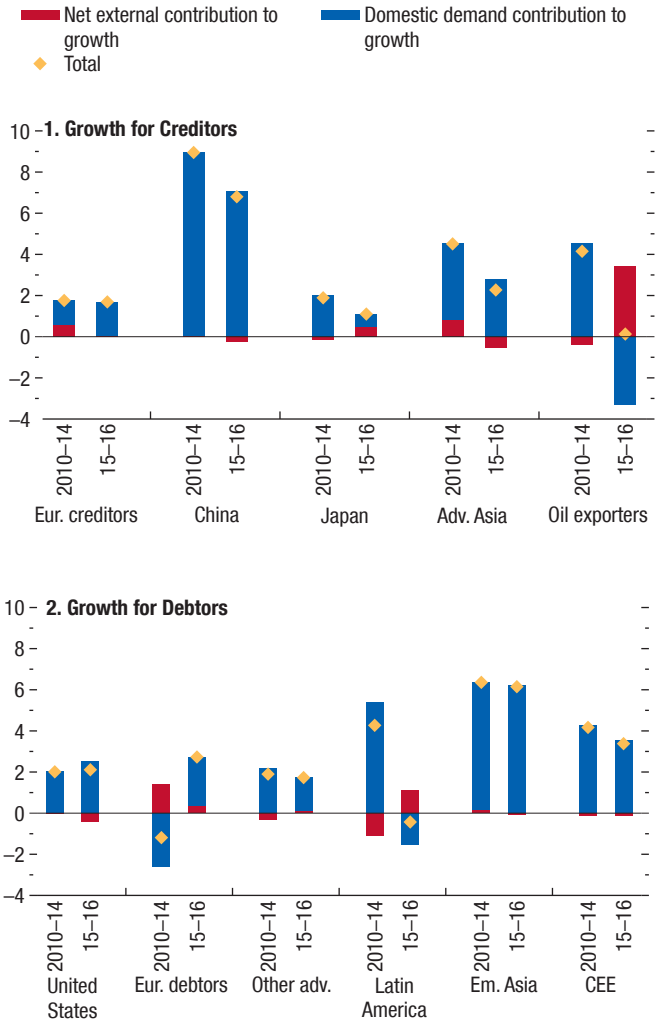
Creditor and debtor positions are estimated to have widened in 2016 and are projected to widen further over the medium term.



Source: IMF staff estimates.
Note: Adv. Asia = advanced Asia (Hong Kong SAR, Korea, Singapore, Taiwan Province of China); Afr. and ME = Africa and the Middle East (Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Jordan, Kenya, Lebanon, Morocco, South Africa, Sudan, Tanzania, Tunisia); CEE = central and eastern Europe (Belarus, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Turkey, Ukraine); Em. Asia = Emerging Asia (India, Indonesia, Pakistan, Philippines, Thailand, Vietnam); Eur. creditors = European creditors (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, Netherlands, Norway, Sweden, Switzerland); Eur. debtors = European debtors (Cyprus, Greece, Ireland, Italy, Portugal, Spain, Slovenia); IIP = international investment position; Lat. Am. = Latin America (Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay); Other adv. = Other advanced economies (Australia, Canada, France, Iceland, New Zealand, United Kingdom); Oil exporters = Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Russia, Saudi Arabia, United Arab Emirates, Venezuela.

Figure 1.18. Growth for Creditors and Debtors
(Percent)

Among creditor countries and regions, net external demand in 2015–16 supported output growth in oil exporters and Japan, whereas it detracted from growth in China and advanced Asia. Among debtors, net external demand has added to growth in Latin America and in European debtor countries, while it has deducted from growth in the United States.



Source: IMF staff calculations.
Note: Adv. Asia = advanced Asia (Hong Kong SAR, Korea, Singapore, Taiwan Province of China); CEE = central and eastern Europe (Belarus, Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Turkey, Ukraine); Em. Asia = emerging Asia (India, Indonesia, Pakistan, Philippines, Thailand, Vietnam); Eur. creditors = European creditors (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, Netherlands, Norway, Sweden, Switzerland); Eur. debtors = European debtors (Cyprus, Greece, Ireland, Italy, Portugal, Spain, Slovenia); Latin America = Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay; other Adv. = other advanced economies (Australia, Canada, France, Iceland, New Zealand, United Kingdom); Oil exporters = Algeria, Azerbaijan, Iran, Kazakhstan, Kuwait, Nigeria, Oman, Qatar, Russia, Saudi Arabia, United Arab Emirates, Venezuela.

among debtor countries the largest reduction in net liabilities is projected for euro area debtor countries (over 18 percentage points of GDP). The projected deterioration in the U.S. net external position is about 8 percentage points of GDP.

Figure 1.18 looks at global rebalancing from a different but related angle—namely, the contribution to a country's or a region's growth rate from domestic demand and from net external demand. In the aftermath of the global financial crisis, the growth rate of creditor countries, in the aggregate, has exceeded that of debtor countries, reflecting to a significant extent rapid growth in China. Among creditor countries and regions, the figure shows that during 2015–16, the contribution of net external demand to growth in China, smaller advanced Asian economies, and European creditor countries has declined. It has, however, increased in Japan and especially in oil exporters, where domestic demand has been contracting, dragging down the demand for imports.[6] Among debtor countries, those in Latin America display a pattern similar to the one for oil exporters for the same reasons. Among other debtor regions, net external demand has been supporting growth in euro area debtor countries, albeit to a lesser extent than in 2010–14 in light of recovery in their domestic demand.

The shifting constellation of global macroeconomic policies and associated exchange rate movements could lead flow imbalances to widen again, generating a further expansion of stock imbalances. In the future, stronger reliance on domestic demand growth in a number of creditor countries, especially those with the policy space to support it, would help sustain world growth while facilitating global rebalancing. In the United States, which already has close to full employment, fiscal policy measures designed to gradually enhance productive capacity along with demand, anchored in a medium-term fiscal consolidation plan to bring down the rising ratio of public debt to GDP, would result in a more sustained growth impact and help contain external imbalances.

Risks

Risks Remain Tilted to the Downside

WEO growth forecasts represent the IMF staff's modal scenario—the growth path the staff sees as

[6]Given the very large terms-of-trade losses discussed in the first section, current account balances have actually worsened in oil exporters, despite the sharp import contraction (Figure 1.16, panel 2).

the most likely within the distribution of possible outcomes. Outturns may differ from the baseline forecast if key macroeconomic policies are different than assumed or if economic and noneconomic shocks materialize. The former factor is particularly salient at this time, given the high uncertainty surrounding policies going forward.

Risks to the baseline forecast remain tilted to the downside, more so over the medium term. But near-term upside potential has risen in recent months. In particular, gains in business and consumer sentiment in advanced economies since last fall, as reflected in survey outcomes and equity prices, could underpin stronger momentum in consumption and investment in the short term. If followed through by supply-friendly reforms and policies, the momentum could become entrenched and sustain the pickup in activity for longer. Another source of short-term upside risk is the possibility of policy easing greater than assumed in the baseline in the United States and China. For instance, pending specifics, the baseline forecast for the United States does not incorporate additional public infrastructure investment. But the size and composition of fiscal policy easing may also be modest and less growth friendly than assumed in the baseline, as discussed below.

There are five primary areas of uncertainty affecting the forecast, most pointing to downside risks relative to the baseline.

Disruption of Global Trade, Capital Flows, and Migration

As noted in Chapter 3, a number of middle-skill jobs in advanced economies have been lost as a result of technological change since the early 1990s. And the slow recovery from the crises of 2008–09 and 2011–12 in countries where the distribution of income has continued to favor the highest earners has left little room for those with lower incomes to advance—or in some cases, even preserve—their living standards. The result—notably in the United States and parts of Europe—has been growing disillusionment with globalization. There is a palpable risk that legitimate equity concerns could trigger protectionist policy actions under the pressure of mounting skepticism toward trade, immigration, and multilateral engagement. In the United States, the authorities have declared their intention to reopen existing trade agreements. If well executed, and mutually agreeable, such efforts could benefit all signatories; by contrast, an increase in tariffs or other trade barriers would harm both the U.S. economy and its trading partners, especially if there are retaliatory responses. In Europe, the coming elections offer a platform for such protectionist policy tendencies to enter the mainstream.

Most economists agree that raising barriers to trade would reduce aggregate output and lower well-being. As shown in Scenario Box 1 of the October 2016 WEO, a country that hikes tariffs can expect to see its price level rise and output fall, especially if its trading partners retaliate. The analysis also shows that a broad-based increase in import costs caused by heightened global trade protectionism would put a dent in global output. The damage could be even higher in light of the increasing fragmentation of production processes across countries (Koopman, Wang, and Wei 2014; Yi 2003, 2010). Higher import costs could do particular harm to the purchasing power of lower-income groups in advanced economies, whose consumption baskets tend to skew toward heavily traded goods (Fajgelbaum and Khandelwal 2016). Further to such immediate adverse effects on demand, a persistent, protection-induced reduction of trade could also harm supply-side potential. As competitive pressures to innovate weaken, and the cross-border diffusion of new technologies slows, productivity growth would suffer over time. Similarly, curbing immigration flows would hinder opportunities for skill specialization in advanced economies, limiting a positive force for productivity and income growth over the long term (Chapter 4 of the October 2016 WEO).

The negative repercussions of protectionism could be even larger if the disruption of international economic linkages leads to a more generalized decline in cross-border cooperation. As coordinated solutions to multilateral challenges become more elusive, heightened perceptions of policy ineffectiveness could magnify the output costs of negative shocks, including those discussed further below.

So far, signs of a potential inward-looking tilt in policies have not had a noticeable impact on economic sentiment indicators in advanced economies. For instance, despite the increased possibility of greater impediments to trade and migration down the road, private sector confidence and spending in the United Kingdom have remained resilient in the aftermath of the Brexit vote. This resilience could reflect still-high expectations of a favorable outcome; the backdrop of an improving global economy may also have helped mask some of the concerns. Nonetheless, growing

salience of a future increase in trade costs will likely gradually dampen expectations of future real earnings and weigh on investment and hiring. Such headwinds could be magnified if the negotiations on new trade agreements are drawn out and contribute to an increase in uncertainty. A case in point is Mexico, where financial market conditions have tightened noticeably because of fears of protectionist policy changes in the United States.

The U.S. Policy Agenda

Several aspects of the U.S. policy agenda contribute to uncertainty around the U.S. and global growth projections, in particular the size and composition of any fiscal policy easing, and the impact of a possible reform of the corporate tax system (toward destination-based cash flow taxation).

The U.S. Fiscal Policy Stance

The projections for the April 2017 WEO were prepared before crucial details of U.S. fiscal policy changes—including the overall amount and composition of easing—were known. Uncertainty about the U.S. policy actions and their effects on U.S. aggregate demand, potential output, the government budget deficit, and the value of the U.S. dollar suggests a wide range of upside and downside risks to the current baseline forecast for the United States, in both the near and the medium term. Global spillovers are thus also uncertain and will vary across countries, depending on their economic linkages with the United States and their sensitivity to changes in global financial conditions, as discussed in Chapter 3 of the April 2017 GFSR.

A sustained noninflationary increase in output in the United States, underpinned by a significant expansion of the U.S. capital stock and a lasting rise in labor force participation, should be associated with a moderate pace of interest rate increases under the Federal Reserve's price stability mandate. By contrast, if a large fiscal stimulus does not lead to a significant increase in supply potential, or if the inflation response to the rise in demand is larger than expected, a steeper path for interest rates would be necessary to contain inflation. The weaker fiscal position could lead markets to deliver faster normalization of the term premium—causing tighter overall financial conditions both in the United States and globally—which could put stress on many emerging market and some low-income economies. The dollar would appreciate more sharply, and the U.S. current account deficit would widen more. The associated widening in global imbalances in such a scenario could intensify the demand for trade protection and retaliatory responses.

Fiscal sustainability would require any increase in the U.S. federal deficit to be reversed at some point. That is, a fiscal policy shift that results in sustained widening of the fiscal deficit would essentially shift demand from the future to the present, supporting short-term activity but imposing a drag on U.S. growth over the medium term. To illustrate these considerations, Scenario Box 1 discusses the potential consequences of an increase in U.S. federal government spending and tax cuts using stylized scenarios. It contrasts a scenario in which the changes yield a strong increase in U.S. potential output with one in which the positive supply effects are more limited (but still positive) and both U.S. and global financial conditions tighten more rapidly. The IMF staff's baseline growth projections for the United States would fall between these two cases. In both hypothetical scenarios, fiscal adjustment is undertaken five years into the simulation horizon to stabilize public debt, which requires a larger contraction in the primary deficit in the second scenario than in the first, given the more limited increase in potential output.

- In the United States, output rises above the baseline path in both cases, an output gap opens up, monetary policy tightens, the U.S. dollar appreciates, and the U.S. current account deficit widens given the increase in U.S. permanent income. These effects are generally stronger in the first case, in which the impact on potential output is more favorable. The increased demand for foreign saving by the United States raises the global interest rate in both cases, but more in the second case owing to the assumed faster normalization in U.S. and global term premia. The permanent increase in the level of U.S. public debt also adds to the upward pressure on the global interest rate. The dollar depreciates over the longer term, given the assumed permanent decline in U.S. public sector saving.
- The impact on most other economies is initially positive under the first scenario because the larger increase in U.S. imports outweighs the negative effect on demand of higher global interest rates. In the second scenario, the boost from U.S. imports to foreign output is more limited, given a smaller rise in U.S. demand, and is more than offset by the adverse impact from the sharper tightening in

financial conditions. Once U.S. fiscal policy tightens in the medium term, the positive demand spillovers weaken and output falls below baseline in all economies in both scenarios because of permanently tighter financial conditions.

A number of factors are not captured in the simulations. On the upside, productivity gains in the United States could spill over to some extent on other economies, boosting permanent incomes and demand there as well. A more generalized rise in productivity would temper the widening of the U.S. current account deficit, the increase in global interest rates, and the attendant negative ramifications for other economies. On the downside, the initial appreciation of the dollar could generate financial and real stress among emerging market economies with de jure or de facto currency pegs to the U.S. dollar and/or balance-sheet vulnerabilities (associated with currency mismatches)—aspects not captured in the model simulations but elaborated further below. Finally, as noted in Scenario Box 1, a similar growth-friendly fiscal policy implemented in a deficit-neutral way would lead to an even higher long-term level of GDP.

All in all, the simulations point to the downside risks associated with deficit-financed U.S. fiscal policy easing, especially in the medium term. The scenarios highlight how the ultimate impact of the policy changes on the U.S. economy itself depend on whether the measures successfully lift U.S. potential output. They also underscore the possible negative international repercussions of the policy easing through tighter global financial conditions.

U.S. Corporate Tax Reform

Beyond a shift to a more expansionary fiscal policy, potentially far-reaching tax policy changes are being considered in the United States, including a structural overhaul of the corporate income tax. The U.S. corporate tax system has well-documented shortcomings and distortions. It is too complex, has a narrow base and a marginal rate that is too high, is rife with legislated exemptions, favors debt financing, and incentivizes a range of cross-border avoidance and tax planning mechanisms to lower U.S. tax liabilities.[7] One specific proposal now under discussion is to replace the U.S. corporate income tax with a destination-based cash flow tax (discussed in detail in Box 1.1 of the *Fiscal Monitor*). If the proposal is implemented, the full and immediate expensing of investment under the destination-based tax would be expected to meaningfully boost U.S. business investment and output.

A replacement of the U.S. corporate income tax with a destination-based cash flow tax could generate large international spillovers through several channels. As discussed in Box 1.1 of the *Fiscal Monitor,* the change would generate strong incentives for profit and production shifting into the United States. Other countries might then take measures to protect their own tax bases or ultimately also move toward destination-based taxation.

A cash flow tax with full expensing of capital would be expected to raise the U.S. household saving rate and put downward pressure on global interest rates. The effects of the change on U.S. competitiveness, however, would likely be limited. The border adjustment inherent in destination-based taxation—which exempts exports from revenues and does not allow firms to deduct the cost of imports from their tax base—would in the simplest textbook case strengthen the dollar relative to all other currencies and/or raise domestic prices and wages, so as to leave the trade balance unchanged. A sharp appreciation of the U.S. dollar, however, would generate deflation pressure in economies whose currencies are tied to the U.S. dollar and could impose financial stress on countries whose private or public balance sheets contain significant currency mismatches. In addition, the border adjustment may prove inconsistent with existing World Trade Organization rules, which may lead to trade disputes with trading partners, posing risks to the open trading system.

Financial Deregulation

As discussed in Chapter 1 of the April 2017 GFSR, the postcrisis reform agenda has strengthened oversight of the financial system, raised capital and liquidity buffers of individual institutions, and improved cooperation among regulators. A wholesale dilution or backtracking on important steps taken since the global financial crisis in enhancing the resilience of the financial system would raise the probability of costly financial crises in the future. Deregulation in one country may also lead to deregulation in others in the highly interconnected international financial system. A failure to complete the global reform agenda and allowing regulatory fragmentation across borders would

[7]See Box 6 of the 2016 IMF Article IV Staff Report on the United States.

also hurt countries outside the central standard-setting bodies, in particular emerging market economies, which rely heavily on a strong global standard to level the playing field and support financial stability at a time when threats to their domestic financial stability have risen.

Tightening of Economic and Financial Conditions in Emerging Market Economies

Emerging market and developing economies have accounted for the bulk of the downward revisions to global growth in recent years and have been a source of uncertainty around the WEO forecasts. Most of the downward revisions to growth have been in China and India, especially during 2011–13; in commodity exporters following the 2015–16 plunge in oil prices; and, to a lesser extent, in Middle Eastern economies suffering from conflict (see Box 1.1).

Many emerging market economies have gone through bouts of financial volatility over the past few years. Some large commodity exporters and other stressed economies have also weathered substantial exchange rate movements, while China has experienced a swing from net capital inflows to sizable net outflows. Though it proved short lived for most, the tightening of financial conditions across emerging market economies in the immediate aftermath of the U.S. election is a reminder that many countries in this group remain vulnerable to sudden shifts in global market sentiment.

Risks from Continued Rapid Credit Expansion in China

Chinese authorities are expected to maintain emphasis on protecting macroeconomic stability in the run-up to the leadership transition later this year. Progress with demand-side rebalancing and reducing excess industrial capacity has continued, but so has the reliance on stimulus measures to maintain high rates of growth and the Chinese economy's dangerous dependence on rapidly expanding credit, intermediated through an increasingly opaque and complex financial system. Recent months have seen a return of capital outflows, reflecting market expectations of renminbi depreciation against the dollar and narrowing yield differentials as global interest rates increased. Though Chinese equity markets have remained tranquil, in stark contrast to the turmoil of August 2015 and January 2016, bond markets have seen bouts of turbulence. Efforts by the People's Bank of China to tighten short-term liquidity pushed up repurchase arrangement rates in late 2016, causing losses for leveraged bond investors and pushing up bond yields sharply. Segments of the repurchase arrangement market began to seize up, leading the authorities to take actions to provide broad-based liquidity support in December 2016. This episode of market turmoil serves as a reminder of the elevated risks associated with existing vulnerabilities in China's financial system, as discussed in Chapter 1 of the April 2017 GFSR.

The baseline forecast assumes limited progress in tackling the corporate debt overhang and reining in credit, and a policy preference for maintaining relatively high GDP growth in the near term. The resulting persistent resource misallocation, however, raises the risk of a disruptive adjustment in China in the medium term.

External triggers, such as a shift toward protectionism in advanced economies or domestic shocks, could lead to a broader tightening of financial conditions in China, possibly exacerbated by capital outflow pressures, with an adverse impact on demand and output. As demonstrated by market jitters in the second half of 2015 and early 2016, spillovers onto other economies from turbulence in China can be large, operating mainly through commodity prices and global financial risk aversion (Chapter 4 of the October 2016 WEO).

Vulnerabilities in Other Emerging Market and Developing Economies

Compared with past episodes of capital inflow slowdowns, emerging market economies have seen fewer financial sector problems in recent years, despite entering the episode with highly leveraged corporate sectors and, in some cases, experiencing sharp losses in earnings driven by adverse shifts in their terms of trade (Chapter 2 of the April 2016 WEO). The improvement in emerging market economies' ability to cope with external volatility is testimony to better macroeconomic policy management and in particular the beneficial role of exchange rate flexibility in smoothing shocks. Credit booms are waning in many economies (with the key exception of China), and corporate leverage, in most cases, has peaked and continues to decline from a high level. But underlying fragilities remain, and in some cases, corporate sector buffers could be wearing thin after a period of macroeconomic strains and financial volatility. More generally, reduced profitability, still-elevated corporate debt, limited policy space, and, in

some cases, weak bank balance sheets suggest that some emerging market economies remain potentially exposed to tighter global financial conditions, capital flow reversals, and the adverse balance sheet implications of sharp currency depreciations (Chapter 1 of the April 2017 GFSR). Such strains could materialize, for example, if the projected fiscal policy easing in the United States proves to be more inflationary than expected, requiring a faster pace of monetary policy tightening and triggering a faster normalization of U.S. term premia (a possibility discussed above), or if there is a marked shift toward protectionist policy actions in advanced economies. As elaborated in Chapter 2, a weakening growth impulse from a less supportive external environment could lead to persistent and durable shifts in growth outcomes for emerging market and developing economies, raising financial vulnerabilities as well.

In the baseline forecast, recoveries in a relatively small number of stressed economies—most of which are commodity exporters—account for an important portion of the global growth pickup in 2017–18. The pace of these recoveries could fall short of the baseline projections if domestic reforms to tackle structural problems are delayed, harming confidence. Likewise, in many commodity-exporting low-income economies where fiscal buffers are exhausted, further delays in policy adjustments could lead to disorderly conditions and weaker growth than currently projected. A reversal of foreign direct investment and other capital flows from China could also put significant strain on a number of low-income economies that rely increasingly on such financing for key infrastructure projects.

Even in emerging market economies where growth has remained resilient in recent years, in some cases because of favorable terms-of-trade shifts, investor sentiment could falter and growth could disappoint if policymakers do not implement needed structural reforms, tackle debt overhangs, and undertake necessary fiscal adjustments.

Weak Demand and Balance Sheet Problems in Parts of Europe

One common theme running through several recent WEO reports has been weak demand in a number of advanced economies and its possibly pernicious and long-lasting effects on inflation and supply potential. These effects could, in principle, work through three channels:

- A downshift in inflation expectations, higher expected real interest rates, debt service difficulties, and negative feedback to demand
- Weak investment and slower adoption of capital-embodied technological change, lower productivity growth, and weaker expected profitability, reinforcing the sluggishness in investment
- A prolonged period of high unemployment leading some job seekers to drop out of the workforce or become unemployable as a result of skill erosion

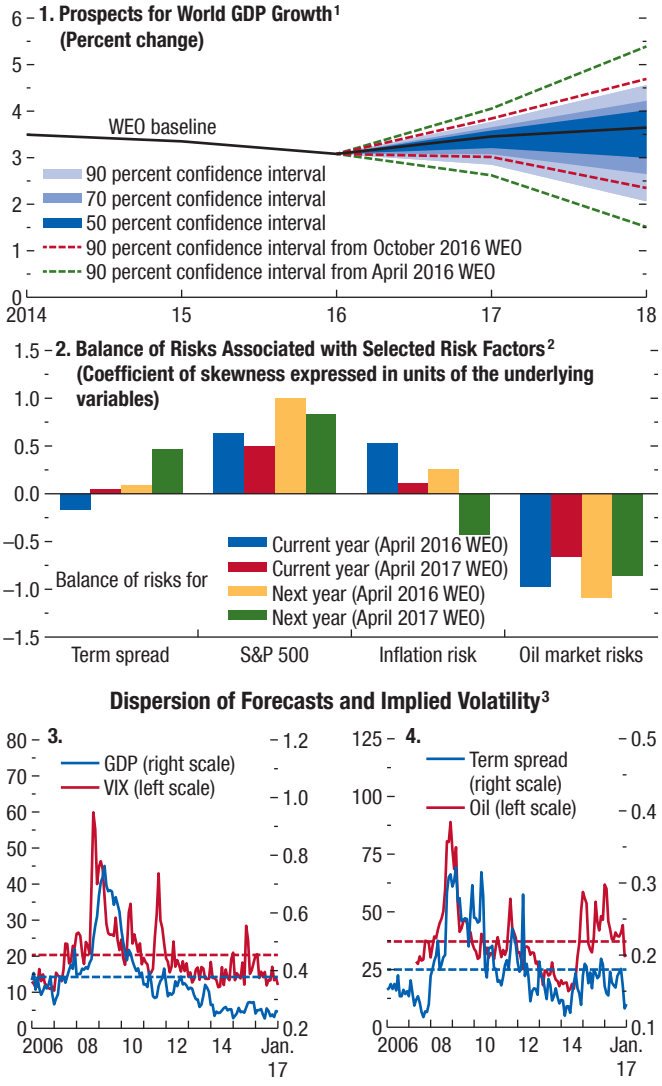
With a slightly firmer outlook for demand in advanced economies, fears of such debilitating cycles have receded somewhat. Steepening yield curves have also alleviated some of the concerns about the profitability of banks and other financial intermediaries and their ability to support the recovery. Nevertheless, in parts of Europe, the cyclical recovery in output, employment, and inflation remains incomplete under a large burden of nonperforming loans, and banking system profitability is challenged by structural features, such as high costs and overbanking (Chapter 1 of the April 2017 GFSR). In the absence of a more concerted effort to clean up balance sheets, consolidate and raise the cost effectiveness of banking systems, maintain demand, and enact productivity-enhancing reforms, these economies will continue to confront weak inflation dynamics and investment and remain susceptible to the danger of self-reinforcing adverse feedback loops. As growth and core inflation prospects in core euro area economies strengthen, there is also a risk that euro area monetary policy tightens, weighing on the recovery in countries with high unemployment and large output gaps. A sluggish recovery in incomes can, in turn, fuel pressures for an inward turn in policies and the adoption of protectionist measures, further harming demand both at home and abroad.

Noneconomic Factors

Geopolitical tensions as well as domestic strife and idiosyncratic political problems have been on the rise in recent years, burdening the outlook for various regions. Most notable are the civil wars and domestic conflicts in parts of the Middle East and Africa, the tragic plight of refugees and migrants in neighboring countries and in Europe, and acts of terror worldwide. For many of the severely affected countries, the baseline scenario assumes a gradual easing of tensions. However, these episodes may turn out to be more protracted, holding back recovery in these countries.

Figure 1.19. Risks to the Global Outlook

A fan chart analysis suggests that risks to the global growth outlook remain skewed to the downside.



Sources: Bloomberg L.P.; Chicago Board Options Exchange (CBOE); Consensus Economics; Haver Analytics; and IMF staff estimates.

[1]The fan chart shows the uncertainty around the April 2017 *World Economic Outlook* (WEO) central forecast with 50, 70, and 90 percent confidence intervals. As shown, the 70 percent confidence interval includes the 50 percent interval, and the 90 percent confidence interval includes the 50 and 70 percent intervals. See Appendix 1.2 of the April 2009 WEO for details. The 90 percent intervals for the current-year and one-year-ahead forecasts from the October 2016 WEO and April 2016 WEO are shown.

[2]The bars depict the coefficient of skewness expressed in units of the underlying variables. The values for inflation risks and oil price risks enter with the opposite sign since they represent downside risks to growth.

[3]GDP measures the purchasing-power-parity-weighted average dispersion of GDP growth forecasts for the Group of Seven economies (Canada, France, Germany, Italy, Japan, United Kingdom, United States), Brazil, China, India, and Mexico. VIX is the CBOE Standard & Poor's (S&P) 500 Implied Volatility Index. Term spread measures the average dispersion of term spreads implicit in interest rate forecasts for Germany, Japan, the United Kingdom, and the United States. Oil is the CBOE crude oil volatility index. Forecasts are from Consensus Economics surveys. Dashed lines represent the average values from 2000 to the present.

Weak governance and large-scale corruption can also undermine confidence and popular support, taking a heavy toll on domestic activity.

Other noneconomic factors weighing on growth include the persistent effects of a drought in eastern and southern Africa and the spread of the Zika virus. If these factors intensify, the hardship in directly affected countries, especially smaller developing economies, would deepen (IMF 2016). Increased geopolitical tensions and terrorism could also take a toll on global market sentiment and broader economic confidence.

Fan Chart

A fan chart analysis—based on equity and commodity market data as well as the dispersion of inflation and term spread projections of private sector forecasters—corroborates the assessment that risks remain skewed to the downside for 2017 and 2018. The analysis suggests a narrower dispersion of outcomes around the current- and next-year baseline than a year ago, consistent with the more optimistic tone in financial markets and reduced uncertainty in the aftermath of the Brexit vote in June 2016 and the U.S. elections in November. Nonetheless, the analysis continues to suggest that the balance of risks to the outlook are tilted to the downside. As illustrated in Figure 1.19, although the width of the 90 percent confidence interval has diminished for both the current- and next-year growth forecasts, the decline is slightly greater for the upper part of the interval, pointing to a somewhat more pronounced downward skew of risks than in October 2016.

The probability of a recession over a four-quarter horizon (first quarter of 2017–fourth quarter of 2017) has declined in most regions, relative to the probability computed in October 2016 for the third quarter of 2016–second quarter of 2017 (Figure 1.20). Stronger cyclical momentum and the anticipated U.S. fiscal stimulus have lifted the growth outlook in advanced economies, while the increase in external demand and the rise in commodity prices have boosted growth prospects in emerging Asia and selected commodity exporters. Deflation risks—as measured by the estimated probability of a decline in the price level relative to one year ago—remain elevated for the euro area and Japan because the pass-through of higher commodity prices to headline inflation is projected to fade next year and core inflation remains weak, especially in Japan.

Policy Priorities

Global economic activity is picking up speed, but the potential for disappointments remains high, and momentum is unlikely to be sustained in the absence of efforts by policymakers to implement the right set of policies and avoid missteps. For many economies, continued demand support and well-targeted structural reforms to lift supply potential and broaden economic opportunities across the skills spectrum remain key goals. The precise combination of priorities differs across individual economies, depending on their cyclical conditions, structural challenges, and needs for enhancing resilience.

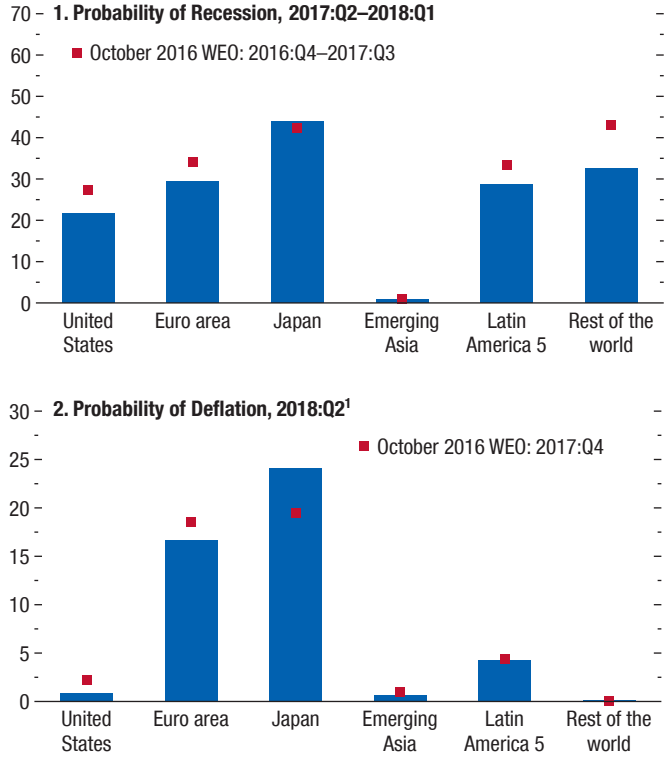
An overarching challenge for policymakers will be to safeguard global economic integration and the cooperative global economic order, which have been critical sources of productivity growth and resilience over the past several decades. A body of research has documented that economic integration together with technological progress has increased the efficient use of global resources, boosted incomes, and expanded access to goods and services.[8] Hundreds of millions were lifted out of poverty through this process, helping to reduce global income inequality.

However, amid weak growth and rising inequality, popular support for international trade and immigration has eroded in some advanced economies. As documented in Chapter 3, wages have not kept up with productivity in many economies over much of the past three decades, leading to a decline in labor's share of national income. Moreover, the declines have been much harsher for those in lower- and middle-skill groups, potentially contributing to worsening income distributions and income polarization within countries. As this process coincided with deepening global economic integration, the economic model of free movement of goods and factors of production, which has guided policymaking over the past several decades, is being increasingly questioned as a politically viable mechanism for delivering broad-based growth. How much of the deterioration in income distributions and the decline in the labor share of income can be traced to cross-border economic integration? The analysis in Chapter 3 suggests that the bulk of the decline in the labor share in advanced economies is attributable to technological change, with trade integration playing only a relatively small role. The analysis does find declining labor shares in emerging market economies to be closely linked to trade integration. However, this reflects the fact that, with the rise in global production sharing, trade has been increasingly accompanied by investment flows and capital deepening—a development that is otherwise beneficial to capital-scarce emerging market economies. Nonetheless, amid growing recognition that the gains from growth often are not broadly shared, support for inward-looking protectionist measures and restrictions on the cross-border movement of people is gaining ground.

[8]For a recent summary, see Baldwin (2016). See also Fajgelbaum and Khandelwal (2016), Costinot and Rodríguez-Clare (2013), and Wacziarg and Welch (2008).

Figure 1.20. Recession and Deflation Risks
(Percent)

The probability of recession has declined in most regions, except in Japan where it is broadly unchanged. Deflation risks remain elevated in Japan and the euro area.



Source: IMF staff estimates.
Note: Emerging Asia comprises China, Hong Kong SAR, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan Province of China, and Thailand; Latin America 5 comprises Brazil, Chile, Colombia, Mexico, and Peru; Rest of the world comprises Argentina, Australia, Bulgaria, Canada, Czech Republic, Denmark, Israel, New Zealand, Norway, Russia, South Africa, Sweden, Switzerland, Turkey, the United Kingdom, and Venezuela. October 2016 WEO data refer to simulations run in September 2016.
[1]Deflation is defined as a fall in the price level on a year-over-year basis in the quarter indicated in the figure.

Rolling back economic integration would not address these legitimate distributional concerns, which are to a significant extent the consequence of technological change, especially in advanced economies. Heightened restrictions on trade and capital flows would impose broad economic costs, harming consumers and producers alike, with the potential to leave all countries worse off if protectionism begets retaliation. Instead, the challenge will be to preserve the gains from cross-border economic integration while ramping up domestic policy efforts to ensure that those gains are shared more broadly. Well-targeted initiatives can help workers adversely affected by structural transformations find jobs in expanding sectors. Short-term measures include active labor market policies combined with social safety nets to smooth the loss of income. In the longer term, adequate education, skill building and retraining, and policies to facilitate reallocation, such as housing and credit access, will be needed to attain inclusive and sustainable growth in a context of continued rapid technological progress and economic integration. Such efforts require public resources, so progressive taxes and well-targeted transfer policies will also have an increasingly important role to play (see Chapter 1 of the April 2017 *Fiscal Monitor)*.

Policies—Advanced Economies

The recent uptick in momentum notwithstanding, advanced economies as a group continue to face modest current and prospective economic growth, characterized by sluggish productivity dynamics, low investment, and, in some cases, persistently low core inflation. These features reflect, to a large extent, the interplay between subdued demand, diminished growth expectations, and aging populations. A cross-cutting theme for economies therefore is the need to lift potential output. At the same time, the cyclical conditions of individual economies continue to diverge. In Germany, the United States, and a number of other advanced economies in Europe and Asia, output is either close to or above potential. By contrast, output remains significantly below potential in France, Italy, Portugal, Spain, and especially in Greece. These heterogeneous cyclical positions call for differentiated macroeconomic policy stances.

- In those advanced economies where output gaps are still negative and wage pressures and inflation expectations for the next few years are muted, the risk of persistently low inflation (or deflation, in some cases) remains. Monetary policy therefore must continue to chart an accommodative course, relying on unconventional strategies, as needed, to help raise inflation expectations and lower the real costs of borrowing for households and firms. But accommodative monetary policy alone cannot lift demand sufficiently and can potentially generate undesirable side effects (as discussed in the October 2016 GFSR). Fiscal support—calibrated to the amount of space available and oriented toward policies that protect the vulnerable and lift medium-term growth prospects—also remains essential for generating momentum and reducing the risk that a prolonged shortfall in demand erodes supply capacity or unmoors medium-term inflation expectations. In cases in which postponing fiscal adjustment is either not possible or too risky, its speed and composition should be configured to minimize the drag on output. And support for demand must be accompanied by efforts to address corporate debt overhangs and decisively repair bank balance sheets (addressing a legacy of nonperforming loans and strengthening operational efficiency, as discussed in the October 2016 GFSR and the October 2016 *Fiscal Monitor)*.
- In those advanced economies where output is close to or above potential, well-anchored inflation expectations should allow for monetary policy to be normalized gradually. Desirable changes to the fiscal policy stance depend on country circumstances, including public debt dynamics. Fiscal policy should aim at strengthening safety nets (including to help with the integration of refugees in some cases) and increasing longer-term potential output.
- Structural reforms are needed across advanced economies to enhance productivity, investment, and labor supply. Specific priorities vary across countries and include measures to boost labor force participation through reforms to labor taxes and social benefits, well-targeted infrastructure investments, corporate income tax reform and tax incentives to boost research and development, facilitation of improvements in human capital by investing in education and health care, and elimination of product and labor market distortions to boost private sector dynamism.[9]

[9]As discussed in Chapter 3 of the April 2016 WEO, removing barriers to entry into product and service markets can also raise near-term activity, but labor market reforms may require supportive macroeconomic policies to lessen possible dampening effects on near-term growth and inflation when the economy is weak.

As discussed earlier, resisting a retreat from global economic integration also needs to be a part of the agenda for strengthening growth.

Country-Specific Priorities

- In the *United States*, the economy regained momentum in the second half of 2016, with strong job creation, solid growth in disposable income, and robust consumer spending. The economy is close to full employment, but core personal consumption expenditure inflation is only slowly inching up toward the Federal Reserve's 2 percent target, suggesting that monetary policy can continue to tighten at a gradual, data-dependent pace. A credible deficit- and debt-reduction strategy is needed to open up space for policies to improve social outcomes and lift productive capacity while putting the debt ratio firmly on a downward path. The fiscal stance should remain neutral this year, and fiscal consolidation could start in 2018. Structural and fiscal policies should seek to upgrade the public infrastructure, boost labor force participation, and enhance human capital. Skill-based immigration reform, job training, paid family leave, and child care assistance are key priorities in this regard. Complementing the fiscal consolidation plan, a comprehensive reform of the business tax code geared toward simplification and fewer exemptions would encourage job creation and investment, ultimately enhancing fiscal sustainability. Any changes to financial regulation should strive to avoid a buildup of financial stability risks. While potential changes to the existing framework could lower existing regulatory burdens for small and community banks, there is a need to strengthen the regulation and supervision of nonbank financial institutions, particularly as financial activity continues to shift to these less-regulated entities.
- In the *euro area*, with inflation expectations still below target and several economies still operating significantly below capacity, the European Central Bank should maintain its current accommodative stance. Additional easing may be needed if core inflation fails to pick up. Critically, monetary policy will be more effective if supported by measures to clean up balance sheets, strengthen the financial sector, use fiscal space where available, and accelerate structural reforms. Specifically,
  - A critical priority for boosting growth and limiting downside risks in the euro area is to accelerate banks' balance sheet repair and the resolution of nonperforming loans, including through a combination of greater supervisory encouragement, insolvency reform, and the development of distressed debt markets. Completion of the banking union, including by introducing a common deposit insurance program with a common effective fiscal backstop, also remains critical. These actions would strengthen the transmission of monetary policy accommodation to the real economy and facilitate the consolidation and restructuring of the banking sector.
  - Greater centralized investment in public infrastructure will help countries with continued demand shortfalls that lack fiscal space or need to consolidate because of high and rising debt burdens. Where consolidation is required, it should be undertaken in a gradual and growth-friendly manner. In countries with fiscal space, such as Germany, fiscal policy should be geared toward bolstering productive capacity as well as demand. In turn, this would help reduce their current account surpluses, support intra-euro-area rebalancing, and generate positive demand spillovers for others.
  - Synergies between structural reforms and demand management policies should be exploited to the extent possible. Where demand is still weak but fiscal space is lacking, budget-neutral fiscal support can enhance the effects of public administration or labor market reforms. Product and labor market reforms are needed to encourage business dynamism, raise labor force participation rates, and address labor market duality. Reforms to complete the single market would help boost productive capacity.
  - Refugee integration into the workforce should be facilitated through swift processing of asylum applications, language training and assistance in job search, better recognition of migrants' skills through credential systems, and support for migrant entrepreneurship.
- In *Japan*, growth was stronger than expected in 2016. Inflation appears to be bottoming out, helped by higher fresh food prices and fading downward pressure from the earlier yen appreciation. Net exports were the main driver of growth

in 2016, with fiscal policy also supportive of the positive economic momentum. Despite a tightening labor market, wage demands are not stronger than in the past few years and thus are unlikely to kindle much-needed positive wage-price dynamics. The Bank of Japan's monetary easing through asset purchases and negative deposit rates, and the introduction of quantitative and qualitative easing with yield curve control, have been critical to preventing another bout of deflation, but the low and declining neutral real rate and low nominal rates constrain monetary policy effectiveness. Continued efforts to raise inflation expectations to further lower real rates thus remain necessary, including through a further upgrade to the Bank of Japan's communication framework. To attain a durable increase in inflation and growth, a comprehensive policy approach that enhances monetary accommodation with a supportive fiscal stance and reforms to labor market policies is needed. Elements of such a package would include reforms to diminish labor market duality and increase labor force participation by women and older workers while admitting more foreign workers, lowering entry barriers in retail trade and services, improving the provision of capital for new ventures, and supporting stronger corporate governance to discourage companies from accumulating excess cash reserves. A credible fiscal consolidation over the medium term—based on a gradual preannounced increase in the consumption tax, social security reform, and a broadening of the tax base—remains critical.

- In the *United Kingdom*, a principal challenge will be to successfully navigate the exit from the European Union and negotiate the new arrangements for economic relations with the European Union and other trading partners. The adverse impact on medium-term output would be lower if the new arrangements limit new economic barriers. The current accommodative monetary policy stance is appropriate because growth is expected to slow and domestic cost pressures to remain contained. On the fiscal front, the envisioned path of steady but gradual fiscal consolidation and the moderate relaxation of the targets strike an appropriate balance between providing an anchor for medium-term objectives and allowing room for short-term maneuvering amid elevated uncertainty about the economic outlook.

Policies—Emerging Market and Developing Economies

Emerging market and developing economies have operated in a complicated external environment in recent years, characterized by generally sluggish demand from advanced economies, a sharp correction in commodity prices followed by a recovery since the first quarter of 2016 (albeit to levels well below previous peaks), and spells of relatively benign financial conditions interspersed with recurrent spikes in market volatility.

As discussed in Chapter 2, some aspects of the external environment are likely to be less supportive going forward than in the past, while others remain uncertain. Weaker potential output growth across advanced economies, together with a possible increase in trade barriers in some, could translate into generally subdued demand growth for emerging market and developing economies. An additional element that may weigh on commodity exporters in particular is China's necessary transition to slower, more sustainable, consumption- and services-based growth. External financial conditions facing emerging market and developing economies are likely to remain uncertain. A gradual, generalized tightening is expected as U.S. monetary policy normalizes, but this tightening will likely be accompanied by a continued search for yield in emerging market investment opportunities as long as returns remain modest in a low-growth environment in advanced economies. A third, important element of the external environment—the terms of trade—may improve for a subset of emerging market and developing economies with the bottoming out of commodity prices, but the outlook for export prices remains subdued compared with the past. By contrast, for importers, the windfall gains from lower commodity prices will diminish.

Although this combination of factors may provide a weaker growth impulse for emerging market and developing economies than had been the case for long intervals since 2000, the analysis in Chapter 2 points to the role of domestic policies that can help these countries secure growth prospects in an increasingly complicated external environment. Country-specific priorities will necessarily differ, based on levels of development and individual circumstances. But, in general, a policy orientation that protects trade integration, permits exchange rate flexibility, and ensures that vulnerabilities stemming from high external imbalances and public debt are contained is likely to help emerging market

and developing economies extract the most out of a weaker external growth impulse and help sustain convergence to higher levels of income.

With ever-present risks of global financial volatility, sharp currency movements, and capital flow reversals, it will be important for economies with large and rising nonfinancial debt, unhedged foreign liabilities, or heavy reliance on short-term borrowing to adopt stronger risk management practices and contain balance sheet mismatches. Decisive actions toward improving domestic governance, institutions, and the business environment can help reduce country risk perceptions and thereby act as a powerful countervailing force against the expected tightening in global financial conditions.

Country-Specific Priorities

- The near-term outlook for *China* has strengthened in recent months, with policy support expected to maintain steady growth in the run-up to the leadership transition in late 2017. The complex process of rebalancing is advancing on multiple fronts, rotating activity away from industry to services and reorienting demand from exports and investment to consumption. Progress lags along one critical dimension, however: the continued heavy reliance on credit to support activity compounds the considerable risks that have accrued in recent years from the rapid buildup of corporate and local government debt, funded through an increasingly opaque financial system. With vulnerabilities continuing to accumulate, the macro policy mix needs to focus on containing the problems at their source by accepting slower and more sustainable growth outcomes; reducing the pace of credit growth closer to that of nominal GDP; raising policy rates; and cutting off-budget public sector investment while increasing on-budget allocations for social assistance, health expenditure, unemployment benefits, and restructuring funds. Together with these measures, structural reform priorities to improve efficiency include deregulating sectors dominated by state-owned enterprises to facilitate entry; decisively restructuring those that are unprofitable and replenishing bank buffers, as needed, once the losses are appropriately accounted for; and accelerating household residency reforms to facilitate more efficient matching of labor market vacancies with job seekers. An intensified focus is also needed on containing financial risks in domestic capital markets by reining in shadow products and strengthening the supervisory framework.
- *India*'s economy has grown at a strong pace in recent years owing to the implementation of critical structural reforms, favorable terms of trade, and lower external vulnerabilities. Beyond the immediate challenge of replacing currency in circulation following the November 2016 currency exchange initiative, policy actions should focus on reducing labor and product market rigidities to ease firm entry and exit, expand the manufacturing base, and gainfully employ the abundant pool of labor. Policy actions should also consolidate the disinflation under way since the collapse in commodity prices through agricultural sector reforms and infrastructure enhancements to ease supply bottlenecks; boost financial stability through full recognition of nonperforming loans and raising public sector banks' capital buffers; and secure the public finances through continued reduction of poorly targeted subsidies and structural tax reforms, including implementation of the recently approved nationwide goods and services tax.
- In *Brazil*, the pace of contraction has diminished, but investment and output had yet to bottom out at the end of 2016, while fiscal crises in some states continue to deepen. Inflation has continued to surprise on the downside, allowing for prospects of faster monetary easing. Growth is projected to recover gradually and remain moderate. Against this backdrop, Brazil's macroeconomic prospects hinge on the implementation of ambitious structural economic and fiscal reforms. To underpin medium-term fiscal consolidation, the focus should be on reforms that address unsustainable expenditure mandates, including in the social security system, but there is also merit in undertaking actions to achieve a more front-loaded reduction in the fiscal deficit. Reforms to boost potential growth are needed not only to restore and improve living standards after the deep recession, but also to facilitate the fiscal consolidation. Imperatives for lifting investment and productivity include addressing long-standing infrastructure bottlenecks, simplifying the tax code, and reducing barriers to trade.
- In *South Africa*, following the decline in commodity prices and amid perceptions of weakening governance and rising policy uncertainty, economic growth gradually softened and came to a near standstill in 2016. The projected near-term recovery remains insufficient to keep pace with population

growth. In the baseline scenario of a moderate resumption of growth this year, monetary policy can remain on hold unless inflation expectations rise or external financing becomes challenging. Envisioned fiscal measures appropriately strike a balance between maintaining debt sustainability and safeguarding the fragile economic recovery. If growth prospects were to falter, additional measures—such as slower public sector wage increases and a moderate increase in consumption taxes—would be needed to stabilize the debt ratio. With monetary and fiscal policies constrained by the need to keep inflation and the rising public debt in check, reforms in product and labor markets that allow greater entry by new firms and reduce impediments to job creation are urgently needed to strengthen confidence, investment, and growth. Such reforms would lower the cost of crucial inputs for businesses and of services for workers—such as in electric power generation, telecommunications, and transportation.

- In *Russia,* the economy is projected to continue its nascent recovery in 2017. Inflation is expected to fall further toward the central bank's inflation target over the course of 2017, providing the conditions for the central bank to gradually resume monetary policy easing, with due attention to external risks and the need to build the credibility of the newly introduced inflation-targeting regime. The reestablishment of a three-year fiscal framework will help facilitate the consolidation required by lower oil revenues. However, to sustain the significant adjustment, better-targeted and more permanent reforms to the pension system, subsidies, and tax exemptions are needed. The adoption of a revised fiscal rule would help reduce policy uncertainty and cement the fiscal adjustment. Improvements to financial supervision and regulation as well as a stronger resolution framework are needed to make the financial system more resilient and improve credit allocation. Raising medium-term growth prospects will necessitate a diversification of the economy, accelerated institutional reforms, and an improved business climate.

Policies—Low-Income Developing Countries

Among low-income economies, the economic prospects of commodity-exporting countries continue to diverge from those with more diversified export bases. The sharp realignment of global commodity prices since mid-2014 has been a major setback for commodity-exporting low-income developing countries, where policies have been slow to adjust to the large income loss. Three years after commodity prices fell from their peak, fiscal deficits remain wide, external positions are weaker, debt is rising, and depreciated currencies—although they help cushion the adverse terms-of-trade shock—have, in some cases, led to higher inflation and pushed up external debt. Although most commodity exporters are set to record positive growth in 2017, their medium-term growth prospects are subdued. By contrast, low-income countries with more diversified export bases have recorded relatively strong growth and are expected to continue to grow at a healthy rate, with the benefit of lower oil bills outweighing the drop in remittances and weaker demand from commodity exporters. Robust growth, however, has not always translated into improved fiscal and external current account positions, reflecting limited progress in adopting countercyclical policies, but also public investment to support activity. Many low-income developing economies have been also hit by idiosyncratic shocks, such as conflicts and security disruptions (Afghanistan, Chad, South Sudan, Yemen, parts of Nigeria), and natural disasters (Haiti, Ethiopia, Malawi). Some still endure the persistent growth-dampening effect of the Ebola outbreak (Guinea, Liberia, Sierra Leone).

With such divergent prospects, the appropriate courses of action in the near term differ across low-income developing countries.

- Commodity exporters need to continue and, in some cases, accelerate the process of adjusting to structurally lower commodity prices based on comprehensive and internally consistent sets of policies. Fiscal policy needs to be better calibrated to contain debt accumulation while protecting outlays that are key to growth prospects, such as priority capital expenditures and social spending. In many countries, improving domestic revenue mobilization and continued rationalization of spending needs, along with concessional financing, are necessary to underpin successful adjustment processes. Monetary tightening may also be needed in a number of countries, either to defend pegged exchange rates or to contain inflation resulting from the side effects of exchange rate flexibility and depreciation. Enhanced financial sector regulation and supervision will be required to manage foreign currency exposures in balance sheets.
- Policy priorities for diversified low-income developing countries vary, given the diversity of coun-

try circumstances. However, an overarching goal for these economies should be to strike a better balance between spending for developmental and social needs and improving public debt sustainability, rebuilding fiscal positions and foreign reserves holdings while growth is strong to enhance resilience against potential future shocks. Stronger debt management will also help those exposed to global financial markets better cope with volatility in capital inflows.

Near-term challenges notwithstanding, low-income developing countries should not lose sight of their longer-term objectives reflected in the United Nations Sustainable Development Goals. In that context, many of the policies that would set these economies on a sustainable macroeconomic trajectory in the near term will also help achieve sustained growth and resilience in the long term, a precondition for convergence and attaining the development goals. In particular, efforts to create fiscal space by enhancing domestic resource mobilization and improving the efficiency of government spending and debt management, steps to reorient fiscal spending to protect the vulnerable and address infrastructure gaps, and measures to improve financial sector resilience and deepen financial inclusion, will help achieve macroeconomic stabilization, overall economic resilience, and durable and inclusive growth.

Multilateral Policies

To put the pickup in global growth on a firmer footing and sustain improvements in global living standards over the medium term, supporting national policy efforts with continued *multilateral cooperation* in a number of areas will be vital. Such cooperation is particularly needed for preserving an open, rules-based multilateral trading system, maintaining global financial stability, cracking down on tax evasion and limiting tax avoidance, and addressing longer-term challenges facing the global economy.

Maintaining a Rules-Based, Open Multilateral Trade System, with Broadly Shared Gains

As documented in Chapter 2 of the October 2016 WEO, the slower pace of new trade reforms and an uptick in protectionist measures have contributed to the remarkable slowdown in global trade in recent years (although their estimated contribution to the trade slowdown is smaller than that of the weakness in aggregate demand, in particular investment). Rolling back temporary barriers to trade introduced since the global financial crisis and further reducing trade costs would support the nascent recovery in trade, revving up an important engine of global productivity growth. To that end, it is critical to preserve the multilateral rules-based trading system and press ahead with an ambitious trade agenda at the global level. Addressing tariff barriers in sectors where they remain high, such as agriculture, and implementing commitments under the Trade Facilitation Agreement, which went into effect in February 2017, can significantly reduce trade costs in traditional areas. Advancing trade reforms in services and in "frontier" areas, such as digital trade, and improving cooperation in investment policies have the potential to make large contributions to cross-border flows and global growth. However, as discussed, further trade liberalization should go hand in hand with domestic policies to support individuals and communities that may be at risk of being left behind.

Cooperation on International Taxation Issues

As increased capital mobility across borders has fueled international tax competition, governments have found it more challenging to finance their budgets without imposing higher taxes on labor income or implementing regressive consumption taxes. Policymakers can achieve equitable tax systems (that prevent an increasing share of after-tax income from accruing to owners of capital) in the future only if their national efforts to tackle tax evasion and avoidance are backed up with multilateral cooperation on these fronts. If firms continue to face pronounced incentives to shift profits across borders for tax planning and avoidance, popular support for trade and investment flows may wane further. Box 1.1 of the April 2017 *Fiscal Monitor* discusses the implications of proposals for corporate tax reform in the United States that aim to reduce the incentives for profit shifting by U.S. firms.

Maintaining Global Financial Stability

Efforts to strengthen the resilience of the global financial system must continue, including by recapitalizing institutions and cleaning up balance sheets where necessary, ensuring effective national and international banking resolution frameworks, and addressing emerging risks from nonbank intermediaries. A stronger global safety net can protect economies with robust fundamentals that may nevertheless be vulnerable to cross-border contagion and spillovers in the context of

elevated downside risks to the global outlook. Closer cross-border regulatory cooperation is also required to limit the withdrawal of correspondent banking relationships that provide low-income countries access to the international payments system.

Longer-Term Challenges

Finally, multilateral cooperation is also indispensable for addressing important longer-term global challenges, such as meeting the 2015 Sustainable Development Goals, providing financial support to vulnerable economies and fragile states, mitigating and adapting to climate change, and preventing the spread of global epidemics. Risks stemming from noneconomic factors with cross-border repercussions, such as the ongoing refugee crisis, further underscore the case for instituting globally funded vehicles to help the exposed economies cope with the strains.

Scenario Box 1. Permanent U.S. Fiscal Expansions

This box uses the IMF's G20 Model (G20MOD) to illustrate the impact of two alternative U.S. fiscal expansions relative to a baseline scenario with no change in U.S. fiscal policy. Both expansions use identical instruments: reduced labor income taxes, reduced corporate income taxes, and increased infrastructure spending. However, differences in the efficacy of the infrastructure spending and labor tax cuts, and the way the public debt is eventually stabilized, lead to different macroeconomic outcomes, as discussed below.

Assumptions

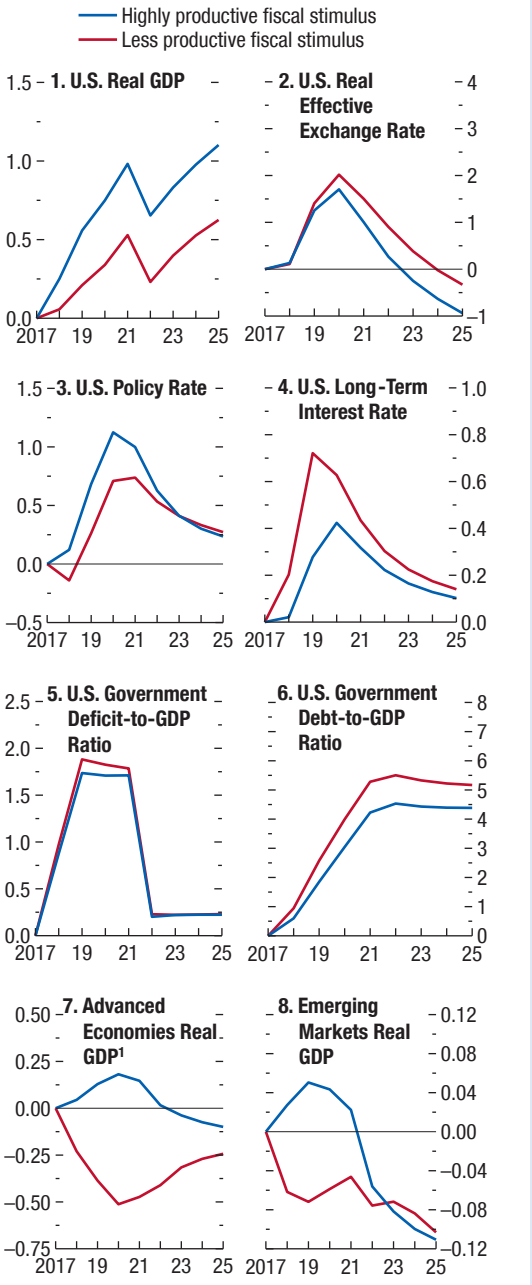
In both cases, the fiscal expansion is debt financed for the first four years (2018–21), and monetary policy in the United States responds endogenously to the change in demand. It is assumed that monetary policy in both Japan and the euro area would accommodate any positive increase in demand, but would have no conventional policy space to respond to negative developments. Households and firms are assumed to learn gradually about the changes in fiscal policy and their permanent nature. In both cases, after four years (2022) the fiscal authority needs to adjust policy to stabilize the debt-to-GDP ratio.

In the first case, the fiscal expansion is highly productive (blue lines in Scenario Figure 1)—the increase in public infrastructure spending is assumed to have a strong positive impact on output, and the cuts in labor income taxes are assumed to be broad based. In the second case, the fiscal expansion is less productive (red lines in Scenario Figure 1)—the infrastructure spending is assumed to be unproductive, and the tax cuts are assumed to go mostly to wealthier households with a very low marginal propensity to spend the additional income on consumption. In the second case, it is also assumed that financial markets deliver a faster normalization in the U.S. term premium than in the case of no change in fiscal policy (25 basis points in 2018 and an additional 25 basis points in 2019). This faster normalization in the U.S. term premium is transmitted into the term premium worldwide, consistent with the empirical correlations in the IMF's *2014 Spillover Report*.

Once policy needs to adjust to stabilize debt, in the highly productive case, the fiscal authority partially cuts back the initial increase in infrastructure spending to simply maintain the new higher level of the public capital stock (Scenario Table 1). Half of the remaining required adjustment comes from reducing tax expen-

Scenario Figure 1. Fiscal Stimulus in the United States

(Percent deviation from case with no change in U.S. fiscal policy)



Source: IMF staff estimates.
[1]Excluding the United States.

Scenario Box 1. *(continued)*

Scenario Table 1. The Impact of Fiscal Measures on the Deficit
(Percent of no-change-in-fiscal-measures case GDP)

	2017	2018	2019	2020	2021	2022
Highly Productive Fiscal Measures						
Capital Income Taxes	0	0.375	0.750	0.750	0.750	0.750
General Labor Income Taxes	0	0.375	0.750	0.750	0.750	–0.330
Productive Infrastructure Spending	0	0.250	0.500	0.500	0.500	0.150
Tax, Expenditures	0	0	0	0	0	–0.320
Total Change in the Deficit	0	1.000	2.000	2.000	2.000	0.200
Less Productive Fiscal Measures						
Capital Income Taxes	0	0.375	0.750	0.750	0.750	0.750
Labor Income Taxes for the Wealthy	0	0.375	0.750	0.750	0.750	0
General Labor Income Taxes	0	0	0	0	0	–0.530
Unproductive Infrastructure Spending	0	0.250	0.500	0.500	0.500	0
Total Change in the Deficit	0	1.000	2.000	2.000	2.000	0.220

Source: IMF staff assumptions for the scenario analysis.

ditures, and the other half comes from higher labor income taxes. In the less productive case, the increase in unproductive infrastructure spending is completely unwound and the tax cuts to the wealthy are completely reversed. The remaining adjustment required to stabilize debt comes in the form of higher general labor income taxes. In both cases, these adjustments stabilize the public-debt-to-GDP ratio roughly 5 percentage points above its prestimulus level.

Results

When the fiscal measures are highly productive, U.S. GDP rises notably, peaking at 1 percent above the no-policy-change case in 2021. When fiscal measures are less productive, U.S. GDP rises by roughly half that amount by 2021. With a smaller increase in U.S. output in the less productive case, the deficit and debt as a share of GDP both rise by more. In both cases, U.S. monetary policy tightens in response to higher demand and inflation, and higher real U.S. interest rates lead to an appreciation of the U.S. dollar. In the less productive case, the U.S. policy rate tightens by less, but the faster normalization of the term premium and thus higher long-term interest rates leads to more upward pressure on the currency in the near term. With regard to spillovers to the rest of the world, in the highly productive case, other advanced economies benefit the most in the short term, with GDP roughly 0.2 percent higher. This outcome reflects inclusion in this group of Canada and Mexico, which have strong trade links with the United States, and the assumption that monetary policy in the euro area and Japan does not tighten in the face of the increase in external demand. In the highly productive case, the spillovers to emerging market economies are also positive in the short term, but modest. Under the less productive fiscal expansion, the short-term spillovers become negative both for other advanced economies and for emerging market economies for two reasons. First, with lower U.S. demand in the less productive case, the direct trade spillovers are smaller. Second, the faster normalization of term premiums worldwide tightens financial conditions, which is particularly onerous for advanced economies that have limited or no conventional monetary policy space with which to respond.

Once U.S. fiscal policy needs to be tightened to stabilize public debt, the withdrawal of stimulus temporarily lowers U.S. GDP relative to its level in 2021 in both cases. However, because capital income taxes are assumed to be permanently lower in both cases, thereby raising the returns to private capital, real GDP subsequently recovers as firms continue investing to raise the private capital stock to its higher desired level. In the highly productive fiscal expansion, this effect is reinforced by the permanently higher level of the public capital stock, which raises private productivity, further increasing the return to private capital. With U.S. output permanently higher in the long term and with no change in the relative price of U.S. tradable

Scenario Box 1. *(continued)*

and nontradable goods, the U.S. dollar would need to depreciate to maintain external stability.

In the long term, the spillovers to all economies outside the United States are small, but negative, because the permanently higher level of U.S. public debt raises global real interest rates. The increase in global interest rates in turn permanently raises the cost of capital, which more than offsets the increase in the return to private capital coming from higher U.S. demand.

It is important to note that the positive effects on U.S. GDP over the medium and long term arise from the beneficial supply-side effects of some tax and expenditure changes (notably the reduction in corporate income tax rates and the increase in public investment in infrastructure) rather than simply from the initial fiscal expansion. Simulations show that a similarly growth-friendly fiscal policy implemented in a deficit-neutral way (financed by a reduction in tax expenditures and lower government consumption) would lead to a higher long-term level of GDP. In the short term, GDP would be lower compared with the deficit-financed expansion, with policy rates and long-term interest rates correspondingly lower. The dollar would appreciate by less, but there would be no subsequent need for additional tightening of fiscal policy, and with lower medium-term debt long-term interest rates would be a bit lower. Both factors support medium-term GDP, the first on a temporary basis and the second on a permanent basis.

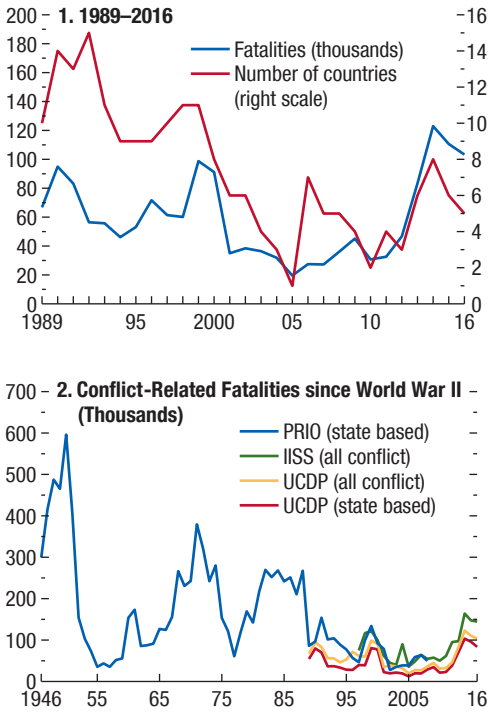
Box 1.1. Conflict, Growth, and Migration

Conflict has been on the rise since the early 2000s. The incidence of conflict, defined as the number of countries that have had at least 100 conflict-related deaths per 1 million people, has risen in recent years from low levels in the early 2000s (Figure 1.1.1, panel 1).[1] Although the total annual number of conflict-related deaths is still relatively low from a historical perspective, its increase in recent years has been quite sharp, reflecting the very deadly conflicts in Afghanistan, Iraq, and Syria (Figure 1.1.1, panel 2). Over time, the nature of conflict has changed: there was more interstate conflict between World War II and the 1990s, and there has been more internal civil war since the 1990s (Blattman and Miguel 2010). The location of conflict has also shifted, from sub-Saharan Africa in the 1990s to the broader Middle East region, especially since 2010.[2]

Conflict leads not only to immeasurable humanitarian suffering, but also to significant economic losses that can persist for years. Empirical research points to conflict as one of the factors that can hold back economic development (Rodrik 1999; Besley and Persson 2008). It can also ignite large refugee flows and may affect the economies of countries near and far for an extended period.

The tragic rise in conflict has also weighed on global GDP growth in recent years, given the increasing number of economies experiencing strife, the severe effect of some of these episodes on economic activity, and the considerable size of some of the affected economies. The countries currently involved in conflict accounted for 1.0–2.5 percent of GDP in 2010, depending on the precise threshold used to define the incidence of conflict (Figure 1.1.2, panel 1).[3] In some countries, the difference between

Figure 1.1.1. Conflict-Related Fatalities and Number of Countries Affected by Conflict



Sources: International Institute for Strategic Studies (IISS) Armed Conflict database; Peace Research Institute Oslo (PRIO) Battle Deaths data set v. 3.1; UN (2016); Uppsala Conflict Data Program (UCDP) Georeferenced Event data set v. 5.0 and Battle-Related Deaths data set v. 5.0; and IMF staff calculations.
Note: In panel 1, a country is considered in conflict if in any year 100 people or more are killed per 1 million population. In panel 2, state-based conflicts are those in which at least one of the conflict parties is a state. All conflicts can also include one-sided violence (for example, violence against civilians perpetrated by rebel groups) and nonstate conflict (for example, organized rebel or communal group fight). Fatalities that are not attributed to a specific country are excluded. The UCDP all-conflict estimate of fatalities excludes the Rwanda outlier in 1994 (501,958 dead).

The authors of this box are Natalija Novta and Evgenia Pugacheva.

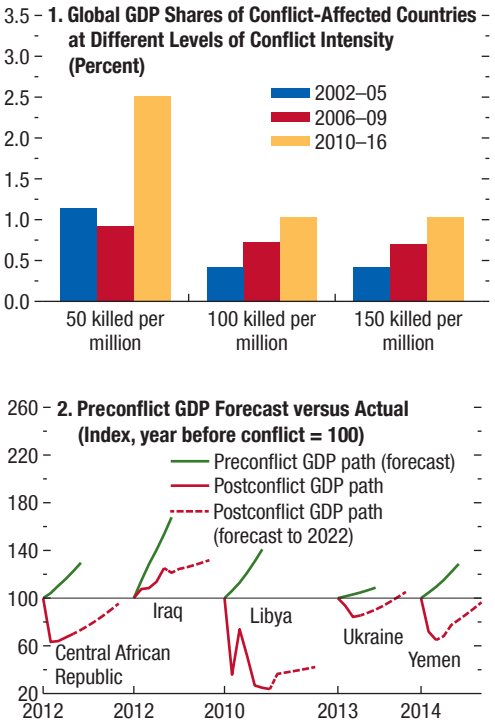
[1]The choice of different thresholds does not change the thrust of the findings. In Figure 1.1.1, a country is considered in conflict in a given year if there are more than 100 conflict-related deaths per 1 million people in the country. In many previous conflict studies, conflict incidence is defined as an absolute number of conflict-related deaths; however, this approach makes it mechanically harder for smaller countries to pass the threshold, even if they are experiencing significant conflict (see Mueller 2016).

[2]Middle East, including Afghanistan, Israel, North Africa, Palestine, and Pakistan.

[3]Three definitions of conflict are used, based on severity—if there are at least 50, 100, or 150 conflict-related deaths per million people in the country and for three different periods: 2002–05, 2006–09, and 2010–15. If calculated separately each year, the share of global GDP in conflict-affected countries mechanically declines during the period of conflict because the GDP of conflict-affected countries typically drops during conflict (Mueller 2013; Cerra and Saxena 2008). To limit this mechanical effect, in panel 1 of Figure 1.1.2, the percentage of global GDP that a country represents is recorded in the first year of the period.

Box 1.1 *(continued)*

Figure 1.1.2. Global GDP Shares of Conflict-Affected Countries and Impact of Conflict on Growth



Sources: UN (2016); Uppsala Conflict Data Program Georeferenced Event data set v. 5.0 and Battle-Related Deaths data set v. 5.0; and IMF staff calculations.
Note: In panel 1, GDP shares are based on the first year within the bin (using 2011 data for South Sudan and rescaling all 2010 numbers). In panel 2, conflict onset is the first year of conflict in which the number of deaths exceeds 100 per 1 million population (after at least four consecutive years without passing that threshold).

preconflict GDP forecasts and actual GDP during conflict is dramatic (Figure 1.1.2, panel 2).

Economic Recovery from Conflict Is Slow

The onset of conflict can hurt GDP per capita growth in many ways, such as by directly reducing the workforce or hampering labor productivity. The negative effects of conflict can be large over the medium and long term if people's health is permanently damaged, they leave the country as refugees or economic migrants, or they are prevented from attending school, which lowers human capital both individually and in the aggregate (see Blattman and Miguel 2010; Justino 2007 and 2009). Furthermore, conflict typically leads to lower investment (as investors lose confidence), changes in household saving and consumption (Voors and others 2012), and capital flight (Collier, Hoeffler, and Pattillo 2004).

During 1989–2016, outbreaks of conflict are estimated to have reduced output per capita by a cumulative 18 percent over the subsequent 10 years, on average (Figure 1.1.3, panel 1).[4] Restricting the analysis to state-based conflicts and using data for a longer period point to losses of about 5 percent after 10 years (Figure 1.1.3, panel 2).[5] The econometric finding of a persistent loss of output holds true if the conflict variable is defined as the share of lost lives in the population or with a dummy variable indicating conflict incidence in a given year. In the first case (conflict fatalities), the cumulative loss in output after 10 years is about 5 percent, and in the second case (annual conflict incidence), the cumulative loss is about 7 percent (not shown in figures). These losses build up as conflict evolves.[6]

[4]The local projection method of Jorda (2005) and Teulings and Zubanov (2014) is used to estimate the impact of conflict on GDP over the subsequent 10-year horizon. The following type of equation is estimated:

$$y_{it+h} - y_{it-1} = \beta_1^h c_{it} + \beta_2^h c_{it-1} + \sum_{j=1}^{h-1} \beta_3^{hj} c_{it+h-j} + \theta_1^h \Delta y_{it-1} + \mu_i^h + \theta_{rt}^h + \varepsilon_{it}^h, \quad h = 0,\ldots,10,$$

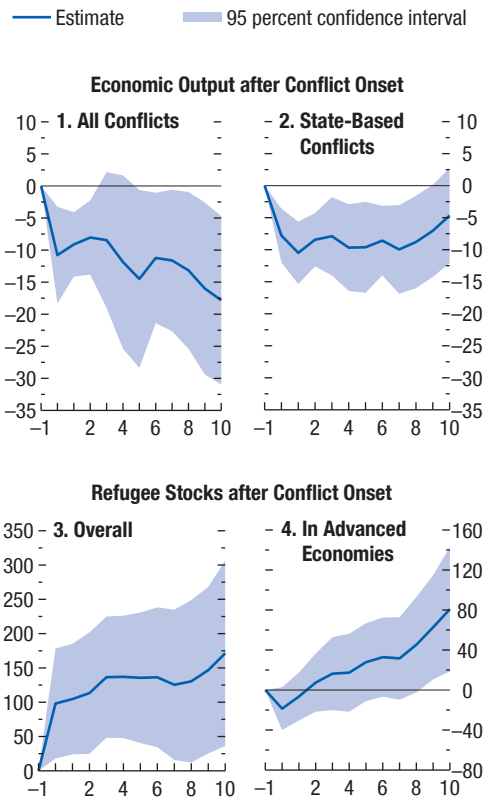
in which y_{it} is log GDP per capita (or log number of refugees, for migration), c_{it} are conflict variables (the onset of conflict, percentage of population killed, or conflict incidence), μ_i^h are country fixed effects, θ_{rt}^h are time fixed effects, and h is the horizon. The reported findings are generally robust to the addition of various controls.

[5]The longest series for conflict-related deaths, which is compiled by the Peace Research Institute Oslo, starts in 1946, but covers only state-based conflicts. The Uppsala Conflict Data Program provides data on fatalities from all types of conflict (including non-state-based actors, one-sided violence against civilians, and so on) starting in 1989.

[6]The econometric estimates would be biased if low growth caused the conflict rather than resulting from it. However, the results do not change much if the *World Economic Outlook* (WEO) GDP per capita forecast for the current year, made the year before the conflict, is controlled for in the regressions (based on the level of GDP per capita projections from different vintages of the WEO). Overall, the results are very similar to those from regressions that do not control for GDP forecasts.

Box 1.1 *(continued)*

Figure 1.1.3. Impact of Conflict Onset
(Percent; years on x-axis)



Sources: UN (2016); UNHCR (2016); Uppsala Conflict Data Program Georeferenced Event data set v. 5.0 and Battle-Related Deaths data set v. 5.0; and IMF staff calculations.
Note: $t = 0$ is the year of the shock. Conflict onset is the first year of conflict in which the number of deaths exceeds 100 per 1 million population (after at least four consecutive years without passing that threshold).

Emigration from Conflict-Ridden Areas Remains High for a Long Time

Refugee populations tend to grow for many years after conflict begins, potentially placing a significant burden on other economies (Figure 1.1.3, panel 3). After a conflict erupts, neighboring economies are typically the first to receive a large influx of refugees, but if these countries do not offer much economic opportunity, refugees may eventually prefer to move to advanced economies. Panel 4 of Figure 1.1.3 shows that refugee populations in advanced economies remain on the rise 10 years after the beginning of a conflict.

Box 1.2. Tackling Measurement Challenges of Irish Economic Activity

On July 12, 2016, the Central Statistics Office of Ireland disseminated unprecedented revisions to some of the country's main macroeconomic statistics. GDP growth in real terms for 2015 was revised from a preliminary figure of 7.8 percent to a record 26.3 percent, growth in the gross national income (GNI) was revised from 5.7 percent to 18.7 percent, and revisions to exports and imports resulted in an increase in net exports of more than €35 billion (about 17 percent of the preliminary 2015 GDP) estimate reported in March 2016 in 2015 (Figure 1.2.1).

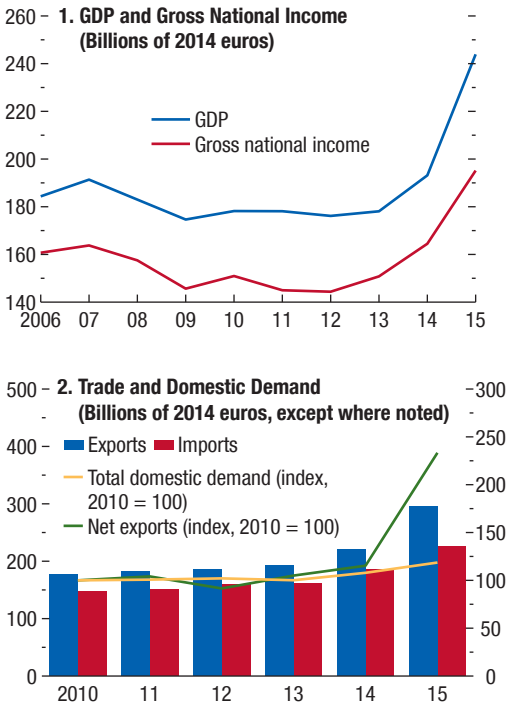
The revisions conform to international standards—the System of National Accounts (2008 SNA) and the European System of Accounts (ESA 2010)—and the new data were disseminated according to an established revision cycle.

The unusually large revisions are explained to a great extent by relocations of entire balance sheets and their related activity to Ireland. More specifically, the revisions were driven mainly by: (1) a significant increase in external contract manufacturing activity attributable to Ireland, and (2) the relocation and use of intellectual property products. From a statistical perspective, the increase in contract manufacturing activity through redomiciliation means that all value added derived from this type of production is now recorded in Ireland. This will have an impact on production, exports, imports, and taxation. Even when actual physical manufacturing of goods is carried out abroad, the payment to the manufacturer is treated as importation of services, and the final output of this activity, once sold (exported), contributes to exports in an amount that includes the cost of intermediate inputs (including manufacturing services), license fees, other production costs, and profit margins.

The relocation of intellectual property products has several direct effects on national accounts, the balance of payments, and the international investment position. Net exports are affected because: (1) the fees that firms located in Ireland charge foreign companies to manufacture patented products result in an increase in services exports, and (2) firms located in Ireland producing patented products no longer pay the fee associated with relocated intellectual property products, which reduces services imports. GDP and GNI are also affected because the increase in fixed assets implies an increase in the estimates of depreciation.

The author of this box is Michael Stanger.

Figure 1.2.1. Irish National Accounts



Sources: Central Statistics Office Ireland; and IMF staff calculations.

The intellectual property product relocations were mostly recorded as "other changes" in the international investment position—implying a sharp downward revision to the net international investment position. This is because the intellectual property product transfer resulted in much larger intercompany debt in foreign direct investment liabilities (Table 1.2.1).[1] If these relocations had been recorded in the balance of payments, the effects on GDP would have been the same, but the Irish accounts would have shown an additional very large one-off increase in imports of services and a correspondingly large one-off current account deficit, along with a one-off increase in gross fixed capital formation in 2015.

The relocation of balance sheets (dominated by intellectual property) is not new, but the scale observed

[1]The transfer of intellectual property capital to Ireland was "financed" by loans to the relevant Irish affiliates from other entities in the group and hence resulted in a sharp increase in foreign direct investment liabilities in the form of debt.

Box 1.2 *(continued)*

Table 1.2.1 Ireland: Balance of Payments and International Investment Position
(Billions of euros)

	Direct Investment	International Investment Position (end of 2014)	Balance of Payments (2015)	Other Changes	International Investment Position (end of 2015)
Release 2015:Q4	Assets	522.8	91.6	114.3	728.8
	Liabilities	311.5	90.7	–2.2	400.0
Release 2016:Q1	Assets	510.2	149.9	155.1	815.2
	Liabilities	342.7	169.8	283.1	795.6
Revisions	Assets	12.6	58.3	40.8	86.4
	Liabilities	31.2	79.2	285.3	395.6

Sources: Central Statistics Office of Ireland (for data on balance of payments and international investment position); "Other Changes" derived residually.

in 2015 is exceptional—it added about €300 billion to Ireland's capital stock and a similar amount to its net external liabilities. Activity attributable to goods for processing (that is, contract manufacturing) also increased significantly. Together, these two factors had a substantial impact on Ireland's macroeconomic statistics, particularly given the small size of the economy.

Need for Additional Measures to Understand Complex New Arrangements

The acquisition of foreign-owned intellectual property assets adds to capital formation, and any subsequent revenue from licensing adds to Ireland's GDP if licenses are charged; this has not happened significantly to date. Moreover, the growth of capital formation significantly increases standard measures of labor productivity and alters their relationship with domestically generated GDP and employment.

The inclusion of contract manufacturing activity in statistical accounts increases output (exports), imports, GDP, and GNI, but leaves domestic employment mostly unchanged. GDP is a measure of production and thus includes value added that accrues to foreign investors. GNI, in contrast, is a measure of income, and Ireland's GNI is significantly lower than its GDP because GNI does not include the income paid abroad or the retained earnings of foreign direct investors in Ireland. However, GNI does include retained earnings on foreign investment that is not direct (many corporate relocations to Ireland entail foreign investment that is not direct—that is, individual owners fall short of the 10 percent threshold that classifies an investment as direct). In those cases, corporate entities are considered Irish, and their retained earnings are treated as Irish income, even though retained earnings ultimately accrue to foreign shareholders through their impact on stock prices. Furthermore, in the case of companies and products with substantial intellectual property content, retained earnings are typically sizable because they need to offset the relatively rapid depreciation of intellectual property capital.

As a consequence of these relocations, the use of standard headline measures—such as domestic production, national income, domestic demand, and net exports—are less applicable to economic activity in Ireland. For instance, the conventional measures of fixed capital formation and domestic demand contain significant components related to the nondomestic economy. Additional measures to reflect the level of activity within the domestic economy are therefore required.

Strategy to Address Measurement Issues

The Central Statistics Office of Ireland convened the Economic Statistics Review Group to provide direction on how best to meet user needs for a better understanding of Irish economic activity in the context of a highly globalized economy.[2] The group finalized its report in December 2016, and in February 2017 the Central Statistics Office published its response to the report's recommendations, including a timetable for implementation.

Based on the report's recommendations, GDP and GNI will remain the key international standard indicators, and new analytical presentations and supplementary statistics will be made available. Annual aggregates will be developed first, followed by quarterly series where feasible and appropriate. Most recommenda-

[2]The Economic Statistics Review Group includes policymakers, analysts, regulators, business and trade union representatives, academics, and members of the international statistics community represented by Eurostat and the IMF.

Box 1.2 *(continued)*

tions are to be implemented between mid-2017 and the end of 2018, in particular the following:

- A reliable indicator of the size of the economy that is relatively immune to relocations. The recommended indicator is an adjusted GNI that is an extension of the standard GNI and takes into account the retained earnings of redomiciled firms and depreciation on foreign-owned domestic capital assets. Corresponding adjusted presentations of the balance of payments and international investment position data are also proposed.
- A standard set of structural macroeconomic indicators that better describe economic activity by multinational-company-dominated and domestic sectors. This includes a breakdown of the nonfinancial sector in the annual Institutional Sector Accounts into two broadly defined, foreign and domestic, subsectors, as this sector accounts for most of the multinational enterprises operating in Ireland. The same detail is needed for the entire system of national accounts, the balance of payments, and the international investment position.
- Additional detail on cross-border economic activities to allow for the monitoring of the domestic macroeconomic situation, which would provide increased detail on gross fixed capital formation, domestic demand, exports, and imports. Along the same lines, an additional breakdown of the industrial production index is proposed.
- A number of initiatives to enhance the communication strategy to make it easier for users to understand major statistical releases.

Annex Table 1.1.1. European Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Europe	**2.0**	**2.0**	**2.0**	**0.9**	**2.5**	**2.4**	**2.4**	**2.3**	**2.4**	. . .	. . .	. . .
Advanced Europe	**1.8**	**1.8**	**1.7**	**0.4**	**1.8**	**1.6**	**2.9**	**2.9**	**2.9**	**8.7**	**8.3**	**8.0**
Euro Area[4,5]	1.7	1.7	1.6	0.2	1.7	1.5	3.4	3.0	3.0	10.0	9.4	9.1
Germany	1.8	1.6	1.5	0.4	2.0	1.7	8.5	8.2	8.0	4.2	4.2	4.2
France	1.2	1.4	1.6	0.3	1.4	1.2	–1.1	–0.9	–0.5	10.0	9.6	9.3
Italy	0.9	0.8	0.8	–0.1	1.3	1.3	2.7	2.0	1.8	11.7	11.4	11.0
Spain	3.2	2.6	2.1	–0.2	2.4	1.4	2.0	1.5	1.6	19.6	17.7	16.6
Netherlands	2.1	2.1	1.8	0.1	0.9	1.4	9.6	9.2	9.1	5.9	5.4	5.3
Belgium	1.2	1.6	1.5	1.8	2.0	1.7	1.0	0.9	1.0	8.0	7.8	7.6
Austria	1.5	1.4	1.3	1.0	2.1	1.8	2.4	2.4	2.2	6.1	5.9	5.9
Greece	0.0	2.2	2.7	0.0	1.3	1.4	–0.6	–0.3	–0.0	23.8	21.9	21.0
Portugal	1.4	1.7	1.5	0.6	1.2	1.4	0.8	–0.3	–0.4	11.1	10.6	10.1
Ireland	5.2	3.5	3.2	–0.2	0.9	1.5	4.7	4.7	4.7	7.9	6.5	6.3
Finland	1.4	1.3	1.4	0.4	1.4	1.6	–1.1	–1.3	–1.2	8.8	8.5	8.3
Slovak Republic	3.3	3.3	3.7	–0.5	1.2	1.5	0.4	0.3	0.2	9.7	7.9	7.4
Lithuania	2.3	2.8	3.1	0.7	2.8	2.0	–0.9	–1.6	–1.5	7.9	7.4	7.2
Slovenia	2.5	2.5	2.0	–0.1	1.5	2.0	6.8	5.5	5.1	7.9	7.0	6.6
Luxembourg	4.0	3.7	3.5	0.1	1.4	1.3	4.8	5.1	5.1	6.4	5.9	5.7
Latvia	2.0	3.0	3.3	0.1	2.8	2.5	1.5	–1.1	–1.4	9.6	9.4	9.2
Estonia	1.6	2.5	2.8	0.8	3.2	2.5	2.7	1.4	0.9	6.9	8.3	8.9
Cyprus	2.8	2.5	2.3	–1.2	1.5	1.4	–2.4	–2.5	–2.5	12.9	11.3	10.2
Malta	5.0	4.1	3.5	0.9	1.5	1.6	5.8	5.5	5.3	4.8	4.7	4.7
United Kingdom[5]	1.8	2.0	1.5	0.6	2.5	2.6	–4.4	–3.3	–2.9	4.9	4.9	5.1
Switzerland	1.3	1.4	1.6	–0.4	0.4	0.7	12.0	10.8	10.5	3.3	3.0	2.9
Sweden	3.3	2.7	2.4	1.1	1.4	1.6	4.7	4.6	4.2	7.0	6.7	6.7
Norway	1.0	1.2	1.9	3.6	2.6	2.5	4.6	5.7	5.7	4.8	4.5	4.2
Czech Republic	2.4	2.8	2.2	0.7	2.3	1.8	1.1	1.2	0.7	4.0	3.8	4.2
Denmark	1.1	1.5	1.7	0.3	0.6	1.1	8.1	7.5	7.2	6.2	5.8	5.8
Iceland	7.2	5.7	3.6	1.7	2.2	2.6	8.0	6.9	6.7	3.0	3.0	3.3
San Marino	1.0	1.2	1.3	0.6	0.7	0.8	. . .	. . .	. . .	8.6	8.0	7.4
Emerging and Developing Europe[6]	**3.0**	**3.0**	**3.3**	**3.2**	**5.7**	**5.5**	**–1.9**	**–2.8**	**–2.8**	. . .	. . .	. . .
Turkey	2.9	2.5	3.3	7.8	10.1	9.1	–3.8	–4.7	–4.6	10.8	11.5	11.0
Poland	2.8	3.4	3.2	–0.6	2.3	2.3	–0.3	–1.7	–1.8	6.1	5.5	5.3
Romania	4.8	4.2	3.4	–1.6	1.3	3.1	–2.4	–2.8	–2.5	6.0	5.4	5.2
Hungary	2.0	2.9	3.0	0.4	2.5	3.3	4.3	3.7	3.0	4.9	4.4	4.3
Bulgaria[5]	3.4	2.9	2.7	–1.3	1.0	1.8	4.2	2.3	2.0	7.7	7.1	6.9
Serbia	2.8	3.0	3.5	1.1	2.6	3.0	–4.0	–4.0	–4.0	15.9	16.0	15.6
Croatia	2.9	2.9	2.6	–1.1	1.1	1.1	3.9	2.8	1.8	15.0	13.9	13.5

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]Current account position corrected for reporting discrepancies in intra-area transactions.
[5]Based on Eurostat's harmonized index of consumer prices except for Slovenia.
[6]Includes Albania, Bosnia and Herzegovina, Kosovo, FYR Macedonia, and Montenegro.

Annex Table 1.1.2. Asian and Pacific Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Asia	**5.3**	**5.5**	**5.4**	**2.3**	**2.9**	**2.9**	**2.5**	**2.1**	**2.0**	**. . .**	**. . .**	**. . .**
Advanced Asia	**1.6**	**1.9**	**1.6**	**0.5**	**1.4**	**1.3**	**4.6**	**4.6**	**4.5**	**3.6**	**3.5**	**3.5**
Japan	1.0	1.2	0.6	–0.1	1.0	0.6	3.9	4.2	4.3	3.1	3.1	3.1
Korea	2.8	2.7	2.8	1.0	1.8	1.9	7.0	6.2	6.1	3.7	3.8	3.6
Australia	2.5	3.1	3.0	1.3	2.0	2.4	–2.6	–2.8	–2.9	5.7	5.2	5.1
Taiwan Province of China	1.4	1.7	1.9	1.4	1.4	1.3	14.2	14.8	15.0	3.9	4.0	4.0
Singapore	2.0	2.2	2.6	–0.5	1.1	1.8	19.0	20.1	19.2	2.1	2.1	2.1
Hong Kong SAR	1.9	2.4	2.5	2.6	2.6	2.7	5.1	3.0	3.1	3.3	3.2	3.2
New Zealand	4.0	3.1	2.9	0.6	1.5	2.0	–2.7	–2.5	–3.1	5.1	5.0	4.8
Macao SAR	–4.0	2.8	1.7	2.4	2.0	2.2	27.1	29.5	30.5	1.9	2.0	2.0
Emerging and Developing Asia	**6.4**	**6.4**	**6.4**	**2.9**	**3.3**	**3.3**	**1.3**	**0.8**	**0.7**	**. . .**	**. . .**	**. . .**
China	6.7	6.6	6.2	2.0	2.4	2.3	1.8	1.3	1.2	4.0	4.0	4.0
India[4]	6.8	7.2	7.7	4.9	4.8	5.1	–0.9	–1.5	–1.5	. . .	. . .	. . .
ASEAN-5	**4.9**	**5.0**	**5.2**	**2.4**	**3.6**	**3.7**	**2.2**	**1.6**	**1.1**	**. . .**	**. . .**	**. . .**
Indonesia	5.0	5.1	5.3	3.5	4.5	4.5	–1.8	–1.9	–2.0	5.6	5.4	5.2
Thailand	3.2	3.0	3.3	0.2	1.4	1.5	11.4	9.7	7.8	0.8	0.7	0.7
Malaysia	4.2	4.5	4.7	2.1	2.7	2.9	2.0	1.8	1.8	3.5	3.4	3.2
Philippines	6.8	6.8	6.9	1.8	3.6	3.3	0.2	–0.1	–0.3	5.5	6.0	5.5
Vietnam	6.2	6.5	6.3	2.7	4.9	5.0	4.7	4.1	3.4	2.4	2.4	2.4
Other Emerging and Developing Asia[5]	**5.5**	**6.1**	**6.3**	**5.6**	**5.9**	**5.6**	**–1.0**	**–2.0**	**–2.6**	**. . .**	**. . .**	**. . .**
Memorandum												
Emerging Asia[6]	6.4	6.4	6.4	2.8	3.2	3.2	1.4	0.9	0.8	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]See country-specific notes for India in the "Country Notes" section of the Statistical Appendix.
[5]Other Emerging and Developing Asia comprises Bangladesh, Bhutan, Brunei Darussalam, Cambodia, Fiji, Kiribati, Lao P.D.R., Maldives, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Nepal, Palau, Papua New Guinea, Samoa, Solomon Islands, Sri Lanka, Timor-Leste, Tonga, Tuvalu, and Vanuatu.
[6]Emerging Asia comprises the ASEAN-5 (Indonesia, Malaysia, Philippines, Thailand, Vietnam) economies, China, and India.

Annex Table 1.1.3. Western Hemisphere Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
North America	**1.7**	**2.2**	**2.4**	**1.4**	**2.8**	**2.4**	**–2.6**	**–2.7**	**–3.2**	**. . .**	**. . .**	**. . .**
United States	1.6	2.3	2.5	1.3	2.7	2.4	–2.6	–2.7	–3.3	4.9	4.7	4.6
Canada	1.4	1.9	2.0	1.4	2.0	2.1	–3.3	–2.9	–2.7	7.0	6.9	6.8
Mexico	2.3	1.7	2.0	2.8	4.8	3.2	–2.7	–2.5	–2.7	4.3	4.4	4.4
Puerto Rico[4]	–1.8	–3.0	–2.5	0.2	1.5	0.5	. . .	. . .	. . .	11.8	12.6	12.1
South America[5]	**–2.7**	**0.6**	**1.8**	**. . .**	**. . .**	**. . .**	**–1.9**	**–1.9**	**–2.1**	**. . .**	**. . .**	**. . .**
Brazil	–3.6	0.2	1.7	8.7	4.4	4.3	–1.3	–1.3	–1.7	11.3	12.1	11.6
Argentina	–2.3	2.2	2.3	. . .	25.6	18.7	–2.6	–2.9	–3.4	8.5	7.4	7.3
Colombia	2.0	2.3	3.0	7.5	4.5	3.2	–4.4	–3.6	–3.3	9.2	9.5	9.3
Venezuela	–18.0	–7.4	–4.1	254.9	720.5	2,068.5	–2.4	–3.3	–2.1	21.2	25.3	28.2
Chile	1.6	1.7	2.3	3.8	2.8	3.0	–1.4	–1.4	–1.7	6.5	7.0	6.8
Peru	3.9	3.5	3.7	3.6	3.1	2.6	–2.8	–1.9	–2.0	6.7	6.7	6.7
Ecuador	–2.2	–1.6	–0.3	1.7	0.3	0.6	1.1	0.9	–0.1	5.2	5.7	5.8
Bolivia	4.1	4.0	3.7	3.6	4.0	5.0	–5.4	–3.9	–2.6	4.0	4.0	4.0
Uruguay	1.4	1.6	2.6	9.6	7.7	7.5	–1.0	–1.5	–1.6	7.9	7.8	7.8
Paraguay	4.1	3.3	3.7	4.1	4.0	4.0	0.6	–1.4	–0.5	5.1	5.4	5.5
Central America[6]	**3.8**	**3.9**	**4.1**	**2.1**	**2.8**	**3.5**	**–3.0**	**–3.1**	**–3.2**	**. . .**	**. . .**	**. . .**
Caribbean[7]	**3.4**	**3.6**	**4.2**	**2.8**	**4.3**	**4.3**	**–3.4**	**–3.7**	**–3.8**	**. . .**	**. . .**	**. . .**
Memorandum												
Latin America and the Caribbean[8]	–1.0	1.1	2.0	5.6	4.2	3.7	–2.1	–2.1	–2.3	. . .	. . .	. . .
East Caribbean Currency Union[9]	1.9	2.4	2.3	–0.2	1.7	1.6	–11.7	–13.8	–13.8	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]Puerto Rico is a territory of the United States but its statistical data are maintained on a separate and independent basis.
[5]Includes Guyana and Suriname. Data for Argentina's and Venezuela's consumer prices are excluded. See country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.
[6]Central America comprises Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.
[7]The Caribbean comprises Antigua and Barbuda, The Bahamas, Barbados, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago.
[8]Latin America and the Caribbean comprises Mexico and economies from the Caribbean, Central America, and South America. Data for Argentina's and Venezuela's consumer prices are excluded. See country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.
[9]Eastern Caribbean Currency Union comprises Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, and St. Vincent and the Grenadines as well as Anguilla and Montserrat, which are not IMF members.

Annex Table 1.1.4. Commonwealth of Independent States Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Commonwealth of Independent States[4]	**0.3**	**1.7**	**2.1**	**8.3**	**5.7**	**5.3**	**–0.2**	**1.6**	**1.8**	**. . .**	**. . .**	**. . .**
Net Energy Exporters	**0.2**	**1.7**	**2.0**	**7.9**	**5.2**	**4.9**	**0.4**	**2.2**	**2.5**	**. . .**	**. . .**	**. . .**
Russia	–0.2	1.4	1.4	7.0	4.5	4.2	1.7	3.3	3.5	5.5	5.5	5.5
Kazakhstan	1.1	2.5	3.4	14.6	8.0	7.2	–6.1	–4.0	–2.8	5.0	5.0	5.0
Uzbekistan	7.8	6.0	6.0	8.0	8.6	8.8	1.4	2.1	1.6	. . .	. . .	. . .
Azerbaijan	–3.8	–1.0	2.0	12.4	10.0	8.0	–3.8	1.3	3.8	6.0	6.0	6.0
Turkmenistan	6.2	6.5	6.3	3.5	6.0	6.2	–21.0	–12.8	–11.5	. . .	. . .	. . .
Net Energy Importers	**1.1**	**1.6**	**2.7**	**11.0**	**9.5**	**8.2**	**–4.7**	**–4.9**	**–4.6**	**. . .**	**. . .**	**. . .**
Ukraine	2.3	2.0	3.2	13.9	11.5	9.5	–3.6	–3.6	–2.9	8.8	9.0	8.7
Belarus	–3.0	–0.8	0.6	11.8	9.3	8.7	–4.3	–4.7	–5.0	1.0	1.0	1.0
Georgia	2.7	3.5	4.0	2.1	5.7	2.4	–12.4	–12.9	–12.5	. . .	. . .	. . .
Armenia	0.2	2.9	2.9	–1.4	2.0	3.5	–2.9	–3.2	–2.9	18.8	18.9	18.9
Tajikistan	6.9	4.5	5.0	5.9	5.8	6.0	–5.1	–5.5	–5.1	. . .	. . .	. . .
Kyrgyz Republic	3.8	3.4	3.8	0.4	3.6	5.2	–9.4	–12.0	–12.1	7.5	7.4	7.3
Moldova	4.0	4.5	3.7	6.4	5.5	5.9	–3.4	–3.8	–4.0	4.2	4.3	4.2
Memorandum												
Caucasus and Central Asia[5]	2.4	3.1	4.1	10.4	7.9	7.2	–6.2	–3.8	–3.0	. . .	. . .	. . .
Low-Income CIS Countries[6]	6.1	5.1	5.2	5.8	7.0	7.1	–2.1	–1.9	–2.2	. . .	. . .	. . .
Net Energy Exporters Excluding Russia	2.2	3.1	4.1	11.5	8.3	7.6	–5.9	–3.2	–2.3	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Table A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States (CIS), are included in this group for reasons of geography and similarity in economic structure.
[5]Caucasus and Central Asia comprises Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.
[6]Low-Income CIS countries comprise Armenia, Georgia, the Kyrgyz Republic, Moldova, Tajikistan, and Uzbekistan.

Annex Table 1.1.5. Middle East, North African Economies, Afghanistan, and Pakistan: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Middle East, North Africa, Afghanistan, and Pakistan	**3.9**	**2.6**	**3.4**	**5.1**	**7.6**	**7.4**	**–3.4**	**–1.1**	**–0.8**	**. . .**	**. . .**	**. . .**
Oil Exporters[4]	**4.0**	**1.9**	**2.9**	**4.6**	**5.8**	**6.3**	**–2.7**	**0.4**	**0.6**	**. . .**	**. . .**	**. . .**
Saudi Arabia	1.4	0.4	1.3	3.5	3.8	5.1	–3.9	1.5	2.0	5.7	. . .	. . .
Iran	6.5	3.3	4.3	8.9	11.2	11.0	6.3	5.3	5.1	12.5	12.5	12.5
United Arab Emirates	2.7	1.5	4.4	1.8	2.8	3.7	2.4	3.5	3.9	. . .	. . .	. . .
Algeria	4.2	1.4	0.6	6.4	4.8	4.3	–16.4	–12.3	–10.2	10.5	11.7	13.2
Iraq	10.1	–3.1	2.6	0.4	2.0	2.0	–7.3	–4.4	–4.9	. . .	. . .	. . .
Qatar	2.7	3.4	2.8	2.7	2.6	5.7	–2.2	0.7	0.6	. . .	. . .	. . .
Kuwait	2.5	–0.2	3.5	3.2	4.2	3.6	2.7	8.2	7.1	2.1	2.1	2.1
Oil Importers[5]	**3.7**	**4.0**	**4.4**	**6.2**	**11.4**	**9.5**	**–4.8**	**–4.9**	**–4.3**	**. . .**	**. . .**	**. . .**
Egypt	4.3	3.5	4.5	10.2	22.0	16.9	–5.6	–5.3	–3.9	12.7	12.6	11.8
Pakistan	4.7	5.0	5.2	2.9	4.3	5.0	–1.1	–2.9	–3.0	6.0	6.0	6.1
Morocco	1.5	4.4	3.9	1.6	1.2	1.5	–3.9	–2.6	–2.0	9.4	9.3	9.5
Sudan	3.0	3.7	3.6	17.8	23.2	16.0	–5.8	–4.7	–4.3	20.6	19.6	18.6
Tunisia	1.0	2.5	3.1	3.7	3.9	3.8	–9.0	–8.6	–8.1	14.0	13.0	12.0
Lebanon	1.0	2.0	2.5	–0.8	2.6	2.0	–16.0	–15.5	–14.9	. . .	. . .	. . .
Jordan	2.1	2.3	2.5	–0.8	2.3	2.5	–9.4	–8.6	–7.4	. . .	. . .	. . .
Memorandum												
Middle East and North Africa	3.8	2.3	3.2	5.4	8.1	7.7	–3.7	–1.0	–0.6	. . .	. . .	. . .
Israel[6]	4.0	2.9	3.0	–0.5	0.7	1.4	3.6	3.4	3.4	4.8	4.8	4.8
Maghreb[7]	2.6	6.2	2.0	5.7	5.6	5.4	–14.1	–9.0	–8.3	. . .	. . .	. . .
Mashreq[8]	3.9	3.3	4.2	8.7	19.3	14.9	–7.2	–7.4	–6.1	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Tables A6 and A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]Includes Bahrain, Libya, Oman, and Yemen.
[5]Includes Afghanistan, Djibouti, and Mauritania. Excludes Syria because of the uncertain political situation.
[6]Israel, which is not a member of the economic region, is included for reasons of geography but is not included in the regional aggregates.
[7]The Maghreb comprises Algeria, Libya, Mauritania, Morocco, and Tunisia.
[8]The Mashreq comprises Egypt, Jordan, and Lebanon. Syria is excluded because of the uncertain political situation.

Annex Table 1.1.6. Sub-Saharan African Economies: Real GDP, Consumer Prices, Current Account Balance, and Unemployment

(Annual percent change, unless noted otherwise)

	Real GDP			Consumer Prices[1]			Current Account Balance[2]			Unemployment[3]		
		Projections			Projections			Projections			Projections	
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018
Sub-Saharan Africa	**1.4**	**2.6**	**3.5**	**11.4**	**10.7**	**9.5**	**–4.0**	**–3.8**	**–3.7**	**. . .**	**. . .**	**. . .**
Oil Exporters[4]	**–1.7**	**0.7**	**1.9**	**18.8**	**18.3**	**16.2**	**–1.4**	**–0.7**	**–0.2**	**. . .**	**. . .**	**. . .**
Nigeria	–1.5	0.8	1.9	15.7	17.4	17.5	0.6	1.0	1.0	12.7	. . .	. . .
Angola	0.0	1.3	1.5	32.4	27.0	17.8	–4.3	–3.8	–3.2	. . .	. . .	. . .
Gabon	2.3	1.0	2.7	2.1	2.5	2.5	–9.0	–8.3	–6.3	. . .	. . .	. . .
Chad	–6.4	0.3	2.4	–1.1	0.2	1.8	–8.8	–4.7	–6.2	. . .	. . .	. . .
Republic of Congo	–2.7	0.6	8.8	3.6	1.3	2.1	–28.5	–4.7	12.1	. . .	. . .	. . .
Middle-Income Countries[5]	**1.9**	**2.5**	**3.5**	**6.8**	**5.9**	**5.2**	**–3.4**	**–3.8**	**–3.8**	**. . .**	**. . .**	**. . .**
South Africa	0.3	0.8	1.6	6.3	6.2	5.5	–3.3	–3.4	–3.6	26.7	27.4	27.7
Ghana	4.0	5.8	9.2	17.5	12.0	9.0	–6.4	–6.0	–4.9	. . .	. . .	. . .
Côte d'Ivoire	7.5	6.9	7.2	1.0	1.5	2.0	–2.2	–4.0	–3.5	. . .	. . .	. . .
Cameroon	4.4	3.7	4.3	0.9	1.0	1.4	–3.6	–3.1	–3.0	. . .	. . .	. . .
Zambia	3.0	3.5	4.0	17.9	9.0	8.0	–5.5	–3.2	–2.5	. . .	. . .	. . .
Senegal	6.6	6.8	7.0	0.9	1.9	2.0	–7.1	–7.8	–7.7	. . .	. . .	. . .
Low-Income Countries[6]	**5.4**	**5.5**	**5.8**	**7.0**	**6.7**	**6.1**	**–8.3**	**–8.3**	**–8.9**	**. . .**	**. . .**	**. . .**
Ethiopia	8.0	7.5	7.5	7.3	6.3	7.5	–9.9	–10.0	–9.1	. . .	. . .	. . .
Kenya	6.0	5.3	5.8	6.3	6.5	5.2	–5.5	–5.8	–5.7	. . .	. . .	. . .
Tanzania	6.6	6.8	6.9	5.2	5.1	5.0	–6.3	–7.2	–7.0	. . .	. . .	. . .
Uganda	4.7	5.0	5.8	5.5	6.3	6.0	–5.9	–7.0	–8.1	. . .	. . .	. . .
Madagascar	4.1	4.5	4.8	6.7	6.9	6.4	–2.3	–3.7	–4.2	. . .	. . .	. . .
Democratic Republic of the Congo	2.4	2.8	3.5	22.4	15.0	10.0	–4.4	–3.8	–2.9	. . .	. . .	. . .
Memorandum												
Sub-Saharan Africa Excluding South Sudan	1.5	2.7	3.5	10.5	10.3	9.4	–4.0	–3.8	–3.7	. . .	. . .	. . .

Note: Data for some countries are based on fiscal years. Please refer to Table F in the Statistical Appendix for a list of economies with exceptional reporting periods.
[1]Movements in consumer prices are shown as annual averages. Year-end to year-end changes can be found in Table A7 in the Statistical Appendix.
[2]Percent of GDP.
[3]Percent. National definitions of unemployment may differ.
[4]Includes Equatorial Guinea and South Sudan.
[5]Includes Botswana, Cabo Verde, Lesotho, Mauritius, Namibia, Seychelles, and Swaziland.
[6]Includes Benin, Burkina Faso, Burundi, the Central African Republic, Comoros, Eritrea, The Gambia, Guinea, Guinea-Bissau, Liberia, Malawi, Mali, Mozambique, Niger, Rwanda, São Tomé and Príncipe, Sierra Leone, Togo, and Zimbabwe.

Special Feature: Commodity Market Developments and Forecasts, with a Focus on the Role of Technology and Unconventional Sources in the Global Oil Market

Commodity prices have rallied since the release of the October 2016 World Economic Outlook *(WEO). Oil prices have increased following the announcement of the production agreement by the Organization of the Petroleum Exporting Countries (OPEC). China's continued strength in the construction sector and the anticipated possibility of a fiscal stimulus in the United States have increased metal demand prospects and prices. And easing of excess supply conditions has helped the recovery in food prices. This special feature on commodity market developments includes an in-depth analysis of the role of technology and unconventional sources in the global oil market.*

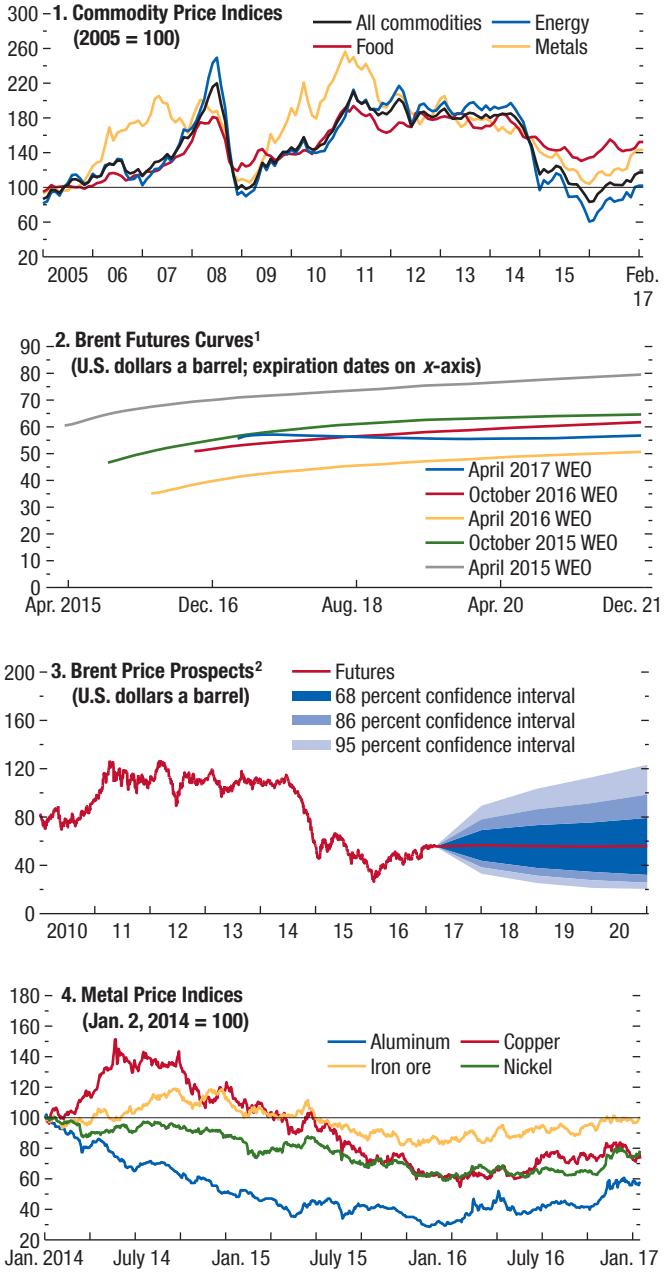
The IMF's Primary Commodities Price Index has increased by 15.5 percent since August 2016, the reference period for the October 2016 WEO (Figure 1.SF.1, panel 1). While energy and metals have rallied, by 21.1 percent and 23.6 percent, respectively, food prices increased more modestly, by 4.9 percent. Oil prices have continued to increase, by 21.2 percent, following the agreement by OPEC members to cut oil production. Natural gas prices have increased in Europe on account of supply tightening and higher oil prices. Coal prices have rallied, by 21.0 percent, following government-led reductions in coal production in China and outages in Australia that affected production and shipment.

On November 30, 2016, members of OPEC agreed to reduce crude oil output to 32.5 million barrels a day (mbd), effective January 2017 and for a duration of six months, extendable for another six months. That agreement would suggest a cut of 1.2 mbd from production levels in October 2016. Iraq, Kuwait, Saudi Arabia, and the United Arab Emirates are bearing the brunt of the cuts, alongside other member countries. Libya and Nigeria are exempt.[1] Participants at an OPEC and non-OPEC meeting in Vienna on Decem-

The authors of this feature are Rabah Arezki (team leader), Claudia Berg, Christian Bogmans, and Akito Matsumoto (team coleader), with research assistance from Clara Galeazzi, Lama Kiyasseh, and Rachel Yuting Fan. The authors also thank Rystad Energy, and Per Magnus Nysveen in particular, for very useful discussions and for kindly providing proprietary data on capital expenditures and cost structures.

[1]Indonesia, which accounted for 0.75 mbd of production, has been suspended from OPEC.

Figure 1.SF.1. Commodity Market Developments



Sources: Bloomberg L.P.; IMF, Primary Commodity Price System; Thomson Reuters Datastream; and IMF staff estimates.
Note: WEO = *World Economic Outlook*.
[1]WEO future prices are baseline assumptions for each WEO and derived from future prices. April 2017 WEO prices are based on February 28, 2017 closing.
[2]Derived from prices of futures options on February 28, 2017.

ber 10, 2016, agreed to additional cuts amounting to about 0.6 mbd. Russia, a country that is not a member of OPEC, has committed to reducing production by 0.3 mbd, and 10 other non-OPEC countries agreed to contribute the remainder. Following these production agreements, Saudi Arabia indicated it could cut production beyond its initial commitment in a bid to enhance the credibility of the agreement.

In response to these agreements, spot oil prices increased to more than $50 a barrel. Oil prices beyond that level will stimulate investment, which is expected to increase in 2017 after two consecutive years of significant decline. The effectiveness of the production agreements could thus be partially offset by an increase in U.S. shale oil production, which, unlike conventional oil, can commence within a year of initial investment. Production data from the International Energy Agency (IEA) for January 2017 indicate that only a few OPEC members fully complied with the agreement, although Saudi Arabia has cut more than initially agreed on. In addition, Libya, which is exempt from the production agreement, increased production.

Oil demand grew at 1.6 mbd in 2016, which is lower than during 2015. The IEA expects demand growth to slow further to 1.4 mbd in 2017—still above trend growth, estimated at 1.2 mbd. Amid a significant cutback in production, fairly robust demand could move the oil market from surplus to deficit in the first half of 2017, in turn reducing oil inventory levels. However, rapid investment recovery in the U.S. shale sector could tip the market back into surplus as early as the second half of 2017.

The natural gas price index—an average for Europe, Japan, and the United States—has increased by 18.7 percent since August 2016. Although prices in Asia and the United States initially rose on expectations of strong winter demand, a fairly mild winter led to subdued demand for gas-fired power generation and contained prices. In Europe, prices rose 38.4 percent, reflecting higher oil prices and a cold winter. Natural gas prices are expected to stay low because ample supply from the United States and Russia will meet strong natural gas demand growth—which is expected to exceed oil demand growth.

The coal price index—an average of Australian and South African prices—has increased by 21.0 percent since August 2016. The rally in coal prices reflects a continued effort by Chinese authorities to reduce coal mining capacity substantially as part of a broader reform agenda to restructure its economy. To help soften rising prices, China has recently sought to relax restrictions on the number of days coal miners may work in a year. Growing environmental and health concerns are expected to lead to a reduction in the share of coal in primary energy, accentuating excess capacity in that sector, especially in China.

Oil futures contracts point to stable prices of about $55 a barrel (Figure 1.SF.1, panel 2). Baseline assumptions for the IMF's average petroleum spot prices, which are based on futures prices, suggest average annual prices of $55.2 a barrel in 2017—an increase of 28.9 percent from the 2016 average—and $55.1 a barrel in 2018 (Figure 1.SF.1, panel 3). The response of futures prices over a three-year horizon has been more muted, suggesting that the production agreements are expected to have a limited effect in the medium term. Uncertainty remains around the baseline assumptions for oil prices, although risks are balanced. Upside risks include unscheduled outages and geopolitical events, especially in the Middle East. Although these occurrences could cause oil market disruptions, high inventory levels and a rapid response by shale production should prevent a sharp rise in prices in the near future.

Metal prices have increased by 23.6 percent since August 2016 (Figure 1.SF.1, panel 4). Iron ore was one of the best performing metals in 2016, almost doubling in price to $80 a metric ton. On the demand side, metal consumption in China, which accounts for half of global demand, rebounded in 2016 in response to the authorities' policies in support of credit growth. In turn, these policies have stimulated construction, which uses metals intensively. The Chinese authorities have also addressed issues of excess capacity in the steel sector by cutting production of outdated factories, including to reduce pollution. Steel mills in mainland China have increased their use of imported higher-grade iron ore, which has helped increase iron ore prices. Amid speculation over the increase in demand for cobalt, a key battery input, spot prices have almost doubled since August 2016.

Announcement following the U.S. election of a $1 trillion infrastructure plan (over 10 years) provided a further boost to metal prices. However, in the global context, the impact of this potential infrastructure spending on world metal demand is likely to be modest. Indeed, in 2015 the United States accounted for only 8 percent of global refined copper demand according to the World Bureau of Metal Statistics and 3 percent of iron ore demand according to the World Steel Association.

On the supply side, the declining investment in, and closure of, high-cost and high-polluting mining operations have driven price increases in iron ore, nickel, tin, zinc, and copper. However, overall excess capacity will probably put downward pressure on prices in many base metals. In January 2017, Indonesia—one of the world's largest nickel producers—relaxed its export ban on ores. This action partly offsets the drop in supply caused by the Philippines' closure of its mines over environmental concerns.

Most metal prices are expected to stay near their current levels, except iron ore prices, which are expected to decline sharply. The IMF metal price index is projected to decline from the current level, but its 2017 average is expected to increase by 23.2 percent from the average in 2016, reflecting the surge during late 2016. The index is expected to decrease by 4.0 percent in 2018 from 2017. There are downside risks to the outlook for metal prices, including from the waning policy support and real estate investment in China, from a faster rebalancing from investment to consumption in the medium term, or from a disorderly adjustment in China's corporate debt market.

The agriculture index, which consists of food, beverages, and agricultural raw materials prices, has increased by 4.3 percent since August 2016. Although prices of palm oil, tea, and rubber have increased significantly, prices of rice and cocoa beans have decreased. Wheat prices reached an 11-year low in December 2016, but have since somewhat recovered. Overall, wheat prices have increased by 15.2 percent since August 2016. Maize prices have increased, although they remain near historical lows. The global stock-to-use ratios of wheat and maize remain significantly above the 10-year average, indicating that markets are well supplied.

Soybean prices have remained broadly unchanged on account of continued strength in animal protein demand countering favorable supply conditions. Palm oil prices climbed more than 36.7 percent throughout 2016 and increased 19 percent year over year. This rise is associated with plantations in Indonesia and Malaysia facing the aftereffects of the El Niño weather system and the reduction in palm oil inventories. The annual price of cocoa has fallen for the first time in five years, as harvests in West Africa have been favorable.

Projections for prices of most agricultural commodities have been revised upward on account of less favorable weather conditions, including in the United States. Annual food prices are now expected to increase by 3.0 percent in 2017, drop by 0.5 percent in 2018, and remain broadly unchanged thereafter. Rising costs of energy and weather variability, including concerns about La Niña, constitute upside risks to the price forecast. Downside risks may arise from China dismantling its price floor systems.

The Role of Technology and Unconventional Sources in the Global Oil Market

Technological factors have played an important role in explaining the collapse in oil prices that started in June 2014. Although technological innovation is often regarded as exogenous, it is endogenous to the level of oil prices. Indeed, high oil prices, prompting breakthroughs in technology in extractive industries, led to the emergence of new sources known as "unconventional oil." Shale, in particular, will have important consequences for the oil market outlook in that it will help lead to more limited and shorter production and price cycles. This special feature documents the endogenous response of technology to oil prices and institutional factors.

Although the OPEC production agreement has captured the public's attention, technological forces affecting oil markets over the medium term have received less attention. Technology has indeed transformed the oil market in powerful ways. Technological innovation and subsequent adoption of new recovery techniques—including drilling and processing—have given rise to new sources known as unconventional oil. One recent example of a new source is shale oil, which has become a major contributor to global oil supply. Provided they pan out and diffuse, improvements in recovery techniques mechanically increase the size of technically recoverable oil reserves. This increase, in turn, changes the outlook for oil supply, with potentially large immediate implications for oil prices—acting through the expectation channel associated with the future path of oil production. Although the feedback effect from lower oil prices reduces investment and hence production, the industry is forced to become more efficient, unleashing automatic stabilization forces.

Innovation in recovery techniques typically follows periods of prolonged high prices or changes in regulations rendering new techniques economical. New oil sources often come onstream in times of need—because of, say, depletion of existing conventional sources—in places that have economic and institu-

tional systems more favorable to innovation and adoption of new recovery techniques. The way drilling is performed has significantly evolved since the inception of the oil market, and in addition to improvements in drilling techniques that gave rise to shale and tight oil production, successive improvements in techniques for offshore drilling have led to a significant increase in new sources of oil. In the 1970s production in the North Sea and the surge of production in the Gulf of Mexico were made possible by deepwater drilling and higher oil prices after the two oil shocks during the 1970s. Such a development—a relatively high-cost producer that emerges with new oil sources—often gives rise to tensions with low-cost OPEC producers, who in the 1980s and more recently responded strategically by moderating their production levels.

The following discussion address four questions about the role of technology and unconventional oil sources in the global oil market:[2]

- What are unconventional oil sources?
- Where are the production and reserve centers?
- How have investment and production evolved?
- What lies ahead?

What Are Unconventional Oil Sources?

Today's version of unconventional oil consists of oil sands, extra heavy oil, shale and tight oil, and ultradeepwater oil.[3] Unconventional oil is typically more difficult and more expensive to extract and process than conventional oil. The categorization as unconventional is, of course, time specific. Before being included in what is now known as conventional sources, heavy oil and deepwater oil were considered unconventional sources. New sources of oil are part of a continuum of oil sources that is evolving thanks to improvements in recovery techniques. For this reason, and to give a historical perspective on how these "new" sources have evolved and contributed to the transformation of the oil market, this feature adopts an all-encompassing definition of unconventional sources.[4]

Oil sands are either loose sands or partially consolidated sandstone containing a naturally occurring mixture of sand, clay, and water, saturated with a dense and extremely viscous form of petroleum technically referred to as bitumen (or colloquially as tar because of its superficially similar appearance). Heavy and extra heavy oil are characterized by high viscosity, high density, and high concentrations of nitrogen, oxygen, sulfur, and heavy metals. These characteristics result in higher costs of extraction, transportation, and refining than are incurred with conventional oil. In spite of their cost and technical difficulties, major oil corporations regard these resources as providing reliable long-term flows of liquid hydrocarbons and substantial payoffs for any incremental improvements in recovery. However, environmental concerns have often surfaced, considering the potential damage these extraction and refining activities may cause. Such concerns surrounding these new oil sources have often been met with specific safety regulations and standards to help limit the risks.

Shale oil (also known as tight oil) is petroleum that consists of light crude oil contained in petroleum-bearing formations of low permeability, often shale or tight sandstone. Exploitation of shale oil began with the development of shale gas extraction using a combination of hydraulic fracturing (or fracking, a well-stimulation technique in which rock is fractured by a hydraulically pressurized liquid) and directional drilling (the practice of drilling nonvertical wells). These techniques were later widely adopted by the oil industry, primarily in the United States. Shale oil sources are developed by relatively smaller corporations and have a cost structure different from those of other oil sources. Shale oil requires lower sunk costs than conventional oil, and the lag between initial investment and production is much shorter.

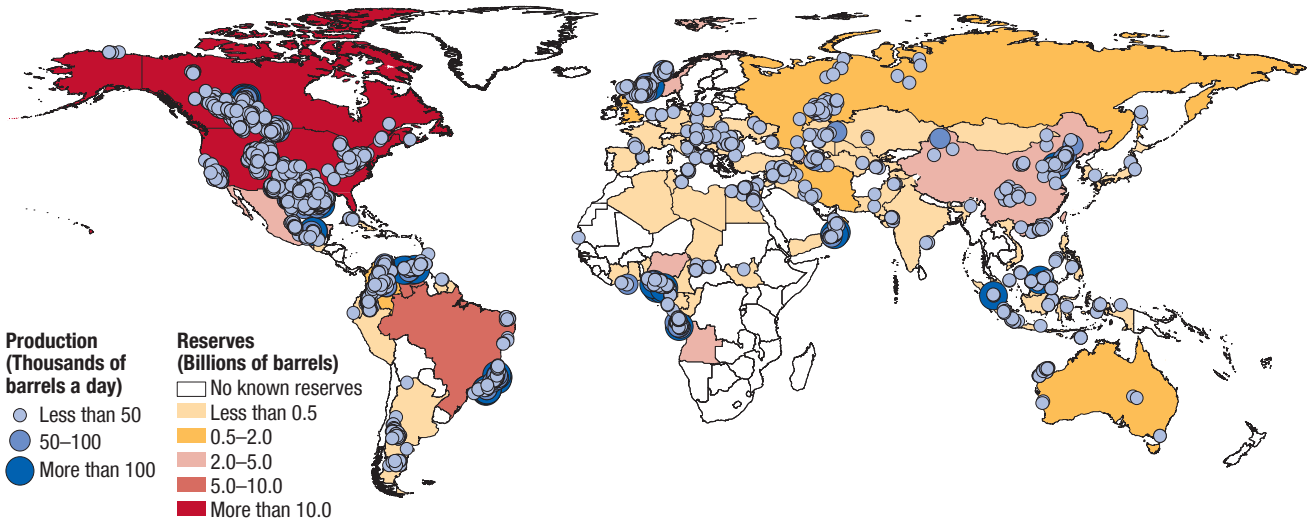
Deepwater and ultradeepwater oil result from offshore production activities that take place at depths of more than 125 meters and 1,500 meters, respectively. As mentioned, successive improvements in drilling techniques have allowed for drilling much farther from coastlines and much deeper. The type of offshore rig used for ultradeepwater oil drilling activities is very different from the type used for deepwater drilling. Ultradeepwater rigs are partially submerged in water and can involve dynamic positioning systems or can be drill ships—self-propelled offshore drilling rigs that can work beyond a depth of 3,000 meters. Although it is a high-fixed-cost activity, ultradeepwater drilling can deliver a steady stream of oil for a very long period, which makes these assets attractive to major international oil corporations.

[2]The focus of this feature is on oil, here referring to liquids including crude oil, condensate, and natural gas liquids.

[3]See Kleinberg (forthcoming) for a discussion of unconventional sources.

[4]Unless indicated otherwise, unconventional oil sources refer to the broader definition rather than the narrower (contemporaneous) definition of unconventional oil sources.

Figure 1.SF.2. Unconventional Oil, Proven Reserves, and Production, 2016



Sources: Rystad Energy research and analysis; and IMF staff calculations.
Note: Production and reserves include oil sands, heavy, extra heavy, tight and shale, deepwater, and ultradeepwater oil. A proven reserve is one with a greater-than-90 percent probability that the resource is recoverable and economically profitable. Deepwater is defined at 125–1,500 meters. Ultradeepwater is defined at 1,500 meters and above. When deepwater (or ultradeepwater) production was also categorized as heavy (or extra heavy) oil, the production was counted once, as deepwater (or ultradeepwater). Oil refers to crude oil, condensate, and natural gas liquids.

Where Are the Production and Reserve Centers?

Production and reserve centers for unconventional sources are concentrated in a few countries. North America has the highest concentration of economically recoverable proven reserves and production in unconventional sources (Figure 1.SF.2; Table 1.SF.1). These consist of shale oil in the United States and oil sands in Canada. Central and South America also host significant reserves and production centers, comprising heavy and extra heavy oil and deepwater and ultradeepwater oil resources in Brazil, Colombia, Ecuador, and Venezuela. The remainder of world reserves and production of unconventional sources are scattered and consist mostly of heavy oil in Europe and deepwater and ultradeepwater oil in the North Sea and West Africa. It is noteworthy that the Middle East has the highest concentration of conventional oil reserves and production, but has a relative low level of proven reserves and production in unconventional oil.

In addition to the actual, hard-to-observe geology, the high concentration of unconventional proven reserves and production reflects the geography of innovation and subsequent adoption of new recovery techniques in the form of investment in exploration and extraction. Conceptually, resource economists have long argued that the resource base is endogenous to how much effort is applied to exploring resources.[5] Knowledge about the actual geology is gained through exploration efforts and constantly evolves with technological improvements. Thus, proven reserves and production are governed as much by economic and institutional factors (above-ground factors) as by actual geology (below-ground factors).

Economic factors affecting the geography of exploration and production include proximity to markets and complementarities with available infrastructure. These factors often lead to agglomeration in production and in proven reserves.[6] Institutional

[5]The canonical model is the exploration model developed by Pindyck (1978) in which a social planner maximizes the present value of the social net benefits from consumption of oil, and the reserve base can be replenished through exploration and discovery of new fields. Resource exploration and discovery has been investigated either as a deterministic or a stochastic process (for example, Pindyck 1978; Arrow and Chang 1982; Devarajan and Fisher 1982).

[6]Moreno-Cruz and Taylor (2016) propose a spatial model of energy exploitation that determines how the location and productivity of energy resources affect the distribution of economic activity

Table 1.SF.1. Unconventional Oil Production, 2016
(Million barrels a day)

Country	Heavy Oil	Oil Sands and Extra Heavy Oil	Deepwater	Ultradeepwater	Shale and Tight Oil	Total
United States	0.07	0.40	0.77	0.79	7.25	9.28
Canada	0.08	2.60	-	-	0.60	3.28
Brazil	0.03	0.09	1.09	1.18	-	2.39
Angola	0.00	-	1.34	0.16	-	1.50
Norway	0.02	-	1.36	-	-	1.39
China	0.73	0.36	0.08	0.01	0.03	1.21
Venezuela	0.18	1.00	-	-	-	1.18
Nigeria	0.08	0.00	0.83	-	-	0.91
Mexico	0.31	0.48	0.01	-	0.00	0.80
Azerbaijan	0.01	0.00	0.72	-	-	0.74
Colombia	0.13	0.50	-	-	0.00	0.63
Oman	0.12	0.30	-	-	0.01	0.43
United Kingdom	0.05	-	0.29	-	-	0.34
Russia	0.19	0.10	-	-	-	0.30
Ecuador	0.20	0.01	-	-	-	0.21
Malaysia	0.01	0.01	0.16	-	-	0.19
Australia	-	0.01	0.16	-	0.00	0.17
Equatorial Guinea	-	-	0.17	-	-	0.17
Congo, Republic of	-	0.01	0.16	-	-	0.17
Indonesia	0.01	0.14	0.00	-	-	0.15
Kazakhstan	0.06	0.09	-	-	-	0.15
Argentina	0.08	0.01	-	-	0.04	0.13

Sources: Rystad Energy research and analysis; and IMF staff calculations.
Note: Deepwater is defined at 125–1,500 meters. Ultradeepwater is defined at 1,500 meters and above. When deepwater (or ultradeepwater) production was also categorized as heavy (or extra heavy) oil, the production was counted once, as deepwater (or ultradeepwater). Oil refers to crude oil, condensate, and natural gas liquids. Dash denotes zero production in record.

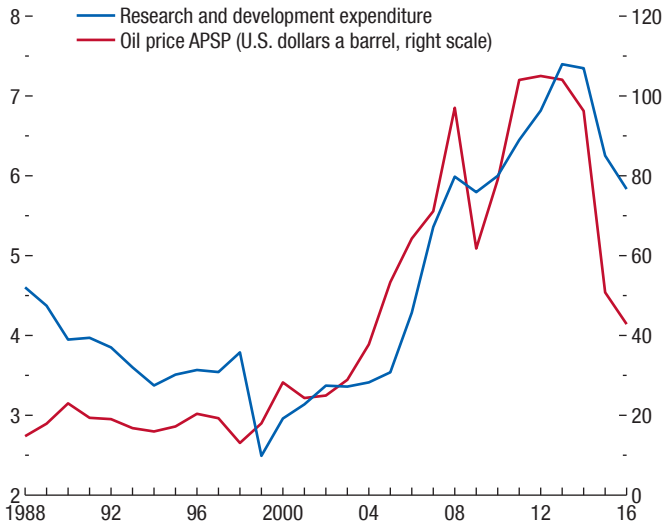
factors affecting exploration and production include openness to foreign investment and the strength of property rights, including in subsoil assets. Arezki, van der Ploeg, and Toscani (2016) provide empirical evidence of a causal—and economically significant—relationship running from changes in market orientation to discoveries of major hydrocarbon and mineral deposits, over and above increases in resource prices and depletion.

The observed differences between known reserves and production across countries reflect differences in production efficiency. These differences can be explained by institutional factors emanating from the ownership structure of the industry. For instance, Wolf (2009) provides evidence that the structure of ownership in the oil sector—that is, whether it is state owned—plays a key role in determining relative efficiency. He finds that, everything else equal, non-state-owned oil corporations significantly outperform state-owned ones. Difficulties with production systems can lead to a low propensity to produce from existing reserves. To exploit unconventional sources, oil companies need to be able to innovate or to implement new techniques.

Regulatory changes also play a central role in determining whether innovation and subsequent adoption of recovery techniques occur. Consider shale oil in the United States. Most large reserves of oil—and gas—in shale rock in the United States have been known for a long time—since as early as the 1920s according to some. Until the mid-2000s, oil extraction from shale rock formations was thought to be too costly, if not technologically impossible. In addition to high prices driven by the rapid increase in demand from emerging economic giants, such as China and India, the advent of shale oil can also be seen as the consequence of a regulatory shock in the United States. This is clear from the published forecasts of the U.S. Energy Information Administration. The expansion of shale oil extraction was aided by a landmark study conducted by the U.S. Environmental Protection Agency in 2004, which found that hydraulic fracturing posed no threat to underground drinking water supplies. Shortly

across geographic space. They find that a novel scaling law links the productivity of energy resources to population size, while rivers and roads effectively magnify productivity. Arezki and Bogmans (2017) provide evidence for the role of proximity to major markets and state capacity in the production of fossil fuels.

Figure 1.SF.3. Evolution of Research and Development Expenditure in Select Integrated Oil and Service Companies
(Billions of U.S. dollars, unless noted otherwise)



Sources: IMF, Primary Commodity Price System; Bloomberg L.P.; and IMF staff calculations.
Note: APSP = average petroleum spot price—average of U.K. Brent, Dubai, and West Texas Intermediate, equally weighted. The companies included are Baker Hughes, BP P.L.C., Chevron Corporation, ExxonMobil Corporation, The Halliburton Company, Royal Dutch Shell plc, Total S.A., and Schlumberger Limited.

afterward, the George W. Bush administration's Energy Policy Act of 2005 exempted chemicals used in hydraulic fracturing from the Safe Drinking Water Act regulations (see Gilje, Loutskina, and Strahan 2016).

Shale oil deposits have been identified in several other countries (for example, Argentina, Australia, Canada, China, Mexico, Russia). However, except for Argentina and Canada, where shale oil production is gearing up, regulatory obstacles and technological challenges, as well as recent low oil prices, have delayed or discouraged extraction.[7] Specifically, regulatory obstacles are related to environmental concerns, including water supply quality and the need for costly tailoring of fracking to the more complex nature of rock in some places.[8] Some countries have gone so far as to ban all exploration and production of shale oil. All in all, the global diffusion of shale oil production remains uncertain, contributing to broader uncertainty about the global oil supply outlook.

How Have Investment and Production Evolved?

The adage "necessity is the mother of invention" illustrates the cyclical nature of technological change (Hanlon 2015). The direction of technical change has been shown to be biased toward specific needs, depending on prevailing forces (see Acemoglu 2002). In the particular case of the oil sector, the need to address the rapid depletion of conventional oil reserves in certain locations, resulting in periods of high oil prices, has fostered improvements in recovery techniques. These episodes of high prices have been accompanied by significant increases in research and development expenditure, mostly on the part of major corporations—and at times smaller corporations—operating in the oil and gas sectors (Figure 1.SF.3). The current low-price environment provides scant incentive for research in oil-recovery techniques. Lindholt (2015) finds that technological improvements through research and development activity have offset the effect of ongoing depletion on the cost of finding and developing additional reserves of oil around the world. However, he finds that when considering a longer period, depletion generally outweighs technological progress. That result could stem from the fact that technical improvements are cyclical while depletion is not.[9]

The so-called peak-oil hypothesis posited that oil supply would top out in the mid-2000s, precisely the moment at which the shale revolution started. In many respects, that revolution can be viewed as an endogenous supply response to high prices in the 2000s, hence challenging the overly pessimistic view that geological factors limit supply (Arezki and others 2017).[10]

[7]Although the prospects for shale oil diffusing beyond the United States have been limited so far, shale gas production is under way in a number of countries, such as Argentina, China, and Russia.

[8]See *Nature Climate Change* (2013) for a discussion of the pros and cons of fracking.

[9]For the Gulf of Mexico, Managi and others (2004, 2005, 2006), using microlevel data from 1947–98, find empirical support for the hypothesis that technological change has offset depletion for offshore oil and gas production. For the United States, Cuddington and Moss (2001) present evidence that technological improvements respond to instances of scarcity by analyzing the determinants of the average finding cost for additional petroleum reserves over the period 1967–90.

[10]High oil prices also stimulate technological change in the energy-using sector. Aghion and others (2016) provide evidence that firms in the auto industry tend to innovate more in "clean" (and less in "dirty") technologies when they face higher fuel prices. The lower-for-longer oil price environment could, however, delay the energy transition by slowing technological change—and subsequent adoption—directed toward moving away from fossil fuel use (Arezki and Obstfeld 2015).

Historically, global investment and operational expenditures in unconventional oil have closely followed oil price developments (Figure 1.SF.4).[11] During episodes of dramatic price movements, as in the late 1970s, investment in the oil sector responded promptly. In late 2008 during the global financial crisis, oil investment plummeted but then rebounded in 2009 following the sharp but temporary drop in oil prices. The 2000s episode marks the most unprecedented increase in global capital expenditure and reflects a prolonged era of high oil prices. The rapid increase in oil demand, especially from large emerging market economies, such as China and India, has driven oil prices up and encouraged further investment in tight oil formations, ultradeepwater oil, and extra heavy oil, which were previously uneconomical at lower oil prices. While comovement between oil prices and capital expenditure in unconventional sources is akin to what it is in conventional sources, expenditure in unconventional sources embodies technological changes that contribute to changing the response of global oil production. Shale oil requires a lower level of sunk costs than conventional oil, and the lag between initial investment and production is much shorter. Shale oil is thus contributing to shorter and more limited oil price cycles (Arezki and Matsumoto 2016).

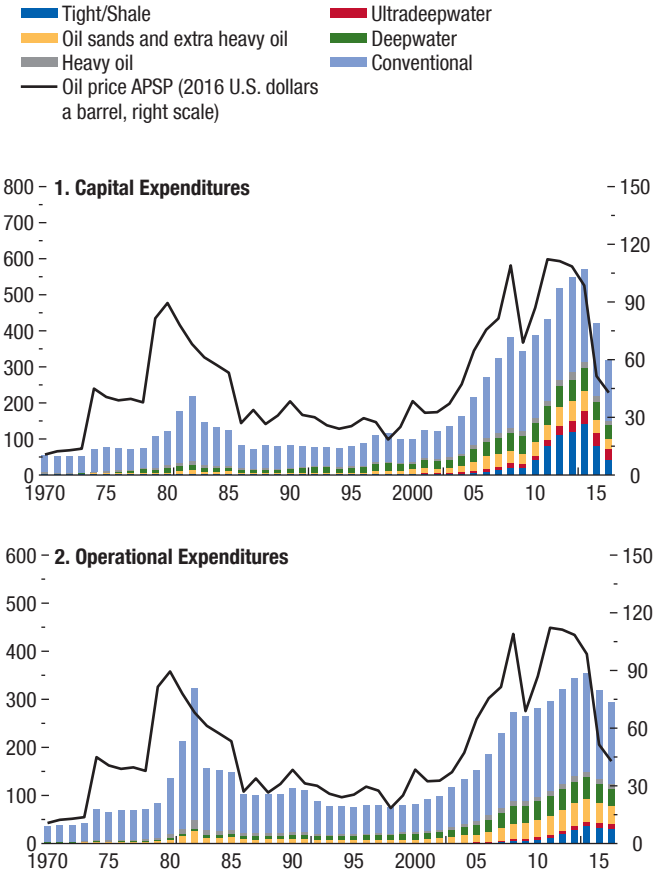
The unprecedented increase in capital expenditure in unconventional sources in the 2000s has contributed to these sources' centrality in the global oil market. In particular, shale oil production growth has emerged as a major contributor to global supply growth (Figure 1.SF.5).[12] The rapid increase in unconventional sources also contributed to the change in OPEC's strategic behavior, leading to the dramatic collapse in oil prices (Arezki and Blanchard 2014). Although that abrupt decline in prices led to a reduction in investment and expenditure, large operational efficiency gains acted as automatic stabilizers.

The downward shift in the cost structure induced by lower oil prices is partly temporary. A commonly held belief is that the cost structure—which is often proxied by the break-even price (the price at which it is economical to produce a barrel of oil)—is constant and driven by immutable factors, such as the nature of the oil extracted and the associated geology (Figure 1.SF.6).

[11]Investment and oil price series are deflated using a price index of private fixed investment in mining and oilfield machinery in the United States obtained from the Bureau of Economic Analysis website.

[12]In 2016, shale oil added 7.9 mbd in a market of 96 mbd—that is, 4.4 mbd in crude oil, 2.7 mbd in natural gas liquids, and 0.8 mbd in condensate.

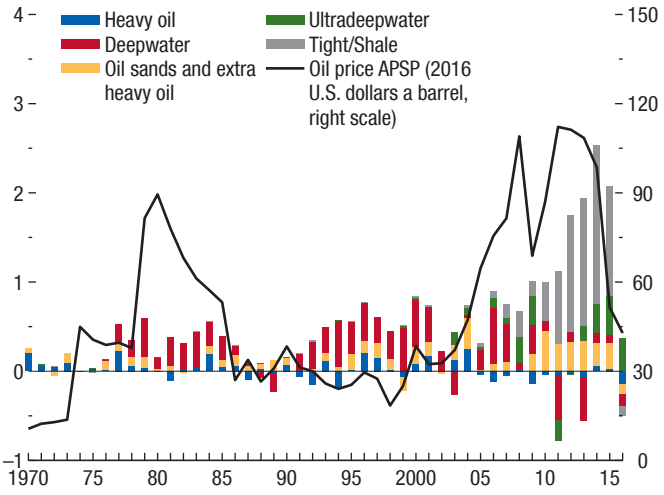
Figure 1.SF.4. Historical Evolution of Global Capital and Operational Expenditures
(Billions of 2016 U.S. dollars, unless noted otherwise)



Sources: IMF, Primary Commodity Price System; IMF International Financial Statistics database; Rystad Energy research and analysis; and IMF staff calculations.
Note: APSP = average petroleum spot price–average of U.K. Brent, Dubai, and West Texas Intermediate, equally weighted. Capital expenditure includes exploration costs associated with seismic and drilling wildcats or appraisal wells to discover and delineate oil and gas fields, and all development costs related to facilities and drilling of wells. Operational expenditure includes operational expenses directly related to oil and gas activities. The costs are estimated at asset level and calibrated against company reported values. Deepwater is defined at 125–1,500 meters. Ultradeepwater is defined at 1,500 meters and above. When deepwater (or ultradeepwater) production was also categorized as heavy (or extra heavy) oil, the production was counted once, as deepwater (or ultradeepwater). Oil refers to crude oil, condensate, and natural gas liquids.

In practice, the cost structure depends on a host of factors, including technological improvements and the extent of "learning by doing," which will reduce costs permanently. In instances such as the recent dramatic drop in prices, break-even prices have moved downward in sync with oil prices. That shift is explained by the operational efficiency gains stemming from the

Figure 1.SF.5. Growth in Unconventional World Oil Production and Real Oil Prices
(Million barrels a day, unless otherwise noted)



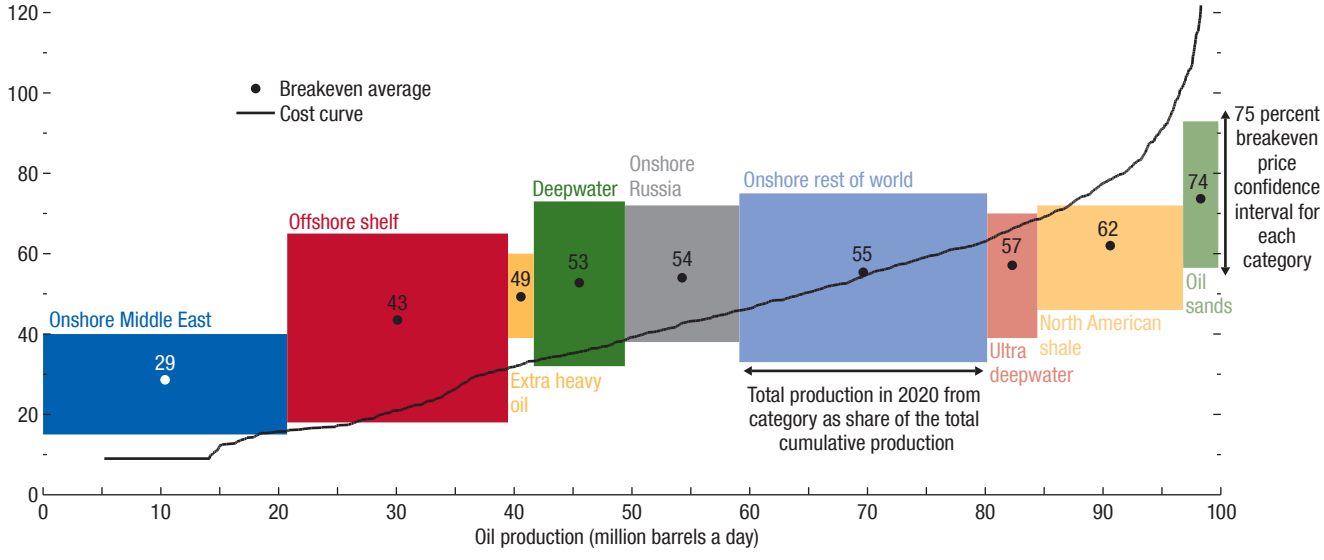
Sources: IMF, Primary Commodity Price System; Bureau of Economic Analysis; Rystad Energy research and analysis; and IMF staff calculations.
Note: APSP = average petroleum spot price—average of U.K. Brent, Dubai, and West Texas Intermediate, equally weighted. Total world production in 2016 was estimated at 96.5 mbd (million barrels a day). Deepwater is defined at 125–1,500 meters. Ultradeepwater is defined at 1,500 meters and above. When deepwater (or ultradeepwater) production was also categorized as heavy (or extra heavy) oil, the production was counted once, as deepwater (or ultradeepwater). Oil refers to crude oil, condensate, and natural gas liquids.

service industry's significant reduction in margins to support the upstream sector. In shale oil specifically, the extraordinary resilience to the drop in oil prices can be explained by important efficiency gains compounded by the fact that shale came on the scene at the onset of an investment cycle in which learning by doing was important (Figure 1.SF.7).[13] The shale cost structure is likely to shift back up somewhat because some of the efficiency gains cannot be sustained under an expansion of oil production, while the cost of capital is expected to increase as U.S. interest rates rise.

The shift in cost structure has not been uniform across unconventional sources. Oil sand production, which is subject to high decommissioning costs, has displayed continued high growth rates. However, the lower investment in exploring new fields is expected to affect production of oil sands down the line. Deepwater and ultradeepwater oil production has been subject to active upgrading, which has made it somewhat resil-

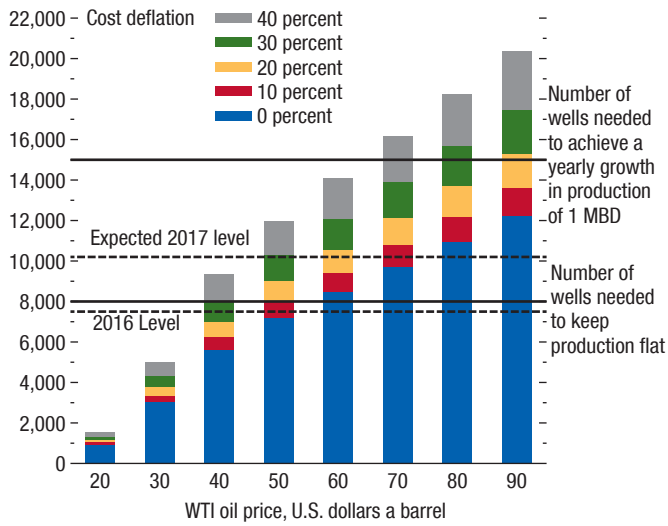
[13]Figure 1.SF.7 indicates that under a scenario of no cost deflation, the oil price level required to keep shale production constant is higher than $80 a barrel. With cost deflation of about 40 percent, akin to what has been observed in the recent past, the required price level is only $40 a barrel. After having weakened production, the recent rally in oil prices has been followed by signs of recovery in investment and production.

Figure 1.SF.6. Global Oil Supply Cost Curve and Breakeven Prices
(U.S. dollars a barrel)



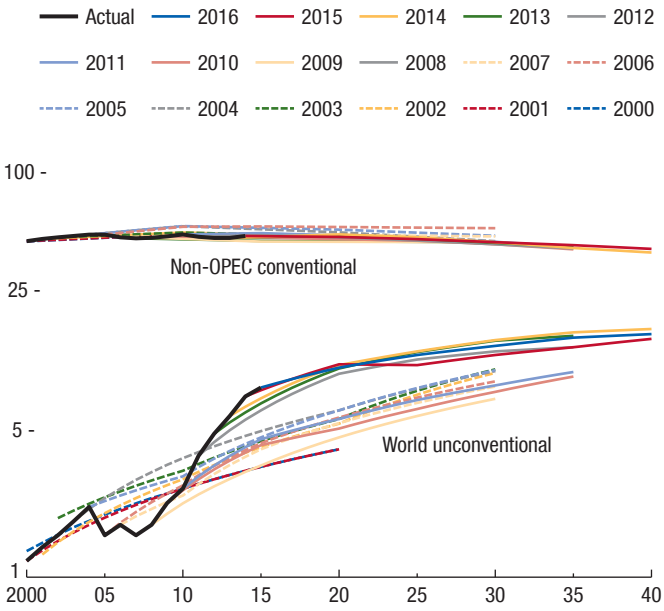
Source: Rystad Energy research and analysis.
Note: The breakeven price is the Brent oil price at which net present value equals zero, considering all future cash flows using a real discount rate of 7.5 percent. Oil refers to crude oil, condensate, and natural gas liquids.

Figure 1.SF.7. North American Shale Oil Wells at Different West Texas Intermediate Oil Prices and Cost Deflation Scenarios
(Annual number of wells)



Source: Rystad Energy research and analysis.
Note: Refers to spudded wells, defined as wells that are drilled but not extracted. At $60/barrel, approximately 8,000 shale wells have to be drilled, with 10 percent cost deflation, to keep production flat. MBD = million barrels a day; WTI = West Texas Intermediate.

Figure 1.SF.8. Unconventional Oil Production Outlook Vintages
(Million barrels a day, logarithmic scale)



Source: International Energy Agency.
Note: OPEC = Organization of the Petroleum Exporting Countries. Replicated from Wachtmeister, Henke, and Höök (2017). Dates correspond to vintages from forecast.

ient. But again, lower investment in new fields will also tend to affect deepwater and ultradeepwater oil further in the future, albeit with different patterns across regions owing to below- and above-ground factors.

What Lies Ahead?

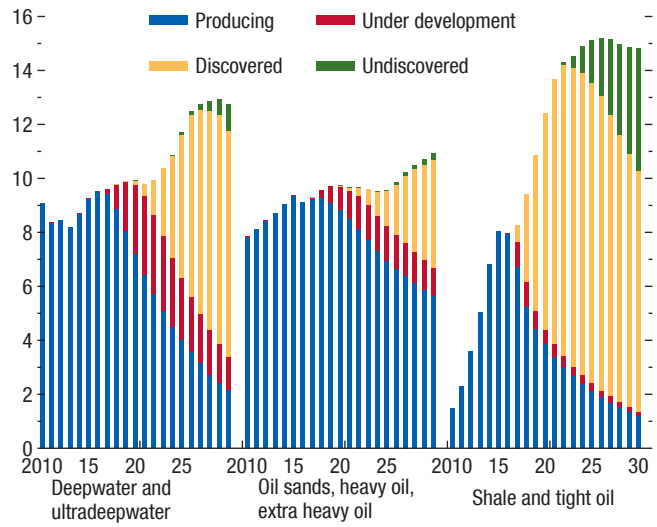
The development of unconventional sources is inherently uncertain. Uncertainty is apparent when comparing the ability to forecast unconventional relative to conventional production (Figure 1.SF.8).[14,15] Technological improvements and their subsequent adoption—including the extent of learning and spatial diffusion—are hard to predict. As mentioned earlier, uncertainty surrounding the development of unconventional sources is governed by the very uncertain nature of the processes of innovation and adoption, owing to an interaction between below- and above-ground factors. All in all, the rising importance of unconventional sources in global supply is not only changing the dynamic response of production to prices, but also results in more uncertainty over the medium term.

Despite uncertainty about technological improvements and the recent OPEC agreement, rebalancing oil supply in line with demand accompanied by stable prices, will hinge on the prospects for unconventional sources (Figure 1.SF.9). The negotiated reduction in oil production by 1.8 mbd for six months will, in principle, help rebalance the market by the end of 2017, eliminating an excess supply currently estimated to be a little less than 1 mbd. Annual oil demand growth, commonly projected at about 1.2 mbd, will be met by unconventional sources over the next few years, mainly through resources under development for deepwater and ultradeepwater oil, oil sands, and heavy and extra heavy oil. In the absence of shale, depletion forces and the legacy of low invest-

[14]The IEA does not provide specific forecasts for oil production by OPEC.

[15]Wachtmeister, Henke, and Höök (2017) present a detailed assessment of the production forecast prepared by the IEA using a narrower definition of unconventional oil sources. Leduc, Moran, and Vigfusson (2013) present evidence of the rather gradual learning in futures markets.

Figure 1.SF.9. Unconventional Oil Outlook
(Million barrels a day)



Sources: Rystad Energy research and analysis; and IMF staff calculations.
Note: Deepwater is defined at 125–1,500 meters. Ultradeepwater is defined at 1,500 meters and above. When deepwater (or ultradeepwater) production was also categorized as heavy (or extra heavy) oil, the production was counted once, as deepwater (or ultradeepwater). Oil refers to crude oil, condensate, and natural gas liquids.

ment would start to kick in and push prices up significantly after a few years. Instead, in the new normal for the oil market, shale oil production will be further stimulated by a moderate price increase (Arezki and Matsumoto 2016). As a result, supply from shale will help somewhat tame the otherwise sharp upward swing in oil prices. Over the medium term, as prices increase further, technical improvements in unconventional oil recovery will be reactivated, which will eventually set off another price cycle.

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CHAPTER 2

ROADS LESS TRAVELED: GROWTH IN EMERGING MARKET AND DEVELOPING ECONOMIES IN A COMPLICATED EXTERNAL ENVIRONMENT

Emerging market and developing economies have become increasingly important in the global economy in recent years. They now account for more than 75 percent of global growth in output and consumption, almost double the share of just two decades ago. The external environment has been important for this transformation. As these economies have integrated into the global economy, terms of trade, external demand, and, in particular, external financial conditions have become increasingly influential determinants of their medium-term growth. With potentially persistent structural shifts occurring in the global economy, emerging market and developing economies may face a less supportive external environment going forward than they experienced for long stretches of the post-2000 period. The still-considerable income gaps in these economies vis-à-vis those in advanced economies suggest further room for catch-up, favoring their prospects of maintaining relatively strong potential growth over the medium term. However, steady catch-up growth has not been automatic in the past. Emerging market and developing economy growth has exhibited episodes of accelerations and reversals over time. Nevertheless, these economies can still get the most out of a weaker growth impulse from external conditions by strengthening their institutional frameworks, protecting trade integration, permitting exchange rate flexibility, and containing vulnerabilities arising from high current account deficits and external borrowing, as well as large public debt.

Introduction

After a remarkable period of synchronized acceleration in the early 2000s and broad resilience immediately following the global financial crisis, growth across emerging market and developing economies in recent years once again displays heterogeneity—a mix of tapering, standstills, reversals, and continued strength in some cases. This change has taken place against a backdrop of fading external tailwinds, including waning potential growth in advanced economies, slowdown and rebalancing in China, and a shift in the commodity cycle that has affected commodity exporters. Together with a risk of protectionism in advanced economies and tighter financial conditions as U.S. monetary policy normalizes, these changes make for a more challenging external environment for emerging market and developing economies going forward.

What are the implications of this environment for medium-term growth in emerging market and developing economies? The still-considerable income gaps in these economies vis-à-vis those in advanced economies suggest room for catch-up and thus favorable prospects for maintaining relatively strong potential growth in emerging market and developing economies over the medium term, even if there is a persistent shift in some key external conditions.

The historical record suggests, however, that steady, sustained catch-up growth spurred by income gaps relative to advanced economies is not automatic (Pritchett 2000; Hausmann, Pritchett, and Rodrik 2005; Jones and Olken 2008; Berg, Ostry, and Zettelmeyer 2012). Growth across emerging market and developing economies over time instead exhibits episodes of accelerations and reversals, with a possible role for external conditions in influencing the patterns. Understanding which policies emerging market and developing economies can deploy to maintain steady growth and avoid reversals as the external environment becomes less supportive is critical for improving living standards in those economies and for lifting global growth.

Against this backdrop, the chapter studies how country-specific external conditions affect emerging market and developing economies' medium-term growth prospects (that is, over five-year horizons that smooth the influence of business cycle fluctuations) and their likelihood of experiencing persistent acceleration and reversal episodes. It also explores how domestic policies and structural attributes influence the impact of external conditions on the propensity to experience these episodes. After taking stock of

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emerging market and developing economy growth performance in recent decades and how much these economies' income gaps have narrowed compared with advanced economies, the chapter examines the following main questions:

- How do country-specific external demand conditions, external financial conditions, and terms of trade influence growth patterns in emerging market and developing economies, their likelihood of experiencing accelerations or reversals, and thus how quickly they narrow income gaps vis-à-vis advanced economies? As emerging market and developing economies have become more integrated into the global economy, have external factors become more important in shaping their growth patterns over time?
- Which domestic policies and structural attributes can help emerging market and developing economies get the most out of external conditions?
- What does the current constellation of external conditions imply for emerging market and developing economies' medium-term growth prospects and their ability to continue to contribute significantly to global growth?

The chapter's main findings are:

- Country-specific external conditions have a significant effect on medium-term growth of emerging market and developing economies. The analysis establishes that variation at the country level in external conditions, as well as global factors that affect all economies in a common manner during particular intervals, matter for medium-term growth outcomes of individual emerging market and developing economies.
- Country-specific external conditions also help explain the occurrence of growth accelerations and reversals—episodes that appear to have persistent effects on growth outcomes in emerging market and developing economies and their relative income gaps vis-à-vis advanced economies.
- The importance of country-specific external conditions for emerging market and developing economies' medium-term growth has increased over time, particularly in the case of external financial conditions. For instance, their contribution to medium-term growth has increased by about ½ percentage point—or one-third of the increase in average per capita income growth—between the 1995–2004 and 2005–14 periods. While the contribution of external demand conditions as a whole appears to have remained broadly stable over this period, demand among emerging market and developing economies has played an increasingly powerful role.
- Certain domestic policy settings and structural attributes can to some extent help offset a diminishing growth impulse from less supportive external conditions. The chapter confirms previous findings in the literature that higher-quality legal systems and stronger protection of property rights are associated with better medium-term growth outcomes (see Jones 2016 and references therein). Sound monetary frameworks, financial depth, and exchange rate flexibility also enhance medium-term growth. But, crucially, the chapter points to an additional role for some attributes: trade integration, exchange rate flexibility, and strong institutions help emerging market and developing economies enhance the growth impulse from external conditions either by increasing the likelihood of accelerations or by decreasing that of reversals.

The analysis presented in this chapter focuses specifically on the impact of the external environment on emerging market and developing economies' medium-term growth in income per capita. The external environment can also influence other important aspects of these economies and raise associated policy challenges not considered in this chapter. As documented in Chapter 4 of the April 2014 *World Economic Outlook* (WEO), external demand and financial shocks have a quantitatively significant impact on short-term growth fluctuations in emerging market and developing economies. Exposure to short-term speculative capital flows can impose costs in the form of higher volatility (Ostry, Loungani, and Furceri 2016). Integration into the global trading system also affects the way rewards of economic growth are divided across domestic factors of production. As shown in Chapter 3, emerging market and developing economies' participation in global value chains may have contributed to lower labor income shares in these economies.

The rest of the chapter is structured as follows. It starts with an overview of emerging market and developing economy growth performance in recent decades and examines the role of country-specific external conditions in shaping growth patterns observed across countries and over time. It then zooms in on episodic patterns of emerging market and developing economy growth and explores the role of external conditions in affecting the likelihood of accelerations and reversals. The analysis

examines how domestic policies and attributes influence the effect of external conditions on the likelihood of experiencing accelerations and reversals. Finally, the chapter looks at the prospects for emerging market and developing economy growth in the external environment they are likely to face over the medium term.

Emerging Market and Developing Economy Growth Performance over Time

In recent decades, the contribution of emerging market and developing economies to global growth of output and consumption has increased rapidly, and these economies' growth prospects have become increasingly relevant for the entire global economy.[1] Understanding how the complicated external environment may affect their growth prospects is therefore important not just for the quest to sustain improvements in these economies' living standards, but also to assess the overall outlook for the global economy.

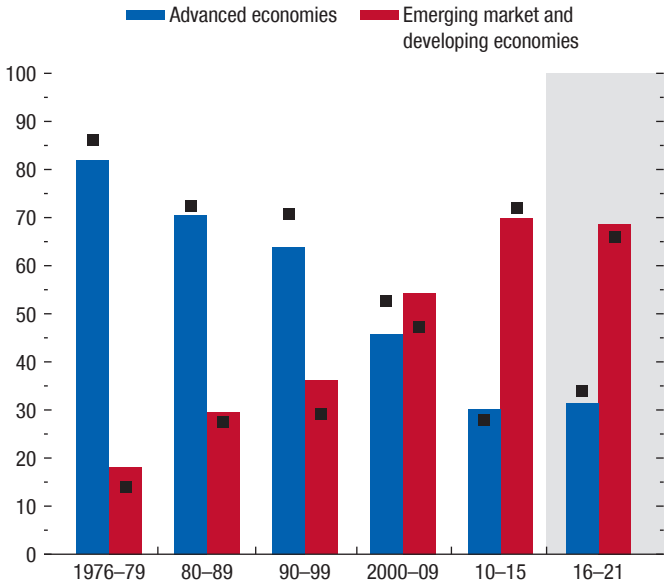
During 2000–08, emerging market and developing economies, on average, accounted for 70 percent of global growth in output and consumption in purchasing-power-parity terms, nearly double their contribution during the 1980s. After the global financial crisis, with advanced economies experiencing a slow recovery, emerging market and developing economies' contribution to global growth rose to about 80 percent of output growth and 85 percent of consumption growth (see also Box 1.1 of the April 2016 WEO). In market exchange-rate terms, emerging market and developing economies accounted for close to 70 percent of global output growth and just over 70 percent of global consumption growth during 2010–15 (Figure 2.1).

Despite emerging market and developing economies' increasing overall importance in the global economy, particularly in the 2000s, income levels of individual countries within the group are still relatively low vis-à-vis those of advanced economies.[2] In 90 percent of emerging market and developing economies, current real income per capita (converted at purchasing-power-parity exchange rates that more accurately reflect differences in the cost of living across countries) is less than half what it is in the United States. In 85 percent of emerging market and developing economies, real income per worker is less than half that in the United States (Figure 2.2).[3]

To the extent that labor productivity growth in emerging market and developing economies is in part a function of the relative productivity gap with advanced economies (proxied by the United States), these large gaps in output per worker suggest that there may still be significant room for catch-up

Figure 2.1. Contribution to Global Output and Consumption Growth
(Percent)

Emerging market and developing economy growth prospects are increasingly relevant for the global economy.



Source: IMF staff calculations.
Note: Weighted averages are calculated using market exchange rates. Colored bars show percentage of contribution to output growth; black squares show percentage of contribution to consumption growth.

[1]In this chapter, the emerging market and developing economy group comprises all economies currently classified as such by the WEO as well as those that have been reclassified as "advanced" since 1996 (Cyprus, Czech Republic, Estonia, Hong Kong SAR, Israel, Korea, Latvia, Lithuania, Macao SAR, Malta, Puerto Rico, San Marino, Singapore, Slovak Republic, Slovenia, Taiwan Province of China). Economies with populations in 2010 below 1 million according to the Penn World Tables 9.0 vintage are excluded from the sample.

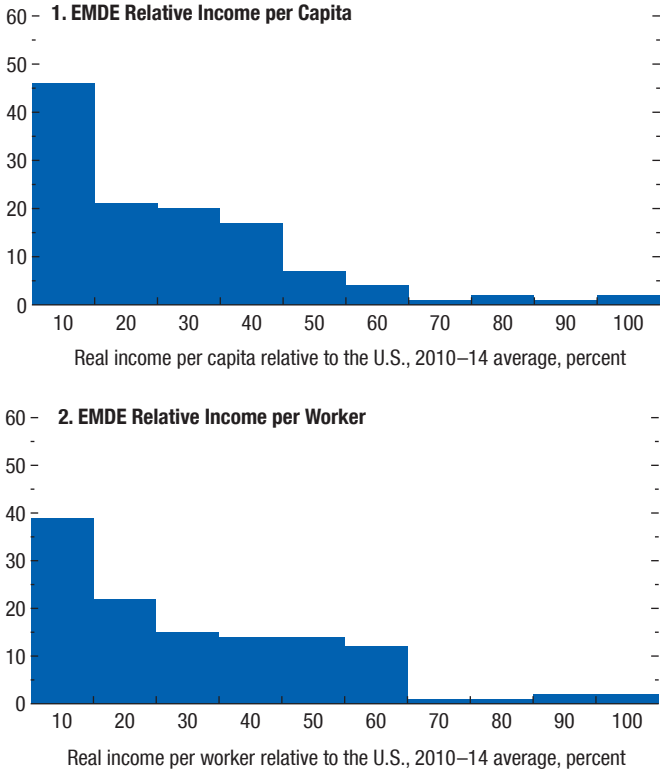
[2]The chapter uses data on cross-country real income, factors of production (physical and human capital; labor input), and population from the Penn World Tables (PWT) 9.0 vintage. See Deaton and Aten (2017), and Inklaar and Rao (2017) for discussions on the methodology of the 2011 International Comparison of Prices, which underpins the calculations of purchasing-power-parity real income in the PWT 9.0.

[3]The ratios are calculated based on average real income per capita over a five-year window, 2010–14, to smooth out business cycle and commodity price fluctuations that may affect the relative income levels. An important caveat is that some emerging market economies use the single-deflation method to calculate real GDP, but this approach may not fully capture relative price changes and may therefore affect the accuracy of the calculation (Alexander and others 2017).

Figure 2.2. Emerging Market and Developing Economies, Relative Income in Purchasing-Power-Parity Terms

(Number of economies per interval)

Large gaps in income per worker vis-à-vis that of advanced economies suggest there may still be significant room for "catch-up" growth in EMDEs.

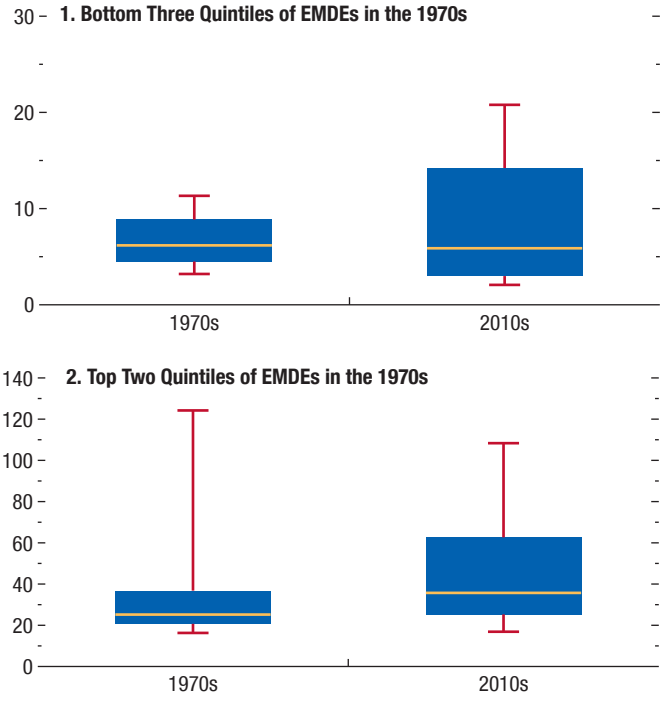


Sources: Penn World Tables 9.0; and IMF staff calculations.
Note: EMDE = emerging market and developing economies; U.S. = United States.

Figure 2.3. Distribution of Income per Capita in EMDEs in the 1970s and the 2010s

(Income per capita in PPP terms relative to the United States, percent)

The narrowing of gaps in income per capita in EMDEs vis-à-vis that of advanced economies has not been automatic in the past. Income gaps of several EMDEs actually widened during 1970–2014.



Sources: Penn World Tables 9.0; and IMF staff calculations.
Note: The horizontal line inside each box represents the median; the upper and lower edges of each box show the top and bottom quartiles; and the red markers denote the top and bottom deciles of the average relative income during the decade. EMDEs = emerging market and developing economies; PPP = purchasing power parity.

(although some countries may be close to their own steady-state levels and unlikely to experience further catch-up growth).[4]

In the past, the narrowing of income gaps has not been automatic. Other forces beyond the gap in productivity have shaped the pattern of emerging market and developing economies' growth. For example, consider the *bottom three quintiles* of the income distribution of these economies in the 1970s—that is, those with relative income per capita vis-à-vis the United States below the 60th percentile of the cross-country distribution of the period-average relative income per capita levels during the 1970s (Figure 2.3, panel 1). Convergence and the narrowing of relative income gaps would have been expected to be greatest among economies in this group; indeed, the best performers in this group (economies in the top decile) have seen some narrowing in income levels relative to the United States (from about 11 percent in the 1970s to about 21 percent in recent years). However, the median relative income level for that group has in fact *declined* over the past four decades. By way of comparison, within the *top two quintiles* of emerging market and developing economies' relative income distribution in the 1970s, the median relative income for the group has increased (Figure 2.3, panel 2).

The uneven record on convergence reflects time variation in the speed at which emerging market

[4]Some emerging market and developing economies have been experiencing a protracted slowdown in labor productivity growth in recent years (Adler and others 2017), which would be consistent with these economies having reached per capita income levels close to their steady states.

and developing economies' income gaps vis-à-vis the United States have narrowed over the decades (Figure 2.4). During the 1970s the median income gap remained broadly unchanged as the two oil shocks hurt oil-importing emerging market and developing economies while they lifted oil exporters' income levels. During the 1980s and 1990s income gaps widened (that is, the median income level declined relative to that of the United States) as emerging market and developing economies suffered a lost decade (Latin America and the Caribbean) and financial crises (Asia and Latin America and the Caribbean). Income gaps subsequently narrowed in the wake of the commodity boom and other tailwinds in the 2000s and 2010s (IMF 2014; Chapter 2 of the October 2015 WEO). However, as Box 2.1 documents, regional disparities remained large in some of the economies that experienced relatively fast growth during that period.

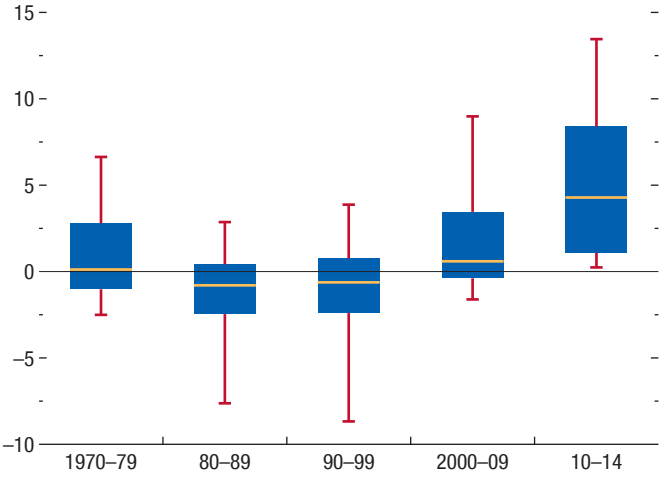
It is important to note that the narrowing of emerging market and developing economies' relative income gap with the United States during the recent period does not reflect "convergence from above:" except during the global financial crisis, real GDP per capita in the United States did not decline in absolute terms during the 2000s and 2010s. While the relatively slow growth in the United States following the crisis has mechanically helped faster-growing emerging market and developing economies narrow their income gaps relative to the United States, for most of the period, this narrowing occurred in part because of exceptional tailwinds that supported synchronized accelerations (IMF 2014). And, in earlier periods when gaps widened, growth reversals in emerging market and developing economies appear to have played an important role. The time variation in the pace at which relative income gaps narrow and widen therefore reflects in part the episodic nature of growth in emerging market and developing economies, with a recurrence of accelerations and reversals.

The rest of the chapter explores the role of external conditions in accounting for these patterns, building on previous research that has documented the importance of certain aspects of external conditions for emerging market and developing economies' growth.[5]

[5]IMF (2014) demonstrates the importance of external demand and terms of trade for medium-term growth in emerging market and developing economies. Jones and Olken (2008) show that growth accelerations ("upbreaks" in their terminology) are associated with increases in the trade share of GDP. Berg, Ostry, and Zettelmeyer (2012) document a positive association between terms-of-trade shocks and the duration of growth spells, while Hausmann, Pritchett, and Rodrik (2005) establish that very strong terms-of-trade realizations are associated with the onset of growth accelerations.

Figure 2.4. Change in Real Income per Capita in EMDEs Relative to the United States over Decades
(Percentage points)

Across decades there is wide variation in the pace at which EMDEs' income gaps vis-à-vis the United States have narrowed.



Sources: Penn World Tables 9.0; and IMF staff calculations.
Note: The horizontal line inside each box represents the median; the upper and lower edges of each box show the top and bottom quartiles; and the red markers denote the top and bottom deciles of the average change in relative income during the decade. *X*-axis labels denote decades. EMDEs = emerging market and developing economies.

How Important Are External Conditions?

The empirical exercise in this section defines and describes a set of external conditions for emerging market and developing economies, assesses their relevance for medium-term growth performance in those economies, and explores how the importance of external conditions varies across economies and over time.

Country-Specific External Conditions Measures

The external conditions that emerging market and developing economies face comprise a complex mix of factors that do not always move in the same direction. For instance, weak external demand associated with low growth in key trading partners may go hand in hand with loose monetary conditions, low global interest rates, and strong capital flows to emerging market and developing economies. To take this potential divergence into account, the chapter focuses on three sets of external conditions—external demand conditions, external

financial conditions, and terms of trade—each of which can manifest itself differently for individual countries. Country-specific metrics of these external conditions are constructed to capture the specificities of the global context for each emerging market and developing economy, while at the same time being largely exogenous from the point of view of each individual economy.[6]

- Country-specific *external demand conditions* are measured by the export-weighted growth rate of domestic absorption of trading partners, along the lines of Arora and Vamvakidis (2005) and IMF (2014). Each country's external demand measure is further decomposed to capture external demand conditions by three groups of trading partners—China, other emerging market and developing economies (excluding China), and advanced economies.
- Country-specific *external financial conditions* are proxied by a quantity-based measure of capital flows to peer economies (other emerging market and developing economies within the same region) as a share of their aggregate GDP (constructed to be exogenous to each country along the lines of Blanchard, Adler, and de Carvalho Filho 2015). A quantity-based metric is used to better capture the fluctuations in availability of diverse financial flows ranging from direct investment to cross-border bank lending. These fluctuations may be missed if price-based proxies for external financial conditions are used, such as those calculated from a narrow set of global interest rates.
- Country-specific changes in the *terms of trade* are based on international commodity prices as in Gruss 2014 and Chapter 2 of the October 2015 WEO to ensure that they are exogenous from the perspective of each economy. The country-specific commodity terms of trade index is constructed by weighting international prices of individual commodities according to the share of net exports of each commodity in GDP. This index provides an indication of the income windfall gains and losses (as a share of GDP) associated with changes in those prices for both commodity exporters and importers.[7]

The cross-correlation between these country-specific measures of external conditions is low (Annex Table 2.1.3), indicating that each dimension potentially exerts an influence separate from the other two. Moreover, the country-specific measures of external conditions often deviate considerably from their corresponding global variables, suggesting that idiosyncratic variation is an important driver of the variability in external conditions at the level of individual economies (Annex Figure 2.1.1). For instance, the time-varying correlation of individual economies' external demand conditions with aggregate world output growth shows that idiosyncratic external conditions often deviate significantly from the average external conditions faced by all countries (Annex Figure 2.1.1, panel 1). In turn, external financial conditions exhibit, not surprisingly, a strong role for the common factor at the regional level.[8] By restricting the set of related economies to those within the same geographical region, the country-specific measure nonetheless shows substantial variability. This is evident in the relatively wide variation in the correlation of individual economies' external financial conditions with aggregate capital flows to emerging market and developing economies (Annex Figure 2.1.1, panel 2). The correlation of changes in commodity terms of trade with that of oil prices or aggregate commodity prices also varies substantially across countries (Annex Figure 2.1.1, panel 3).

Establishing the Importance of External Conditions

Have external conditions had a persistent, medium-term impact on income per capita growth in emerging market and developing economies? And how has the importance of external conditions as a whole, and each one in particular, evolved over time and across groups of countries?

To answer these questions, this section follows the approach of Arora and Vamvakidis (2005); Calderón, Loayza, and Schmidt-Hebbel (2006); and Box 4.1 in Chapter 4 of the April 2014 WEO to estimate a standard growth regression over 1970–2014 for a broad sample of more than 80 emerging market and developing economies (Annex 2.3). The dependent variable is the growth rate of GDP per capita in purchasing-power-parity terms averaged over nonoverlapping five-year windows (to smooth the influence of business cycles).

[6]See Annex 2.1 for details on the construction of these measures of external conditions.

[7]The country-specific weights capture differences across countries in the composition of commodity export and import baskets and in the importance of commodities in the overall economy. The weights are predetermined, so that movements in commodity terms of trade reflect exogenous changes in international prices (see Annex 2.1).

[8]This is consistent with the findings of Chapter 2 of the April 2016 WEO, which establish the importance of a common global factor in driving capital flows and their cycles.

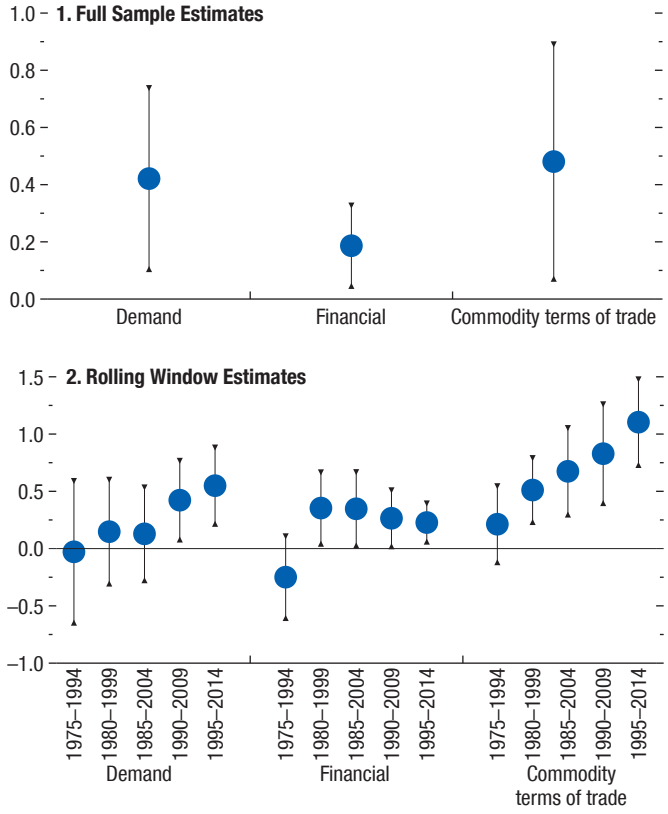
The explanatory variables of interest are the country-specific measures of external demand conditions, external financial conditions, and terms of trade, defined in the previous section. While the construction of the country-specific measures described above aims to capture aspects of the external environment that are exogenous to the economy, for some individual cases the measures may nevertheless be affected by growth outcomes of the economy in question or respond to other variables that also affect medium-term growth. A priori, across the entire sample, there is no reason to expect that the external conditions measures are systematically affected by growth outcomes or by other variables that also directly affect growth in ways that would introduce reverse causality or omitted variables bias in the estimations presented below. Nevertheless, the analysis presented here attempts to mitigate these concerns by simultaneously including all three external conditions in the specifications, together with time fixed effects that capture unobservable common factors.[9] The regression also allows for unobserved country fixed effects and includes initial real income per capita at the start of the period and a set of domestic variables found in the literature to be associated with medium-term growth.[10]

For the period as a whole, all three external conditions have economically and statistically significant effects on emerging market and developing economies' medium-term growth. The coefficients are statistically significant at the 10 percent level, even after controlling for common global factors captured by the time fixed effect (Figure 2.5, panel 1, and Annex Table 2.3.1). Specifically,

- A 1 percentage point increase in the growth rate of domestic absorption in trading partners is associated with a 0.4 percentage point increase in medium-term growth, equivalent to about one-fifth of the average annual growth rate of GDP per capita in the sample. This strong effect may reflect, for example, persistent productivity gains from economies of scale associated with a larger market size via trade.[11]

Figure 2.5. Elasticity of Medium-Term GDP per Capita Growth in EMDEs with Respect to External Conditions
(Percentage points)

External conditions have a significant effect on EMDE medium-term growth. The sensitivity to external conditions has risen as EMDEs have become more integrated into the global economy.



Source: IMF staff calculations.
Note: The figure shows the coefficient estimates from the baseline growth regression described in Annex 2.3. The specification includes all three external conditions variables, country and time fixed effects, and additional control variables. The first panel corresponds to the estimates for the whole sample period (1970–2014), while the second panel shows estimates over subintervals. The vertical lines denote 90 percent confidence intervals. EMDEs = emerging market and developing economies.

[9]Additional exercises show that the results are robust to excluding key large emerging market and developing economies, using alternative measures of external conditions that are less likely to be affected by growth outcomes of the economy in question, and instrumenting some of the external conditions variables with exogenous variables such as interest rates from a few large advanced economies (Annex 2.3).

[10]Because the interest is in exploring the role of external conditions rather than on assessing the contribution of all factors that may affect medium-term growth, the domestic covariates included in the regression are aimed at attenuating potential omitted variable bias (rather than at maximizing the share of variance explained by the model). The country-specific measures of external conditions are derived from demand or financial conditions in trading partners and from global commodity prices, so there is less of a concern of omitted variable bias or endogeneity than would be the case if the analysis were using measures of export growth or openness (which could be affected by domestic factors that directly affect per capita income growth).

[11]See Grossman and Helpman (2015) for a discussion of the various potential links between integration and growth, and Ahn and Duval (forthcoming) on the productivity gains from trade.

- A 1 percentage point increase in the ratio of capital flows to GDP of emerging market and developing economies within the region raises medium-term growth by 0.2 percentage point. A larger volume of inflows can raise growth by, for example, easing credit rationing and reducing borrowing costs in recipient economies (Box 2.2).[12]
- A 1 percentage point increase in commodity terms of trade increases medium-term growth by almost ½ percentage point, reflecting the comovement of actual and potential output with commodity terms-of-trade windfalls (see Chapter 2 of the October 2015 WEO).[13]

Has the Role of External Conditions Evolved across Groups of Economies and over Time?

The universe of emerging market and developing economies is heterogeneous in terms of income levels, economic size, and degree of integration with the global economy. Looking within subsamples of economies could shed light on whether the overall results are affected by particular economies (for example, very large emerging market and developing economies).

A first exercise along these lines examines whether the results reported above are driven by large emerging market and developing economies. The estimation is repeated on a sample that excludes China. Subsequently, all economies in the sample that are members of the Group of Twenty (Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey) are excluded from the estimation. The coefficients for these alternative samples are very similar to those for the overall sample (Annex Table 2.3.2), suggesting that the large economies are not driving the results for the entire set.

The baseline sample includes several very small economies. A natural question is to what extent the baseline result is representative of aggregate growth dynamics in emerging market and developing economies. A second exercise repeats the estimation on a reduced sample that excludes the smallest economies, which collectively account for less than 5 percent of emerging market and developing economies' aggregate GDP, effectively reducing the sample by about half. The coefficient on terms of trade is about twice as large and strongly significant when the smallest economies are excluded (Annex Table 2.3.2), while the coefficient on external financial conditions is similar to the estimate based on the full sample. In turn, the coefficient on external demand conditions is smaller and statistically insignificant in the reduced sample.

The importance of external conditions may also change over time as, for instance, countries become more open to international trade (and, more recently, become more integrated with global supply chains) as well as to cross-border capital flows (Chapter 3 of the October 2015 WEO; Leigh and others 2017). To trace this evolution over time, the analysis is repeated within subsamples. Specifically, rolling regressions are estimated over 20-year horizons (such that each regression has four nonoverlapping five-year windows).[14]

The results of the rolling regressions indicate that the coefficients generally increase over time as countries become more integrated into the global economy (Figure 2.5, panel 2). The elasticity is almost four times as large over 1995–2014 compared with 1980–99 in the case of external demand and more than twice as large in the case of commodity terms of trade. The elasticity with respect to external financial conditions varies much less.

Contribution of Country-Specific External Conditions to per Capita Income Growth

The full sample results indicate that the three external conditions considered in this chapter have collectively contributed, on average, almost 2 percentage points to income per capita growth over 1975–2014 (Figure 2.6, panel 1). Their contribution increased from about 1.7 percentage points over 1975–94 to about 2⅓ percentage points during the past two decades, accounting for more than half of medium-term growth, on average, across emerging market and developing economies during this latter period. In general, external conditions have been very important for growth in Latin America and the Caribbean; the Middle East, North Africa, Afghanistan, and Pakistan; and sub-Saharan Africa; whereas for Asia and European emerging market and developing economies, domestic and unaccounted-for

[12]Exposure to external financial conditions does not necessarily imply a loss of control over domestic financial conditions, as documented in Chapter 3 of the April 2017 *Global Financial Stability Report*.

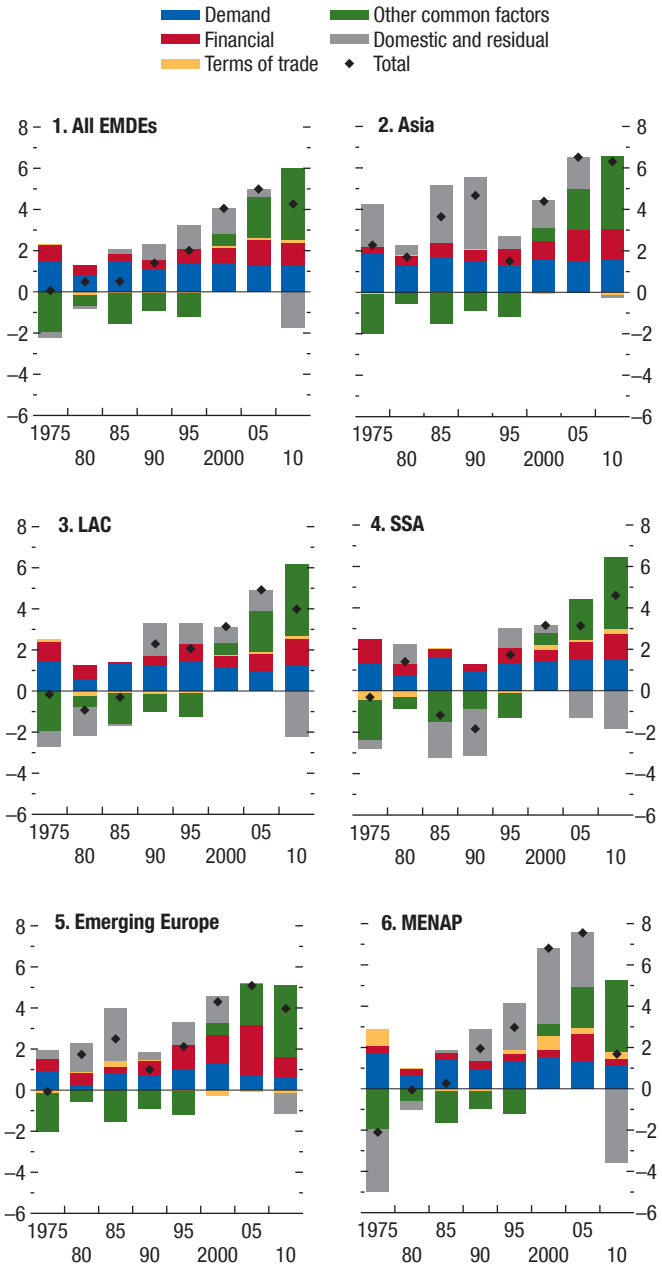
[13]A 1 percentage point change in the commodity terms of trade index is akin to a windfall income gain of 1 percent of GDP—a relatively large amount. The interquartile range for the average annual change in the commodity terms of trade index across all countries and periods is –0.4 to 0.3 percent.

[14]This naturally comes at the cost of having fewer observations per estimation, resulting in less precisely estimated coefficients, so the focus of the narrative here is on comparing point estimates.

Figure 2.6. Average Contribution to GDP per Capita Growth

(Percentage points)

The contribution of external conditions to income per capita growth in EMDEs is important throughout the sample period and increased somewhat during the past two decades. External conditions appear to have been particularly important for growth in the LAC, MENAP, and SSA regions.

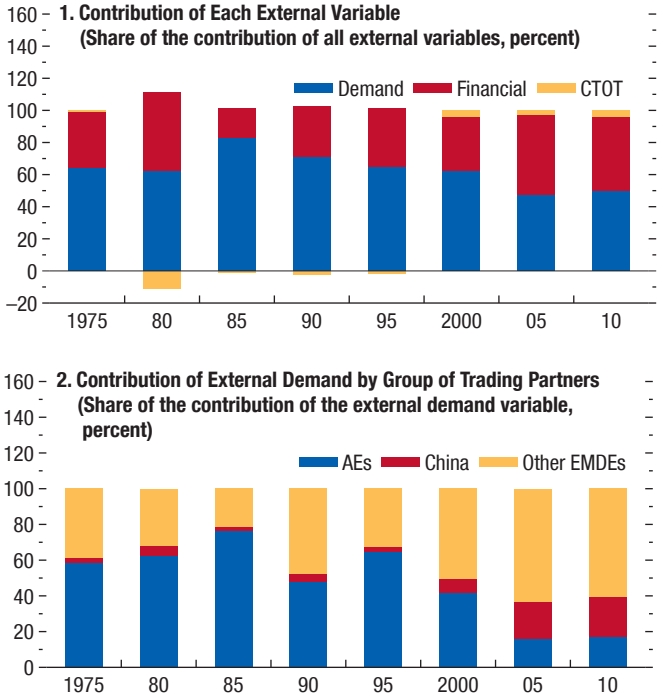


Source: IMF staff calculations.
Note: The figure shows, for each variable and period, the average contribution to fitted GDP per capita growth across economies. The results are based on the coefficient estimates from the baseline growth regression for the whole sample (see Annex 2.3). "Other common factors" corresponds to the estimated time fixed effects (de-meaned). *X*-axis labels indicate start of a five-year period. EMDEs = emerging market and developing economies; LAC = Latin America and the Caribbean; MENAP = Middle East, North Africa, Afghanistan, and Pakistan; SSA = sub-Saharan Africa.

Figure 2.7. Relative Average Contribution to GDP per Capita Growth among External Conditions Variables

(Percent)

External financial conditions and intra-EMDE trade have become increasingly influential drivers of medium-term growth in EMDEs over time.



Source: IMF staff calculations.
Note: The results are based on the estimates from the baseline growth regression for the whole sample (see Annex 2.3). *X*-axis labels indicate starting year of five-year period. AEs = advanced economies; CTOT = commodity terms of trade; EMDEs = emerging market and developing economies.

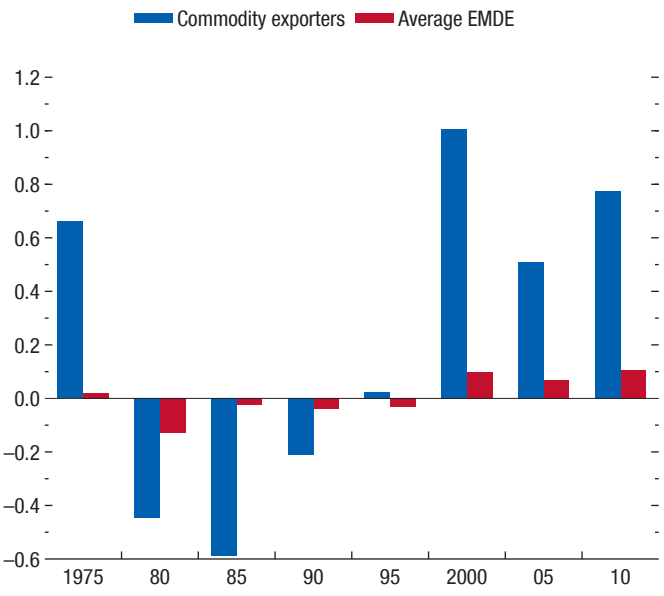
factors appear to be just as important as external conditions in terms of their contributions to growth.

Zooming in on the role of each external condition suggests that financial conditions, as proxied by the intensity of gross capital inflows, are becoming increasingly important over time. Their contribution to medium-term growth has increased by about ½ percentage point—or one-third of the increase in average income per capita growth—between the 1995–2004 and 2005–14 periods. This represents about half of the contribution from external factors since 2005—up from about one-third during 1995–2004 (Figure 2.7, panel 1).

Another important question regarding the shifting role among external conditions is how China's growing influence in the global economy and, more generally, the expansion of trade among emerging market and developing economies have affected these economies'

Figure 2.8. Average Contribution of Terms of Trade to GDP per Capita Growth, by Groups of Economies
(Percentage points)

The contribution of commodity terms of trade to medium-term growth is substantially larger for commodity exporters than for the average EMDE.



Source: IMF staff calculations.
Note: The figure shows the average contribution of commodity terms of trade to fitted GDP per capita growth across economies. Commodity exporters are defined in Annex 2.1. The results are based on the coefficient estimates from the baseline growth regression for the whole sample (see Annex 2.3). *X*-axis labels indicate starting year of five-year period. EMDE = emerging market and developing economy.

growth outcomes. To explore how these developments have influenced medium-term growth in emerging market and developing economies, the decomposition of the external demand measure by trading group is used instead of the aggregate external demand measure.[15] The results show that China's domestic absorption from 2000 onward has become increasingly important in accounting for growth in other emerging market and developing economies (Figure 2.7, panel 2). Furthermore, the combined demand from China and other emerging market and developing economies accounts for more than 80 percent of the contribution of external demand to GDP per capita growth in other emerging market and developing economies (up from 36 percent in the late 1990s).

While the contribution of commodity terms of trade to medium-term growth for the average economy in the sample appears to be relatively small, this reflects the fact that the beneficial impact from higher prices for commodity exporters is weighed down in the average by its negative impact on economies that rely on imported commodities. The contribution of commodity terms of trade to annual GDP per capita growth is substantially larger for commodity exporters than for the average country in the sample. It fluctuates from about 1 percentage point around the time of the oil price shock in the late 1970s and the commodity boom in the early 2000s to –0.6 percentage point in the mid-1980s (Figure 2.8).

Moreover, a breakdown of the variance explained jointly by all three external conditions suggests that, in fact, commodity terms of trade account for a large fraction (Figure 2.9). Over the whole sample, commodity terms of trade account for almost 40 percent of the variance attributable to the three external factors, external demand about 35 percent, and external financial conditions the remaining 25 percent. The relative contributions of each external condition to the variance of output per capita vary substantially over time, however. The share of variance attributable to commodity terms of trade among all three external variables over 1975–80 was as large as 80 percent, but only about 10 percent in 1990–94.

In sum, the analysis in this subsection points to the importance of country-specific external conditions in influencing medium-term growth in emerging market and developing economies. These conditions have become more important over time as economies have opened up to trade and became more financially integrated into international capital markets.

The Role of Common Factors

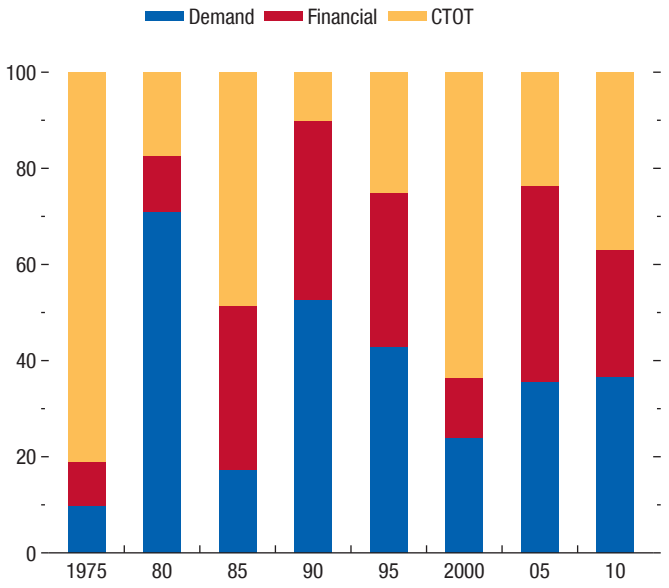
Above and beyond the influence of country-specific external conditions, the shift in the contribution of other common factors may be capturing to some extent the influence of external conditions that are common across economies. The estimates presented above on the contribution of country-specific external conditions to emerging market and developing economies' medium-term growth could therefore be interpreted as a lower bound on the impact of external conditions.

[15]While this breakdown does not separate out the role of global value chains and trade in intermediate goods (thus some of the demand attributed to China may in fact reflect final demand from another country), the use of trading partner domestic absorption in the construction of the external demand measure allows for a closer mapping into final demand from the individual regions than would have been the case had aggregate GDP been used in the calculation.

Figure 2.9. Variance of GDP per Capita Growth Accounted for by Each External Conditions Variable

(Share of the variance accounted for by all external variables, percent)

The relative importance of each country-specific external conditions variable in explaining growth variability across economies has varied significantly over decades. On average, commodity terms of trade and external demand each account for almost 40 percent of the variability.

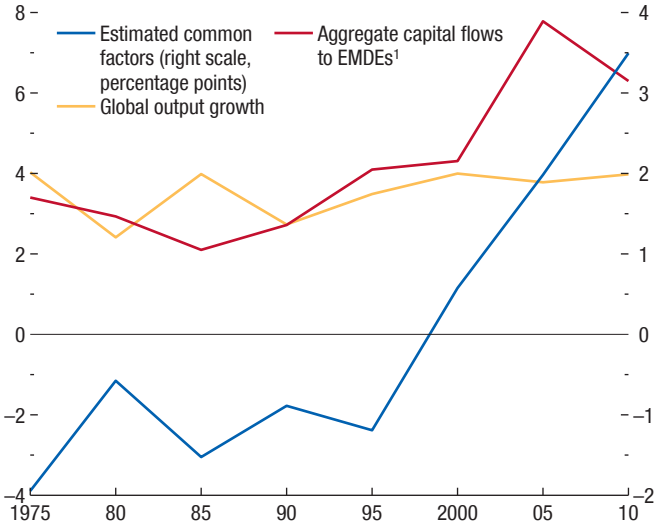


Source: IMF staff calculations.
Note: The results are based on the estimates from the baseline growth regression for the whole sample (see Annex 2.3). *X*-axis labels indicate starting year of five-year period. CTOT = commodity terms of trade.

Figure 2.10. Contribution of Other Common Factors to GDP per Capita Growth and Selected Global Variables

(Percent, unless noted otherwise)

The increase in the contribution from other common factors to EMDE growth since the early 2000s may reflect a larger role of external financial conditions and the changing nature of intra-EMDE trade linkages.



Source: IMF staff calculations.
Note: Estimated common factors correspond to the estimated time fixed effects (de-meaned) from the baseline growth regression for the whole sample (see Annex 2.3). *X*-axis labels indicate start year of five-year period. EMDEs = emerging market and developing economies.
[1]Aggregate capital flows to EMDEs are expressed as a share of their aggregate GDP.

The contribution of other common factors captured by the time fixed effects (which includes the influence of external conditions common across economies) appears to have been relatively stable during 1975–99, but has increased sharply since the early 2000s. Comparing the estimated role of common factors with global activity and financial variables suggests that the overall contribution of external conditions—and, in particular, external financial conditions—to medium-term growth over the past 15 years may have been larger than what is captured by the country-specific external conditions variables (Figure 2.10).

The shift in the contribution of other common factors over the past few decades may reflect, in part, the synchronized increase of gross capital inflows to emerging market and developing economies.[16] By contrast, the association between estimated common factors and global economic activity is less clear. Economic activity in advanced economies slowed during 2000–14, largely offsetting the faster growth and higher influence in the global economy of large emerging market and developing economies. The demand implications from these developments are likely to be adequately captured by the country-specific external demand variable. But the transformation in trade linkages between emerging market and developing economies over the past few decades may have affected their growth through channels beyond external demand. The share of value added from many emerging market and developing economies absorbed by China's final demand during the 2000s increased faster than can be explained by China's economic growth during that period (Box 2.3). Emerging market and developing

[16]Given that global asset prices and capital flows to emerging market and developing economies are affected by portfolio shifts in advanced economies, the rising importance of external financial conditions in emerging market and developing economies' medium-term growth may also indicate a change in how advanced economies influence emerging market and developing economies' growth, with the relative importance of the financial channel rising and that of the demand channel declining.

economies' participation in global value chains has also increased significantly since the mid-1990s (Chapter 2 of the October 2016 WEO), which may have affected the efficiency of resource use and productivity growth. The increasing contribution of estimated common factors during 2000–14 may therefore also reflect in part the growth effects of changes in trade linkages among emerging market and developing economies.

How Do External Conditions Influence the Occurrence of Growth Episodes?

With the importance of external conditions for emerging market and developing economies' medium-term growth established, this section takes a closer look at their influence on the occurrence of growth accelerations and reversals—a key feature of the growth process in several emerging market and developing economies.[17]

Identifying Persistent Growth Acceleration and Reversal Episodes

Growth acceleration and reversal episodes are identified using statistical methods similar to those employed in the literature. Along the lines of Hausmann, Pritchett, and Rodrik (2005), a *growth acceleration episode* is defined as an interval spanning five years during which the following occur (see also Annex 2.4):[18,19]

- The trend growth rate of real GDP per capita during the period is relatively strong (at least 3.5 percent a year).[20]
- Trend growth increases by at least 2 percentage points.[21]
- The level of real GDP per capita at the end of the episode is at least as large as the maximum level recorded prior to the onset of the episode (to rule out capturing the rebound from a collapse).

A fourth criterion is applied to distinguish between persistent accelerations and those that end in a banking crisis or growth reversal. Accelerations associated with either a reversal that starts within three years of the end of the episode, or a banking crisis (as identified by Laeven and Valencia 2013) that starts three years before or after the end of the episode are labeled as nonpersistent accelerations.

In turn, a *growth reversal episode* is defined as an interval spanning five years during which the following occurs:

- There is a discrete drop in the trend growth rate such that it is at least 2 percentage points lower than during the preceding five-year interval.
- The level of real GDP per capita declines such that its average during the five-year episode is lower than the average during the five-year period immediately preceding the episode.

The History and Geography of Episodes

These filters pick up substantial variation over time in the occurrence of growth episodes (Figure 2.11). In total, there are 127 growth acceleration episodes in the sample during 1970–2014. Of these, 95 represent persistent accelerations, and 32 represent nonpersistent accelerations (see Annex Table 2.4.1 for a list of country-year persistent acceleration episodes). Of the 32 nonpersistent accelerations, 12 are associated with subsequent reversals, 18 with banking crises, and 2 with both. The filter for reversals identifies 125 such episodes during 1970–2014. (Annex Table 2.4.2 lists the country-year reversal episodes.)

A closer look at the occurrence of the episodes over time shows that accelerations picked up in the 2000s, but were relatively rare during other decades. More recent decades have also seen the balance of accelerations shift increasingly toward the persistent kind. There was a large number of reversals in the 1970s and 1980s as oil-importing emerging market and developing econo-

[17]A large volume of work has studied the occurrence and determinants of episodes and structural breaks (or, alternatively, "growth regimes" and "spells") in the long-term time series of emerging market and developing economies' growth. See, for example, Ben-David and Papell (1998); Pritchett (2000); Hausmann, Pritchett, and Rodrik (2005); Pattillo, Poirson, and Ricci (2004); Hausmann, Rodrigues, and Wagner (2006); Jerzmanowski (2006); Jones and Olken (2008); Reddy and Minoiu (2010); Berg, Ostry, and Zettelmeyer (2012); the April 2012 WEO; and Eichengreen, Park, and Shin (2013). The lack of persistence in emerging market and developing economies' medium-term growth rates was documented by Easterly and others (1993) and recently revisited by Pritchett and Summers (2014).

[18]Jones and Olken (2008); Berg, Ostry, and Zettelmeyer (2012); and Tsangarides (2012) use an alternative statistical approach. In particular, the latter two papers use a variant of the procedure proposed by Bai and Perron (1998, 2003) to test for multiple structural breaks in time series when both the total number and the location of breaks are unknown.

[19]As a robustness test, an alternative interval spanning seven years is used to identify episodes (Annex 2.5).

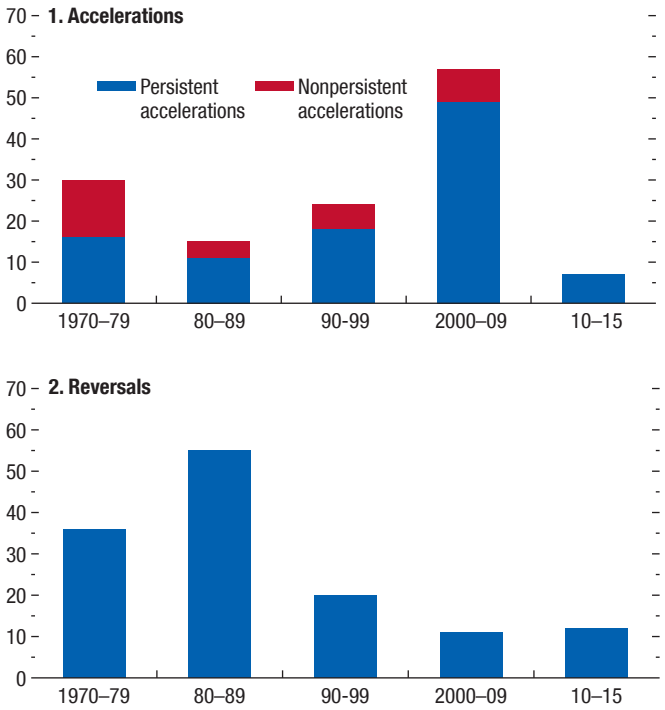
[20]A trend growth rate of 3.5 percent a year is slightly above the 60th percentile of the distribution of the annual growth rates for the full sample and about the 75th percentile of the trend growth rates over five-year intervals.

[21]An increase in trend growth of 2 percentage points is about the 75th percentile of the difference in trend growth rates between two periods in the sample.

Figure 2.11. Growth Episodes in Emerging Market and Developing Economies, 1970–2015

(Number of episodes)

Over time, the balance of acceleration episodes has tilted toward the persistent kind, and the number of reversal episodes has declined.

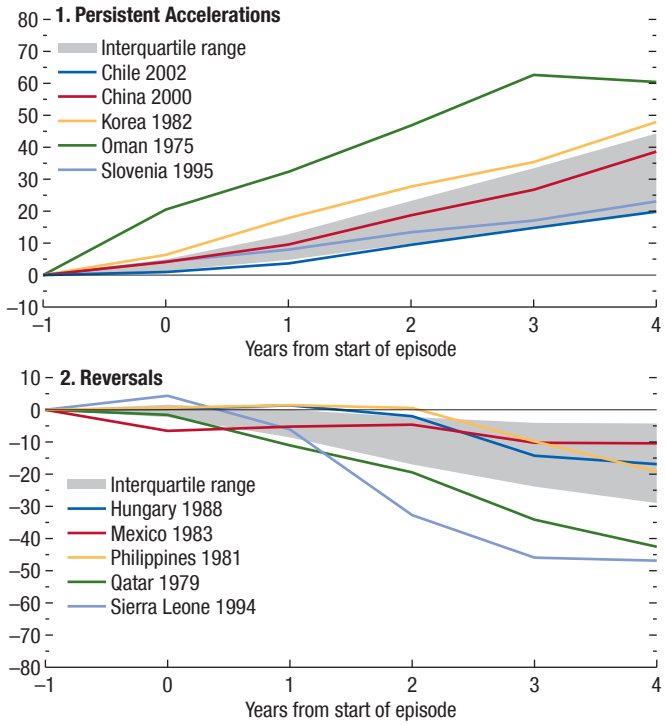


Source: IMF staff calculations.
Note: Growth episodes are identified according to the criteria described in Annex 2.4.

Figure 2.12. Cumulative Growth during Episodes, 1970–2015

(Percent change relative to the initial level of income per capita)

While the cumulative change in income per capita during episodes is large, there is considerable variation across countries.



Source: IMF staff calculations.
Note: Growth episodes are identified according to the criteria described in Annex 2.4. For the full list of episodes, see Annex Tables 2.4.1 and 2.4.2. "Interquartile range" denotes the interquartile range of the distribution of cumulative growth for all country-year episodes.

mies suffered during the decade of high oil prices, and other economies, particularly in Latin America and the Caribbean, experienced severe financial crises with persistent negative effects on income per capita. Reversals have declined in number since then.

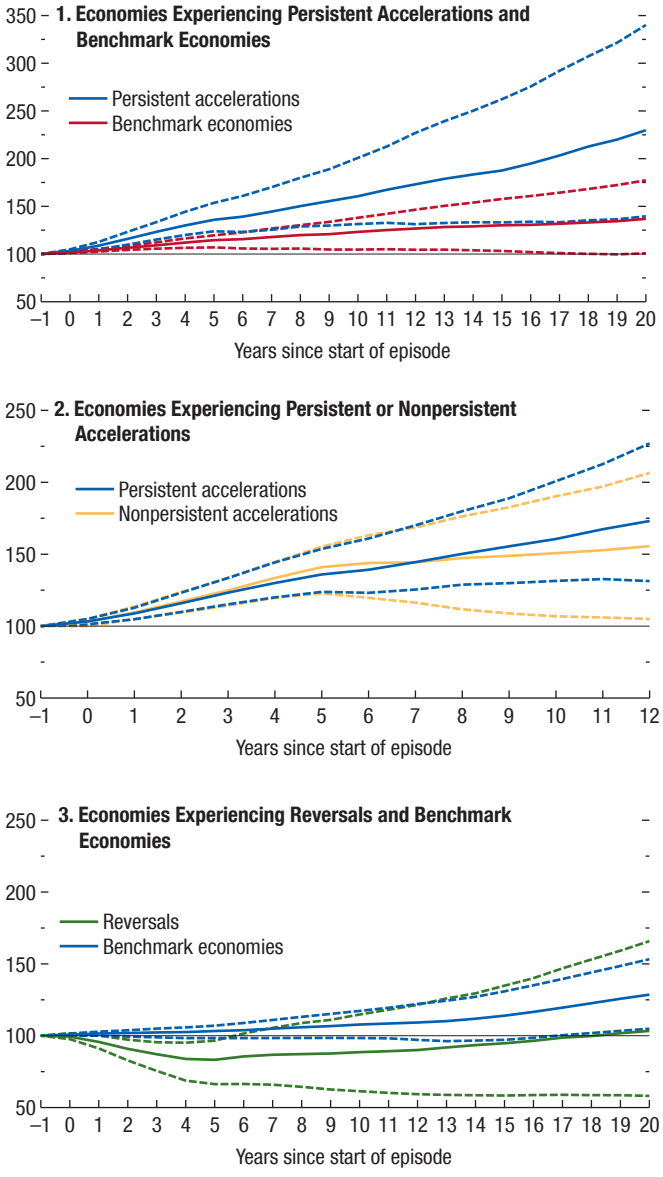
Across regions, accelerations have been relatively steady in Asia over time (including, for example, the persistent acceleration in Korea in the beginning of the 1980s and in China in the 2000s; [Figure 2.12, panel 1]), but they have been more variable elsewhere (Annex Figure 2.4.2). It is important to note, though, that growth accelerations occur in all regions and are not largely restricted to emerging market and developing economies in one or two regions of the world. Some examples include Oman in 1975, Slovenia in 1995, and Chile in 2002 (Figure 2.12, panel 1). Reversals, on the other hand, are more concentrated geographically. They tend to occur mostly in the Middle East, North Africa, Afghanistan, and Pakistan; Latin America and the Caribbean; and sub-Saharan Africa (for instance, Qatar in 1979, Mexico in 1983, and Sierra Leone in 1994). Asia and Europe have seen fewer of these episodes.

Do Episodes Have Persistent Effects on Growth Trajectories?

The cumulative impact of episodes on per capita income levels appears to be large, with considerable variation across country experiences. Persistent accelerations are associated with increases in real income per capita typically ranging from 15–40 percent above the starting level before the episode (Figure 2.12, panel 1). During reversals, real income per capita typically declines 5–30 percent relative to the initial starting level—with income drops as large as 50 percent in

Figure 2.13. Normalized GDP per Capita during Growth Episodes and Their Aftermath, 1970–2015
(Scalar)

Persistent accelerations and reversals seem to have long-lasting effects on the level of income per capita beyond the span of the episode.



Source: IMF staff calculations.
Note: Growth episodes are identified according to the criteria described in Annex 2.4. For the full list of episodes, see Annex Tables 2.4.1 and 2.4.2. *Y*-axis labels represent GDP per capita levels, normalized to be equal to 100 at $t = -1$. Solid lines denote the medians. Dashed lines denote the interquartile range of the distribution of the normalized GDP per capita for all country-years episodes.

some cases, such as Sierra Leone in the mid-1990s (Figure 2.12, panel 2).

Persistent accelerations and reversals also appear to have long-lasting effects on the level of real income per capita beyond the span of the episode. Persistent accelerations, for example, are associated with permanent increases in income levels: during the two decades after the onset of a persistent acceleration, the median level of income per capita increases nearly twice as much as the median level of income per capita for economies that do not experience accelerations (Figure 2.13, panel 1).

Moreover, comparing persistent with nonpersistent accelerations (Figure 2.13, panel 2), the level of real GDP per capita increases in similar fashion during the first five years of both sets of episodes. The level of real GDP per capita then increases at a slower rate in the case of nonpersistent accelerations, leading to a lower level eight years after the onset of the episode compared with that seen in the group of persistent accelerations.

Reversals also appear to have persistent negative effects on real GDP per capita, with the level not returning to that attained at the start of the episode until about 15 years after the start of the episode (Figure 2.13, panel 3).

The persistent effects of episodes are also seen in the association between cumulative income gains during accelerations (or losses during reversals) and long-term average growth rates (Figure 2.14). Economies with larger increases in levels of per capita income during persistent accelerations tend to grow faster, on average, over the long term, while those with bigger decreases in income levels during reversals tend also to witness lower long-term average growth rates.

External Conditions during Episodes: How Different?

Before estimating the effect of external conditions on the likelihood of accelerations and reversals, the data are examined to explore how attributes of episodes differ from those of comparators spanning the same time interval.[22]

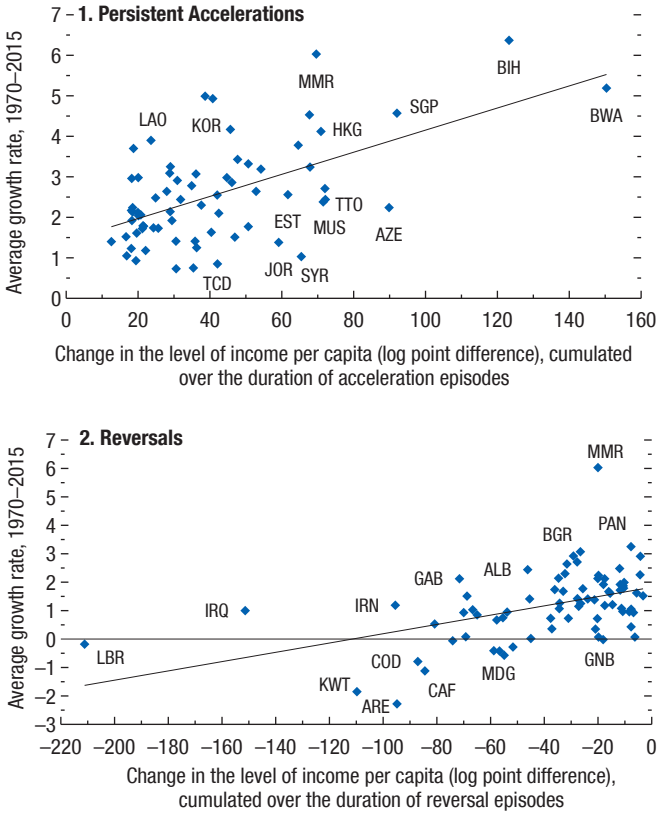
The median annual growth rate during persistent acceleration episodes in the sample is about 5.5 percent (compared with 1.7 percent for comparator economies not in an episode over the same period), while

[22]The comparison is based on a test of equality of medians, and the results are robust to a Kolmogorov-Smirnov test of congruence of the distribution of the variable (Chakravarti, Laha, and Roy 1967) for the two sets of countries.

Figure 2.14. Cumulative Growth Rate of Real Income per Capita during Episodes versus Average Growth Rate of Real Income per Capita during 1970–2015

(Percent)

The occurrence of growth episodes seems to have persistent effects on long-term income per capita growth rates.

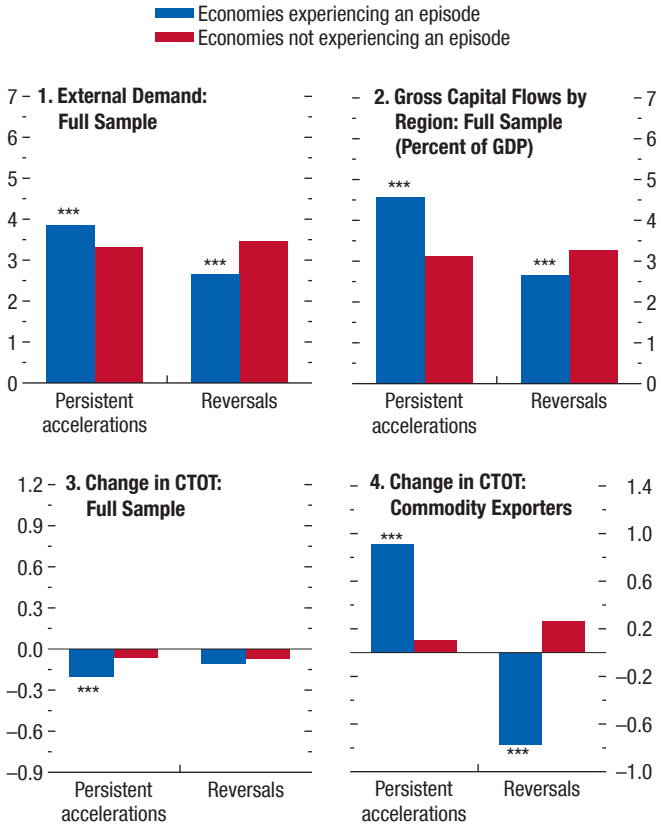


Source: IMF staff calculations.
Note: Growth episodes are identified according to the criteria described in Annex 2.4. For the full list of episodes, see Annex Tables 2.4.1 and 2.4.2. Data labels in the figure use International Organization for Standardization (ISO) country codes.

Figure 2.15. Event Analysis: Persistent Accelerations and Reversals, 1970–2015

(Percent, unless noted otherwise)

Differences in external conditions between economies that experience growth episodes and those that do not suggest these conditions may play a relevant role in the occurrence of growth episodes.



Source: IMF staff calculations.
Note: Each variable is measured as the average between $t+1$ and $t+5$, where t corresponds to the onset of the episode. ***, **, and * denote significance of an equality test of medians at the 1, 5, and 10 percent level, respectively. The results are robust to a Kolmogorov-Smirnov test of congruence of the distribution of the variable for the two sets of economies. CTOT = commodity terms of trade.

the median growth rate during reversals is –3 percent (compared with 2.6 percent for comparators over the same period).

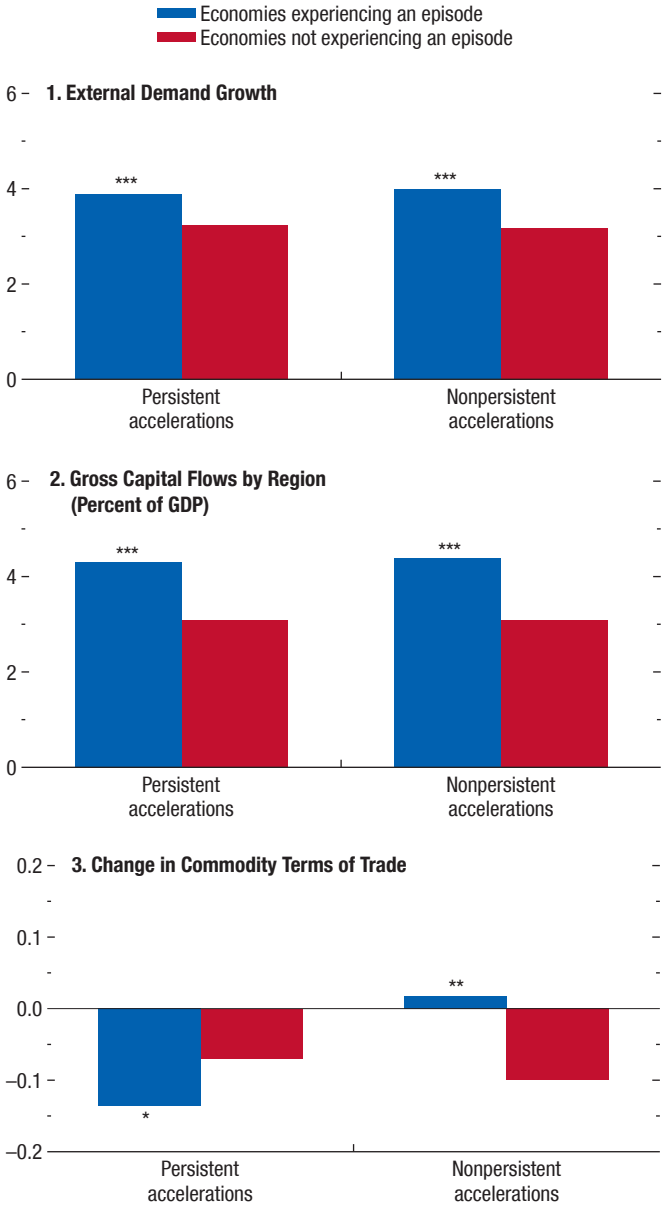
External conditions during the episodes evolve differently from the comparator set not experiencing an episode (Figure 2.15) as well as across persistent and nonpersistent accelerations (Figure 2.16). For persistent acceleration episodes, the median of trading partner growth is just above half a percentage point higher than the median trading partner growth for comparator economies not in an episode (Figure 2.15, panel 1). The difference in medians is statistically significant. External financing—the gross capital flow into the region—is about 1.5 percentage points higher than for comparator economies (Figure 2.15, panel 2).

The median change in commodity terms of trade is very close to zero and only marginally different between the two sets of economies (–0.2 percent for persistent accelerations episodes versus about –0.1 percent for the comparator countries), given that the full sample includes both commodity importers and exporters (Figure 2.15, panel 3). However, for commodity exporters only (Figure 2.15, panel 4), the median change in terms of trade is positive and significantly higher for those among them that experienced persistent accelerations

Figure 2.16. Event Analysis: Persistent and Nonpersistent Accelerations, 1970–2015

(Percent, unless noted otherwise)

While external demand and financial conditions evolve in a similar manner in economies experiencing persistent accelerations compared with those experiencing nonpersistent accelerations, commodity terms of trade behave differently.



Source: IMF staff calculations.
Note: Each variable is measured as the average between $t + 1$ and $t + 5$, where t corresponds to the onset of the episode. ***, **, and * denote significance of an equality test of medians at the 1, 5, and 10 percent level, respectively. The results are robust to a Kolmogorov-Smirnov test of congruence of the distribution of the variable for the two sets of economies.

than for the comparator group of commodity exporters (0.9 percent and 0.1 percent, respectively). The median change in terms of trade is also positive and significantly higher for those that experienced nonpersistent accelerations (Figure 2.16, panel 3).

For reversal episodes, trading partner growth is almost 0.7 percentage point lower than for nonepisodes spanning the same time interval (Figure 2.15). Capital flows to the region for reversal episodes are also roughly 0.7 percentage point lower compared with nonepisode countries over the same period. The median change in terms of trade for reversals is again very close to zero and with no statistically significant difference between the episode and nonepisode samples (–0.10 percent and –0.08 percent, respectively). However, among commodity exporters alone, that difference becomes significant, with commodity exporters in reversal episodes experiencing a decline of about 0.75 percentage point in their terms of trade versus an increase of about 0.3 percentage point for commodity exporters that did not experience a reversal during the same period.

The Tipping Point: Do External Conditions Influence the Likelihood of Experiencing Accelerations and Reversals?

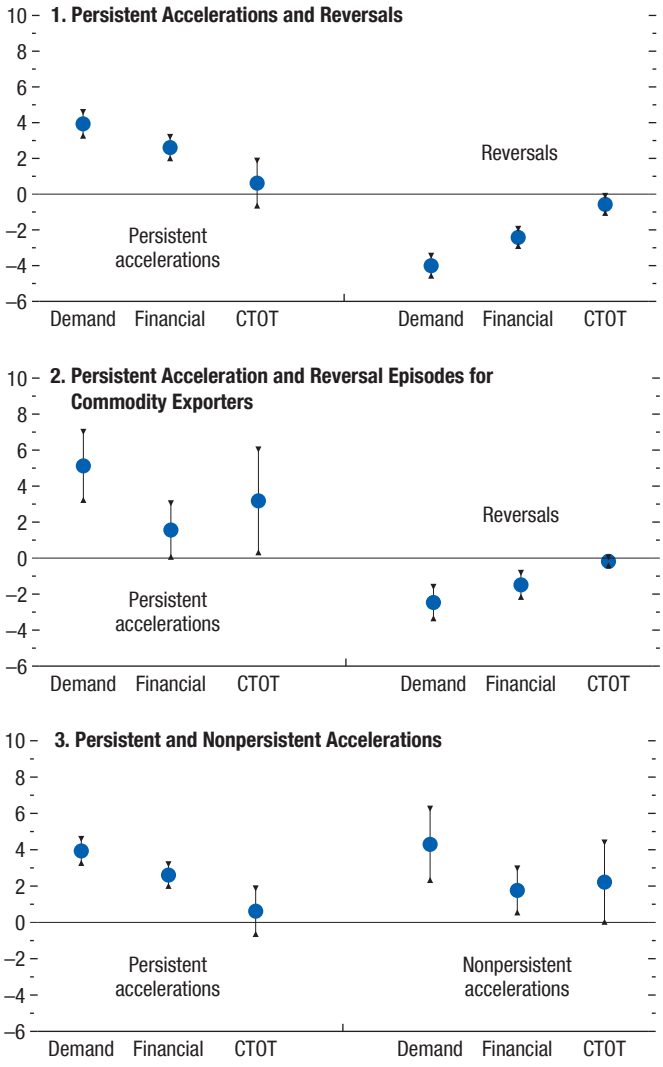
To assess how external conditions affect the likelihood of accelerations and reversals, this section reports estimates from logit regressions (along the lines of Hausmann, Pritchett, and Rodrik 2005). The regressions are estimated with a dummy for the onset of the identified episodes as dependent variable. Given the challenge of accurately dating the beginning of the episodes, the dummy assumes the value 1 for the periods t, t–1, and t+1 of the episode (see Hausmann, Pritchett, and Rodrik 2005).

The specifications include as independent variables the moving average of each of the three external conditions variables between periods t and t+5.[23] As an additional control, the logit specification also includes country fixed effects in the baseline estimations. As shown in Annex 2.6, however, the pattern of significance across coefficients is robust to the inclusion of additional

[23]Using leading moving averages implies that the external conditions variables are contemporary to the output outcome used to identify episodes in the economy in question, raising concerns of potential endogeneity. However, these variables are based on measures of the external environment that are expected to be exogenous to the economy in question. The results of the baseline and robustness exercises from the linear growth model (Annex 2.3) further suggest that the potential endogeneity of the external conditions variables in the sample is not a serious concern.

Figure 2.17. Change in the Probability of Occurrence of Growth Episodes, 1970–2015
(Percentage points)

External conditions influence the growth process in EMDEs by significantly affecting the probability of persistent acceleration and reversal episodes.



Source: IMF staff calculations.
Note: Estimates are from a logistic regression with a dummy for the identified episodes as dependent variable and including country fixed effects and the three external conditions variables. No additional controls are included in the estimates (see Annex 2.5). The vertical lines denote 90 percent confidence intervals. EMDEs = emerging market and developing economies. CTOT = commodity terms of trade.

controls, including time fixed effects and measures of de jure integration and institutional variables, and controls for the quality of the policy framework.

Figure 2.17 shows the impact of a one-unit increase in the external conditions variable on the likelihood of experiencing persistent accelerations, nonpersistent accelerations, and reversals. These *marginal effects* are derived from the logit estimations presented in Annex 2.5 and with the external conditions evaluated at their means.

Accelerations

In the case of accelerations, a 1 percentage point increase in trading partner demand evaluated at the mean of all external conditions significantly raises the probability of acceleration by 3.9 percentage points (Figure 2.17, panel 1). Compared with the unconditional probability, this represents a near-doubling—to 9.7 percent—of the probability of acceleration. The persistent effect of external demand conditions in this instance may reflect the favorable impact of higher exports on productivity growth via technology upgrades and scale efficiencies associated with an expansion in production.

In turn, a 1 percentage point of GDP increase in regional capital flows raises the probability of persistent acceleration by 2.6 percentage points, possibly reflecting that greater availability of funding facilitates investment and capital deepening (see also Annex 2.5).

Finally, an improvement in the terms of trade is not significantly associated with a change in the likelihood of persistent accelerations in the entire sample of emerging market and developing economies. However, there are two exceptions. First, for commodity exporters (Figure 2.17, panel 2), the increase in the terms of trade is significantly associated with an increase in the likelihood of persistent accelerations. This is in line with Chapter 2 of the October 2015 WEO and Aslam and others (2016), which find a significant effect of changes in the terms of trade on potential output. Second, for the subset of 32 nonpersistent accelerations (Figure 2.17 panel 3), the increase in the terms of trade is significantly associated with the occurrence of such episodes, reflecting that terms-of-trade windfalls may trigger accelerations with an initial surge in growth that is not sustained over a longer horizon.[24]

[24]This finding is consistent with Collier and Goderis (2012), who find that commodity price booms do not necessarily have positive effects on output growth over long-term horizons.

Reversals

Turning to reversals, all three external conditions have a statistically significant effect on the probability of a reversal (Figure 2.17, panel 1).

With all external conditions evaluated at the mean, a 1 percentage point increase in external demand lowers the probability of a reversal by 4 percentage points (about 50 percent of the unconditional probability). Similar patterns emerge for external financial conditions: a 1 percentage point of GDP increase in capital flows to the region is associated with a 2.4 percentage point decrease in the probability of a reversal. The change in terms of trade is associated with a statistically significant reduction in the likelihood of reversals of 0.6 percentage point.

The Role of Policies and Structural Attributes in Mediating the Impact of External Conditions

Although external conditions affect the likelihood of accelerations and reversals, domestic policies and structural attributes could amplify or mitigate the persistence of the response of domestic activity to shifts in external conditions.

Previous research on emerging market and developing economies' growth episodes has found evidence of a positive association between the duration of an episode and such attributes as macroeconomic stability, quality of domestic institutions, and integration with the global economy (for example, Berg, Ostry, and Zettelmeyer 2012). Greater resilience in emerging market and developing economies has also been linked to improvements in policy frameworks and augmented policy space—seen, for instance, in low inflation and low public debt (Chapter 4 of the October 2012 WEO). Conversely, persistent declines in emerging market and developing economies' growth rates ("downbreaks") have been found to be associated with increases in inflation and possibly diminished monetary policy control (Jones and Olken 2008). In line with the approaches adopted in the literature, four broad categories of domestic attributes are studied to examine how they influence the impact of external conditions on the likelihood of accelerations and reversals.

- The first category of domestic attributes includes the degree of de jure trade and financial integration, as well as domestic financial depth (as a proxy for the capacity to intermediate cross-border capital flows and allocate them domestically). Economies more integrated into the global economy would be more sensitive to external conditions than those that are relatively closed.
- The second category includes initial conditions, such as the level of external debt and the current account balance, at the onset of the episode. A low level of external debt, for instance, may be associated with stronger confidence effects and thus a more forceful response of domestic economic activity to favorable shifts in the external environment, as well as with stronger buffers that can smooth the impact of worsening global financial conditions (Chapter 2 of the April 2016 WEO).
- The third category covers aspects of the macroeconomic policy framework, such as the exchange rate regime, extent of monetary stability, and level of public debt. The policy framework affects expectations of future fundamentals, borrowing costs, and the overall predictability of the economic environment. In turn, these factors shape firms' investment decisions and households' spending on durable goods—both critical channels that determine the persistence of the response of domestic activity to shifts in the external environment. Prudent fiscal policy, for example, may be associated with less crowding out of private investment as public debt remains contained (Chapter 2 of the April 2016 *Fiscal Monitor*). It could also imply larger buffers and fiscal space for a countercyclical policy response to reduce the probability of a persistent reversal. In addition, a flexible exchange rate regime can play an important role in adjusting to shifting external conditions by mitigating persistent deviations in the real exchange rate from its equilibrium level and facilitating price signals that ensure an efficient allocation of resources.
- The fourth category represents structural factors and institutions, such as quality of governance, legal and regulatory environment, availability of public services, and level of education. These elements have an important bearing on long-term growth outcomes (Acemoglu, Johnson, and Robinson 2001) and could also influence, for example, how economies respond to changes in external factors (Rodrik 1999).

An initial inspection of the domestic attributes comparing episodes with nonepisodes (Figure 2.18) indicates that de jure trade integration, financial depth, and institutional quality are significantly different across growth episodes and nonepisode comparators

over the same period. For example, economies experiencing accelerations (reversals) have a larger (smaller) number of free trade agreements than comparator economies not experiencing accelerations (reversals) over the same period. Similarly, economies experiencing accelerations (reversals) have higher (lower) financial depth—measured as the ratio of bank assets to GDP—than comparators not experiencing accelerations (reversals) over the same period.

Some of these domestic attributes, in particular those associated with policy frameworks and structural characteristics, are likely to affect medium-term growth outcomes in and of themselves—that is, independently of their effect through the impact of external conditions. Including these domestic attributes in the logit regressions discussed in the previous section suggests that this is indeed the case (Annex 2.6). In particular, the analysis suggests that economies with stronger institutions—proxied by higher-quality legal systems and better protection of property rights—are significantly more likely to experience persistent acceleration episodes (Annex Figure 2.6.1). The likelihood of experiencing growth reversal episodes, in turn, significantly decreases with the extent of exchange rate flexibility. A sound monetary framework and domestic financial depth are significantly associated with a higher likelihood of persistent acceleration episodes and lower likelihood of growth reversal episodes. Trade and financial openness and initial conditions in themselves are not found to significantly affect the probability of experiencing a sustained shift in growth—although they may affect how external conditions influence the occurrence of episodes, as explored below.

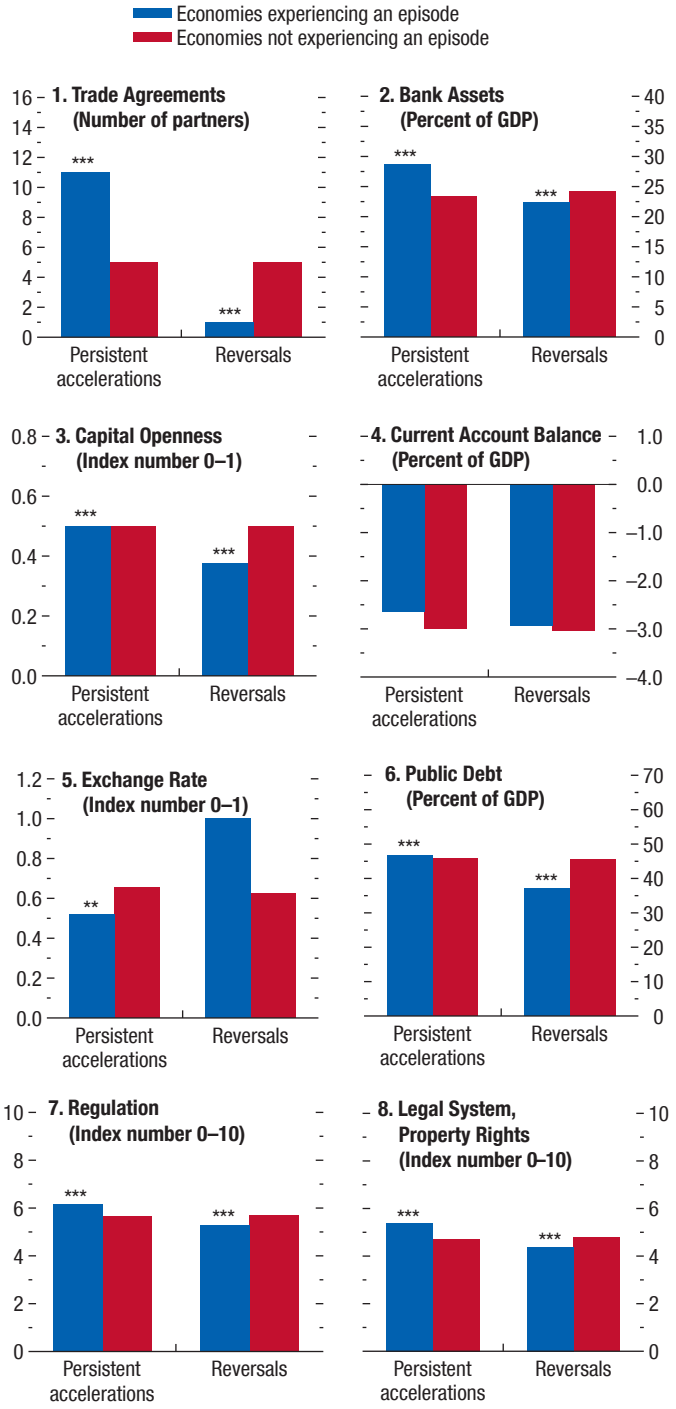
How Do Domestic Attributes Affect the Influence of External Conditions on Growth Episodes?

As already established in the previous section, external conditions influence the likelihood of accelerations and reversals. This section examines whether this sensitivity depends on domestic attributes. More precisely, it explores whether a change in each domestic attribute leads to an additional increase in the likelihood of an acceleration for a given impulse from external conditions, an additional decrease in the likelihood of a reversal, or both.

Results from the logit regressions confirm the role played by several of these domestic attributes in influencing the marginal effect of external conditions

Figure 2.18. Domestic Attributes across Persistent Accelerations and Reversals, 1970–2015

Domestic attributes are significantly different between economies that experience a persistent acceleration or reversal and economies that do not.



Source: IMF staff calculations.
Note: Each variable is measured as the average between $t-3$ and $t-1$, where t corresponds to the onset of the episode. ***, **, and * denote significance of an equality test of medians at the 1, 5, and 10 percent level, respectively. The results are robust to a Kolmogorov-Smirnov test of congruence of the distribution of the variable for the two sets of economies.

on episode probabilities. The exercise examines how shifting each domestic attribute from its 25th percentile (low quality) to its 75th percentile (high quality) within the estimation sample changes the marginal effect of external conditions, which are evaluated at their medians.[25] Each domestic attribute is measured as the moving average of the variable during the three years preceding the onset of the episode to minimize concerns that the attributes are responding to changes in growth rates during the episode.[26]

Integration and Domestic Absorptive Capacity

The analysis suggests that demand from trading partners has a stronger growth impact in emerging market and developing economies that are de jure more open to international trade. Likewise, a given loosening of external financial conditions is more likely to result in sustained growth when these economies impose fewer restrictions on capital mobility and the domestic financial system is sufficiently developed and sound. In other words, it channels external financing to financially constrained agents while maintaining relatively robust risk management and origination standards that minimize the pitfalls from excessive credit growth. More specifically (Figure 2.19, panel 1):

Deeper de jure *trade integration* as captured by the coverage of trade agreements increases the likelihood that supportive external conditions lead to growth accelerations in emerging market and developing economies.[27] For instance, when the number of partners with which an economy has free trade agreements increases from the 25th to the 75th percentile in the sample, a 1 percentage point increase in external demand raises the probability of an acceleration by 3 additional percentage points.

Financial development helps emerging market and developing economies benefit from favorable financial conditions. For instance, supportive external financial conditions (an increase in capital inflows to the region of 1 percentage point of GDP) raise the probability of accelerations by 6.6 percent in economies at the 75th percentile of financial development compared with 4.5 percent in economies at the 25th percentile, and the difference is statistically significant.[28] Deeper financial systems also further reduce, for a given impulse from external financial conditions, the probability of reversals, although by only ⅓ percentage point.

Sound credit growth—that is, avoiding credit booms—is associated with stronger growth outcomes under favorable external financial conditions.[29] The probability of a persistent acceleration when external financial conditions are supportive is about 7 percentage points higher when domestic credit has been growing at a healthy pace as opposed to under credit-boom conditions. The marginal effect of external financial conditions on reversals also improves (that is, the probability of the episode decreases further) by 2⅓ percentage points for economies that avoid excessive credit growth.

Capital account openness enhances the supportive role of external financial conditions in avoiding reversals: in more open economies, favorable external financial conditions lower the probability of reversals 2½ percentage points more than under restrictive capital account settings.[30] There is a trade-off, though, as the probability of an acceleration *increases less* for economies with more open capital accounts—although the change in the marginal effect is small and not statistically significant.

[25]The logit model specification for the purpose of evaluating the impact of domestic attributes includes one external condition at a time, the relevant domestic attribute variable (constructed as the moving average during the three years preceding the episode), the interaction of these two, and country fixed effects (see Annex 2.6 for more details). In all estimation results discussed in this section, the marginal effects of the external conditions on the probability of experiencing growth episodes evaluated at the median of the external condition and the 75th percentile of the domestic attribute are statistically significant. For a discussion on how to calculate and interpret interaction terms and their marginal effects in a logit model see, for example, Ai and Norton (2003).

[26]The results discussed below are those for which the marginal effects of the external conditions on the probability of experiencing growth episodes (evaluated at the median of the external condition and the 75th percentile of the domestic attribute) are statistically significant.

[27]De jure trade integration is proxied by the number of trading partners with which a country has a trade agreement according to the Design of Trade Agreements database (Chapter 2 of the April 2016 WEO and Annex 2.6).

[28]Financial depth is proxied by the ratio of bank assets to GDP from the World Bank World Development Indicators database (Annex 2.6).

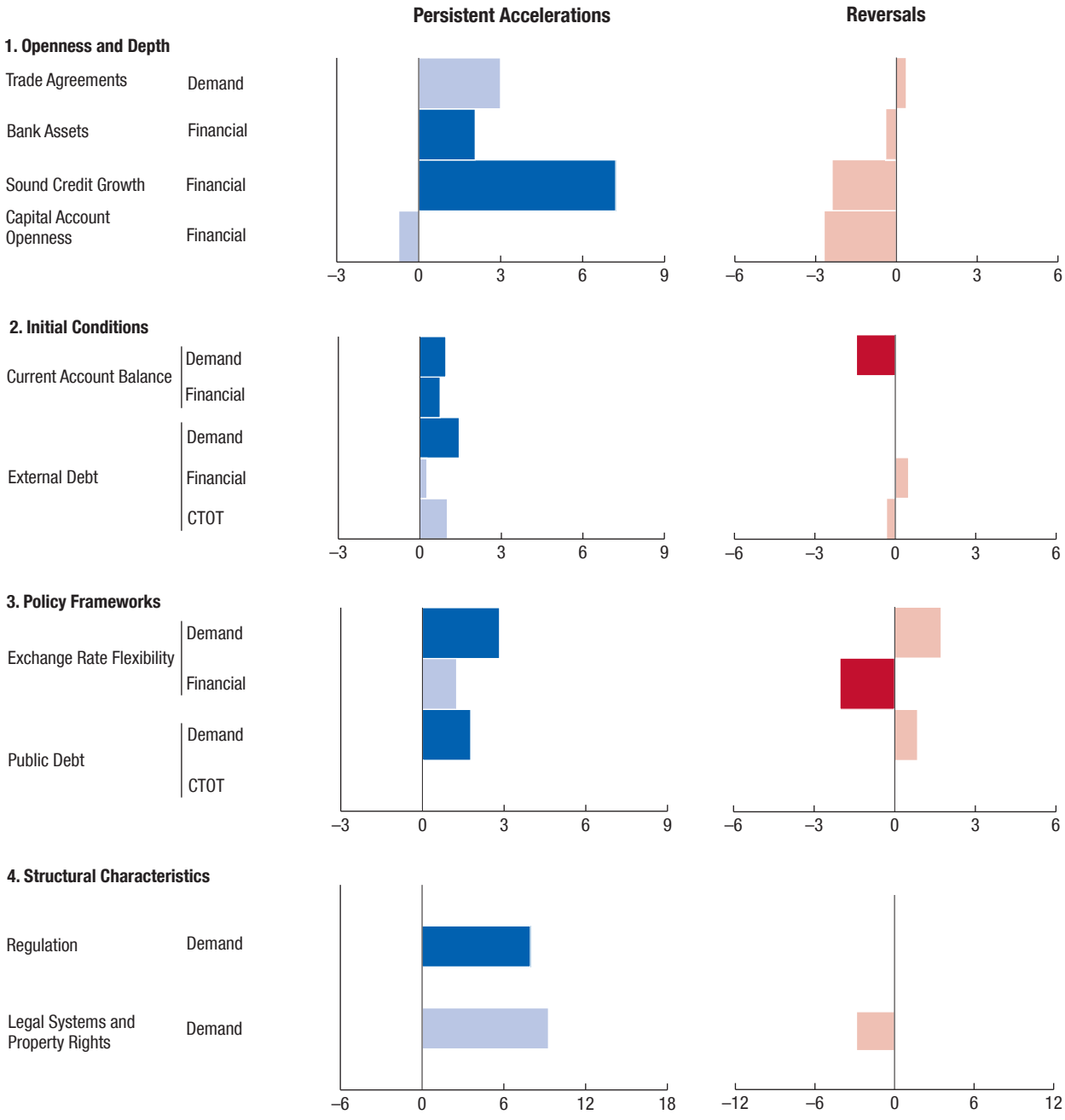
[29]An economy is considered to have sound credit growth if it has not experienced credit-boom conditions, as defined in Dell'Ariccia and others (2016), during the four years preceding the episode (Annex 2.6). As noted in Sahay and others (2015), if financial deepening proceeds "too fast" and is poorly regulated and supervised, it can trigger instability by encouraging excessive risk taking.

[30]Capital account openness is based on the Quinn (1997) measure of capital account liberalization (Annex 2.6).

Figure 2.19. Change in Marginal Effect of External Conditions When Domestic Attributes Improve

(Percentage points)

The impact of external conditions on the likelihood of growth outcomes is significantly affected by domestic attributes. A mix of policies that protect trade integration, permit exchange rate flexibility, and reduce vulnerabilities associated with external imbalances and high levels of debt can help emerging market and developing economies extract the most out of external conditions.



Source: IMF staff calculations.

Note: The figure shows the change in the marginal effect of each external condition when the domestic attribute variable is evaluated at the 75th versus at the 25th percentile of its distribution (while holding the external condition variable at its median value). Estimation results have been transformed such that the 75th percentile represents more openness, lower levels of external and public debt, and higher exchange rate flexibility. A favorable effect from the change in the domestic attribute is represented by a positive (negative) value in the case of persistent acceleration (reversal) episodes. Solid bars denote difference in marginal effects significant at the 10 percent level. CTOT = commodity terms of trade.

Initial Conditions

The results point to the importance of low external imbalances for translating favorable external conditions into positive growth outcomes (Figure 2.19, panel 2):

A *small current account deficit* significantly increases the marginal effect of external financial conditions on the probability of accelerations by ¾ percentage point, while it has a negligible and statistically insignificant impact on the probability of reversals. The marginal effect of better external demand conditions on the likelihood of an acceleration also improves significantly—by 1 percentage point—when the initial current account deficit is small. This finding is consistent with the idea that large current account deficits are often associated with overheating and thus diminished capacity for further sustained acceleration in growth as external conditions improve. The effect of demand conditions on the probability of reversals also significantly decreases—by 1½ percentage points—when the initial current account deficit is small.

A lower level of external debt increases the likelihood of accelerations when external demand conditions, terms of trade, or external financial conditions improve—by about 1½ percentage points, 1 percentage point, and ⅓ percentage point, respectively.[31] It also increases the extent to which improvements in terms of trade reduce the probability of reversals.

Policies

The results suggest that certain policy characteristics help emerging market and developing economies experience better growth outcomes for a given impulse from external conditions. In particular, exchange rate flexibility and fiscal discipline appear to have a broadly positive influence on growth outturns, although their influences vary across specific external conditions and by growth episode (Figure 2.19, panel 3):[32]

The *exchange rate regime* plays an important role in influencing the impact of external demand and financial conditions on the probability of growth episodes.[33] The marginal effect of external demand conditions on the likelihood of episodes of sustained growth significantly improves—by 3 percentage points—with exchange rate flexibility. The lower impact of positive external demand conditions on the likelihood of sustained growth episodes under less flexible exchange rates could reflect inefficient allocation of resources and low productivity growth as price signals are distorted. The trade-off is that the effect of external demand on the probability of reversals decreases *less* for economies with more flexible exchange rate regimes—although the change is not statistically significant—possibly reflecting that steeper real appreciation under favorable external demand growth already exerts a countervailing force on activity. Turning to financial conditions, the effect of exchange rate flexibility on growth outcomes is unambiguously positive. The effect of external financial conditions on the probability of experiencing a period of sustained growth is about 1¼ percentage points larger under a more flexible exchange rate regime than otherwise, while the probability of a reversal decreases further and significantly—by about 2 percentage points.

Prudent fiscal policy, as proxied by the level of public debt to GDP, also influences the impact of external demand conditions on the probability of growth episodes. The marginal effect of external demand conditions on the likelihood of persistent accelerations significantly improves—by about 1.8 percentage points—when public debt is low.

Structural Characteristics

Other structural characteristics that have been identified in the literature as important for medium-term growth, such as the quality of institutions and property rights (Hall and Jones 1999; Acemoglu, Johnson, and Robinson 2001; Acemoglu and Robinson 2014), are also found to influence the effect of external conditions on the likelihood of favorable growth outturns (Figure 2.19, panel 4):

The *quality of regulation* improves the impact of external demand conditions. The marginal effect of external demand on accelerations increases significantly—by 8 percentage points—when the quality of regulation improves.[34]

[31]The measure of external debt corresponds to the stock of external debt liabilities (updated from Lane and Milesi-Ferretti 2007) as a share of GDP.

[32]While a sound monetary framework in itself has a significant favorable effect on the likelihood of persistent acceleration and reversal episodes (Annex Figure 2.6.1), the exercise in this section suggests that it does not meaningfully influence the marginal effect of external conditions on episode probabilities.

[33]The exchange rate regime flexibility index is a de facto index based on Aizenman, Chinn, and Ito (2010).

[34]The indices of quality of regulation, strength of the legal system, and property rights protection are from Gwartney, Lawson, and Hall (2016). Each index is based on indicators from several sources, including the Global Competitiveness Report (World Economic Forum), International Country Risk Guide (Political Risk Services Group), Doing Business and World Development Indicators (World Bank), and International Financial Statistics (IMF). See Annex 2.6 for further details.

An improvement in the quality of *the legal system and property rights* further increases the marginal effect of external demand on accelerations by 9 percentage points and further decreases the probability of reversals by 3 percentage points.[35]

In sum, improvements in all four categories of domestic attributes considered are typically associated with a better growth outturn for a given impulse from external conditions. The exercise in this subsection assumes neutral external conditions—that is, external conditions variables evaluated at their sample medians. Additional analysis suggests that the beneficial impact of sound domestic attributes is even larger in a relatively worse external environment. For instance, the effect that each percentage point of capital flows to the region has on reducing the likelihood of a reversal when the financial system is deep and sound and the exchange rate is flexible, is larger when external financing is scarce than when it is abundant (see Annex Figure 2.6.2).

Taking Stock: What Does the Current Environment Imply for Growth Prospects in Emerging Market and Developing Economies?

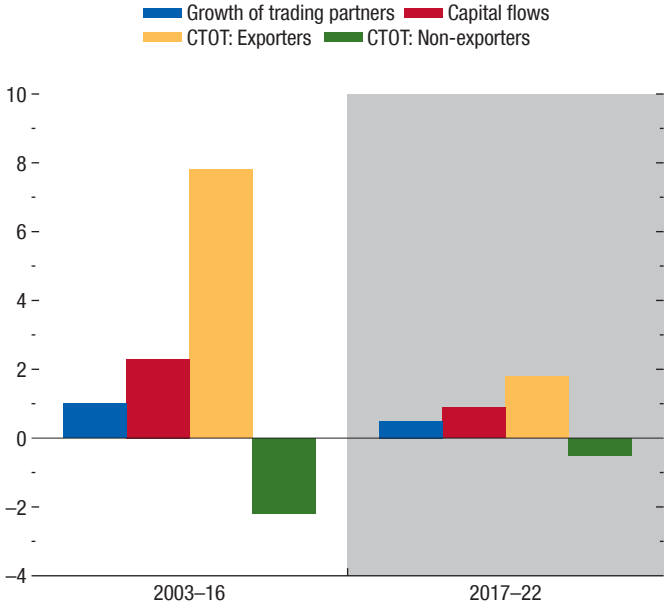
The external environment has been getting more complicated for emerging market and developing economies over the past few years. Some conditions may be less supportive in the near future, while others remain highly uncertain.

On the external demand front, some of the exceptionally favorable conditions that emerging market and developing economies enjoyed over long stretches during the post-2000 period are not likely to return soon. Waning potential output growth in advanced economies will lead to weaker demand growth for emerging market and developing economies. WEO projections for advanced economy potential output growth have been reduced from close to 2 percent (October 2014 WEO) to just over 1½ percent (October 2016 WEO). An additional complication is the risk of protectionism in some advanced economies and a less favorable view of integration, as documented in Chapter 2 of the October 2016 WEO. While some of these effects may be offset by rising demand among emerging market and developing economies, consistent with the projected pickup in growth for this group over the medium term (see Chapter 1 of this WEO and Box 1.1 of the October 2016 WEO), growth in external demand, on average, is expected to be weaker during 2017–22 than in the past (Figure 2.20).

As discussed in Chapter 1, external financial conditions facing emerging market and developing economies are expected to gradually tighten as U.S. monetary policy normalizes. However, this generalized tightening will likely be accompanied by a continued search for yield in emerging market investment opportunities as long as returns remain modest in a low-growth environment in advanced economies. Investors may therefore discriminate across emerging market and developing economies based on fundamentals. Those with relatively stronger fundamentals may stand to benefit from capital inflows, provided that capital is absorbed into productive uses that sustain growth (Box 2.4).

Figure 2.20. Actual and Projected External Conditions for Emerging Market and Developing Economies
(Percentage points; difference relative to the average in 2015–16)

The impulse from the external environment for EMDEs is expected to be weaker, on average, over the medium term compared with what they enjoyed over long stretches during the post-2000 period.



Source: IMF staff calculations.
Note: Projected values for country-specific external conditions variables are constructed based on forecasts of domestic demand, gross capital inflows, and commodity prices from the IMF *World Economic Outlook*. CTOT = commodity terms of trade; EMDEs = emerging market and developing economies.

[35]These effects possibly reflect that better institutions are also associated with better (fiscal) policy frameworks (Rajkumar and Swaroop 2008; Lledó and Poplawski-Ribeiro 2013).

The third aspect of the external environment studied in this chapter—commodity terms of trade—may improve for a subset of emerging market and developing economies as commodity prices recover, but the outlook remains subdued compared with the past: prices are expected to approach a fraction of those prevailing during the boom years.

Although this constellation of external conditions is not necessarily adverse for emerging market and developing economies, it does point to a less buoyant external environment than a few years ago. In this context, the results of this chapter suggest that emerging market and developing economies should expect a weaker growth impulse from external conditions. Nevertheless, as the analysis demonstrates, domestic policies and structural attributes in emerging market and developing economies matter for mediating the impact of this broad constellation of external forces. In particular, the results indicate that for a given impulse from external conditions, certain domestic policies and reforms can help these economies obtain a more favorable growth outturn.[36]

Conclusion

Emerging market and developing economies have become increasingly important in the global economy, not just as centers of production but also as final destinations for consumer goods and services. They now account for more than three-fourths of global growth in output and consumption, almost double the share of just two decades ago. Although domestic elements (changes to policy frameworks, structural reforms, and accumulation of factors of production) have no doubt been crucial for this transformation, the external environment has also played an important role in shaping these economies' medium-term growth.

The evidence presented in this chapter highlights that country-specific external—demand, financial, and terms of trade—conditions are increasingly influential determinants of emerging market and developing economies' growth over time as these economies become more integrated into the global economy. This result largely reflects the increasingly important role played by external financial conditions. Comparing the post-2005 period with 1995–2004, for instance, their contribution to emerging market and developing economies' medium-term growth has increased by about ½ percentage point—or one-third of the increase in average income per capita growth for the group over this time. Furthermore, demand among emerging market and developing economies has exerted an increasingly powerful force on these economies' medium-term growth outcomes (even though the contribution of external demand conditions as a whole appears to have remained broadly stable over this period).

External conditions also influence the growth process in emerging market and developing economies through their effect on the probability of persistent growth acceleration and reversal episodes. In particular, a favorable impulse from external demand and financial conditions helps medium-term growth outcomes by making growth accelerations more likely. It also reduces the likelihood of growth reversals. The impact varies across groups of economies: terms-of-trade windfalls are particularly influential for the medium-term growth outcomes of commodity exporters, but less so for the broader sample of emerging market and developing economies. These ruptures matter for growth outcomes and the evolution of living standards over horizons beyond the medium-term focus of this chapter. As far as two decades after the onset of acceleration or reversal episodes, real income per capita still appears to diverge from a benchmark path of economies that do not experience the episodes.

Although external conditions have an impact on the likelihood of accelerations and reversals, certain domestic policies and structural attributes can affect the response of domestic activity to shifts in external conditions (in addition to directly affecting the probability of growth episodes). Faced with a potentially less supportive external environment than in the past, emerging market and developing economies can get the most out of a weaker growth impulse from external conditions by strengthening their institutional frameworks and adopting a policy mix that protects trade integration; permits exchange rate flexibility; and ensures that vulnerabilities stemming from high current account deficits and external debt, as well as high public debt, are contained.

[36]For instance, the impact on the probability of an acceleration episode of trading partners' demand growing by 1 percentage point less would be almost entirely offset by opening up to trade or allowing the exchange rate to fluctuate more.

Box 2.1. Within-Country Trends in Income per Capita: The Cases of Brazil, Russia, India, China, and South Africa

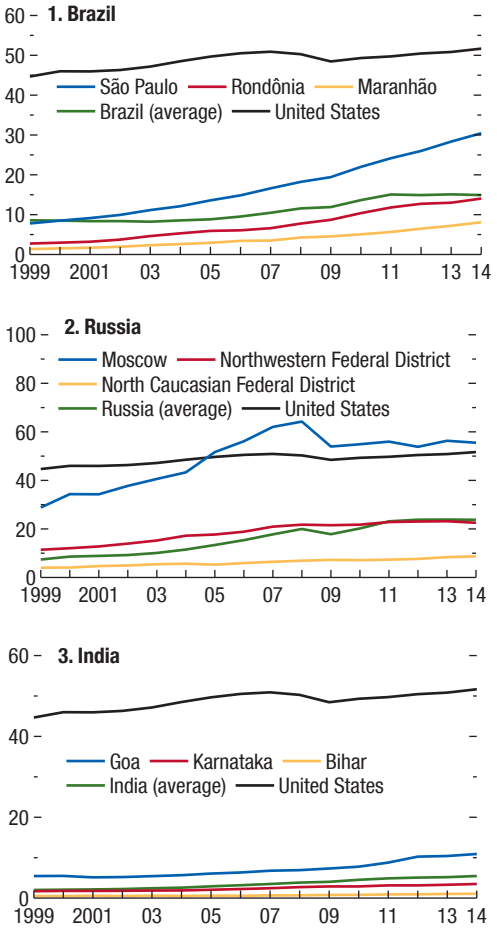
This box examines the province-level distribution of real purchasing power parity GDP per capita in Brazil, Russia, India, China, and South Africa, the "BRICS" economies.[1] Within these emerging markets, large regional disparities remain, with some provinces of these economies operating at per capita levels close to those of upper-middle- and high-income countries, whereas other provinces continue to lag.

All BRICS economies enjoyed a period of strong income growth in the early 2000s due to a period of favorable external tailwinds (as discussed in the chapter) and as some of them exited from crises. The gap between their average income per capita (in purchasing-power-parity adjusted U.S. dollars) and that of the United States narrowed significantly between 2002 and 2014. For instance, in China and Russia, per capita income as a share of that in the United States increased by about 13 percentage points and 26 percentage points, respectively, during that period.

Zooming in on developments at the national level, the analysis shows important differences in the level of real income per capita across provinces within a country (Figure 2.1.1). The time series on individual province-level real GDP and population data are gathered from national sources. The IMF *World Economic Outlook* purchasing-power-parity exchange rate indicator is used to convert real GDP per capita in national currencies to purchasing-power-parity adjusted real GDP per capita. The transformation allows for a cross-country comparison of living standards at the provincial level, after adjusting for average differences in the cost of living across countries. However, it is important to bear in mind that using national averages may overestimate the real income level in rich provinces and underestimate it in poor provinces, to the extent that there is substantial variation in prices across provinces at times.

While income per capita in the richest provinces in some BRICS economies has risen to more than half of that in the United States (notably in Moscow, Russia, and, to a lesser extent, São Paulo, Brazil), the poorest provinces are still lagging behind. In Russia, incomes are close to seven times higher in the richest than in the poorest province; in India they are 10 times higher in the richest than in the poorest province (also see Sodsriwiboon and Cashin 2017). In Brazil and China,

Figure 2.1.1. Decomposition of Selected Emerging Market Economies by Province
(Real PPP GDP per capita, thousands of PPP U.S. dollars)



Source: IMF staff calculations.
Note: The selected provinces within each country denote the top, median, and bottom provinces, ordered by real PPP GDP per capita for 2014. PPP adjustment is calculated using the base year 2010. PPP = purchasing power parity.

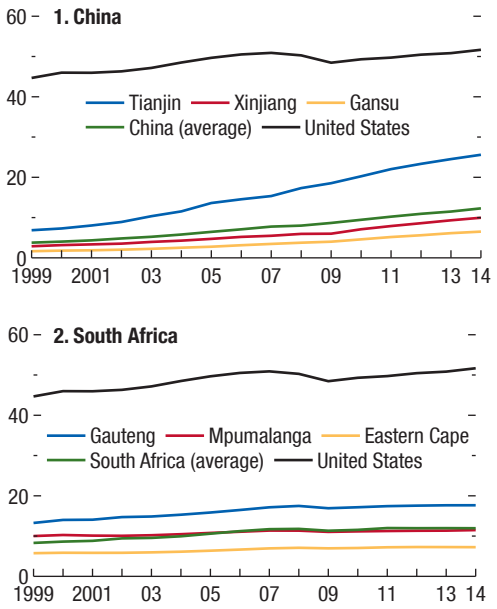
The author of this box is Felicia Belostecinic.

[1]The box uses the term "province" to refer to subnational administrative units immediately below the federal government, as is the case in China and South Africa. In Brazil and India these units are referred to as states, and in Russia these units are federal districts.

Box 2.1 *(continued)*

Figure 2.1.1. Decomposition of Selected Emerging Market Economies by Province (cont'd)

(Real PPP GDP per capita, thousands of PPP U.S. dollars)



Source: IMF staff calculations.
Note: The selected provinces within each country denote the top, median, and bottom provinces, ordered by real PPP GDP per capita for 2014. PPP adjustment is calculated using the base year 2010. PPP = purchasing power parity.

the richest province is approximately four times better off than the poorest one.[2] In South Africa, this gap is narrower—with the richest province two-and-a-half times better off than the poorest.

[2]São Paulo is Brazil's second-richest state (after Distrito Federal, which includes Brasilia, the nation's capital). However, given that Distrito Federal is a relatively small administrative jurisdiction with a very large fraction of its population related to the federal government, São Paulo was used for the purpose of this analysis.

Box 2.2. Growing with Flows: Evidence from Industry-Level Data

Capital inflows can enhance growth in emerging market and developing economies through various channels: augmentation of funds available for investment, transmission of crucial know-how and technological diffusion, and adoption of market discipline and better governance practices. Cross-country aggregate data often do not allow for a clean identification of the causal impact of capital flows on growth because of endogeneity and reverse causality concerns. This box uses industry-level data that permit a more reliable identification of causal impacts of capital inflows on growth. The analysis sheds light on the role played by the first channel, when capital inflows relax credit constraints and reduce borrowing costs and thereby stimulate growth.[1]

The empirical strategy relies on a panel-based fixed-effects approach that investigates whether capital inflows affect growth differentially in industries that are more dependent on external finance. Industries that depend more on external finance in countries that host more capital inflows are expected to grow disproportionately faster; relaxation of constraints would benefit these firms more. The analysis uses a data set covering 28 manufacturing industries in 22 emerging market economies during 1998–2007.[2,3] Data on total gross private capital inflows come from the Institute of International Finance and are expressed in percent of GDP.[4] Industry growth is computed as the percent change in the real output of an industry in a given country.[5] Dependence on external finance is determined following Rajan and Zingales (1998).[6] The empirical specification is:

$$G_{ict} = \alpha + \beta_1 S_{ic,t-1} + \beta_2 CI_{ct} + \beta_3 CI_{ct} * D_i + \theta_i + \theta_c + \theta_{ic} + \theta_t + \varepsilon_{ict}. \quad (2.2.1)$$

G_{ict} is the growth of industry i in country c in period t. $S_{ic,t-1}$ is the share of value added by each industry to total value added by all industries in a country, and comes in with a one-period lag, capturing the heterogeneous degree of importance and development across industries within a country over time. CI_{ct} and D_i denote capital inflows and external finance dependence. The interaction term, $CI_{ct} * D_i$, is the main variable of interest in detecting whether capital inflows affect growth in industries that are more dependent on external finance than those that are not. Also included is an expansive set of fixed effects to capture time-invariant industry-, country-, and cross-industry cross-country factors and time-varying global factors. Standard errors are clustered by industry-country.[7]

Integration of emerging markets into global financial markets has gone hand in hand with a rapid process of industrialization in these economies, supporting the argument that international capital is important for industrialization (for example, Markusen and Venables 1999). Indeed, aggregate industry growth moves closely with capital inflows (Figure 2.2.1).

Looking across industries distinguished by their need for external finance and their peers located in countries receiving different amounts of capital inflows, it is evident that industries that are more dependent on external finance grow disproportionately faster if they are located in countries hosting more

The author of this box is Deniz Igan. The analysis is based primarily on that in Igan, Kutan, and Mirzaei (2016).

[1]The analysis here uses a reduced-form specification and investigates the association between capital inflows and growth. Evidence on the intermediate step of capital inflows relaxing constraints and reducing the cost of capital has been presented, for instance, in Henry (2000); Harrison, Love, and McMillan (2004); and Bekaert, Harvey, and Lundblad (2005).

[2]The countries in the sample are Argentina, Brazil, Bulgaria, Chile, China, Colombia, the Czech Republic, Ecuador, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Peru, Poland, Romania, Russia, South Africa, and Turkey. The results are robust to excluding China, which stands out for its size and transformation experience during the sample period.

[3]Industry-level data come from the United Nations Industrial Development Organization's Industrial Statistics database. The data can be extended to 2010 with the currently available data. The box focuses on the period before the global financial crisis given that the relationship between capital inflows and industry growth is markedly different during the crisis and its immediate aftermath. See Igan, Kutan, and Mirzaei (2016) for more details.

[4]The results are robust to using net inflows and capital inflows data from the IMF's International Financial Statistics database. The data sources are used as alternatives, with no implications for the conclusions of the analysis.

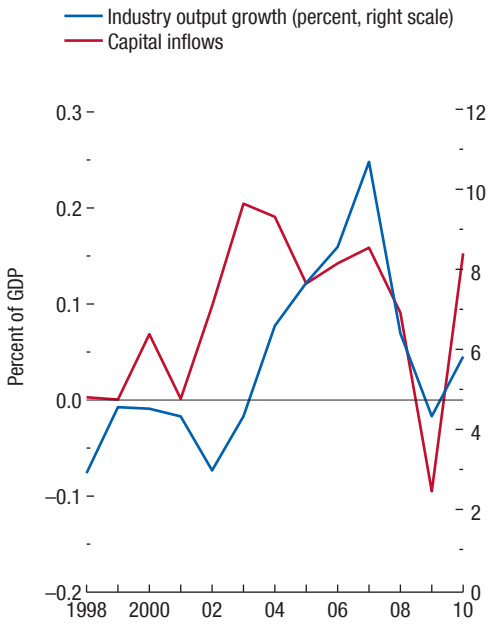
[5]Industry output data are reported in nominal U.S. dollars. For the analysis, the series are deflated using the producer price index for finished goods.

[6]External finance dependence aims to capture the ability of internally generated funds to meet investment demand, as determined by an industry's intrinsic technological characteristics. It is computed as the ratio of capital expenditures net of cash flow from operations to total capital expenditures using U.S. data (based on the observation that given the relatively advanced capital markets in the United States, U.S. firms' dependence on external funds reflects demand factors rather than supply constraints).

[7]Given that the identification strategy aims to exploit cross-industry differences on external finance dependence, the specification focuses on financial conditions and not on external demand and terms of trade.

Box 2.2 *(continued)*

Figure 2.2.1. Capital Inflows and Industry Growth, 1998–2010



Sources: Institute of International Finance; United Nations Industrial Development Organization; and IMF staff calculations.

inflows (Table 2.2.1). This relationship is statistically significant, even after purging industry and country effects, and holds both for annual growth rates and for growth rates calculated over three-year windows (Table 2.2.2).

The differential effects of capital inflows on industry growth are economically relevant. Based on the results using annual growth rates, relative to less dependent industries (at the 25th percentile level), industries dependent on external finance (at the 75th percentile level) grow about 1.58 percent faster in a country that receives significant capital inflows (in the 75th percentile) than in a country that receives only limited foreign capital (in the 25th percentile). This accounts for approximately 14 percent of the observed sample mean of 11 percent. This relationship is driven mainly by, and is slightly stronger for, debt flows. An industry at the 75th percentile of external finance dependence grows 1.71 percent faster than one at the 25th percentile if it is domiciled in a country at the 75th percentile of debt capital inflows rather than in one at the 25th percentile. This translates to 16 percent of the observed sample mean.

Table 2.2.1. Industry Growth with Low versus High Levels of Capital Inflows

	Economies with Low Capital Inflows (25th percentile)	Economies with High Capital Inflows (75th percentile)	Difference
Highly Dependent Industries (75th percentile)	0.08	0.12	0.04
Less Dependent Industries (25th percentile)	0.06	0.09	0.03
Difference-in-Difference	0.02	0.03	0.01

Source: IMF staff calculations.

Box 2.2 *(continued)*

Table 2.2.2. Capital Inflows and Industry Growth

	Total Inflows	Equity Inflows	Debt Inflows
	(1)	(3)	(5)
Annual Growth Rates, 1998–2007			
Share (*t*-1)	–5.002***	–5.018***	–5.009***
	(–5.33)	(–5.40)	(–5.33)
Capital Inflow	0.004**	0.003	0.005**
	(2.52)	(1.03)	(2.51)
Capital Inflow * Dependence	0.008**	0.004	0.013***
	(2.34)	(0.73)	(2.93)
Constant	0.856***	0.853***	0.867***
	(3.75)	(3.76)	(3.79)
Number of Observations	4,396	4,396	4,396
R^2	0.257	0.252	0.259
Growth over Three-Year Windows, 1999–2007			
Share (*t*-1)	–0.951*	–0.956*	–0.971*
	(–1.89)	(–1.90)	(–1.90)
Capital Inflow	0.003	0.005	0.002
	(1.32)	(1.42)	(0.78)
Capital Inflow * Dependence	0.006*	0.004	0.011*
	(1.87)	(0.47)	(1.93)
Constant	–0.065	–0.068	–0.052
	(–0.55)	(–0.57)	(–0.42)
Number of Observations	1,570	1,570	1,570
R^2	0.548	0.546	0.547
Industry Fixed Effects	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes
Industry * Country Fixed Effects	Yes	Yes	Yes
Period Fixed Effects	Yes	Yes	Yes
Number of Economies	22	22	22
Number of Industries	28	28	28

Source: IMF staff calculations.
Note: ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively. *t*-statistics are reported in parentheses.

Box 2.3. The Evolution of Emerging Market and Developing Economies' Trade Integration with China's Final Demand

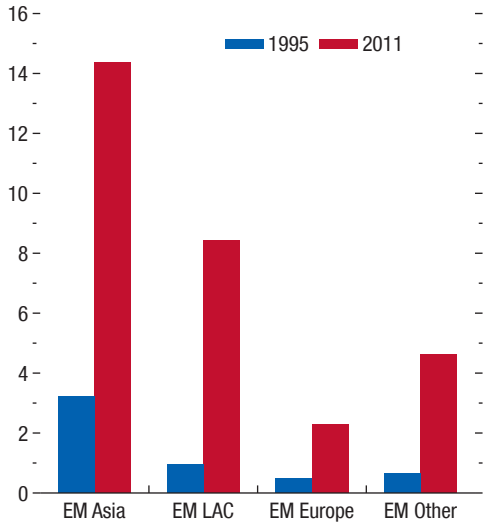
The implications for the global economy of China's rapid growth have been studied extensively in recent years (see Chapter 4 of the October 2016 *World Economic Outlook* [WEO], among others). This box explores the evolution of various emerging market and developing economies' integration with China over the past two decades, using data on countries' value added in China's final demand.[1]

As a result of many years of strong growth, China has accounted for a rapidly increasing share of global demand—this growth alone suggests countries' exposures to China should be increasing. As such, it is not surprising that the analysis indicates that all emerging market and developing economies have become more integrated with China over time (Figure 2.3.1). More interesting, commodity exporters and countries outside Asia have seen more substantial gains in recent years, outpacing the gains predicted by China's growth alone (Figure 2.3.2). In addition, the sectors of China's economy to which countries are linked have been relatively stable over time, with the exception of commodity-exporting countries that benefited from the increase in oil and metal prices during 2005–10, as well as rapid infrastructure development in China.

To assess countries' integration with China, this box uses data on trade in *value added*, which captures the marginal contribution of a country's domestic economy to the production of a given good or service. These data also provide a better measure of countries' ties to China than do conventional bilateral trade statistics because they account for exports that are ultimately consumed in China—even if they are routed through other countries—and they discount goods that are exported to China but are ultimately reexported elsewhere (and hence are not related to changes in China's final demand).

As Figure 2.3.2, panel 1 indicates, commodity-exporting countries have experienced a rapid increase in their integration with China, but only since 2005, likely reflecting higher commodity prices as well as rapid growth in China's infrastructure development. Emerging market and developing economies in Asia have strong ties to China's final demand—

Figure 2.3.1. Value Added in China's Final Demand
(Share of country group's world total, percent)



Sources: Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added database; and IMF staff calculations.
Note: EM = emerging market; LAC = Latin America and the Caribbean.

China consumed only 3 percent of the nondomestic global-value-added production of these countries in 1995, but this measure has since increased rapidly, to about 14 percent in 2011. Still, over this time, Asian countries' integration with China's final demand has in fact merely kept pace with China's rising share of global GDP—that is, the rising exposure of countries in Asia to China's final demand is as expected, given its strong growth. For countries outside Asia, however, China has become an increasingly important source of demand—by considerably more than would be suggested by China's strong demand growth alone (Figure 2.3.2, panel 2). The sharp rise in integration since 2000 indicates that this was associated with China's accession to the World Trade Organization in 2001, which fostered stronger trade integration between China and countries outside the region.

Within countries, the sectoral composition of links with China has been quite stable over time for noncommodity exporters (Figure 2.3.3); although

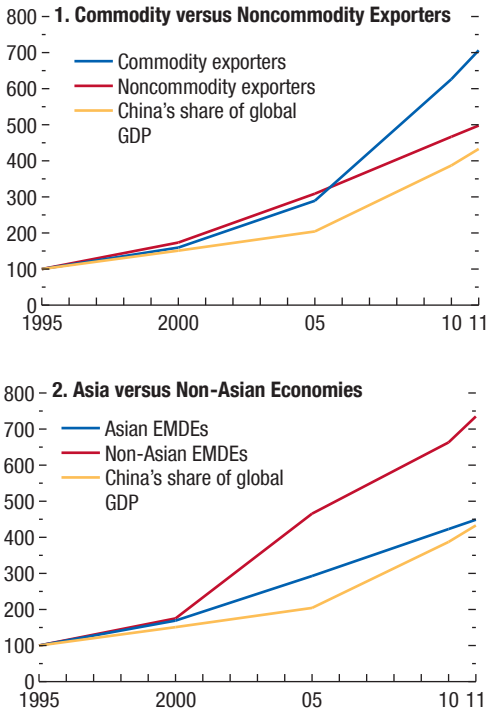
The authors of this box are Patrick Blagrave and Ava Yeabin Hong.

[1]Organisation for Economic Co-operation and Development Trade in Value Added database.

Box 2.3 *(continued)*

Figure 2.3.2. Relative Changes in Country Exposures to China's Final Demand

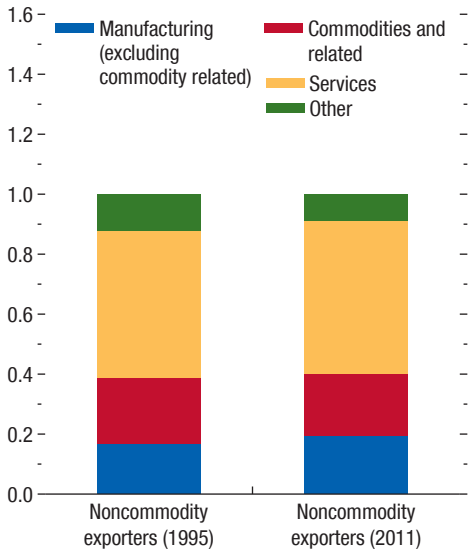
(Share of world exposure, index 1995 = 100)



Sources: Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added database; and IMF staff calculations.
Note: EMDEs = emerging market and developing economies.

Figure 2.3.3. Sector Composition of Value Added in China's Final Demand

(Share of total, by sector of final demand)



Sources: Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added database; and IMF staff calculations.

rapid growth fostered tighter integration with China, this integration seems to have occurred broadly similarly across sectors for this group of countries. However, for commodity exporters, the share of exports relating to commodities has risen dramatically in recent years.[2] Although this development partly reflects a shift in relative prices—given that these data are in nominal terms—stronger, relatively commodity-intensive demand in China also played a role. Indeed, comparing the composition of these countries' exports to China (Figure 2.3.4, far-right bar) to the composition of their exports to the rest of the world (Figure 2.3.4, second bar from right), the increase in commodity-related exports to China has been much sharper relative to the benchmark of these countries' commodity-related exports to the rest of the world. Given that this rest-of-the-world benchmark provides a proxy for the relative price effect on the sectoral composition of countries' value-added exports, the larger increase in these countries' commodity-related exports to China is plausibly due to stronger demand for these types of goods, which fostered increased integration.[3]

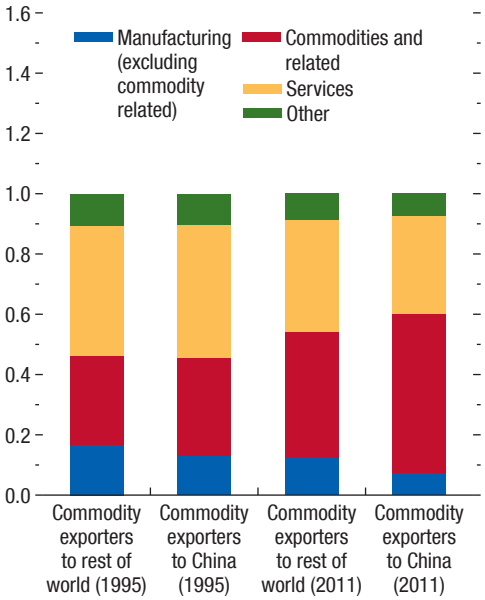
Ultimately, greater integration with China's final demand has been a boon to many countries over the past two decades. As discussed in Chapter 4 of the October 2016 WEO, China's recent slowdown poses challenges for trading partners, as this long-standing source of demand growth slows. However, some elements of China's economic transition—such as its

[2]Commodity-related sectors are chemicals and nonmetal mineral products, basic metals and fabricated metal products, and mining and quarrying.

[3]From 1995 to 2011, commodity-exporting countries' share of commodity-related exports to China increased by 20 percentage points, and by 12 percentage points to the rest of the world.

Box 2.3 *(continued)*

Figure 2.3.4. Sector Composition of Commodity-Exporting Economies' Foreign Value Added
(Share of total, by sector of final demand)



Sources: Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added database; and IMF staff calculations.

move up the value chain and the prospective boost to domestic consumption growth in coming years—will create opportunities for some economies, notably in emerging Asia. In addition, the increase in services trade associated with rebalancing and China's increasing investment abroad are likely to continue to produce short-term benefits for some countries in the years ahead.[4]

[4]For a discussion of the short-term costs and long-term gains of China's transition, see Chapter 4 of the October 2016 WEO, and Hong and others (2016).

Box 2.4. Shifts in the Global Allocation of Capital: Implications for Emerging Market and Developing Economies

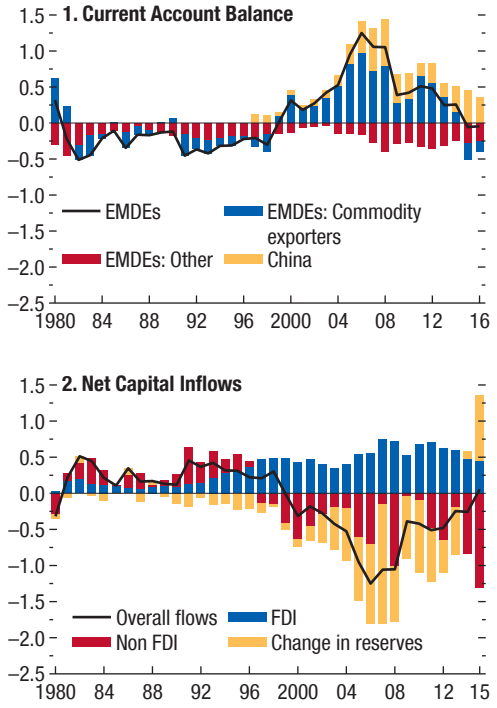
Uphill flows, or flows from poor to rich countries, have intensified during most of the 2000s (Rajan 2006; Prasad, Rajan, and Subramanian 2007). Basic economic theory suggests that saving should flow from relatively wealthy, capital-rich countries to poorer countries where capital is scarce and profitable investment opportunities should therefore be abundant. However, this theory is not borne out in the data, as highlighted by Robert Lucas in his seminal 1990 paper. Measuring total inflows by the size of the current account deficit (the difference between national saving and investment), advanced economies as a group received persistent and sizable net inflows during the decade preceding the global financial crisis. These inflows reflected large and growing outflows from China and commodity-exporting emerging market and developing economies (especially fuel exporters). These were in turn supported by China's integration into the global economy, low global interest rates, and the sharp rise in commodity prices (Figure 2.4.1, panel 1). Moreover, the capital outflows were dominated by official reserve accumulation, which was used to back the export-oriented growth models of some emerging market and developing economies, smooth the use of the commodity windfalls, and self-insure against external shocks.

After the global financial crisis, however, uphill flows slowed and have reversed more recently (Boz, Cubeddu, and Obstfeld 2017). Net outflows from emerging market and developing economies fell and reversed, as China started to rebalance its economy toward domestic absorption and the commodity income windfall for commodity exporters vanished (Chapter 4 of the October 2016 WEO). The slowdown and eventual reversal in uphill flows largely reflected movements in official foreign reserves, which started registering an overall decline a few years ago (Figure 2.4.1, panel 2). These declines in foreign reserves, which are official capital inflows, imply that *private* net capital inflows need not match the behavior of *total* capital inflows and, indeed, some emerging market and developing economies have recently experienced increased total net inflows despite decreased private net inflows.

Despite these shifts in the global allocation of capital, most emerging market and developing economies have consistently been net recipients of capital inflows since 2000, and foreign direct investment has flowed in the expected direction (Figure 2.4.1, panel 2; Figure 2.4.2).

- Across emerging market and developing economies, about 75 percent of countries were, on average, net recipients of inflows after 2000; excluding commodity exporters, this ratio increases to about 90 percent. Moreover, although these countries' net capital inflows were small in relation to world GDP, their unweighted average inflow ratio to domestic GDP reached as high as almost 4 percent.
- Net foreign direct investment inflows to emerging market and developing economies have stayed positive throughout the post-2000 period and have displayed far more stability than other capital

Figure 2.4.1. EMDEs: Current Account Balance by Group and Net Capital Inflows by Type
(Percent of world GDP)

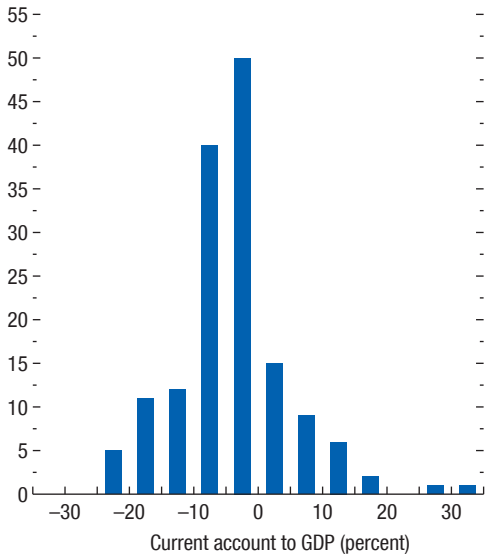


Source: IMF staff calculations.
Note: EMDEs = emerging market and developing economies; FDI = foreign direct investment.

The authors of this box are Emine Boz and Luis Cubeddu.

Box 2.4 *(continued)*

Figure 2.4.2. Distribution of EMDEs' Average Current Account Balances, 2000–16
(Number of economies per interval)



Source: IMF staff calculations.
Note: EMDEs = emerging market and developing economies.

Figure 2.4.3. Correlation between Capital Flows and per Capita Real GDP Growth
(Correlation coefficient, 20-year rolling windows)

Source: IMF staff calculations.

account components. This stability is consistent with findings of other researchers (Alfaro, Kalemli-Ozcan, and Volosovych 2014), who have documented that sovereign-to-sovereign flows, including foreign reserve accumulation, accounted for a large share of uphill flows, and that, apart from such flows, the data are consistent with *private* capital flowing from rich to poor countries. This result is also broadly consistent with the finding that *nonreserve* capital flows respond strongly to growth differentials (Chapter 2 of the April 2016 *World Economic Outlook*).

Capital has tended to flow somewhat more to countries with higher per capita output growth, which is positively correlated with labor productivity growth (Figure 2.4.3).[1] Although it is not clear which way causality runs, the data suggest a slightly positive relationship between overall net inflows and per capita output growth since 1990. The positive correlation between net inflows and per capita real GDP growth across around 150 emerging market and developing economies using 20-year rolling window averages is, moreover, fairly stable throughout the period. In other words, countries with higher growth rates have tended to run smaller current account surpluses and to be net capital importers.[2] The analogous correlation has been positive for net foreign direct investment flows, as well, although the relationship appears to have weakened over time. Overall, capital flows seem to have discriminated among potential destinations, on average favoring countries with higher output growth.

Going forward, the overall direction of flows will depend on the relative strength of several forces. On the one hand, stronger growth and infrastructure needs in emerging market and developing economies, as well as structural changes such as population aging in advanced economies, could direct excess savings to emerging market and developing economies. On

[1]A vast amount of literature studies the drivers of capital flows to emerging market and developing economies and was recently surveyed by Koepke (2015).

[2]This exercise is in the spirit of Gourinchas and Jeanne (2013), who calculate a similar correlation for 1980–2000, but only for a narrower set of countries.

Box 2.4 *(continued)*

the other hand, prospects of monetary policy normalization in advanced economies could work in the opposite direction, especially if associated with a more expansionary U.S. fiscal stance or adverse balance sheet effects in emerging market and developing economies. Moreover, global uncertainties remain large, not least because of the rising risk of protectionism, which, if realized, could affect emerging market and developing economies disproportionately. In sum, a large and persistent downhill flow of capital seems unlikely to develop over the short term.

Reaping the benefits of capital inflows remains a central challenge for emerging market and developing economies. Meeting this challenge will require that these countries further strengthen policy frameworks to address potential capital flow reversals triggered by higher U.S. interest rates and a stronger U.S. dollar. Exchange rate flexibility in particular can help insulate these economies from changes in global financial conditions, although additional tools may be needed at times to maintain orderly market conditions (IMF 2016). Moreover, as highlighted in a vast literature on the topic, robust institutions and policy frameworks (Obstfeld 1998; Kose and others 2006; Ghosh, Ostry, and Qureshi 2016), including well-functioning domestic and international financial markets (Igan, Kutan, and Mirzaei 2016), remain crucial to harness the benefits of capital inflows.

Annex 2.1. Data

Data Sources

The primary data sources for this chapter are the IMF World Economic Outlook (WEO) database, the Penn World Tables (version 9.0), and the World Bank World Development Indicators database. The chapter also uses several other databases to construct the external conditions variables and policy and other domestic attribute variables used in the empirical analyses. Annex Table 2.1.1 lists all indicators used in the chapter as well as their sources.

The sample of countries included in the various analytical exercises varies due to data constraints. Annex Table 2.1.2 lists the sample of all emerging market and developing economies used in the various analytical exercises. It includes all emerging market and developing economies currently classified as such by the WEO as well as those that have been reclassified as "advanced" since 1996 (Cyprus, Czech Republic, Estonia, Hong Kong Special Administrative Region, Israel, Korea, Latvia, Lithuania, Macao Special Administrative Region, Malta, Puerto Rico, San Marino, Singapore, Slovak Republic, Slovenia, Taiwan Province of China), but excludes economies with a population of less than 1 million in 2010 (according to Penn World Tables 9.0 data).

Data Definitions

Real GDP per Capita

Aggregate GDP and population data used to construct real GDP per capita at purchasing-power-parity adjusted U.S. dollars are from Penn World Tables 9.0. The source for aggregate GDP used to construct real GDP per capita at constant national prices is also Penn World Tables 9.0, to be consistent with data used on production factors (labor and capital).

Annex Table 2.1.1. Data Sources

Indicator	Source
Banking Crisis Indicator	Laeven and Valencia (2013)
Bilateral Cross-Border Bank Claims	Bank for International Settlements
Capital Account Openness	Quinn (1997); Aizenman, Chinn, and Ito (2010)
Capital Inflows	IMF, Financial Flows Analytics database
Capital Stock	Penn World Tables 9.0
Commodity Terms of Trade	Gruss 2014
Commodity Export Weights	United Nations Commodity Trade Statistics (Comtrade) database; IMF, World Economic Outlook database
Credit Boom Episodes	Dell'Ariccia and others (2016)
Current Account Balance	IMF, World Economic Outlook database
Deposit Money Banks' Assets Ratio to GDP (percent)	World Bank, World Development Indicators database
Employment	Penn World Tables 9.0
Exchange Rate Stability Index	Aizenman, Chinn, and Ito (2010)
Export Value of Goods (bilateral)	IMF, Direction of Trade Statistics database
External Debt Liabilities as a Share of GDP	Lane and Milesi-Ferretti (2007)
Free Trade Agreements by Year of Signature of Agreement	DESTA, Free Trade Area database; October 2016 *World Economic Outlook*
Free Trade Agreements Coverage	WTO Regional Trade Agreements database; October 2016 *World Economic Outlook*
Human Capital	Penn World Tables 9.0
Legal System and Property Rights Quality Index	Gwartney, Lawson, and Hall (2016)
Nominal GDP	IMF, World Economic Outlook database
Nominal Interest Rate	IMF, World Economic Outlook database
Oil Price in U.S. Dollars	IMF, Global Assumptions database
Polity Score (combined)	Polity IV/Transparency International
Population	Penn World Tables 9.0; United Nations Population database
Public Debt as a Share of GDP	Mauro and others (2013); IMF, World Economic Outlook database
Real GDP at Constant National Prices	IMF, World Economic Outlook database; Penn World Tables 9.0
Real GDP in Purchasing Power Parity Terms	Penn World Tables 9.0
Real Domestic Absorption	Penn World Tables 9.0
Regulation Quality Index	Gwartney, Lawson, and Hall (2016)
Sound Monetary Framework	Gwartney, Lawson, and Hall (2016)
Tariffs	UNCTAD, Trade Analysis Information System; WTO Tariff Download Facility; IMF, Structural Reforms database; October 2016 *World Economic Outlook*

Source: IMF staff compilation.
Note: DESTA = Design of Trade Agreements database; UNCTAD = United Nations Conference on Trade and Development; WTO = World Trade Organization.

Annex Table 2.1.2. Sample of Emerging Market and Developing Economies Included in the Analyses

Albania, Algeria*, Angola*, Argentina, Armenia, Azerbaijan*, Bahrain*, Bangladesh, Belarus, Benin, Bolivia*, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon*, Central African Republic, Chad, Chile*, China, Colombia, Democratic Republic of the Congo, Republic of Congo*, Costa Rica, Côte d'Ivoire*, Croatia, Czech Republic, Dominican Republic, Ecuador*, Egypt, El Salvador, Estonia, Ethiopia, Gabon*, The Gambia, Georgia, Ghana, Guatemala, Guinea*, Guinea-Bissau, Haiti, Honduras, Hong Kong SAR, Hungary, India, Indonesia*, Islamic Republic of Iran*, Iraq*, Israel, Jamaica, Jordan, Kazakhstan*, Kenya, Korea, Kuwait*, Kyrgyz Republic, Lao P.D.R., Latvia, Lebanon, Lesotho, Liberia, Lithuania, FYR Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania*, Mauritius, Mexico, Moldova, Mongolia*, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria*, Oman*, Pakistan, Panama, Paraguay, Peru*, Philippines, Poland, Qatar*, Romania, Russia*, Rwanda, Saudi Arabia*, Senegal, Serbia, Sierra Leone, Singapore, Slovak Republic, Slovenia, South Africa, Sri Lanka, Sudan, Swaziland, Syria, Taiwan Province of China, Tajikistan*, Tanzania, Thailand, Togo, Trinidad and Tobago*, Tunisia, Turkey, Turkmenistan*, Uganda, Ukraine, United Arab Emirates, Uruguay, Uzbekistan, Venezuela*, Vietnam, Yemen*, Zambia*, Zimbabwe

Source: IMF staff compilation.
Note: The classification of emerging market and developing economies includes economies considered emerging markets before 1996. * denotes commodity exporters, which are economies for which commodity exports constitute the main source of export earnings during the sample period (commodity exports exceed 65 percent of total exports of goods, and net commodity exports account for at least 6 percent of GDP).

Country-Specific External Conditions Measures

The country-specific *external demand condition* is measured as the export-weighted domestic absorption of trading partners, as in Arora and Vamvakidis 2005 and IMF 2014. Thus, for an emerging market economy j in year t, the growth rate of external demand can be represented by

$$\sum_{i \in \Theta_j} \omega_{i,t}^{*} da_{i,t}, \tag{2.1}$$

in which $\omega_{i,t}$ is the share of economy j's exports accounted for by economy i (based on IMF Direction of Trade Statistics [DOTS] data); $da_{i,t}$ is the annual growth rate of real domestic absorption in economy i (at constant national prices, from Penn World Tables 9.0); Θ_j is the set of economy j's trading partners for which bilateral export data are reported in DOTS and collectively account for at least 50 percent of total exports. The time-varying correlation of individual country external demand conditions with aggregate world output growth shows that the external conditions that each faces often deviate significantly from average external conditions (Annex Figure 2.1.1). The country-specific external demand series was further decomposed into three components, capturing demand from China, other emerging market and developing economies (excluding China), and advanced economies.

Following Blanchard, Adler, and de Carvalho Filho (2015), country-specific *external financial conditions* are measured by the ratio of capital inflows to the region of the economy in question (excluding inflows to that economy) as a share of GDP of other economies in the same region. Thus, for emerging market economy j in year t, the external financial condition is measured by the ratio

$$\frac{\sum_{i \in \Theta \backslash j} K\_inflow_{i,t}}{\sum_{i \in \Theta \backslash j} GDP_{i,t-1}}, \tag{2.2}$$

in which $K\_inflow_{i,t}$ is gross inflows to economy i, $GDP_{i,t-1}$ is GDP of economy i measured in U.S. dollars, and $\Theta \backslash j$ is the set of all related economies (within the same region) but excluding economy j. By excluding capital flows to the economy itself and aggregating capital flows to related economies, the measure aims to capture push factors that are exogenous to the economy in focus. While economies within a comparable group naturally have an important common element, there is important variation across economies, as shown in Annex Figure 2.1.1, panel 2.

The change in *terms of trade* is analyzed in the chapter through commodity terms of trade (CTOT) indices. These are constructed for each economy as a trade-weighted average of the prices of imported and exported commodities, following Gruss (2014). The annual change in the economy i's CTOT index in year t is given by

$$\Delta logCTOT_t = \sum_{j=1}^{J} \Delta log P_{j,t} \tau_{i,j,t}, \tag{2.3}$$

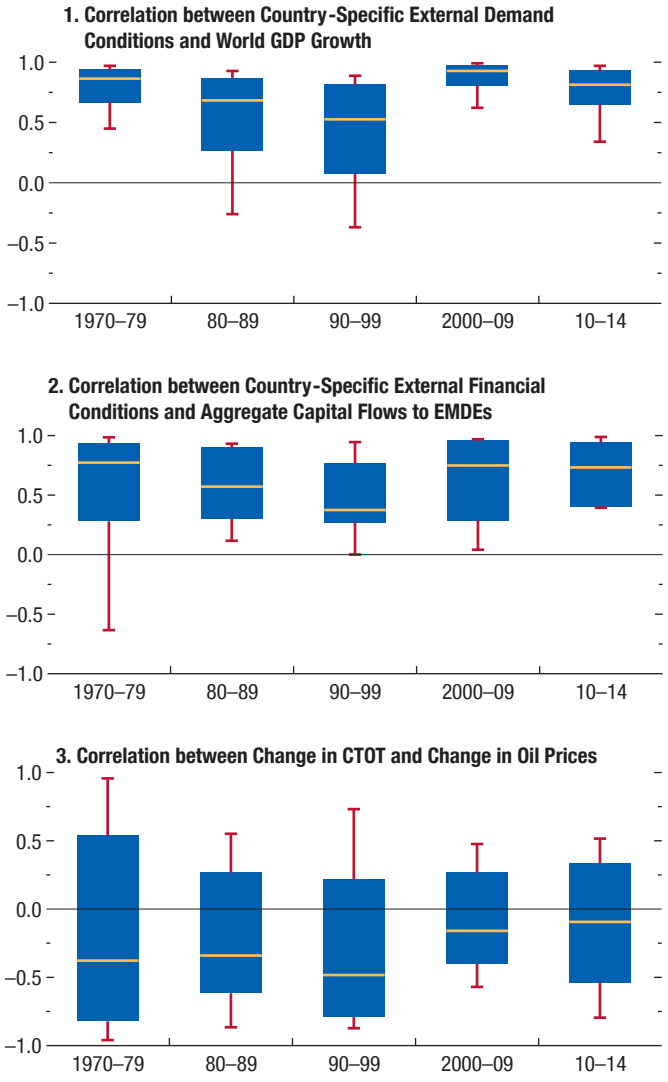
in which $P_{j,t}$ is the relative price of commodity j at time t (in U.S. dollars and divided by the IMF's unit value index for manufactured exports), and Δ denotes the first difference. Economy i's weights for each commodity price, $\tau_{i,j,t}$, are given by

$$\tau_{i,j,t} = \frac{x_{i,j,t-1} - m_{i,j,t-1}}{\mathrm{GDP}_{i,t-1}}, \tag{2.4}$$

in which $x_{i,j,t-1}$ ($m_{i,j,t-1}$) denote the average export (import) value of commodity j by the economy i between t–1 and t–3 (in U.S. dollars, from the United Nations Comtrade database), and $\mathrm{GDP}_{i,t-1}$ denotes the average GDP of the economy i between t–1 and t–3 (in U.S. dollars). An alternative index with $(\sum_{j=1}^{J} x_{i,j,t-1} + \sum_{j=1}^{J} m_{i,j,t-1})$ instead of $\mathrm{GDP}_{i,t-1}$ in equation 2.4 is used in robustness exercises in Annex 2.3.

Annex Figure 2.1.1. Correlation between Country-Specific External Conditions Variables and Global Variables over Time

(Correlation coefficient)



Source: IMF staff calculations.
Note: The figure shows the rolling correlation between country-specific variables and global variables over nonoverlapping five-year windows. The horizontal line inside each box represents the median; the upper and lower edges of each box show the top and bottom quartiles; and the red markers denote the top and bottom deciles. World GDP growth is the weighted average (using market exchange rates) of growth in individual economies. CTOT = commodity terms of trade; EMDEs = emerging market and developing economies.

Annex Table 2.1.3. Pairwise Correlation between External Conditions Variables

Variable	External Demand Conditions	External Financial Conditions	Commodity Terms of Trade
External Demand Conditions	1		
External Financial Conditions	0.1288	1	
Commodity Terms of Trade	0.0737	–0.0016	1

Source: IMF staff calculations.

The commodity price series start in 1960. Prices of 41 commodities are used, sorted into four broad categories:

1. *Energy*: coal, crude oil, and natural gas
2. *Metals*: aluminum, copper, iron ore, lead, nickel, tin, and zinc
3. *Food*: bananas, barley, beef, cocoa, coconut oil, coffee, corn, fish, fish meal, groundnuts, lamb, oranges, palm oil, poultry, rice, shrimp, soybean meal, soybean oil, soybeans, sugar, sunflower oil, tea, and wheat
4. *Raw materials*: cotton, hardwood logs and sawn wood, hides, rubber, softwood logs and sawn wood, soybean meal, and wool

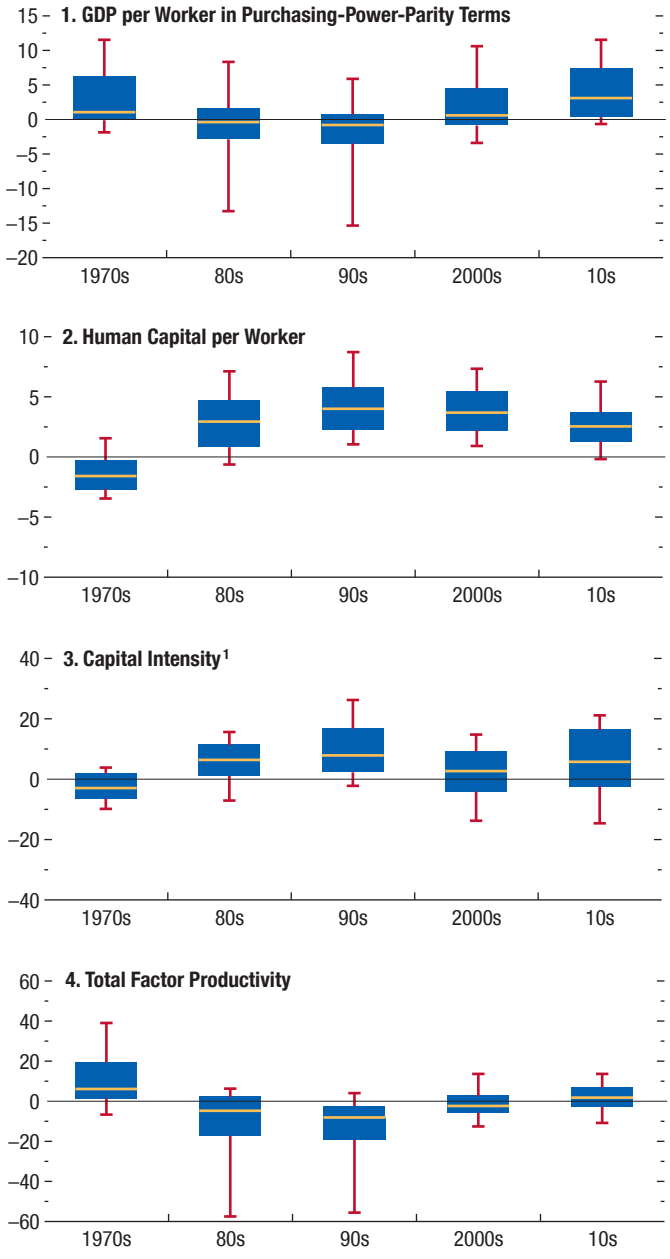
The primary source for international commodity prices is the IMF's International Financial Statistics database. The price of crude oil is the simple average of three spot prices: Dated Brent, West Texas Intermediate, and Dubai Fateh. The World Bank's Global Economic Monitor database is used to extend the price series of barley, iron ore, and natural gas from the IMF's Primary Commodity Price System back to 1960. The price of coal is the Australian coal price, extended back to 1960 using the World Bank's Global Economic Monitor database and U.S. coal price data from the U.S. Energy Information Administration.

Annex Table 2.1.3 shows the pairwise correlation between the three external conditions variables. The low correlation between these variables suggests that each dimension potentially exerts a separate influence from the other two.

Annex 2.2. Channels through Which Emerging Market and Developing Economies Have Narrowed Income Differentials with Advanced Economies

Over the medium term, once the effects of business cycle fluctuations are smoothed out, gaps in income per capita between countries are associated with differences in the stocks of physical and

Annex Figure 2.2.1. Changes in Levels of Selected Variables Relative to the United States
(Percentage points)



Source: IMF staff calculations.
Note: The horizontal line inside each box represents the median; the upper and lower edges of each box show the top and bottom quartiles; and the red markers denote the top and bottom deciles of the average change in the selected variable during the decade.
[1]Capital intensity is defined as $(K/Y)^{\alpha/(1-\alpha)}$ as explained in Annex 2.2.

human capital used in production (factor gaps) and differences in technology and efficiency (total factor productivity [TFP] gaps). This annex examines the variation over time in factor and TFP gaps between emerging market and developing economies and the United States.

Using a standard production function approach, aggregate output can be expressed as

$$Y = A^* K^{\alpha} (hL)^{1-\alpha}, \tag{2.5}$$

in which Y is real output, K is the stock of physical capital, h is human capital per worker, L is labor input, A is total factor productivity, and α is the capital share of income.

Aggregate GDP can be reexpressed to give output per worker as a function of human capital per worker, the capital-output ratio, and TFP[37]:

$$y = Y/L = A^{\frac{1}{1-\alpha}} * h * \left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}}. \tag{2.6}$$

Comparing each emerging market economy i to the United States, the gap in output per worker can be decomposed into the factor gaps and the residual TFP gap as follows[38]:

$$\frac{y_i}{y_{U.S.}} = \frac{\left(A^{\frac{1}{1-\alpha}}\right)_i}{\left(A^{\frac{1}{1-\alpha}}\right)_{U.S.}} * \frac{h_i}{h_{U.S.}} * \frac{\left(\left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}}\right)_i}{\left(\left(\frac{K}{Y}\right)^{\frac{\alpha}{1-\alpha}}\right)_{U.S.}}. \tag{2.7}$$

The decomposition reveals that, over time, the relative importance of different channels through which income gaps have narrowed and widened has shifted (Annex Figure 2.2.1). During the 1970s, 1980s, and 1990s, movements in income-per-worker gaps mirrored movements in the TFP gap, with factor accumulation often moving in the opposite direction. By contrast, over the past 15 years, the relative output-per-worker gap has mirrored movements in the factor gaps more than it has TFP gaps. This suggests that the channels have varied in importance: whereas the TFP channel appears more important in the 1970s, 1980s, and 1990s, factor accumulation appears to have played a greater role in recent years.

[37]Klenow and Rodríguez-Clare (1997); Hall and Jones (1999); Hsieh and Klenow (2010).
[38]The residual also captures any measurement error in output of any of the inputs.

Annex 2.3. Estimation of the Impact of External Conditions on Emerging Market and Developing Economy Growth

The empirical framework used to assess the role of external conditions for medium-term growth over time is based on a fixed-effects panel growth regression that is standard in the literature.[39] The general regression equation is given by

$$g_{it} = \alpha_i + \mu_t + \beta X_{it} + \gamma Z_{it} + \epsilon_{it}, \quad (2.8)$$

in which g_{it} is the average annual growth rate of real GDP per capita in purchasing-power-parity terms in country i over period t; α_i captures time-invariant country fixed effects; and μ_t is a time fixed effect that controls for common, global factors. As is common in the literature, each period corresponds to a five-year nonoverlapping window to smooth the influence of business cycles. The period of analysis is 1970–2014, although the panel is not balanced (that is, data are not available for all countries in all periods).

The vector Z_{it} includes the main variables of interest, that is, the three country-specific external conditions described in Annex 2.1. The equation also includes a vector (X_{it}) of standard covariates in long-term growth regressions. Given that the interest is in exploring the role of external conditions, rather than assessing the contribution of all factors that may affect medium-term growth, X_{it} is a parsimonious set of control variables mainly aimed at attenuating potential omitted variable bias affecting the estimates (rather than at maximizing the share of variance explained by the model).[40] The set of controls includes the initial level of income per capita (average log GDP per capita over the previous five-year period) to account for transitional convergence, the average rate of inflation to account for macroeconomic stability, the level of human capital, de jure measures of trade and financial openness (proxied by the level of average import tariffs and an index of restrictions to the capital account, respectively), and deep institutional characteristics (as captured by the combined Polity IV index of governance characteristics).

The model is estimated with the generalized method of moments (GMM) for dynamic panel models developed by Arellano and Bond (1991) and Arellano and Bover (1995). Given that the model is dynamic, estimation by ordinary least squares (OLS) may lead to biased estimates (lagged income can be correlated with the fixed effects in the error term, leading to dynamic panel bias). Moreover, some of the control variables are potentially endogenous. The difference GMM estimator relies on differencing and instrumentation to deal with these issues.

Table 2.3.1 reports the estimation results. Columns (1) to (3) report the results when one external conditions variable is included at a time. The results reported in the text of the chapter correspond to column (4), in which all three country-specific external variables are included jointly. The results using an OLS estimator with country fixed effects are reported in columns (5) through (8).

Robustness Exercises

Annex Table 2.3.2 reports results from robustness exercises. In all of these exercises, all external conditions variables are included jointly and the model is estimated with a difference GMM method.

Sample of Countries

Some large emerging market and developing economies, notably China, have started to play a key role in global activity in recent decades. To address concerns of potential endogeneity of external demand conditions, key large emerging market and developing economies are excluded from the estimation sample in the exercises reported in columns (1) and (2). More precisely, column (1) excludes China from the estimation sample, while, in column (2), all large emerging market and developing economies (that is, those in the sample that are members of the Group of Twenty—Argentina, Brazil, China, India, Indonesia, Korea, Mexico, Russia, Saudi Arabia, South Africa, and Turkey) are excluded from the estimation.

The baseline sample includes many very small economies (even if economies with very small population are excluded). In this sense, the average coefficients from the baseline sample may not be very representative of aggregate growth in emerging market and developing economies, which is largely driven by large

[39]See for instance Barro and Sala-i-Martin (2004). Related studies that include measures of external conditions in standard growth regression include, among others, Arora and Vamvakidis (2005); Calderón, Loayza, and Schmidt-Hebbel (2006); and Box 4.1 in IMF (2014).

[40]In any case, the variables in Z_{it} are derived from demand or financial conditions in trading partners and from global commodity prices, so there is less of a concern of omitted variable bias or endogeneity than would be the case if the analysis were using measures of export growth or openness (which could be affected by domestic factors that directly affect per capita income growth).

Annex Table 2.3.1. Estimation Results from Linear Panel Growth Regression

Dependent Variable: GDP per Capita Growth Rate	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Explanatory Variables								
External Demand Conditions	0.524**			0.421**	0.331			0.243
	(0.203)			(0.192)	(0.199)			(0.189)
External Financial Conditions		0.266***		0.186**		0.339***		0.289***
		(0.099)		(0.085)		(0.096)		(0.086)
Commodity Terms of Trade			0.453*	0.481*			0.539**	0.538**
			(0.238)	(0.249)			(0.220)	(0.218)
Estimation Details								
Estimation Method	GMM	GMM	GMM	GMM	OLS	OLS	OLS	OLS
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	505	517	509	497	587	601	592	578
Number of Economies	81	84	83	80	82	84	83	81
R^2					0.411	0.422	0.417	0.432
Specification Tests (*p*-values)								
Second-Order Correlation Test	0.863	0.913	0.567	0.507				
Hansen Test	0.149	0.173	0.197	0.201				

Source: IMF staff calculations.
Note: The dependent variable is the annual growth rate of GDP per capita in purchasing-power-parity terms, averaged over nonoverlapping five-year windows. One unit of external demand conditions corresponds to a 1 percentage point growth in domestic absorption of trading partners; one unit of external financial conditions corresponds to 1 percentage point of GDP in capital flows to regional economies; one unit of the commodity terms of trade corresponds to a 1 percent increase in the commodity terms of trade index (akin to a windfall income gain of 1 percent of GDP). The sample period is 1970–2014. Robust standard errors are reported in parentheses. GMM = generalized method of moments; OLS = ordinary least squares. ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively.

Annex Table 2.3.2. Estimation Results from Linear Panel Growth Regression: Robustness Exercises

Dependent Variable: GDP per Capita Growth Rate	(1)	(2)	(3)	(4)	(5)	(6)
Explanatory Variables						
External Demand Conditions	0.401**	0.361*	0.153	0.408**	0.400**	0.372*
	(0.194)	(0.204)	(0.322)	(0.191)	(0.196)	(0.214)
External Financial Conditions	0.204**	0.223**	0.194**	0.199**	0.244***	0.330***
	(0.087)	(0.101)	(0.089)	(0.086)	(0.093)	(0.111)
Commodity Terms of Trade	0.502**	0.454*	1.036***	0.195***	0.473*	0.954***
	(0.255)	(0.245)	(0.293)	(0.053)	(0.246)	(0.213)
Estimation Details						
Estimation Method	GMM	GMM	GMM	GMM	GMM	GMM
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Other Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	491	441	235	497	497	413
Number of Economies	79	71	36	80	80	80
Specification Tests (*p*-values)						
Second-Order Correlation Test	0.512	0.462	0.681	0.602	0.693	0.523
Hansen Test	0.198	0.235	1.000	0.138	0.327	0.207

Source: IMF staff calculations.
Note: The dependent variable is the annual growth rate of GDP per capita in purchasing-power-parity terms, averaged over nonoverlapping five-year windows. One unit of external demand conditions corresponds to a 1 percentage point growth in domestic absorption of trading partners; one unit of external financial conditions corresponds to 1 percentage point of GDP in capital flows to regional economies; one unit of the commodity terms of trade corresponds to a 1 percent increase in the commodity terms of trade index (akin to a windfall income gain of 1 percent of GDP). The sample period is 1970–2014. Robust standard errors are reported in parentheses. GMM = generalized method of moments. ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively.

economies. To explore how the baseline results may be affected by this, the exercise reported in column (3) excludes the smallest economies, which collectively accounted for less than 5 percent of emerging market and developing economies' aggregate GDP in purchasing-power-parity terms in 2011.

Endogeneity of External Conditions Variables

A priori there is no reason to believe that country-specific external conditions variables used in the analysis are systematically affected by growth outcomes of the economy in question or by other variables that also directly affect medium-term growth in ways that would introduce reverse causality or omitted variable bias in the baseline estimation. Nonetheless, this exogeneity assumption may be questioned in some individual cases. The baseline estimation attempts to mitigate these concerns by simultaneously including all three external conditions in the specifications together with time fixed effects that capture unobservable common factors. The robustness exercise reported in column (2), which excludes large emerging market and developing economies, should also alleviate these concerns.

Columns (4) to (6) report additional robustness exercises related to potential endogeneity of the external financial conditions variable and the commodity terms of trade (CTOT) variable. Regarding the former, the regional criterion to select peer economies in the construction of the external financial variable may introduce spatial correlation in capital flows caused by omitted variables, potentially biasing the estimates. The external financial variable may also be affected by pull factors of other economies in the same region that are unrelated to the availability of external finance for the economy in question. In a first exercise, the external financial conditions variable was considered as potentially endogenous and instrumented in the difference GMM estimation with its own lags. The results in column (4) show that the coefficient is marginally larger and even more statistically significant than in the baseline estimation. In a second exercise, reported in column (5), a country-specific financial-flows-weighted average of interest rates in large advanced economies (France, Germany, Japan, United Kingdom, United States) is used as an additional instrument.[41] The coefficient estimates are somewhat different, as the time sample is also different (the financial flows data used to weight interest rates start only in 1984), but the results are qualitatively unchanged and reinforce the finding that external financial conditions have a significant effect on medium-term growth in emerging market and developing economies.

To construct the CTOT index, individual commodity price fluctuations are weighted by net exports of each commodity as a share of GDP (Annex 2.1). While the weights are lagged, they could potentially be affected by growth outcomes averaged over five years in the economy in question. Even if there is some overlap between the window over which the dependent variable and the weights of individual commodity prices are constructed, it is not clear that this implies that the aggregate CTOT index is systematically affected by growth outcomes in a way that would bias the coefficient estimates. Nonetheless, an additional exercise is reported in column (6) based on an alternative CTOT index that uses overall commodity trade rather than GDP to weight individual price fluctuations. The coefficient is larger, given that the alternative index has larger variability, but the results are qualitatively unchanged.[42]

Annex 2.4. Identification of Growth Episodes

The procedure to identify growth acceleration episodes follows Hausmann, Pritchett, and Rodrik (2005). The trend growth rate of each economy at time t over horizon h, $g_{t,t+h}$, is defined as the least squares growth rate of real GDP per capita at constant national prices (y) from t to $t+h$ described by the following equation estimated over rolling windows of six years $[t,t+h]$[43]:

$$\ln(y_{t+i}) = \alpha + g_{t,t+h} \times i, i = 0, \ldots, h. \qquad (2.9)$$

A growth acceleration episode is defined as a time interval spanning $[t,t+h]$ with the following attributes (in which the horizon h is set at five years in the baseline case):

- the trend growth rate of real GDP per capita is at least 3.5 percent a year $\left(g_{t,t+h} \geq 3.5\right)$;
- the trend growth rate during the episode exceeds the trend growth rate during the preceding equal-

[41]The country-specific weights are constructed from cross-border flows from Bank for International Settlements data.

[42]The interquartile range for the average annual change in the alternative CTOT index across all countries and periods is –2.8 to 3 percent, while it is –0.4 to 0.3 percent in the case of the baseline CTOT index.

[43]Episodes are identified up to the year 2010 using real income per capita from PWT 9.0 through 2014 and extended to 2015 using the growth rate of real income per capita from the WEO database.

Annex Table 2.4.1. Persistent Acceleration Episodes

Economy	Year	Economy	Year
Albania	1995	FYR Macedonia	2003
Algeria	2000	Malawi	2005
Argentina	2003	Malaysia	2002
Armenia	2000	Mali	1974
Azerbaijan	2003	Mauritius	1973, 1985
Belarus	1999, 2002	Mozambique	1994
Benin	1977	Myanmar	1993, 1998
Bosnia	1995	Namibia	2002
Botswana	1970, 1986, 1994, 2003	Nigeria	2000
Bulgaria	2003	Oman	1975
Burkina Faso	1994	Pakistan	2002
Cambodia	2003	Panama	2003
Cameroon	1970, 1976	Paraguay	2000, 2009
Chad	2000	Peru	2003
Chile	2002	Philippines	2003
China	1980, 2000	Poland	1995, 2003
Colombia	2004	Rwanda	1975, 2003
Costa Rica	2003	Sierra Leone	2009
Czech Republic	2003	Singapore	1977, 1986, 2003
Dominican Republic	1994, 2004	Slovak Republic	2003
Ecuador	1970	Slovenia	1995
Egypt	2004	Sri Lanka	1976, 1990, 2003
Estonia	2002, 2010	Sudan	1997
Ethiopia	2003	Swaziland	1985
Ghana	2008	Syria	1972, 1993
Honduras	2003	Taiwan Province of China	1984
Hong Kong SAR	1976, 2003	Tanzania	2000
Hungary	1997	Thailand	1986, 2002
India	1993, 2002	Trinidad and Tobago	1996, 2001
Indonesia	1988, 2002	Tunisia	1995
Jordan	1975, 2001	Turkey	2002
Korea	1982	Turkmenistan	2004
Lao P.D.R.	1979	Uzbekistan	2003
Lesotho	1987, 2005	Vietnam	1975, 1981
Lithuania	2002		

Source: IMF staff calculations.

length interval by at least 2 percentage points $(g_{t,t+h} - g_{t,t-h} \geq 2)$; and
- the level of real GDP per capita at the end of the episode is at least as large as the maximum level recorded prior to the onset of the episode $(y_{t,t+h} \geq \max\{y_i\}, \forall i \leq t)$.

The set of acceleration episodes identified is in line with those in Hausmann, Pritchett, and Rodrik (2005) for the period during which the samples overlap.

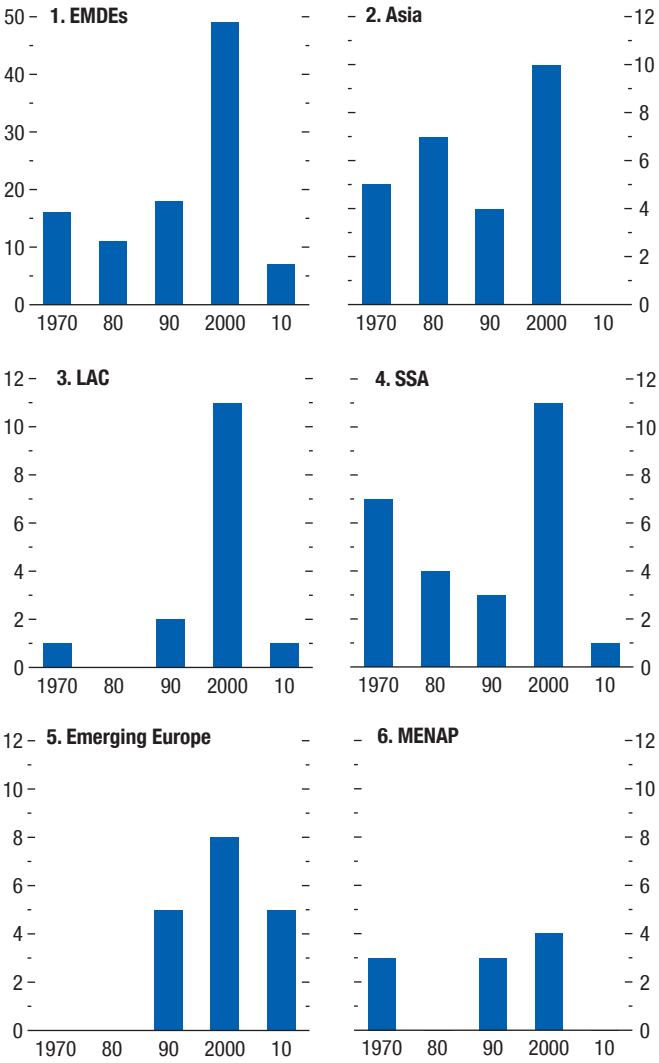
Starting with the set of identified acceleration episodes, a *persistent* acceleration episode is defined as an acceleration that is not associated with a subsequent reversal (defined below) or a banking crisis (as defined by Laeven and Valencia 2013) within three years before or after the end of the acceleration episode. Annex Table 2.4.1 lists the 95 episodes of persistent accelerations identified through this procedure. Their distribution by region and decade is shown in Annex Figure 2.4.1.

A reversal episode, in turn, is defined as an interval spanning $[t,t+h]$ during which
- the trend growth rate during the reversal is at least 2 percentage points lower than during the preceding interval $(g_{t,t-h} - g_{t,t+h} \geq 2)$; and
- real GDP per capita declines such that the average level of real GDP per capita during the episode $[t,t+h]$ is lower than the average level of real GDP per capita during $[t-h,t]$, or $(\bar{y}_{t,t+h} \leq \bar{y}_{t-h,t})$.

Annex Table 2.4.2 lists the 125 episodes identified as reversals, and Annex Figure 2.4.2 shows the distribution of reversal episodes by region and decade.

Annex Figure 2.4.1. Persistent Acceleration Episodes by Region

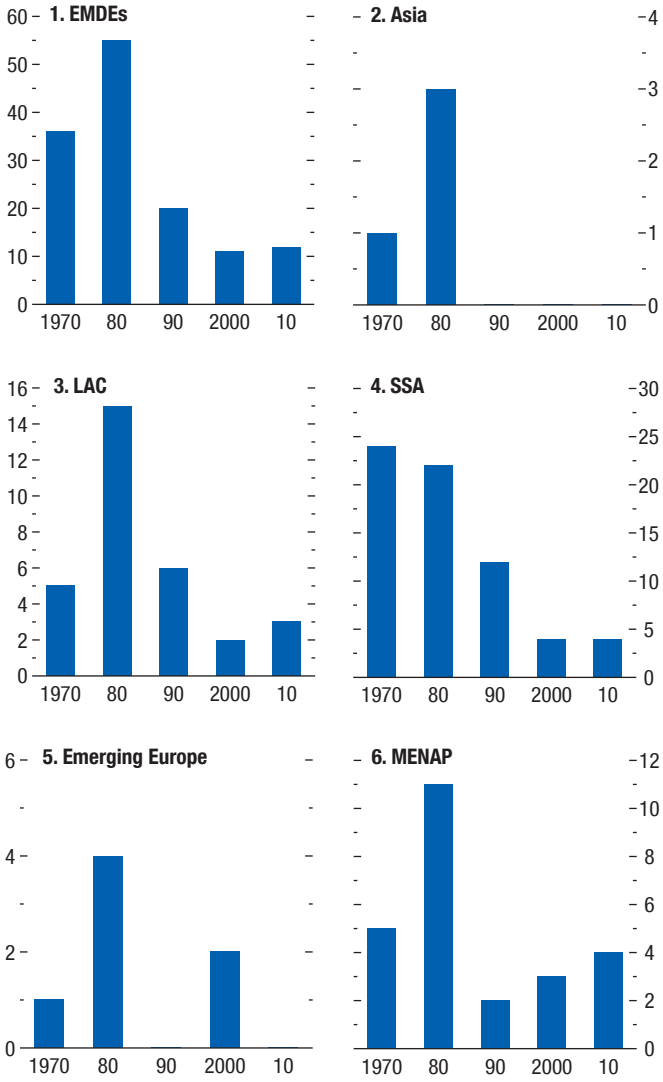
(Number of episodes)



Source: IMF staff calculations.
Note: *X*-axis labels indicate the start year of a 10-year period. EMDEs = emerging market and developing economies; LAC = Latin America and the Caribbean; MENAP = Middle East, North Africa, Afghanistan, and Pakistan; SSA = sub-Saharan Africa.

Annex Figure 2.4.2. Reversal Episodes by Region

(Number of episodes)



Source: IMF staff calculations.
Note: *X*-axis labels indicate the start year of a 10-year period. EMDEs = emerging market and developing economies; LAC = Latin America and the Caribbean; MENAP = Middle East, North Africa, Afghanistan, and Pakistan; SSA = sub-Saharan Africa.

Annex Table 2.4.2. Reversal Episodes

Economy	Year	Economy	Year
Albania	1988	Lesotho	1980
Algeria	1985	Liberia	1979, 1989, 2003
Angola	1976, 1989	Madagascar	1973, 1979, 1990, 2009
Argentina	1980, 1999	Malawi	1980, 1999
Bahrain	1981, 2006	Mauritania	1979
Bangladesh	1971	Mexico	1983
Bolivia	1981	Mongolia	1989
Brazil	1989	Mozambique	1981
Bulgaria	1989	Myanmar	1985
Burkina Faso	1981	Namibia	1981
Burundi	1992	Nicaragua	1976, 1985
Cameroon	1985	Niger	1971, 1982
Central African Republic	1970, 1978, 2000, 2010	Nigeria	1979
Chad	1977, 1991	Oman	2010
Chile	1971	Panama	1985
Democratic Republic of the Congo	1974, 1989	Paraguay	1983, 1996
Republic of Congo	1986	Peru	1980, 1987
Costa Rica	1980	Philippines	1981
Croatia	2009	Poland	1979, 1988
Côte d'Ivoire	1979, 1989, 1999	Qatar	1979
El Salvador	1978	Rwanda	1985, 1990
Ethiopia	1973, 1982, 1988	Saudi Arabia	1980, 1994
Gabon	1978, 1983, 1997	Senegal	1976, 1989
The Gambia	1984	Sierra Leone	1994
Ghana	1973, 1979	Slovenia	2009
Guatemala	1982	South Africa	1982
Guinea	1989	Sudan	1978
Guinea-Bissau	1978, 1997	Syria	1985, 2010
Haiti	1981, 1990, 2000	Tanzania	1979
Honduras	1981	Togo	1972, 1979, 1989, 1998
Hungary	1988	Trinidad and Tobago	1982
Iran	1976, 1984	Uganda	1976
Iraq	1980, 1987	United Arab Emirates	1984, 2005
Jamaica	1975, 1996, 2007	Uruguay	1981, 1999
Jordan	1986	Venezuela	1979, 1998
Kenya	1990	Zambia	1970, 1976, 1990
Kuwait	1979, 1986, 1998, 2007	Zimbabwe	1974, 1983, 2001
Lebanon	1987		

Source: IMF staff calculations.

Annex 2.5. Estimation of the Influence of External Conditions on the Likelihood of Experiencing Persistent Accelerations and Reversals

This annex provides additional details on the empirical approach used to explore the influence of external conditions on the occurrence of growth accelerations and reversals and reports the main results as well as robustness analyses.

Data and Methodology

Two dummy variables are constructed to implement the empirical analysis on growth episodes: one dummy takes a value of 1 for the economy-years identified as persistent acceleration episodes (Annex Table 2.4.1) and zero otherwise; and the other dummy takes a value of 1 for the economy-years identified as reversal episodes (Annex Table 2.4.2) and zero otherwise. Given the empirical challenge of accurately dating growth episodes, following Hausmann, Pritchett, and Rodrik (2005) the dummy variables also take a value of 1 in the first lead ($t+1$) and lag ($t-1$) around each identified episode.

Using these dummy variables, the influence of country-specific external conditions on the likelihood of growth episodes can be tested by the following distribution function:

$$\Pr(episode_{it} = 1) = \Phi(\gamma Z_{it}), \quad (2.10)$$

in which Z_{it} is the vector of moving averages (between $t+1$ and $t+h$) of the three country-specific external conditions variables described in Annex 2.1, and Φ is

Annex Table 2.5.1. Logistic Estimates of the Effects of External Conditions Variables on the Odds Ratio of Persistent Accelerations

Specification	No Country or Time Fixed Effects	Country Fixed Effects and Other Controls	Time Fixed Effects Only	Country and Time Fixed Effects	Random Effects	Probit Random Effects	Baseline Country Fixed Effects
External Demand	1.248***	1.607***	1.095	1.158**	1.330***	1.165***	1.384***
	(0.087)	(0.151)	(0.097)	(0.085)	(0.119)	(0.052)	(0.088)
External Financial	1.209***	1.227***	1.103**	1.098**	1.243***	1.123***	1.240***
	(0.045)	(0.050)	(0.050)	(0.044)	(0.049)	(0.021)	(0.034)
Change in Terms of Trade	0.970	1.042	0.935	1.040	1.007	1.009	1.052
	(0.047)	(0.091)	(0.046)	(0.076)	(0.063)	(0.030)	(0.066)
Model Chi-Squared Test	43.4***	98.2***	31,482.8***	245.5***	45.8***	51.8***	103.6***
Country Fixed Effects	No	Yes	No	Yes	No	No	Yes
Time Fixed Effects	No	No	Yes	Yes	No	No	No
Other Controls	No	Yes	No	No	No	No	No
Number of Economies[1]	110	110	110	110	110	116	110
Number of Observations	4,176	1,325	4,176	2,279	4,176	4,322	2,279

Source: IMF staff calculations.
Note: ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively; other controls not reported include de jure measures of trade and financial openness, the level of inflation, and deep institutional characteristics. The coefficients report changes in the odds ratio of persistent accelerations. Value greater (smaller) than 1 indicates increase (decrease) in the odds ratio relative to the unconditional odds. Robust standard errors are reported in parentheses.
[1]Maximum number of economies. For estimations with country fixed effects, economies without episodes are excluded.

Annex Table 2.5.2. Logistic Estimates of the Effects of External Conditions Variables on the Odds Ratio of Reversals

Specification	No Country or Time Fixed Effects	Country Fixed Effects and Other Controls	Time Fixed Effects Only	Country and Time Fixed Effects	Random Effects	Probit Random Effects	Baseline Country Fixed Effects
External Demand	0.818***	0.738***	0.841***	0.793***	0.736***	0.851***	0.655***
	(0.047)	(0.067)	(0.046)	(0.061)	(0.055)	(0.033)	(0.038)
External Financial	0.822***	0.710***	1.014	0.977	0.788***	0.876***	0.774***
	(0.037)	(0.043)	(0.061)	(0.055)	(0.041)	(0.023)	(0.028)
Change in Terms of Trade	0.933*	0.851*	0.976	0.973	0.935**	0.963**	0.941**
	(0.039)	(0.074)	(0.041)	(0.028)	(0.031)	(0.017)	(0.027)
Country Fixed Effects	No	Yes	No	Yes	No	No	Yes
Time Fixed Effects	No	No	Yes	Yes	No	No	No
Other Controls	No	Yes	No	No	No	No	No
Number of Economies[1]	110	110	110	110	110	116	110
Number of Observations	4,176	1,184	4,176	2,835	4,135	4,322	2,835

Source: IMF staff calculations.
Note: ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively; other controls not reported include de jure measures of trade and financial openness, the level of inflation, and deep institutional characteristics. The coefficients report changes in the odds ratio of persistent accelerations. Value greater (smaller) than 1 indicates increase (decrease) in the odds ratio relative to the unconditional odds. Robust standard errors are reported in parentheses.
[1]Maximum number of economies. For estimations with country fixed effects, economies without episodes are excluded.

a nonlinear function representing how Z_{it} affects the probability $\Pr(episode_{it} = 1)$. The nonlinear binary dependent model is then empirically estimated using either a probit or a logit functional form to replace $\Phi(\cdot)$.[44] To establish an appropriate baseline specification, country and time fixed effects as well as additional control variables are considered. The benchmark specification is given by the following equation:

$$\log\left(\frac{\Pr(episode_{it} = 1)}{1 - \Pr(episode_{it} = 1)}\right) = \gamma Z_{it} + \beta X_{it} + \alpha_i + \epsilon_{it}, \quad (2.11)$$

in which X_{it} is a vector of controls (using moving averages between t–3 and t–1) that includes domestic covariates associated with medium-term growth (for example, de jure integration, credibility of policy frameworks), and α_i captures time-invariant country fixed effects.

[44]As a robustness check, the linear probability model was also tested, and the significance of the variables are robust to this estimation method.

Logit Estimates

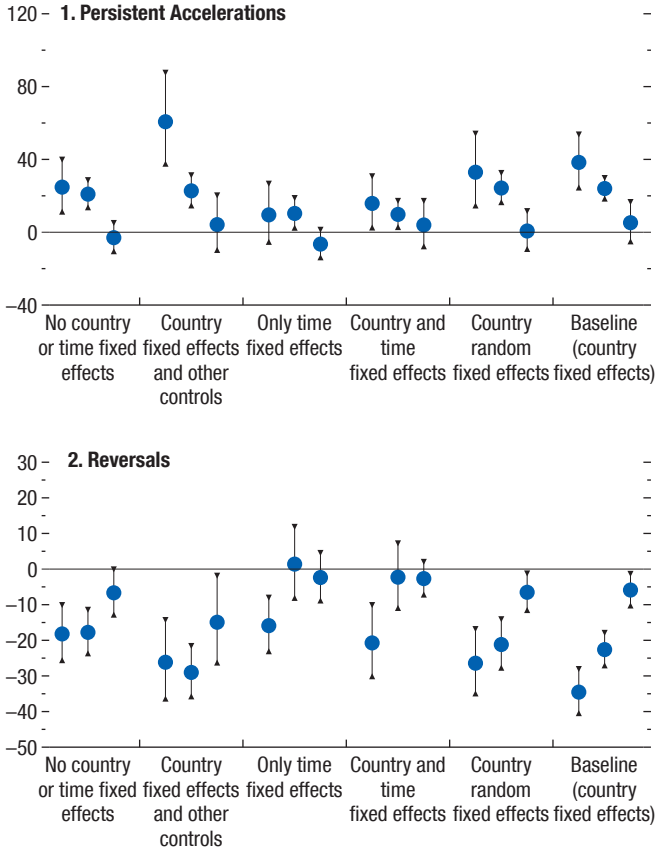
The coefficient estimates of several variations of the model in (2.11) are reported in Annex Tables 2.5.1 (persistent accelerations) and 2.5.2 (reversals) and in Annex Figure 2.5.1, panels 1 and 2. They indicate a robust positive association between the odds ratio of persistent accelerations and external demand and

financial conditions in all specifications. In turn, the commodity terms-of-trade variable is not significant in any of the specifications estimated on the full sample of countries (including commodity exporters and non-commodity exporters).

In the case of reversals, external financial conditions are not statistically significant when time fixed effects are included in the regression (columns (3) and (4) in Annex Table 2.5.2 and Annex Figure 2.5.1, panel 2). This is likely due to the importance of common factors in explaining capital flows to emerging markets, as documented in Chapter 2 of the April 2016 *World Economic Outlook* and Figure 2.10. The effect of commodity terms of trade on the likelihood of reversals is also statistically insignificant when time fixed effects are included, which likely capture common drivers of commodity prices, while they are statistically significant in all other specifications.

In sum, Annex Tables 2.5.1 and 2.5.2 and Annex Figure 2.5.1 show that the statistically significant association between external conditions and the increase in the odds ratio of persistent accelerations and reversals is robust to different specifications, including when country fixed effects are not included (column (1) of the tables), or estimating the model with random effects using logit or probit approaches (columns (5) and (6) of the tables). The baseline specification used in the analysis (equation 2.11) includes only country fixed effects.

Annex Figure 2.5.1. Change in the Odds Ratio of Occurrence of Growth Episodes, 1970–2015
(Percent)



Source: IMF staff calculations.
Note: For each estimation procedure, the first estimation point refers to external demand conditions; the second estimation point refers to external financial conditions; and the third estimation point refers to commodity terms of trade. "Other controls" include de jure measures of trade and financial openness, the level of inflation, and deep institutional characteristics. Vertical lines denote 90 percent confidence intervals.

Marginal Effects

The logit estimates of the previous section can be used to compute the average *marginal effect* of a one-unit change in a given variable on the likelihood of a growth episode. This is the statistic used in the text and figures of the chapter to discuss the impact of external conditions as well as domestic attributes on the likelihood of growth episodes. Using equations (2.10) and (2.11), the average marginal effects can be represented by

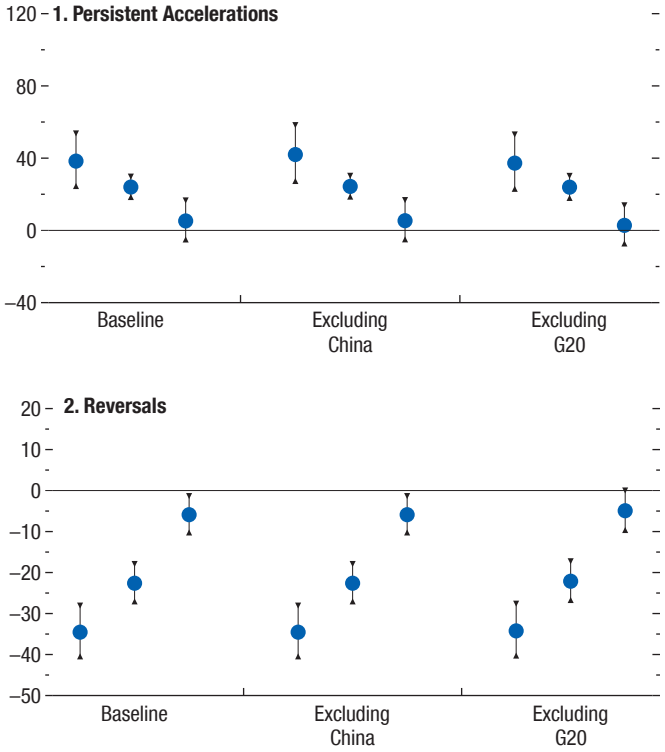
$$\frac{\partial \Pr(episode_{it} = 1)}{\partial z_{1,it}} = \gamma_1 \Phi'(\gamma_1 z_{1,it} + \gamma_2 z_{2,it} + \gamma_3 z_{3,it} + \beta_1 x_{1,it} + \ldots + \beta_n x_{n,it} + \alpha_1 + \ldots + \alpha_N). \quad (2.12)$$

Marginal effects in nonlinear binary dependent models depend not only on γ_1, but also on the value of $z_{1,it}$ and all other variables in equation (2.11)—and hence the need for parsimony in the number of explanatory variables. The baseline results reported in Figure 2.17 are based on a specification that includes only the external conditions variables, which are evaluated at their sample means.

Robustness Tests

The baseline results for the effects of external conditions on the likelihood of growth episodes are compared with those based on different country samples. Annex Figure 2.5.2 reports the change in the odds ratio (in percent) of a one-unit increase in

Annex Figure 2.5.2. Change in the Odds Ratio of Occurrence of Growth Episodes by Subsamples, 1970–2015
(Percent)

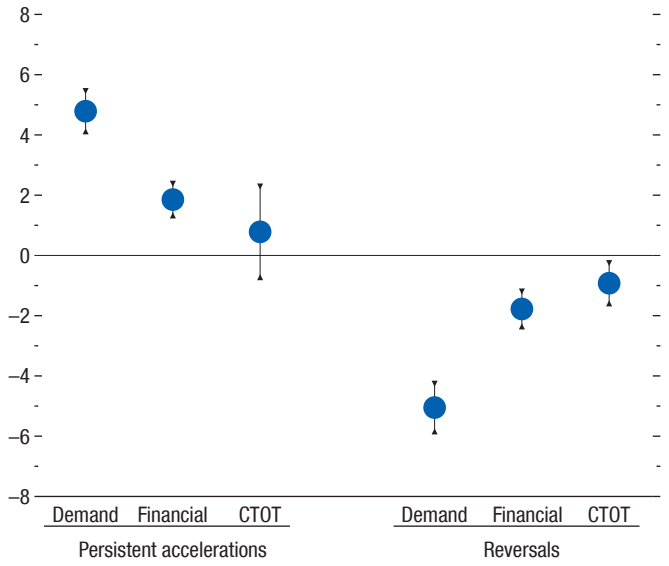


Source: IMF staff calculations.
Note: For each estimation procedure, the first estimation point refers to external demand conditions; the second estimation point refers to external financial conditions; and the third estimation point refers to commodity terms of trade. Vertical lines denote 90 percent confidence intervals. G20 = Group of Twenty.

each external condition for different sample splits. For both persistent accelerations and reversals, the results of the baseline specification of Annex Tables 2.5.1 and 2.5.2 are robust to the sample splits (that is, samples excluding China or Group of Twenty economies).

A second robustness test extends the horizon of the growth episode identification criteria of Annex 2.4 to seven years (thus, $h = 7$ instead of $h = 5$ in equation (2.9) as well as in all identification criteria in that section). The logit model (2.11) and its marginal effects represented by equation (2.12) are reestimated using the seven-year span for episodes. Annex Figure 2.5.3 reports the marginal effects of those reestimations. It shows that the marginal effects of external conditions are robust in terms of statistical significance to the change in the span of the episode. The point estimates

Annex Figure 2.5.3. Change in the Probability of Occurrence of Growth Episodes (Marginal Effect) Using Seven-Year Durations, 1970–2015
(Percentage points)



Source: IMF staff calculations.
Note: Vertical lines denote 90 percent confidence intervals. CTOT = commodity terms of trade.

change slightly relative to those for the five-year episodes, but the pattern of statistical significance of the results is unchanged.

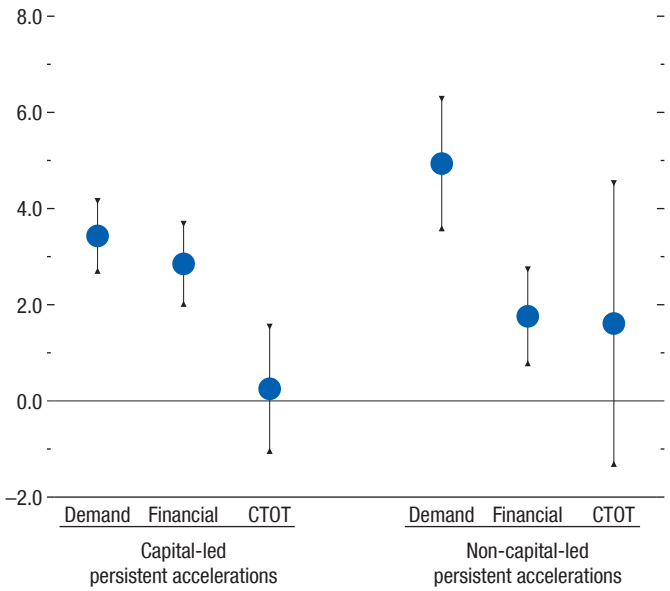
Channels through Which External Conditions Help Emerging Market and Developing Economies Narrow Income Differentials with Respect to Advanced Economies

The analysis in this section aims at understanding the role of external conditions in influencing the channels of physical capital deepening and other factors (documented in Annex 2.2) through which income gaps between emerging market and developing economies and advanced economies are narrowed. To this end, the persistent acceleration episodes listed in Annex Table 2.4.1 are further split into capital-led and non-capital-led accelerations.

Capital-led accelerations are those in which the contribution to growth during the episode from capital deepening (measured as described above using the capital-output ratio rather than capital per worker)[45]

[45]See Klenow and Rodríguez-Clare (1997); Hall and Jones (1999); and Jones (2016).

Annex Figure 2.5.4. Change in the Probability of Occurrence of Persistent Accelerations (Marginal Effect) by Type of Acceleration, 1970–2015
(Percentage points)



Source: IMF staff calculations.
Note: Vertical lines denote 90 percent confidence intervals. CTOT = commodity terms of trade.

exceeds the average contribution to growth from capital deepening for that country in the entire sample. The remaining acceleration episodes are classified as non-capital-led. Based on this criterion, there are 61 capital-led and 34 non-capital-led acceleration episodes in the set of identified persistent accelerations.

Annex Figure 2.5.4 reports the marginal effect of external conditions on the two episode probabilities. Favorable external demand raises the probability of non-capital-led acceleration episodes relatively more than the probability of capital-led episodes, whereas favorable external financing raises the probability of capital-led episodes more than the probability of non-capital-led episodes.

Annex 2.6. Analysis of Domestic Attributes in Mediating the Impact of External Conditions

This annex provides additional details on the empirical analysis carried out in the chapter's section on the role of policies and structural attributes. The analysis explores how policies and other domestic attributes may influence the impact of external conditions on the likelihood of acceleration of reversal episodes.

Free trade agreements: Data on flows of agreements by year of signature are obtained from the October 2016 *World Economic Outlook* (Chapter 2) using the Design of Trade Agreements database. This data set is complemented with the stock of free trade agreements in effect from the World Trade Organization Regional Trade Agreements database. The former builds on the latter, supplementing it with data from other multilateral institutions and national sources.

Financial depth: Financial depth is proxied by total assets held by deposit money banks as a share of GDP from the World Bank's Global Financial Development database.

Sound credit growth: While a deeper financial system is associated with increased access to finance and greater support for economic activity, a too-rapid expansion of credit may lead to vulnerabilities that end up undermining growth. The identification of excessive credit growth—or credit booms—follows Dell'Ariccia and others (2016).

Capital account openness: The index of de jure capital account openness is an update of the Quinn (1997) measure of capital controls, which draws from the narrative portion of the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions*. A higher value denotes fewer restrictions.

Current account balance: The current account balance as a share of GDP is from the IMF World Economic Outlook database.

Exchange rate flexibility: The degree of exchange rate flexibility is based on the de facto index developed by Aizenman, Chinn, and Ito (2010).

Public debt: The ratio of public debt to GDP from Mauro and others (2013) is used as a proxy for fiscal prudence.

Sound monetary framework: The quality of the monetary framework is proxied by the sound money index from Gwartney, Lawson, and Hall (2016). The index is a standardized measure that combines indicators on the growth of money supply, the level and volatility of inflation, and the possibility of owning foreign currency bank accounts, based on data from the *World Developments Indicators* (World Bank), *International Financial Statistics* and *Annual Report on Exchange Arrangements and Exchange Restrictions* (IMF), and United Nations National Accounts.

Regulation, legal system, and property rights: The indices on the quality of regulation, the legal system, and protection of property rights are from Gwartney, Lawson, and Hall (2016). A higher value is associated

with better quality of institutions. Each index compiles indicators from several sources, including the *Global Competitiveness Report* (World Economic Forum), *International Country Risk Guide* (Political Risk Services Group), *Doing Business* and *World Developments Indicators* (World Bank), and *International Financial Statistics* (IMF). Some individual indicators may be vulnerable to perception-based rankings and measurement uncertainties. However, by combining several indicators—including from international financial institutions that compile their data from national official sources—the constructed indices potentially have more comprehensive data coverage than a single indicator and may also be less sensitive to outliers and concerns about subjectivity.

Direct Effect of Domestic Policies and Attributes on the Likelihood of Growth Episodes

Before analyzing how policies and other domestic attributes affect the impact of external conditions on the likelihood of acceleration of reversal episodes, the direct effect of these domestic attributes on the likelihood of growth episodes is explored. To this end, a variation of the logit regression (2.11) described in Annex 2.5 is used in which X_{it} includes the moving average (between t–3 and t–1) of one domestic policy or attribute at a time. This allows for testing of whether the policy or domestic attribute variable significantly affects the likelihood of growth episodes—once the external conditions and country fixed effects are controlled for.

Annex Tables 2.6.1 and 2.6.2 report the results for persistent acceleration and reversal episodes, respectively. The coefficients on the domestic attribute variables indicate their impact, in percent, on the odds ratio of experiencing a growth episode versus not experiencing one: values below (above) 1 indicate lower (higher) odds of experiencing an episode versus not experiencing an episode for higher values of the domestic attribute variable. The results suggest that more financial depth, a sound monetary framework, and better quality of institutions significantly increase the odds ratio of a persistent acceleration episode (Annex Table 2.6.1). A sound monetary framework and more financial depth also significantly reduce the odds ratio of a reversal episode, whereas lower exchange rate flexibility increases the odds ratio of experiencing a reversal (Annex Table 2.6.2). To assess the economic relevance of these results, Annex Figure 2.6.1 shows the marginal effect (that is, the change in the likelihood of a growth episode, in percentage points) when the policy or domestic attribute changes by an amount equivalent to moving from the 25th percentile to the 75th percentile of its sample distribution (in the case of the exchange rate regime, the 25th percentile corresponds to a fully flexible exchange rate regime, while the 75th percentile corresponds to a fixed exchange rate regime).

Exploring How the Impact of External Conditions on the Likelihood of Growth Episodes Depends on Policies and Other Domestic Attributes

To explore how domestic attributes affect the impact of external conditions on the likelihood of growth episodes, the baseline empirical specification (2.11) is modified to include interaction terms as follows:

$$\log\left(\frac{\Pr(episode_{it} = 1)}{1 - \Pr(episode_{it} = 1)}\right) = \gamma z_{it} + \beta x_{it} + \delta(z_{it} \times x_{it}) + \alpha_i + \epsilon_{it}, \qquad (2.13)$$

in which z_{it} is one of the three country-specific external conditions; x_{it} is the moving average between t–3 and t–1 of the domestic policy or attribute in question; and α_i captures time-invariant country fixed effects. The estimates from the logit regression with interaction terms in (2.13) are then used to derive the marginal effects reported in Figures 2.19 and Annex Figure 2.6.2:[46]

- The exercise reported in Figure 2.19 is based on two sets of marginal effects: one in which the domestic attribute variable is set at a low value (the 25th percentile of its sample distribution) and one in which it is set at a high value (the 75th percentile of its sample distribution). In both cases, however, the external conditions variable is set at its sample median (interpreted as neutral external conditions). The bars in Figure 2.19 correspond to the difference between these two sets of marginal effects, interpreted as the change in the marginal effect of the external conditions variable as the domestic attribute improves; in the case of some variables, such as the exchange rate stability index, the credit boom indicator, and the external and public debt variables, the

[46]The use of marginal effects is particularly relevant for exploring how domestic attributes affect the impact of external conditions on the likelihood of growth episodes, given that the coefficient of the interaction term in the nonlinear logit estimation using odds ratios (2.13) is not sufficient to infer how the effect of one independent variable depends on the magnitude of another independent variable (Ai and Norton 2003).

Annex Table 2.6.1. Logistic Estimates of the Effects of Policy Variables on the Odds Ratio of Persistent Accelerations

External Demand	1.266***	1.296***	1.234***	1.382***	1.275***	1.285***	1.264***	1.268***	1.282***	1.352***	1.279***	1.293***	1.401***
	(0.088)	(0.094)	(0.091)	(0.110)	(0.088)	(0.093)	(0.097)	(0.090)	(0.104)	(0.109)	(0.104)	(0.103)	(0.143)
External Financial	1.200***	1.217***	1.209***	1.193***	1.223***	1.213***	1.224***	1.195***	1.204***	1.218***	1.213***	1.215***	1.215***
	(0.041)	(0.042)	(0.041)	(0.044)	(0.040)	(0.039)	(0.040)	(0.040)	(0.040)	(0.045)	(0.049)	(0.047)	(0.055)
Change in Terms of Trade	0.970	0.950	0.945	0.955	0.967	1.016	0.985	0.981	0.995	1.005	1.066	1.024	1.318
	(0.082)	(0.044)	(0.062)	(0.049)	(0.049)	(0.053)	(0.060)	(0.051)	(0.070)	(0.070)	(0.080)	(0.081)	(0.223)
Number of Trading Partners (Log)	0.928												0.916
	(0.088)												(0.112)
Financial Openness Index		0.813											
		(0.312)											
Deposit Money Banks' Assets to GDP			1.007**										1.009**
			(0.003)										(0.004)
Capital Account Openness				1.190									0.919
				(0.523)									(0.674)
Credit Booms					0.599								0.643
					(0.308)								(0.339)
Current Account Balance to GDP						0.979							0.960
						(0.022)							(0.024)
External Debt to GDP							1.000						1.002
							(0.001)						(0.002)
Exchange Rate Stability Index								0.586					1.539
								(0.204)					(0.768)
Public Debt to GDP									0.999				0.998
									(0.002)				(0.004)
Sound Monetary Framework										1.120**			
										(0.063)			
Regulation											1.018		0.975
											(0.101)		(0.155)
Legal System and Property Rights												1.189**	1.037
												(0.102)	(0.133)
Constant	0.017***	0.011***	0.011***	0.010***	0.011***	0.011***	0.011***	0.017***	0.013***	0.004***	0.011***	0.005***	0.008***
	(0.007)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.006)	(0.004)	(0.002)	(0.007)	(0.003)	(0.010)
Model Chi-Squared Test	44.99***	51.42***	49.63***	40.97***	56.28***	56.67***	54.39***	48.60***	48.73***	47.14***	37.43***	47.29***	45.49***
Number of Economies	113	116	114	92	115	116	116	114	115	103	103	105	81
Number of Observations	3,044	3,793	3,203	3,292	4,159	4,048	3,880	4,138	3,643	3,353	2,871	2,780	1,699

Source: IMF staff calculations.

Note: Estimations do not include country fixed effects. ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively. The coefficients report changes in the odds ratio of persistent accelerations. Value greater (smaller) than 1 indicates increase (decrease) in the odds ratio relative to the unconditional odds. Robust standard errors are reported in parentheses.

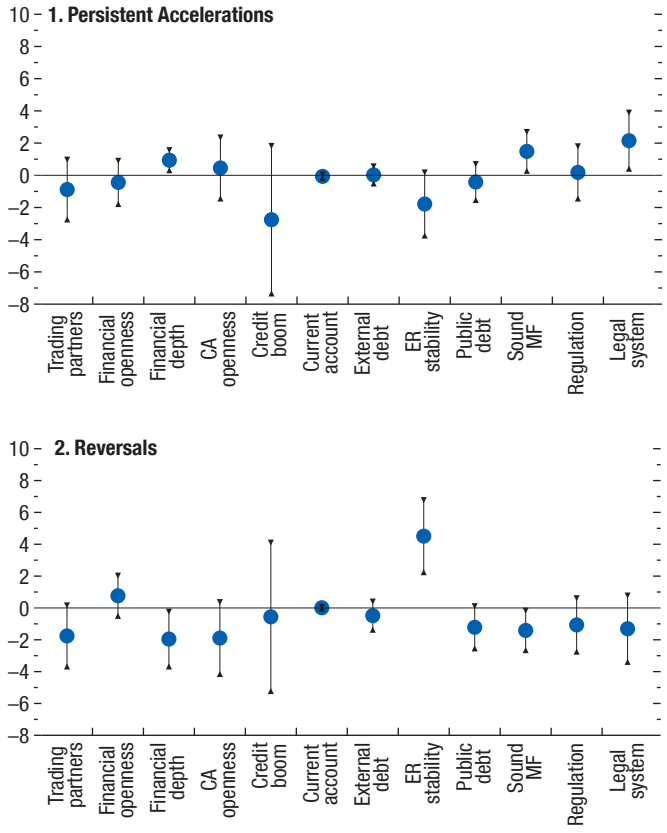
Annex Table 2.6.2. Logistic Estimates of the Effects of Policy Variables on the Odds Ratio of Reversals

External Demand	0.820**	0.694***	0.686***	0.705***	0.806***	0.731***	0.717***	0.694***	0.755***	0.700***	0.702***	0.749***	0.607***
	(0.063)	(0.052)	(0.057)	(0.059)	(0.049)	(0.048)	(0.051)	(0.048)	(0.057)	(0.055)	(0.067)	(0.083)	(0.097)
External Financial	0.783***	0.774***	0.740***	0.786***	0.804***	0.804***	0.779***	0.809***	0.784***	0.790***	0.715***	0.691***	0.701***
	(0.050)	(0.040)	(0.046)	(0.048)	(0.036)	(0.037)	(0.038)	(0.038)	(0.039)	(0.043)	(0.053)	(0.043)	(0.053)
Change in Terms of Trade	0.842	0.943	0.946	0.896**	0.940	0.953	0.960	0.936*	0.967	0.983	0.969	1.024	0.777
	(0.097)	(0.043)	(0.066)	(0.049)	(0.038)	(0.049)	(0.046)	(0.036)	(0.055)	(0.060)	(0.075)	(0.091)	(0.149)
Number of Trading Partners (Log)	0.827												0.768
	(0.098)												(0.152)
Financial Openness Index		1.315											
		(0.364)											
Deposit Money Banks' Assets to GDP			0.988*										0.987
			(0.007)										(0.011)
Capital Account Openness				0.504									1.183
				(0.242)									(1.128)
Credit Booms					0.926								2.289
					(0.363)								(1.532)
Current Account Balance to GDP						1.003							0.967
						(0.007)							(0.036)
External Debt to GDP							0.999						1.005***
							(0.001)						(0.002)
Exchange Rate Stability Index								2.783***					2.410
								(0.865)					(1.834)
Public Debt to GDP									0.997				0.992
									(0.002)				(0.007)
Sound Monetary Framework										0.925*			
										(0.039)			
Regulatory System											0.907		0.723
											(0.084)		(0.144)
Legal System and Property Rights												0.913	1.165
												(0.081)	(0.183)
Constant	0.383***	0.566*	1.030	0.701	0.359***	0.481***	0.614*	0.268***	0.567*	0.979	1.181	0.955	3.205
	(0.131)	(0.165)	(0.322)	(0.241)	(0.088)	(0.122)	(0.169)	(0.093)	(0.170)	(0.387)	(0.648)	(0.471)	(5.641)
Model Chi-Squared Test	42.95***	45.73***	55.70***	50.31***	39.71***	45.60***	50.82***	61.38***	42.21***	40.44***	43.97***	50.45***	72.65***
Number of Economies	113	116	114	92	115	116	116	114	115	103	103	105	81
Number of Observations	3,044	3,793	3,203	3,292	4,159	4,048	3,880	4,138	3,643	3,353	2,871	2,780	1,699

Source: IMF staff calculations.

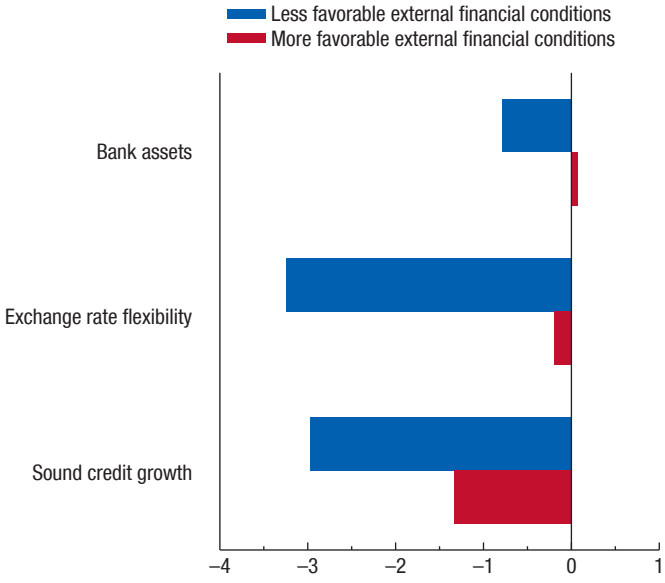
Note: Estimations do not include country fixed effects. ***,**, and * denote significance at the 1, 5, and 10 percent level, respectively. The coefficients report changes in the odds ratio of persistent accelerations. Value greater (smaller) than 1 indicates increase (decrease) in the odds ratio relative to the unconditional odds. Robust standard errors are reported in parentheses.

Annex Figure 2.6.1. Change in the Probability of Occurrence of Growth Episodes (Marginal Effect), 1970–2015
(Percentage points)



Source: IMF staff calculations.
Note: Vertical lines denote 90 percent confidence intervals. The figure shows the marginal effect of a given change in each domestic attribute evaluated at its mean. The magnitude of the change corresponds to an increase from the 25th to the 75th percentile of its sample distribution. CA = capital account; ER = exchange rate; MF = monetary framework.

Annex Figure 2.6.2. Reversals: Change in the Marginal Effect of External Financial Conditions When Selected Domestic Attributes Improve
(Percentage points)



Source: IMF staff calculations.
Note: The figure shows the change in the marginal effect of external financial conditions on the likelihood of reversal episodes when the domestic attribute variable is evaluated at the 75th versus at the 25th percentile of its distribution. Less (more) favorable external financial conditions correspond to the 25th (75th) percentile of their sample distribution. A negative value implies a further reduction in the probability of a reversal.

comparison is reversed to represent an improvement in the domestic attribute. The test of the difference in marginal effects assumes a *t*-distribution.

- The exercise reported in Annex Figure 2.6.2 shows the change in the marginal effect of external financial conditions as selected domestic attributes improve, but when external financial conditions are relatively favorable or unfavorable—rather than neutral. To this end, additional marginal effects are computed with the external conditions variable evaluated at two alternative values (for each value of the domestic attribute variable): a low value (the 25th percentile of its sample distribution) representing relatively adverse external conditions, and a high value (the 75th percentile of its sample distribution) representing relatively favorable external conditions.

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CHAPTER 3

UNDERSTANDING THE DOWNWARD TREND IN LABOR INCOME SHARES

This chapter documents the downward trend in the labor share of income since the early 1990s, as well as its heterogeneous evolution across countries, industries, and workers of different skill groups, using newly assembled data for a large sample of advanced and emerging market and developing economies. The chapter then analyzes the forces behind these trends. Technological progress, reflected in the steep decline in the relative price of investment goods, along with varying exposure to routine-based occupations, explains about half the overall decline in advanced economies, with a larger negative impact on the earnings of middle-skilled workers. In emerging markets, the labor share evolution is explained predominantly by the forces of global integration, particularly the expansion of global value chains that contributed to raising the overall capital intensity in production.

Introduction

The labor share of income—the share of national income paid in wages, including benefits, to workers—has been on a downward trend in many countries (Figure 3.1). In advanced economies, labor income shares began trending down in the 1980s, reaching their lowest level of the past half century just prior to the global financial crisis of 2008–09, and have not recovered materially since. Data are more limited for emerging market and developing economies, but in more than half of them—and especially the larger economies in this group—labor shares have also declined since the early 1990s. At the same time, the extent of the declines has been diverse across countries, both within the advanced economy and emerging market economy groups.

A falling labor share implies that product wages grow more slowly than average labor productivity.[1] If labor productivity increases at a rapid pace due to technological progress, and this is accompanied by steadily rising labor incomes, a declining labor share may be viewed as a byproduct of a favorable development. However, in a number of economies, declining labor shares result from the failure of product wage growth to keep up with weak productivity growth.[2] Furthermore, the decline in the labor share has been concomitant with increases in income inequality (Figure 3.2), for two reasons. The first is that within the workforce, lower-skilled workers have borne the brunt of the fall in labor share amid evidence of persistent declines in middle-skill occupations and income losses for middle-skilled workers in advanced economies (Autor and Dorn 2013; Goos, Manning, and Salomons 2014). The second is that capital ownership is typically concentrated among the top of the income distribution (Wolff 2010) and hence an increase in the share of income accruing to capital tends to raise income inequality (Box 3.1).

Inequality can fuel social tension, and recent research suggests that it can also harm economic growth (Berg and Ostry 2011). Low productivity growth, if persistent, leaves little room for expectations of future wage growth short of a reversal in favor of higher labor shares. As the global economy continues to struggle with subpar growth, an increasing recognition that the gains from growth often have not been broadly shared has strengthened a backlash against economic integration and bolstered support for inward-looking policies.

The forces behind the apparently widespread decline in labor income shares and the diversity of country experiences are not yet well understood. The fact that many advanced and emerging market and developing economies have experienced declines through somewhat synchronized evolutions—through domestic business cycles and over a period of profound structural transformation in advanced and emerging market economies alike—suggests key driving forces that are likely global. At the same time, varying exposures to

The authors of this chapter are Mai Chi Dao, Mitali Das (team leader), Zsoka Koczan, Weicheng Lian, with contributions from Jihad Dagher and support from Benjamin Hilgenstock and Hao Jiang. Robert Feenstra and Brent Neiman were external consultants.

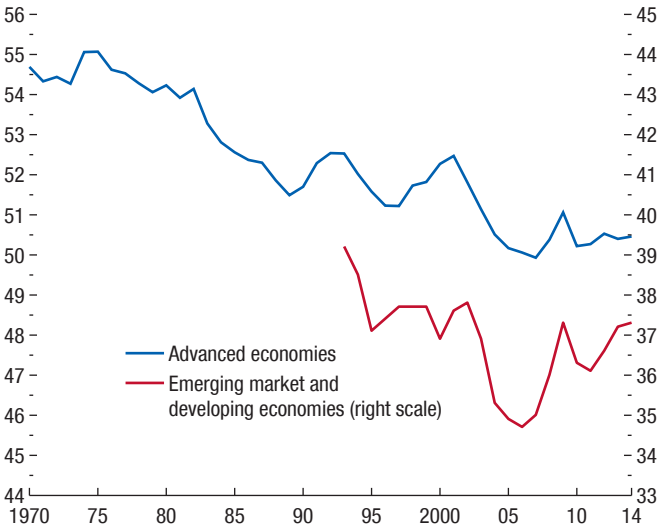
[1]The labor share of income can be written as: $(wL)/(PY) = (w/P) / (Y/L)$, in which w is the money wage (including benefits) per worker, L is employment (hours worked), Y is real output, Y/L is therefore labor productivity, and P is the GDP deflator. Because w/P is the wage expressed in units of domestic output, it is also called the *(real) product wage*. The product wage may differ from the *consumption wage* (that is, wages measured in terms of consumption), as the latter takes into account the terms of trade (the price of imports in terms of exports) and is a preferred measure of the purchasing power of workers' wage income (Annex 3.1).

[2]On the link between wages and productivity, see ILO (2015). On the productivity slowdown, see Ollivaud, Guillemette, and Turner (2016), and IMF (2017).

Figure 3.1. Evolution of the Labor Share of Income

(Percent)

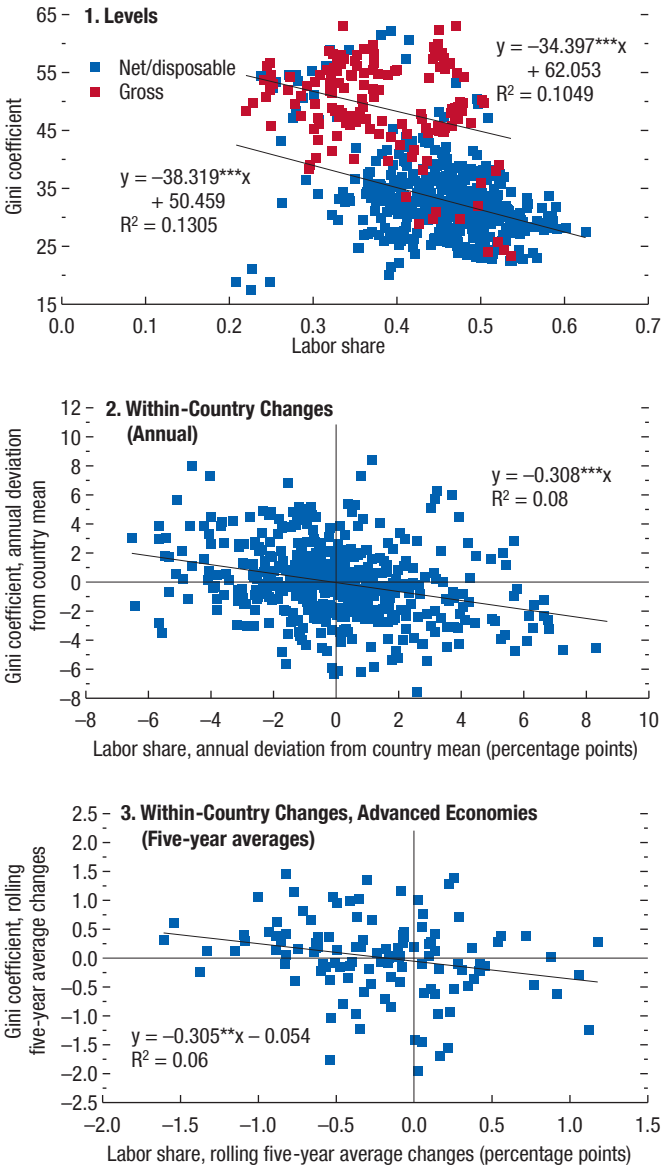
The labor share of income has been on a downward trend in both advanced economies and emerging market and developing economies.



Sources: CEIC database; Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: For advanced economies the figure shows averages weighted by nominal GDP in current U.S. dollars. For emerging market and developing economies the figure shows year fixed effects weighted least squares regressions (using nominal GDP weights) that also include country fixed effects. Year fixed effects are normalized to reflect the level of the labor share in 2000.

Figure 3.2. Labor Shares and Income Inequality

Lower labor shares are strongly associated with higher income inequality (measured by Gini coefficients) both across countries and over time within countries.



Sources: CEIC database; Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; World Bank, All the Ginis database; and IMF staff calculations.
Note: *** indicates 1 percent statistical significance; ** indicates 5 percent statistical significance.

common global trends may help explain the diversity in labor share trends across countries (Figure 3.3).

Analysts focusing predominantly on the United States and advanced economies have concentrated on two leading explanations for the downward trends in labor shares: the rapid advance of technology and the globalization of trade and capital.[3] There is broad consensus that, notwithstanding the considerable adjustment costs these forces have imposed on some groups of workers, both trends have contributed strongly to overall growth and prosperity worldwide as well as to income convergence in emerging market and developing economies. In particular, the benefits of trade and financial integra-

[3]See, for example, Blanchard (1997); Elsby, Hobijn, and Şahin (2013); Rognlie (2015); Autor and others (2017); and Acemoglu and Restrepo (2016) for analyses of the United States and other advanced economies. Chapter 5 of the April 2007 WEO documents shifts in employment across sectors and technological advancement as the key contributors to the evolution of labor shares in advanced economies during 1980–2002. See Harrison (2002); Rodrigues and Jayadev (2010); and Karabarbounis and Neiman (2014) for analyses that include emerging market economies.

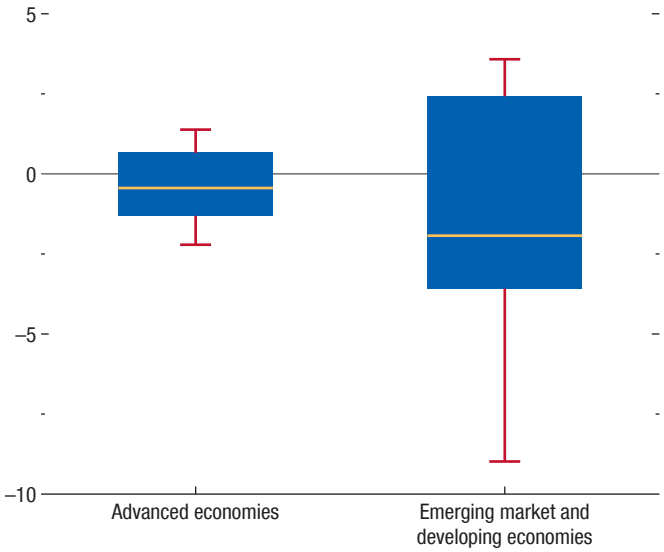
tion to emerging market and developing economies—where they have fostered convergence, raised incomes, expanded access to goods and services, and lifted millions from poverty—are well documented.[4] Even though product wages have grown more slowly than average productivity in some emerging market and developing economies (Annex 3.1), the rise in product wages has, to some extent, been driven by the integration of these countries into the global economy. Indeed, the rise in inequality in some emerging market economies must also be viewed in the context of rising income levels for those at the bottom of the income distribution (OECD 2011; World Bank 2016). At the same time, empirical analysis has shown that, in some advanced economies, the automation of jobs, along with offshoring and import competition, have led to persistent losses of jobs in middle-skill occupations.[5]

One way in which technological advancement has affected factor shares is through a steep decline in the relative price of investment goods, which has lowered firms' cost of capital and therefore has given them strong incentives to replace labor with capital (Karabarbounis and Neiman 2014).[6] The chapter makes two key contributions on this front. First, it explores whether the rapid advance in information and communications technology, which underpins much of the decline in the price of investment goods, has lowered labor shares by encouraging the automation of routine tasks.[7] To this end, the chapter introduces measures of exposure to routinization to assess whether the declining price of investment has led to a greater decline in labor shares in more exposed countries and industries.[8] Second, the chapter highlights that, while the relative price of investment has declined steeply in advanced economies, it has experienced a milder decline in emerging market economies, where it has even risen in some (Annex Figure 3.4.2).

Trade and financial integration have increased dramatically over the past 25 years. This process has been driven by the removal of restrictions on international

Figure 3.3. Distribution of Estimated Trends in Labor Shares, 1991–2014
(Percentage points per 10 years)

The evolution of the labor share of income has been heterogeneous, noticeably more in emerging market and developing economies than in advanced economies.



Sources: CEIC database; Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: The horizontal line inside each box represents the median; the upper and lower edges of each box show the top and bottom quartiles; and the red markers denote the top and bottom deciles.

[4]The benefits of global economic integration are widely documented. A recent summary is in Baldwin (2016). See also, Fajgelbaum and Khandelwal (2014), Costinot and Rodriguez-Clare (2013), Wacziarg and Welch (2008), Section 2 in Chapter 2 of the October 2016 *World Economic Outlook,* and IMF (2017). Chapter 2 of this WEO documents that stronger capital inflows have tended to come with higher per capita growth in emerging market and developing economies.

[5]Autor and Dorn (2013) provide evidence of a link between the adoption of information technology and the polarization of employment and wages in the United States, whereas Autor, Dorn, and Hanson (2016) and Pierce and Schott (2016) document employment losses in U.S. industries more exposed to import competition from China. Goos, Manning, and Salomons (2014) provide evidence that routine-biased technological change, and to a much lesser extent, offshoring of tasks, can explain job polarization in European advanced economies.

[6]The channel by which technological progress affects the labor share is by lowering the user cost of capital, inducing firms to substitute capital for labor. The impact on the labor share depends on the elasticity of substitution between labor and capital (see Box 3.2). The user cost of capital is the annual opportunity cost of using rather than selling existing capital, and increases with the price of capital, the interest rate, the depreciation rate, and the expected decline in the price of capital. Technology that produces investment goods more efficiently lowers the price of capital and thus the user cost. A decline in interest rates or capital depreciation rates could play a role similar to that of technological progress in lowering the user cost of capital.

[7]The role of information and communications technology in the price of investment is discussed in Krusell (1998); its role in the displacement of labor through the automation of routine tasks is discussed in Autor and Dorn (2013) and Goos, Manning, and Salomons (2014).

[8]See Box 3.3 for details on construction of the routinization exposures and stylized facts about them. Eden and Gaggl (2015) illustrate the impact of routine and nonroutine tasks on U.S. labor shares in a calibration exercise.

trade and capital mobility, as well as by declining transportation and communications costs, which have themselves been facilitated by technological progress. Economic integration has brought about domestic factor reallocation in response to import competition; promoted the relocation of lower-skill, labor-intensive stages of production to cheaper locations in emerging and developing economies; and may have lowered the relative cost of capital. By increasing competitive pressure on domestic firms and credibly raising their ability to relocate abroad, trade and financial integration may have also lowered labor's bargaining power.

Traditional theories of trade based on international differences in given factor endowments predict that trade integration will reduce labor shares in capital-abundant advanced economies but raise them in labor-abundant emerging market economies. The actual evolution of labor shares in the latter group of countries is, however, at odds with this prediction. As alluded to above, the process of integration is more complex than captured by classical trade models, as it involves movement of factors across borders, technology transfers, and shifts in relative bargaining power between capital and labor. This chapter highlights a mechanism by which participation in global value chains can simultaneously lead to lower labor shares in advanced and emerging market economies (see the section titled "Drivers of the Labor Share of Income: Key Concepts and Mechanisms" and Annex 3.2), and explores empirically whether trade and financial integration in general—and participation in global value chains in particular—is correlated with the evolution of labor shares.

Other explanations for the downward trends in labor shares are also possible. The regulation of labor and product markets is an important determinant of both the size of profits and their distribution between capital and labor (Blanchard and Giavazzi 2003). Changes in product market structure that favor agglomeration, for example, may have increased concentration across a number of industries, raising profit shares and lowering the labor share of income (Council of Economic Advisers 2016; Autor and others 2017). Changes in policies (such as declining corporate income tax rates) may have strengthened incentives to substitute capital for labor, while changes in institutional arrangements (such as unionization rates) may have contributed to the decline in labor's share of income by lowering labor's bargaining power.[9]

[9]Some evidence for the impact of declining bargaining power on lowering labor shares is in Kramarz (2016) and OECD (2012).

Finally, as noted in Gollin (2002) and Bridgman (2014), there are two measurement problems that present well-known challenges to the analysis of labor shares: self-employed individuals, whose labor compensation is not recorded separately in national income accounts; and the depreciation of capital, which should arguably be removed from the calculation of factor shares as it does not reflect net capital income. Though data limitations constrain the use of adjusted measures of labor shares for all of the analysis, the chapter considers robustness of the results to allow for both of these considerations. The chapter focuses in particular on the following questions:

- How widespread has the decline in the labor share of income been since the early 1990s? To what extent have trends in labor income shares differed across countries, industries, and skill groups?
- What are the key drivers of the labor share of income and through which mechanisms do they operate? Do the drivers vary between advanced economies and emerging market and developing economies, industries, and skill groups?
- How have exposures to routinization and participation in global value chains affected labor shares? What roles have regulations of labor and product markets played?

The chapter begins by documenting stylized facts about recent trends in labor shares of income. It then presents the mechanisms by which key drivers can influence labor share dynamics. The chapter then employs two complementary approaches to analyze long-term changes in labor shares. The first approach is a shift-share analysis that determines whether the downward trend in the global labor share is driven by within-industry declines (declines within individual industries, such as manufacturing or transportation) or by changes in industrial composition (shifts from high-labor-share sectors to low-labor-share sectors). The second approach, which constitutes the core of the empirical analysis, quantifies the extent to which drivers can track long-term changes in labor income shares. This analysis is conducted using a newly assembled data set on aggregate and sectoral labor shares for both advanced economies and emerging market and developing economies, in addition to data on labor shares of different skill groups.[10]

[10]The sectoral labor share data on emerging market and developing economies is new to this chapter. It is compiled using official sources and is described in detail in Annex 3.3, and Dao and others (forthcoming).

In this chapter, global integration is measured by three variables: trade in final goods and services (proxied by value-added exports and imports relative to GDP), participation in global value chains (proxied by the sum of forward and backward linkages [see Annex 3.4 for details]), and financial integration (proxied by the sum of external assets and liabilities excluding reserves, in percent of GDP). Although the chapter treats global integration and technology as distinct drivers of labor shares, it is clear that they are both conceptually and empirically difficult to disentangle. For instance, technological advances have likely facilitated economic integration by lowering communications and logistic costs, but economic integration has plausibly eased the diffusion of technology across borders. It should therefore be kept in mind that their effects cannot be fully separated out and results should be interpreted in light of these empirical challenges. The chapter's main findings are as follows:

- Between 1991 and 2014, the labor share declined in 29 of the largest 50 economies; those 29 economies accounted for about two-thirds of world GDP in 2014. Across industries, labor income shares have declined in 7 of the 10 major industries, with the sharpest declines occurring in the more tradable sectors, such as manufacturing, and transportation and communication.
- The decline in the labor share of income between 1993 and 2014 appears to result from within-industry declines, rather than a shift from high-labor-share sectors to sectors with relatively lower labor shares. A shift-share decomposition, which separates such within-industry changes and between-industry changes, reveals that more than 90 percent of changes in labor income shares reflect within-industry changes rather than sectoral reallocation. An important exception is China, where reallocation from agriculture to other industries accounts for the majority of the decline in the labor share of income.
- Technological advancement, measured by the long-term change in the relative price of investment goods, together with the initial exposure to routinization, have been the largest contributors to the decline in labor income shares in advanced economies. The empirical analysis suggests that about half of the total decline in labor shares can be traced to the impact of technology. Importantly, for a given change in the relative price of investment, economies with high exposure to routinization experienced about four times the decline in labor income shares than those with low exposure. Global integration has also played a role, largely by lowering labor shares in tradables sectors. The quantitative impact of changes in policies and institutions, and reforms in product and labor markets, appears to be limited but may reflect in part the difficulty of empirically separating trends in global integration and de-unionization. The results for the advanced economy composite mirrors the results for individual economies, where technology is the largest contributor to the change in labor shares in the large majority of countries.
- In emerging market economies as a whole, global integration, and more specifically, participation in global value chains, appears to be an important factor behind the decline in the labor share of income. Its impact has been partly offset by financial integration, which has raised labor shares, conceivably by lowering the cost of capital, as well as by the limited substitutability between labor and capital in these economies.[11] For emerging market economies in the aggregate, there is no discernible role of technology in the evolution of labor shares. This reflects both a relatively mild decline in the relative price of investment goods and, importantly, a much lower exposure to routinization, which has limited labor displacement arising from routine-biased technology. However, the results for the emerging market composite mask significant differences across individual economies, resulting from substantial diversity in the evolution of the relative prices of investment goods as well as the initial exposures to routinization in these economies.[12]
- The decline in labor shares driven by technology and global integration has been particularly sharp for middle-skilled labor. This finding is consistent with the hypothesis that routine-biased technology has taken over many of the tasks performed by middle-skilled labor, contributing to job polarization toward high-skill and low-skill occupations.
- Adjustments to the labor share of income for self-employment and capital depreciation rates, which present the two measurement challenges confronting labor share data, can have important effects on both

[11]As discussed in the section titled "Drivers of the Labor Share of Income: Key Concepts and Mechanisms," and in Box 3.2, when exposure to the automation of tasks is low, lower cost of capital can *raise* the labor share of income.

[12]By contrast, the trend change in participation in global value chains is much more homogeneous across the emerging market economies in the sample, implying a more homogeneous impact on the change in their labor shares.

the level and evolution of labor shares (Box 3.4). However, for both advanced and emerging market economies, findings about the key drivers of the unadjusted labor shares are robust to adjustments for both self-employment and depreciation rates.

Trends in the Labor Share of Income: Key Facts

The global labor share of income began a downward trend in the 1980s, declining 5 percentage points to its trough in 2006. It has since then trended up by about 1.3 percentage points, which may reflect either cyclical or structural factors associated with the global financial crisis. This downward trend has overturned one of the enduring stylized facts in Kaldor (1957), which supported a long tradition of assuming a constant labor share of income in growth and other macroeconomic models, and thus raised complex questions about the rising role of capital in production and its implications for the future of employment and labor income.

This chapter focuses on the past two decades—1991 through 2014—during which the global labor share of income declined by some 2 percentage points, because this is a period of significant flux in the global economy through trade, technology, and political changes, including the transformation of global labor markets following the entry of China, India, and former Eastern bloc countries into the world economy in the early 1990s.[13] In particular, the period since 2000 saw an acceleration of global integration following China's accession to the World Trade Organization, along with rapid increases in emerging market investment in infrastructure and education that led to a surge in offshoring to these economies (Obstfeld 2016). As a result of both offshoring and technological advances, routine occupations in advanced economies became increasingly automated in this period, contributing to a deep decline in middle-skill employment (Autor and Dorn 2013; Goos, Manning, and Salomons 2014). In recent years, the global economy has undergone further structural changes—a protracted period of weak growth, a trade slowdown, and a deceleration of total factor productivity growth—which, coupled with demographic shifts, have all likely affected labor income shares.

A less well-known fact about the fall in labor shares at the global level is that it reflects declining shares in both advanced and, to a lesser extent, emerging market and developing economies.[14] Indeed, the labor share of income has declined in four of the world's five largest economies, led by the steepest decline in China, while the labor share of income in the United Kingdom has trended up (Figure 3.4, panel 1). At the same time, the evolution of the labor share within each of these country groups has been heterogeneous (Figure 3.3). In a sample of 35 advanced economies, between 1991 and 2014, the labor share declined in 19, which accounted for 78 percent of 2014 advanced economy GDP, and rose or remained relatively stable in the remainder. The overall cross-country dispersion of labor shares is considerably larger in emerging market and developing economies than in advanced economies.[15] In a sample of 54 emerging market and developing economies (for which, on average, the decline in the labor share over the sample period is concentrated in the early 1990s), the labor share declined in 32 economies, which accounted for about 70 percent of 2014 emerging market GDP, while rising or remaining roughly constant in the rest.

The broad contours of the decline in the global labor share of income also conceal a heterogeneous evolution across industries (Figure 3.4, panel 2).[16] At the global level, the sharpest decline in the labor share was in manufacturing, followed by transportation, while some sectors (food and accommodation, agriculture) witnessed an increase. This global picture reflects largely developments in advanced economies; in emerging market and developing economies, the sharpest decline was observed in agriculture, and labor shares rose in manufacturing and, particularly, in health services and construction. This partly reflects the industrial labor share evolution in China, given its increasing GDP weight in this country group since 1993.

The decline in the global labor share has been borne by low- and middle-skilled labor. During 1995–2009 their combined labor income share was reduced by more than 7 percentage points, while the global high-skilled labor share increased by more than 5 percent-

[13]The chosen period also serves to maximize data coverage of emerging market and developing economies.

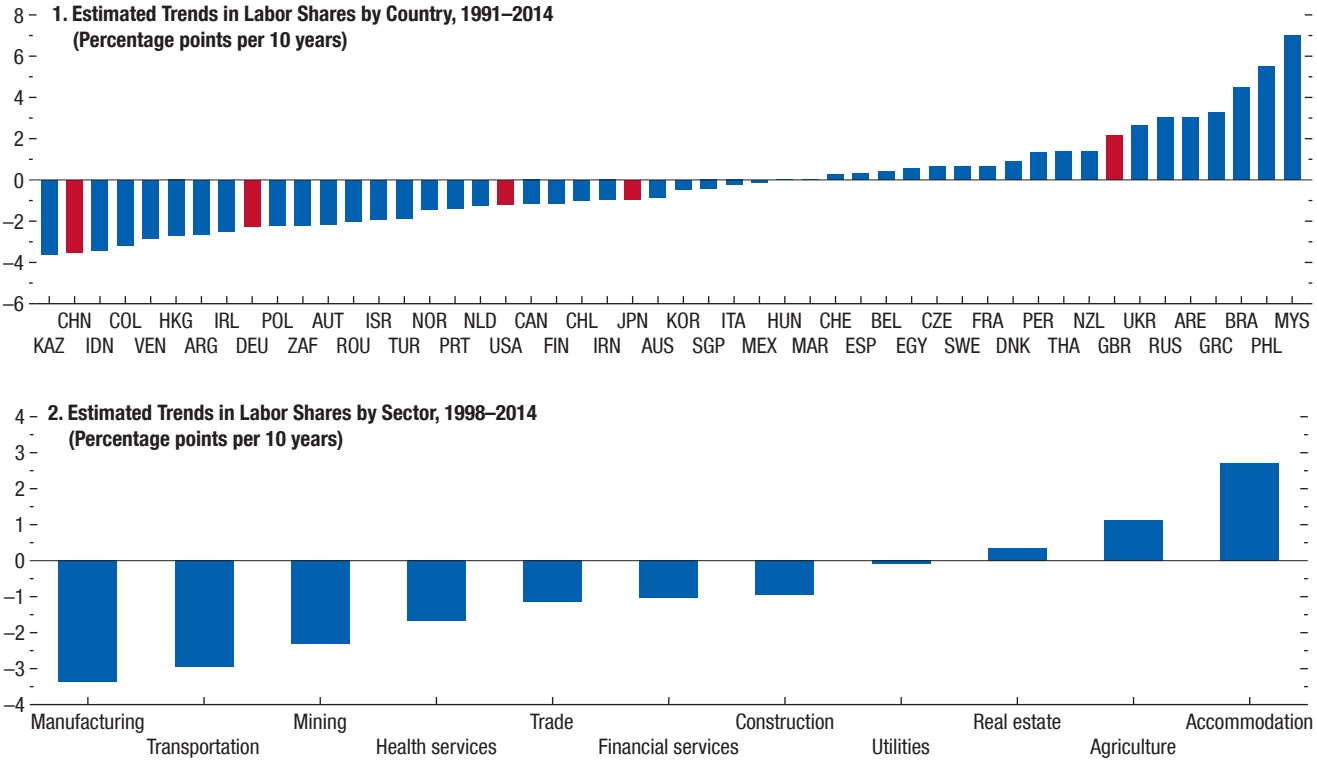
[14]This finding corroborates that of Karabarbounis and Neiman (2014). Relative to that paper, the chapter's data cover a larger number of countries and extend their time period by up to four years. Importantly, the data used in this chapter include significant revisions to the official labor share data for systemically large countries such as Brazil, China, Germany, and the United Kingdom.

[15]The standard deviation of long-term changes in labor shares was 4.8 across emerging market and developing economies and 1.5 across advanced economies.

[16]Sector-level data country coverage is smaller than aggregate labor share data coverage for emerging market and developing economies and spans a slightly shorter period.

Figure 3.4. Estimated Trends in Labor Shares by Country and Sector

While the downward trend in the labor share of income is fairly broad based across countries and industries, there is tremendous diversity in its evolution.



Sources: CEIC database; Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; and IMF staff calculations.
Note: The figure shows estimated trends in labor shares. In the first panel, the largest five economies are highlighted in red. Data labels in the figure use International Organization for Standardization (ISO) country codes.

age points (Figure 3.5, panels 1–2). The decline in middle-skilled labor's income share was driven primarily by a drop in their relative wage rate. The share of middle-skill employment in the total workforce remained stable or even rose (Figure 3.5, panels 3–4), while the labor share decline for low-skilled labor and the increase for high-skilled labor were also driven, to a large extent, by the diverging trend in employment composition, reflecting rising levels of education. This pattern is consistent with the notion that technological progress has been biased in favor of high-skilled labor.[17] Furthermore, while the broad patterns hold for both advanced and emerging market and developing economies, they are more pronounced in advanced economies, consistent with evidence of wage and employment polarization in these economies.[18]

Drivers of the Labor Share of Income: Key Concepts and Mechanisms

This section provides a brief description of the key concepts surrounding and the mechanisms by which the main drivers can influence the labor share of income.

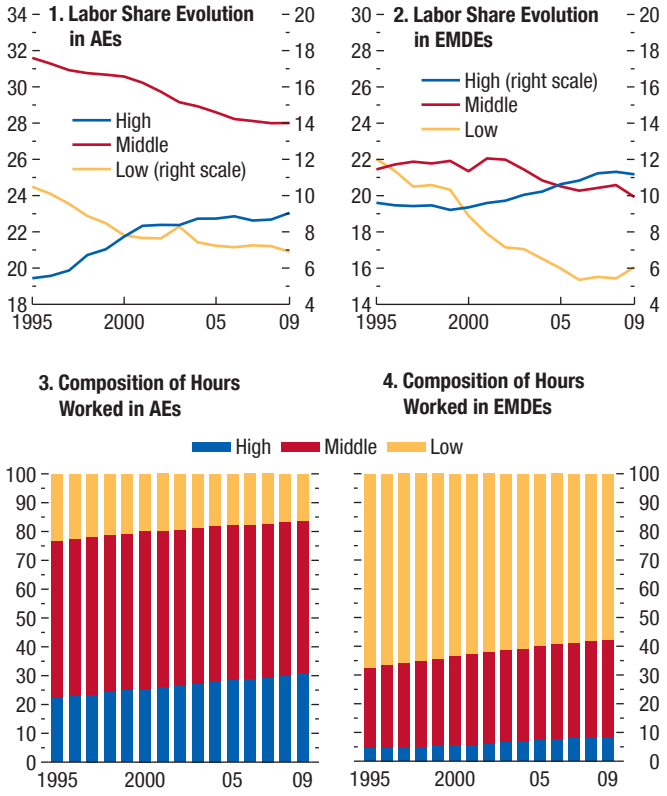
A key parameter that influences the factor shares of income is the elasticity of substitution between capital and labor, which measures how easily one is substituted with the other when their relative cost changes

[17]See Berman, Bound, and Griliches (1994); and Caselli (2015). Jones and Romer (2009) reexamine Kaldor's (1957) stylized facts and highlight the long-term stability of relative wages. In particular, they note that the rising quantity of human capital relative to unskilled labor has not been matched by a sustained decline in its relative price, which they propose is explained by the skill-bias of technological change.

[18]Evidence of job polarization in the United States is presented in Autor and Dorn (2013) and, for European economies, in Goos, Manning, and Salomons (2014).

Figure 3.5. Labor Share Evolutions and Labor Force Composition by Skill Level
(Percent)

The decline in the labor share of income for low- and middle-skill workers has been especially pronounced, with the decline for middle-skill workers driven primarily by a decline in their relative wage rate.



Sources: World Input-Output Database; and IMF staff calculations.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies.

(Box 3.2). The role of this elasticity in the distribution of income has a rich conceptual and empirical history that originates in Arrow and others (1961).[19] When capital is highly substitutable for labor (the elasticity of substitution is larger than 1), a decline in the relative cost of capital drives firms to substitute capital for labor to such a high degree that, despite the lower cost of capital, the labor share of income declines. As revealed by the illustrative model built for this chapter, this elasticity of substitution can also play a role in the impact of offshoring on labor income shares. In particular, if, for the tasks offshored from high-wage to low-wage countries, capital cannot easily be replaced by labor (the elasticity of substitution is lower than 1), the labor income share may decline in the receiving country.[20]

With this key concept in mind, this section describes the main drivers of labor shares, dividing them into four broad categories: technological advancement; global integration; policies, institutions, and regulation of labor and product markets; and measurement issues. Although the first three drivers are treated as distinct channels for exposition, this is an artificial separation, as they are all potentially intertwined. In addition to the mutually reinforcing forces of technology and global integration described earlier, the evolution of country-specific policies, regulations, and reforms may themselves reflect global factors. For example, the decline in corporate taxation rates may reflect intercountry competition to attract capital in a globalized world where capital is freely mobile (Rodrik 1998). Similarly, declining unionization rates may reflect the decline of labor's bargaining power, itself a result of trade integration (Elsby, Hobijn, and Şahin 2013). It is therefore extremely difficult to quantify the distinct effects of each of these drivers.

Technological Advancement

Technological progress, embodied in faster productivity growth in the capital goods sector relative to the rest of the economy, lowers the price of investment goods and thus induces firms to substitute capital for labor (Chapter 5 of the April 2007 WEO; ILO 2012; OECD 2012; Karabarbounis and Neiman 2014). This chapter puts particular emphasis on the rapid advance of information and communications technology, which accelerates the automation of routine tasks and thus induces firms to disproportionately substitute capital for labor where the exposure to such tasks is larger (see Box 3.3). The two mechanisms are likely to interact: a decline in the relative price of investment goods will trigger greater substitution away from labor, and this impact is likely more pronounced where labor performs more routine tasks.

[19]The constant elasticity of substitution production function, which is widely used to analyze the functional distribution of income, originates in Arrow and others (1961), where it was presented as an alternative to the Cobb-Douglas and Leontief production functions and used to estimate labor's share of income on disaggregated cross-country data. See also Robinson (1933) and Karabarbounis and Neiman (2014).

[20]The theoretical model (Annex 3.2, Proposition 1) suggests that offshoring from advanced economies may indeed involve tasks with lower elasticity of substitution. The key insight is that the capital deepening induced by a decline in the relative price of investment goods renders tasks with a high elasticity of substitution *less* labor-intensive, which in turn implies that firms benefit less from offshoring these tasks to low-wage destinations.

The steep global decline in the price of investment is by and large an advanced-economy phenomenon (Figure 3.6, panel 1).[21] The milder overall decline experienced by emerging market and developing economies is explained, in large measure, by the smaller weight of information and communications technology capital and machinery and equipment (the group of capital goods that has led the decline in the relative price of investment) in their investment goods basket and the greater commodity intensity of their investment.[22] Countries also differ widely in their initial exposure to routinization, which exhibits a negative correlation with the subsequent change in labor shares of income (Figure 3.6, panel 2).[23] On this aspect as well, emerging market and developing economies differ systematically from advanced economies, exhibiting substantially lower initial exposure to routinization (see Boxes 3.2 and 3.3).

Taken together, these two stylized facts suggest that advances in technology have triggered greater substitution of capital for labor in advanced economies than in emerging market and developing economies because the former were more exposed to automation of routine tasks and experienced a larger fall in investment good prices than the latter (Figure 3.7).

Global Integration

Trade and financial integration are other factors widely viewed as a significant determinant of the evolution of labor shares (Harrison 2002; Rodrigues and Jayadev 2010; Chapter 5 of the April 2007 WEO; Elsby, Hobijn, and Şahin 2013). Several interrelated mechanisms—with potentially offsetting impacts—may be at play.

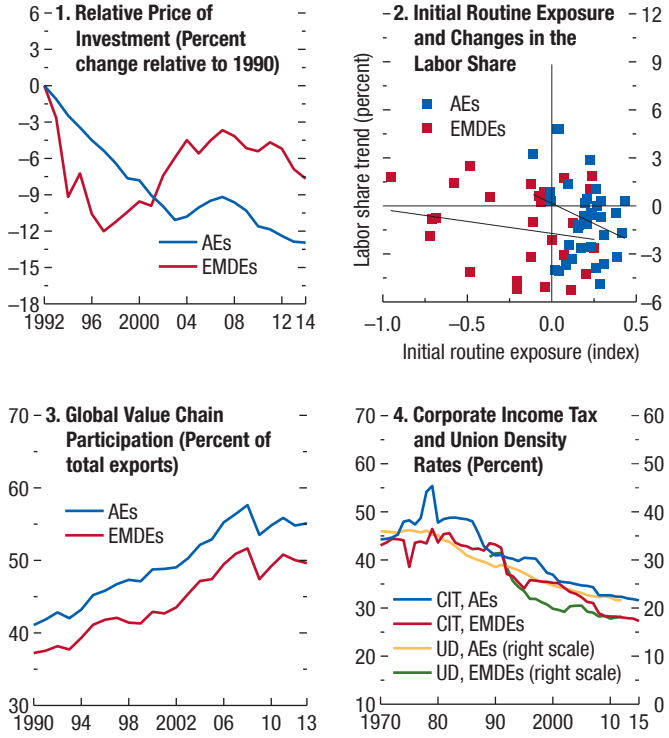
[21]Between 1993 and 2014 the relative price of investment declined by about 12 percent in advanced economies, reflecting declines in the clear majority of individual economies as well; and by about 7 percent in emerging market and developing economies as a whole, declining by less in several individual economies and even rising in some.

[22]Hsieh and Klenow (2007) document the higher *level* of the relative price of investment in poor countries. Some evidence in Obstfeld and Taylor (2004) suggests that this is driven by distortions, including import barriers and taxes. Dao and others (forthcoming) find a strong negative correlation between the import price deflator and the relative price of consumption in emerging market economies, as well as in some commodity-intensive advanced economies, which is absent in other advanced economies. Factors that affect the level of the relative price of investment in emerging market economies could affect the trend change if the role of these factors has changed over time (see Dao and others, forthcoming).

[23]The initial exposure to routinization is measured as the first available observation between 1990 and 1995.

Figure 3.6. Trends in Potential Drivers of Labor Shares

The relative price of investment has declined more in advanced economies than in emerging market and developing economies. Countries with higher initial routine exposure experienced larger subsequent declines in labor shares. Global value chain participation increased, while corporate income taxes and union density rates declined in both sets of countries.



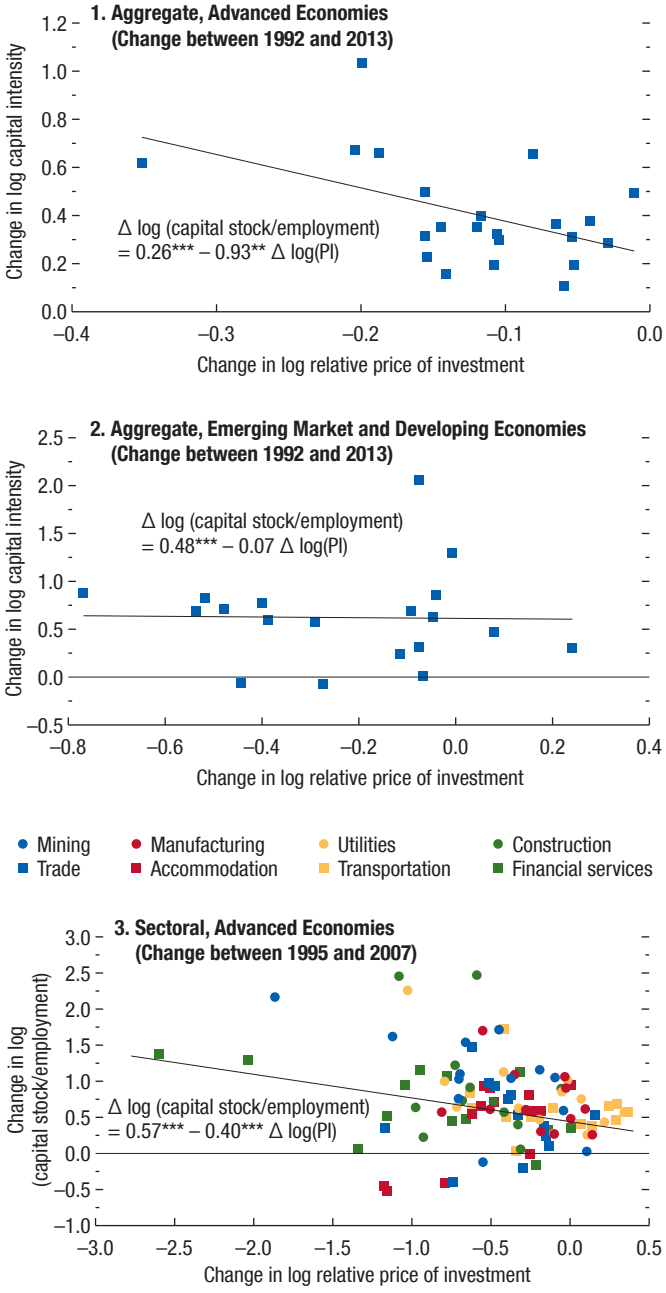
Sources: Autor and Dorn (2013); Eora Multi-Region Input-Output database; Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; United Nations database; World Input-Output Database; and IMF staff calculations.
Note: Panel 2 shows estimated trends in the labor share. Trend coefficients are reported on the *y*-axis in units per 10 years. Initial routine exposure is measured as the first available observation between 1990 and 1995. Panels 1, 3, and 4 show fixed effects from regressions that also include country fixed effects to account for entry and exit during the sample. The regressions are weighted by nominal GDP in current U.S. dollars. Fixed effects are normalized to reflect the respective variable's level in 1993. AEs = advanced economies; CIT = corporate income tax rate; EMDEs = emerging market and developing economies; UD = union density rate.

Trade integration

Traditional theory predicts that trade integration will lead capital-abundant advanced economies to specialize in the production of capital-intensive goods, triggering resource reallocation across sectors that lowers the labor share of income. The opposite is predicted to occur in labor-abundant emerging market and developing economies. Although this model is at odds with the decline in labor shares of emerging market and developing econ-

Figure 3.7. Change in the Relative Price of Investment and Capital Intensity

Technological advancement has triggered greater substitution of capital for labor in advanced economies than in emerging market and developing economies.



Sources: EU KLEMS database; Penn World Table 9.0 database; World Input-Output Database; and IMF staff calculations.
Note: Change in capital intensity refers to the change in log (capital stock/employment). *** indicates 1 percent statistical significance; ** indicates 5 percent statistical significance. PI = price of investment.

omies as a whole, it could well play a prominent role in the evolution of labor shares in specific economies, such as those where the labor share of income has risen.

Participation in global value chains

Figure 3.6 (panel 3) illustrates the rising trend in global value chain participation—measured as the sum of so-called forward and backward linkages in vertical specialization, a widely used measure of participation in global value chains.[24] Among advanced economies, this reflects an offshoring of production of intermediate goods, and, since the late 1990s, a steady increase in offshoring of services as well (Amiti and Wei 2009). Among emerging market and developing economies, it reflects an increase in the importation of components for assembly and re-exportation in global value chains (Hummels and others 2014; Koopman, Wang, and Wei 2014).[25]

An important insight in modern trade literature is that most trade flows occur within narrowly defined industries and that the production of a final good is often broken up into a set of tasks that can each be carried out in the most cost-efficient location (Grossman and Rossi-Hansberg 2008). This chapter presents a mechanism by which the expansion of global value chains has the potential to account for a decline in labor shares in both advanced and emerging market and developing economies. The mechanism described here is one of many possibilities but is supported by a key stylized fact about global value chain participation and capital deepening. A sketch of the main elements of this mechanism is presented below (Annex 3.2 presents the details).

The expansion of global value chains has been enabled by a collapse in the costs of communications and transportation, which has allowed firms to unbundle production into many tasks and minimize production costs by exploiting factor cost disparities across

[24]Backward linkages capture the extent of offshoring of intermediate inputs used in exports and are defined as the share of foreign value added in gross exports. Forward linkages measure the extent of vertical specialization and are defined as the share of exports consisting of intermediate inputs used by trading partners for production of their exports to third countries (Koopman, Wang, and Wei 2014).

[25]For simplicity of exposition, the chapter assumes that advanced economies' participation in global value chains mostly entails offshoring of labor-intensive jobs to lower-wage destinations (and specialization in high-skill tasks at either end of the value chain), and that emerging markets' participation in global value chains reflects mostly onshoring of such jobs for assembly and re-exportation. This is an obvious simplification because a country can specialize along different stages of the global production chain at the same time, producing along several parts of a value-added chain that entail both offshoring and onshoring (Hummels and others 2014).

countries (Feenstra and Hanson 1997; Grossman and Rossi-Hansberg 2008). Because wages are higher in advanced economies than in emerging market and developing economies, tasks that are relatively labor-intensive are likely to be offshored from the former to the latter. For advanced economies, the implications are straightforward: because offshored tasks are relatively labor-intensive, the composition of production becomes more capital-intensive, and a decline in labor income shares ensues. In addition, offshoring—or the threat thereof—lowers labor's bargaining power (Harrison 2002), further reducing the labor share *within* remaining tasks.

To consider how participation in global value chains can also reduce labor income shares in emerging market and developing economies, a preliminary observation is that the expansion of global value chains has coincided with the steep decline in the relative price of investment goods in advanced economies, leading to automation of more tasks in these economies. In particular, tasks most likely to be automated are those for which labor is most substitutable by capital, thus implying that tasks with low elasticity of substitution between capital and labor are most likely to be offshored.[26] The key insight of the stylized model is that insofar as tasks offshored have limited substitution between capital and labor, participation in global value chains can also reduce labor income shares in emerging market and developing economies.

How can the offshoring of tasks with limited substitutability between factors reduce the overall labor income share in emerging market and developing economies? The crucial insight is that in an environment of *high local relative cost of capital*—precisely the environment in capital-scarce emerging market economies—tasks with high substitutability between factors will have lower capital shares than the average task, as firms exploit low relative labor costs to substitute labor for capital. Symmetrically, tasks with low substitutability between capital and labor will have high capital shares. It follows that by raising the proportion of tasks for which it is difficult to replace capital by labor, offshoring can shift the composition of production to tasks with higher capital shares, thus lowering the average labor income share in receiving countries.

Elsby, Hobijn, and Şahin (2013) hypothesize that one way to rationalize declining labor shares worldwide is to consider that tasks that are labor-intensive in advanced economies are capital-intensive compared with existing tasks in the economies to which they are offshored, which would raise capital shares in both sending and receiving economies.[27] This idea resembles that in Feenstra and Hanson (1997), in which low-skill tasks offshored from advanced economies are nevertheless relatively high-skill tasks in recipient emerging market economies. By clarifying the nature of tasks likely to be offshored, the mechanism proposed in this chapter provides a conceptual foundation for the hypothesis in Elsby, Hobijn, and Şahin (2013).

The model of this chapter is intended to illustrate a mechanism that can relate global value chain participation to the observed decline in labor shares worldwide. The model contains some assumptions—for instance on the parameters of the task-specific production function. Whether participation in global value chains lowers or raises overall labor shares is thus ultimately an empirical question. The stylized evidence in Figure 3.8, however (examined more systematically in the following section), suggests that rising global value chain participation is indeed associated with rising capital intensity, particularly in emerging market and developing economies.

Financial integration

Fewer barriers to the mobility of capital across borders, particularly foreign direct investment, may also play a role in labor share dynamics. This may happen through two distinct channels. First, by facilitating the relocation of production to countries with cheaper inputs, capital mobility lowers labor's bargaining position.[28] Second, by increasing access to capital, financial integration lowers the cost of capital in capital-scarce countries, facilitating capital deepening and potentially inducing greater substitution of capital for labor.[29] The second channel may be

[26]This intuition is formally proved in Proposition 1 in Annex 3.2.

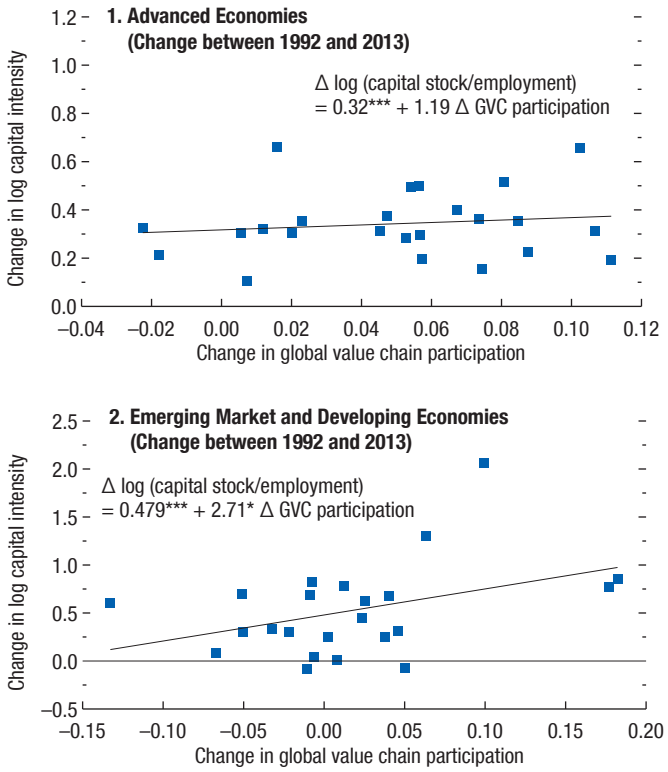
[27]A related hypothesis is in Cho (2016), in which technological advancement is always labor saving, and tasks that are relatively more labor intensive in advanced economies are offshored to emerging market economies. In that case, offshoring lowers labor shares in emerging markets because offshored tasks use more advanced technology than existing technology. In contrast with Cho (2016), in this chapter's model, technological advancement may or may not be labor saving to allow for the possibility that high-skilled workers in emerging markets benefit more from technological advancement but are also highly complementary with capital.

[28]Kramarz (2016) discusses this channel and provides supporting empirical evidence using firm-level data.

[29]Net foreign direct investment flows have indeed gone from rich to poor countries despite the Lucas paradox (the assertion that total capital flows from rich to poor countries are far lower than predicted by theory). Caselli and Feyrer (2007) show that the net return differential between rich and poor countries is not as large as originally assumed; for an updated overview see Boz, Cubeddu and Obstfeld (2017).

Figure 3.8. Changes in Global Value Chain Participation and Capital Intensity

Rising participation in global value chains is associated with increasing capital intensity in production, particularly in emerging market and developing economies.



Sources: Eora Multi-Region Input-Output database; Penn World Table 9.0 database; and IMF staff calculations.
Note: Change in capital intensity refers to the change in log (capital stock/employment); change in global value chain participation is measured using the backward linkage—that is, the share of foreign value added in gross exports. *** indicates 1 percent statistical significance; * indicates 10 percent statistical significance. GVC = global value chain.

especially relevant for emerging market and developing economies where financial frictions and credit rationing are more prevalent, and the benefits of financial integration accrue largely to high-skilled workers, whose skills are more complementary to capital.[30]

Policies, Institutions, and Regulations

Labor and product market policies, institutions, and regulations can also play a role in the evolution of labor shares. While policies themselves may have changed partly in response to trends in global integration and technology, these changes may also have had independent impacts on labor income shares. A decline in corporate income tax rates, for instance, can raise the relative return to capital, which may induce a further substitution of capital for labor and lower the labor share of income. The trend decline in unionization rates may reflect the lower bargaining power of labor (Figure 3.6, panel 4), also causing a decline in labor income shares. Moreover, changes in market regulations over the past two decades—for example, those that regulate worker hiring and dismissal or competition in product markets—may have affected factor shares through their impact on the size and distribution of rents. Changes in product market structure could also emerge independently of regulation and may reflect, for example, technological advances and the integration of global product markets that result in a rising concentration of industries. Autor and others (2017) describe a "winner-take-most" dynamic to explain rising profit shares, and consequent declining labor shares, across industries.

Measurement

Two important measurement challenges could account for some of the apparent decline in labor shares. The first has to do with the labor income of the self-employed, which is imputed for the purposes of reporting a headline figure in national accounts. The second concerns the depreciation of capital, which should arguably be discarded from the calculation of factor income shares because it cannot be consumed by either workers or capital owners.[31] Adjustments for self-employment and depreciation would, in general, raise the level of the labor share. However, these measurement issues could also affect the evolution of labor shares over time. For instance, all else equal, falling self-employment rates would make the labor share decline steeper, while rising capital depreciation rates would make the decline less pronounced. Given data limitations, this chapter treats measurement issues as a fourth factor in explaining the evolution and cross-country comparison of labor shares and reports the robustness of results to different measures of the labor share of income (Figure 3.9, Box 3.4).

In summary, the factors discussed so far can affect labor shares differentially in different country

[30]See Berman, Bound, and Griliches (1994); and Jaumotte, Lall, and Papageorgiou (2013).

[31]Rognlie (2015) emphasizes this second factor, noting that the net capital share has risen more modestly than the gross capital share in the United States and that the labor share has thus declined less than commonly reported.

groups. Furthermore, different facets of globalization—such as participation in global value chains and financial integration—may have offsetting or reinforcing impacts. Assessing their relative contributions to labor share trends is thus ultimately an empirical exercise.

Analyzing Trends in the Labor Share of Income: Empirical Analysis

The analysis begins with a shift-share analysis and empirically quantifies how much of the global decline in labor shares is attributable to decreases *within* industries and how much to compositional changes—that is, a reallocation of labor *between* industries, from those with higher to those with lower labor shares. This exercise is an important first step for two reasons. First, it is an essential tool to gauge the role of structural transformation—for example, from manufacturing to services in advanced economies and from agriculture to manufacturing and services in emerging market economies—in the decline in labor shares. Classical trade theory, for example, predicts a shift toward capital-intensive industries in capital-abundant advanced economies (resulting in lower labor shares) and a shift toward labor-intensive industries in labor-abundant emerging market economies (resulting in rising labor shares). Second, the shift-share analysis can then determine whether it would be more useful to study within-industry changes in labor shares or those arising from reallocation of resources between industries.

Shift-Share Analysis

The shift-share analysis is performed on a sample of 27 advanced economies and 13 emerging market and developing economies across 10 one-digit industries (International Standard Industrial Classification), decomposing the trend changes in labor shares into their within-industry and between-industry components.[32] The results of this exercise are shown in Figure 3.10 (panel 1), which plots the total trend change on the horizontal axis against the within component on the vertical axis.

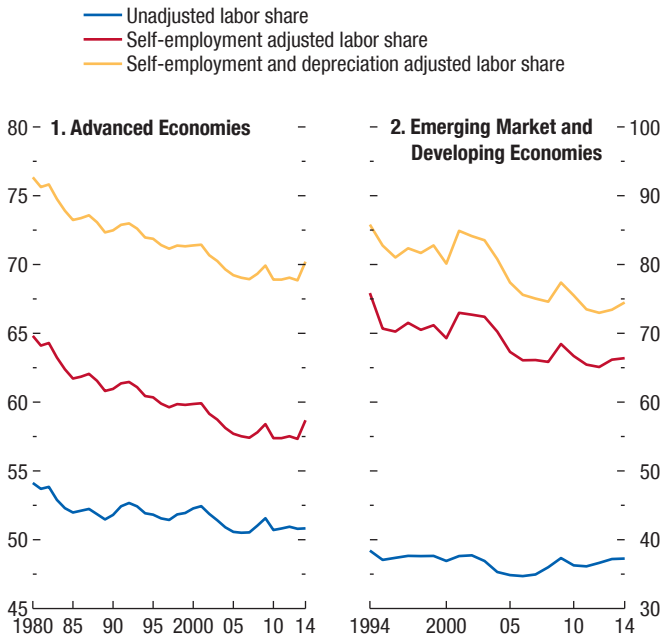
[32]The total change is decomposed for each yearly change as

$$\triangle LS_{i,t} = \sum_{k=1}^{n} \left(w_{i,k,t-1} \triangle LS_{i,k,t} \right) + \sum_{k=1}^{n} \left(\triangle w_{i,k,t} LS_{i,k,t-1} \right)$$

(where the first sum is the within change and the second is the between change), and summed overall years in the sample.

Figure 3.9. Evolution of the Adjusted Labor Share of Income
(Percent)

Adjustment of the labor share of income for self-employment and capital depreciation results in level changes as well as changes in the trend of the labor share. The level shift of self-employment adjustment is larger in emerging markets and developing economies while that of capital depreciation adjustment is larger in advanced economies.

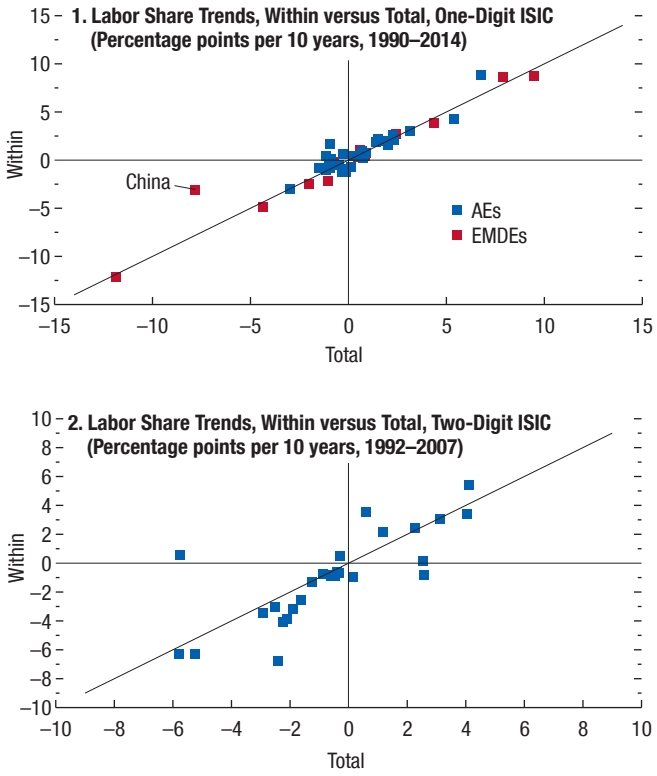


Sources: Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; World Bank, World Development Indicators database; and IMF staff calculations.
Note: Both panels show year fixed effects from regressions that also include country fixed effects to account for entry and exit during the sample. The regressions are weighted by nominal GDP in current U.S. dollars. Fixed effects are normalized to reflect the level of the labor share in 2000.

The shift-share analysis suggests that the reallocation of factors across broad industrial categories has generally not been a significant driver of labor share trends. Most countries are clustered around the 45-degree line, indicating that trend changes in labor shares emerge overwhelmingly from trend changes in within-industry labor shares rather than from the reallocation of factors across industries. Indeed, the within component is found to account for more than 90 percent of the total trend change. An important exception is China, where reallocation from industries with relatively high labor shares, most notably agriculture, to expanding industries with lower labor shares, such as wholesale trade and transportation and communication, accounts for

Figure 3.10. Shift-Share Analysis

More than 90 percent of variation in labor share trends across countries is explained by within one-digit sector variation, and over 70 percent by within two-digit sector variation. The role of between-sector reallocation often associated with structural transformation is small, on average, but plays a dominant role in China.



Sources: CEIC database; Organisation for Economic Co-operation and Development database; World Input-Output Database; and IMF staff calculations.
Note: AEs = advanced economies; EMDEs = emerging market and developing economies; ISIC = International Standard Industrial Classification of all Economic Activities, Revision 4.

some 60 percent of the total decline in the labor share during 1991–2014.[33,34] Similar findings are obtained when the analysis is performed for 22 Organization for Economic Co-operation and Development economies using more disaggregated (two-digit level) data covering 31 sectors (Figure 3.10, panel 2). Although many countries in the sample now deviate a little farther from the 45-degree line, they typically lie below the line, indicating that factor reallocation between industries has often tended to *increase* labor shares in advanced economies. These findings do not provide much support for the predictions of traditional trade theory and suggest that it would be useful instead to study the drivers of within-industry changes to understand overall trends in labor shares.[35] The empirical analysis turns to these drivers next, starting with an exploration of country-level data, then moving to country-sector data, and finally to country-sector data by skill level.

Analysis of Long-Term Changes in the Aggregate Labor Share of Income

To assess the contributions of the key drivers of labor income shares, this section examines the empirical relationship between trends in labor shares and technology, global integration, and other factors. Following influential work on the analysis of labor shares, the approach focuses on long-term changes in labor shares and relates them to long-term changes in potential drivers.[36] This strategy is motivated by important considerations, including the long time horizons of adjustments to structural changes triggered by technological advances and global integration, and the lower likelihood of being biased by cyclical or temporary conditions that have little implication for long-term changes in labor shares. Measuring long-term changes in drivers of labor shares, such as financial integration, allows for better capturing of country-specific fundamentals as opposed to high-frequency movements triggered by cyclical or temporary conditions.[37]

[33]For a further analysis of the evolution of labor shares in China see Dao and others (forthcoming).

[34]This finding contrasts with that of Karabarbounis and Neiman (2014), reflecting both a slightly different timeframe in this chapter's analysis and, importantly, nontrivial revisions to China's labor share data in official sources.

[35]Shift-share analyses have well-known limitations. Two possible limitations in the exercise here are that the shift-share decomposition does not take account of structural changes in the nature of industry, for example, the surge in internet commerce in the retail sector. Furthermore, while the decomposition at the two-digit level is useful to consider the possibility of between-sector shifts within one-digit sectors, the two-digit industrial groups are arguably still fairly aggregated.

[36]See, for example, Harrison (2002); Rodrigues and Jayadev (2010); Elsby, Hobijn, and Şahin (2013); Karabarbounis and Neiman (2014); and Acemoglu and Restrepo (2016).

[37]All regressions allow for capital and labor to adjust freely in response to changes in their relative costs over the long term. Therefore, controlling for the relative price of investment goods not only captures the immediate demand effect, but also any potentially offsetting adjustment from changes in relative factor supplies. Similarly, rising global value chain participation may trigger an endogenous response of capital and labor supply in addition to the immediate demand and composition effect.

Limiting the analysis to countries that have at least 10 years of data over the 1991–2014 period, the regression model is estimated on a sample of 49 countries (31 advanced economies and 18 emerging market economies). Technical details of the estimation are summarized in Annex 3.4. To estimate the effect of technology, the analysis follows Karabarbounis and Neiman (2014) by using the change in the relative price of investment goods to proxy firms' incentives for capital-labor substitution. Furthermore, an important innovation of the chapter is the recognition that such substitution will be stronger in countries that are initially more exposed to routinization. By measuring exposure to routinization for each country at the start of the time period, the chapter's approach mitigates concerns that high initial exposure to routinizable jobs will itself lead to greater adoption of routine technology and thereby *lower* subsequent exposure to routinizability. The results consider alternative measures for both the technology and global integration variables to assess robustness of the results.[38] For labor and product market structure, the chapter uses changes in union density and corporate taxation rates over the sample period.[39] Furthermore, to assess whether reforms to the regulation of product and labor markets during 1991–2014 have affected labor shares, the regressions also include an indicator for countries that enacted significant reforms in deregulating employment protections and product markets.

The empirical model closely tracks changes in labor shares during 1991–2014 across countries, and strongly confirms the significant roles played by technological advancement, exposure to routinization, and global integration in the decline in labor shares (Annex Table 3.5.1 and Figure 3.11, panel 1). One notable outlier is China, where—consistent with the findings of the shift-share analysis—a significant change in industrial composition has contributed to the decline in the labor share. Another outlier is South Africa, where a substantial increase in financial integration is the key contribution to the predicted rise in labor share, while in fact much of the cross-border financial flows has been driven by extractive industries and thus is not likely to contribute as much to higher wages and labor share as in other emerging markets. The empirical estimates imply that a decline of 15 percent in the relative price of investment goods (the average decline in the sample) leads to a 0.4 percentage point decline in the labor share in a country with relatively low initial exposure to routinization, and about a 1.5 percentage point decline in a country with high exposure to routinization.[40,41]

While overall trade in goods and services does not appear to matter much for labor shares, participation in global value chains does. Participation in global value chains is estimated to have exerted a strong negative effect on the labor share of income in both advanced economies and emerging markets, supporting the notion that offshored tasks are labor-intensive for the former group of countries but raise capital intensity in the latter. The empirical estimates indicate that an increase in intermediate goods imports of 4 percent of GDP (corresponding to the median increase in global value chain integration in the sample) is associated with a 1.6 percentage point decline in the aggregate labor share, on average, with a significantly larger impact in emerging markets.[42]

International financial integration has contrasting effects on the two country groups, depressing labor shares in advanced economies while raising them in emerging markets. It has long been argued that rising capital mobility increases the bargaining power of capital relative to that of labor by facilitating the

[38]These include, for example, a measure of intermediate imports, excluding commodities, as well as volumes of intermediate imports, in lieu of global value chain participation; gross stocks of inward and outward foreign direct investment for financial integration; and a measure of the user cost of capital in lieu of the price of investment goods. Additional robustness checks are described in Annex 3.4.

[39]Corporate tax rates are measured using basic central government statutory (flat or top marginal) corporate income tax rates.

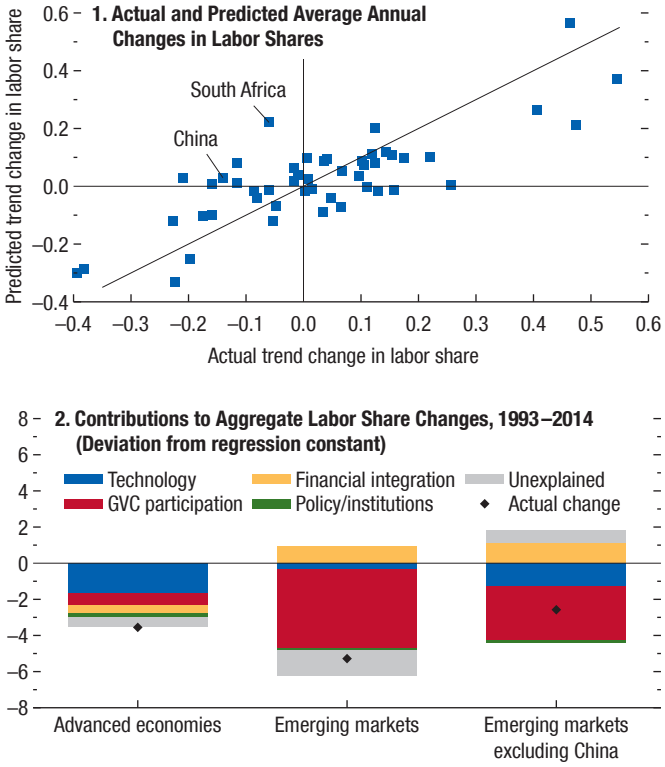
[40]High exposure refers to those economies whose initial exposure to routinization is at the 75th percentile of the distribution of exposures, while low exposure refers to those where the initial exposure is at the 25th percentile.

[41]The finding that about half of the decline in labor shares is traceable to technology is consistent with Karabarbounis and Neiman (2014).

[42]The smaller impact of offshoring in advanced economies may reflect the reallocation of displaced workers in advanced economies from manufacturing to low-skill (but labor-intensive) service industries, which may itself raise the labor share and work against the negative impact of offshoring on labor shares. In emerging market economies, the impact on labor shares due to reallocation from labor- to more capital-intensive jobs is more straightforward. Another possible reason for the smaller impact of offshoring in advanced economies is that imported intermediate inputs may raise the labor share in some tasks or sectors through their positive effect on productivity, if such tasks have a relatively low elasticity of substitution.

Figure 3.11. Aggregate Results

The empirical model explains about two-thirds of the evolution of aggregate labor share trends across countries, with China and South Africa being two important outliers. In advanced economies, technology contributes to about half the variation in labor share declines across countries, with global value chain (GVC) participation and financial integration accounting for one-quarter. In emerging markets, GVC participation is the dominant factor for labor share declines, offset by the positive effect of financial integration, while technology plays a much smaller role.



Source: IMF staff calculations.
Note: Panel 1 shows actual average annual changes in labor shares for countries with at least 10 years of data and predictions based on the aggregate trend regression model (see Annex 3.4). Derived contributions are scaled to show total changes over 25 years.

relocation of production.[43] The empirical estimates are consistent with this notion for advanced economies, which are, in general, the source countries of cross-border capital flows. The finding for emerging markets, on the other hand, is consistent with the notion that capital inflows lower the cost of capital and, so long as production has limited substitutability of capital for labor (the elasticity of substitution is lower than 1), raises the labor share of income. Consistent with the evidence in Jaumotte, Lall, and Papageorgiou (2013), the impact in emerging market economies is likely driven by raising the labor income share of high-skilled workers.

The measures of trend changes in labor and product market regulation, as well as changes in corporate taxation, are not found to have robust effects on labor share trends over the sample period. Declines in corporate income taxation do appear to have a strong bivariate correlation with the trend changes in labor shares, but these are not estimated to be statistically significant in a richer setting that controls for the strong contemporaneous trends in globalization and technological progress.

With the caveat that it is difficult to cleanly separate the impacts of technology from global integration, or from policies and reforms, Figure 3.11 (panel 2) presents a decomposition into these various factors to gauge their relative contributions to changes in labor shares. In advanced economies as a whole, technology, proxied by the declining relative price of investment goods and the initial exposure to routinization, has been the largest contributor to the decline in labor shares, accounting for almost half of the overall decline. Global integration—in particular, participation in global value chains and financial integration—is estimated to have contributed about half as much as technology.

The results for advanced economies as a group generally also hold for individual economies. For example, the joint negative effect of technology and global integration can explain roughly three-quarters of the decline in labor shares in Germany and Italy and more than half of the decline in the United States (all countries with relatively high exposure to routinization and, in the case of the United States and Germany, rising integration into global value chains). However, the increase in labor share in the United Kingdom, though modest, fails to conform to this general pattern. Finland and Norway, on the other hand, are examples of countries that had low exposure to routinization and, as predicted by the empirical analysis, experienced a trend increase in labor shares.

For emerging market and developing economies, the forces of global integration have had large but partially offsetting effects, with participation in global value chains lowering the labor share of income and financial integration raising it. Technology has played a very small role in the aggregate, but its impact on labor shares is heterogeneous across individual countries. Furthermore, there is more variation in the relative contribution of

[43]See Harrison (2002) and Jaumotte and Tytell (2007).

different drivers to labor share trends across the sample of emerging markets than in advanced economies. For example, the increase in the relative price of investment goods, together with financial integration, explain about half of the trend rise in labor share in Brazil, while participation in global value chains plays a negligible role. In Turkey, by contrast, the decline in labor share is explained almost exclusively by the rapid rise in its participation in global value chains, while technology plays a limited role, reflecting in particular its very low exposure to routinization.

Analysis of Long-Term Changes in Sectoral Labor Shares

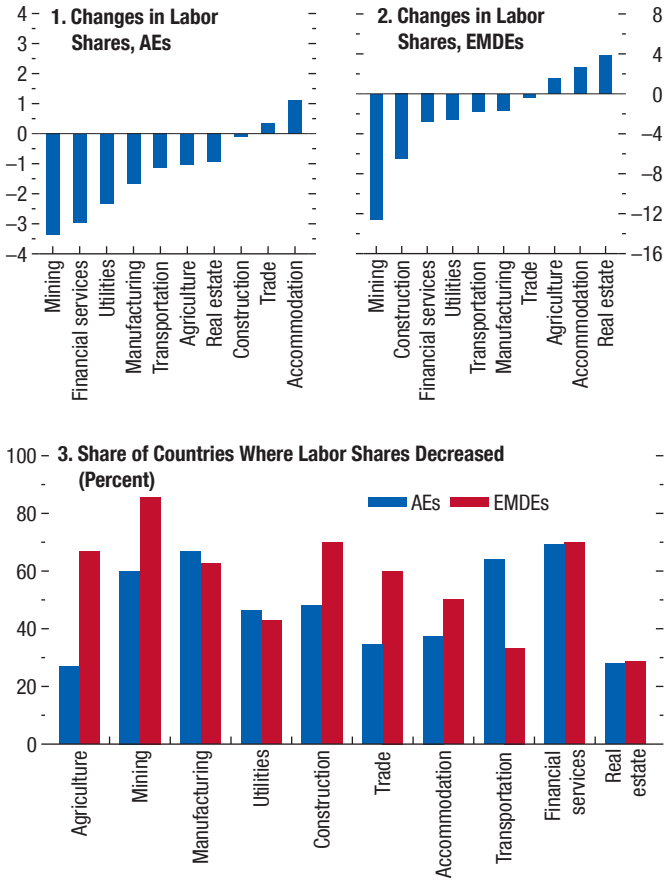
This section complements the analysis of aggregate labor shares by analyzing their changes across countries and industries. Given data limitations, the sample is restricted to 27 advanced economies for which country-sector data are available for at least 10 years. As noted earlier, while the global labor share of income has been on a declining trend since the 1980s, this aggregate picture conceals considerable heterogeneity across industries (Figure 3.12, panels 1 and 2). However, even within given industries, there are meaningful cross-country differences. For example, in manufacturing, which saw large declines on average, labor shares fell in only about two-thirds of the countries (Figure 3.12, panel 3).

The sectoral analysis explores this additional heterogeneity. While results from the analysis of aggregate labor shares shed light on the contributions of drivers to overall labor shares, where those estimated contributions are small, they may reflect large offsetting contributions across sectors. For example, the apparently small impact of participation in global value chains on aggregate labor shares in advanced economies could be concealing a large negative impact in tradables sectors that is potentially offset by a positive impact in nontradables sectors. In such cases, it is important to qualify the aggregate results with a more nuanced interpretation of the contribution of specific drivers.

The sectoral analysis is potentially also more robust to concerns that drivers are correlated with unobserved country- or sector-specific factors that could not be accounted for in the country-level analysis (see Annex 3.3 for definitions of variables and sources and Annex 3.4 for a detailed description of the methodology). The sectoral results can also help clearly test for hypotheses that vary along the sectoral dimension,

Figure 3.12. Heterogeneity across Sectors and Countries

Changes in aggregate labor shares conceal considerable heterogeneity across industries, but even within given industries, there are important cross-country differences.



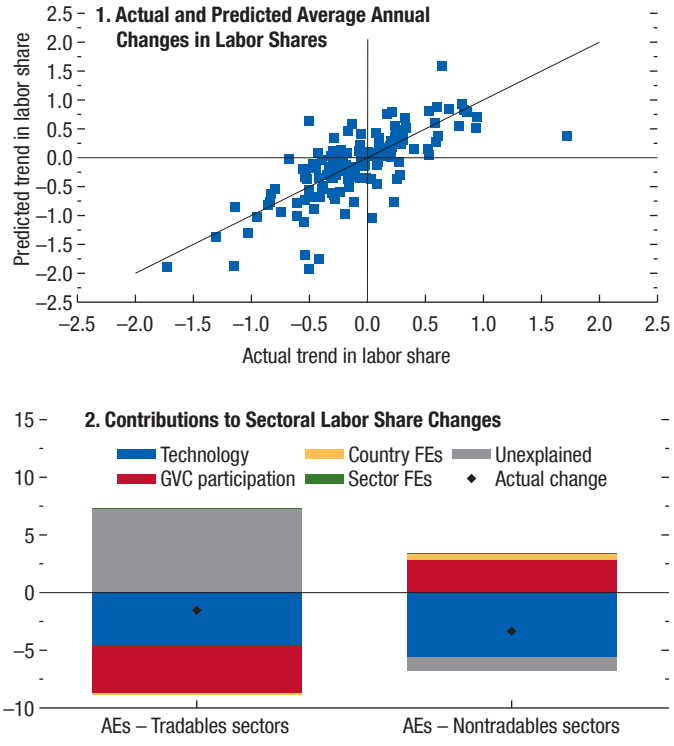
Sources: National authorities; and IMF staff calculations.
Note: Panels 1 and 2 show average changes in percentage points over 25 years in sectoral labor shares for country sectors with at least 10 years of data. AEs = advanced economies; EMDEs = emerging market and developing economies.

such as the role of trade and participation in global value chains, which should be found to be greater in tradables than in nontradables. It is also important, however, to underscore some limitations of sectoral analysis, including smaller country coverage, and a shorter time series (see Annex 3.3 for the list of countries included in the sectoral analysis). Results should thus be seen as complementing the aggregate findings.

As in the aggregate analysis, a model incorporating the effects of trade and technology can explain observed changes in labor shares reasonably well (Figure 3.13, panel 1). Bearing in mind that these factors are interrelated, a simple decomposition based on the sec-

Figure 3.13. Sectoral Results, Advanced Economies

Increasing participation in global value chains is associated with declines in labor shares only in tradables sectors.



Source: IMF staff calculations.
Note: Panel 1 shows actual average annual changes in labor shares for country sectors with at least 10 years of data, and predictions based on trend on trend regressions of sectoral labor shares on the price of investment, initial routine exposures, their interaction, and GVC participation. Contributions are based on trend regressions for country sectors with at least 10 years of data and are scaled to show total changes over 25 years. FE = fixed effects; GVC = global value chain.

toral analysis confirms the large role of technology in advanced economies (Figure 3.13, panel 2, and Annex Table 3.5.6).

Declines in the relative price of investment have been associated with declines in labor shares, more so for sectors with higher initial exposures to routinization. For instance, in line with actual changes in labor shares, the model predicts relatively large declines in labor shares in manufacturing, mining and quarrying, and transportation (sectors with high initial levels of routinization), but it predicts increases in agriculture and wholesale and retail trade (sectors with low initial exposure to routinization).

The median decline in the price of investment would predict a labor share decline that roughly corresponds to the observed decline in a country sector with a low exposure to routinization.[44] This, for example, matches the pattern observed in restaurants and hotels in the United States. The effect of a decline in the price of investment has roughly double that effect on a country sector highly exposed to routinization. This in turn matches the experience of the manufacturing sector in Italy. Furthermore, in the cross-section, the predicted difference between the evolution of labor shares in restaurants and hotels, which are relatively less routinizable, and the evolution of labor shares in manufacturing, which is much more at risk of automation, matches observed differences well.[45]

Trends in technological advancement, however, over-predict the overall decline in labor shares in advanced economies, with unobserved sector-level trends playing an important counterbalancing role. The model is thus estimated separately for the tradables and nontradables sectors to examine whether the relative roles of trade and technology differ. Increasing participation in global value chains is associated with declines in labor shares only in the tradables sectors. This is in line with the predictions of the model outlined earlier: as labor-intensive tasks are offshored, labor shares in tradables sectors are expected to decline as remaining production becomes more capital-intensive (Figure 3.13, panel 2, and Annex Table 3.5.6).[46]

Analysis of Long-Term Changes in Labor Shares by Skill

This section turns to the analysis of labor shares of different skill levels. Due to data limitations, the sample of the analysis is also dominated by advanced economies.[47] The goal is to examine the distrib-

[44]The median decline in the price of investment was about 15 percent over 25 years. This would predict a 1.8 percentage point decline in the labor share of a country sector at the 25th percentile of the distribution of routinization and an approximately 3.8 percentage point decline in the labor share of a country sector at the 75th percentile of the distribution of routinization.

[45]The model predicts a 6 percentage point larger decline in labor shares in manufacturing (around the 75th percentile of the distribution of routinization) than in restaurants and hotels (around the 25th percentile of the distribution of routinization); this is very similar to observed differences.

[46]Global value chain participation does not have a statistically significant effect on nontradables sectors. Here, the model's predictions are also more ambiguous and would depend on how these sectors are linked to the unbundled and offshored production processes.

[47]Aggregate analysis by skill focuses on a sample of 27 advanced economies and 10 emerging market economies, while sectoral

utive effects of technology and trade, including whether these have contributed to polarization and the so-called hollowing out of the middle class in advanced economies. The approach is to analyze the evolution of the labor shares of high-, middle-, and low-skilled workers separately.[48]

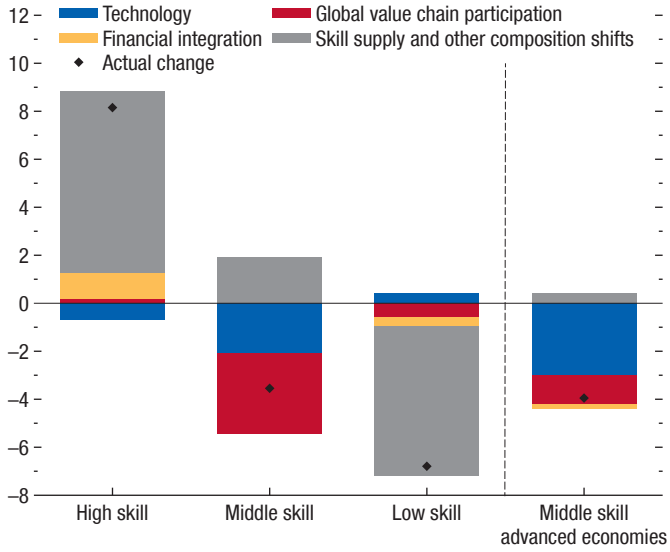
As Figure 3.5 indicates, the labor income share of high-skilled workers has been increasing while that of middle- and low-skilled workers has been declining.[49] A benign explanation for this evolution is that the rising skill premium has encouraged an upgrading of skills, resulting in higher relative supply of high-skilled labor and lower relative supply of middle- and low-skilled labor over time. This section studies whether, over and above this composition effect, the drivers of the overall labor income share have also contributed to this diverging evolution.[50] The analysis of labor income shares at the skill-group level follows the previous analysis of overall labor income shares (see Annex 3.4 for details).

The results, summarized in Figure 3.14, suggest that both technological advancement and participation in global value chains have lowered the income share of middle-skilled workers but have had little discernible effect on those of low- or high-skilled workers.[51] Moreover, countries with higher exposure to routinization and greater increase in participation in global value chains have experienced stronger declines in the middle-skilled labor income share, which has been especially pronounced in Austria, Germany, and the United States.[52] This finding is consistent with evidence for the United States and European economies, where declining costs of automating routine tasks have caused a polarization of employment and wages along the skill spectrum (Autor and Dorn 2013; Goos, Manning, and Salomons 2014). This finding also strongly suggests that the decline in the aggregate labor income share has been borne disproportionately by middle-skilled workers.

Because exposure to routine-biased technological progress differs across sectors, it is interesting to

Figure 3.14. Contributions to Aggregate Labor Share Change by Skill, 1995–2009

While increases in high-skilled and decreases in low-skilled labor shares are driven predominantly by common shifts to skill supply across countries (through higher educational attainment, for example), technological change and global value chain integration exert strong negative impacts on middle-skill labor shares, consistent with the hollowing-out hypothesis.



Sources: World Input-Output Database; and IMF staff calculations.
Note: Decompositions are derived from aggregate labor share regressions by skill group. Middle-skill advanced economies refers to the decomposition of the aggregate middle-skilled labor share, using only the advanced economy subsample in the regression. Contribution of skill supply and other shifts in composition is the combined effect of educational composition and the regression constant.

analysis by skill is based on a sample of 27 advanced economies and 5 emerging market economies (Annex Table 3.3.1).

[48]The definition of skill types is based on the level of education of workers. The World Input-Output Database uses the 1997 International Standard Classification of Education to define low skilled as workers with primary and lower secondary education, middle skilled as those with upper secondary or postsecondary, nontertiary education, and high skilled as those with first-stage tertiary education or higher.

[49]The labor income share of a skilled group is defined as the compensation to employees belonging to the skill group divided by total income.

[50]To the extent that drivers have opposite effects on labor shares of different skill groups, the analysis of labor income share dynamics by skill can help better identify the drivers of the labor income share.

[51]"Skill supply and other composition shifts" refers to the impact of relative skill supply measured by the share of low, middle, and high educational attainment in the total population and the contribution of the regression constant, which measures other deterministic trends in each group's labor share. Since this is the averaged decomposition for all countries in the sample, there is no contribution from the residual.

[52]The stronger negative effect of global value chain participation over technology for the middle-skilled labor share is based on a sample that includes emerging market and developing economies, for which the aggregate labor share results find that global value chain participations exerts a stronger downward pressure on labor shares than technology. Estimating and decomposing the fall in the middle-skilled labor share for a sample consisting only of advanced economies delivers the same ranking as for the aggregate labor share, that is, a much larger role of technology relative to global value chain participation (Figure 3.14).

explore whether industries with higher exposures also experience stronger declines in their middle-skilled labor income shares. In addition, the sector-level analysis can control for country-specific trends and is tested in a larger sample. Findings from this analysis also suggest that measures of technological change have a stronger effect on the middle-skilled labor income share, and that sectors more exposed to routine-biased technological progress experience a stronger decline in the labor income shares of middle-skilled workers, consistent with the aggregate-level skill results (Annex Table 3.5.8).

Because changes in the skill-specific labor income share can be driven by employment or wage adjustment of the skill group, additional analysis presents regression estimates that take into account changes in skill composition (measured as the share of each skill group in total hours). The impact of technological advancement on the middle-skilled labor income share is very similar, suggesting that the decline of the middle-skilled labor share in response to advances in technology has occurred mostly through wage adjustment or relocation within broadly defined sectors.[53] The robustness of these results is explored for instance by replacing country-specific trends by policy and institutional variables (Annex 3.5).

Summary and Policy Implications

The analysis in this chapter has highlighted the downward trend in the labor share of income at the global level since the early 1990s, as well as its heterogeneity across countries, sectors, and skill groups. In the vast majority of economies, within-sector declines, rather than labor reallocation toward low-labor-share sectors, have driven the overall decline in labor's share of income.

The empirical analysis points to a dominant role of technology and global integration in this trend, although to different degrees between advanced and emerging market economies. Technological progress, reflected in the steep decline in the relative price of investment goods, has been the key driver in advanced economies, along with high exposure to routine occupations that could be automated, with global integration playing a smaller role.

The evidence also suggests that the impact of technological advancement and participation in global value chains on the aggregate labor share in advanced economies comes through a reduced share for middle-skilled labor. This finding corroborates existing evidence for advanced economies that automation and import competition and offshoring have led to long-term losses in middle-skill occupations and displacement of middle-skilled workers to lower-wage occupations.

In emerging markets as a group, the evolution of labor shares is explained predominantly by the forces of global integration, with a more limited role for technology. This difference, compared with advanced economy experiences, reflects, in part, a much less pronounced decline in the relative price of investment goods, as well as lower exposure to routinization, which has limited the ability of technology to displace labor. As noted above, this effect of global integration could be interpreted as benign—it results from capital deepening and has been associated with rising wages and employment.

The design of specific policy responses will have to depend on country circumstances, given the sizable differences in levels of development, the extent of decline in labor shares and the relative importance of their underlying drivers, and existing social safety nets. In general, policies in advanced economies should be designed to help workers better cope with disruptions caused by technological progress and global integration, including through skill upgrading for affected workers. More generally, long-term investment in education as well as opportunities for skill upgrading throughout workers' careers, could help reduce the disruptions associated with technological change. Policies facilitating the reallocation of displaced workers to new jobs that reduce the costs of job search and transitions should also be a priority. Well-designed policies can support reemployment and reduce the use (and cost) of income-support programs. By themselves, these policies are, however, unlikely to be sufficient, especially if shocks are concentrated in specific regions, sectors, or skill/age groups. To the extent that some workers are affected more permanently, longer-term redistributive measures might be required as well. These would need to be tailored to specific circumstances and anchored in each country's social contract.

[53]The results also exhibit capital-skill complementarity: the coefficient on the relative price of investment suggests that low-skilled workers are more likely to be replaced by capital than middle- and high-skilled workers.

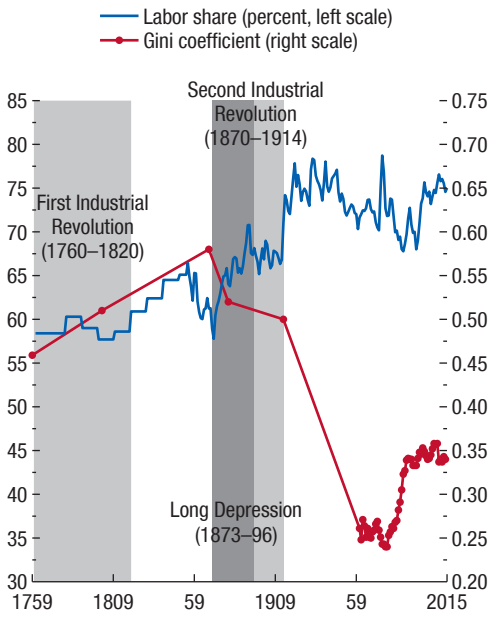
In emerging markets and developing economies, global integration has allowed for expanded access to capital and technology and, by raising productivity and growth, led to a rise in living standards. In principle, the decline in the labor share of income may not by itself call for policy intervention but, as in advanced economies, policies should work to make access to opportunities as well as gains from growth more broadly shared. Moreover, challenges similar to those in advanced economies could arise as automation progresses. Policies to promote skill deepening may therefore have an important role to play in preparing workers in emerging market and developing economies for further structural transformation in addition to facilitating the income convergence process.

Box 3.1. Technological Progress and Labor Shares: A Historical Overview

Some observers draw parallels between current advances in technology and earlier episodes of rapid technological progress. This box reviews the literature on this key driver's effect on labor shares during the Industrial Revolution.[1] The review suggests that, not only is the workers' so-called technological anxiety related to rapid technological change not unique to the current context, but earlier episodes of technological progress were also accompanied by lower labor shares during phases when labor-saving technologies spread across the economy and particular groups of workers and sectors were affected disproportionately.

Two caveats are in order. First, given the scarcity of data on labor shares over the period of analysis, this box looks at measures of both labor shares and inequality. Measures of inequality (based on social tables and housing wealth and tax statistics) are more widely available for the earlier period and are likely to be correlated with labor shares given that capital and land ownership were highly concentrated then.[2] Moreover, there was likely less overlap at that time between capital and labor income than there is today. Second, disentangling the relative importance of various drivers is even more difficult for the historical episodes than for the more recent period, as the evolution of labor shares may reflect not only technological change, but also its interaction with other forces, such as increasing international trade, the scarcity of labor, and policies and institutions.[3] The examples below should thus be viewed as illustrative.

Figure 3.1.1. Labor Share and Inequality in the United Kingdom



Sources: Bank of England, Three Centuries Macroeconomic data set (Version 2.3); Institute for Fiscal Studies, Living Standards, Inequality and Poverty data set; Lindert and Williamson (1983); Milanovic (2016); and Milanovic, Lindert, and Williamson (2011).

Figure 3.1.1 shows the historical evolution of the labor share and inequality in the United Kingdom, for which both series are available for a long period. It indicates that labor shares were largely flat during the first Industrial Revolution (usually referring to 1760–1820/1840), as early 19th-century mechanization was able to replace only a limited number of human activities—it affected only some parts of the economy while increasing the demand for labor complementary to the capital goods embodied in new technologies (Mokyr 2002).[4,5] It also created entirely

The author of this box is Zsóka Kóczán.

[1]Milanovic (2016) draws parallels between the "first Kuznets wave" linked to the Industrial Revolution, and the modern-day "second Kuznets wave," arguing that in both cases increases in inequality were driven by technological improvements (whose payoffs accrued more heavily to the higher-income groups) and globalization (which accompanied technological changes in both periods).

[2]Social tables divide society into status or occupational groups, and provide the numbers of households in each group and their average incomes.

[3]The role of different factor prices in driving technological progress has been emphasized by Allen (2003, 2005, 2007, 2011), who argued that the Industrial Revolution started in the United Kingdom because of the high cost of labor there, which made it profitable to replace it with capital. Fochesato (2014) noted a similar contrast between northern and southern Europe, driven by differences in feudal institutions, with higher wages in the former making labor-substituting machinery more attractive.

[4]This could include mechanics to fix the new machines, but also supervisors to oversee the new factory system and accountants to manage businesses operating on an unprecedented scale (Mokyr, Vickers, and Ziebarth 2015). Mechanization here is distinct from the routinization considered in the chapter, which is about automation due strictly to information and communications technology capital.

[5]The "Luddite" riots (1811–16) by textile workers and weavers who destroyed weaving machinery and the Swing riots (1830–32)

Box 3.1 *(continued)*

new sectors—a development that was essentially missed in the discussions of economists at the time (Mokyr, Vickers, and Ziebarth 2015).[6] Subsequently, however, profit and capital shares (including net income of railways, Allen 2007) increased during the 1850s to 1870s at the expense of labor, as adoption of major labor-saving technologies spread across the economy, including steam transportation, the large-scale manufacture of machine tools, and the use of machinery in steam-powered factories. Labor shares initially increased during the Second Industrial Revolution (1870–1914) as profits fell during the Long Depression (1873–96), in line with the (countercyclical) behavior of labor shares during the recent global financial crisis.[7]

Consistent with the varying impacts on labor shares by skill, documented in the chapter, industrialization affected certain sectors and groups of workers disproportionately. In the United Kingdom, workers employed in domestic cottage industries, with very low capital intensity and low productivity, bore most of the burden of technological displacement during the 1820s–50s (Bythell 1969). While factory wages rose, the real incomes of most domestic workers and independent artisans fell (Lyons 1989). The widening of the wage distribution is reflected in increases in inequality, even as the labor share was broadly constant or even increasing (Figure 3.1.1). Greenwood (1997) notes that the demand for skill increased during industrialization in the United Kingdom. Goldin and Katz (1998) document similar capital-skill complementarity in the United States. Katz and Margo (2013) point to a more nuanced picture of occupations hollowing out in 19th century American manufacturing.[8] The long-term pattern of economic inequality in the Low Countries (roughly, the territories of the Netherlands and Belgium) also confirms the importance of skill-biased technological progress: inequality was especially high during periods of large-scale, standardized-export production in a low-wage economy (13th–14th and 18th–19th centuries, Ryckbosch 2014). Examining measures of inequality, which are more widely available than estimates of labor shares, suggests that, along the lines proposed by Kuznets (1955), inequality rose from the time of industrialization to a peak around the end of the 19th or the beginning of the 20th century in most of the rich world.[9]

Current concern about the impact of rapid technological change on workers seems also to be characteristic of the earlier episodes of rapid change. For instance, Mortimer (1772) worried that machines would "exclude the labour of thousands of the human race, who are usefully employed . . ."; in a change of opinion, Ricardo (1821 [1971]) concluded that the "substitution of machinery for human labour is often very injurious to the interests of the class of labourers . . . [It] may render the population redundant and deteriorate the condition of the labourer." Many writers concurred with machinery's possibly negative effects on employment in the short term, but they typically distinguished between short-term dislocation and long-term effects. Steuart (1767) argued that technological unemployment would occur only if changes are introduced suddenly and that, even in the case of sudden changes, dislocation is temporary, while

of agricultural workers, which included attacks on labor-displacing threshing machines, are traditionally seen as focused on technological change. However, more recently, some have argued that the role of laborers' fears of being replaced by machinery has been greatly exaggerated (Mokyr, Vickers, and Ziebarth 2015). The Luddite riots started in Nottingham, where workers were more concerned with low wages and work practices, in general, than mechanization alone. In Lancashire, it appears that machines were destroyed because they were a convenient target in a dispute between industrialists and their employees (Mokyr, Vickers, and Ziebarth 2015). In Yorkshire, on the other hand, wool croppers were well organized and clearly determined to slow the pace of mechanization (Thomis 1970). The Swing riots were directed as much against cheap Irish migrant labor as against the new steam threshers (Stevenson 1979) and sought principally a minimum living wage and an end to rural unemployment (Hobsbawm and Rude 2001). Yet these were one of the few instances in which mechanization actually slowed as a result of political action (Mokyr, Vickers, and Ziebarth 2015).

[6]This included for instance the rapid development of the labor-intensive communications sector, giving rise to new professions, such as telegraph operator (Mokyr, Vickers, and Ziebarth 2015).

[7]The figure also shows the post–World War II increase in the labor share, which accompanied the increasing power of unions, and an uptick around 1970 coinciding with the "worldwide wage explosion" (Nordhaus 1972).

[8]The share of middle-skill jobs (of artisans) declined, while those of the highly skilled (white-collar nonproduction workers) and low skilled (operators and laborers) increased (Katz and Margo 2013).

[9]Inequality increased dramatically in the United Kingdom (Allen 2005; Greenwood 1997; Lindert 2000) and in the United States (Milanovic 2016). Inequality also increased in Japan from 1895 to 1937 (Minami 1998, 2008); in the Low Countries (van Zanden 1995; Soltow and van Zanden 1998; Ryckbosch 2014); and in Prussia (Grant 2002) and, to a lesser extent, in Italy (Brandolini and Vecchi 2011).

Box 3.1 *(continued)*

the advantages of higher productivity are permanent. A similar point was made later by Keynes (1932): "this [technological unemployment (. . .) unemployment due to our discovery of means of economizing the use of labour outrunning the pace at which we can find new uses of labour] is only a temporary phase of maladjustment. All this means in the long run that mankind is solving its economic problem."

In summary, technological progress during various episodes of industrialization was associated with declines in labor shares during certain phases and for some groups of workers—and with increases in inequality. Although the effects of technology on these changes are difficult to quantify, the level of inequality at its historical peak (typically around the late 19th to early 20th centuries in rich countries) was considerably higher than it is today.[10] Adjustment to technological changes is argued to have taken about a generation (Lyons 1989).

[10]The rate of increase in inequality varied across countries and is difficult to assess, as it can be measured only from the first available data point, which varies between the 13th and 19th centuries. A full comparison between the effects of technological progress on labor shares and inequality during the Industrial Revolution and more recent times would also require a comparison between technological changes then and now—similarly difficult to quantify.

Box 3.2. The Elasticity of Substitution between Capital and Labor: Concept and Estimation

The Elasticity of Substitution between Capital and Labor

Elasticity of substitution between capital and labor plays a key role in labor-income-share dynamics. The concept was introduced independently by Hicks (1932) and Robinson (1933) and measures the extent to which firms can substitute capital for labor as the relative cost of the two factors changes.[1] In the case of a Cobb-Douglas production function, the elasticity of substitution is equal to 1, which means that changes in the relative cost of capital and labor are fully offset by changes in relative quantities of these two factors, ensuring a constant labor income share. In the more general case, in which the production function takes a constant-elasticity-of-substitution form, the elasticity of substitution can be greater or less than 1 and, as a result, the labor income share may change with varying relative factor costs. For example, if the elasticity of substitution is greater than 1, a decline in the relative cost of capital lowers the labor share.[2]

In principle, the elasticity of substitution need not be stable over time and could vary across industries and countries.[3] In the transportation services industry, for example, it has been changing: labor substitution increased dramatically with the advent of global positioning technology and is likely to rise even more in the future with self-driving cars. It also depends on workers' skills: the highly skilled are considered less replaceable by capital than people with medium and low skills (Krusell and others 2000).

Moreover, the elasticity of substitution depends on the nature of tasks—routine and codifiable tasks are more substitutable than those that are more complex and are more at risk of being replaced by capital when the relative cost of capital declines.[4] Autor and Dorn (2013) and Goos, Manning, and Salomons (2014) find that routine-biased technological progress has played a role in displacing workers performing routine tasks. This has contributed to job polarization (that is, declines in middle-skill employment shares and increases in high and low-skill employment shares) in the United States and Europe. Examples of tasks with high elasticity of substitution include clerical and assembly-line work, as opposed to tasks such as cutting hair and performing surgery, which are not as prone to substitution.

Empirical Evidence of the Heterogeneity of Elasticity of Substitution

In the aggregate, elasticity of substitution may differ between advanced and emerging market and developing economies. Firms in advanced economies may be more inclined to replace medium- and low-skilled workers with capital, given the larger share of routine tasks in their employment composition (see Box 3.3). On the other hand, workers in advanced economies may, on average, have better skills than those in emerging market and developing economies and hence could be more complementary to—that is, less substitutable by—capital. Therefore, it is ultimately an empirical question whether the elasticity of substitution in advanced economies tends to be larger than in emerging market and developing economies.

As derived in Annex 3.2, an elasticity of substitution greater than 1 predicts a decrease in the labor share when the relative price of investment goods falls, and the opposite when it is less than 1. Cross-country

The authors of this box are Mai Chi Dao, Hao Jiang, and Weicheng Lian. More details can be found in Jiang and Lian (forthcoming).

[1]Elasticity of substitution is mathematically defined as

$$-\frac{\partial \ln\left(\frac{K}{L}\right)}{\partial \ln\left(\frac{MPK}{MPL}\right)}, \tag{3.2.1}$$

in which K denotes capital, L labor, MPK the marginal productivity of capital, and MPL the marginal productivity of labor. With competitive factor markets, MPK is equal to the cost of capital, and MPL is equal to the wage. As long as changes in MPK and MPL are proportional to changes in the cost of capital and wages, respectively—which is the case if the wedge between MPK and the cost of capital and between MPL and the wage is constant—the elasticity of substitution simply measures how the quantities of factors change in response to changes in their relative costs.

[2]A constant-elasticity-of-substitution production function has the form

$$Y = A\left(\alpha K^{1-\frac{1}{\rho}} + (1-\alpha) L^{1-\frac{1}{\rho}}\right)^{\frac{\rho}{\rho-1}}, \tag{3.2.2}$$

in which A denotes total factor productivity, Y output, K capital, and L labor, and α and ρ govern capital intensity and the elasticity of substitution, respectively,

$$\frac{MPK}{MPL} = \left(\frac{K}{L}\right)^{-\frac{1}{\rho}} \tag{3.2.3}$$

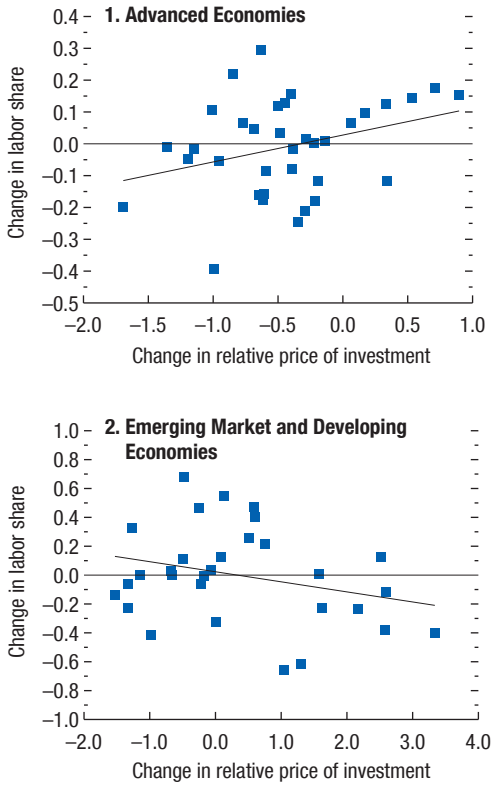
and, by definition, the elasticity of substitution is exactly ρ. When $\rho = 1$, the constant-elasticity-of-substitution production function is reduced to the Cobb-Douglas production function: $Y = AK^{\alpha} L^{1-\alpha}$.

[3]For example, when the production function does not have a constant elasticity of substitution form, the elasticity of substitution may depend on the quantity of capital and labor.

[4]The heterogeneity of the elasticity of substitution at the task level is an important assumption in the illustrative model outlined in Annex 3.2.

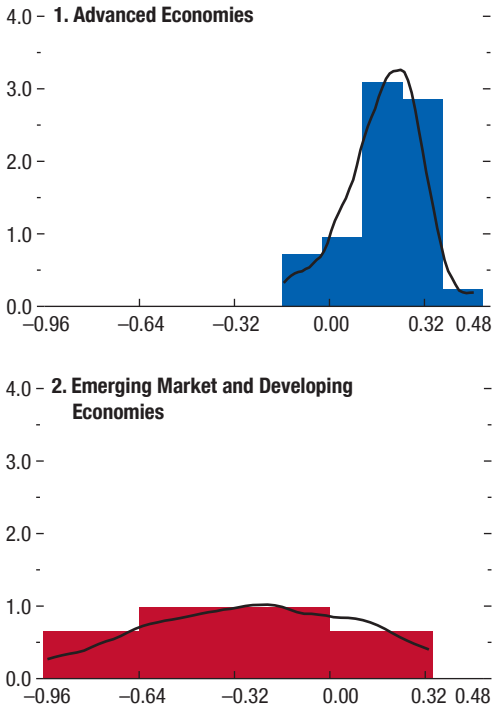
Box 3.2 *(continued)*

Figure 3.2.1. Change in Labor Share versus Change in Relative Price of Investment, 1992–2014



Sources: National authorities; World Bank, World Development Indicators database; and IMF staff calculations.
Note: Figure denotes annualized changes in percent for the relative price of investment and percentage points for labor shares.

Figure 3.2.2. Distribution of Initial Routine Exposure, 1990–95



Sources: Autor and Dorn (2013); Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; national authorities; United Nations; and IMF staff calculations.

regressions of the type used in the main text of the chapter are used to estimate the country-level elasticity of substitution separately for advanced and emerging market economies.[5] Results, illustrated in Figure 3.2.1, strongly suggest that, on average, the elasticity of substitution is greater than 1 for advanced economies (panel 1: positive slope coefficient statistically significant at the 5 percent level). It is less than 1 for emerging market and developing economies (panel 2: negative slope coefficient statistically significant at the 10 percent level).

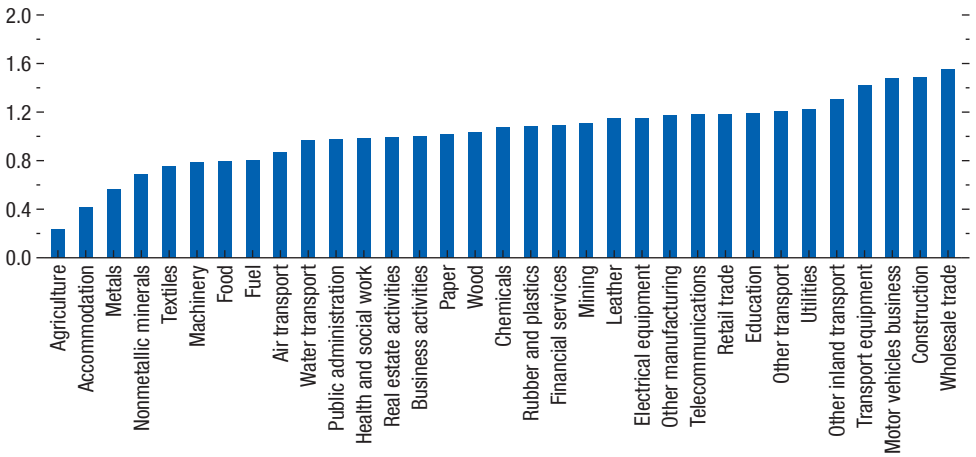
One explanation for the higher aggregate elasticity of substitution in advanced economies is their greater exposure to routinization, as shown by their higher aggregate routine task intensity (RTI). (Details of the construction of RTI indices are in Box 3.3.) Using data on routinization scores by occupation and aggregating up for each country using employment shares from population censuses, a distribution of the aggregate RTI index is obtained. The distribution of the RTI index for advanced economies has a higher mean and median and is less dispersed than for the emerging market group (Figure 3.2.2).

This finding (that the estimated elasticity of substitution is greater than 1 in advanced economies

[5]Long-term changes (that is, over at least eight years) in labor shares are regressed on long-term changes in the log of the relative price of investment goods for each country—separately for advanced and emerging market and developing economies—according to the reduced-form equation $\widehat{LS}_c = \alpha + \beta\widehat{PI}_c + \varepsilon_c$. As argued above (and derived algebraically in Annex 3.2), an elasticity of substitution greater than 1 would imply the reduced-form coefficient $\beta > 0$ and vice versa for an elasticity of substitution less than 1.

Box 3.2 *(continued)*

Figure 3.2.3. Estimated Elasticity of Substitution by Two-Digit Industry

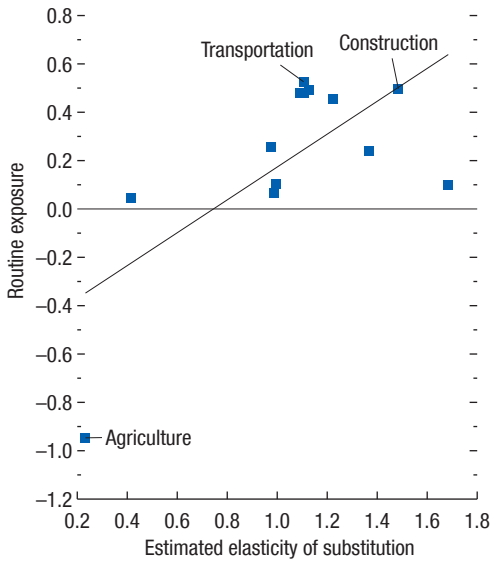


Sources: World Input-Output Database; and IMF staff calculations.

and lower than 1 in emerging market and developing economies) is consistent with the higher exposure to routinization in the former group of countries. This supports one of the key findings of the chapter: declines in the relative cost of capital have played a more prominent role for labor share declines in advanced than in emerging market economies.

There is also a link between the elasticity of substitution and exposure to routinization at the industry level. The industry-specific elasticity of substitution is estimated by regressing changes in labor income shares on changes in the relative price of investment in two-digit industries using data from the World Input-Output database. The estimated elasticity of substitution is lowest in agriculture and accommodation and food services and highest in construction, transportation, and wholesale trade (Figure 3.2.3). There is a strong correlation between this estimated elasticity of substitution by sector and the sector's average degree of routinization of tasks, which is measured by averaging the sector-specific RTI index (constructed from census data) across countries. Consistent with the estimated elasticity of substitution, agriculture also yields the lowest RTI index across countries, while construction and transportation have among the highest RTI indices and estimated elasticity of substitution (Figure 3.2.4). Given that the share of agriculture in total employment is significantly lower and that of construction and transportation is higher in advanced economies, this finding is consistent with advanced economies' higher exposure to routinization, as shown in Figure 3.2.2.

Figure 3.2.4. Elasticity of Substitution versus Routine Exposure by Sector, 1992–2014



Sources: Autor and Dorn (2013); Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; national authorities; United Nations; World Input-Output Database; and IMF staff calculations.

Box 3.3. Routine Tasks, Automation, and Economic Dislocation around the World

Concerns about economic dislocation of workers because of technological progress and the automation of a large number of middle-skill jobs are widespread across advanced economies. But which economies are most exposed to such dislocations? And, how has automation affected the workplace in emerging market and developing economies? This box describes the metrics used in the chapter to assess country- and industry-level exposure to routine tasks and presents stylized facts about this exposure across countries and industries and over time.

Routine Tasks and the Information Technology Revolution

The real cost of computing power is estimated to have fallen at a staggering rate of more than 50 percent *annually* between 1969 and 2005 (Nordhaus 2007). A fundamental insight about the implications of this technological revolution—on the nature of tasks, patterns of international trade, and industrial structure—began with the characterization of tasks most likely to be affected by the surge in computing power as *routine* tasks (Autor, Levy, and Murnane 2003). As defined in this work, routine tasks are those which ". . . require methodical repetition of an unwavering procedure . . . exhaustively specified with programmed instructions and performed by machines."

The steep decline in computing costs has presented firms with strong incentives to automate routine tasks. Routinization (that is, the automation of routine tasks) has been identified as an important cause of the substantial displacement and stagnant wage growth of middle-skilled labor in many advanced economies.[1] The magnitude of these dislocations, however, is estimated to vary significantly across countries. This suggests that if routinization does lie behind these trends, either the intensity of routine occupations varies across countries, countries with comparable routine intensities automate at different rates reflecting idiosyncratic factors (such as industrial composition), or both.

Aggregate Metrics of Routinization

Empirically assessing these considerations requires comparable measures of routinization across industries and countries. This begins with a set of scores for 330 occupations at the three-digit level constructed by Autor and Dorn (2013). The scores contain no information other than the ordinal position of occupations, in increasing order of routinizability. On the left tail of this scale are occupations with the most nonroutine tasks: farmers, firefighters, and kindergarten teachers; on the right tail are those with the most routine tasks: cashiers, proofreaders, and machine operators.

Autor and Dorn (2013) define the intrinsic routinizability of a task (that is, the propensity of a routine task to be automated) as its "routine task intensity" (RTI). A key assumption of this chapter's approach is that an occupation's RTI is fixed across industries and countries and over time.[2] A first step is mapping the 330 occupation-level scores into nine aggregate one-digit occupation categories based on the 1988 International Standard Classification of Occupations. These aggregated scores for one-digit occupation categories are then standardized to have a mean of zero and a standard deviation of one.[3] To measure aggregate *routine exposure* of countries and industries, the chapter subsequently weights the scores for one-digit occupation categories with their relative employment shares within a country or an industry.[4] For occupation category l, industry j, and country i at time t, industry- and country-level *exposures to routinization* are constructed as, respectively,

$$RTI_{jit} = \sum_l \omega_{ljit} \times RTI_l, RTI_{it} = \sum_l \omega_{lit} \times RTI_l \quad (3.3.1)$$

in which ω_{ljit} and ω_{lit} are, respectively, occupation l's share of employment in industry j, country i, at time

The authors of this box are Mitali Das and Benjamin Hilgenstock.

[1]The impact of routinization on wage and job polarization in the United States is shown in Autor and Dorn (2013) and in a sample of European economies in Goos, Manning, and Salomons (2014).

[2]Under this assumption only certain tasks—such as those performed, for example, by a babysitter—are considered to present inherent challenges to computerization. Those performed, for example, by an assembly plant worker are considered inherently automatable, regardless of where or when they are performed. Notably, the assumed intrinsic quality of the task is *distinct* from whether the task is actually automated, which may indeed vary with time or across industries or countries.

[3]There are several steps in this calculation because the different international occupation and industry classification systems, which also change over time, must first be harmonized. The detailed steps and data sources are available in Das and Hilgenstock (forthcoming).

[4]For details see Das and Hilgenstock (forthcoming).

Box 3.3 *(continued)*

t and occupation l's share of employment in country i at time t.

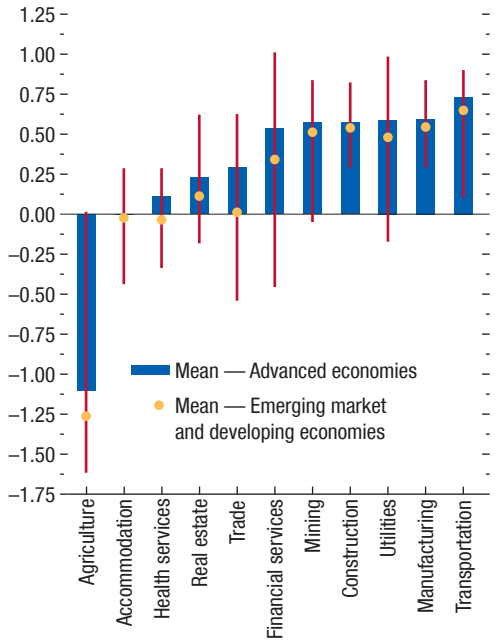
Using employment data from population censuses and labor force surveys, the routine exposures are constructed for all years in which a national census or labor force survey was conducted. Between 1990 and 2015, this yields time-varying exposures to routinization for 160 countries at annual, biennial, quinquennial, or decennial frequencies. In general, exposures are available at annual frequency for many advanced economies, while the frequencies are lower for most emerging market and developing economies. Routine exposures at the industry level are available for a slightly smaller subset of years and countries than economy-level metrics, reflecting that not all censuses and labor force surveys record the industrial affiliation of the employed.

Routine Exposures around the World and over Time

The aggregate metrics of exposure contain a wealth of information that establishes several new stylized facts about routine exposures across countries, industries, and country groups.

- Initial exposures to routinization vary across industries, and both their level and rank differ somewhat between country income groups (Figure 3.3.1). Reflecting the manual, in-person nature of tasks, agriculture is least exposed to routine tasks, followed by sectors where tasks have high interpersonal content that is also not easily routinized (accommodation, health services). Initial exposure to routinization is highest where core tasks follow "precise, well-understood procedures" (Acemoglu and Autor 2011), such as in manufacturing and transportation.
- Routine exposures are highest in advanced economies, but they have been converging across country income groups over time (Figure 3.3.2). The higher exposure to routinization reflects, to a significant degree, lower employment and the lower contribution to GDP of agriculture in advanced economies compared with emerging market and developing economies.[5] While exposures in advanced economies have declined over time, they have risen steadily in emerging market and developing economies (Figure 3.3.2). The result is a convergence in worldwide routine exposures.
- The initial exposure to routinization is a powerful predictor of the subsequent change in exposure (Figure 3.3.3). In advanced economies, the higher the initial exposure to routinization, the larger its subsequent decline. This corroborates a key

Figure 3.3.1. Initial Routine Exposure across Industries, 1995–2000

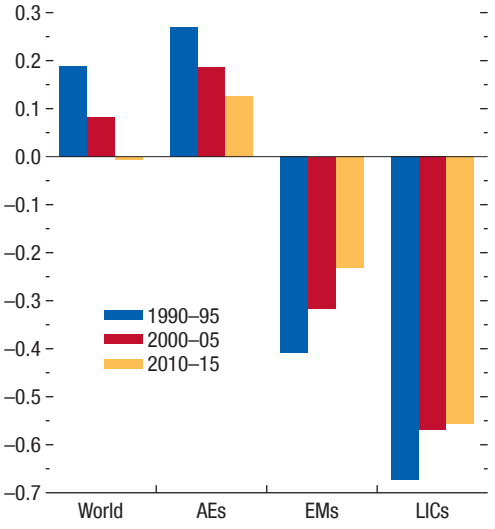


Sources: Autor and Dorn (2013); Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; national authorities; United Nations; and IMF staff calculations.
Note: Initial routine exposure is measured in the first available year within 1995–2000. Means are calculated by weighting countries' routine exposures by nominal GDP in current U.S. dollars. Vertical lines represent range between maximum and minimum values for all countries.

[5]The routine exposure of agriculture is very similar in all country groups and over time, between –1.15 and –1.2. However, while value added for agriculture was 2 percent of GDP or less in advanced economies as a whole between 1990 and 2014, it ranged from 13 to 20 percent in emerging market and developing economies as a whole during that period. More generally, sectoral routine exposure is not generally very different between advanced and emerging market and developing economies. Critically, however, employment in these sectors varies significantly between these economies, which is a key reason that *aggregate* exposure in emerging market and developing economies differs from that in advanced economies.

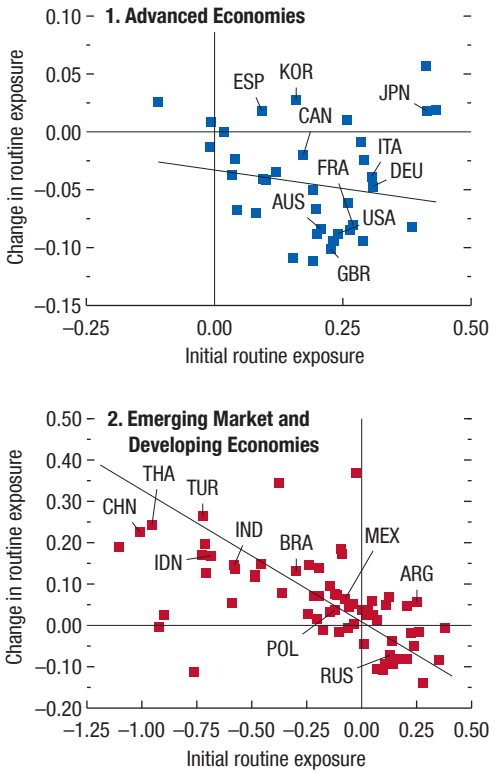
Box 3.3 *(continued)*

Figure 3.3.2. Routine Exposure across Country Groups and over Time, 1990–2015



Sources: Autor and Dorn (2013); Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; national authorities; United Nations; and IMF staff calculations.
Note: Bars represent GDP-weighted averages for the respective groups and time periods based on the first available year for each country in each period. AEs = advanced economies; EMs = emerging markets; LICs = low-income countries.

Figure 3.3.3. Initial Routine Exposure and Subsequent Change in Routine Exposure, 1990–2015



Sources: Autor and Dorn (2013); Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; national authorities; United Nations; and IMF staff calculations.
Note: Initial routine exposure is measured in the first available year within 1990–95. Change in routine exposure is measured as the average annual change observed between initial exposure and the last available observation and is reported as units per 10 years. Data labels in the figure use International Organization for Standardization (ISO) country codes.

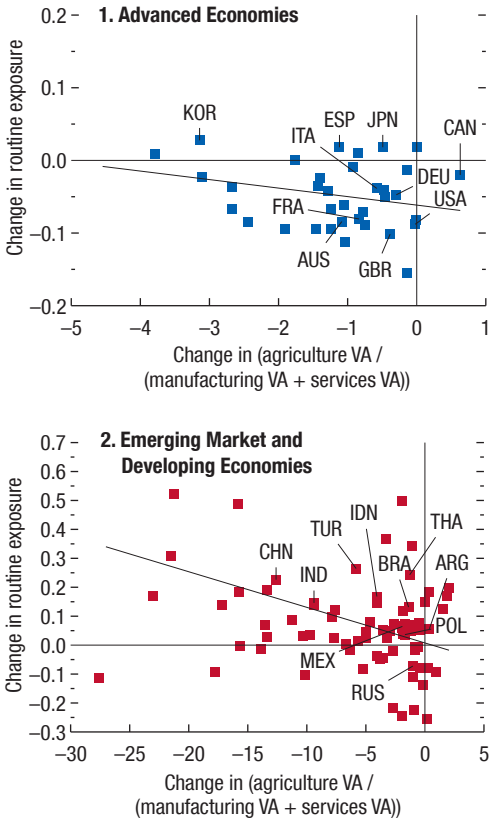
hypothesis implicit in the use of initial exposure indicators in the chapter: where exposure was higher to begin with, through more intensive displacement of labor with capital, marginal tasks became *less* routine. In emerging market and developing economies, however, the higher the initial exposure to routinization, the smaller the subsequent *rise* in exposure.[6] This suggests that forces that plausibly lower the exposure to routinization—such as the declining relative price of investment and the subsequent substitution of labor with capital—have been weaker in emerging market economies than those that raise routine exposure—such as structural transformation.

- Structural transformation appears to be a key driver of the evolution of routine exposures (Figure 3.3.4). As emerging market and developing economies have made the transition from agriculture to manufacturing and services (sectors that have generally more routine occupations), their routine exposure has risen. Advanced economies, by contrast, are at a different stage of structural transformation.

[6]Note that advanced economies are predominantly in the fourth quadrant of Figure 3.3.3, whereas emerging market and developing economies are largely in the first and second quadrants.

Box 3.3 *(continued)*

Figure 3.3.4. Structural Transformation and Routine Exposure, 1990–2015



Sources: Autor and Dorn (2013); Eurostat, European Union Labor Force Survey; Integrated Public Use Microdata Series International; Integrated Public Use Microdata Series USA; International Labour Organization; national authorities; United Nations; World Bank, World Development Indicators database; and IMF staff calculations.
Note: Data labels in the figure use International Organization for Standardization (ISO) country codes. VA = value added.

Since the 1990s some sectors with high exposure to routine occupations, such as manufacturing, have been hollowed out, while others, with low exposure to routine occupations (including both low-skill-intensive and high-skill-intensive service sectors), have expanded (Autor and Dorn 2013; Goos, Manning, and Salomons 2014). This has resulted in a decline in their routine exposures.[7]

[7]Other factors, such as the relative price of capital goods, demographic transition in emerging markets, aging in advanced economies, participation in global value chains, and the change in the skill supply of labor, may also play a role. A detailed empirical analysis, including over an earlier period in advanced economies, is considered in Das and Hilgenstock (forthcoming).

Box 3.4. Adjustments to the Labor Share of Income

As documented in this chapter, the labor share of income has decreased in the majority of advanced economies as well as in a number of emerging market and developing economies. This box discusses the extent to which measurement issues may account for some of these patterns. In particular, it explores the impact on the evolution of the labor share of the statistical treatment of self-employment and capital depreciation.

Unadjusted Labor Share

The traditional measure of the labor share, subsequently called the unadjusted labor share, is calculated by dividing compensation of employees by GDP:

$$LS^U = \frac{compensation\ of\ employees}{gross\ domestic\ product\ (GDP)} \qquad (3.4.1)$$

Given that, in most national accounts, compensation of employees captures only the compensation of payroll employees, this measure ignores the labor income of self-employed people. For this reason, the unadjusted labor share is sometimes also referred to as the payroll share or the "naive" labor share.

By disregarding self-employment, the measure may not only underestimate the level of the labor share, it may also fail to properly reflect structural changes in the economy over time. For example, the share of self-employment in the total employed population is much larger for developing economies, but it also tends to decline as these countries develop and the formal employment sector grows. As a result, the level of the unadjusted labor share may be biased downward, but the trend could be biased upward. A similar dynamic can be found in advanced economies; however, the average decline in the share of self-employment is less pronounced.

Despite its shortcomings, the unadjusted measure is sometimes the only available measure due to data limitations. Furthermore, in an environment where structural changes are slow and relatively homogeneous across countries (or within a group of countries), as suggested by the findings in this chapter, this measure can be useful to understand changes in labor shares and to provide a cross-country comparison of the trends.

The authors of this box are Jihad Dagher and Benjamin Hilgenstock.

Adjustment for Self-Employment

Several approaches have been proposed to adjust labor shares for the income of self-employed people. The main challenge is that proprietors' income is usually not directly recorded in the data, and therefore assumptions are necessary to split this income into its capital and labor components. The two most common approaches assume some equivalence between the payroll sector and the self-employment sector. The first assumes that the labor share of the self-employed is equal to the labor share in the payroll sector, which in turn is computed by dividing compensation of employees by the value added of the payroll sector.

The second adjustment option assumes that, on average, the self-employed earn the same compensation as payroll employees. For example, when the composition of labor is known, the unadjusted labor share LS^U can be adjusted as follows, with L^S and L^P representing the number of self-employed people and payroll employees, respectively. This adjustment approach, among others, is discussed by Gollin (2002).

$$LS^{SE} = \left(1 + \frac{L^S}{L^P}\right) \times LS^U. \qquad (3.4.2)$$

To illustrate the adjustment for self-employment, panel 1 of Figure 3.4.1 compares the self-employment-adjusted labor share with the unadjusted measure in the United States between 1948 and 2016. As expected, the decline in the adjusted measure is more pronounced than in the unadjusted labor share because of the trend decline in the share of the self-employed in the labor force. Nonetheless, both point to a steady decline of the labor share in the United States since the early 1970s.

Adjustment for Capital Depreciation

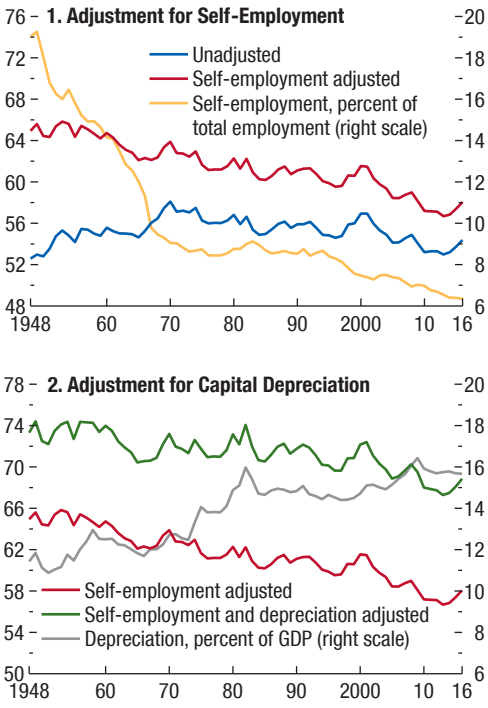
The second adjustment discussed in the literature attempts to account for capital depreciation. Karabarbounis and Neiman (2014) and Bridgman (2014) argue that the labor share needs to be adjusted for depreciation to more accurately reflect labor's true share of GDP—that is, because depreciation cannot be consumed and therefore cannot be attributed to either capital or labor income. The adjustment consists of subtracting depreciation from the denominator of the labor share calculation:

$$LS^D = \frac{compensation\ of\ employees}{GDP - depreciation}. \qquad (3.4.3)$$

Box 3.4 *(continued)*

Figure 3.4.1. Adjustments to the Labor Share of Income in the United States, 1948–2016

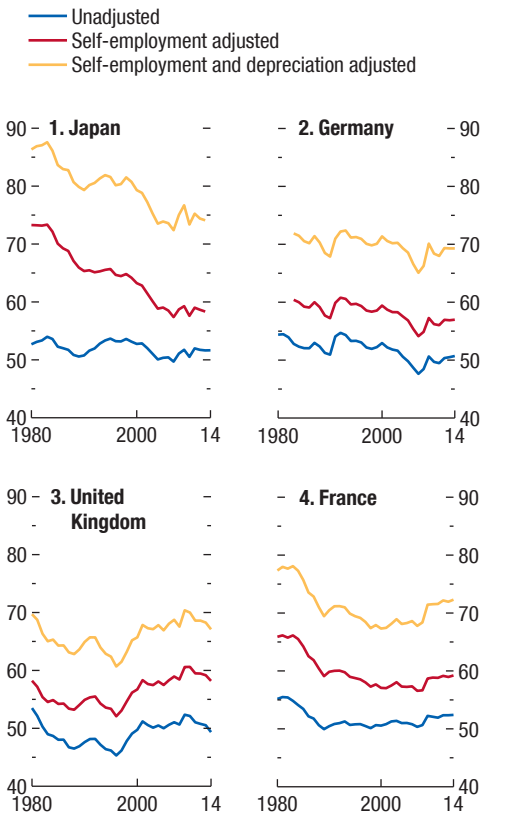
(Percent)



Sources: Bureau of Economic Analysis; Bureau of Labor Statistics; and IMF staff calculations.

Figure 3.4.2. Adjustments to the Labor Share of Income in Large Advanced Economies, 1980–2014

(Percent)



Sources: National authorities; World Bank, World Development Indicators database; and IMF staff calculations.

Capital depreciation has increased over time in the United States, thanks to the growing weight of information, communications, and technology capital, which depreciates faster than other types of capital. Panel 2 of Figure 3.4.1 shows that—although it remains negative—the trend in the labor share is less steep compared with the previous measure after adjustment for depreciation.

Adjusting Labor Shares in Large Advanced Economies

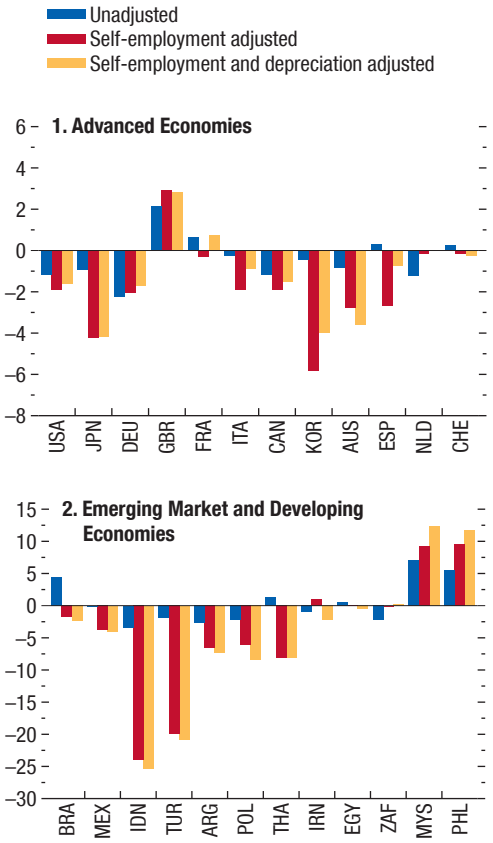
Applying these adjustments to some other advanced and emerging market and developing economies confirms that they can have a substantial impact on labor share developments. Figure 3.4.2 shows the impact of the aforementioned adjustments on labor share time series for four large advanced economies. Figure 3.4.3 shows the effect of adjusting for self-employment and capital depreciation on the long-term trend in the labor share for 12 advanced economies and 12 emerging market and developing economies. Trends in self-employment and depreciation are shown in Figure 3.4.4.[1] In almost all cases, adjusting for self-employment makes the labor share

[1]Decreases in depreciation as a percentage of GDP in emerging Europe could reflect relatively higher depreciation rates during the transition to market economies when capital stock valuations were reassessed.

Box 3.4 *(continued)*

Figure 3.4.3. Long Changes in Unadjusted and Adjusted Labor Shares, 1991–2014

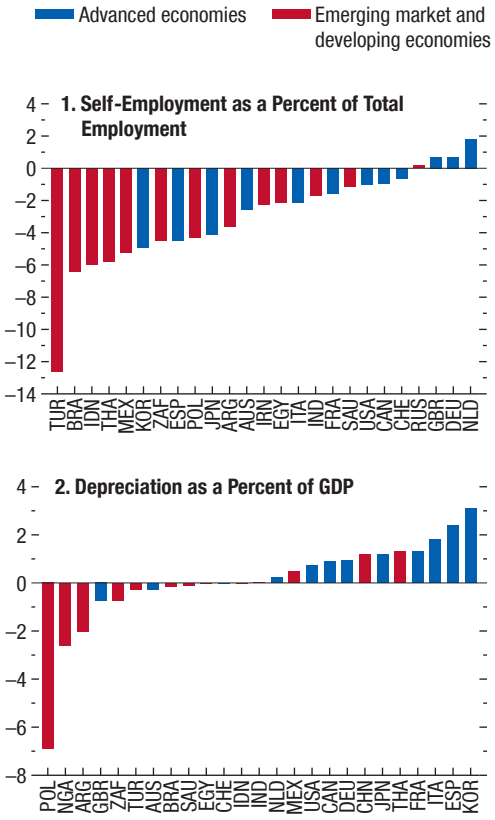
(Percentage points per 10 years)



Sources: CEIC database; Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development; World Bank, World Development Indicators database; and IMF staff calculations.
Note: Long changes refer to the predicted values of regressions of the variable on a time trend, reported in units per 10 years. Data labels in the figure use International Organization for Standardization (ISO) country codes.

Figure 3.4.4. Long Changes in Self-Employment and Depreciation, 1991–2014

(Percentage points per 10 years)



Sources: World Bank, World Development Indicators database; and IMF staff calculations.
Note: Long changes refer to the predicted values of regressions of the variable on a time trend, reported in units per 10 years. Data labels in the figure use International Organization for Standardization (ISO) country codes.

decline steeper, particularly in emerging market and developing economies. By contrast, adjusting for capital depreciation leads, in most cases, to flattening of the labor share, primarily in advanced economies because of their higher share of information, communications, and technology in total capital.

While unadjusted labor shares are used in the empirical analysis of the chapter due to data limitations, key findings are robust to using adjusted measures instead, as illustrated in Annex Table 3.5.5.

Annex 3.1. Wages and Deflators

Real wages can be calculated by deflating wages by consumer prices—the prices of goods and services bought by consumers—or by the GDP deflator—the prices of all goods and services produced in the economy.

The appropriate choice of deflator depends on the questions asked.

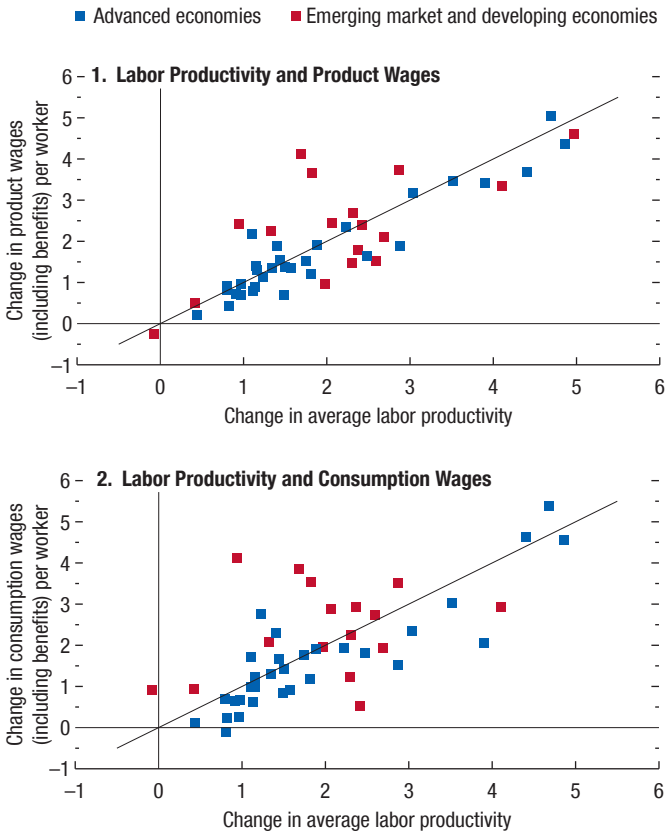
- The *real or consumption wage*—that is, the wage deflated using the consumer price index (CPI), is the value of workers' earnings in terms of the basket of goods and services they consume and thus more accurately reflects changes in purchasing power. This is relevant for assessing welfare implications for workers and, in turn, the political economy implications of changes in nominal wages.
- The *product wage*, deflated using the GDP deflator, is the measure affecting firms' hiring incentives and is more appropriate for comparisons with productivity when examining the functional distribution of GDP.

The distinction between the two deflators is important for open economies, given that an increase in the price of an imported good, such as oil, increases the CPI relative to an output price index. Thus, real wages deflated using the CPI would appear to fall relative to productivity, even though this decline is driven only by differences in their respective deflators.

Such changes in the terms of trade would also have distributional implications depending on people's consumption of imports. Fajgelbaum and Khandelwal (2016), for example, note that poor consumers spend relatively more on imports, while high-income individuals consume relatively more services, a sector that is among the least traded.

Wage growth has been lagging productivity growth, which suggests that labor has been receiving an ever-smaller share of national income. Annex Figure 3.1.1 shows changes in average labor productivity and changes in wages, deflated using the GDP deflator and using the CPI. Annex Figure 3.1.2 shows the evolution of product wages, consumption wages, and average labor productivity in manufacturing for advanced economies. While the choice of deflator affects the exact evolution of wages over time, on average, consumption wages have increased less than product wages, and both have lagged productivity.[54]

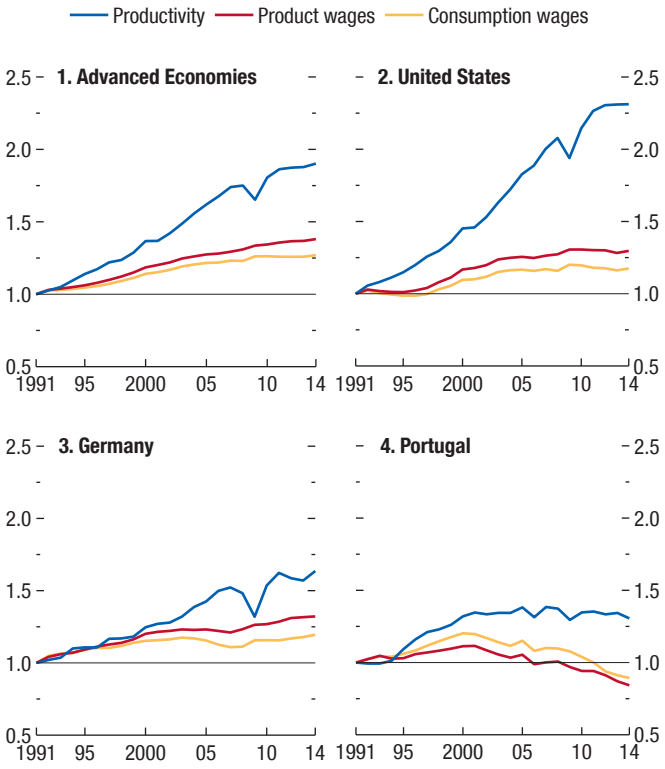
Annex Figure 3.1.1. Decomposition of the Labor Share of Income, 1991–2014
(Percentage points per year)



Source: IMF staff calculations.
Note: Product wage is defined as nominal wage deflated by the GDP deflator, and consumption wage is defined as nominal wage deflated by the consumer price index.

[54]This finding is in line with ILO (2015); Fleck, Glaser, and Sprague (2011); and Council of Economic Advisers (2014) for the United States.

Annex Figure 3.1.2. Product Wages, Consumption Wages, and Productivity in Manufacturing
(Index, 1991 = 1)



Source: IMF staff calculations.

Annex 3.2. A Theoretical Model of Relative Cost of Capital, Offshoring, and Labor Shares of Income in Advanced Economies and Emerging Market and Developing Economies[55]

This section develops a theoretical model to show how a fall in the relative cost of capital may influence offshoring and its impact on the labor share of income. This is motivated by the observation that a strong expansion of global value chains since the 1990s has coincided with a rapid fall in the relative cost of capital in advanced economies.[56] Three important drivers of the cost of capital—the price of investment goods, the interest rate, and the corporate income tax—have declined substantially during this period (see Figure 3.6).[57] These drivers started trending down in the early 1980s and should have strongly influenced the labor cost share of individual tasks. Given that the offshoring of tasks from advanced economies to emerging market economies is driven mainly by wage differentials, it is natural to expect the incentive for offshoring to vary across tasks with different exposure to the fall in the cost of capital. This further influences labor income share dynamics by changing the composition of tasks with different levels of labor cost share.

The model highlights a mechanism by which participation in global value chains, when combined with a strong decline in the relative cost of capital, can simultaneously lead to lower labor shares in both advanced and emerging market economies. For advanced economies, the mechanism is straightforward: because offshored tasks are relatively labor intensive, the composition of remaining production becomes more capital intensive, and a decline in labor income shares ensues. For emerging market economies, the mechanism has two parts. First, the steep decline in the relative cost of capital leads firms in advanced economies to automate primarily tasks that can be performed easily by labor and to offshore those that cannot—that is, those with low elasticity of substitution between capital and labor—to emerging market economies. Second, because the relative cost of capital tends to be comparatively high in emerging market economies due to capital scarcity, tasks with low substitutability between factors will have higher capital shares than the average task, because firms cannot as easily exploit low relative labor costs to substitute labor for capital. Thus, offshoring will shift the composition of production toward tasks with higher capital shares, thereby lowering the aggregate labor income share in emerging market economies.[58]

It is important to note that the model is not used to argue that offshoring is caused mainly by a decline

[55]See Lian (forthcoming) for a more detailed analysis.

[56]Relative to wages.

[57]The depreciation rate of capital may rise during this period due to a larger share of software in capital (Eden and Gaggl 2015), which is however unlikely to offset other drivers' decline.

[58]The hypothesis that offshored tasks may be more capital intensive than existing tasks in emerging market and developing economies is proposed by Elsby, Hobijn, and Şahin (2013) and Cho (2016). Cho (2016) assumes that technology advancement has always been labor saving and that tasks that are relatively more labor intensive in advanced economies are offshored from them to emerging market economies. To the extent that these tasks use more advanced technology than is currently in use in emerging market economies or, equivalently, that these tasks have a lower labor income share than existing tasks in these economies, offshoring can reduce the labor income share. In contrast with Cho (2016), technology advancement causes a fall in the cost of capital in this chapter's model, which may or may not be labor saving, depending on whether the elasticity of substitution of tasks is above or below 1. In particular, the chapter finds that the declining cost of capital may not cause labor saving in emerging market and developing economies, given that elasticity of substitution is, on average, low in these economies (Box 3.2).

in the cost of capital. Instead, the mechanism should hold with other important drivers of offshoring as well, such as its declining cost (Feenstra and Hanson 1997; Grossman and Rossi-Hansberg 2008), because those drivers simply make all tasks more likely to be offshored and do not offset the mechanism emphasized here. Instead, the model is used to highlight that, in the presence of a fall in the relative cost of capital in an advanced economy, the types of tasks offshored tend to be such that they reduce the labor share in the receiving emerging market economy.[59]

To begin with, consider a spectrum of tasks that are produced by capital K and labor L through a constant elasticity of substitution production function:

$$\left(\alpha K^{1-\frac{1}{\rho}} + (1-\alpha) L^{1-\frac{1}{\rho}}\right)^{\frac{\rho}{\rho-1}}, \tag{3.1}$$

in which α and ρ govern the capital intensity and the elasticity of substitution between capital and labor.[60] Both can differ across tasks. Cost minimization implies that the cost of producing one unit of output of task $\{\alpha, \rho\}$ is:

$$c(r, w; \alpha, \rho) = \left(\alpha^{\rho} r^{1-\rho} + (1-\alpha)^{\rho} w^{1-\rho}\right)^{\frac{1}{1-\rho}}, \tag{3.2}$$

in which r denotes the cost of capital and w denotes the wage.

The labor income share of the task $\{\alpha, \rho\}$ is:

$$LS = \frac{1}{1 + \alpha^{\rho}(1-\alpha)^{-\rho}\left(\frac{r}{w}\right)^{1-\rho}}. \tag{3.3}$$

Therefore:

$$\frac{\partial LS}{\partial\left(\frac{r}{w}\right)} = (\rho - 1)\frac{\alpha^{\rho}(1-\alpha)^{-\rho}\left(\frac{r}{w}\right)^{-\rho}}{\left(1 + \alpha^{\rho}(1-\alpha)^{-\rho}\left(\frac{r}{w}\right)^{1-\rho}\right)^{2}}. \tag{3.4}$$

Equation (3.2.1) suggests a critical role of the elasticity of substitution ρ for the impact of the relative cost of capital on the labor income share. Specifically, a fall in the relative cost of capital $\frac{r}{w}$ leads to a decline in the labor income share if and only if the elasticity of substitution ρ is larger than 1.

To model offshoring from advanced economies to emerging market economies, the model looks at two countries with different wage levels and focuses on the offshoring of tasks from the high-wage country to the low-wage country. The cost of producing a unit of task $\{\alpha, \rho\}$ in the high-wage country is $c(r, w; \alpha, \rho) = \left(\alpha^{\rho} r^{1-\rho} + (1-\alpha)^{\rho} w^{1-\rho}\right)^{\frac{1}{1-\rho}}$, and due to assumed high failure rates and monitoring costs, the cost of producing one unit of task in the low-wage country is $\left(1+\tau\right) c(r, w''; \alpha, \rho) = \left(1+\tau\right)\left(\alpha^{\rho} r^{1-\rho} + (1-\alpha)^{\rho} w'^{1-\rho}\right)^{\frac{1}{1-\rho}}$, in which $w' < w$, and τ captures these costs of offshoring. The set of tasks A that are offshored from the high-wage to low-wage country can be defined as:

$$A \triangleq \left\{(\alpha, \rho, \tau) : c(r, w; \alpha, \rho) > (1+\tau) c\left(r, w'; \alpha, \rho\right)\right\}. \tag{3.5}$$

The assumption that the cost of capital is the same for the high-wage and the low-wage countries is plausible, given that offshoring is often associated with foreign direct investment flows (Feenstra and Hanson 1997) that help achieve a relatively low cost of capital for the project considered, despite overall capital scarcity in emerging market economies. This also makes the model of offshoring presented here different from conventional trade theory, which assumes that capital does not move across countries. Capital mobility implies that offshoring will effectively contribute to capital deepening, reduce the cost of capital, and change the composition of tasks.

For simplicity, the analysis below is based on a partial equilibrium analysis in which w and w' and the cost of capital are given exogenously. Lian (forthcoming) provides a general equilibrium analysis, which corroborates the main conclusions of this partial equilibrium analysis, given that the abundant labor supply in emerging market and developing economies implies that the wage increase in low-wage countries as a result of stronger demand for labor caused by offshoring would probably not be large enough to reverse the relationship $w > w'$.

Equivalently, taking logs and rearranging terms, A can be characterized as:

$$A \triangleq \left\{(\alpha, \rho, \tau) : \int_{w'}^{w} \frac{\partial lnc(r, z; \alpha, \rho)}{\partial z} dz > \ln(1+\tau)\right\}. \tag{3.6}$$

The model studies labor income share dynamics caused by offshoring in two steps. First, the model proves that tasks with low elasticity of substitution are more likely—and those with high elasticity of substitution less likely—to be offshored if the relative cost of capital falls. Second, the model considers how the offshoring of tasks with low elasticity of substitution affects the labor income share in both the sending (advanced) economy and the receiving (emerging market) economies.

As a first step, Proposition 1 provides a comparative static result that a decline in the relative cost of capital makes the offshoring of tasks with elasticity of substitution higher than (lower than) 1 less (more) attractive.

[59]Otherwise, offshoring could lead to a zero sum in terms of the impact on the global labor income share.

[60]See Box 3.2 for the definition of elasticity of substitution.

Annex Figure 3.2.1. Impact of the Costs of Capital and Offshoring on the Set of Tasks Offshored from a High-Wage Country to a Low-Wage Country

Source: IMF staff estimates.
Note: The shaded areas represent tasks that are offshored from a high-wage country to a low-wage country. This figure suggests that tasks with $\rho < 1$ are more likely to be offshored than tasks with $\rho > 1$ if there are declines in the cost of capital and the cost of offshoring, where r_0 and r_1 denote the cost of capital and $r_0 > r_1$, and τ_0 and τ_1 denote the cost of offshoring and $\tau_0 > \tau_1$. For illustrative purposes, all tasks with capital intensity below α are offshored in panel 1, and the set of tasks with $\rho > 1$ that are offshored in panel 3 are set to be identical with that in panel 1.

Proposition 1: A decline in the cost of capital causes more tasks with $\rho < 1$ and fewer tasks with $\rho > 1$ to be offshored from the high-wage country to the low-wage country.

Proof: Through the use of algebra, it can be shown straightforwardly that:

$$\frac{\partial^2 lnc(r, w; \alpha, \rho)}{\partial w \partial r} = (\rho - 1)\, r^{\rho - 2} w^{-\rho} \left(\frac{1-\alpha}{\alpha}\right)^{\rho} \frac{1}{\left[1 + \left(\frac{1-\alpha}{\alpha}\right)^{\rho} \left(\frac{w}{r}\right)^{1-\rho}\right]^2}. \tag{3.7}$$

Therefore:

$$\frac{\partial^2 lnc(r, w; \alpha, \rho)}{\partial w \partial r} \begin{cases} > 0 & \text{if } \rho > 1 \\ < 0 & \text{if } \rho < 1 \end{cases}. \tag{3.8}$$

Assume the cost of capital is r_1 initially and declines to $r_2 < r_1$. Inequalities in (3.2.4) imply that:

$$\int_{w''}^{w} \frac{\partial lnc(r_2, z; \alpha, \rho)}{\partial z} dz < \int_{w''}^{w} \frac{\partial lnc(r_1, z; \alpha, \rho)}{\partial z} dz, \text{ for any } \rho > 1,$$

$$\int_{w''}^{w} \frac{\partial lnc(r_2, z; \alpha, \rho)}{\partial z} dz > \int_{w''}^{w} \frac{\partial lnc(r_1, z; \alpha, \rho)}{\partial z} dz, \text{ for any } \rho < 1. \tag{3.9}$$

The definition of the set of offshorable tasks as characterized by (3.6) implies that a decline in the cost of capital causes an expansion of the set of tasks that are offshored and have elasticity of substitution lower than 1, and a reduction of the set of tasks that are offshored and have elasticity of substitution higher than 1.

As a second step, the model considers a decline in the cost of offshoring τ and studies how offshoring affects labor income shares in the low- and high-wage countries. In the current partial equilibrium analysis, the definition (3.6) implies directly that it causes more tasks to be offshored, regardless of their elasticity of substitution ρ.[61] Because declines in the cost of capital and offshoring costs have conflicting effects on offshoring when $\rho > 1$ while they reinforce each other when $\rho < 1$, their combined effect should imply that tasks with $\rho < 1$ are more likely to be offshored, as illustrated in Annex Figure 3.2.1.[62]

[61]Lian (forthcoming) conducts simulations based on plausible parameters in a general equilibrium environment. These confirm that declining costs of offshoring substantially increase the number of tasks that are offshored from the high-wage to the low-wage country, despite a convergence in wage levels.

[62]This figure illustrates that the mechanism—the declining cost of capital makes tasks with elasticity of substitution lower than 1 more likely to be offshored than tasks with elasticity of substitution higher than 1—holds for other important drivers of

For simplicity, to study how the offshoring of tasks with low elasticity of substitution affects the labor income share, it is helpful to consider a special case in which all offshorable tasks have a Leontief production function $F(K, L) = \min\left\{\frac{K}{a}, L\right\}$, implying zero elasticity of substitution between capital and labor, while non-offshorable tasks have a Cobb-Douglas production function, implying an elasticity of substitution equal to 1. It is further assumed that consumers have a log preference function over the tasks.

Proposition 2: If the average labor income share of offshorable tasks is the same as that of non-offshorable tasks, offshoring because of a decline in the costs of capital and offshoring can reduce the labor income share in the high-wage country.

Proof: for task a, the labor income share is

$$\frac{wL}{F(K,L)} = \frac{wL}{wL + r(aL)} = \frac{1}{1 + a\frac{r}{w}}. \tag{3.10}$$

Using definition (3.6), it is straightforward to show that any task a that is offshored from high- to low-wage countries satisfy $a < a^*$, in which $a^* = \frac{w - (1+\tau)w'}{\tau r}$. As the labor income share is declining in a, the remaining tasks become more capital intensive, which reduces the labor income share in the high-wage country.

The log preference function of consumers ensures that the share of each task in aggregate expenditure is constant, so a decline in labor income share within offshored tasks implies that *offshoring will drive down the global labor income share.*[63]

Finally, it is generally possible for offshoring to reduce the labor income share in the low-wage country as well. As mentioned above, offshored tasks are likely to be predominantly those with low elasticity of substitution. As a result, the share of tasks with low elasticity of substitution will increase in the low-wage country. To the extent that the average labor income share of tasks with elasticity of substitution lower than 1 is substantially lower than that of those with elasticity of substitution equal to or greater than 1, offshoring may reduce the aggregate labor income share in the low-wage country.[64]

Annex 3.3. Country Coverage and Data

The analysis is based on countries with at least 10 years of data on labor shares over the 1991–2014 period, resulting in a sample of 31 advanced economies and 18 emerging market economies for the aggregate analysis and a sample of 27 advanced economies for the sectoral analysis. For the skill-based results, a sample of 27 advanced economies and 10 emerging market economies is included at the aggregate level, and 27 advanced economies and 5 emerging market economies are included at the sectoral level.

The chapter assembles a new data set on labor shares based on primary sources from national authorities for most major economies, as well as on data from the Organisation for Economic Co-operation and Development and the data set of Karabarbounis and Neiman (2014).

The primary data sources for other variables used in this chapter are the IMF's *World Economic Outlook*, Organisation for Economic Co-operation and Development, CEIC, Penn World Tables 9.0 database, World Bank, World Development Indicators database, World Input-Output Database, Eora Multi-Regional Input-Output database, United Nations Industrial Development Organization database, and United Nations Comtrade database.

The routine task intensity measure relies on data from Autor and Dorn (2013) for routine, manual, and abstract task inputs; the offshorability measure is constructed using data from Blinder and Krueger (2013). For the calculation of aggregate and sectoral routinization and offshorability scores, the chapter incorporates employment by industry and occupation data from Eurostat, European Union Labor Force Survey; International Labour Organization; Integrated Public Use Microdata Series (IPUMS) International; IPUMS USA; and National Bureau of Statistics of China.

offshoring. From panel 1 to panel 2, a decline in the cost of capital makes tasks with elasticity of substitution larger than 1 less likely to be offshored and those with elasticity of substitution less than 1 more likely to be offshored—as proved in Proposition 1. Next, from panel 2 to panel 3, a further decline in the cost of offshoring makes all tasks more likely to be offshored. With the two changes combined, it is evident that tasks with elasticity of substitution lower than 1 are more likely to be offshored than those with elasticity of substitution higher than 1.

[63]For details, see Lian (forthcoming).

[64]This is likely if also taking into account capital scarcity—possible strong credit rationing in emerging market and developing economies, which may limit the access to capital for many private sector firms.

Annex Table 3.3.1. Country Coverage

Aggregate Long-Term Analysis	Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States
	Brazil, Bulgaria, Chile, China, Costa Rica, Egypt, Hungary, Indonesia, Kyrgyz Republic, Mexico, Morocco, Peru, Philippines, Poland, Romania, South Africa, Thailand, Turkey
Aggregate Stacked Five-Year Analysis	Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States
	Bolivia, Brazil, Bulgaria, Chile, China, Croatia, Egypt, Hungary, Indonesia, Jamaica, Kyrgyz Republic, Mexico, Morocco, Namibia, Peru, Philippines, Poland, Romania, South Africa, Tanzania, Thailand, Turkey, Venezuela
Sectoral Analysis	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States
Aggregate Analysis by Skill	Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Japan, Korea, Latvia, Lithuania, Malta, Netherlands, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States
	Brazil, Bulgaria, China, Hungary, India, Indonesia, Mexico, Poland, Romania, Turkey
Sectoral Analysis by Skill	Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom, United States
	Brazil, China, Mexico, Romania, Turkey

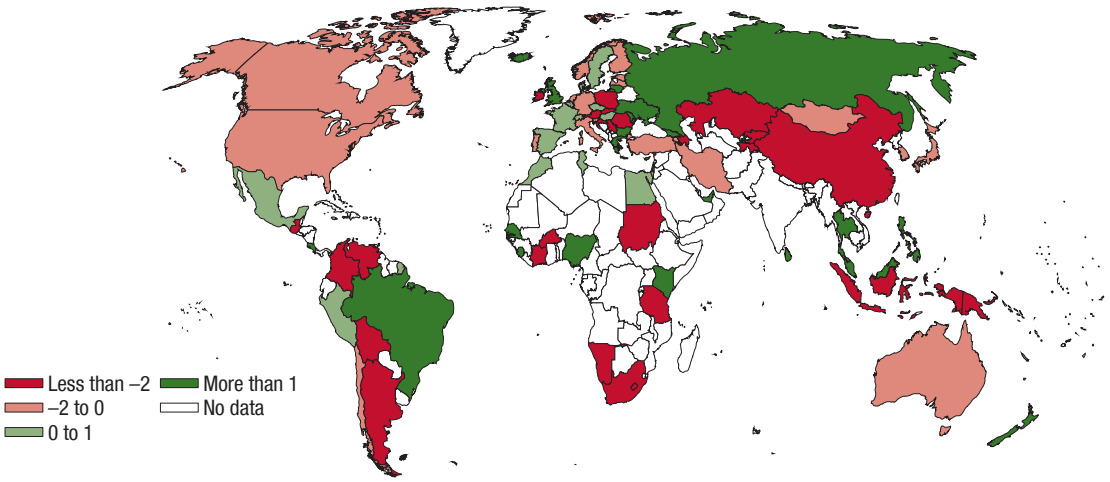
Source: IMF staff compilation.

Annex Table 3.3.2. Data Sources

Indicator	Source
Labor Share (aggregate)	Karabarbounis and Neiman (2014); national authorities; Organisation for Economic Co-operation and Development
Labor Share (sectoral)	CEIC database; EU KLEMS database; Organisation for Economic Co-operation and Development
Labor Share by Skill	World Input-Output Database, Socio Economic Accounts, Release of July 2014
Price of Investment	IMF, World Economic Outlook database
Intermediate Imports	EORA MRIO database; World Input-Output Database
Global Value Chain Participation	EORA MRIO database; IMF staff calculations
Domestic Value Added	EORA MRIO database
Imports and Exports of Goods and Services	IMF, World Economic Outlook database
Union Density Rate	Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts; Organisation for Economic Co-operation and Development
Routinization	Autor and Dorn (2014); Eurostat, European Union Labor Force Survey; IPUMS International; IPUMS USA; International Labour Organization; national authorities; United Nations
Corporate Income Tax	IMF, Fiscal Monitor database
GDP, Per Capita GDP	IMF, World Economic Outlook database
External Assets and Liabilities	External Wealth of Nations Mark II database
Credit to Private Sector	World Bank World Development Indicators database
Inflation Expectations	Consensus Forecast database; IMF, World Economic Outlook database
Capital Depreciation Rate	World Bank database
Old-Age Dependency Ratio	World Bank database
Migrant Stock	United Nations database
Relative Skill Supply (percent of population with primary, secondary, tertiary education)	Barro Lee Educational Attainment for Population Aged 15 and Over database (2013); World Input-Output Database; IMF staff calculations
Long-Term Treasury Yield	IMF, International Financial Statistics database; IMF, World Economic Outlook database

Source: IMF staff compilation.
Note: IPUMS = Integrated Public Use Microdata Series; MRIO = Multi-Region Input-Output.

Annex Figure 3.4.1. Estimated Trends in Labor Shares across the World
(Percentage points per 10 years)



Sources: National authorities; and IMF staff calculations.
Note: This world map shows the labor share trend of countries with at least 10 years of data, starting in 1991.

Annex 3.4. Methodology

This annex provides further details on the methodologies used in the aggregate, sectoral, and skill-based analyses of labor shares. Regressions exploit cross-country as well as cross-sector heterogeneity in the evolution of labor shares (Annex Figure 3.4.1) as well as in the evolution of its potential drivers (Annex Figure 3.4.2).

Aggregate Analysis

The baseline estimation equation of the aggregate regression is:

$$\widehat{LS}_c = \alpha + \beta_2 \widehat{PI}_c + [\beta_3 RTI_{0,c} + \beta_4 RTI_{0,c}\widehat{PI}_c] + \beta_1{}'\widehat{G}_c + \beta_5{}'\widehat{Pol}_c + \varepsilon_c, \quad (3.11)$$

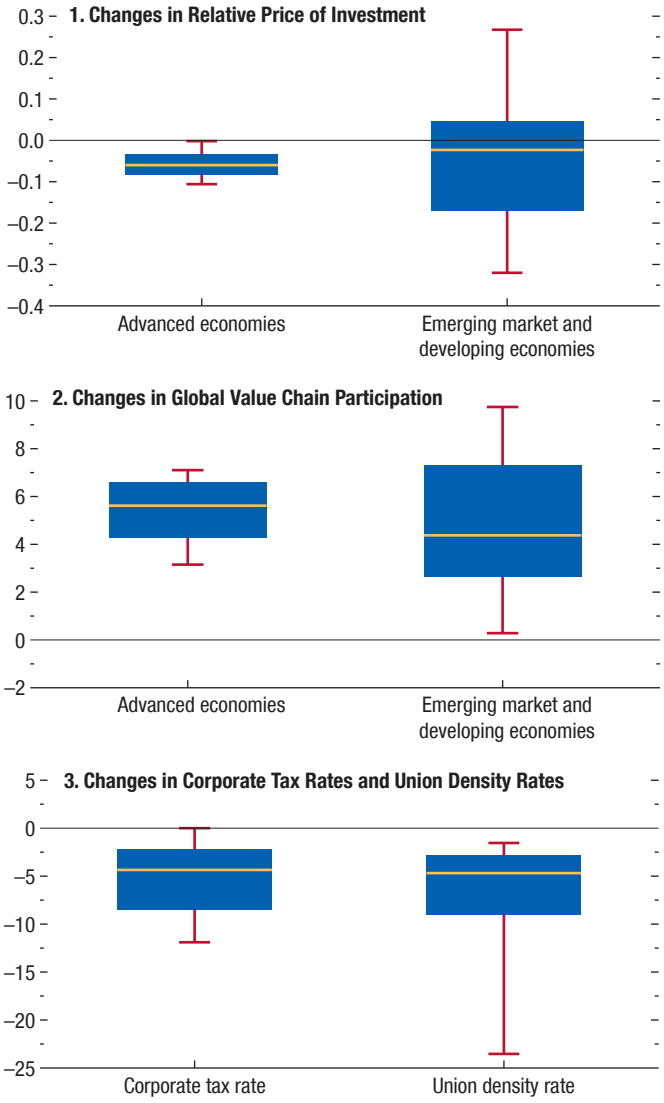
in which (hat) variables are long-term annualized changes during 1991–2014 at the country level. (A similar approach was used by Karabarbounis and Neiman 2014; Elsby, Hobijn, and Şahin 2013; and Acemoglu and Restrepo 2016.) *PI* denotes the relative price of investment (relative to consumption) goods, and RTI_0 the initial exposure to routinization. *G* subsumes variables measuring the evolution of globalization: changes in total goods trade (value-added exports and non-oil imports in percent of GDP), as well as trade in intermediate goods and global value chain participation (measured alternatively by the sum of forward and backward linkages as defined in the text, or by imported intermediate inputs in percent of gross value added), and changes in financial globalization (external assets and liabilities, excluding international reserves in percent of GDP). *Pol* summarizes policy and institutional factors, including changes in union density, corporate taxation, employment protection legislation, and product market reforms.

Labor and Product Market Reform Indicators

Indicators for labor market and product market reforms were developed using the Fraser Institute's Economic Freedom of the World data set, specifically based on the indicators "hiring and firing regulations" and "business regulations" between 1995 and 2014.[65] To identify major regulation or deregulation efforts for each country, ordinal scaled variables are assigned the value 1 (describing major deregulations) in every year the change in the index is larger than the country-specific mean plus one standard deviation. The value –1 (describing major regulations) is assigned where the change in the index is larger than the country-specific mean minus one standard deviation; the indicator is otherwise zero. Some individual indicators may be vulnerable to perception-based rankings and measurement uncertainties. However, by combining data from

[65]For details, see Gwartney, Lawson, and Hall (2016).

Annex Figure 3.4.2. Heterogeneity in the Evolution of Key Drivers of the Labor Share
(Percentage points)



Sources: Eora Multi-Region Input-Output database; and IMF staff calculations.
Note: The horizontal line inside each box represents the median; the upper and lower edges of each box show the top and bottom quartiles; and the red markers denote the top and bottom deciles. Changes are shown in units per 10 years.

several sources—the Fraser Institute's indicators are constructed using, among others, data from the World Bank, World Economic Forum and the International Institute for Management Development World Competitiveness data—the constructed indices potentially have more comprehensive data coverage than a single indicator and may also be less sensitive to outliers and concerns about subjectivity.

Due to a structural break in the series in 2001, separate means and standard deviations are calculated (for each country) in the two series.

Sectoral Analysis

The empirical strategy at the sectoral level closely follows that used at the aggregate level, examining the effects of long-term changes in technology and globalization on long-term changes in labor shares. The following cross-sectional regressions are estimated at the country-sector level:

$$\widehat{LS}_{cs} = \beta_1' \widehat{G_{cs}} + \beta_2 \widehat{PI}_{cs} + \left[\beta_3 RTI_{0,cs} + \beta_4 RTI_{0,cs} \widehat{PI_{cs}}\right] + \gamma_0' FE_c + \gamma_1' FE_s + \varepsilon_{cs}, \quad (3.12)$$

relating long-term changes (denoted using hats) in sectoral labor shares (LS) to long-term changes in globalization (G, including total, intermediate trade and financial integration) and long-term changes in sectoral relative prices of investment (PI) and their interactions with sectoral routinization scores (RTI_0). Country and sector fixed effects are included to account for unobservable country- and sector-specific trends. Results are reported in Annex Table 3.5.6.

Analysis by Skill

Labor compensation by skill is constructed using the World Input-Output Database's skill level labor compensation as a percent of total labor compensation, multiplied by labor compensation data, at the country and sector levels, respectively. Labor share by skill is then computed by taking the ratio of labor compensation by skill and value added, at both the country and sector levels.

Annex 3.5. Robustness and Additional Tables

This annex provides background tables and additional robustness checks for the aggregate, sectoral, and skill-based analyses of trends in labor shares discussed in the chapter. It first looks at baseline results and robustness checks for the aggregate analysis, using a stacked-differences regression to augment the sample size and alternative measures of technology and globalization, including further potential drivers, and analyzing robustness when adjusting labor shares for measurement issues. It then provides additional tables on sectoral results and finally turns to an analysis of aggregate as well as sectoral results by skill level, including those controlling explicitly for skill composition.

Annex Table 3.5.1. Baseline Aggregate Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Technology	Global Integration	Policies		All	
Initial Routinization	–0.000135				0.0000178	–0.000119
	(0.00119)				(0.00110)	(0.00137)
Relative PI * Initial Routinization	0.267***				0.247***	0.524***
	(0.0969)				(0.0779)	(0.124)
Relative PI	0.0847**				0.0444	0.183**
	(0.0380)				(0.0336)	(0.0734)
Value Added Export/GDP		–0.123			–0.110	
		(0.128)			(0.155)	
Import/GDP		0.0286			0.0131	
		(0.0204)			(0.0174)	
Financial Integration		–0.234***			–0.205***	1.72*
		(0.0806)			(0.0607)	(0.895)
Global Value Chain Participation		–0.288***			–0.253***	–0.574***
		(0.0717)			(0.0796)	(0.0962)
Employment Protection Legislation Reform			0.00144	0.000786		
			(0.00294)	(0.00266)		
Product Market Reform			–0.0000306	0.00125		
			(0.00154)	(0.00123)		
Unionization				0.0285		
				(0.0563)		
Corporate Taxation				0.194**	0.0384	0.0170
				(0.0710)	(0.0373)	(0.0316)
Relative PI * AE dummy						–0.177*
						(0.0954)
Global Value Chain Participation * AE dummy						0.483***
						(0.101)
Financial Integration * AE dummy						–1.88**
						(0.897)
AE dummy						–0.00117
						(0.000820)
Number of Observations	49	50	50	26	49	49
R^2	0.196	0.288	0.004	0.377	0.448	0.636

Source: IMF staff calculations.

Note: All variables (except initial routinization) are expressed as long-term changes. Robust standard errors are in parentheses. Here and in all subsequent tables, the long-term change in financial integration, measured as the sum of external assets and liabilities in percent of domestic GDP, is divided by 100. AE = advanced economy; PI = price of investment.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Aggregate Analysis

Annex Table 3.5.1 summarizes the baseline aggregate regression results. Columns 1–4 present the estimates block by block, column 5 estimates all drivers jointly, and column 6 interacts the variables that are statistically significantly different between advanced economies and emerging market economies, with an advanced economy dummy.

Annex Table 3.5.2 summarizes the results of the stacked-differences estimation according to the following regression equation:

$$\widehat{LS}_{c,t} = \alpha + \beta_2 \widehat{PI}_{ct} + [\beta_3 RTI_{0,ct} + \beta_4 RTI_{0,ct}\widehat{PI}_{ct}] + \beta_1{}'\widehat{G_{ct}} + \beta_5{}'\widehat{Pol_{ct}} + \gamma FE_c + \delta FE_t + \varepsilon_{ct}, \quad (3.13)$$

in which all variables are defined as in the baseline aggregate regression equation, but with t denoting nonoverlapping consecutive five-year periods (t = 1992–96, 1997–2001, 2002–06, 2007–11, depending on country), stacked for each country c. The panel structure makes it possible to control for country-specific trends and period-specific unobservables, while significantly increasing the number of observations compared with the baseline cross-sectional trend regression. However, a drawback of the stacked regression is that it loses some of the trend changes that are discernible only over a longer horizon (more than five years) and that cyclical and temporary factors are not completely purged.

Annex Table 3.5.2. Stacked Aggregate Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Ordinary Least Square Estimations					Robust Regression
Technology						
Initial Routinization	–0.00222*	–0.0150*		–0.0126	–0.0149**	–0.0293***
	(0.00120)	(0.00887)		(0.00819)	(0.00644)	(0.00459)
Relative PI	0.0339	0.0535		0.0112	0.0615	0.0223
	(0.0279)	(0.0434)		(0.0457)	(0.0489)	(0.0350)
Relative PI * Initial Routinization	0.128**	0.101		0.233	0.207	0.273**
	(0.0530)	(0.201)		(0.193)	(0.172)	(0.116)
Global Integration						
Global Value Chain Participation	–0.152**	–0.207***		–0.253***	–0.174*	–0.131**
	(0.0655)	(0.0627)		(0.0632)	(0.0911)	(0.0628)
Financial Integration	0.0890***	0.0726*		0.0744**	0.0312	0.0784
	(0.0219)	(0.0369)		(0.0338)	(0.046)	(0.0568)
Policy						
Corporate Taxation	0.0201	0.0709		0.0651	0.0511	0.127***
	(0.0524)	(0.0711)		(0.0646)	(0.0573)	(0.0425)
Employment Protection Legislation Reform			–0.00207**	–0.0000182	0.000291	–0.000626
			(0.000806)	(0.000854)	(0.00104)	(0.000794)
Product Market Reform			–0.000780			
			(0.000771)			
Country Fixed Effects	N	Y	Y	Y	Y	Y
Period Fixed Effects	N	N	N	N	Y	Y
Number of Observations	165	165	181	154	154	153
R^2	0.157	0.197	0.038	0.238	0.501	0.834

Source: IMF staff calculations.

Note: All variables (except initial routinization) are expressed as long-term changes. Robust standard errors are clustered at the country level. PI = price of investment.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Given that the variables are formulated as annualized changes, they can be directly compared with the baseline long-term trend regressions. Results of the stacked-differences regression in Annex Table 3.5.2 strongly confirm findings in the baseline. The impact of technology is similar in magnitude, but less precisely estimated, arguably because adjustments to technological change materialize only over a longer time horizon. That said, the effect of global value chain participation is very similar to the trend results, implying a faster adjustment to globalization forces than to technology. The effect of employment protection legislation reforms is also statistically significantly negative for labor shares within five years of the reform. However, they are again swamped out by the impact of technology and trade in the joint specification.

Annex Table 3.5.3.A examines robustness with respect to alternative measures of the relative cost of capital. In column 1, the baseline regression is first rerun using the smaller sample for which sufficiently long time series of user cost of capital data can be obtained. In column 2, instead of using only relative *PI*, the comprehensive measure of user cost of capital (UCC) is derived from the steady state of the Euler equation of the model to be:

$$\text{UCC} = \text{PI} * (\text{real IR} + \text{depreciation rate}),$$

in which the real interest rate (*IR*) is computed using long-term (10-year) government bond yields deflated by long-term inflation expectations, which can be constructed for sufficiently long periods for a subsample of 40 countries. Column 3 adds further baseline control variables. Column 4 controls for trends in financial deepening directly by adding trends in private credit as a share of GDP. Results imply that the comprehensive measure of UCC affects labor shares similarly to the price of investment, though the result is less significant, possibly because more measurement error is introduced with the additional variables (especially depreciation rates). Accounting for general financial deepening actually raises the labor share, a result that is driven mostly by the emerging market economies sample. This is consistent with the finding

Annex Table 3.5.3.A. Aggregate Results, Robustness (User Cost)

	(1)	(2)	(3)	(4)
	Baseline	User Cost of Capital		Credit/GDP
Initial Routinization	–0.00103	0.00228	0.00214	–0.000356
	(0.000809)	(0.00280)	(0.00188)	(0.000755)
Relative PI * Initial Routinization	0.285***			0.220***
	(0.0743)			(0.0702)
Relative PI	0.0556*			0.0450
	(0.0327)			(0.0296)
Global Value Chain Participation	–0.166**		–0.168**	–0.235***
	(0.0653)		(0.0751)	(0.0651)
Trade Integration	0.00794		0.0137	0.0126
	(0.0183)		(0.0206)	(0.0200)
Financial Integration	–0.182*		–0.220*	–0.236**
	(0.0973)		(0.120)	(0.106)
Corporate Taxation	0.0440		0.0676	0.0299
	(0.0496)		(0.0549)	(0.0403)
Initial Routinization * User Cost of Capital		0.121**	0.0889*	
		(0.0613)	(0.0541)	
User Cost of Capital		0.00320	0.00290	
		(0.0161)	(0.0137)	
Private Credit/GDP				0.0290*
				(0.0154)
Number of Observations	40	40	40	49
R^2	0.492	0.170	0.362	0.478

Source: IMF staff calculations.
Note: All variables (except initial routinization) are expressed as long-term changes. Robust standard errors are in parentheses. PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

that the average elasticity of substitution is lower than 1 in this country group, because financial and capital deepening would, on net, boost wages and labor shares in such an environment. In all cases, the effect of participation in global value chains remains significantly negative and of similar magnitude as in the baseline estimate.

Annex Table 3.5.3.B examines robustness with respect to alternative measures of trends in offshoring. First, intermediate imported input share (in percent of GDP) is used instead of global value chain participation (column 1). Second, to rule out the possibility that the effect of offshoring is driven by generally more complex production that is also manifested in a higher share of total intermediate use, column 2 controls instead for the share of *imported* intermediate goods in total intermediate goods used. Third, to rule out the possibility that results are driven by long-term swings in commodity prices, intermediate import shares are computed excluding commodities for a subsample of countries that have data on intermediate imports by detailed product categories (column 3). Finally, column 4 measures intrinsic or de jure trends in offshoring by interacting the initial offshorability index computed from microlevel occupation data with the trend in the import price index for each country. All results confirm that globalization in intermediate trade has negatively affected labor shares.

Annex Table 3.5.4 summarizes further robustness results. Column 1 repeats the baseline trend regression using robust regression instead of ordinary least squares—that is, dropping gross outlier countries and using a Huber iteration algorithm to estimate coefficients by assigning different weights to countries. Column 2 repeats the baseline regression by weighting countries by their average GDP (in purchasing power parity) over the sample period. Column 3 excludes transition economies. Column 4 includes additional covariates: trends in demographics (old-age dependency ratio) and the trend change in migrant stocks and human capital (relative high-skill supply) as well as initial GDP per capita. Column 5 ends the sample period in 2007 to exclude the impact of the global financial crisis.

Finally, Annex Table 3.5.5 presents the results' robustness when using labor share data adjusted for self-employment and capital depreciation. As shown in Box 3.4, the evolution of the adjusted labor shares may differ from the baseline labor share for a given country. That said, the impact of the main drivers of labor

Annex Table 3.5.3.B. Aggregate Results, Robustness (Alternative Measure of Offshoring)

	(1)	(2)	(3)	(4)
	Imported Intermediate Inputs/GDP	Imported Intermdiate Inputs/Total Intermediate Use	Imported Intermediate/GDP excluding Commodities	De jure Measure of Offshoring
Intermediate Goods Trade	–0.499***	–0.397***	–0.242*	
	(0.161)	(0.0979)	(0.135)	
Initial Offshorability				0.000154
				(0.00223)
Initial Offshorability*Import Price Index				0.159**
				(0.0670)
Import Price Index				0.00343
				(0.0128)
Import/GDP	0.0161	–0.0000922	–0.00146	–0.0481*
	(0.0166)	(0.0155)	(0.0134)	(0.0276)
Value-Added Export/GDP	0.0800	0.229	0.0395	–0.0526
	(0.180)	(0.167)	(0.160)	(0.193)
Financial Integration	–0.160**	–0.169***	–0.0764	–0.152**
	(0.0604)	(0.0593)	(0.0720)	(0.0726)
Initial Routinization	–0.0000345	–0.000421	–0.0213	–0.154
	(0.00118)	(0.00103)	(0.00117)	(0.00167)
Relative PI * Initial Routinization	0.261***	0.339***	0.211**	0.230**
	(0.0879)	(0.0829)	(0.0959)	(0.0943)
Relative PI	0.0539	0.0740**	0.0431	0.0697*
	(0.0335)	(0.0303)	(0.0357)	(0.0366)
Corporate Taxation	0.0536	0.0510	0.0946**	0.107***
	(0.0410)	(0.0406)	(0.0414)	(0.0381)
Number of Observations	49	49	48	48
R^2	0.417	0.470	0.335	0.400

Source: IMF staff calculations.
Note: All variables (except initial routinization) are expressed as long-term changes. Robust standard errors are in parentheses. PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.5.4. Aggregate Results, Robustness (Other Robustness Checks)

	(1)	(2)	(3)	(4)	(5)
	Robust Regression	GDP Weighted	AEs, No Transition Countries	Additional Controls	Without Global Financial Crisis
Initial Routinization	–0.000332	0.00120	0.00160	–0.00171	–0.00128
	(0.00093)	(0.00102)	(0.00363)	(0.00125)	(0.00155)
Relative PI * Initial Routinization	0.235***	0.335**	0.923**	0.282***	0.292**
	(0.0835)	(0.132)	(0.430)	(0.0846)	(0.111)
Relative PI	0.0317	0.150**	–0.0646	0.0360	0.0586
	(0.0364)	(0.0675)	(0.0832)	(0.0316)	(0.0432)
Global Value Chain Participation	–0.235***	–0.282**	–0.0838**	–0.384***	–0.145**
	(0.0809)	(0.120)	(0.0342)	(0.0664)	(0.0600)
Financial Integration	–0.206	–0.105	–0.184**	–0.206***	–0.164**
	(0.131)	(0.0901)	(0.0813)	(0.0657)	(0.0714)
Corporate Taxation	0.0406	–0.000645	0.0658	0.00808	0.120
	(0.0497)	(0.0395)	(0.0469)	(0.0485)	(0.0749)
Old-Age Dependency Ratio				0.000312	
				(0.000995)	
Migrant Stock				0.0629	
				(0.139)	
Initial GDP per Capita				0.000399	
				(0.000595)	
Human Capital				0.541	
				(0.335)	
Number of Observations	49	49	25	44	50
R^2	0.357	0.425	0.584	0.581	0.338

Source: IMF staff calculations.
Note: All variables (except initial routinization and initial GDP per capita) are expressed as long-term changes. Robust standard errors are in parentheses. AEs = advanced economies; PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.5.5. Aggregate Results, Robustness (Measurement Issues)

	Baseline Labor Share	Self-Employment-Adjusted Labor Share	Depreciation-Adjusted Labor Share	Self-Employment- and Depreciation-Adjusted Labor Share
Initial Routinization	0.0000178	0.00691**	0.000655	0.00762**
	(0.00110)	(0.00300)	(0.00173)	(0.00346)
Relative PI * Initial Routinization	0.247***	0.460*	0.322***	0.570*
	(0.0779)	(0.264)	(0.0933)	(0.305)
Relative PI	0.0444	–0.0484	0.0616	–0.0901
	(0.0336)	(0.120)	(0.0493)	(0.138)
Global Value Chain Participation	–0.253***	–0.617**	–0.227*	–0.665**
	(0.0796)	(0.252)	(0.134)	(0.291)
Value-Added Export/GDP	–0.110	–0.0223	–0.0205	0.0937
	(0.155)	(0.482)	(0.197)	(0.557)
Import/GDP	0.0131	0.0655	–0.0304	0.0222
	(0.0174)	(0.0864)	(0.0288)	(0.0998)
Financial Integration	–0.205***	–0.346	–0.0903	–0.255
	(0.0607)	(0.402)	(0.0945)	(0.464)
Corporate Taxation	0.0384	0.119	0.0798	0.170
	(0.0373)	(0.155)	(0.0615)	(0.178)
Number of Observations	49	48	49	48
R^2	0.448	0.362	0.339	0.377

Source: IMF staff calculations.
Note: All variables (except initial routinization) are expressed as long-term changes. Robust standard errors are in parentheses. PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

share trends in the cross-section of countries is largely preserved both in sign and magnitude.

Sectoral Analysis

Annex Table 3.5.6 provides the regression results underlying Figure 3.13, highlighting differences between tradables and nontradables sectors.

Analysis by Skill

The empirical strategy for the labor income share of different skill groups resembles that of the overall labor income share. It studies how long-term changes in drivers affect long-term changes in the labor income shares of each skill group, with the labor income share of a particular skill group defined as the labor compensation of that group divided by the value added of the industry in the country.

The analysis is conducted at both the aggregate and the sectoral levels. Results are consistent and robust across exercises, though coefficients are not strictly comparable due to a smaller (predominantly advanced economy) sample for the sectoral analysis, likely larger measurement errors of the price of investment goods and intermediate goods at the sectoral level, and greater mobility of factors across sectors than across countries. The cross-country analysis and the within-country cross-sectoral analysis may thus reflect somewhat different mechanisms.

Annex Table 3.5.6. Baseline Sectoral Results

	Tradables Sectors	Nontradables Sectors
Relative PI	0.000412	–0.00167***
	(0.000279)	(0.000491)
Initial Routinization	–0.00598**	–0.00584
	(0.00256)	(0.00879)
Relative PI * Initial Routinization	–0.0000989	0.00486**
	(0.000488)	(0.00181)
Trade Integration	–0.000673**	–0.0000691
	(0.000292)	(0.000122)
Financial Integration	0.00356	0.0267
	(0.0100)	(0.0180)
Global Value Chain Participation	–0.00220**	0.00171
	(0.000857)	(0.00279)
Country Fixed Effects	Y	Y
Sector Fixed Effects	Y	Y
Number of Observations	92	37
R^2	0.356	0.173

Source: IMF staff calculations.
Note: For country coverage and a description of included variables, see Annex 3.3; for a detailed description of the estimation strategy, see Annex 3.4. Tradables sectors include agriculture, mining and quarrying, manufacturing, wholesale and retail trade, and transportation. Nontradables sectors include construction, finance, real estate, government, and community. All variables (except for initial routinization) are expressed as long-term trend changes. Trade integration refers to value added exports plus imports as a share of gross output. Robust standard errors are clustered at the country level. PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.5.7. Aggregate Results by Skill Level

	High Skilled	Middle Skilled	Low Skilled
Technology			
Relative PI	0.0317	0.224**	–0.0293
	(0.0338)	(0.104)	(0.0686)
Initial Routinization	–0.001	0.002	–0.0001
	(0.00110)	(0.00263)	(0.00187)
Relative PI * Initial Routinization	0.0460	0.408**	–0.104
	(0.0616)	(0.169)	(0.146)
Global Integration			
Global Value Chain Participation	0.0315	–0.811**	–0.100
	(0.0989)	(0.354)	(0.187)
Financial Integration	0.839***	–0.195	–0.316
	(0.266)	(0.301)	(0.339)
Policies and Institutions			
Corporate Taxation	0.0268	–0.237	–0.0701
	(0.0576)	(0.151)	(0.0847)
Relative Skill Supply	0.666**	1.738	–0.156
	(0.308)	(1.545)	(2.152)
Number of Observations	37	37	37
R^2	0.299	0.351	0.047

Source: IMF staff calculations.
Note: All variables (except for initial routinization) are expressed as long-term changes. Robust standard errors are clustered at the country level. PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.5.7 provides the aggregate regression results by skill level; Annex Tables 3.5.8–3.5.10 present the sectoral regressions by skill level. Compared with Annex Table 3.5.8, Annex Table 3.5.9 additionally controls for skill composition, and Annex Table 3.5.10 replaces country fixed effects with measures of financial globalization and policy and institutional variables, which have only country-level variations. Different de jure institutional variables are added here—first individually, before examining a joint specification with technology and financial globalization variables.

Annex Table 3.5.8. Sectoral Results by Skill Level

	High Skilled		Middle Skilled		Low Skilled	
	(1)	(2)	(3)	(4)	(5)	(6)
Technology						
Relative PI	–0.00778	0.0152	–0.0276	–0.0143	0.0152	0.0337
	(0.0113)	(0.0124)	(0.0198)	(0.0215)	(0.0254)	(0.0306)
Initial Routinization	–0.00134	–0.00233	0.00118	0.000386	–0.00216	–0.00223
	(0.00144)	(0.00144)	(0.00256)	(0.00252)	(0.00314)	(0.00339)
Relative PI * Initial Routinization	0.0147	0.0142	0.0755*	0.0795**	–0.0390	–0.0235
	(0.0233)	(0.0217)	(0.0405)	(0.0376)	(0.0481)	(0.0488)
Global Integration						
Global Value Chain Participation	1.70e-05	0.000152	0.00430	0.00117	–0.00144	–0.00125
	(0.00210)	(0.00207)	(0.00329)	(0.00326)	(0.00399)	(0.00425)
Fixed Effects						
Country Fixed Effects	Y	Y	Y	Y	Y	Y
Sector Fixed Effects	N	Y	N	Y	N	Y
Number of Observations	289	289	297	297	275	275
R^2	0.143	0.381	0.201	0.435	0.059	0.214

Source: IMF staff calculations.
Note: All variables (except for initial routinization) are expressed as long-term changes. Robust standard errors are clustered at the country level. PI = price of investment.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.5.9. Sectoral Results by Skill Level, Controlling for Skill Composition

	High Skilled	Middle Skilled	Low Skilled
Technology			
Relative PI	0.00345	0.00147	0.0393
	(0.0112)	(0.0190)	(0.0284)
Initial Routinization	–0.00144	0.000979	–0.00378
	(0.00129)	(0.00222)	(0.00315)
Relative PI * Initial Routinization	0.0271	0.0649*	–0.0404
	(0.0195)	(0.0331)	(0.0452)
Global Integration			
Global Value Chain Participation	–0.00864	–0.000356	–0.0108
	(0.0152)	(0.0265)	(0.0361)
Skill Composition			
Skill Share in Total Hours	0.511***	0.733***	0.712***
	(0.0650)	(0.0846)	(0.114)
Fixed Effects			
Country Fixed Effects	Y	Y	Y
Sector Fixed Effects	Y	Y	Y
Number of Observations	289	297	275
R^2	0.506	0.564	0.329

Source: IMF staff calculations.

Note: All variables (except for initial routinization) are expressed as long-term changes. Robust standard errors are clustered at the country level. PI = price of investment.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Annex Table 3.5.10. Sectoral Results by Skill Level, Controlling for Policy and Institution Variables

	(1)	(2)	(3)	(4)	(5)	(6)
	High Skilled	Middle Skilled	Low Skilled	High Skilled	Middle Skilled	Low Skilled
Technology						
Relative PI				–0.00369	–0.0209	0.00140
				(0.0113)	(0.0198)	(0.0259)
Initial Routinization				–0.00189	0.000193	–0.00111
				(0.00140)	(0.00249)	(0.00315)
Relative PI * Initial Routinization				0.00793	0.0659*	–0.0303
				(0.0226)	(0.0392)	(0.0480)
Global Integration						
Global Value Chain Participation				–0.00237	–0.0187	0.00372
				(0.0171)	(0.0307)	(0.0376)
Financial Integration				0.805***	1.52***	–0.689*
				(0.182)	(0.334)	(0.395)
Policies and Institutions						
Unionization	–0.00635*	–0.0226***	–0.00630	–0.00398	–0.00735	–0.0162*
	(0.00363)	(0.00797)	(0.00913)	(0.00428)	(0.00763)	(0.00939)
Employment Protection Legislation	–0.00241	0.00112	–0.00774			
	(0.00331)	(0.00718)	(0.00800)			
Corporate Taxation	–1.28e-05	5.86e-05	–0.000566			
	(0.000382)	(0.000841)	(0.000938)			
Sector Fixed Effects	Y	Y	Y	Y	Y	Y
Number of Observations	373	382	357	357	365	342
R^2	0.164	0.120	0.050	0.214	0.237	0.069

Source: IMF staff calculations.

Note: All variables (except for initial routinization) are expressed as long-term changes. Robust standard errors are clustered at the country level. PI = price of investment.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

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STATISTICAL APPENDIX

The Statistical Appendix presents historical data as well as projections. It comprises seven sections: Assumptions, What's New, Data and Conventions, Country Notes, Classification of Countries, Key Data Documentation, and Statistical Tables.

The assumptions underlying the estimates and projections for 2017–18 and the medium-term scenario for 2019–22 are summarized in the first section. The second section presents a brief description of the changes to the database and statistical tables since the October 2016 *World Economic Outlook* (WEO). The third section provides a general description of the data and the conventions used for calculating country group composites. The fourth section summarizes selected key information for each country. The classification of countries in the various groups presented in the WEO is summarized in the fifth section. The sixth section provides information on methods and reporting standards for the member countries' national account and government finance indicators included in the report.

The last, and main, section comprises the statistical tables. (Statistical Appendix A is included here; Statistical Appendix B is available online.) Data in these tables have been compiled on the basis of information available through April 3, 2017. The figures for 2017 and beyond are shown with the same degree of precision as the historical figures solely for convenience; because they are projections, the same degree of accuracy is not to be inferred.

Assumptions

Real effective exchange rates for the advanced economies are assumed to remain constant at their average levels measured during the period February 1 to March 1, 2017. For 2017 and 2018, these assumptions imply average U.S. dollar–special drawing right (SDR) conversion rates of 1.353 and 1.351, U.S. dollar–euro conversion rates of 1.062 and 1.059, and yen–U.S. dollar conversion rates of 112.8 and 111.7, respectively.

It is assumed that the *price of oil* will average $55.23 a barrel in 2017 and $55.06 a barrel in 2018.

Established *policies* of national authorities are assumed to be maintained. The more specific policy assumptions underlying the projections for selected economies are described in Box A1.

With regard to *interest rates*, it is assumed that the London interbank offered rate (LIBOR) on six-month U.S. dollar deposits will average 1.7 percent in 2017 and 2.8 percent in 2018, that three-month euro deposits will average –0.3 percent in 2017 and –0.2 percent in 2018, and that six-month yen deposits will average 0.0 percent in 2017 and 2018, respectively.

As a reminder, with respect to *introduction of the euro*, on December 31, 1998, the Council of the European Union decided that, effective January 1, 1999, the irrevocably fixed conversion rates between the euro and currencies of the member countries adopting the euro are as follows:

1 euro	=	13.7603	Austrian schillings
	=	40.3399	Belgian francs
	=	0.585274	Cyprus pound[1]
	=	1.95583	Deutsche marks
	=	15.6466	Estonian krooni[2]
	=	5.94573	Finnish markkaa
	=	6.55957	French francs
	=	340.750	Greek drachmas[3]
	=	0.787564	Irish pound
	=	1,936.27	Italian lire
	=	0.702804	Latvian lat[4]
	=	3.45280	Lithuanian litas[5]
	=	40.3399	Luxembourg francs
	=	0.42930	Maltese lira[1]
	=	2.20371	Netherlands guilders
	=	200.482	Portuguese escudos
	=	30.1260	Slovak koruna[6]
	=	239.640	Slovenian tolars[7]
	=	166.386	Spanish pesetas

[1]Established on January 1, 2008.
[2]Established on January 1, 2011.
[3]Established on January 1, 2001.
[4]Established on January 1, 2014.
[5]Established on January 1, 2015.
[6]Established on January 1, 2009.
[7]Established on January 1, 2007.

See Box 5.4 of the October 1998 WEO for details on how the conversion rates were established.

What's New

- On October 1, 2016, the Chinese renminbi joined the U.S. dollar, euro, yen, and British pound in the IMF's SDR basket.
- Nauru is the latest country added to the WEO database, expanding it to a total of 192 countries.
- Belarus redenominated its currency by replacing 10,000 old Belarusian rubles with 1 new Belarusian ruble. Local currency data for Belarus are expressed in the new currency starting with the April 2017 WEO database.

Data and Conventions

Data and projections for 192 economies form the statistical basis of the WEO database. The data are maintained jointly by the IMF's Research Department and regional departments, with the latter regularly updating country projections based on consistent global assumptions.

Although national statistical agencies are the ultimate providers of historical data and definitions, international organizations are also involved in statistical issues, with the objective of harmonizing methodologies for the compilation of national statistics, including analytical frameworks, concepts, definitions, classifications, and valuation procedures used in the production of economic statistics. The WEO database reflects information from both national source agencies and international organizations.

Most countries' macroeconomic data presented in the WEO conform broadly to the 1993 version of the *System of National Accounts* (SNA). The IMF's sector statistical standards—the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6), the *Monetary and Financial Statistics Manual* (MFSM 2000), and the *Government Finance Statistics Manual 2014* (GFSM 2014)—have been or are being aligned with the SNA 2008. These standards reflect the IMF's special interest in countries' external positions, financial sector stability, and public sector fiscal positions. The process of adapting country data to the new standards begins in earnest when the manuals are released. However, full concordance with the manuals is ultimately dependent on the provision by national statistical compilers of revised country data; hence, the WEO estimates are only partially adapted to these manuals. Nonetheless, for many countries the impact, on major balances and aggregates, of conversion to the updated standards will be small. Many other countries have partially adopted the latest standards and will continue implementation over a period of years.[1]

Composite data for country groups in the WEO are either sums or weighted averages of data for individual countries. Unless noted otherwise, multiyear averages of growth rates are expressed as compound annual rates of change.[2] Arithmetically weighted averages are used for all data for the emerging market and developing economies group except data on inflation and money growth, for which geometric averages are used. The following conventions apply:

- Country group composites for exchange rates, interest rates, and growth rates of monetary aggregates are weighted by GDP converted to U.S. dollars at market exchange rates (averaged over the preceding three years) as a share of group GDP.
- Composites for other data relating to the domestic economy, whether growth rates or ratios, are weighted by GDP valued at purchasing power parity as a share of total world or group GDP.[3]
- Unless noted otherwise, composites for all sectors for the euro area are corrected for reporting discrepancies in intra-area transactions. Annual data are not adjusted for calendar-day effects. For data prior to 1999, data aggregations apply 1995 European currency unit exchange rates.
- Composites for fiscal data are sums of individual country data after conversion to U.S. dollars at the average market exchange rates in the years indicated.
- Composite unemployment rates and employment growth are weighted by labor force as a share of group labor force.
- Composites relating to external sector statistics are sums of individual country data after conversion to U.S. dollars at the average market exchange rates in the years indicated for balance of payments data

[1] Many countries are implementing the SNA 2008 or European System of National Accounts (ESA) 2010, and a few countries use versions of the SNA older than that from 1993. A similar adoption pattern is expected for the BPM6 and GFSM 2014. Please refer to Table G, which lists the statistical standards adhered to by each country.

[2] Averages for real GDP and its components, employment, GDP per capita, inflation, factor productivity, trade, and commodity prices are calculated based on the compound annual rate of change, except in the case of the unemployment rate, which is based on the simple arithmetic average.

[3] See "Revised Purchasing Power Parity Weights" in the July 2014 *WEO Update* for a summary of the revised purchasing-power-parity-based weights, as well as Box A2 of the April 2004 WEO and Annex IV of the May 1993 WEO. See also Anne-Marie Gulde and Marianne Schulze-Ghattas, "Purchasing Power Parity Based Weights for the *World Economic Outlook*," in *Staff Studies* for the *World Economic Outlook* (Washington, DC: International Monetary Fund, December 1993), 106–23.

and at end-of-year market exchange rates for debt denominated in currencies other than U.S. dollars.
- Composites of changes in foreign trade volumes and prices, however, are arithmetic averages of percent changes for individual countries weighted by the U.S. dollar value of exports or imports as a share of total world or group exports or imports (in the preceding year).
- Unless noted otherwise, group composites are computed if 90 percent or more of the share of group weights is represented.
- Data refer to calendar years, except in the case of a few countries that use fiscal years. Please refer to Table F, which lists the economies with exceptional reporting periods for national accounts and government finance data for each country.

For some countries, the figures for 2016 and earlier are based on estimates rather than actual outturns. Please refer to Table G, which lists the latest actual outturns for the indicators in the national accounts, prices, government finance, and balance of payments indicators for each country.

Country Notes

- The consumer price data for *Argentina* before December 2013 reflect the consumer price index (CPI) for the Greater Buenos Aires Area (CPI-GBA), while from December 2013 to October 2015 the data reflect the national CPI (IPCNu). The new government that took office in December 2015 discontinued the IPCNu, stating that it was flawed, and released a new CPI for the Greater Buenos Aires Area on June 15, 2016. At its November 9, 2016, meeting, the IMF Executive Board considered the new CPI series to be in line with international standards and lifted the declaration of censure issued in 2013. Given the differences in geographical coverage, weights, sampling, and methodology of these series, the average CPI inflation for 2014, 2015, and 2016 and end-of-period inflation for 2015 and 2016 are not reported in the April 2017 *World Economic Outlook*.
- *Argentina*'s authorities discontinued the publication of labor market data in December 2015 and released new series starting in the second quarter of 2016.
- *Argentina*'s and *Venezuela*'s consumer prices are excluded from all WEO group aggregates.
- *Greece*'s primary balance estimates for 2016 are based on preliminary data provided by the Ministry of Finance as of February 15 and are subject to change once data on an accrual basis (ESA 2010) become available on April 21. Medium-term fiscal projections reflect the IMF staff's assessment based on currently legislated fiscal policies.
- *India*'s growth rates of real GDP calculated from 1998 to 2011 are as per national accounts with base year 2004/05, and thereafter are as per national accounts with base year 2011/12.
- Against the background of a civil war and weak capacities, the reliability of *Libya*'s data, especially medium-term projections, is low.
- Data for *Syria* are excluded from 2011 onward because of the uncertain political situation.
- Projecting the economic outlook in Venezuela, including assessing past and current economic developments as the basis for the projections, is complicated by the lack of discussions with the authorities (the last Article IV consultation took place in 2004), long intervals in receiving data with information gaps, incomplete provision of information, and difficulties in interpreting certain reported economic indicators in line with economic developments. The fiscal accounts include the budgetary central government and Petróleos de Venezuela, S.A. (PDVSA), and the fiscal accounts data for 2016–22 are IMF staff estimates. Revenue includes the IMF staff's estimated foreign exchange profits transferred from the central bank to the government (buying U.S. dollars at the most appreciated rate and selling at more depreciated rates in a multitier exchange rate system) and excludes the staff's estimated revenue from PDVSA's sale of PetroCaribe assets to the central bank. Fiscal accounts for 2010–22 correspond to the budgetary central government and PDVSA. Fiscal accounts before 2010 correspond to the budgetary central government, public enterprises (including PDVSA), Instituto Venezolano de los Seguros Sociales (IVSS—social security), and Fondo de Garantía de Depósitos y Protección Bancaria (FOGADE—deposit insurance).

Classification of Countries

Summary of the Country Classification

The country classification in the WEO divides the world into two major groups: advanced economies and emerging market and developing economies.[4] This classification is not based on strict criteria, economic

[4] As used here, the terms "country" and "economy" do not always refer to a territorial entity that is a state as understood by international law and practice. Some territorial entities included here are not states, although their statistical data are maintained on a separate and independent basis.

or otherwise, and it has evolved over time. The objective is to facilitate analysis by providing a reasonably meaningful method of organizing data. Table A provides an overview of the country classification, showing the number of countries in each group by region and summarizing some key indicators of their relative size (GDP valued at purchasing power parity, total exports of goods and services, and population).

Some countries remain outside the country classification and therefore are not included in the analysis. Anguilla, Cuba, the Democratic People's Republic of Korea, and Montserrat are examples of countries that are not IMF members, and their economies therefore are not monitored by the IMF. Somalia is omitted from the emerging market and developing economies group composites because of data limitations.

General Features and Composition of Groups in the *World Economic Outlook* Classification

Advanced Economies

The 39 advanced economies are listed in Table B. The seven largest in terms of GDP based on market exchange rates—the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada—constitute the subgroup of *major advanced economies* often referred to as the Group of Seven (G7). The members of the *euro area* are also distinguished as a subgroup. Composite data shown in the tables for the euro area cover the current members for all years, even though the membership has increased over time.

Table C lists the member countries of the European Union, not all of which are classified as advanced economies in the WEO.

Emerging Market and Developing Economies

The group of emerging market and developing economies (153) includes all those that are not classified as advanced economies.

The *regional breakdowns* of emerging market and developing economies are *Commonwealth of Independent States (CIS)*, *emerging and developing Asia, emerging and developing Europe* (sometimes also referred to as "central and eastern Europe"), *Latin America and the Caribbean (LAC),* the *Middle East, North Africa, Afghanistan, and Pakistan (MENAP), and sub-Saharan Africa (SSA)*.

Emerging market and developing economies are also classified according to *analytical criteria*. The analytical criteria reflect the composition of export earnings and a distinction between net creditor and net debtor economies. The detailed composition of emerging market and developing economies in the regional and analytical groups is shown in Tables D and E.

The analytical criterion *source of export earnings* distinguishes between the categories *fuel* (Standard International Trade Classification [SITC] 3) and *nonfuel* and then focuses on *nonfuel primary products* (SITCs 0, 1, 2, 4, and 68). Economies are categorized into one of these groups when their main source of export earnings exceeded 50 percent of total exports on average between 2011 and 2015.

The financial criteria focus on *net creditor economies*, *net debtor economies, heavily indebted poor countries* (HIPCs), and *low-income developing countries* (LIDCs). Economies are categorized as net debtors when their latest net international investment position, where available, was less than zero or their current account balance accumulations from 1972 (or earliest available data) to 2015 were negative. Net debtor economies are further differentiated on the basis of *experience with debt servicing*.[5]

The HIPC group comprises the countries that are or have been considered by the IMF and the World Bank for participation in their debt initiative known as the HIPC Initiative, which aims to reduce the external debt burdens of all the eligible HIPCs to a "sustainable" level in a reasonably short period of time.[6] Many of these countries have already benefited from debt relief and have graduated from the initiative.

The LIDCs are countries that were designated as eligible to use the IMF's concessional financing resources under the Poverty Reduction and Growth Trust (PRGT) in the 2013 PRGT eligibility review and as of 2011, had a level of per capita gross national income less than the PRGT income graduation threshold for non–small states (that is, twice the World Bank International Development Association operational threshold, or US$2,390 in 2011 as measured by the World Bank's Atlas method) and Zimbabwe.

[5] During 2011–15, 24 economies incurred external payments arrears or entered into official or commercial bank debt-rescheduling agreements. This group is referred to as *economies with arrears and/or rescheduling during 2011–15*.

[6] See David Andrews, Anthony R. Boote, Syed S. Rizavi, and Sukwinder Singh, *Debt Relief for Low-Income Countries: The Enhanced HIPC Initiative*, IMF Pamphlet Series 51 (Washington, DC: International Monetary Fund, November 1999).

Table A. Classification by *World Economic Outlook Groups* and Their Shares in Aggregate GDP, Exports of Goods and Services, and Population, 2016[1]

(Percent of total for group or world)

	Number of Economies	GDP		Exports of Goods and Services		Population	
		Advanced Economies	World	Advanced Economies	World	Advanced Economies	World
Advanced Economies	**39**	**100.0**	**41.9**	**100.0**	**64.4**	**100.0**	**14.5**
United States		37.0	15.5	16.8	10.8	30.5	4.4
Euro Area	19	28.1	11.8	40.9	26.3	31.9	4.6
Germany		7.9	3.3	12.1	7.8	7.8	1.1
France		5.4	2.3	5.5	3.5	6.1	0.9
Italy		4.4	1.9	4.2	2.7	5.7	0.8
Spain		3.4	1.4	3.1	2.0	4.4	0.6
Japan		10.4	4.4	6.1	3.9	12.0	1.7
United Kingdom		5.5	2.3	5.6	3.6	6.2	0.9
Canada		3.4	1.4	3.6	2.3	3.4	0.5
Other Advanced Economies	16	15.6	6.5	27.0	17.4	16.0	2.3
Memorandum							
Major Advanced Economies	7	74.1	31.0	53.9	34.7	71.7	10.4
		Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World	Emerging Market and Developing Economies	World
Emerging Market and Developing Economies	**153**	**100.0**	**58.1**	**100.0**	**35.6**	**100.0**	**85.5**
Regional Groups							
Commonwealth of Independent States[2]	12	7.7	4.5	6.9	2.4	4.6	3.9
Russia		5.5	3.2	4.5	1.6	2.3	2.0
Emerging and Developing Asia	30	54.4	31.6	50.2	17.9	57.0	48.7
China		30.6	17.8	30.1	10.7	22.2	19.0
India		12.4	7.2	6.0	2.1	21.0	17.9
Excluding China and India	28	11.4	6.6	14.1	5.0	13.8	11.8
Emerging and Developing Europe	12	6.1	3.5	9.9	3.5	2.8	2.4
Latin America and the Caribbean	32	13.5	7.9	14.2	5.0	9.8	8.4
Brazil		4.5	2.6	3.0	1.1	3.3	2.8
Mexico		3.3	1.9	5.5	1.9	2.0	1.7
Middle East, North Africa, Afghanistan, and Pakistan	22	13.1	7.6	14.5	5.2	10.7	9.1
Middle East and North Africa	20	11.6	6.7	14.2	5.0	7.0	6.0
Sub-Saharan Africa	45	5.2	3.0	4.3	1.5	15.2	13.0
Excluding Nigeria and South Africa	43	2.6	1.5	2.6	0.9	11.3	9.7
Analytical Groups[3]							
By Source of Export Earnings							
Fuel	29	19.4	11.3	20.6	7.3	12.4	10.6
Nonfuel	123	80.6	46.8	79.4	28.3	87.6	74.8
Of Which, Primary Products	30	4.5	2.6	4.7	1.7	7.7	6.6
By External Financing Source							
Net Debtor Economies	120	49.9	29.0	46.5	16.6	67.3	57.5
Net Debtor Economies by Debt-Servicing Experience							
Economies with Arrears and/or Rescheduling during 2011–15	24	3.2	1.8	2.0	0.7	5.3	4.6
Other Groups							
Heavily Indebted Poor Countries	38	2.4	1.4	1.9	0.7	11.4	9.7
Low-Income Developing Countries	59	7.3	4.2	6.7	2.4	22.7	19.4

[1]The GDP shares are based on the purchasing-power-parity valuation of economies' GDP. The number of economies comprising each group reflects those for which data are included in the group aggregates.

[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

[3]Syria is omitted from the source of export earnings and South Sudan and Syria are omitted from the net external position group composites because of insufficient data.

Table B. Advanced Economies by Subgroup

Major Currency Areas		
United States		
Euro Area		
Japan		
Euro Area		
Austria	Greece	Netherlands
Belgium	Ireland	Portugal
Cyprus	Italy	Slovak Republic
Estonia	Latvia	Slovenia
Finland	Lithuania	Spain
France	Luxembourg	
Germany	Malta	
Major Advanced Economies		
Canada	Italy	United States
France	Japan	
Germany	United Kingdom	
Other Advanced Economies		
Australia	Korea	Singapore
Czech Republic	Macao SAR[2]	Sweden
Denmark	New Zealand	Switzerland
Hong Kong SAR[1]	Norway	Taiwan Province of China
Iceland	Puerto Rico	
Israel	San Marino	

[1]On July 1, 1997, Hong Kong was returned to the People's Republic of China and became a Special Administrative Region of China.
[2]On December 20, 1999, Macao was returned to the People's Republic of China and became a Special Administrative Region of China.

Table C. European Union

Austria	Germany	Poland
Belgium	Greece	Portugal
Bulgaria	Hungary	Romania
Croatia	Ireland	Slovak Republic
Cyprus	Italy	Slovenia
Czech Republic	Latvia	Spain
Denmark	Lithuania	Sweden
Estonia	Luxembourg	United Kingdom
Finland	Malta	
France	Netherlands	

Table D. Emerging Market and Developing Economies by Region and Main Source of Export Earnings

	Fuel	Nonfuel Primary Products
Commonwealth of Independent States		
	Azerbaijan	Uzbekistan
	Kazakhstan	
	Russia	
	Turkmenistan[1]	
Emerging and Developing Asia		
	Brunei Darussalam	Marshall Islands
	Timor-Leste	Mongolia
		Papua New Guinea
		Solomon Islands
		Tuvalu
Latin America and the Caribbean		
	Bolivia	Argentina
	Colombia	Chile
	Ecuador	Guyana
	Trinidad and Tobago	Honduras
	Venezuela	Paraguay
		Suriname
		Uruguay
Middle East, North Africa, Afghanistan, and Pakistan		
	Algeria	Afghanistan
	Bahrain	Mauritania
	Iran	Sudan
	Iraq	
	Kuwait	
	Libya	
	Oman	
	Qatar	
	Saudi Arabia	
	United Arab Emirates	
	Yemen	
Sub-Saharan Africa		
	Angola	Burkina Faso
	Chad	Burundi
	Republic of Congo	Central African Republic
	Equatorial Guinea	Democratic Republic of the Congo
	Gabon	Côte d'Ivoire
	Nigeria	Eritrea
	South Sudan	Guinea
		Guinea-Bissau
		Liberia
		Malawi
		Mali
		Sierra Leone
		South Africa
		Zambia

[1]Turkmenistan, which is not a member of the Commonwealth of Independent States, is included in this group for reasons of geography and similarity in economic structure.

Table E. Emerging Market and Developing Economies by Region, Net External Position, and Status as Heavily Indebted Poor Countries and Low-Income Developing Countries

	Net External Position[1]	Heavily Indebted Poor Countries[2]	Low-Income Developing Countries
Commonwealth of Independent States			
Armenia	*		
Azerbaijan	●		
Belarus	*		
Georgia[3]	*		
Kazakhstan	*		
Kyrgyz Republic	*		*
Moldova	*		*
Russia	●		
Tajikistan	*		*
Turkmenistan[3]	*		
Ukraine[3]	*		
Uzbekistan	●		*
Emerging and Developing Asia			
Bangladesh	*		*
Bhutan	*		*
Brunei Darussalam	●		
Cambodia	*		*
China	●		
Fiji	*		
India	*		
Indonesia	*		
Kiribati	●		*
Lao P.D.R.	*		*
Malaysia	●		
Maldives	*		
Marshall Islands	*		
Micronesia	●		
Mongolia	*		*
Myanmar	*		*
Nauru	*		
Nepal	●		*
Palau	●		
Papua New Guinea	*		*
Philippines	*		
Samoa	*		
Solomon Islands	*		*
Sri Lanka	*		
Thailand	*		
Timor-Leste	●		
Tonga	*		
Tuvalu	*		
Vanuatu	*		
Vietnam	*		*

	Net External Position[1]	Heavily Indebted Poor Countries[2]	Low-Income Developing Countries
Emerging and Developing Europe			
Albania	*		
Bosnia and Herzegovina	*		
Bulgaria	*		
Croatia	*		
Hungary	*		
Kosovo	*		
FYR Macedonia	*		
Montenegro	*		
Poland	*		
Romania	*		
Serbia	*		
Turkey	*		
Latin America and the Caribbean			
Antigua and Barbuda	*		
Argentina	●		
The Bahamas	*		
Barbados	*		
Belize	*		
Bolivia	●	●	*
Brazil	*		
Chile	*		
Colombia	*		
Costa Rica	*		
Dominica	*		
Dominican Republic	*		
Ecuador	*		
El Salvador	*		
Grenada	*		
Guatemala	*		
Guyana	*	●	
Haiti	*	●	*
Honduras	*	●	*
Jamaica	*		
Mexico	*		
Nicaragua	*	●	*
Panama	*		
Paraguay	*		
Peru	*		
St. Kitts and Nevis	*		
St. Lucia	*		
St. Vincent and the Grenadines	*		
Suriname	*		
Trinidad and Tobago	●		
Uruguay	*		
Venezuela	●		

Table E. Emerging Market and Developing Economies by Region, Net External Position, and Status as Heavily Indebted Poor Countries and Low-Income Developing Countries *(continued)*

	Net External Position[1]	Heavily Indebted Poor Countries[2]	Low-Income Developing Countries
Middle East, North Africa, Afghanistan, and Pakistan			
Afghanistan	•	•	*
Algeria	•		
Bahrain	•		
Djibouti	*		*
Egypt	*		
Iran	•		
Iraq	•		
Jordan	*		
Kuwait	•		
Lebanon	*		
Libya	•		
Mauritania	*	•	*
Morocco	*		
Oman	•		
Pakistan	*		
Qatar	•		
Saudi Arabia	•		
Sudan	*	*	*
Syria[4]	. . .		
Tunisia	*		
United Arab Emirates	•		
Yemen	*		*
Sub-Saharan Africa			
Angola	*		
Benin	*	•	*
Botswana	•		
Burkina Faso	*	•	*
Burundi	*	•	*
Cabo Verde	*		
Cameroon	*	•	*
Central African Republic	*	•	*
Chad	*	•	*
Comoros	*	•	*
Democratic Republic of the Congo	*	•	*
Republic of Congo	*	•	*
Côte d'Ivoire	*	•	*
Equatorial Guinea	•		
Eritrea	*	*	*
Ethiopia	*	•	*
Gabon	•		
The Gambia	*	•	*
Ghana	*	•	*
Guinea	*	•	*
Guinea-Bissau	*	•	*
Kenya	*		*
Lesotho	*		*
Liberia	*	•	*
Madagascar	*	•	*
Malawi	*	•	*
Mali	*	•	*
Mauritius	•		
Mozambique	*	•	*
Namibia	*		
Niger	*	•	*
Nigeria	*		*
Rwanda	*	•	*
São Tomé and Príncipe	*	•	*
Senegal	*	•	*
Seychelles	*		
Sierra Leone	*	•	*
South Africa	•		
South Sudan[4]	. . .		*
Swaziland	*		
Tanzania	*	•	*
Togo	*	•	*
Uganda	*	•	*
Zambia	*	•	*
Zimbabwe	*		*

[1]Dot (star) indicates that the country is a net creditor (net debtor).

[2]Dot instead of star indicates that the country has reached the completion point, which allows it to receive the full debt relief committed to at the decision point.

[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

[4]South Sudan and Syria are omitted from the net external position group composite for lack of a fully developed database.

Table F. Economies with Exceptional Reporting Periods[1]

	National Accounts	Government Finance
The Bahamas		Jul/Jun
Bangladesh		Jul/Jun
Barbados		Apr/Mar
Belize		Apr/Mar
Bhutan	Jul/Jun	Jul/Jun
Botswana		Apr/Mar
Dominica		Jul/Jun
Egypt	Jul/Jun	Jul/Jun
Ethiopia	Jul/Jun	Jul/Jun
Haiti	Oct/Sep	Oct/Sep
Hong Kong SAR		Apr/Mar
India	Apr/Mar	Apr/Mar
Iran	Apr/Mar	Apr/Mar
Jamaica		Apr/Mar
Lao P.D.R.		Oct/Sep
Lesotho		Apr/Mar
Malawi		Jul/Jun
Marshall Islands	Oct/Sep	Oct/Sep
Micronesia	Oct/Sep	Oct/Sep
Myanmar	Apr/Mar	Apr/Mar
Namibia		Apr/Mar
Nauru	Jul/Jun	Jul/Jun
Nepal	Aug/Jul	Aug/Jul
Pakistan	Jul/Jun	Jul/Jun
Palau	Oct/Sep	Oct/Sep
Puerto Rico	Jul/Jun	Jul/Jun
St. Lucia		Apr/Mar
Samoa	Jul/Jun	Jul/Jun
Singapore		Apr/Mar
Swaziland		Apr/Mar
Thailand		Oct/Sep
Trinidad and Tobago		Oct/Sep

[1]Unless noted otherwise, all data refer to calendar years.

Table G. Key Data Documentation

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Afghanistan	Afghan afghani	NSO	2014	2002/03	SNA 1993		NSO	2015
Albania	Albanian lek	IMF staff	2015	1996	SNA 1993	From 1996	NSO	2016
Algeria	Algerian dinar	NSO	2015	2001	SNA 1993	From 2005	NSO	2016
Angola	Angolan kwanza	MEP	2015	2002	ESA 1995		NSO	2015
Antigua and Barbuda	Eastern Caribbean dollar	CB	2016	2006[6]	SNA 1993		NSO	2016
Argentina	Argentine peso	NSO	2016	2004	SNA 2008		NSO	2016
Armenia	Armenian dram	NSO	2015	2005	SNA 2008		NSO	2015
Australia	Australian dollar	NSO	2016	2014/15	SNA 2008	From 1980	NSO	2016
Austria	Euro	NSO	2016	2010	ESA 2010	From 1995	NSO	2016
Azerbaijan	Azerbaijan manat	NSO	2016	2003	SNA 1993	From 1994	NSO	2015
The Bahamas	Bahamian dollar	NSO	2015	2006	SNA 1993		NSO	2015
Bahrain	Bahrain dinar	MoF	2015	2010	SNA 2008		NSO	2015
Bangladesh	Bangladesh taka	NSO	2015	2005	SNA 1993		NSO	2015
Barbados	Barbados dollar	NSO and CB	2014	1974[6]	SNA 1993		NSO	2015
Belarus	Belarusian ruble	NSO	2015	2014	SNA 2008	From 2005	NSO	2015
Belgium	Euro	CB	2015	2014	ESA 2010	From 1995	CB	2015
Belize	Belize dollar	NSO	2015	2000	SNA 1993		NSO	2015
Benin	CFA franc	NSO	2015	2007	SNA 1993		NSO	2016
Bhutan	Bhutanese ngultrum	NSO	2015/16	2000[6]	SNA 1993		CB	2015/16
Bolivia	Bolivian boliviano	NSO	2015	1990	Other		NSO	2016
Bosnia and Herzegovina	Bosnia convertible marka	NSO	2015	2010	ESA 2010	From 2000	NSO	2015
Botswana	Botswana pula	NSO	2015	2006	SNA 1993		NSO	2016
Brazil	Brazilian real	NSO	2016	1995	SNA 2008		NSO	2016
Brunei Darussalam	Brunei dollar	NSO and GAD	2015	2010	SNA 1993		NSO and GAD	2016
Bulgaria	Bulgarian lev	NSO	2016	2010	ESA 2010	From 1996	NSO	2016
Burkina Faso	CFA franc	NSO and MEP	2014	1999	SNA 1993		NSO	2015
Burundi	Burundi franc	NSO	2015	2005	SNA 1993		NSO	2015
Cabo Verde	Cabo Verdean escudo	NSO	2015	2007	SNA 2008	From 2011	NSO	2015
Cambodia	Cambodian riel	NSO	2013	2000	SNA 1993		NSO	2014
Cameroon	CFA franc	NSO	2014	2000	SNA 1993		NSO	2014
Canada	Canadian dollar	NSO	2016	2007	SNA 2008	From 1980	NSO	2016
Central African Republic	CFA franc	NSO	2012	2005	SNA 1993		NSO	2015
Chad	CFA franc	CB	2015	2005	Other		NSO	2015
Chile	Chilean peso	CB	2016	2013[6]	SNA 2008	From 2003	NSO	2016
China	Chinese yuan	NSO	2016	2015	SNA 2008		NSO	2016
Colombia	Colombian peso	NSO	2016	2005	Other	From 2000	NSO	2016
Comoros	Comorian franc	MEP	2015	2000	Other		NSO	2015
Democratic Republic of the Congo	Congolese franc	NSO	2015	2005	SNA 1993		CB	2015
Republic of Congo	CFA franc	NSO	2014	1990	SNA 1993		NSO	2014
Costa Rica	Costa Rican colón	CB	2015	2012	SNA 2008		CB	2016

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Afghanistan	MoF	2014	2001	CG	C	NSO, MoF, and CB	2014	BPM 5
Albania	IMF staff	2015	1986	CG,LG,SS,MPC, NFPC	Other	CB	2015	BPM 6
Algeria	MoF	2016	1986	CG	C	CB	2016	BPM 5
Angola	MoF	2015	2001	CG,LG	Other	CB	2015	BPM 5
Antigua and Barbuda	MoF	2016	2001	CG	C	CB	2016	BPM 5
Argentina	MEP	2016	1986	CG,SG,LG,SS	C	NSO	2016	BPM 5
Armenia	MoF	2015	2001	CG	C	CB	2015	BPM 6
Australia	MoF	2015/16	2001	CG,SG,LG,TG	A	NSO	2016	BPM 6
Austria	NSO	2016	2001	CG,SG,LG,SS	A	CB	2016	BPM 6
Azerbaijan	MoF	2015	Other	CG	C	CB	2015	BPM 5
The Bahamas	MoF	2015/16	2001	CG	C	CB	2015	BPM 5
Bahrain	MoF	2015	2001	CG	C	CB	2015	BPM 6
Bangladesh	MoF	2014/15	Other	CG	C	CB	2015	BPM 6
Barbados	MoF	2015/16	1986	CG,SS,NFPC	C	CB	2015	BPM 5
Belarus	MoF	2015	2001	CG,LG,SS	C	CB	2015	BPM 6
Belgium	CB	2015	ESA 2010	CG,SG,LG,SS	A	CB	2015	BPM 6
Belize	MoF	2015/16	1986	CG,MPC	Mixed	CB	2015	BPM 5
Benin	MoF	2016	1986	CG	C	CB	2015	BPM 5
Bhutan	MoF	2015/16	1986	CG	C	CB	2014/15	BPM 6
Bolivia	MoF	2016	2001	CG,LG,SS,NMPC, NFPC	C	CB	2016	BPM 5
Bosnia and Herzegovina	MoF	2015	2001	CG,SG,LG,SS	Mixed	CB	2015	BPM 6
Botswana	MoF	2015/16	1986	CG	C	CB	2015	BPM 5
Brazil	MoF	2016	2001	CG,SG,LG,SS, MPC,NFPC	C	CB	2016	BPM 6
Brunei Darussalam	MoF	2016	Other	CG, BCG	C	NSO, MEP, and GAD	2015	BPM 6
Bulgaria	MoF	2016	2001	CG,LG,SS	C	CB	2016	BPM 6
Burkina Faso	MoF	2014	2001	CG	CB	CB	2014	BPM 5
Burundi	MoF	2015	2001	CG	A	CB	2015	BPM 6
Cabo Verde	MoF	2015	2001	CG,SS	A	NSO	2015	BPM 5
Cambodia	MoF	2014	1986	CG,LG	A	CB	2014	BPM 5
Cameroon	MoF	2014	2001	CG,NFPC	C	MoF	2013	BPM 5
Canada	MoF	2016	2001	CG,SG,LG,SS	A	NSO	2016	BPM 6
Central African Republic	MoF	2016	2001	CG	C	CB	2015	BPM 5
Chad	MoF	2015	1986	CG,NFPC	C	CB	2015	BPM 5
Chile	MoF	2015	2001	CG,LG	A	CB	2015	BPM 6
China	MoF	2015	2001	CG,LG	C	GAD	2016	BPM 6
Colombia	MoF	2015	2001	CG,SG,LG,SS	Other	CB and NSO	2015	BPM 5
Comoros	MoF	2016	1986	CG	Mixed	CB and IMF staff	2015	BPM 5
Democratic Republic of the Congo	MoF	2015	2001	CG,LG	A	CB	2015	BPM 5
Republic of Congo	MoF	2014	2001	CG	A	CB	2012	BPM 5
Costa Rica	MoF and CB	2015	1986	CG	C	CB	2015	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Côte d'Ivoire	CFA franc	NSO	2014	2009	SNA 1993		NSO	2015
Croatia	Croatian kuna	NSO	2015	2010	ESA 2010		NSO	2015
Cyprus	Euro	NSO	2016	2005	ESA 2010	From 1995	NSO	2016
Czech Republic	Czech koruna	NSO	2015	2010	ESA 2010	From 1995	NSO	2016
Denmark	Danish krone	NSO	2015	2010	ESA 2010	From 1980	NSO	2016
Djibouti	Djibouti franc	NSO	2014	1990	Other		NSO	2015
Dominica	Eastern Caribbean dollar	NSO	2015	2006	SNA 1993		NSO	2015
Dominican Republic	Dominican peso	CB	2016	2007	SNA 2008	From 2007	CB	2016
Ecuador	U.S. dollar	CB	2015	2007	SNA 1993		NSO and CB	2016
Egypt	Egyptian pound	MEP	2015/16	2011/12	SNA 1993		NSO	2015/16
El Salvador	U.S. dollar	CB	2016	1990	Other		NSO	2016
Equatorial Guinea	CFA franc	MEP and CB	2014	2006	SNA 1993		MEP	2016
Eritrea	Eritrean nakfa	IMF staff	2006	2005	SNA 1993		NSO	2009
Estonia	Euro	NSO	2016	2010	ESA 2010	From 2010	NSO	2016
Ethiopia	Ethiopian birr	NSO	2015/16	2010/11	SNA 1993		NSO	2016
Fiji	Fijian dollar	NSO	2015	2011[6]	SNA 1993/ 2008		NSO	2015
Finland	Euro	NSO	2016	2010	ESA 2010	From 1980	NSO	2016
France	Euro	NSO	2016	2010	ESA 2010	From 1980	NSO	2016
Gabon	CFA franc	MoF	2015	2001	SNA 1993		MoF	2016
The Gambia	Gambian dalasi	NSO	2013	2004	SNA 1993		NSO	2016
Georgia	Georgian lari	NSO	2016	2000	SNA 1993	From 1996	NSO	2016
Germany	Euro	NSO	2015	2010	ESA 2010	From 1991	NSO	2016
Ghana	Ghanaian cedi	NSO	2015	2006	SNA 1993		NSO	2015
Greece	Euro	NSO	2016	2010	ESA 2010	From 1995	NSO	2016
Grenada	Eastern Caribbean dollar	NSO	2015	2006	SNA 1993		NSO	2016
Guatemala	Guatemalan quetzal	CB	2015	2001	SNA 1993	From 2001	NSO	2015
Guinea	Guinean franc	NSO	2011	2003	SNA 1993		NSO	2015
Guinea-Bissau	CFA franc	NSO	2015	2005	SNA 1993		NSO	2016
Guyana	Guyanese dollar	NSO	2016	2006[6]	SNA 1993		NSO	2016
Haiti	Haitian gourde	NSO	2015/16	1986/87	SNA 2008		NSO	2015/16
Honduras	Honduran lempira	CB	2015	2000	SNA 1993		CB	2015
Hong Kong SAR	Hong Kong dollar	NSO	2015	2014	SNA 2008	From 1980	NSO	2016
Hungary	Hungarian forint	NSO	2016	2005	ESA 2010	From 2005	IEO	2016
Iceland	Icelandic króna	NSO	2016	2005	ESA 2010	From 1990	NSO	2016
India	Indian rupee	NSO	2016/17	2011/12	SNA 2008		NSO	2016/17
Indonesia	Indonesian rupiah	NSO	2016	2010	SNA 2008		NSO	2016
Iran	Iranian rial	CB	2014/15	2004/05	SNA 1993		CB	2015/16
Iraq	Iraqi dinar	NSO	2014	2007	SNA 1968		NSO	2014
Ireland	Euro	NSO	2016	2014	ESA 2010	From 1995	NSO	2016
Israel	New Israeli shekel	NSO	2016	2010	SNA 2008	From 1995	NSO	2016
Italy	Euro	NSO	2016	2010	ESA 2010	From 1980	NSO	2016
Jamaica	Jamaican dollar	NSO	2015	2007	SNA 1993		NSO	2015

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Côte d'Ivoire	MoF	2015	1986	CG	A	CB	2014	BPM 6
Croatia	MoF	2015	2001	CG,LG	A	CB	2015	BPM 6
Cyprus	NSO	2015	ESA 2010	CG,LG,SS	Other	NSO	2015	BPM 6
Czech Republic	MoF	2015	2001	CG,LG,SS	A	NSO	2015	BPM 6
Denmark	NSO	2016	2001	CG,LG,SS	A	NSO	2015	BPM 6
Djibouti	MoF	2015	2001	CG	A	CB	2015	BPM 5
Dominica	MoF	2015/16	1986	CG	C	CB	2016	BPM 5
Dominican Republic	MoF	2016	2001	CG,SG,LG,SS,NMPC	Mixed	CB	2016	BPM 6
Ecuador	CB and MoF	2015	1986	CG,SG,LG,SS,NFPC	C	CB	2015	BPM 6
Egypt	MoF	2014/15	2001	CG,LG,SS,MPC	C	CB	2015/16	BPM 5
El Salvador	MoF	2016	1986	CG,LG,SS	C	CB	2016	BPM 6
Equatorial Guinea	MoF	2016	1986	CG	C	CB	2015	BPM 5
Eritrea	MoF	2008	2001	CG	C	CB	2008	BPM 5
Estonia	MoF	2016	1986/2001	CG,LG,SS	C	CB	2016	BPM 6
Ethiopia	MoF	2015/16	1986	CG,SG,LG,NFPC	C	CB	2015/16	BPM 5
Fiji	MoF	2015	1986	CG	C	CB	2015	BPM 6
Finland	MoF	2016	2001	CG,LG,SS	A	NSO	2016	BPM 6
France	NSO	2015	2001	CG,LG,SS	A	CB	2016	BPM 6
Gabon	IMF staff	2016	2001	CG	A	CB	2015	BPM 5
The Gambia	MoF	2016	2001	CG	C	CB and IMF staff	2014	BPM 4
Georgia	MoF	2016	2001	CG,LG	C	NSO and CB	2015	BPM 5
Germany	NSO	2016	2001	CG,SG,LG,SS	A	CB	2015	BPM 6
Ghana	MoF	2015	2001	CG	C	CB	2015	BPM 5
Greece	MoF	2016	2014	CG,LG,SS	A	CB	2016	BPM 6
Grenada	MoF	2015	2001	CG	CB	CB	2015	BPM 5
Guatemala	MoF	2016	2001	CG	C	CB	2015	BPM 5
Guinea	MoF	2015	2001	CG	Other	CB and MEP	2015	BPM 6
Guinea-Bissau	MoF	2014	2001	CG	A	CB	2015	BPM 6
Guyana	MoF	2016	1986	CG,SS,NFPC	C	CB	2016	BPM 5
Haiti	MoF	2015/16	2001	CG	C	CB	2015/16	BPM 5
Honduras	MoF	2015	1986	CG,LG,SS,NFPC	A	CB	2015	BPM 5
Hong Kong SAR	NSO	2015/16	2001	CG	C	NSO	2015	BPM 6
Hungary	MEP and NSO	2015	ESA 2010	CG,LG,SS,NMPC	A	CB	2015	BPM 6
Iceland	NSO	2015	2001	CG,LG,SS	A	CB	2016	BPM 6
India	MoF and IMF staff	2015/16	1986	CG,SG	C	CB	2016/17	BPM 6
Indonesia	MoF	2016	2001	CG,LG	C	CB	2016	BPM 6
Iran	MoF	2015/16	2001	CG	C	CB	2015/16	BPM 5
Iraq	MoF	2014	2001	CG	C	CB	2014	BPM 5
Ireland	MoF	2015	2001	CG,LG,SS	A	NSO	2016	BPM 6
Israel	MoF and NSO	2015	2001	CG,LG,SS	Other	NSO	2015	BPM 6
Italy	NSO	2016	2001	CG,LG,SS	A	NSO	2015	BPM 6
Jamaica	MoF	2015/16	1986	CG	C	CB	2015	BPM 5

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Japan	Japanese yen	GAD	2016	2011	SNA 2008	From 1980	GAD	2016
Jordan	Jordanian dinar	NSO	2015	1994	Other		NSO	2016
Kazakhstan	Kazakhstani tenge	NSO	2015	2007	SNA 1993	From 1994	CB	2016
Kenya	Kenya shilling	NSO	2015	2009	SNA 2008		NSO	2015
Kiribati	Australian dollar	NSO	2014	2006	SNA 2008		NSO	2015
Korea	South Korean won	CB	2016	2010	SNA 2008	From 1980	MoF	2016
Kosovo	Euro	NSO	2015	2015	ESA 2010		NSO	2015
Kuwait	Kuwaiti dinar	MEP and NSO	2015	2010	SNA 1993		NSO and MEP	2015
Kyrgyz Republic	Kyrgyz som	NSO	2015	2005	SNA 1993		NSO	2016
Lao P.D.R.	Lao kip	NSO	2015	2002	SNA 1993		NSO	2015
Latvia	Euro	NSO	2016	2010	ESA 2010	From 1995	NSO	2016
Lebanon	Lebanese pound	NSO	2013	2010	SNA 2008	From 2010	NSO	2016
Lesotho	Lesotho loti	NSO	2015	2012	Other		NSO	2016
Liberia	U.S. dollar	CB	2014	1992	SNA 1993		CB	2016
Libya	Libyan dinar	MEP	2015	2003	SNA 1993		NSO	2015
Lithuania	Euro	NSO	2016	2010	ESA 2010	From 2005	NSO	2016
Luxembourg	Euro	NSO	2015	2010	ESA 2010	From 1995	NSO	2015
Macao SAR	Macanese pataca	NSO	2015	2014	SNA 2008	From 2001	NSO	2016
FYR Macedonia	Macedonian denar	NSO	2016	2005	ESA 2010		NSO	2016
Madagascar	Malagasy ariary	NSO	2015	2000	SNA 1968		NSO	2015
Malawi	Malawian kwacha	NSO	2015	2010	SNA 2008		NSO	2015
Malaysia	Malaysian ringgit	NSO	2016	2010	SNA 2008		NSO	2016
Maldives	Maldivian rufiyaa	MoF and NSO	2015	2003[6]	SNA 1993		CB	2015
Mali	CFA franc	MoF	2015	1999	SNA 1993		MoF	2016
Malta	Euro	NSO	2016	2010	ESA 2010	From 2000	NSO	2016
Marshall Islands	U.S. dollar	NSO	2014/15	2003/04	Other		NSO	2014/15
Mauritania	Mauritanian ouguiya	NSO	2014	2004	SNA 1993		NSO	2014
Mauritius	Mauritian rupee	NSO	2016	2006	SNA 1993	From 1999	NSO	2016
Mexico	Mexican peso	NSO	2016	2008	SNA 2008		NSO	2016
Micronesia	U.S. dollar	NSO	2014/15	2004	Other		NSO	2014/15
Moldova	Moldovan leu	NSO	2015	1995	SNA 1993		NSO	2016
Mongolia	Mongolian tögrög	NSO	2016	2010	SNA 1993		NSO	2016
Montenegro	Euro	NSO	2015	2006	ESA 1995		NSO	2016
Morocco	Moroccan dirham	NSO	2015	2007	SNA 1993	From 1998	NSO	2016
Mozambique	Mozambican metical	NSO	2016	2009	SNA 1993/ 2008		NSO	2016
Myanmar	Myanmar kyat	MEP	2015/16	2010/11	Other		NSO	2015/16
Namibia	Namibia dollar	NSO	2015	2000	SNA 1993		NSO	2016
Nauru	Australian dollar	Other	2014/15	2007	SNA 2008		NSO	2015/16
Nepal	Nepalese rupee	NSO	2015/16	2000/01	SNA 1993		CB	2016/17
Netherlands	Euro	NSO	2016	2010	ESA 2010	From 1980	NSO	2016
New Zealand	New Zealand dollar	NSO	2016	2009/10	Other	From 1987	NSO	2016
Nicaragua	Nicaraguan córdoba	CB	2015	2006	SNA 1993	From 1994	CB	2016
Niger	CFA franc	NSO	2015	2000	SNA 1993		NSO	2016
Nigeria	Nigerian naira	NSO	2016	2010	SNA 2008		NSO	2016/17
Norway	Norwegian krone	NSO	2016	2014	ESA 2010	From 1980	NSO	2016

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Japan	GAD	2015	2001	CG,LG,SS	A	MoF	2016	BPM 6
Jordan	MoF	2015	2001	CG,NFPC	C	CB	2015	BPM 5
Kazakhstan	IMF staff	2016	2001	CG,LG	A	CB	2015	BPM 6
Kenya	MoF	2015	2001	CG	A	CB	2015	BPM 6
Kiribati	MoF	2013	1986	CG,LG	C	NSO	2014	BPM 6
Korea	MoF	2015	2001	CG	C	CB	2016	BPM 6
Kosovo	MoF	2015	Other	CG,LG	C	CB	2015	BPM 5
Kuwait	MoF	2015	1986	CG	Mixed	CB	2015	BPM 5
Kyrgyz Republic	MoF	2016	Other	CG,LG,SS	C	CB	2016	BPM 5
Lao P.D.R.	MoF	2015/16	2001	CG	C	CB	2013	BPM 5
Latvia	MoF	2015	1986	CG,LG,SS,NFPC	C	CB	2016	BPM 6
Lebanon	MoF	2015	2001	CG	Mixed	CB and IMF staff	2015	BPM 5
Lesotho	MoF	2015/16	2001	CG,LG	C	CB	2015	BPM 5
Liberia	MoF	2016	2001	CG	A	CB	2014	BPM 5
Libya	MoF	2015	1986	CG,SG,LG	C	CB	2015	BPM 5
Lithuania	MoF	2015	2014	CG,LG,SS	A	CB	2016	BPM 6
Luxembourg	MoF	2015	2001	CG,LG,SS	A	NSO	2015	BPM 6
Macao SAR	MoF	2015	2001	CG,SS,MPC,NFPC	C	NSO	2015	BPM 6
FYR Macedonia	MoF	2015	1986	CG,SG,SS	C	CB	2016	BPM 6
Madagascar	MoF	2015	1986	CG,LG	C	CB	2015	BPM 5
Malawi	MoF	2015/16	1986	CG	C	NSO and GAD	2015	BPM 5
Malaysia	MoF	2015	1986	CG,SG,LG	C	NSO	2016	BPM 6
Maldives	MoF	2015	1986	CG	C	CB	2015	BPM 5
Mali	MoF	2015	2001	CG	Mixed	CB	2015	BPM 5
Malta	NSO	2015	2001	CG,SS	A	NSO	2015	BPM 6
Marshall Islands	MoF	2014/15	2001	CG,LG,SS	A	NSO	2014/15	BPM 6
Mauritania	MoF	2014	1986	CG	C	CB	2013	BPM 5
Mauritius	MoF	2015	2001	CG,LG,NFPC	C	CB	2016	BPM 5
Mexico	MoF	2016	2001	CG,SS,NMPC,NFPC	C	CB	2016	BPM 5
Micronesia	MoF	2014/15	2001	CG,SG,LG,SS	Other	NSO	2014/15	Other
Moldova	MoF	2016	1986	CG,LG,SS	C	CB	2015	BPM 5
Mongolia	MoF	2016	2001	CG,SG,LG,SS	C	CB	2016	BPM 5
Montenegro	MoF	2015	1986	CG,LG,SS	C	CB	2015	BPM 6
Morocco	MEP	2016	2001	CG	A	GAD	2016	BPM 5
Mozambique	MoF	2016	2001	CG,SG	Mixed	CB	2015	BPM 6
Myanmar	MoF	2015/16	Other	CG,NFPC	Mixed	IMF staff	2015/16	BPM 5
Namibia	MoF	2015/16	2001	CG	C	CB	2015	BPM 5
Nauru	MoF	2015/16	2001	CG	Mixed	IMF staff	2013/14	BPM 6
Nepal	MoF	2015/16	2001	CG	C	CB	2015/16	BPM 5
Netherlands	MoF	2015	2001	CG,LG,SS	A	CB	2015	BPM 6
New Zealand	MoF	2015/16	2001	CG	A	NSO	2016	BPM 6
Nicaragua	MoF	2015	1986	CG,LG,SS	C	IMF staff	2015	BPM 6
Niger	MoF	2015	1986	CG	A	CB	2015	BPM 6
Nigeria	MoF	2016	2001	CG,SG,LG,NFPC	C	CB	2016	BPM 5
Norway	NSO and MoF	2015	2014	CG,LG,SS	A	NSO	2015	BPM 6

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Oman	Omani rial	NSO	2015	2010	SNA 1993		NSO	2016
Pakistan	Pakistan rupee	NSO	2015/16	2005/06[6]	SNA 1968/ 1993		NSO	2015/16
Palau	U.S. dollar	MoF	2014/15	2005	Other		MoF	2014/15
Panama	U.S. dollar	NSO	2015	2007	SNA 1993	From 2007	NSO	2015
Papua New Guinea	Papua New Guinea kina	NSO and MoF	2013	1998	SNA 1993		NSO	2013
Paraguay	Paraguayan guaraní	CB	2015	1994	SNA 1993		CB	2016
Peru	Peruvian nuevo sol	CB	2015	2007	SNA 1993		CB	2015
Philippines	Philippine peso	NSO	2016	2000	SNA 2008		NSO	2016
Poland	Polish zloty	NSO	2016	2010	ESA 2010	From 1995	NSO	2016
Portugal	Euro	NSO	2016	2011	ESA 2010	From 1980	NSO	2016
Puerto Rico	U.S. dollar	MEP	2014/15	1954	SNA 1968		MEP	2015/16
Qatar	Qatari riyal	NSO and MEP	2014	2013	SNA 1993		NSO and MEP	2015
Romania	Romanian leu	NSO	2016	2010	ESA 2010	From 2000	NSO	2016
Russia	Russian ruble	NSO	2016	2011	SNA 2008	From 1995	NSO	2016
Rwanda	Rwanda franc	MoF	2016	2014	SNA 1993		NSO	2016
Samoa	Samoa tala	NSO	2015/16	2009/10	SNA 1993		NSO	2015/16
San Marino	Euro	NSO	2015	2007	Other		NSO	2015
São Tomé and Príncipe	São Tomé and Príncipe dobra	NSO	2013	2000	SNA 1993		NSO	2016
Saudi Arabia	Saudi riyal	NSO and MEP	2016	2010	SNA 1993		NSO and MEP	2016
Senegal	CFA franc	NSO	2016	2000	SNA 1993		NSO	2016
Serbia	Serbian dinar	NSO	2015	2010	ESA 2010	From 2010	NSO	2015
Seychelles	Seychellois rupee	NSO	2014	2006	SNA 1993		NSO	2016
Sierra Leone	Sierra Leonean leone	NSO	2015	2006	SNA 1993	From 2010	NSO	2016
Singapore	Singapore dollar	NSO	2016	2010	SNA 1993	From 2010	NSO	2016
Slovak Republic	Euro	NSO	2015	2010	ESA 2010	From 1997	NSO	2015
Slovenia	Euro	NSO	2015	2010	ESA 2010	From 2000	NSO	2015
Solomon Islands	Solomon Islands dollar	CB	2014	2004	SNA 1993		NSO	2015
South Africa	South African rand	CB	2016	2010	SNA 1993		NSO	2016/17
South Sudan	South Sudanese pound	NSO	2014	2010	SNA 1993		NSO	2014
Spain	Euro	NSO	2016	2010	ESA 2010	From 1995	NSO	2016
Sri Lanka	Sri Lankan rupee	NSO	2015	2010	SNA 1993		NSO	2016
St. Kitts and Nevis	Eastern Caribbean dollar	NSO	2014	2006[6]	SNA 1993		NSO	2014
St. Lucia	Eastern Caribbean dollar	NSO	2016	2006	SNA 1993		NSO	2016
St. Vincent and the Grenadines	Eastern Caribbean dollar	NSO	2016	2006[6]	SNA 1993		NSO	2016
Sudan	Sudanese pound	NSO	2010	2007	Other		NSO	2015
Suriname	Surinamese dollar	NSO	2015	2007	SNA 1993		NSO	2016

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Oman	MoF	2015	2001	CG	C	CB	2015	BPM 5
Pakistan	MoF	2015/16	1986	CG,SG,LG	C	CB	2015/16	BPM 5
Palau	MoF	2014/15	2001	CG	Other	MoF	2014/15	BPM 6
Panama	MoF	2015	1986	CG,SG,LG,SS,NFPC	C	NSO	2015	BPM 5
Papua New Guinea	MoF	2013	1986	CG	C	CB	2013	BPM 5
Paraguay	MoF	2015	2001	CG,SG,LG,SS,MPC, NFPC	C	CB	2015	BPM 5
Peru	MoF	2015	1986	CG,SG,LG,SS	C	CB	2015	BPM 5
Philippines	MoF	2016	2001	CG,LG,SS	C	CB	2016	BPM 6
Poland	MoF and NSO	2016	ESA 2010	CG,LG,SS	A	CB	2016	BPM 6
Portugal	NSO	2015	2001	CG,LG,SS	A	CB	2016	BPM 6
Puerto Rico	MEP	2014/15	2001	Other	A	…	…	…
Qatar	MoF	2015	1986	CG	C	CB and IMF staff	2014	BPM 5
Romania	MoF	2016	2001	CG,LG,SS	C	CB	2016	BPM 6
Russia	MoF	2015	2001	CG,SG,SS	Mixed	CB	2016	BPM 6
Rwanda	MoF	2015	2001	CG,LG	Mixed	CB	2015	BPM 6
Samoa	MoF	2015/16	2001	CG	A	CB	2015/16	BPM 6
San Marino	MoF	2015	Other	CG	Other	…	…	…
São Tomé and Príncipe	MoF and Customs	2016	2001	CG	C	CB	2016	BPM 6
Saudi Arabia	MoF	2016	1986	CG	C	CB	2016	BPM 5
Senegal	MoF	2015	2001	CG	C	CB and IMF staff	2016	BPM 6
Serbia	MoF	2015	1986/2001	CG,SG,LG,SS	C	CB	2015	BPM 6
Seychelles	MoF	2015	1986	CG,SS	C	CB	2015	BPM 6
Sierra Leone	MoF	2016	1986	CG	C	CB	2015	BPM 5
Singapore	MoF	2015/16	2001	CG	C	NSO	2016	BPM 6
Slovak Republic	NSO	2015	2001	CG,LG,SS	A	CB	2015	BPM 6
Slovenia	MoF	2015	1986	CG,SG,LG,SS	C	NSO	2015	BPM 6
Solomon Islands	MoF	2014	1986	CG	C	CB	2014	BPM 6
South Africa	MoF	2015/16	2001	CG,SG,SS	C	CB	2016	BPM 6
South Sudan	MoF and MEP	2015	Other	CG	C	MoF, NSO, and MEP	2015	BPM 5
Spain	MoF and NSO	2015	ESA 2010	CG,SG,LG,SS	A	CB	2015	BPM 6
Sri Lanka	MoF	2015	2001	CG	C	CB	2015	BPM 5
St. Kitts and Nevis	MoF	2014	1986	CG	C	CB	2014	BPM 5
St. Lucia	MoF	2015/16	1986	CG	C	CB	2016	BPM 5
St. Vincent and the Grenadines	MoF	2016	1986	CG	C	CB	2016	BPM 5
Sudan	MoF	2015	2001	CG	Mixed	CB	2015	BPM 5
Suriname	MoF	2015	1986	CG	CB	CB	2016	BPM 5

Table G. Key Data Documentation *(continued)*

		National Accounts					Prices (CPI)	
Country	Currency	Historical Data Source[1]	Latest Actual Annual Data	Base Year[2]	System of National Accounts	Use of Chain-Weighted Methodology[3]	Historical Data Source[1]	Latest Actual Annual Data
Swaziland	Swazi lilangeni	NSO	2015	2011	SNA 1993		NSO	2015
Sweden	Swedish krona	NSO	2015	2015	ESA 2010	From 1993	NSO	2016
Switzerland	Swiss franc	NSO	2016	2010	ESA 2010	From 1980	NSO	2016
Syria	Syrian pound	NSO	2010	2000	SNA 1993		NSO	2011
Taiwan Province of China	New Taiwan dollar	NSO	2015	2011	SNA 2008		NSO	2016
Tajikistan	Tajik somoni	NSO	2014	1995	SNA 1993		NSO	2014
Tanzania	Tanzania shilling	NSO	2015	2007	SNA 1993		NSO	2016
Thailand	Thai baht	MEP	2016	2002	SNA 1993	From 1993	MEP	2016
Timor-Leste	U.S. dollar	MoF	2014	2010[6]	Other		NSO	2015
Togo	CFA franc	MOF and NSO	2014	2000	SNA 1993		NSO	2015
Tonga	Tongan pa'anga	CB	2014	2010	SNA 1993		CB	2015
Trinidad and Tobago	Trinidad and Tobago dollar	NSO	2016	2000	SNA 1993		NSO	2015
Tunisia	Tunisian dinar	NSO	2014	2004	SNA 1993	From 2009	NSO	2016
Turkey	Turkish lira	NSO	2016	2009	ESA 2010	From 2009	NSO	2016
Turkmenistan	New Turkmen manat	NSO	2015	2008	SNA 1993	From 2000	NSO	2015
Tuvalu	Australian dollar	PFTAC advisors	2012	2005	SNA 1993		NSO	2013
Uganda	Ugandan shilling	NSO	2014	2010	SNA 1993		CB	2015/16
Ukraine	Ukrainian hryvnia	NSO	2016	2010	SNA 2008	From 2005	NSO	2016
United Arab Emirates	U.A.E. dirham	NSO	2015	2007	SNA 1993		NSO	2015
United Kingdom	Pound sterling	NSO	2016	2013	ESA 2010	From 1980	NSO	2016
United States	U.S. dollar	NSO	2016	2009	Other	From 1980	NSO	2016
Uruguay	Uruguayan peso	CB	2016	2005	SNA 1993		NSO	2016
Uzbekistan	Uzbek sum	NSO	2014	1995	SNA 1993		NSO	2014
Vanuatu	Vanuatu vatu	NSO	2014	2006	SNA 1993		NSO	2015
Venezuela	Venezuelan bolívar fuerte	CB	2015	1997	SNA 2008		CB	2016
Vietnam	Vietnamese dong	NSO	2016	2010	SNA 1993		NSO	2016
Yemen	Yemeni rial	IMF staff	2008	1990	SNA 1993		NSO, CB, and IMF staff	2009
Zambia	Zambian kwacha	NSO	2015	2010	SNA 1993		NSO	2016
Zimbabwe	U.S. dollar	NSO	2013	2009	Other		NSO	2016

Table G. Key Data Documentation *(continued)*

	Government Finance					Balance of Payments		
Country	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source	Subsectors Coverage[4]	Accounting Practice[5]	Historical Data Source[1]	Latest Actual Annual Data	Statistics Manual in Use at Source
Swaziland	MoF	2015/16	2001	CG	A	CB	2015	BPM 5
Sweden	MoF	2015	2001	CG,LG,SS	A	NSO	2015	BPM 6
Switzerland	MoF	2014	2001	CG,SG,LG,SS	A	CB	2016	BPM 6
Syria	MoF	2009	1986	CG	C	CB	2009	BPM 5
Taiwan Province of China	MoF	2015	1986	CG,LG,SS	C	CB	2015	BPM 6
Tajikistan	MoF	2015	1986	CG,LG,SS	C	CB	2014	BPM 5
Tanzania	MoF	2015	1986	CG,LG	C	CB	2015	BPM 5
Thailand	MoF	2014/15	2001	CG,BCG,LG,SS	A	CB	2016	BPM 6
Timor-Leste	MoF	2015	2001	CG	C	CB	2015	BPM 6
Togo	MoF	2014	2001	CG	C	CB	2015	BPM 5
Tonga	CB and MoF	2014	2001	CG	C	CB and NSO	2015	BPM 6
Trinidad and Tobago	MoF	2014/15	1986	CG,NFPC	C	CB and NSO	2015	BPM 5
Tunisia	MoF	2015	1986	CG	C	CB	2015	BPM 5
Turkey	MoF	2015	2001	CG,LG,SS	A	CB	2016	BPM 6
Turkmenistan	MoF	2015	1986	CG,LG	C	NSO and IMF staff	2013	BPM 5
Tuvalu	IMF staff	2013	Other	CG	Mixed	IMF staff	2013	BPM 6
Uganda	MoF	2015	2001	CG	C	CB	2015	BPM 6
Ukraine	MoF	2015	2001	CG,SG,LG,SS	C	CB	2015	BPM 6
United Arab Emirates	MoF	2015	2001	CG,BCG,SG,SS	C	CB	2015	BPM 5
United Kingdom	NSO	2016	2001	CG,LG	A	NSO	2016	BPM 6
United States	MEP	2015	2001	CG,SG,LG	A	NSO	2016	BPM 6
Uruguay	MoF	2016	1986	CG,LG,SS,MPC, NFPC	A	CB	2016	BPM 6
Uzbekistan	MoF	2014	Other	CG,SG,LG,SS	C	MEP	2014	BPM 5
Vanuatu	MoF	2015	2001	CG	C	CB	2014	BPM 5
Venezuela	MoF	2010	2001	BCG,NFPC	C	CB	2015	BPM 5
Vietnam	MoF	2014	2001	CG,SG,LG	C	CB	2015	BPM 5
Yemen	MoF	2013	2001	CG,LG	C	IMF staff	2009	BPM 5
Zambia	MoF	2015	1986	CG	C	CB	2015	BPM 6
Zimbabwe	MoF	2014	1986	CG	C	CB and MoF	2013	BPM 4

Note: BPM = Balance of Payments Manual; CPI = consumer price index; ESA = European System of National Accounts; SNA = System of National Accounts.

[1]CB = Central Bank; Customs = Customs Authority; GAD = General Administration Department; IEO = International Economic Organization; MEP = Ministry of Economy, Planning, Commerce, and/or Development; MoF = Ministry of Finance and/or Treasury; NSO = National Statistics Office; PFTAC = Pacific Financial Technical Assistance Centre.

[2]National accounts base year is the period with which other periods are compared and the period for which prices appear in the denominators of the price relationships used to calculate the index.

[3]Use of chain-weighted methodology allows countries to measure GDP growth more accurately by reducing or eliminating the downward biases in volume series built on index numbers that average volume components using weights from a year in the moderately distant past.

[4]For some countries, the structures of government consist of a broader coverage than specified for the general government. Coverage: BCG = Budgetary Central Government; CG = Central Government; EUA = Extrabudgetary Units/Accounts; LG = Local Government; MPC = Monetary Public Corporation, including Central Bank; NFPC = Nonfinancial Public Corporations; NMPC = Nonmonetary Financial Public Corporations; SG = State Government; SS = Social Security Funds; TG = Territorial Governments.

[5]Accounting Standard: A = Accrual accounting; C = Cash accounting; CB = Commitments basis accounting; Mixed = Combination of accrual and cash accounting.

[6]Base year is not equal to 100 because the nominal GDP is not measured in the same way as real GDP or the data are seasonally adjusted.

Box A1. Economic Policy Assumptions Underlying the Projections for Selected Economies

Fiscal Policy Assumptions

The short-term fiscal policy assumptions used in the *World Economic Outlook* (WEO) are normally based on officially announced budgets, adjusted for differences between the national authorities and the IMF staff regarding macroeconomic assumptions and projected fiscal outturns. When no official budget has been announced, projections incorporate policy measures that are judged likely to be implemented. The medium-term fiscal projections are similarly based on a judgment about the most likely path of policies. For cases in which the IMF staff has insufficient information to assess the authorities' budget intentions and prospects for policy implementation, an unchanged structural primary balance is assumed unless indicated otherwise. Specific assumptions used in regard to some of the advanced economies follow. (See also Tables B5 to B9 in the online section of the Statistical Appendix for data on fiscal net lending/borrowing and structural balances.)[1]

Argentina: Fiscal projections are based on the available information regarding budget outturn and budget plans for the federal government and provincial governments, fiscal measures announced by the authorities, and IMF staff macroeconomic projections.

Australia: Fiscal projections are based on Australian Bureau of Statistics data, the fiscal year 2016/17 budget, the 2016–17 Mid-year Economic and Fiscal Outlook, and IMF staff estimates.

Austria: Fiscal projections are based on data from Statistics Austria, the authorities' projections, and IMF staff estimates and projections.

Belgium: Projections reflect the IMF staff's assessment of policies and measures laid out in the 2017 budget and the 2016–19 Stability Programme, incorporated into the IMF staff's macroeconomic framework.

[1] The output gap is actual minus potential output, as a percentage of potential output. Structural balances are expressed as a percentage of potential output. The structural balance is the actual net lending/borrowing minus the effects of cyclical output from potential output, corrected for one-time and other factors, such as asset and commodity prices and output composition effects. Changes in the structural balance consequently include effects of temporary fiscal measures, the impact of fluctuations in interest rates and debt-service costs, and other noncyclical fluctuations in net lending/borrowing. The computations of structural balances are based on IMF staff estimates of potential GDP and revenue and expenditure elasticities. (See Annex I of the October 1993 WEO.) Net debt is calculated as gross debt minus financial assets corresponding to debt instruments. Estimates of the output gap and of the structural balance are subject to significant margins of uncertainty.

Brazil: Fiscal projections for the end of 2017 take into account budget performance through December 31, 2016, and the deficit target approved in the budget law.

Canada: Projections use the baseline forecasts in the 2017 federal budget and 2017 provincial budget updates as available. The IMF staff makes adjustments to these forecasts, including for differences in macroeconomic projections. The IMF staff forecast also incorporates the most recent data releases from Statistics Canada's Canadian System of National Economic Accounts, including federal, provincial, and territorial budgetary outturns through the end of 2016.

Chile: Projections are based on the authorities' budget projections, adjusted to reflect the IMF staff's projections for GDP and copper prices.

China: The pace of fiscal consolidation is likely to be more gradual, reflecting reforms to strengthen social safety nets and the social security system announced as part of the Third Plenum reform agenda.

Denmark: Estimates for 2016 are aligned with the latest official budget estimates and the underlying economic projections, adjusted where appropriate for the IMF staff's macroeconomic assumptions. For 2017–18, the projections incorporate key features of the medium-term fiscal plan as embodied in the authorities' Convergence Programme 2016 submitted to the European Union (EU).

France: Projections for 2017 reflect the budget law. For 2018–19, they are based on the multiyear budget and the April 2016 Stability Programme, adjusted for differences in assumptions on macro and financial variables, and revenue projections. Historical fiscal data reflect the statistical institute's September 2016 and February 2017 revisions and update of the fiscal accounts, debt data, and national accounts.

Germany: The IMF staff's projections for 2017 and beyond are based on the authorities' 2017–20 financial plan, adjusted for the differences in the IMF staff's macroeconomic framework. The estimate of gross debt includes portfolios of impaired assets and noncore business transferred to institutions that are winding up, as well as other financial sector and EU support operations.

Greece: The fiscal projections reflect the IMF staff's assessment, assuming full implementation of the authorities' fiscal policy package under the European Stability Mechanism–supported program. Primary balance estimates for 2016 are based on preliminary data provided by the Ministry of Finance as of February 15 and are subject to change once data on an accrual basis (ESA 2010) become available on April 21.

Box A1 *(continued)*

Medium-term fiscal projections reflect the IMF staff's assessment based on currently legislated fiscal policies.

Hong Kong SAR: Projections are based on the authorities' medium-term fiscal projections on expenditures.

Hungary: Fiscal projections include IMF staff projections of the macroeconomic framework and of the impact of recent legislative measures, as well as fiscal policy plans announced in the 2017 budget.

India: Historical data are based on budgetary execution data. Projections are based on available information on the authorities' fiscal plans, with adjustments for IMF staff assumptions. Subnational data are incorporated with a lag of up to two years; general government data are thus finalized well after central government data. IMF and Indian presentations differ, particularly regarding divestment and license auction proceeds, net versus gross recording of revenues in certain minor categories, and some public sector lending.

Indonesia: IMF projections are based on moderate tax policy and administration reforms, fuel subsidy pricing reforms introduced in January 2015, and a gradual increase in social and capital spending over the medium term in line with fiscal space.

Ireland: Fiscal projections are based on the IMF staff's assessment of the policies presented in the 2017 Budget and September 2016 Economic and Financial Document.

Italy: IMF staff estimates and projections are based on the fiscal plans included in the government's 2017 budget and September 2016 Economic and Financial Document.

Japan: The projections include fiscal measures already announced by the government, including the fiscal stimulus package for 2017 and the consumption tax hike in October 2019.

Korea: The medium-term forecast incorporates the government's announced medium-term consolidation path.

Mexico: Fiscal projections for 2017 are broadly in line with the approved budget; projections for 2018 onward assume compliance with rules established in the Fiscal Responsibility Law.

Netherlands: Fiscal projections for the period 2016–22 are based on the authorities' Bureau for Economic Policy Analysis budget projections, after differences in macroeconomic assumptions are adjusted for. Historical data were revised following the June 2014 Central Bureau of Statistics release of revised macro data because of the adoption of the European System of National and Regional Accounts (ESA 2010) and the revisions of data sources.

New Zealand: Fiscal projections are based on the authorities' fiscal year 2016/17 budget, the 2016 Half Year Economic and Fiscal Update, and IMF staff estimates.

Portugal: The estimate for 2016 reflects the cash outturn and January through September execution data on a national accounts basis; the projections for 2017 are based on the authorities' approved budget, adjusted to reflect the IMF staff's macroeconomic forecast. Projections thereafter are based on the assumption of unchanged policies.

Puerto Rico: Fiscal projections are based on the Puerto Rico Fiscal and Economic Growth Plan (FEGP), which was prepared in 2015 pursuant to Governor Alejandro García Padilla's executive order, with subsequent further updates on debt data in 2016. In line with assumptions of this plan, IMF projections assume that Puerto Rico will lose federal funding for the Affordable Care Act (ACA) starting in 2018. Likewise, projections assume federal tax incentives, which were neutralizing the effects of Puerto Rico's Act 154 on foreign companies, will no longer be available, starting in 2018, leading to additional revenue losses. In terms of policy assumptions, FEGP presents a scenario without measures and an alternative scenario with various revenue and expenditure measures; IMF projections assume full implementation of the FEGP measures. On the revenue side, the main measures are (1) an increase in the corporate tax base and (2) improvement in tax administration and enforcement. These are in addition to full transition to a value-added tax, which is an ongoing measure and is expected to be completed by the end of 2016. On the expenditure side, measures include extension of Act 66, which freezes much government spending, through 2021; reduction of operating costs; decreases in government subsidies; and spending cuts in education and health care. Although IMF policy assumptions are exactly as in the FEGP scenario with full measures, the IMF's projections of fiscal revenues, expenditures, and balance are different from FEGP's. This stems from two main differences in methodologies: first and foremost, while IMF projections are on an accrual basis, FEGP's are on a cash basis. Second, the IMF and FEGP make very different macroeconomic assumptions.

Russia: Projections for 2016–19 are IMF staff estimates, based on the authorities' budget. Projections

Box A1 *(continued)*

for 2020–22 are based on the proposed oil price rule assumed to be introduced in December 2017, with adjustments by the IMF staff.

Saudi Arabia: IMF staff projections of oil revenues are based on WEO baseline oil prices. On the expenditure side, starting in 2017, following recent reforms, the wage bill estimates no longer include the 13th-month pay that used to be awarded every three years in accordance with the lunar calendar. Expenditure projections take the 2017 budget as a starting point and adjust for the budget surplus fund payment and the IMF staff's estimates of arrears payments.

Singapore: For fiscal years 2016/17 and 2017/18, projections are based on budget numbers. For the remainder of the projection period, the IMF staff assumes unchanged policies.

South Africa: Fiscal projections are based on the authorities' 2017 Budget Review.

Spain: For 2016, fiscal data are IMF staff projections, reflecting the cash outturn through November. For 2017 and beyond, fiscal projections are based on the measures specified in the Stability Programme Update 2016–19 and the IMF staff's macroeconomic projections.

Sweden: Fiscal projections take into account the authorities' projections based on the 2017 Spring Budget. The impact of cyclical developments on the fiscal accounts is calculated using the Organisation for Economic Co-operation and Development's 2005 elasticity to take into account output and employment gaps.

Switzerland: The projections assume that fiscal policy is adjusted as necessary to keep fiscal balances in line with the requirements of Switzerland's fiscal rules.

Turkey: Fiscal projections assume that both current and capital spending will be in line with the authorities' 2017–19 Medium Term Programme based on current trends and policies.

United Kingdom: Fiscal projections are based on the country's Budget 2017, published in March 2017, with expenditure projections based on the budgeted nominal values and with revenue projections adjusted for differences between IMF staff forecasts of macroeconomic variables (such as GDP growth and inflation) and the forecasts of these variables assumed in the authorities' fiscal projections. IMF staff data exclude public sector banks and the effect of transferring assets from the Royal Mail Pension Plan to the public sector in April 2012. Real government consumption and investment are part of the real GDP path, which, according to the IMF staff, may or may not be the same as projected by the U.K. Office for Budget Responsibility.

United States: Fiscal projections are based on the January 2017 Congressional Budget Office baseline adjusted for the IMF staff's policy and macroeconomic assumptions. The baseline incorporates the key provisions of the Bipartisan Budget Act of 2015, including a partial rollback of the sequester spending cuts in fiscal year 2016. In fiscal years 2017 through 2022, the IMF staff assumes that the sequester cuts will continue to be partially replaced, in proportions similar to those already implemented in fiscal years 2014 and 2015, with back-loaded measures generating savings in mandatory programs and additional revenues. Projections also incorporate the Protecting Americans from Tax Hikes Act of 2015, which extended some existing tax cuts for the short term and some permanently. Also, projections assume there will be corporate and personal income tax cuts during 2017–19, cumulatively worth of about 1.8 percent of 2017's GDP. Finally, fiscal projections are adjusted to reflect the IMF staff's forecasts for key macroeconomic and financial variables and different accounting treatment of financial sector support and of defined-benefit pension plans and are converted to a general government basis. Historical data start at 2001 for most series because data compiled according to the 2001 *Government Finance Statistics Manual* (GFSM 2001) may not be available for earlier years.

Monetary Policy Assumptions

Monetary policy assumptions are based on the established policy framework in each country. In most cases, this implies a nonaccommodative stance over the business cycle: official interest rates will increase when economic indicators suggest that inflation will rise above its acceptable rate or range; they will decrease when indicators suggest that inflation will not exceed the acceptable rate or range, that output growth is below its potential rate, and that the margin of slack in the economy is significant. On this basis, the London interbank offered rate (LIBOR) on six-month U.S. dollar deposits is assumed to average 1.7 percent in 2017 and 2.8 percent in 2018 (see Table 1.1). The rate on three-month euro deposits is assumed to average –0.3 percent in 2017 and –0.2 percent in 2018. The interest rate on six-month Japanese yen deposits is assumed to average 0.0 percent in 2017 and 2018.

Australia: Monetary policy assumptions are in line with market expectations.

Box A1 *(continued)*

Brazil: Monetary policy assumptions are consistent with gradual convergence of inflation toward the middle of the target range over the relevant horizon.

Canada: Monetary policy assumptions are in line with market expectations.

China: Monetary policy is expected to tighten with a gradual rise in the interest rate.

Denmark: The monetary policy is to maintain the peg to the euro.

Euro area: Monetary policy assumptions for euro area member countries are in line with market expectations.

Hong Kong SAR: The IMF staff assumes that the currency board system remains intact.

India: The policy (interest) rate assumption is consistent with an inflation rate within the Reserve Bank of India's targeted band.

Indonesia: Monetary policy assumptions are in line with the maintenance of inflation within the central bank's targeted band.

Japan: Monetary policy assumptions are in line with market expectations.

Korea: Monetary policy assumptions are in line with market expectations.

Mexico: Monetary assumptions are consistent with attaining the inflation target.

Russia: Monetary projections assume increasing exchange rate flexibility as part of the new inflation-targeting regime, with policy rates falling over the next year as inflation continues to decline and second-round effects are subdued.

Saudi Arabia: Monetary policy projections are based on the continuation of the exchange rate peg to the U.S. dollar.

Singapore: Broad money is projected to grow in line with the projected growth in nominal GDP.

Sweden: Monetary projections are in line with Riksbank projections.

Switzerland: The projections assume no change in the policy rate in 2016–17.

Turkey: Broad money, the long-term bond yield, and the short-term deposit rate are based on IMF staff projections.

United Kingdom: Projections assume no change in the Bank Rate in the next two years, consistent with market expectations.

United States: Following the Federal Reserve's 25 basis point rate hike in mid-March, the IMF staff expects the federal funds target rate to increase by 50 more basis points in 2017 and rise gradually thereafter.

List of Tables

Table A1. Summary of World Output[1]

(Annual percent change)

	Average									Projections		
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
World	**4.2**	**–0.1**	**5.4**	**4.2**	**3.5**	**3.4**	**3.5**	**3.4**	**3.1**	**3.5**	**3.6**	**3.8**
Advanced Economies	**2.5**	**–3.4**	**3.1**	**1.7**	**1.2**	**1.3**	**2.0**	**2.1**	**1.7**	**2.0**	**2.0**	**1.7**
United States	2.6	–2.8	2.5	1.6	2.2	1.7	2.4	2.6	1.6	2.3	2.5	1.7
Euro Area	2.1	–4.5	2.1	1.5	–0.9	–0.3	1.2	2.0	1.7	1.7	1.6	1.5
Japan	1.0	–5.4	4.2	–0.1	1.5	2.0	0.3	1.2	1.0	1.2	0.6	0.6
Other Advanced Economies[2]	3.5	–2.0	4.6	2.9	1.9	2.3	2.9	1.9	2.0	2.2	2.1	2.3
Emerging Market and Developing Economies	**6.2**	**2.9**	**7.4**	**6.3**	**5.4**	**5.1**	**4.7**	**4.2**	**4.1**	**4.5**	**4.8**	**5.0**
Regional Groups												
Commonwealth of Independent States[3]	7.2	–6.4	4.7	4.6	3.5	2.1	1.1	–2.2	0.3	1.7	2.1	2.4
Emerging and Developing Asia	8.0	7.5	9.6	7.9	7.0	6.9	6.8	6.7	6.4	6.4	6.4	6.3
Emerging and Developing Europe	4.3	–3.0	4.6	6.5	2.4	4.9	3.9	4.7	3.0	3.0	3.3	3.1
Latin America and the Caribbean	3.3	–1.8	6.1	4.7	3.0	2.9	1.2	0.1	–1.0	1.1	2.0	2.6
Middle East, North Africa, Afghanistan, and Pakistan	5.3	1.4	4.8	4.3	5.4	2.3	2.8	2.7	3.9	2.6	3.4	3.8
Middle East and North Africa	5.3	1.4	5.0	4.4	5.5	2.1	2.7	2.6	3.8	2.3	3.2	3.5
Sub-Saharan Africa	5.6	3.9	7.0	5.0	4.3	5.3	5.1	3.4	1.4	2.6	3.5	3.9
Memorandum												
European Union	2.5	–4.3	2.1	1.7	–0.4	0.3	1.7	2.4	2.0	2.0	1.8	1.7
Low-Income Developing Countries	6.0	5.7	7.4	5.3	5.2	6.2	6.0	4.6	3.6	4.7	5.3	5.4
Analytical Groups												
By Source of Export Earnings												
Fuel	6.1	–1.5	5.1	4.9	5.1	2.4	2.3	0.4	1.1	1.3	2.2	2.4
Nonfuel	6.2	4.2	8.1	6.7	5.5	5.8	5.3	5.2	4.9	5.2	5.4	5.5
Of Which, Primary Products	3.7	–0.9	6.7	4.8	2.5	4.0	1.7	2.9	1.1	2.5	2.9	3.6
By External Financing Source												
Net Debtor Economies	5.0	2.3	6.9	5.3	4.4	4.8	4.3	4.1	3.6	4.3	4.8	5.4
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2011–15	5.1	0.0	3.9	2.6	2.2	3.2	1.3	0.4	2.8	3.0	4.1	5.2
Memorandum												
Median Growth Rate												
Advanced Economies	3.1	–3.8	2.3	2.0	1.1	1.4	2.1	1.8	1.8	2.3	2.1	1.9
Emerging Market and Developing Economies	4.7	1.8	4.5	4.6	4.1	4.2	4.0	3.1	2.9	3.3	3.5	3.9
Low-Income Developing Countries	4.9	3.8	6.2	5.6	5.2	5.4	5.2	4.0	4.0	4.5	5.0	5.4
Output per Capita												
Advanced Economies	1.8	–4.0	2.5	1.1	0.6	0.8	1.3	1.6	1.1	1.5	1.5	1.2
Emerging Market and Developing Economies	4.8	1.7	6.3	5.2	4.1	3.9	3.5	3.2	3.0	3.4	3.7	4.0
Low-Income Developing Countries	3.8	3.6	5.2	4.1	2.8	4.0	3.9	2.6	1.6	2.6	3.3	3.5
World Growth Rate Based on Market Exchange Rates	**3.1**	**–2.1**	**4.1**	**3.0**	**2.5**	**2.6**	**2.7**	**2.7**	**2.4**	**2.9**	**3.0**	**3.0**
Value of World Output (billions of U.S. dollars)												
At Market Exchange Rates	43,837	60,279	65,900	73,084	74,438	76,458	78,520	74,197	75,278	77,988	81,962	99,956
At Purchasing Power Parities	62,784	83,770	89,269	94,789	99,616	104,597	110,086	114,870	119,884	126,688	134,184	168,202

[1]Real GDP.
[2]Excludes the United States, euro area countries, and Japan.
[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

Table A2. Advanced Economies: Real GDP and Total Domestic Demand[1]

(Annual percent change)

	Average									Projections			Fourth Quarter[2]	Projections	
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022	2016:Q4	2017:Q4	2018:Q4
Real GDP															
Advanced Economies	**2.5**	**–3.4**	**3.1**	**1.7**	**1.2**	**1.3**	**2.0**	**2.1**	**1.7**	**2.0**	**2.0**	**1.7**	**2.0**	**2.0**	**2.0**
United States	2.6	–2.8	2.5	1.6	2.2	1.7	2.4	2.6	1.6	2.3	2.5	1.7	2.0	2.3	2.5
Euro Area	2.1	–4.5	2.1	1.5	–0.9	–0.3	1.2	2.0	1.7	1.7	1.6	1.5	1.7	1.7	1.5
Germany	1.6	–5.6	4.0	3.7	0.7	0.6	1.6	1.5	1.8	1.6	1.5	1.2	1.8	1.7	1.5
France	2.0	–2.9	2.0	2.1	0.2	0.6	0.6	1.3	1.2	1.4	1.6	1.9	1.2	1.9	1.4
Italy	1.2	–5.5	1.7	0.6	–2.8	–1.7	0.1	0.8	0.9	0.8	0.8	0.8	1.0	0.8	0.8
Spain	3.6	–3.6	0.0	–1.0	–2.9	–1.7	1.4	3.2	3.2	2.6	2.1	1.6	3.0	2.3	2.1
Netherlands	2.5	–3.8	1.4	1.7	–1.1	–0.2	1.4	2.0	2.1	2.1	1.8	1.6	2.7	2.0	1.7
Belgium	2.3	–2.3	2.7	1.8	0.1	–0.1	1.7	1.5	1.2	1.6	1.5	1.5	1.2	1.7	1.4
Austria	2.4	–3.8	1.9	2.8	0.7	0.1	0.6	1.0	1.5	1.4	1.3	1.1	1.8	1.1	1.4
Greece	3.5	–4.3	–5.5	–9.1	–7.3	–3.2	0.4	–0.2	0.0	2.2	2.7	1.0	–0.8	4.2	2.0
Portugal	1.6	–3.0	1.9	–1.8	–4.0	–1.1	0.9	1.6	1.4	1.7	1.5	1.0	2.0	1.1	1.7
Ireland	5.3	–4.6	2.0	–0.1	–1.1	1.1	8.4	26.3	5.2	3.5	3.2	2.8	6.6	5.2	3.2
Finland	3.3	–8.3	3.0	2.6	–1.4	–0.8	–0.6	0.3	1.4	1.3	1.4	1.5	1.2	1.5	1.6
Slovak Republic	5.1	–5.4	5.0	2.8	1.7	1.5	2.6	3.8	3.3	3.3	3.7	3.4	2.9	3.3	3.7
Lithuania	6.1	–14.8	1.6	6.0	3.8	3.5	3.5	1.8	2.3	2.8	3.1	3.0	3.4	1.8	3.7
Slovenia	4.3	–7.8	1.2	0.6	–2.7	–1.1	3.1	2.3	2.5	2.5	2.0	1.8	3.6	1.4	2.3
Luxembourg	4.4	–5.4	5.8	2.0	0.0	4.2	4.7	3.5	4.0	3.7	3.5	3.0	2.9	2.9	4.3
Latvia	6.6	–14.3	–3.8	6.4	4.0	2.6	2.1	2.7	2.0	3.0	3.3	4.0	2.2	2.9	3.2
Estonia	5.6	–14.7	2.5	7.6	4.3	1.4	2.8	1.4	1.6	2.5	2.8	3.0	2.8	2.4	3.0
Cyprus	4.1	–1.8	1.3	0.3	–3.2	–6.0	–1.5	1.7	2.8	2.5	2.3	2.1	2.9	2.2	2.3
Malta	2.2	–2.4	3.5	1.4	2.8	4.3	8.3	7.4	5.0	4.1	3.5	3.0	5.1	4.0	3.5
Japan	1.0	–5.4	4.2	–0.1	1.5	2.0	0.3	1.2	1.0	1.2	0.6	0.6	1.6	1.0	0.6
United Kingdom	2.5	–4.3	1.9	1.5	1.3	1.9	3.1	2.2	1.8	2.0	1.5	1.9	1.9	1.7	1.5
Korea	5.7	0.7	6.5	3.7	2.3	2.9	3.3	2.8	2.8	2.7	2.8	3.1	2.4	3.6	2.3
Canada	2.9	–2.9	3.1	3.1	1.7	2.5	2.6	0.9	1.4	1.9	2.0	1.8	1.9	1.7	2.0
Australia	3.4	1.7	2.3	2.7	3.6	2.1	2.8	2.4	2.5	3.1	3.0	2.7	2.4	3.4	3.0
Taiwan Province of China	4.6	–1.6	10.6	3.8	2.1	2.2	4.0	0.7	1.4	1.7	1.9	2.5	2.4	0.8	3.2
Switzerland	2.3	–2.1	2.8	1.9	1.1	1.8	2.0	0.8	1.3	1.4	1.6	1.7	1.0	1.9	1.4
Sweden	3.0	–5.2	6.0	2.7	–0.3	1.2	2.6	4.1	3.3	2.7	2.4	1.7	2.3	2.7	2.0
Singapore	5.9	–0.6	15.2	6.2	3.9	5.0	3.6	1.9	2.0	2.2	2.6	2.6	2.9	0.5	3.2
Hong Kong SAR	4.7	–2.5	6.8	4.8	1.7	3.1	2.8	2.4	1.9	2.4	2.5	3.2	3.1	1.0	3.6
Norway	2.2	–1.6	0.6	1.0	2.7	1.0	1.9	1.6	1.0	1.2	1.9	2.2	1.9	1.1	2.4
Czech Republic	4.0	–4.8	2.3	2.0	–0.8	–0.5	2.7	4.5	2.4	2.8	2.2	2.3	1.9	3.3	1.7
Israel	3.7	1.4	5.7	5.1	2.4	4.4	3.2	2.5	4.0	2.9	3.0	3.0	4.8	1.6	3.7
Denmark	1.8	–4.9	1.9	1.3	0.2	0.9	1.7	1.6	1.1	1.5	1.7	1.8	1.9	1.9	1.5
New Zealand	3.4	0.4	2.0	1.9	2.5	2.1	2.8	3.1	4.0	3.1	2.9	2.5	3.5	3.6	2.2
Puerto Rico	1.7	–2.0	–0.4	–0.4	0.0	–0.3	–1.4	0.0	–1.8	–3.0	–2.5	–0.6	. . .	. . .	. . .
Macao SAR	. . .	1.3	25.3	21.7	9.2	11.2	–1.2	–21.5	–4.0	2.8	1.7	3.8	. . .	. . .	. . .
Iceland	4.6	–6.9	–3.6	2.0	1.2	4.4	1.9	4.1	7.2	5.7	3.6	2.6	10.5	6.4	2.5
San Marino	. . .	–12.8	–4.6	–9.5	–7.5	–3.0	–0.9	0.5	1.0	1.2	1.3	1.3	. . .	. . .	. . .
Memorandum															
Major Advanced Economies	2.1	–3.8	2.8	1.6	1.4	1.4	1.8	2.0	1.5	1.9	1.9	1.5	1.8	1.9	1.8
Real Total Domestic Demand															
Advanced Economies	**2.4**	**–3.7**	**3.0**	**1.4**	**0.8**	**1.0**	**1.9**	**2.3**	**1.7**	**2.2**	**2.2**	**1.7**	**2.1**	**2.1**	**2.1**
United States	2.7	–3.8	2.9	1.6	2.1	1.3	2.4	3.2	1.7	2.8	3.0	1.7	2.1	2.7	3.0
Euro Area	2.0	–4.0	1.5	0.7	–2.4	–0.6	1.2	1.9	2.0	1.7	1.6	1.5	1.6	1.7	1.5
Germany	0.9	–3.2	2.9	3.0	–0.8	1.0	1.5	1.5	2.2	1.5	1.6	1.5	2.0	1.2	1.6
France	2.4	–2.5	2.1	2.0	–0.3	0.7	1.1	1.5	2.0	1.7	1.6	1.8	1.5	1.9	1.5
Italy	1.4	–4.1	2.0	–0.6	–5.6	–2.6	0.2	1.3	1.0	1.0	0.8	0.7	1.6	0.8	0.7
Spain	4.2	–6.0	–0.5	–3.1	–5.1	–3.2	1.9	3.4	2.9	2.3	2.0	1.5	2.3	2.3	1.9
Japan	0.6	–4.0	2.4	0.7	2.3	2.4	0.4	0.7	0.5	0.9	0.7	0.6	0.7	1.1	0.7
United Kingdom	2.8	–4.9	2.5	–0.6	2.2	2.1	3.4	1.9	1.5	1.5	1.1	1.9	1.6	1.9	1.1
Canada	3.5	–3.0	5.1	3.4	2.0	2.1	1.5	0.0	0.7	1.9	1.7	1.7	1.4	2.4	1.4
Other Advanced Economies[3]	3.7	–2.6	6.1	3.1	2.0	1.5	2.5	2.5	1.8	2.6	2.7	2.8	2.0	2.7	2.8
Memorandum															
Major Advanced Economies	2.1	–3.7	2.8	1.4	1.1	1.3	1.8	2.2	1.5	2.1	2.1	1.5	1.8	2.1	2.1

[1]In this and other tables, when countries are not listed alphabetically, they are ordered on the basis of economic size.
[2]From the fourth quarter of the preceding year.
[3]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

Table A3. Advanced Economies: Components of Real GDP

(Annual percent change)

	Averages										Projections	
	1999–2008	2009–18	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Private Consumer Expenditure												
Advanced Economies	**2.6**	**1.4**	**–1.2**	**1.9**	**1.3**	**0.9**	**1.2**	**1.8**	**2.3**	**2.2**	**2.1**	**2.0**
United States	3.1	1.9	–1.6	1.9	2.3	1.5	1.5	2.9	3.2	2.7	2.7	2.5
Euro Area	1.8	0.5	–1.1	0.8	0.0	–1.1	–0.6	0.8	1.8	2.0	1.5	1.5
Germany	0.9	1.1	0.3	0.3	1.3	1.3	0.9	1.0	1.9	1.8	1.3	1.4
France	2.3	1.0	0.2	1.8	0.5	–0.2	0.5	0.7	1.5	1.8	1.5	1.7
Italy	1.0	–0.2	–1.5	1.2	0.0	–4.0	–2.4	0.2	1.6	1.3	0.8	0.7
Spain	3.4	0.0	–3.6	0.3	–2.4	–3.5	–3.1	1.6	2.9	3.2	2.6	2.1
Japan	1.0	0.6	–0.7	2.4	–0.4	2.0	2.4	–0.9	–0.4	0.4	0.7	0.7
United Kingdom	3.0	1.0	–3.2	0.6	–0.5	1.7	1.6	2.2	2.4	2.8	1.9	1.2
Canada	3.6	2.1	0.0	3.6	2.3	1.9	2.6	2.7	1.9	2.2	2.2	1.8
Other Advanced Economies[1]	3.7	2.3	0.0	3.7	3.0	2.2	2.3	2.3	2.7	2.2	2.4	2.6
Memorandum												
Major Advanced Economies	2.3	1.4	–1.2	1.7	1.3	1.1	1.3	1.8	2.2	2.1	2.0	1.8
Public Consumption												
Advanced Economies	**2.2**	**0.9**	**2.9**	**1.0**	**–0.5**	**0.2**	**–0.3**	**0.5**	**1.7**	**1.6**	**1.2**	**1.2**
United States	2.1	0.2	3.7	0.1	–2.7	–0.9	–2.4	–0.7	1.6	0.8	0.8	1.4
Euro Area	2.0	0.9	2.4	0.8	–0.1	–0.3	0.3	0.6	1.3	1.8	1.2	0.9
Germany	1.0	1.9	3.0	1.3	0.9	1.1	1.2	1.2	2.7	4.0	2.1	1.6
France	1.6	1.4	2.4	1.3	1.0	1.6	1.5	1.2	1.4	1.5	1.4	0.8
Italy	1.4	–0.3	0.4	0.6	–1.8	–1.4	–0.3	–0.7	–0.7	0.6	0.4	0.2
Spain	5.1	0.2	4.1	1.5	–0.3	–4.7	–2.1	–0.3	2.0	0.8	0.7	0.7
Japan	1.8	1.3	2.0	1.9	1.9	1.7	1.5	0.5	1.6	1.5	0.4	–0.4
United Kingdom	3.1	1.0	1.1	0.2	0.2	1.7	0.3	2.3	1.3	0.8	1.0	0.7
Canada	2.6	1.4	2.7	2.3	1.3	0.7	–0.7	0.8	1.5	2.0	1.9	1.4
Other Advanced Economies[1]	2.8	2.5	3.4	2.8	1.6	2.0	2.3	2.4	2.5	3.1	2.3	2.2
Memorandum												
Major Advanced Economies	1.9	0.7	2.9	0.7	–0.9	0.1	–0.7	0.1	1.6	1.4	1.0	1.0
Gross Fixed Capital Formation												
Advanced Economies	**2.3**	**1.0**	**–11.0**	**1.7**	**2.9**	**2.3**	**1.5**	**3.0**	**2.6**	**1.5**	**2.8**	**3.5**
United States	2.3	1.7	–13.1	1.1	3.7	6.3	3.1	4.2	3.7	0.7	3.4	5.3
Euro Area	2.7	–0.4	–11.2	–0.3	1.6	–3.5	–2.5	1.5	3.2	2.6	2.7	2.7
Germany	1.0	1.0	–9.9	5.0	7.4	–0.1	–1.1	3.5	1.2	2.1	1.6	1.8
France	3.4	0.2	–9.1	2.1	2.1	0.2	–0.8	–0.3	1.0	2.7	2.3	2.7
Italy	2.3	–2.2	–9.9	–0.5	–1.9	–9.3	–6.6	–2.3	1.6	2.9	2.8	2.1
Spain	5.3	–2.4	–16.9	–4.9	–6.9	–8.6	–3.4	3.8	6.0	3.1	3.1	2.7
Japan	–1.0	0.6	–9.7	–1.6	1.7	3.5	4.9	2.9	0.0	1.0	2.4	1.6
United Kingdom	1.8	0.8	–15.2	5.0	1.9	2.3	3.2	6.7	3.4	0.5	0.8	1.3
Canada	4.9	0.4	–11.8	11.4	4.6	4.9	1.3	0.9	–4.6	–3.2	0.6	2.1
Other Advanced Economies[1]	3.7	2.1	–5.1	5.9	4.0	2.9	2.6	2.1	1.7	1.9	2.7	3.0
Memorandum												
Major Advanced Economies	1.8	1.0	–11.8	1.8	3.2	3.4	1.9	3.3	2.2	1.0	2.6	3.6

Table A3. Advanced Economies: Components of Real GDP *(continued)*

(Annual percent change)

	Averages										Projections	
	1999–2008	2009–18	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Final Domestic Demand												
Advanced Economies	**2.5**	**1.3**	**–2.6**	**1.7**	**1.3**	**1.0**	**1.0**	**1.8**	**2.3**	**2.0**	**2.1**	**2.1**
United States	2.8	1.6	–3.1	1.5	1.7	1.9	1.2	2.6	3.1	2.1	2.6	2.9
Euro Area	2.0	0.4	–2.7	0.5	0.3	–1.5	–0.8	0.9	2.0	2.1	1.7	1.6
Germany	0.9	1.3	–1.4	1.4	2.5	1.0	0.6	1.5	1.9	2.3	1.5	1.5
France	2.4	0.9	–1.5	1.8	0.9	0.3	0.4	0.6	1.4	1.9	1.6	1.7
Italy	1.3	–0.6	–2.9	0.7	–0.8	–4.5	–2.8	–0.4	1.1	1.5	1.1	0.8
Spain	4.2	–0.6	–5.9	–0.7	–3.0	–4.8	–3.0	1.6	3.3	2.7	2.4	2.0
Japan	0.6	0.8	–2.4	1.4	0.5	2.3	2.8	0.2	0.1	0.8	1.2	0.7
United Kingdom	2.8	1.0	–4.4	1.1	0.0	1.8	1.6	2.9	2.3	2.0	1.5	1.1
Canada	3.7	1.6	–2.2	5.0	2.6	2.4	1.6	1.9	0.3	0.9	1.8	1.8
Other Advanced Economies[1]	3.5	2.3	–0.7	4.3	2.9	2.2	2.3	2.3	2.5	2.3	2.6	2.7
Memorandum												
Major Advanced Economies	2.2	1.2	–2.7	1.6	1.3	1.4	1.1	1.8	2.1	1.8	2.0	2.0
Stock Building[2]												
Advanced Economies	**0.0**	**0.0**	**–1.1**	**1.3**	**0.1**	**–0.2**	**0.0**	**0.1**	**0.1**	**–0.3**	**0.1**	**0.0**
United States	–0.1	0.1	–0.8	1.5	–0.1	0.1	0.2	–0.1	0.2	–0.4	0.2	0.1
Euro Area	0.0	–0.1	–1.3	0.9	0.4	–0.9	0.2	0.3	–0.1	–0.1	0.0	0.0
Germany	–0.1	–0.2	–1.7	1.4	0.5	–1.6	0.4	–0.1	–0.5	–0.1	0.0	0.0
France	0.0	0.1	–1.1	0.3	1.1	–0.6	0.2	0.5	0.1	0.0	0.1	0.0
Italy	0.0	0.0	–1.2	1.3	0.2	–1.1	0.2	0.6	0.2	–0.5	–0.1	0.0
Spain	0.0	0.0	–0.2	0.2	–0.1	–0.2	–0.3	0.3	0.1	0.1	0.0	0.0
Japan	0.0	0.0	–1.6	1.0	0.2	0.0	–0.4	0.1	0.6	–0.3	–0.1	0.0
United Kingdom	–0.1	0.1	–0.5	1.5	–0.6	0.2	0.3	0.7	–0.2	–0.5	0.0	0.0
Canada	0.0	–0.1	–0.7	0.1	0.7	–0.3	0.5	–0.3	–0.3	–0.2	–0.2	0.0
Other Advanced Economies[1]	0.2	–0.1	–1.9	1.9	0.2	–0.3	–0.8	0.2	0.1	–0.4	0.1	0.0
Memorandum												
Major Advanced Economies	0.0	0.0	–1.0	1.2	0.1	–0.2	0.2	0.0	0.1	–0.3	0.1	0.1
Foreign Balance[2]												
Advanced Economies	**0.0**	**0.1**	**0.4**	**0.1**	**0.3**	**0.4**	**0.3**	**0.0**	**–0.2**	**–0.1**	**–0.1**	**–0.2**
United States	–0.2	–0.1	1.2	–0.5	0.0	0.1	0.3	–0.2	–0.7	–0.1	–0.5	–0.6
Euro Area	0.1	0.3	–0.6	0.6	0.9	1.4	0.4	0.0	0.2	–0.1	0.1	0.1
Germany	0.7	0.1	–2.6	1.1	0.9	1.4	–0.3	0.3	0.1	–0.3	0.2	0.1
France	–0.3	–0.2	–0.4	–0.1	0.0	0.5	–0.1	–0.5	–0.3	–0.9	–0.3	–0.1
Italy	–0.1	0.2	–1.3	–0.3	1.2	2.8	0.8	–0.1	–0.5	–0.1	–0.1	0.1
Spain	–0.7	0.9	2.8	0.5	2.1	2.2	1.5	–0.5	–0.1	0.5	0.3	0.1
Japan	0.2	–0.1	–1.2	1.6	–0.9	–0.8	–0.4	0.0	0.5	0.5	0.2	–0.1
United Kingdom	–0.2	–0.1	0.3	–0.8	1.4	–0.7	–0.8	–0.4	0.0	–0.4	0.3	0.3
Canada	–0.7	0.1	0.0	–2.1	–0.3	–0.4	0.3	1.1	1.0	0.7	0.3	0.2
Other Advanced Economies[1]	0.4	0.4	1.5	0.1	0.5	0.5	0.9	0.5	–0.4	0.1	0.0	–0.1
Memorandum												
Major Advanced Economies	–0.1	–0.1	0.0	–0.1	0.1	0.2	0.0	–0.1	–0.3	–0.1	–0.2	–0.3

[1]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.
[2]Changes expressed as percent of GDP in the preceding period.

Table A4. Emerging Market and Developing Economies: Real GDP

(Annual percent change)

	Average									Projections		
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
Commonwealth of Independent States[1,2]	**7.2**	**–6.4**	**4.7**	**4.6**	**3.5**	**2.1**	**1.1**	**–2.2**	**0.3**	**1.7**	**2.1**	**2.4**
Russia	6.9	–7.8	4.5	4.0	3.5	1.3	0.7	–2.8	–0.2	1.4	1.4	1.5
Excluding Russia	8.0	–2.5	5.0	6.2	3.6	4.2	2.0	–0.5	1.8	2.5	3.5	4.4
Armenia	10.5	–14.1	2.2	4.7	7.1	3.3	3.6	3.0	0.2	2.9	2.9	4.0
Azerbaijan	14.6	9.3	5.0	0.1	2.2	5.8	2.8	1.1	–3.8	–1.0	2.0	3.0
Belarus	7.5	0.2	7.8	5.4	1.7	1.0	1.8	–3.8	–3.0	–0.8	0.6	2.0
Georgia	6.6	–3.7	6.2	7.2	6.4	3.4	4.6	2.9	2.7	3.5	4.0	5.5
Kazakhstan	8.7	1.2	7.3	7.5	5.0	6.0	4.3	1.2	1.1	2.5	3.4	4.6
Kyrgyz Republic	4.7	2.9	–0.5	6.0	–0.1	10.9	4.0	3.5	3.8	3.4	3.8	5.4
Moldova	4.9	–6.0	7.1	6.8	–0.7	9.4	4.8	–0.4	4.0	4.5	3.7	3.9
Tajikistan	8.1	3.9	6.5	7.4	7.5	7.4	6.7	6.0	6.9	4.5	5.0	6.0
Turkmenistan	15.2	6.1	9.2	14.7	11.1	10.2	10.3	6.5	6.2	6.5	6.3	5.4
Ukraine[3]	6.2	–15.1	0.3	5.5	0.2	0.0	–6.6	–9.8	2.3	2.0	3.2	4.0
Uzbekistan	6.1	8.1	8.5	8.3	8.2	8.0	8.1	8.0	7.8	6.0	6.0	6.0
Emerging and Developing Asia	**8.0**	**7.5**	**9.6**	**7.9**	**7.0**	**6.9**	**6.8**	**6.7**	**6.4**	**6.4**	**6.4**	**6.3**
Bangladesh	5.8	5.3	6.0	6.5	6.3	6.0	6.3	6.8	6.9	6.9	7.0	7.0
Bhutan	8.3	5.7	9.3	9.7	6.4	3.6	4.0	6.1	6.2	5.9	11.2	6.3
Brunei Darussalam	1.9	–1.8	2.7	3.7	0.9	–2.1	–2.5	–0.4	–3.2	–1.3	0.7	5.3
Cambodia	9.5	2.1	3.9	7.1	7.3	7.4	7.1	7.0	7.0	6.9	6.8	6.3
China	10.1	9.2	10.6	9.5	7.9	7.8	7.3	6.9	6.7	6.6	6.2	5.7
Fiji	1.9	–1.4	3.0	2.7	1.4	4.7	5.6	3.6	2.0	3.7	3.7	3.5
India[4]	6.9	8.5	10.3	6.6	5.5	6.5	7.2	7.9	6.8	7.2	7.7	8.2
Indonesia	4.9	4.7	6.4	6.2	6.0	5.6	5.0	4.9	5.0	5.1	5.3	5.5
Kiribati	1.0	0.3	–1.6	0.5	5.2	5.8	2.4	3.5	3.2	2.8	2.0	1.7
Lao P.D.R.	6.6	7.5	8.1	8.0	7.9	8.0	8.0	7.5	6.9	6.8	6.7	6.7
Malaysia	5.5	–1.5	7.5	5.3	5.5	4.7	6.0	5.0	4.2	4.5	4.7	4.8
Maldives	9.1	–5.3	7.2	8.7	2.5	4.7	6.0	2.8	3.9	4.1	4.7	4.7
Marshall Islands	1.9	6.4	1.7	3.7	2.4	–0.9	0.6	1.4	1.8	1.8	1.6	1.2
Micronesia	0.5	1.2	3.3	1.0	–1.7	–3.0	–2.4	3.7	2.0	2.0	1.5	0.6
Mongolia	6.2	–2.1	7.3	17.3	12.3	11.6	7.9	2.4	1.0	–0.2	1.8	8.5
Myanmar	11.7	5.1	5.3	5.6	7.3	8.4	8.0	7.3	6.3	7.5	7.6	7.5
Nauru	. . .	8.7	13.6	11.7	10.1	34.2	36.5	2.8	10.4	4.0	–4.0	2.0
Nepal	4.1	4.5	4.8	3.4	4.8	4.1	6.0	2.7	0.6	5.5	4.5	3.8
Palau	. . .	–9.3	3.2	5.4	3.5	–2.5	4.4	9.3	0.1	5.0	5.0	2.0
Papua New Guinea	2.4	2.9	11.6	3.7	6.1	4.7	7.4	6.6	2.5	3.0	3.2	3.4
Philippines	4.6	1.1	7.6	3.7	6.7	7.1	6.2	5.9	6.8	6.8	6.9	7.0
Samoa	3.8	–6.1	–2.0	5.6	0.4	–1.9	1.2	1.6	6.6	2.1	0.9	2.1
Solomon Islands	1.6	–4.7	6.9	12.9	4.6	3.0	2.0	1.8	3.2	3.0	3.0	3.2
Sri Lanka	5.1	3.5	8.0	8.4	9.1	3.4	4.9	4.8	4.3	4.5	4.8	5.3
Thailand	4.8	–0.7	7.5	0.8	7.2	2.7	0.9	2.9	3.2	3.0	3.3	3.0
Timor-Leste[5]	. . .	13.0	10.2	8.3	5.8	2.9	5.9	4.3	5.0	4.0	6.0	5.2
Tonga	1.1	3.0	3.2	1.8	–1.1	–0.6	2.9	3.6	3.5	3.9	3.6	1.8
Tuvalu	. . .	–4.4	–2.7	8.5	0.2	1.3	2.2	2.6	4.0	2.3	2.3	1.9
Vanuatu	3.0	3.3	1.6	1.2	1.8	2.0	2.3	–0.8	4.0	4.5	4.0	3.0
Vietnam	6.8	5.4	6.4	6.2	5.2	5.4	6.0	6.7	6.2	6.5	6.3	6.2
Emerging and Developing Europe	**4.3**	**–3.0**	**4.6**	**6.5**	**2.4**	**4.9**	**3.9**	**4.7**	**3.0**	**3.0**	**3.3**	**3.1**
Albania	6.8	3.4	3.7	2.5	1.4	1.0	1.8	2.6	3.4	3.7	4.1	4.1
Bosnia and Herzegovina	5.4	–0.8	0.8	0.9	–1.1	2.4	1.1	3.1	2.5	3.0	3.5	4.0
Bulgaria	5.3	–3.6	1.3	1.9	0.0	0.9	1.3	3.6	3.4	2.9	2.7	2.5
Croatia	3.7	–7.4	–1.7	–0.3	–2.2	–1.1	–0.5	1.6	2.9	2.9	2.6	2.1
Hungary	3.4	–6.6	0.7	1.7	–1.6	2.1	4.0	3.1	2.0	2.9	3.0	2.2
Kosovo	. . .	3.6	3.3	4.4	2.8	3.4	1.2	4.1	3.6	3.5	3.6	4.0
FYR Macedonia	3.6	–0.4	3.4	2.3	–0.5	2.9	3.6	3.8	2.4	3.2	3.4	3.8
Montenegro	. . .	–5.7	2.5	3.2	–2.7	3.5	1.8	3.4	2.4	3.3	3.4	3.1
Poland	4.1	2.6	3.7	5.0	1.6	1.4	3.3	3.9	2.8	3.4	3.2	2.7
Romania	5.4	–7.1	–0.8	1.1	0.6	3.5	3.1	3.9	4.8	4.2	3.4	3.3
Serbia	4.1	–3.1	0.6	1.4	–1.0	2.6	–1.8	0.8	2.8	3.0	3.5	4.0
Turkey	4.0	–4.7	8.5	11.1	4.8	8.5	5.2	6.1	2.9	2.5	3.3	3.4

Table A4. Emerging Market and Developing Economies: Real GDP *(continued)*

(Annual percent change)

	Average									Projections		
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
Latin America and the Caribbean	**3.3**	**–1.8**	**6.1**	**4.7**	**3.0**	**2.9**	**1.2**	**0.1**	**–1.0**	**1.1**	**2.0**	**2.6**
Antigua and Barbuda	4.4	–10.7	–8.4	–1.8	3.5	1.4	4.8	3.8	3.7	2.2	1.7	1.7
Argentina	2.6	–5.9	10.1	6.0	–1.0	2.4	–2.5	2.6	–2.3	2.2	2.3	3.1
The Bahamas	2.1	–4.2	1.5	0.6	3.1	0.0	–0.5	–1.7	0.0	1.4	2.2	1.3
Barbados	1.8	–4.0	0.3	0.8	0.3	–0.1	0.1	0.9	1.6	1.7	1.8	1.2
Belize	5.7	0.8	3.3	2.1	3.7	0.7	4.1	2.9	–1.0	3.0	2.3	2.0
Bolivia	3.4	3.4	4.1	5.2	5.1	6.8	5.5	4.8	4.1	4.0	3.7	3.5
Brazil	3.4	–0.1	7.5	4.0	1.9	3.0	0.5	–3.8	–3.6	0.2	1.7	2.0
Chile	4.3	–1.6	5.8	6.1	5.3	4.0	2.0	2.3	1.6	1.7	2.3	3.3
Colombia	3.4	1.7	4.0	6.6	4.0	4.9	4.4	3.1	2.0	2.3	3.0	3.6
Costa Rica	4.7	–1.0	5.0	4.3	4.8	2.3	3.7	4.7	4.3	4.0	4.0	3.8
Dominica	2.8	–1.2	0.7	–0.2	–1.1	0.8	4.2	–1.8	0.6	3.0	2.1	1.5
Dominican Republic	5.2	0.9	8.3	3.1	2.8	4.7	7.6	7.0	6.6	5.3	5.0	5.0
Ecuador	3.3	0.6	3.5	7.9	5.6	4.9	4.0	0.2	–2.2	–1.6	–0.3	1.6
El Salvador	2.6	–3.1	1.4	2.2	1.9	1.8	1.4	2.5	2.4	2.3	2.3	2.0
Grenada	3.7	–6.6	–0.5	0.8	–1.2	2.4	7.3	6.2	3.1	2.7	2.7	2.7
Guatemala	3.6	0.5	2.9	4.2	3.0	3.7	4.2	4.1	3.0	3.3	3.5	4.0
Guyana	1.8	3.3	4.4	5.4	4.8	5.2	3.8	3.1	3.3	3.5	3.6	2.8
Haiti	0.7	3.1	–5.5	5.5	2.9	4.2	2.8	1.2	1.4	1.0	3.0	3.0
Honduras	4.5	–2.4	3.7	3.8	4.1	2.8	3.1	3.6	3.6	3.4	3.6	3.8
Jamaica	1.3	–3.4	–1.5	1.4	–0.5	0.2	0.5	1.0	1.5	2.0	2.4	2.8
Mexico	2.6	–4.7	5.1	4.0	4.0	1.4	2.3	2.6	2.3	1.7	2.0	2.7
Nicaragua	3.9	–2.8	3.2	6.2	5.6	4.5	4.6	4.9	4.7	4.5	4.3	4.5
Panama	5.7	1.6	5.8	11.8	9.2	6.6	6.1	5.8	5.0	5.8	6.1	6.0
Paraguay	2.2	–4.0	13.1	4.3	–1.2	14.0	4.7	3.0	4.1	3.3	3.7	3.8
Peru	5.1	1.0	8.5	6.5	6.0	5.8	2.4	3.3	3.9	3.5	3.7	3.5
St. Kitts and Nevis	3.7	–1.0	–2.9	–0.8	–0.8	6.6	5.1	4.9	2.9	3.5	3.4	2.7
St. Lucia	2.2	–0.4	–1.7	0.2	–1.4	0.1	0.4	1.8	0.8	0.5	1.5	1.5
St. Vincent and the Grenadines	3.5	–2.0	–2.3	0.2	1.3	2.5	0.2	0.6	1.8	2.5	2.8	2.8
Suriname	4.1	3.0	5.2	5.8	2.7	2.9	0.4	–2.7	–10.5	–1.2	0.8	3.0
Trinidad and Tobago	7.6	–4.4	3.3	–0.3	1.3	2.7	–0.6	–0.6	–5.1	0.3	3.4	1.4
Uruguay	1.5	4.2	7.8	5.2	3.5	4.6	3.2	1.0	1.4	1.6	2.6	3.0
Venezuela	3.4	–3.2	–1.5	4.2	5.6	1.3	–3.9	–6.2	–18.0	–7.4	–4.1	–1.3
Middle East, North Africa, Afghanistan, and Pakistan	**5.3**	**1.4**	**4.8**	**4.3**	**5.4**	**2.3**	**2.8**	**2.7**	**3.9**	**2.6**	**3.4**	**3.8**
Afghanistan	. . .	20.6	8.4	6.5	14.0	3.9	1.3	0.8	2.0	3.0	3.5	5.5
Algeria	4.0	1.6	3.6	2.8	3.3	2.8	3.8	3.8	4.2	1.4	0.6	2.3
Bahrain	6.0	2.5	4.3	2.0	3.7	5.4	4.4	2.9	2.9	2.3	1.6	2.2
Djibouti	3.3	1.6	4.1	7.3	4.8	5.0	6.0	6.5	6.5	7.0	7.0	6.0
Egypt	5.1	4.7	5.1	1.8	2.2	3.3	2.9	4.4	4.3	3.5	4.5	6.0
Iran	5.1	2.3	6.6	3.7	–6.6	–1.9	4.0	–1.6	6.5	3.3	4.3	4.4
Iraq	13.0	3.4	6.4	7.5	13.9	7.6	0.7	4.8	10.1	–3.1	2.6	1.6
Jordan	6.3	5.5	2.3	2.6	2.7	2.8	3.1	2.4	2.1	2.3	2.5	3.0
Kuwait	5.9	–7.1	–2.4	10.9	7.9	0.4	0.6	2.1	2.5	–0.2	3.5	2.9
Lebanon	3.7	10.3	8.0	0.9	2.8	2.5	2.0	1.0	1.0	2.0	2.5	3.0
Libya[4]	4.5	–3.1	2.5	–64.2	106.5	–30.8	–47.7	–7.3	–4.4	53.7	3.0	3.1
Mauritania	5.2	–1.0	4.8	4.7	5.8	6.1	5.6	0.9	1.5	3.8	2.7	4.0
Morocco	4.4	4.2	3.8	5.2	3.0	4.5	2.6	4.5	1.5	4.4	3.9	4.7
Oman	2.9	6.1	4.8	–1.1	9.3	4.4	2.5	4.2	3.1	0.4	3.8	2.2
Pakistan	5.1	0.4	2.6	3.6	3.8	3.7	4.1	4.0	4.7	5.0	5.2	5.9
Qatar	11.3	12.0	18.1	13.4	4.7	4.4	4.0	3.6	2.7	3.4	2.8	1.6
Saudi Arabia	3.2	–2.1	4.8	10.3	5.4	2.7	3.7	4.1	1.4	0.4	1.3	2.1
Sudan[6]	6.2	4.7	2.5	–1.2	–3.0	5.2	1.6	4.9	3.0	3.7	3.6	3.5
Syria[7]	3.4	5.9	3.4	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tunisia	4.9	3.1	2.6	–1.9	3.9	2.4	2.3	1.1	1.0	2.5	3.1	4.5
United Arab Emirates	5.9	–5.2	1.6	4.9	7.1	4.7	3.1	3.8	2.7	1.5	4.4	3.2
Yemen	4.1	3.9	7.7	–12.7	2.4	4.8	–0.2	–28.1	–9.8	5.0	13.7	5.7

Table A4. Emerging Market and Developing Economies: Real GDP *(continued)*

(Annual percent change)

	Average									Projections		
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
Sub-Saharan Africa	**5.6**	**3.9**	**7.0**	**5.0**	**4.3**	**5.3**	**5.1**	**3.4**	**1.4**	**2.6**	**3.5**	**3.9**
Angola	11.2	2.4	3.4	3.9	5.2	6.8	4.8	3.0	0.0	1.3	1.5	1.4
Benin	4.5	2.3	2.1	3.0	4.8	7.2	6.4	2.1	4.0	5.4	6.0	6.2
Botswana	5.2	–7.7	8.6	6.0	4.5	11.3	4.1	–1.7	2.9	4.1	4.2	4.1
Burkina Faso	5.7	3.0	8.4	6.6	6.5	5.7	4.2	4.0	5.4	6.1	6.3	6.2
Burundi	3.1	3.8	5.1	4.0	4.4	5.9	4.5	–4.0	–1.0	0.0	0.1	0.5
Cabo Verde	7.4	–1.3	1.5	4.0	1.1	0.8	0.6	1.1	4.0	4.0	4.1	4.2
Cameroon	3.6	1.9	3.3	4.1	4.6	5.6	5.9	5.8	4.4	3.7	4.3	5.3
Central African Republic	1.2	1.7	3.0	3.3	4.1	–36.7	1.0	4.8	4.5	4.7	5.0	5.6
Chad	7.8	4.1	13.6	0.1	8.8	5.8	6.9	1.8	–6.4	0.3	2.4	4.2
Comoros	2.0	1.8	2.1	2.2	3.0	3.5	2.0	1.0	2.2	3.3	4.0	4.0
Democratic Republic of the Congo	2.4	2.9	7.1	6.9	7.1	8.5	9.5	6.9	2.4	2.8	3.5	4.9
Republic of Congo	3.5	7.8	8.7	3.4	3.8	3.3	6.8	2.6	–2.7	0.6	8.8	2.2
Côte d'Ivoire	0.5	3.3	2.0	–4.2	10.1	9.3	8.8	8.9	7.5	6.9	7.2	6.6
Equatorial Guinea	27.0	1.3	–8.9	6.5	8.3	–4.1	–0.5	–7.4	–10.0	–5.0	–5.1	–1.7
Eritrea	–1.1	3.9	2.2	8.7	7.0	3.1	5.0	4.8	3.7	3.3	3.6	4.0
Ethiopia	8.1	10.0	10.6	11.4	8.7	9.9	10.3	10.4	8.0	7.5	7.5	7.3
Gabon	–0.1	–2.3	6.3	7.1	5.3	5.5	4.4	3.9	2.3	1.0	2.7	4.9
The Gambia	3.7	6.4	6.5	–4.3	5.6	4.8	0.9	4.3	2.5	3.0	3.5	4.0
Ghana	5.3	4.8	7.9	14.0	9.3	7.3	4.0	3.9	4.0	5.8	9.2	5.3
Guinea	3.1	–0.3	1.9	3.3	3.2	1.5	1.1	0.1	5.2	4.3	4.9	4.1
Guinea-Bissau	2.9	3.4	4.6	8.1	–1.7	3.3	1.0	5.1	5.2	5.0	5.0	5.0
Kenya	3.3	3.3	8.4	6.1	4.6	5.7	5.3	5.6	6.0	5.3	5.8	6.5
Lesotho	3.5	4.5	6.9	4.5	5.3	3.6	3.4	2.5	2.9	2.2	2.4	4.1
Liberia	. . .	5.1	6.1	7.4	8.2	8.7	0.7	0.0	–1.2	3.0	5.3	6.9
Madagascar	4.0	–4.7	0.3	1.5	3.0	2.3	3.3	3.1	4.1	4.5	4.8	5.0
Malawi	3.8	8.3	6.9	4.9	1.9	5.2	5.7	2.9	2.3	4.5	5.0	5.5
Mali	5.4	4.7	5.4	3.2	–0.8	2.3	7.0	6.0	5.4	5.2	4.7	4.7
Mauritius	4.3	3.0	4.1	3.9	3.2	3.2	3.6	3.5	3.6	3.9	4.0	4.1
Mozambique	7.8	6.4	6.7	7.1	7.2	7.1	7.4	6.6	3.4	4.5	5.5	14.9
Namibia	4.1	0.3	6.0	5.1	5.1	5.7	6.5	5.3	0.1	3.5	4.8	3.7
Niger	4.4	–0.7	8.4	2.2	11.8	5.3	7.0	3.5	4.6	5.2	5.5	6.7
Nigeria	7.5	8.4	11.3	4.9	4.3	5.4	6.3	2.7	–1.5	0.8	1.9	1.8
Rwanda	8.0	6.3	7.3	7.8	8.8	4.7	7.6	8.9	5.9	6.1	6.8	7.5
São Tomé and Príncipe	4.3	4.0	4.5	4.8	4.5	4.3	4.1	4.0	4.0	5.0	5.5	5.5
Senegal	4.4	2.4	4.3	1.9	4.5	3.6	4.3	6.5	6.6	6.8	7.0	6.4
Seychelles	2.2	–1.1	5.9	5.4	3.7	5.0	6.2	5.7	4.4	4.1	3.4	3.3
Sierra Leone	7.5	3.2	5.3	6.3	15.2	20.7	4.6	–20.6	4.9	5.0	6.6	7.3
South Africa	4.0	–1.5	3.0	3.3	2.2	2.5	1.7	1.3	0.3	0.8	1.6	2.2
South Sudan	. . .	. . .	. . .	. . .	–52.4	29.3	2.9	–0.2	–13.8	–3.5	–1.1	3.9
Swaziland	3.6	4.5	3.5	2.0	3.5	4.8	3.6	1.1	–0.4	0.3	0.3	0.7
Tanzania	6.1	5.4	6.4	7.9	5.1	7.3	7.0	7.0	6.6	6.8	6.9	6.5
Togo	1.6	3.5	4.1	4.8	5.9	6.1	5.4	5.3	5.0	5.0	5.3	5.6
Uganda	7.5	8.1	7.7	6.8	2.6	4.0	5.2	5.0	4.7	5.0	5.8	8.1
Zambia	6.4	9.2	10.3	5.6	7.6	5.1	4.7	2.9	3.0	3.5	4.0	4.5
Zimbabwe[8]	–6.9	7.5	11.4	11.9	10.6	4.5	3.8	1.1	0.5	2.0	–1.5	0.9

[1]Data for some countries refer to real net material product (NMP) or are estimates based on NMP. The figures should be interpreted only as indicative of broad orders of magnitude because reliable, comparable data are not generally available. In particular, the growth of output of new private enterprises of the informal economy is not fully reflected in the recent figures.
[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[3]Data are based on the 2008 System of National Accounts. The revised national accounts data are available beginning in 2000 and exclude Crimea and Sevastopol from 2010 onward.
[4]See country-specific notes for India and Libya in the "Country Notes" section of the Statistical Appendix.
[5]In this table only, the data for Timor-Leste are based on non-oil GDP.
[6]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[7]Data for Syria are excluded for 2011 onward owing to the uncertain political situation.
[8]The Zimbabwe dollar ceased circulating in early 2009. Data are based on IMF staff estimates of price and exchange rate developments in U.S. dollars. IMF staff estimates of U.S. dollar values may differ from authorities' estimates. Real GDP is in constant 2009 prices.

Table A5. Summary of Inflation

(Percent)

	Average									Projections		
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
GDP Deflators												
Advanced Economies	**1.8**	**0.7**	**0.9**	**1.4**	**1.2**	**1.2**	**1.4**	**1.2**	**1.0**	**1.6**	**1.7**	**1.9**
United States	2.3	0.8	1.2	2.1	1.8	1.6	1.8	1.1	1.3	2.2	2.2	2.1
Euro Area	2.0	1.0	0.7	1.1	1.3	1.2	0.9	1.1	0.9	1.2	1.4	1.7
Japan	–1.2	–0.6	–1.9	–1.7	–0.8	–0.3	1.7	2.0	0.3	0.4	0.7	1.1
Other Advanced Economies[1]	2.1	0.9	2.0	2.0	1.2	1.4	1.3	1.0	1.0	1.8	1.8	2.1
Consumer Prices												
Advanced Economies	**2.2**	**0.2**	**1.5**	**2.7**	**2.0**	**1.4**	**1.4**	**0.3**	**0.8**	**2.0**	**1.9**	**2.1**
United States	2.8	–0.3	1.6	3.1	2.1	1.5	1.6	0.1	1.3	2.7	2.4	2.3
Euro Area[2]	2.2	0.3	1.6	2.7	2.5	1.3	0.4	0.0	0.2	1.7	1.5	1.9
Japan	–0.2	–1.3	–0.7	–0.3	–0.1	0.3	2.8	0.8	–0.1	1.0	0.6	1.6
Other Advanced Economies[1]	2.1	1.4	2.4	3.3	2.1	1.7	1.5	0.5	1.0	1.9	2.0	2.0
Emerging Market and Developing Economies[3]	**7.5**	**5.0**	**5.6**	**7.1**	**5.8**	**5.5**	**4.7**	**4.7**	**4.4**	**4.7**	**4.4**	**4.1**
Regional Groups												
Commonwealth of Independent States[4]	18.8	11.1	7.2	9.8	6.2	6.5	8.1	15.5	8.3	5.7	5.3	4.5
Emerging and Developing Asia	3.9	2.8	5.1	6.5	4.6	4.6	3.5	2.7	2.9	3.3	3.3	3.7
Emerging and Developing Europe	15.4	4.8	5.7	5.5	6.1	4.5	4.1	3.2	3.2	5.7	5.5	4.6
Latin America and the Caribbean	6.7	4.6	4.2	5.2	4.6	4.6	4.9	5.5	5.6	4.2	3.7	3.6
Middle East, North Africa, Afghanistan, and Pakistan	6.3	7.3	6.6	9.2	9.8	9.1	6.8	5.7	5.1	7.6	7.4	4.9
Middle East and North Africa	6.3	6.1	6.2	8.7	9.7	9.3	6.6	5.9	5.4	8.1	7.7	4.9
Sub-Saharan Africa	10.5	9.8	8.1	9.4	9.3	6.6	6.3	7.0	11.4	10.7	9.5	7.6
Memorandum												
European Union	2.7	1.0	2.0	3.1	2.6	1.5	0.5	0.0	0.2	1.8	1.7	2.0
Low-Income Developing Countries	9.8	8.2	9.1	11.7	9.9	8.0	7.2	7.2	9.0	9.4	8.6	7.2
Analytical Groups												
By Source of Export Earnings												
Fuel	12.0	7.5	6.4	8.3	7.8	7.7	6.3	8.6	7.3	6.6	6.5	5.0
Nonfuel	6.2	4.3	5.4	6.8	5.3	4.9	4.3	3.8	3.7	4.2	4.0	3.9
Of Which, Primary Products[5]	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
By External Financing Source												
Net Debtor Economies	8.3	7.2	6.8	7.7	7.0	6.3	5.7	5.6	5.4	5.9	5.5	4.8
Net Debtor Economies by Debt-Servicing Experience												
Economies with Arrears and/or Rescheduling during 2011–15	9.0	12.7	10.1	10.4	7.9	6.9	10.7	16.0	10.0	16.5	12.8	6.5
Memorandum												
Median Inflation Rate												
Advanced Economies	2.3	0.8	1.9	3.2	2.6	1.3	0.7	0.1	0.6	1.5	1.6	2.0
Emerging Market and Developing Economies[3]	5.4	3.7	4.1	5.4	4.5	3.9	3.2	2.7	2.8	3.6	3.5	3.1

[1]Excludes the United States, euro area countries, and Japan.
[2]Based on Eurostat's harmonized index of consumer prices.
[3]Excludes Argentina and Venezuela. See country-specific notes for Argentina and Venezuela in the "Country Notes" section of the Statistical Appendix.
[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[5]Data are missing because of Argentina, which accounts for more than 30 percent of the weights of the group. See country-specific notes for Argentina in the "Country Notes" section of the Statistical Appendix.

Table A6. Advanced Economies: Consumer Prices[1]

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022	2016	2017	2018
Advanced Economies	**2.2**	**0.2**	**1.5**	**2.7**	**2.0**	**1.4**	**1.4**	**0.3**	**0.8**	**2.0**	**1.9**	**2.1**	**1.5**	**1.9**	**2.0**
United States	2.8	–0.3	1.6	3.1	2.1	1.5	1.6	0.1	1.3	2.7	2.4	2.3	2.2	2.3	2.7
Euro Area[3]	2.2	0.3	1.6	2.7	2.5	1.3	0.4	0.0	0.2	1.7	1.5	1.9	1.1	1.5	1.5
Germany	1.7	0.2	1.1	2.5	2.1	1.6	0.8	0.1	0.4	2.0	1.7	2.4	1.7	1.6	1.8
France	1.9	0.1	1.7	2.3	2.2	1.0	0.6	0.1	0.3	1.4	1.2	1.8	0.7	1.4	1.3
Italy	2.4	0.8	1.6	2.9	3.3	1.2	0.2	0.1	–0.1	1.3	1.3	1.4	0.5	1.4	1.3
Spain	3.3	–0.3	1.8	3.2	2.4	1.4	–0.1	–0.5	–0.2	2.4	1.4	1.9	1.6	1.3	1.4
Netherlands	2.4	1.0	0.9	2.5	2.8	2.6	0.3	0.2	0.1	0.9	1.4	1.6	0.5	1.2	1.5
Belgium	2.2	0.0	2.3	3.4	2.6	1.2	0.5	0.6	1.8	2.0	1.7	2.0	2.2	1.4	1.9
Austria	1.9	0.4	1.7	3.5	2.6	2.1	1.5	0.8	1.0	2.1	1.8	2.2	1.5	1.7	1.9
Greece	3.3	1.3	4.7	3.1	1.0	–0.9	–1.4	–1.1	0.0	1.3	1.4	1.7	0.3	1.3	1.2
Portugal	2.9	–0.9	1.4	3.6	2.8	0.4	–0.2	0.5	0.6	1.2	1.4	1.8	0.9	2.6	1.9
Ireland	3.4	–1.7	–1.6	1.2	1.9	0.5	0.3	0.0	–0.2	0.9	1.5	1.9	–0.2	1.4	1.6
Finland	1.8	1.6	1.7	3.3	3.2	2.2	1.2	–0.2	0.4	1.4	1.6	2.0	1.1	1.5	1.7
Slovak Republic	6.2	0.9	0.7	4.1	3.7	1.5	–0.1	–0.3	–0.5	1.2	1.5	2.0	0.2	1.4	1.6
Lithuania	2.7	4.2	1.2	4.1	3.2	1.2	0.2	–0.7	0.7	2.8	2.0	2.5	2.0	2.4	2.0
Slovenia	5.4	0.8	1.8	1.8	2.6	1.8	0.2	–0.5	–0.1	1.5	2.0	2.0	0.5	1.4	2.0
Luxembourg	2.8	0.0	2.8	3.7	2.9	1.7	0.7	0.1	0.1	1.4	1.3	2.0	2.3	–1.2	2.7
Latvia	5.6	3.3	–1.2	4.2	2.3	0.0	0.7	0.2	0.1	2.8	2.5	2.3	2.1	1.5	1.7
Estonia	4.7	0.2	2.7	5.1	4.2	3.2	0.5	0.1	0.8	3.2	2.5	2.5	2.4	3.4	2.3
Cyprus	2.7	0.2	2.6	3.5	3.1	0.4	–0.3	–1.5	–1.2	1.5	1.4	2.0	0.0	1.5	1.4
Malta	2.6	1.8	2.0	2.5	3.2	1.0	0.8	1.2	0.9	1.5	1.6	1.8	1.0	1.5	1.7
Japan	–0.2	–1.3	–0.7	–0.3	–0.1	0.3	2.8	0.8	–0.1	1.0	0.6	1.6	0.3	0.8	0.6
United Kingdom[3]	1.8	2.2	3.3	4.5	2.8	2.6	1.5	0.1	0.6	2.5	2.6	2.0	1.2	2.8	2.5
Korea	2.9	2.8	2.9	4.0	2.2	1.3	1.3	0.7	1.0	1.8	1.9	2.0	1.3	2.2	1.9
Canada	2.3	0.3	1.8	2.9	1.5	0.9	1.9	1.1	1.4	2.0	2.1	2.0	1.4	2.1	2.2
Australia	3.1	1.8	2.9	3.3	1.7	2.5	2.5	1.5	1.3	2.0	2.4	2.5	1.5	2.0	2.6
Taiwan Province of China	1.1	–0.9	1.0	1.4	1.9	0.8	1.2	–0.3	1.4	1.4	1.3	2.0	1.7	1.4	1.3
Switzerland	1.1	–0.5	0.7	0.2	–0.7	–0.2	0.0	–1.1	–0.4	0.4	0.7	1.0	0.0	0.7	0.8
Sweden	1.7	1.9	1.9	1.4	0.9	0.4	0.2	0.7	1.1	1.4	1.6	2.0	1.7	1.5	1.7
Singapore	1.4	0.6	2.8	5.2	4.6	2.4	1.0	–0.5	–0.5	1.1	1.8	1.9	0.0	1.4	1.9
Hong Kong SAR	–0.6	0.6	2.3	5.3	4.1	4.3	4.4	3.0	2.6	2.6	2.7	3.0	2.6	2.6	2.7
Norway	2.1	2.2	2.4	1.3	0.7	2.1	2.0	2.2	3.6	2.6	2.5	2.5	3.5	2.6	2.5
Czech Republic	2.9	1.0	1.5	1.9	3.3	1.4	0.3	0.3	0.7	2.3	1.8	2.0	2.0	2.3	1.8
Israel	2.2	3.3	2.7	3.5	1.7	1.5	0.5	–0.6	–0.5	0.7	1.4	2.0	–0.2	1.1	1.8
Denmark	2.2	1.3	2.3	2.8	2.4	0.8	0.6	0.5	0.3	0.6	1.1	2.0	0.5	0.7	1.4
New Zealand	2.5	2.1	2.3	4.0	1.1	1.1	1.2	0.3	0.6	1.5	2.0	2.0	1.3	1.7	2.0
Puerto Rico	2.8	0.3	2.5	2.9	1.3	1.1	0.6	–0.8	0.2	1.5	0.5	–0.4	–0.2	1.5	0.5
Macao SAR	. . .	1.2	2.8	5.8	6.1	5.5	6.0	4.6	2.4	2.0	2.2	3.0	1.4	2.0	2.2
Iceland	5.3	12.0	5.4	4.0	5.2	3.9	2.0	1.6	1.7	2.2	2.6	2.5	1.9	2.4	2.7
San Marino	. . .	2.4	2.6	2.0	2.8	1.3	1.1	0.1	0.6	0.7	0.8	1.2	0.6	0.7	0.8
Memorandum															
Major Advanced Economies	2.0	–0.1	1.4	2.6	1.9	1.3	1.5	0.3	0.8	2.1	1.9	2.1	1.6	1.9	2.1

[1]Movements in consumer prices are shown as annual averages.
[2]Monthly year-over-year changes and, for several countries, on a quarterly basis.
[3]Based on Eurostat's harmonized index of consumer prices.

Table A7. Emerging Market and Developing Economies: Consumer Prices[1]

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022	2016	2017	2018
Commonwealth of Independent States[3,4]	**18.8**	**11.1**	**7.2**	**9.8**	**6.2**	**6.5**	**8.1**	**15.5**	**8.3**	**5.7**	**5.3**	**4.5**	**6.5**	**5.4**	**4.9**
Russia	19.8	11.7	6.9	8.4	5.1	6.8	7.8	15.5	7.0	4.5	4.2	4.0	5.4	4.4	4.0
Excluding Russia	15.7	9.6	8.1	13.3	9.2	5.7	8.8	15.6	11.3	8.8	7.9	5.6	9.3	7.8	6.9
Armenia	3.3	3.5	7.3	7.7	2.5	5.8	3.0	3.7	–1.4	2.0	3.5	4.0	–1.1	3.4	4.0
Azerbaijan	5.9	1.6	5.7	7.9	1.0	2.4	1.4	4.0	12.4	10.0	8.0	6.0	13.3	4.2	4.1
Belarus	49.1	13.0	7.7	53.2	59.2	18.3	18.1	13.5	11.8	9.3	8.7	6.0	10.6	10.0	9.1
Georgia	8.0	1.7	7.1	8.5	–0.9	–0.5	3.1	4.0	2.1	5.7	2.4	3.0	1.8	5.4	3.0
Kazakhstan	9.3	7.3	7.1	8.3	5.1	5.8	6.7	6.7	14.6	8.0	7.2	4.4	8.5	7.7	6.8
Kyrgyz Republic	11.2	6.8	8.0	16.6	2.8	6.6	7.5	6.5	0.4	3.6	5.2	5.0	–0.5	4.7	5.5
Moldova	15.5	0.0	7.4	7.6	4.6	4.6	5.1	9.6	6.4	5.5	5.9	5.0	2.4	6.5	5.5
Tajikistan	18.1	6.4	6.5	12.4	5.8	5.0	6.1	5.8	5.9	5.8	6.0	6.0	6.1	6.3	6.0
Turkmenistan	10.2	–2.7	4.4	5.3	5.3	6.8	6.0	7.4	3.5	6.0	6.2	6.2	6.2	6.1	6.2
Ukraine[5]	13.5	15.9	9.4	8.0	0.6	–0.3	12.1	48.7	13.9	11.5	9.5	5.0	12.4	10.0	7.0
Uzbekistan	17.4	12.3	12.3	12.4	11.9	11.7	9.1	8.5	8.0	8.6	8.8	9.0	7.9	8.2	9.0
Emerging and Developing Asia	**3.9**	**2.8**	**5.1**	**6.5**	**4.6**	**4.6**	**3.5**	**2.7**	**2.9**	**3.3**	**3.3**	**3.7**	**3.0**	**3.4**	**3.3**
Bangladesh	5.7	4.9	9.4	11.5	6.2	7.5	7.0	6.2	6.4	6.4	5.8	5.6	6.2	6.4	5.8
Bhutan	5.0	6.3	5.7	7.3	9.3	11.3	9.9	6.3	4.2	4.1	4.6	4.7	3.7	4.2	4.6
Brunei Darussalam	0.5	1.0	0.2	0.1	0.1	0.4	–0.2	–0.4	–0.7	–0.1	0.0	0.2	–1.6	0.1	0.3
Cambodia	4.9	–0.7	4.0	5.5	2.9	3.0	3.9	1.2	3.0	3.2	3.1	3.0	3.5	3.1	3.0
China	1.8	–0.7	3.3	5.4	2.6	2.6	2.0	1.4	2.0	2.4	2.3	3.0	2.1	2.5	2.3
Fiji	3.2	3.7	3.7	7.3	3.4	2.9	0.5	1.4	3.9	4.0	3.5	3.0	3.9	4.0	3.5
India	4.8	10.6	9.5	9.5	9.9	9.4	5.9	4.9	4.9	4.8	5.1	5.0	4.9	4.9	5.1
Indonesia	10.0	5.0	5.1	5.3	4.0	6.4	6.4	6.4	3.5	4.5	4.5	4.0	3.0	4.5	4.4
Kiribati	2.7	9.8	–3.9	1.5	–3.0	–1.5	2.1	0.6	1.9	2.2	2.5	2.5	1.9	2.2	2.5
Lao P.D.R.	17.1	0.0	6.0	7.6	4.3	6.4	4.1	1.3	2.0	2.3	2.7	3.1	3.2	2.3	2.6
Malaysia	2.4	0.6	1.7	3.2	1.7	2.1	3.1	2.1	2.1	2.7	2.9	3.0	1.8	2.7	2.9
Maldives	3.1	4.5	6.2	11.3	10.9	4.0	2.5	1.4	0.9	2.5	1.9	2.5	2.2	1.6	2.2
Marshall Islands	. . .	0.5	1.8	5.4	4.3	1.9	1.1	–2.2	0.9	1.1	1.8	2.1	0.9	1.1	1.8
Micronesia	2.5	7.7	3.7	4.1	6.3	2.2	0.7	–0.2	1.3	2.6	2.4	2.0	1.3	2.6	2.4
Mongolia	8.9	6.3	10.2	7.7	15.0	8.6	12.9	5.9	0.5	4.0	5.1	6.5	0.5	6.1	6.1
Myanmar	19.9	2.2	8.2	2.8	2.8	5.7	5.1	10.0	7.0	6.9	6.7	5.7	8.3	7.1	6.5
Nauru	. . .	22.4	–2.0	–3.4	0.3	–1.1	0.3	9.8	8.2	6.0	2.0	2.0	8.2	5.0	2.0
Nepal	5.4	12.6	9.6	9.6	8.3	9.9	9.0	7.2	9.9	6.7	7.6	6.5	10.4	6.5	7.5
Palau	. . .	1.4	1.4	4.7	3.6	3.4	4.1	0.9	–1.0	2.0	2.0	2.0	0.4	2.0	2.0
Papua New Guinea	8.3	6.9	5.1	4.4	4.5	5.0	5.2	6.0	6.9	7.5	6.5	6.0	7.0	7.5	6.0
Philippines	5.1	4.2	3.8	4.7	3.2	2.9	4.2	1.4	1.8	3.6	3.3	3.0	2.6	3.7	3.0
Samoa	4.3	14.6	–0.2	2.9	6.2	–0.2	–1.2	1.9	0.1	1.8	1.9	3.0	2.3	1.4	2.4
Solomon Islands	9.2	7.1	1.0	7.4	5.9	5.4	5.2	–0.6	0.4	2.5	2.6	3.1	–3.0	5.4	3.3
Sri Lanka	11.1	3.5	6.2	6.7	7.5	6.9	3.3	0.9	3.7	5.8	5.0	5.0	4.5	5.1	5.0
Thailand	1.9	–0.8	3.3	3.8	3.0	2.2	1.9	–0.9	0.2	1.4	1.5	2.5	1.1	1.6	1.2
Timor-Leste	. . .	–0.2	5.2	13.2	10.9	9.5	0.7	0.6	–1.3	1.0	2.7	4.0	0.0	2.0	3.5
Tonga	8.0	3.5	3.9	4.6	2.0	1.5	1.2	–0.3	1.4	3.7	3.4	2.6	2.5	3.9	3.0
Tuvalu	. . .	–0.3	–1.9	0.5	1.4	2.0	1.1	3.2	3.5	2.9	2.8	2.5	3.5	2.9	2.8
Vanuatu	2.8	4.3	2.8	0.9	1.3	1.5	0.8	2.5	2.2	2.6	2.8	3.0	2.5	2.7	2.9
Vietnam	6.3	6.7	9.2	18.7	9.1	6.6	4.1	0.6	2.7	4.9	5.0	5.0	4.7	5.0	5.0
Emerging and Developing Europe	**15.4**	**4.8**	**5.7**	**5.5**	**6.1**	**4.5**	**4.1**	**3.2**	**3.2**	**5.7**	**5.5**	**4.6**	**4.2**	**5.8**	**5.4**
Albania	2.5	2.3	3.6	3.4	2.0	1.9	1.6	1.9	1.3	2.3	2.9	3.0	2.2	2.6	3.0
Bosnia and Herzegovina	3.2	–0.4	2.1	3.7	2.0	–0.1	–0.9	–1.0	–1.1	1.4	1.7	2.0	–0.3	1.9	2.1
Bulgaria[6]	6.7	2.5	3.0	3.4	2.4	0.4	–1.6	–1.1	–1.3	1.0	1.8	2.1	–0.5	1.7	1.8
Croatia	3.3	2.4	1.0	2.3	3.4	2.2	–0.2	–0.5	–1.1	1.1	1.1	2.0	0.2	0.8	1.2
Hungary	6.7	4.2	4.9	3.9	5.7	1.7	–0.2	–0.1	0.4	2.5	3.3	3.0	1.8	2.8	3.0
Kosovo	. . .	–2.4	3.5	7.3	2.5	1.8	0.4	–0.5	0.3	0.9	1.8	2.0	1.3	1.0	1.8
FYR Macedonia	2.6	–0.7	1.5	3.9	3.3	2.8	–0.3	–0.3	–0.2	0.6	1.7	2.0	–0.2	1.5	1.9
Montenegro	. . .	3.6	0.6	3.5	4.0	2.1	–0.8	1.2	–0.4	2.1	1.5	1.9	0.8	1.5	1.4
Poland	3.9	3.4	2.6	4.3	3.7	0.9	0.0	–0.9	–0.6	2.3	2.3	2.5	0.8	2.3	2.4
Romania	19.4	5.6	6.1	5.8	3.3	4.0	1.1	–0.6	–1.6	1.3	3.1	2.5	–0.5	2.2	3.1
Serbia	23.5	8.1	6.1	11.1	7.3	7.7	2.1	1.4	1.1	2.6	3.0	3.0	1.5	2.6	3.0
Turkey	27.2	6.3	8.6	6.5	8.9	7.5	8.9	7.7	7.8	10.1	9.1	7.0	8.5	10.0	8.8

Table A7. Emerging Market and Developing Economies: Consumer Prices[1] *(continued)*

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022	2016	2017	2018
Latin America and the Caribbean[7]	**6.7**	**4.6**	**4.2**	**5.2**	**4.6**	**4.6**	**4.9**	**5.5**	**5.6**	**4.2**	**3.7**	**3.6**	**4.6**	**4.2**	**3.7**
Antigua and Barbuda	2.0	–0.6	3.4	3.5	3.4	1.1	1.1	1.0	–0.4	1.7	2.4	2.5	–0.6	2.3	2.4
Argentina[8]	7.6	6.3	10.5	9.8	10.0	10.6	. . .	. . .	. . .	25.6	18.7	9.1	. . .	21.6	17.2
The Bahamas	2.2	1.7	1.6	3.1	1.9	0.4	1.2	1.9	0.4	1.5	1.5	1.5	0.4	1.5	1.5
Barbados	3.5	3.6	5.8	9.4	4.5	1.8	1.9	–1.1	0.3	2.0	2.5	2.5	0.8	2.4	2.5
Belize	2.5	–1.1	0.9	1.7	1.2	0.5	1.2	–0.9	1.2	2.4	2.3	2.0	2.3	2.4	2.3
Bolivia	4.7	3.3	2.5	9.9	4.5	5.7	5.8	4.1	3.6	4.0	5.0	5.0	4.0	4.7	5.0
Brazil	6.8	4.9	5.0	6.6	5.4	6.2	6.3	9.0	8.7	4.4	4.3	4.5	6.3	4.4	4.5
Chile	3.7	1.5	1.4	3.3	3.0	1.9	4.4	4.3	3.8	2.8	3.0	3.0	2.8	3.1	3.0
Colombia	6.9	4.2	2.3	3.4	3.2	2.0	2.9	5.0	7.5	4.5	3.2	3.0	5.7	4.1	3.0
Costa Rica	11.1	7.8	5.7	4.9	4.5	5.2	4.5	0.8	0.0	1.9	3.0	3.0	0.8	3.0	3.0
Dominica	2.1	0.0	2.8	1.1	1.4	0.0	0.8	–0.8	0.0	0.6	1.4	2.0	–0.2	1.4	1.4
Dominican Republic	12.8	1.4	6.3	8.5	3.7	4.8	3.0	0.8	1.6	3.9	4.2	4.0	1.7	4.3	4.0
Ecuador	19.6	5.2	3.6	4.5	5.1	2.7	3.6	4.0	1.7	0.3	0.6	1.4	1.1	0.3	0.7
El Salvador	3.5	0.5	1.2	5.1	1.7	0.8	1.1	–0.7	0.6	0.9	2.3	2.0	–0.9	2.7	2.0
Grenada	2.9	–0.3	3.4	3.0	2.4	0.0	–0.8	–0.6	1.8	2.9	2.1	1.9	1.4	3.2	1.8
Guatemala	7.3	1.9	3.9	6.2	3.8	4.3	3.4	2.4	4.5	3.6	4.0	4.0	4.2	4.0	4.0
Guyana	6.6	3.0	4.3	4.4	2.4	1.9	0.7	–0.9	0.8	2.3	2.7	3.1	1.5	2.6	2.7
Haiti	15.3	3.4	4.1	7.4	6.8	6.8	3.9	7.5	13.4	13.1	6.4	5.0	12.5	11.0	5.0
Honduras	8.8	5.5	4.7	6.8	5.2	5.2	6.1	3.2	2.7	3.8	4.5	4.5	3.3	4.7	4.5
Jamaica	10.6	9.6	12.6	7.5	6.9	9.4	8.3	3.7	3.8	4.5	5.3	5.4	4.0	5.0	5.5
Mexico	6.3	5.3	4.2	3.4	4.1	3.8	4.0	2.7	2.8	4.8	3.2	3.0	3.4	4.6	3.1
Nicaragua	9.7	3.7	5.5	8.1	7.2	7.1	6.0	4.0	3.1	5.9	7.4	7.2	3.1	5.9	7.4
Panama	2.3	2.4	3.5	5.9	5.7	4.0	2.6	0.1	0.7	2.0	2.3	2.3	1.5	2.5	2.3
Paraguay	8.6	2.6	4.7	8.3	3.7	2.7	5.0	3.1	4.1	4.0	4.0	4.0	3.9	4.1	4.0
Peru	2.6	2.9	1.5	3.4	3.7	2.8	3.2	3.5	3.6	3.1	2.6	2.5	3.2	2.9	2.5
St. Kitts and Nevis	3.6	2.1	0.9	5.8	0.8	1.1	0.2	–2.3	–0.4	1.2	1.6	1.9	0.9	1.5	1.6
St. Lucia	3.0	–0.2	3.3	2.8	4.2	1.5	3.5	–1.0	–1.7	1.9	0.7	1.5	0.6	0.7	1.1
St. Vincent and the Grenadines	2.9	0.4	0.8	3.2	2.6	0.8	0.2	–1.7	–0.1	1.3	1.3	1.4	1.3	1.3	1.3
Suriname	21.0	–0.3	6.9	17.7	5.0	1.9	3.4	6.9	55.5	32.1	27.3	3.4	52.4	29.9	18.9
Trinidad and Tobago	5.9	7.0	10.5	5.1	9.3	5.2	5.7	4.7	3.4	3.7	4.7	4.8	3.4	3.7	4.7
Uruguay	8.3	7.1	6.7	8.1	8.1	8.6	8.9	8.7	9.6	7.7	7.5	6.1	8.1	8.4	7.1
Venezuela[8]	20.5	27.1	28.2	26.1	21.1	40.6	62.2	121.7	254.9	720.5	2,068.5	4,684.8	274.4	1,133.8	2,529.6
Middle East, North Africa, Afghanistan, and Pakistan	**6.3**	**7.3**	**6.6**	**9.2**	**9.8**	**9.1**	**6.8**	**5.7**	**5.1**	**7.6**	**7.4**	**4.9**	**5.9**	**8.4**	**6.6**
Afghanistan	. . .	–6.8	2.2	11.8	6.4	7.4	4.7	–1.5	4.4	6.0	6.0	6.0	4.6	7.2	6.0
Algeria	2.9	5.7	3.9	4.5	8.9	3.3	2.9	4.8	6.4	4.8	4.3	4.0	5.9	4.8	4.3
Bahrain	1.2	2.8	2.0	–0.4	2.8	3.3	2.7	1.8	2.8	1.3	3.4	1.7	2.3	1.5	3.1
Djibouti	3.2	1.7	4.0	5.1	3.7	2.4	2.9	2.1	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Egypt	5.8	16.2	11.7	11.1	8.6	6.9	10.1	11.0	10.2	22.0	16.9	7.0	14.0	26.1	11.4
Iran	15.6	10.7	12.4	21.2	30.8	34.7	15.6	11.9	8.9	11.2	11.0	8.7	10.5	11.9	10.7
Iraq	. . .	–2.2	2.4	5.6	6.1	1.9	2.2	1.4	0.4	2.0	2.0	2.0	–1.0	2.0	2.0
Jordan	3.8	–0.7	4.8	4.2	4.5	4.8	2.9	–0.9	–0.8	2.3	2.5	2.5	0.8	2.5	2.5
Kuwait	2.8	4.6	4.5	4.9	3.2	2.7	2.9	3.2	3.2	4.2	3.6	3.4	3.5	4.2	3.6
Lebanon	2.3	1.2	4.0	5.0	6.6	4.8	1.9	–3.7	–0.8	2.6	2.0	2.0	3.1	2.0	2.0
Libya[8]	–0.1	2.4	2.5	15.9	6.1	2.6	2.4	9.8	27.1	32.8	32.1	23.5	29.9	35.1	29.9
Mauritania	6.4	2.1	6.3	5.7	4.9	4.1	3.8	0.5	1.5	3.6	4.3	4.4	2.8	3.3	5.1
Morocco	1.9	1.0	1.0	0.9	1.3	1.9	0.4	1.5	1.6	1.2	1.5	2.0	1.8	1.2	1.5
Oman	2.2	3.5	3.3	4.0	2.9	1.2	1.0	0.1	1.1	4.1	3.0	3.1	1.1	4.1	3.0
Pakistan	6.2	19.6	10.1	13.7	11.0	7.4	8.6	4.5	2.9	4.3	5.0	5.0	3.2	5.3	5.0
Qatar	6.3	–4.9	–2.4	2.0	1.9	3.1	3.4	1.8	2.7	2.6	5.7	2.1	. . .	. . .	. . .
Saudi Arabia	1.0	4.1	3.8	3.7	2.9	3.5	2.7	2.2	3.5	3.8	5.1	2.0	1.7	3.8	5.1
Sudan[9]	9.1	11.3	13.0	18.3	35.4	36.5	36.9	16.9	17.8	23.2	16.0	14.0	30.5	17.0	15.0
Syria[10]	4.1	2.8	4.4	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tunisia	2.7	3.7	3.3	3.5	5.1	5.8	4.9	4.9	3.7	3.9	3.8	3.5	4.2	3.9	3.8
United Arab Emirates	5.6	1.6	0.9	0.9	0.7	1.1	2.3	4.1	1.8	2.8	3.7	2.4	1.8	2.8	3.7
Yemen	11.4	3.7	11.2	19.5	9.9	11.0	8.2	39.4	5.0	20.0	17.0	10.0	22.0	21.0	15.0

Table A7. Emerging Market and Developing Economies: Consumer Prices[1] *(continued)*

(Annual percent change)

	Average									Projections			End of Period[2]	Projections	
	1999–2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022	2016	2017	2018
Sub-Saharan Africa	**10.5**	**9.8**	**8.1**	**9.4**	**9.3**	**6.6**	**6.3**	**7.0**	**11.4**	**10.7**	**9.5**	**7.6**	**12.7**	**10.4**	**9.3**
Angola	81.6	13.7	14.5	13.5	10.3	8.8	7.3	10.3	32.4	27.0	17.8	9.0	41.9	20.0	16.0
Benin	3.1	0.4	2.2	2.7	6.7	1.0	–1.1	0.3	–0.8	2.0	2.1	2.0	–2.7	2.2	2.0
Botswana	8.7	8.1	6.9	8.5	7.5	5.9	4.4	3.1	2.8	3.5	4.2	4.6	3.0	3.9	4.5
Burkina Faso	2.6	0.9	–0.6	2.8	3.8	0.5	–0.3	0.9	0.7	1.5	2.0	2.0	0.6	2.0	2.0
Burundi	10.0	10.6	6.5	9.6	18.2	7.9	4.4	5.6	5.5	12.4	16.4	14.0	9.5	14.9	17.7
Cabo Verde	2.3	1.0	2.1	4.5	2.5	1.5	–0.2	0.1	–1.5	1.0	1.5	2.0	–1.2	1.2	1.8
Cameroon	2.4	3.0	1.3	2.9	2.4	2.1	1.9	2.7	0.9	1.0	1.4	2.0	0.3	1.5	1.4
Central African Republic	2.9	3.5	1.5	1.2	5.9	6.6	11.6	4.5	4.6	3.8	3.7	3.0	4.7	3.6	3.6
Chad	1.6	10.1	–2.1	1.9	7.7	0.2	1.7	6.8	–1.1	0.2	1.8	3.0	–4.9	7.8	–2.9
Comoros	4.0	4.8	3.9	2.2	5.9	1.6	1.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Democratic Republic of the Congo	77.9	46.1	23.5	14.9	0.9	0.9	1.2	1.0	22.4	15.0	10.0	4.0	22.9	17.0	12.0
Republic of Congo	2.7	4.3	0.4	1.8	5.0	4.6	0.9	2.7	3.6	1.3	2.1	2.5	0.8	0.4	3.6
Côte d'Ivoire	3.0	1.0	1.4	4.9	1.3	2.6	0.4	1.2	1.0	1.5	2.0	2.0	1.2	1.7	2.0
Equatorial Guinea	5.0	5.7	5.3	4.8	3.4	3.2	4.3	1.7	1.4	1.6	1.5	1.9	1.6	1.5	1.5
Eritrea	16.3	33.0	11.2	3.9	6.0	6.5	10.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
Ethiopia	10.2	8.5	8.1	33.2	24.1	8.1	7.4	10.1	7.3	6.3	7.5	7.5	6.7	6.9	7.5
Gabon	0.7	1.9	1.4	1.3	2.7	0.5	4.5	–0.1	2.1	2.5	2.5	2.5	4.1	2.5	2.5
The Gambia	6.5	4.6	5.0	4.8	4.6	5.2	6.3	6.8	7.2	8.1	6.2	3.1	7.9	7.0	5.4
Ghana	17.7	13.1	6.7	7.7	7.1	11.7	15.5	17.2	17.5	12.0	9.0	6.0	15.4	10.0	8.0
Guinea	15.1	4.7	15.5	21.4	15.2	11.9	9.7	8.2	8.2	8.4	7.0	5.0	8.7	8.1	6.0
Guinea-Bissau	3.0	–1.6	1.1	5.1	2.1	0.8	–1.0	1.5	1.5	2.0	2.2	3.0	1.6	2.0	2.2
Kenya	6.8	10.6	4.3	14.0	9.4	5.7	6.9	6.6	6.3	6.5	5.2	5.0	6.3	6.0	5.0
Lesotho	7.5	5.9	3.4	6.0	5.5	5.0	4.0	5.0	7.0	6.6	6.2	5.0	6.7	6.5	6.0
Liberia	. . .	7.4	7.3	8.5	6.8	7.6	9.9	7.7	8.8	11.0	9.5	7.2	12.5	10.0	9.1
Madagascar	10.3	9.0	9.2	9.5	5.7	5.8	6.1	7.4	6.7	6.9	6.4	5.0	7.1	7.1	6.3
Malawi	17.4	8.4	7.4	7.6	21.3	28.3	23.8	21.9	21.7	12.9	10.6	8.8	19.5	11.8	9.5
Mali	2.2	2.2	1.3	3.1	5.3	–0.6	0.9	1.4	–1.8	0.2	1.2	2.2	–0.8	1.0	1.4
Mauritius	6.4	2.5	2.9	6.5	3.9	3.5	3.2	1.3	1.0	3.2	2.8	3.0	2.3	2.7	3.0
Mozambique	10.5	3.3	12.7	10.4	2.1	4.2	2.3	2.4	19.2	19.0	10.6	5.6	24.6	13.5	7.0
Namibia	7.6	9.5	4.9	5.0	6.7	5.6	5.3	3.4	6.7	6.0	5.8	5.8	7.3	6.0	5.8
Niger	2.4	4.3	–2.8	2.9	0.5	2.3	–0.9	1.0	1.1	2.0	2.1	2.0	1.2	2.2	2.0
Nigeria	11.6	12.5	13.7	10.8	12.2	8.5	8.0	9.0	15.7	17.4	17.5	14.5	18.6	17.5	17.5
Rwanda	6.8	10.3	2.3	5.7	6.3	4.2	1.8	2.5	5.7	7.1	6.0	5.0	7.3	7.0	5.0
São Tomé and Príncipe	15.3	17.0	13.3	14.3	10.6	8.1	7.0	5.3	5.4	3.2	3.0	3.0	5.1	3.0	3.0
Senegal	2.3	–2.2	1.2	3.4	1.4	0.7	–1.1	0.1	0.9	1.9	2.0	2.0	2.1	1.9	2.0
Seychelles	6.3	31.8	–2.4	2.6	7.1	4.3	1.4	4.0	–1.0	2.2	3.7	3.0	–0.2	3.8	3.4
Sierra Leone	9.8	9.2	17.8	18.5	13.8	9.8	8.3	9.0	11.3	14.7	8.5	7.5	16.7	9.0	8.0
South Africa	5.8	7.1	4.3	5.0	5.6	5.8	6.1	4.6	6.3	6.2	5.5	5.5	6.7	5.9	5.5
South Sudan	. . .	. . .	. . .	. . .	45.1	0.0	1.7	52.8	379.8	143.0	28.5	7.5	479.7	119.9	20.0
Swaziland	7.4	7.4	4.5	6.1	8.9	5.6	5.7	5.0	8.0	7.6	6.2	5.7	9.0	6.5	5.9
Tanzania	6.1	12.1	7.2	12.7	16.0	7.9	6.1	5.6	5.2	5.1	5.0	5.0	5.0	5.0	5.0
Togo	2.5	3.7	1.4	3.6	2.6	1.8	0.2	1.8	0.9	1.5	1.9	2.0	2.3	2.5	1.9
Uganda	5.7	13.0	3.7	15.0	12.7	4.9	3.1	5.4	5.5	6.3	6.0	5.0	5.7	6.9	5.1
Zambia	18.5	13.4	8.5	8.7	6.6	7.0	7.8	10.1	17.9	9.0	8.0	6.0	7.5	8.5	7.5
Zimbabwe[11]	–7.4	6.2	3.0	3.5	3.7	1.6	–0.2	–2.4	–1.6	3.0	6.6	4.0	–0.9	5.0	8.0

[1]Movements in consumer prices are shown as annual averages.
[2]Monthly year-over-year changes and, for several countries, on a quarterly basis.
[3]For many countries, inflation for the earlier years is measured on the basis of a retail price index. Consumer price index (CPI) inflation data with broader and more up-to-date coverage are typically used for more recent years.
[4]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in the group for reasons of geography and similarity in economic structure.
[5]Starting in 2014 data exclude Crimea and Sevastopol.
[6]Based on Eurostat's harmonized index of consumer prices.
[7]Excludes Argentina and Venezuela.
[8]See country-specific notes for Argentina, Libya, and Venezuela in the "Country Notes" section of the Statistical Appendix.
[9]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[10]Data for Syria are excluded for 2011 onward owing to the uncertain political situation.
[11]The Zimbabwe dollar ceased circulating in early 2009. Data are based on IMF staff estimates of price and exchange rate developments in U.S. dollars. IMF staff estimates of U.S. dollar values may differ from authorities' estimates.

Table A8. Major Advanced Economies: General Government Fiscal Balances and Debt[1]

(Percent of GDP unless noted otherwise)

	Average							Projections		
	1999–2008	2011	2012	2013	2014	2015	2016	2017	2018	2022
Major Advanced Economies										
Net Lending/Borrowing	–3.4	–7.3	–6.3	–4.3	–3.6	–3.0	–3.5	–3.3	–3.3	–3.5
Output Gap[2]	0.9	–2.3	–2.1	–1.9	–1.5	–0.9	–0.8	–0.3	0.0	0.1
Structural Balance[2]	–3.8	–6.4	–5.1	–3.7	–3.1	–2.8	–3.0	–3.2	–3.3	–3.6
United States										
Net Lending/Borrowing[3]	–3.5	–9.6	–7.9	–4.4	–4.0	–3.5	–4.4	–4.0	–4.5	–5.8
Output Gap[2]	1.8	–3.1	–2.2	–1.9	–1.3	–0.4	–0.4	0.0	0.4	0.1
Structural Balance[2]	–4.0	–8.2	–6.4	–4.3	–3.8	–3.4	–3.9	–4.0	–4.6	–5.8
Net Debt	43.2	76.8	80.2	81.5	81.0	80.5	81.5	82.4	83.1	92.6
Gross Debt	62.6	99.9	103.4	105.4	105.2	105.6	107.4	108.3	108.9	117.4
Euro Area										
Net Lending/Borrowing	–2.0	–4.2	–3.6	–3.0	–2.6	–2.1	–1.7	–1.5	–1.2	–0.3
Output Gap[2]	0.9	–0.5	–2.0	–2.8	–2.5	–1.9	–1.2	–0.7	–0.3	0.4
Structural Balance[2]	–2.5	–3.9	–2.1	–1.3	–1.1	–0.9	–0.9	–1.1	–0.9	–0.4
Net Debt	47.6	62.6	65.9	68.1	68.4	67.5	67.0	66.3	65.3	58.9
Gross Debt	67.8	86.8	91.4	93.7	94.4	92.6	91.3	90.1	88.6	79.9
Germany										
Net Lending/Borrowing	–2.1	–1.0	0.0	–0.2	0.3	0.7	0.8	0.6	0.6	1.1
Output Gap[2]	0.1	1.0	0.4	–0.3	0.0	0.0	0.4	0.6	0.7	0.6
Structural Balance[2]	–2.2	–1.3	–0.1	0.0	0.6	0.7	0.6	0.2	0.2	0.8
Net Debt	45.3	55.5	54.8	53.8	50.6	47.8	45.0	42.7	40.6	31.9
Gross Debt	62.6	78.7	79.9	77.5	74.9	71.2	67.6	64.7	62.0	50.9
France										
Net Lending/Borrowing	–2.6	–5.1	–4.8	–4.0	–4.0	–3.5	–3.3	–3.2	–2.8	–0.6
Output Gap[2]	0.5	–1.0	–1.7	–2.2	–2.5	–2.2	–2.0	–1.7	–1.2	0.3
Structural Balance[2]	–3.0	–4.5	–3.6	–2.6	–2.4	–2.0	–1.9	–2.1	–2.0	–0.8
Net Debt	54.6	76.9	80.6	83.5	86.4	87.4	88.3	89.1	89.1	82.1
Gross Debt	63.1	85.2	89.5	92.3	95.2	96.2	96.6	97.4	97.4	90.4
Italy										
Net Lending/Borrowing	–2.9	–3.7	–2.9	–2.9	–3.0	–2.7	–2.4	–2.4	–1.4	0.0
Output Gap[2]	0.2	–0.5	–2.8	–4.1	–4.1	–3.3	–2.4	–1.6	–1.1	0.0
Structural Balance[2,4]	–3.6	–4.1	–1.5	–0.5	–1.1	–0.9	–1.3	–1.6	–0.8	0.0
Net Debt	89.3	100.4	105.0	109.9	111.9	112.5	113.3	113.8	113.0	104.4
Gross Debt	102.9	116.5	123.3	129.0	131.8	132.0	132.6	132.8	131.6	121.3
Japan										
Net Lending/Borrowing	–5.5	–9.1	–8.3	–7.6	–5.4	–3.5	–4.2	–4.0	–3.3	–2.0
Output Gap[2]	–0.8	–4.6	–3.7	–2.2	–2.6	–2.0	–1.7	–1.0	–0.9	–0.7
Structural Balance[2]	–5.5	–7.5	–7.1	–7.1	–5.1	–3.9	–3.9	–3.7	–3.1	–1.8
Net Debt	64.2	117.9	120.5	117.4	119.0	118.4	119.8	119.9	120.1	113.1
Gross Debt[5]	165.8	230.6	236.6	240.5	242.1	238.0	239.2	239.2	239.4	232.4
United Kingdom										
Net Lending/Borrowing	–1.9	–7.5	–7.7	–5.6	–5.7	–4.4	–3.1	–2.8	–2.1	–0.8
Output Gap[2]	1.1	–2.0	–2.3	–1.7	–0.7	–0.2	–0.2	0.1	–0.2	0.0
Structural Balance[2]	–2.7	–5.9	–6.0	–4.2	–4.9	–4.1	–3.0	–2.8	–2.0	–0.8
Net Debt	34.9	73.2	76.4	77.8	79.7	80.4	80.7	80.4	80.2	74.6
Gross Debt	39.5	81.6	85.1	86.2	88.1	89.0	89.2	89.0	88.7	83.2
Canada										
Net Lending/Borrowing	1.1	–3.3	–2.5	–1.5	0.0	–1.1	–1.9	–2.4	–2.2	–1.2
Output Gap[2]	1.5	–1.1	–1.3	–0.8	–0.2	–0.9	–0.9	–0.5	0.0	0.2
Structural Balance[2]	0.3	–2.7	–1.8	–1.1	–0.2	–0.7	–1.4	–2.1	–2.1	–1.3
Net Debt	34.1	27.1	28.2	29.0	27.2	25.2	27.6	26.4	25.1	18.1
Gross Debt	75.6	81.5	84.8	85.8	85.4	91.6	92.3	91.2	89.8	82.7

Note: The methodology and specific assumptions for each country are discussed in Box A1. The country group composites for fiscal data are calculated as the sum of the U.S. dollar values for the relevant individual countries.

[1]Debt data refer to the end of the year and are not always comparable across countries. Gross and net debt levels reported by national statistical agencies for countries that have adopted the System of National Accounts (SNA) 2008 (Australia, Canada, Hong Kong SAR, United States) are adjusted to exclude unfunded pension liabilities of government employees' defined-benefit pension plans. Fiscal data for the aggregated major advanced economies and the United States start in 2001, and the average for the aggregate and the United States is therefore for the period 2001–07.

[2]Percent of potential GDP.

[3]Figures reported by the national statistical agency are adjusted to exclude items related to the accrual-basis accounting of government employees' defined-benefit pension plans.

[4]Excludes one-time measures based on the authorities' data and, if unavailable, on receipts from the sale of assets.

[5]Includes equity shares; nonconsolidated basis.

Table A9. Summary of World Trade Volumes and Prices

(Annual percent change)

	Averages										Projections	
	1999–2008	2009–18	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Trade in Goods and Services												
World Trade[1]												
Volume	6.6	3.0	–10.5	12.5	7.1	2.7	3.7	3.7	2.7	2.2	3.8	3.9
Price Deflator												
In U.S. Dollars	4.4	–1.4	–10.4	5.5	11.1	–1.7	–0.7	–1.8	–13.3	–4.2	2.6	1.0
In SDRs	2.8	0.1	–8.2	6.6	7.4	1.4	0.1	–1.7	–5.9	–3.5	5.4	1.1
Volume of Trade												
Exports												
Advanced Economies	5.6	2.8	–11.1	12.0	6.0	2.3	3.2	3.9	3.7	2.1	3.5	3.2
Emerging Market and Developing Economies	8.8	3.6	–7.9	13.7	8.5	3.5	4.9	2.8	1.4	2.5	3.6	4.3
Imports												
Advanced Economies	5.6	2.6	–11.6	11.4	5.1	1.2	2.4	3.9	4.4	2.4	4.0	4.0
Emerging Market and Developing Economies	10.0	3.9	–9.6	14.5	11.5	5.2	5.3	4.0	–0.8	1.9	4.5	4.3
Terms of Trade												
Advanced Economies	–0.5	0.3	2.5	–0.9	–1.6	–0.6	0.8	0.3	1.8	0.9	–0.5	0.1
Emerging Market and Developing Economies	2.8	–0.5	–6.2	2.1	4.3	0.6	–0.5	–0.6	–4.2	–1.2	1.3	–0.4
Trade in Goods												
World Trade[1]												
Volume	6.7	2.9	–11.5	14.4	7.0	2.4	3.4	3.1	2.2	2.2	3.9	4.0
Price Deflator												
In U.S. Dollars	4.5	–1.6	–11.8	6.5	12.5	–1.7	–1.2	–2.5	–14.4	–4.9	3.2	1.0
In SDRs	2.9	–0.1	–9.6	7.6	8.7	1.3	–0.5	–2.4	–7.0	–4.3	6.0	1.1
World Trade Prices in U.S. Dollars[2]												
Manufactures	1.8	0.0	–1.7	2.2	4.3	2.8	–3.0	–0.4	–2.4	–5.4	2.8	1.7
Oil	22.2	–5.5	–36.3	27.9	31.6	1.0	–0.9	–7.5	–47.2	–15.7	28.9	–0.3
Nonfuel Primary Commodities	6.2	–0.7	–16.0	26.6	18.0	–10.1	–1.4	–3.9	–17.4	–1.9	8.5	–1.3
Food	5.6	–0.7	–15.2	12.1	20.3	–2.6	0.7	–4.1	–17.1	2.0	3.0	–0.5
Beverages	2.4	0.5	1.6	14.1	16.6	–18.6	–11.9	20.7	–3.1	–5.0	–5.7	3.5
Agricultural Raw Materials	1.9	0.6	–17.1	33.2	22.7	–12.7	1.6	2.0	–13.5	–5.7	7.0	–0.3
Metal	11.8	–1.8	–19.2	48.2	13.5	–16.8	–4.3	–10.1	–23.0	–5.4	23.2	–4.0
World Trade Prices in SDRs[2]												
Manufactures	0.3	1.6	0.7	3.3	0.8	5.9	–2.2	–0.4	6.0	–4.8	5.6	1.8
Oil	20.3	–4.0	–34.8	29.3	27.2	4.1	–0.1	–7.5	–42.7	–15.1	32.4	–0.2
Nonfuel Primary Commodities	4.6	0.8	–13.9	28.0	14.1	–7.3	–0.6	–3.8	–10.4	–1.3	11.5	–1.2
Food	4.0	0.9	–13.1	13.3	16.2	0.4	1.5	–4.0	–10.0	2.7	5.8	–0.4
Beverages	0.9	2.1	4.1	15.3	12.7	–16.1	–11.2	20.8	5.2	–4.4	–3.2	3.6
Agricultural Raw Materials	0.4	2.2	–15.1	34.6	18.5	–10.0	2.4	2.0	–6.1	–5.1	9.9	–0.2
Metal	10.1	–0.2	–17.2	49.8	9.7	–14.3	–3.5	–10.1	–16.4	–4.8	26.5	–3.9
World Trade Prices in Euros[2]												
Manufactures	–1.0	3.4	3.9	7.3	–0.5	11.2	–6.1	–0.5	16.9	–5.2	7.1	2.0
Oil	18.8	–2.3	–32.7	34.3	25.5	9.3	–4.1	–7.6	–36.8	–15.4	34.3	0.0
Nonfuel Primary Commodities	3.3	2.6	–11.2	32.9	12.6	–2.7	–4.5	–3.9	–1.1	–1.6	13.0	–1.0
Food	2.7	2.6	–10.4	17.7	14.7	5.5	–2.6	–4.1	–0.8	2.3	7.3	–0.2
Beverages	–0.4	3.9	7.3	19.8	11.2	–11.9	–14.7	20.7	16.1	–4.8	–1.8	3.8
Agricultural Raw Materials	–0.9	4.0	–12.5	39.8	17.0	–5.5	–1.7	1.9	3.6	–5.5	11.5	0.0
Metal	8.7	1.5	–14.6	55.5	8.3	–10.0	–7.3	–10.2	–7.8	–5.2	28.3	–3.7

Table A9. Summary of World Trade Volumes and Prices *(continued)*

(Annual percent change)

	Averages										Projections	
	1999–2008	2009–18	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Trade in Goods												
Volume of Trade												
Exports												
Advanced Economies	5.7	2.5	–13.0	14.7	6.1	1.9	2.7	3.4	3.1	1.8	3.4	3.3
Emerging Market and Developing Economies	8.9	3.6	–8.3	15.2	7.5	3.8	4.8	2.7	1.1	2.6	3.3	4.3
Fuel Exporters	5.6	1.8	–6.2	6.3	5.8	2.7	2.3	–0.7	2.2	2.4	0.4	3.4
Nonfuel Exporters	10.2	4.2	–9.3	18.8	8.2	4.3	6.0	4.1	0.7	2.7	4.1	4.6
Imports												
Advanced Economies	5.7	2.4	–12.7	13.1	5.5	0.4	2.1	3.5	3.5	2.1	4.4	4.2
Emerging Market and Developing Economies	9.9	3.8	–9.9	15.5	11.0	5.0	4.8	2.6	–0.2	2.4	4.3	4.4
Fuel Exporters	11.1	1.0	–15.4	8.1	12.1	8.4	4.0	0.7	–7.4	–5.4	6.2	1.8
Nonfuel Exporters	9.6	4.5	–8.6	17.4	10.8	4.3	5.0	3.0	1.5	4.1	3.9	4.9
Price Deflators in SDRs												
Exports												
Advanced Economies	1.7	–0.3	–7.4	4.4	6.3	–0.3	0.3	–2.0	–6.2	–2.4	4.0	1.4
Emerging Market and Developing Economies	6.6	0.3	–13.2	12.7	13.3	3.1	–1.3	–3.2	–8.9	–7.0	9.9	0.8
Fuel Exporters	14.4	–2.1	–25.9	21.6	25.6	4.5	–2.4	–6.7	–29.2	–13.0	21.8	0.3
Nonfuel Exporters	3.6	1.1	–6.8	9.0	8.3	2.5	–0.7	–1.6	–0.7	–5.2	6.7	0.9
Imports												
Advanced Economies	2.5	–0.5	–10.7	6.3	8.5	0.9	–0.5	–2.1	–7.9	–3.6	4.2	1.1
Emerging Market and Developing Economies	3.6	0.8	–7.4	10.9	8.3	2.5	–0.7	–2.7	–5.1	–5.7	8.4	1.2
Fuel Exporters	3.3	1.3	–2.4	8.2	6.6	3.5	–0.1	–2.4	–2.8	–4.1	6.3	1.5
Nonfuel Exporters	3.7	0.6	–8.6	11.5	8.7	2.3	–0.9	–2.8	–5.6	–6.0	8.8	1.1
Terms of Trade												
Advanced Economies	–0.8	0.3	3.7	–1.8	–2.0	–1.2	0.9	0.1	1.9	1.2	–0.2	0.3
Emerging Market and Developing Economies	2.9	–0.5	–6.3	1.6	4.6	0.6	–0.5	–0.5	–4.0	–1.4	1.4	–0.4
Regional Groups												
Commonwealth of Independent States[3]	7.6	–3.0	–25.7	12.9	20.6	1.9	–6.6	–1.6	–20.1	–12.7	13.9	–2.2
Emerging and Developing Asia	–1.6	0.5	2.7	–6.1	–2.3	1.2	0.9	2.3	8.9	0.3	–2.7	0.3
Emerging and Developing Europe	0.1	0.2	3.6	–3.9	–1.8	–1.0	1.5	1.3	2.7	1.6	–2.6	0.3
Latin America and the Caribbean	3.9	–0.6	–5.0	8.4	5.6	–1.4	–1.4	–2.5	–9.4	2.0	1.2	–2.4
Middle East, North Africa, Afghanistan, and Pakistan	9.5	–2.9	–17.8	7.6	13.5	0.3	–0.2	–4.7	–25.5	–6.1	12.0	–0.5
Middle East and North Africa	10.0	–3.0	–18.2	7.5	13.7	0.9	–0.1	–4.7	–26.3	–6.7	12.3	–0.5
Sub-Saharan Africa	5.6	–0.9	–12.2	11.7	12.3	–1.5	–0.3	–3.4	–15.3	–1.8	5.3	–0.5
Analytical Groups												
By Source of Export Earnings												
Fuel	10.8	–3.4	–24.1	12.4	17.8	1.0	–2.4	–4.4	–27.2	–9.3	14.6	–1.2
Nonfuel	–0.1	0.4	1.9	–2.3	–0.4	0.2	0.2	1.2	5.2	0.9	–1.9	–0.2
Memorandum												
World Exports in Billions of U.S. Dollars												
Goods and Services	11,465	21,205	15,739	18,696	22,254	22,486	23,215	23,593	20,928	20,522	21,802	22,813
Goods	9,117	16,639	12,223	14,895	17,910	18,039	18,476	18,569	16,165	15,713	16,803	17,597
Average Oil Price[4]	22.2	–5.5	–36.3	27.9	31.6	1.0	–0.9	–7.5	–47.2	–15.7	28.9	–0.3
In U.S. Dollars a Barrel	44.79	75.41	61.78	79.03	104.01	105.01	104.07	96.25	50.79	42.84	55.23	55.06
Export Unit Value of Manufactures[5]	1.8	0.0	–1.7	2.2	4.3	2.8	–3.0	–0.4	–2.4	–5.4	2.8	1.7

[1]Average of annual percent change for world exports and imports.
[2]As represented, respectively, by the export unit value index for manufactures of the advanced economies and accounting for 83 percent of the advanced economies' trade (export of goods) weights; the average of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil prices; and the average of world market prices for nonfuel primary commodities weighted by their 2002–04 shares in world commodity exports.
[3]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[4]Percent change of average of U.K. Brent, Dubai Fateh, and West Texas Intermediate crude oil prices.
[5]Percent change for manufactures exported by the advanced economies.

Table A10. Summary of Current Account Balances

(Billions of U.S. dollars)

									Projections		
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
Advanced Economies	**–89.5**	**2.4**	**–45.1**	**8.4**	**224.2**	**232.6**	**296.6**	**374.6**	**334.7**	**212.6**	**201.5**
United States	–384.0	–442.0	–460.4	–446.5	–366.4	–392.1	–463.0	–481.2	–522.8	–672.5	–766.5
Euro Area	19.0	31.1	31.8	161.8	286.9	320.6	351.4	399.8	347.2	355.8	379.6
Germany	196.7	192.3	229.0	248.9	252.9	282.9	280.3	294.3	280.5	280.0	291.3
France	–22.5	–22.2	–28.3	–32.7	–24.6	–30.3	–4.8	–26.8	–22.9	–11.2	13.0
Italy	–41.4	–72.7	–68.6	–7.5	20.5	40.5	29.6	50.8	37.0	32.2	13.4
Spain	–64.3	–56.2	–47.4	–3.1	20.7	14.9	16.3	24.7	19.0	20.1	25.9
Japan	145.3	221.0	129.8	59.7	45.9	36.5	135.6	191.0	202.5	210.7	230.3
United Kingdom	–70.1	–66.6	–46.6	–97.4	–119.6	–140.0	–122.7	–114.5	–81.4	–73.2	–61.4
Canada	–40.4	–58.2	–49.6	–65.7	–59.4	–43.6	–52.8	–51.1	–46.8	–45.3	–34.6
Other Advanced Economies[1]	207.5	286.8	271.2	279.7	355.8	371.7	370.9	380.5	371.3	370.9	379.5
Emerging Market and Developing Economies	**232.5**	**272.8**	**366.3**	**347.7**	**184.2**	**155.7**	**–71.2**	**–88.8**	**–84.8**	**–103.3**	**–240.1**
Regional Groups											
Commonwealth of Independent States[2]	42.9	68.5	107.3	66.3	18.2	56.9	52.1	–2.8	32.1	38.6	68.0
Russia	50.4	67.5	97.3	71.3	33.4	57.5	69.0	22.2	51.5	55.8	79.3
Excluding Russia	–7.5	1.0	10.0	–5.0	–15.2	–0.6	–16.9	–25.0	–19.5	–17.2	–11.3
Emerging and Developing Asia	274.5	233.3	97.6	121.7	99.5	231.2	314.7	216.8	139.0	128.9	52.3
China	243.3	237.8	136.1	215.4	148.2	236.0	304.2	196.4	149.3	158.6	168.4
India	–38.4	–48.1	–78.2	–87.8	–32.3	–26.8	–22.1	–20.9	–36.5	–41.5	–80.9
ASEAN-5[3]	66.1	45.4	49.4	6.4	–3.6	22.7	31.7	46.2	36.6	26.5	–14.1
Emerging and Developing Europe	–53.9	–86.9	–119.5	–81.9	–72.2	–59.2	–35.9	–34.6	–49.9	–52.8	–65.5
Latin America and the Caribbean	–33.7	–97.4	–117.1	–141.9	–165.7	–191.9	–183.1	–107.2	–113.0	–130.3	–172.3
Brazil	–26.3	–75.8	–77.0	–74.2	–74.8	–104.2	–58.9	–23.5	–28.4	–38.2	–51.1
Mexico	–8.7	–5.3	–14.0	–17.0	–31.0	–26.2	–33.3	–27.9	–24.5	–27.5	–29.8
Middle East, North Africa, Afghanistan, and Pakistan	32.6	167.0	409.2	411.3	342.3	185.1	–127.6	–105.0	–36.0	–27.8	–36.6
Sub-Saharan Africa	–29.8	–11.7	–11.2	–27.8	–38.1	–66.4	–91.4	–56.0	–56.8	–59.9	–85.8
South Africa	–8.1	–5.6	–9.2	–20.3	–21.6	–18.7	–14.0	–9.6	–10.8	–11.7	–14.5
Analytical Groups											
By Source of Export Earnings											
Fuel	125.4	299.3	605.4	577.9	457.1	279.9	–104.0	–81.1	26.4	41.8	62.6
Nonfuel	108.7	–24.8	–239.1	–230.1	–272.9	–124.1	32.9	–7.7	–111.1	–145.1	–302.7
Of Which, Primary Products	–4.1	–11.7	–27.6	–59.1	–71.0	–47.9	–51.3	–39.4	–45.4	–52.6	–75.6
By External Financing Source											
Net Debtor Economies	–177.9	–275.2	–374.7	–420.3	–393.0	–375.9	–316.0	–225.0	–262.9	–297.0	–451.7
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2011–15	–27.3	–19.4	–32.6	–49.3	–48.9	–33.4	–39.8	–40.8	–34.7	–36.3	–56.7
Memorandum											
World	**143.0**	**275.3**	**321.2**	**356.2**	**408.3**	**388.3**	**225.4**	**285.8**	**250.0**	**109.2**	**–38.6**
European Union	–19.9	2.1	77.2	204.0	301.8	309.7	359.9	389.9	372.5	386.7	413.2
Low-Income Developing Countries	–24.1	–20.6	–31.4	–37.1	–43.1	–49.8	–77.5	–43.7	–47.8	–55.2	–98.4
Middle East and North Africa	40.3	169.9	408.0	414.9	343.1	187.8	–125.4	–103.1	–28.0	–18.6	–27.0

Table A10. Summary of Current Account Balances *(continued)*

(Percent of GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	2018	2022
Advanced Economies	**–0.2**	**0.0**	**–0.1**	**0.0**	**0.5**	**0.5**	**0.7**	**0.8**	**0.7**	**0.4**	**0.4**
United States	–2.7	–3.0	–3.0	–2.8	–2.2	–2.3	–2.6	–2.6	–2.7	–3.3	–3.2
Euro Area	0.1	0.2	0.2	1.3	2.2	2.4	3.0	3.4	3.0	3.0	2.8
Germany	5.7	5.6	6.1	7.0	6.7	7.3	8.3	8.5	8.2	8.0	7.4
France	–0.8	–0.8	–1.0	–1.2	–0.9	–1.1	–0.2	–1.1	–0.9	–0.5	0.5
Italy	–1.9	–3.4	–3.0	–0.4	1.0	1.9	1.6	2.7	2.0	1.8	0.7
Spain	–4.3	–3.9	–3.2	–0.2	1.5	1.1	1.4	2.0	1.5	1.6	1.8
Japan	2.8	3.9	2.1	1.0	0.9	0.8	3.1	3.9	4.2	4.3	4.3
United Kingdom	–3.0	–2.7	–1.8	–3.7	–4.4	–4.7	–4.3	–4.4	–3.3	–2.9	–2.1
Canada	–2.9	–3.6	–2.8	–3.6	–3.2	–2.4	–3.4	–3.3	–2.9	–2.7	–1.8
Other Advanced Economies[1]	4.2	5.0	4.2	4.3	5.2	5.4	5.9	5.9	5.5	5.3	4.7
Emerging Market and Developing Economies	**1.2**	**1.2**	**1.4**	**1.2**	**0.6**	**0.5**	**–0.2**	**–0.3**	**–0.3**	**–0.3**	**–0.5**
Regional Groups											
Commonwealth of Independent States[2]	2.5	3.2	4.1	2.3	0.6	2.1	2.8	–0.2	1.6	1.8	2.6
Russia	3.8	4.1	4.8	3.3	1.5	2.8	5.1	1.7	3.3	3.5	4.3
Excluding Russia	–1.8	0.2	1.7	–0.8	–2.1	–0.1	–3.2	–5.4	–3.9	–3.2	–1.6
Emerging and Developing Asia	3.4	2.4	0.8	0.9	0.7	1.5	2.0	1.3	0.8	0.7	0.2
China	4.7	3.9	1.8	2.5	1.5	2.2	2.7	1.8	1.3	1.2	1.0
India	–2.8	–2.8	–4.3	–4.8	–1.7	–1.3	–1.1	–0.9	–1.5	–1.5	–2.1
ASEAN-5[3]	4.9	2.7	2.6	0.3	–0.2	1.1	1.6	2.2	1.6	1.1	–0.4
Emerging and Developing Europe	–3.4	–5.0	–6.3	–4.4	–3.6	–2.9	–2.0	–1.9	–2.8	–2.8	–2.8
Latin America and the Caribbean	–0.8	–1.9	–2.0	–2.4	–2.8	–3.2	–3.5	–2.1	–2.1	–2.3	–2.5
Brazil	–1.6	–3.4	–2.9	–3.0	–3.0	–4.2	–3.3	–1.3	–1.3	–1.7	–1.9
Mexico	–1.0	–0.5	–1.2	–1.4	–2.5	–2.0	–2.9	–2.7	–2.5	–2.7	–2.3
Middle East, North Africa, Afghanistan, and Pakistan	1.4	6.1	12.7	12.4	10.1	5.3	–4.1	–3.4	–1.1	–0.8	–0.8
Sub-Saharan Africa	–2.8	–0.9	–0.8	–1.8	–2.4	–3.9	–6.0	–4.0	–3.8	–3.7	–4.1
South Africa	–2.7	–1.5	–2.2	–5.1	–5.9	–5.3	–4.4	–3.3	–3.4	–3.6	–3.8
Analytical Groups											
By Source of Export Earnings											
Fuel	3.0	5.9	9.8	8.9	6.9	4.3	–2.0	–1.7	0.5	0.7	0.9
Nonfuel	0.7	–0.1	–1.2	–1.1	–1.2	–0.5	0.1	0.0	–0.4	–0.5	–0.8
Of Which, Primary Products	–0.4	–0.9	–1.7	–3.6	–4.2	–2.9	–3.1	–2.5	–2.6	–2.9	–3.1
By External Financing Source											
Net Debtor Economies	–1.9	–2.4	–2.9	–3.2	–2.9	–2.7	–2.5	–1.7	–1.9	–2.0	–2.3
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2011–15	–5.0	–3.1	–4.7	–6.6	–6.2	–4.3	–5.3	–5.4	–5.0	–5.0	–5.4
Memorandum											
World	**0.2**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.3**	**0.4**	**0.3**	**0.1**	**0.0**
European Union	–0.1	0.0	0.4	1.2	1.7	1.7	2.2	2.4	2.3	2.3	2.2
Low-Income Developing Countries	–2.1	–1.6	–2.1	–2.3	–2.4	–2.6	–4.1	–2.4	–2.5	–2.6	–3.3
Middle East and North Africa	1.8	6.6	13.6	13.5	10.9	5.9	–4.4	–3.7	–1.0	–0.6	–0.7

Table A10. Summary of Current Account Balances *(continued)*

(Percent of exports of goods and services)

									Projections		
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2022
Advanced Economies	**–0.9**	**0.0**	**–0.3**	**0.1**	**1.6**	**1.6**	**2.2**	**2.8**	**2.4**	**1.5**	**1.2**
United States	–24.3	–23.8	–21.6	–20.1	–16.0	–16.5	–20.5	–21.8	–22.4	–27.4	–24.6
Euro Area	0.8	1.1	1.0	5.0	8.4	9.0	11.0	12.5	. . .	. . .	. . .
Germany	15.2	13.3	13.6	15.3	14.8	16.0	17.8	18.4	17.4	16.7	14.7
France	–3.4	–3.1	–3.4	–4.1	–2.9	–3.5	–0.6	–3.7	–2.8	–1.3	1.2
Italy	–8.4	–13.5	–11.1	–1.3	3.3	6.4	5.4	9.2	6.7	5.6	1.9
Spain	–18.9	–15.3	–11.0	–0.8	4.7	3.3	4.1	6.1	4.5	4.5	4.7
Japan	21.7	25.4	13.9	6.5	5.5	4.2	17.3	23.6	23.8	23.8	23.2
United Kingdom	–11.2	–9.7	–5.9	–12.3	–14.8	–16.6	–15.5	–15.4	–11.0	–9.8	–7.8
Canada	–10.4	–12.4	–9.1	–11.9	–10.7	–7.7	–10.8	–10.8	–9.2	–8.6	–5.5
Other Advanced Economies[1]	7.8	8.8	7.0	7.1	8.7	9.1	10.2	10.7	9.8	9.4	8.2
Emerging Market and Developing Economies	**4.2**	**3.9**	**4.4**	**3.8**	**2.0**	**1.9**	**–0.7**	**–1.0**	**–1.0**	**–1.1**	**–2.0**
Regional Groups											
Commonwealth of Independent States[2]	8.2	10.2	12.1	7.3	2.0	6.7	8.9	–0.6	5.3	6.1	8.9
Russia	14.7	15.3	17.0	12.1	5.6	10.2	17.5	6.7	12.7	13.4	16.1
Excluding Russia	–4.1	0.5	3.2	–1.5	–5.0	–0.2	–8.7	–14.5	–9.6	–8.0	–4.1
Emerging and Developing Asia	12.5	8.3	2.8	3.3	2.6	5.7	8.3	5.9	3.5	3.1	1.0
China	19.5	14.8	6.8	9.9	6.3	9.6	12.9	8.9	6.4	6.5	5.9
India	–13.8	–12.6	–17.3	–19.4	–6.9	–5.6	–5.3	–4.7	–7.4	–7.8	–10.4
ASEAN-5[3]	10.9	6.1	5.5	0.7	–0.4	2.3	3.5	5.1	3.8	2.6	–1.1
Emerging and Developing Europe	–10.3	–14.8	–17.3	–11.9	–9.7	–7.5	–5.1	–4.8	–6.4	–6.3	–6.1
Latin America and the Caribbean	–4.2	–9.7	–9.6	–11.4	–13.2	–15.7	–17.2	–10.4	–10.0	–11.0	–11.7
Brazil	–14.6	–32.7	–26.3	–26.4	–26.8	–39.5	–26.3	–10.8	–11.6	–15.4	–17.9
Mexico	–3.6	–1.7	–3.8	–4.4	–7.7	–6.3	–8.3	–7.0	–5.7	–6.0	–4.7
Middle East, North Africa, Afghanistan, and Pakistan	2.5	13.3	26.7	24.3	20.9	13.1	–9.8	–8.6	–2.5	–1.4	–0.2
Sub-Saharan Africa	–9.9	–3.0	–2.3	–5.8	–7.9	–14.6	–26.3	–17.7	–15.9	–15.8	–18.4
South Africa	–9.8	–5.2	–7.3	–17.3	–19.0	–17.0	–14.5	–10.8	–11.5	–12.1	–12.9
Analytical Groups											
By Source of Export Earnings											
Fuel	8.0	15.5	24.1	21.3	17.3	12.0	–5.1	–4.5	1.8	2.8	4.6
Nonfuel	2.8	–0.5	–4.1	–3.9	–4.4	–1.9	0.6	–0.1	–1.8	–2.2	–3.7
Of Which, Primary Products	–1.4	–3.1	–6.2	–13.9	–16.8	–11.7	–14.5	–11.6	–12.3	–13.6	–16.0
By External Financing Source											
Net Debtor Economies	–7.3	–9.1	–10.3	–11.3	–10.3	–9.8	–9.3	–6.6	–7.1	–7.5	–8.7
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2011–15	–17.8	–10.4	–14.7	–22.6	–22.4	–16.8	–24.3	–27.4	–20.9	–19.8	–23.2
Memorandum											
World	**0.8**	**1.4**	**1.4**	**1.5**	**1.7**	**1.7**	**1.2**	**1.5**	**1.2**	**0.5**	**0.0**
European Union	–0.3	0.0	1.0	2.8	3.9	3.9	5.0	5.4	5.1	5.0	4.5
Low-Income Developing Countries	–8.0	–5.4	–6.4	–7.4	–8.0	–9.0	–15.7	–8.9	–8.7	–9.1	–11.9
Middle East and North Africa	3.4	13.9	27.3	25.0	21.4	13.5	–9.9	–8.7	–1.9	–0.7	0.5

[1]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.
[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[3]Indonesia, Malaysia, Philippines, Thailand, Vietnam.

Table A11. Advanced Economies: Balance on Current Account

(Percent of GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	2018	2022
Advanced Economies	**–0.2**	**0.0**	**–0.1**	**0.0**	**0.5**	**0.5**	**0.7**	**0.8**	**0.7**	**0.4**	**0.4**
United States	–2.7	–3.0	–3.0	–2.8	–2.2	–2.3	–2.6	–2.6	–2.7	–3.3	–3.2
Euro Area[1]	0.1	0.2	0.2	1.3	2.2	2.4	3.0	3.4	3.0	3.0	2.8
Germany	5.7	5.6	6.1	7.0	6.7	7.3	8.3	8.5	8.2	8.0	7.4
France	–0.8	–0.8	–1.0	–1.2	–0.9	–1.1	–0.2	–1.1	–0.9	–0.5	0.5
Italy	–1.9	–3.4	–3.0	–0.4	1.0	1.9	1.6	2.7	2.0	1.8	0.7
Spain	–4.3	–3.9	–3.2	–0.2	1.5	1.1	1.4	2.0	1.5	1.6	1.8
Netherlands	5.8	7.4	9.1	10.8	9.9	8.9	8.7	9.6	9.2	9.1	8.5
Belgium	–1.1	1.8	–1.1	–0.1	–0.3	–0.7	0.4	1.0	0.9	1.0	1.9
Austria	2.6	2.9	1.6	1.5	2.0	2.4	1.8	2.4	2.4	2.2	2.1
Greece	–12.3	–11.4	–10.0	–3.8	–2.0	–1.6	0.1	–0.6	–0.3	0.0	0.1
Portugal	–10.4	–10.1	–6.0	–1.8	1.6	0.1	0.1	0.8	–0.3	–0.4	–1.6
Ireland	–4.7	–1.2	–1.6	–2.6	2.1	1.7	10.2	4.7	4.7	4.7	4.5
Finland	1.9	1.2	–1.8	–1.9	–1.6	–1.1	–0.4	–1.1	–1.3	–1.2	–0.8
Slovak Republic	–3.4	–4.7	–5.0	0.9	1.8	1.2	0.2	0.4	0.3	0.2	1.4
Lithuania	2.1	–0.3	–3.9	–1.2	1.5	3.6	–2.3	–0.9	–1.6	–1.5	–2.6
Slovenia	–0.6	–0.1	0.2	2.6	4.8	6.2	5.2	6.8	5.5	5.1	3.3
Luxembourg	7.4	6.7	6.1	5.9	5.6	5.1	5.2	4.8	5.1	5.1	5.8
Latvia	7.8	2.0	–3.2	–3.6	–2.7	–2.0	–0.8	1.5	–1.1	–1.4	–1.4
Estonia	2.5	1.8	1.3	–2.4	–0.1	1.0	2.2	2.7	1.4	0.9	–1.9
Cyprus	–7.7	–11.3	–4.1	–6.0	–4.9	–4.3	–2.9	–2.4	–2.5	–2.5	–2.2
Malta	–6.6	–4.7	–0.2	1.7	3.1	9.5	5.2	5.8	5.5	5.3	5.0
Japan	2.8	3.9	2.1	1.0	0.9	0.8	3.1	3.9	4.2	4.3	4.3
United Kingdom	–3.0	–2.7	–1.8	–3.7	–4.4	–4.7	–4.3	–4.4	–3.3	–2.9	–2.1
Korea	3.7	2.6	1.6	4.2	6.2	6.0	7.7	7.0	6.2	6.1	5.7
Canada	–2.9	–3.6	–2.8	–3.6	–3.2	–2.4	–3.4	–3.3	–2.9	–2.7	–1.8
Australia	–4.6	–3.6	–3.0	–4.1	–3.2	–2.9	–4.7	–2.6	–2.8	–2.9	–3.5
Taiwan Province of China	10.9	8.9	8.2	9.5	10.4	12.0	14.5	14.2	14.8	15.0	15.8
Switzerland	7.5	14.9	8.0	10.5	11.5	8.8	11.5	12.0	10.8	10.5	8.8
Sweden	6.0	6.0	5.5	5.6	5.3	4.6	4.7	4.7	4.6	4.2	3.6
Singapore	16.8	23.4	22.1	17.4	16.9	19.7	18.1	19.0	20.1	19.2	17.1
Hong Kong SAR	9.9	7.0	5.6	1.6	1.5	1.4	3.3	5.1	3.0	3.1	3.5
Norway	10.6	10.9	12.4	12.4	10.2	11.0	8.7	4.6	5.7	5.7	6.3
Czech Republic	–2.3	–3.6	–2.1	–1.6	–0.5	0.2	0.9	1.1	1.2	0.7	–0.8
Israel	3.6	3.6	2.3	0.5	3.5	4.0	4.3	3.6	3.4	3.4	3.2
Denmark	3.5	6.6	6.6	6.3	7.8	8.9	9.2	8.1	7.5	7.2	6.3
New Zealand	–2.2	–2.3	–2.8	–3.9	–3.2	–3.2	–3.4	–2.7	–2.5	–3.1	–3.5
Puerto Rico	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Macao SAR	28.2	39.4	41.0	39.3	40.2	34.2	25.4	27.1	29.5	30.5	29.3
Iceland	–9.6	–6.6	–5.3	–4.0	6.0	4.0	5.5	8.0	6.9	6.7	5.2
San Marino	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Memorandum											
Major Advanced Economies	–0.7	–0.8	–0.8	–1.0	–0.7	–0.7	–0.6	–0.4	–0.4	–0.7	–0.7
Euro Area[2]	0.4	0.5	0.8	2.2	2.8	3.0	3.7	3.8	3.5	3.5	3.4

[1]Data corrected for reporting discrepancies in intra-area transactions.
[2]Data calculated as the sum of the balances of individual euro area countries.

Table A12. Emerging Market and Developing Economies: Balance on Current Account

(Percent of GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	2018	2022
Commonwealth of Independent States[1]	**2.5**	**3.2**	**4.1**	**2.3**	**0.6**	**2.1**	**2.8**	**–0.2**	**1.6**	**1.8**	**2.6**
Russia	3.8	4.1	4.8	3.3	1.5	2.8	5.1	1.7	3.3	3.5	4.3
Excluding Russia	–1.8	0.2	1.7	–0.8	–2.1	–0.1	–3.2	–5.4	–3.9	–3.2	–1.6
Armenia	–16.5	–13.6	–10.4	–10.0	–7.3	–7.6	–2.7	–2.9	–3.2	–2.9	–4.3
Azerbaijan	22.8	28.0	26.5	20.0	16.1	13.3	–0.4	–3.8	1.3	3.8	6.3
Belarus	–12.0	–14.5	–8.2	–2.8	–10.0	–6.6	–3.6	–4.3	–4.7	–5.0	–3.5
Georgia	–10.5	–10.2	–12.8	–11.7	–5.8	–10.6	–12.0	–12.4	–12.9	–12.5	–9.2
Kazakhstan	–3.6	0.9	5.3	0.5	0.5	2.7	–3.0	–6.1	–4.0	–2.8	0.6
Kyrgyz Republic	0.9	–2.2	–2.9	3.7	–1.1	–16.0	–11.1	–9.4	–12.0	–12.1	–9.1
Moldova	–8.2	–7.5	–11.7	–7.5	–5.2	–5.3	–5.0	–3.4	–3.8	–4.0	–4.9
Tajikistan	–3.6	–9.6	–7.3	–9.2	–7.8	–2.8	–6.0	–5.1	–5.5	–5.1	–3.2
Turkmenistan	–16.6	–12.9	–0.8	–0.9	–7.3	–6.4	–14.0	–21.0	–12.8	–11.5	–10.8
Ukraine[2]	–1.4	–2.2	–6.3	–8.1	–9.2	–3.9	–0.3	–3.6	–3.6	–2.9	–3.2
Uzbekistan	2.6	6.6	5.8	1.2	2.9	1.7	–0.5	1.4	2.1	1.6	2.8
Emerging and Developing Asia	**3.4**	**2.4**	**0.8**	**0.9**	**0.7**	**1.5**	**2.0**	**1.3**	**0.8**	**0.7**	**0.2**
Bangladesh	2.4	0.4	–1.0	0.7	1.2	1.3	1.9	0.9	–0.5	–1.0	–2.2
Bhutan	–6.3	–22.2	–29.8	–21.5	–25.4	–26.4	–28.3	–29.1	–29.4	–16.6	9.9
Brunei Darussalam	32.3	36.6	34.7	29.8	20.9	30.7	16.0	9.5	8.3	4.3	18.9
Cambodia	–6.9	–6.8	–10.2	–11.0	–12.3	–12.1	–10.6	–8.7	–8.5	–8.5	–8.0
China	4.7	3.9	1.8	2.5	1.5	2.2	2.7	1.8	1.3	1.2	1.0
Fiji	–4.0	–4.3	–5.1	–1.4	–9.7	–7.6	–1.5	–3.0	–5.8	–6.2	–5.7
India	–2.8	–2.8	–4.3	–4.8	–1.7	–1.3	–1.1	–0.9	–1.5	–1.5	–2.1
Indonesia	1.8	0.7	0.2	–2.7	–3.2	–3.1	–2.0	–1.8	–1.9	–2.0	–2.1
Kiribati	–13.3	–2.2	–13.4	–4.5	8.2	24.0	43.2	5.0	–5.7	–9.7	–4.9
Lao P.D.R.	–22.0	–19.7	–18.6	–29.9	–29.6	–20.7	–16.8	–17.0	–18.8	–19.2	–14.5
Malaysia	15.0	10.1	10.9	5.2	3.5	4.4	3.0	2.0	1.8	1.8	1.8
Maldives	–10.5	–8.2	–16.5	–7.3	–4.5	–3.8	–10.2	–17.9	–16.7	–14.8	–10.6
Marshall Islands	–10.3	–20.5	2.6	0.1	–7.7	0.0	17.9	13.6	10.8	9.4	5.3
Micronesia	–19.0	–15.4	–18.8	–13.4	–10.1	1.2	8.6	8.2	6.7	5.6	3.0
Mongolia	–6.9	–13.0	–26.5	–27.4	–25.4	–11.5	–4.0	–4.1	–4.4	–9.5	–6.2
Myanmar	–1.2	–1.1	–1.8	–4.0	–4.9	–3.3	–5.2	–6.5	–6.6	–6.7	–6.4
Nauru	63.8	46.3	26.1	38.1	18.8	–13.5	–9.5	1.7	0.5	–1.8	2.2
Nepal	4.2	–2.4	–1.0	4.8	3.3	4.5	5.0	6.3	–0.3	–1.3	–2.1
Palau	–9.9	–9.0	–11.7	–11.2	–11.8	–14.6	–3.4	–6.3	–7.8	–8.8	–4.4
Papua New Guinea	–8.4	–20.5	–24.0	–36.1	–31.5	3.0	19.6	15.3	15.9	14.2	10.5
Philippines	5.0	3.6	2.5	2.8	4.2	3.8	2.5	0.2	–0.1	–0.3	–1.0
Samoa	–5.3	–6.8	–3.1	–6.3	–0.4	–8.1	–3.0	–6.1	–6.1	–5.9	–4.3
Solomon Islands	–21.9	–33.4	–8.7	1.8	–3.5	–4.3	–2.7	–1.7	–4.0	–5.2	–7.4
Sri Lanka	–0.4	–1.9	–7.1	–5.8	–3.4	–2.5	–2.5	–2.3	–2.8	–2.3	–2.0
Thailand	7.9	3.4	2.5	–0.4	–1.2	3.7	8.1	11.4	9.7	7.8	3.0
Timor-Leste	37.9	39.3	39.4	40.2	42.4	26.2	8.3	–4.7	13.0	–9.6	–12.1
Tonga	–19.4	–18.8	–17.2	–12.3	–7.9	–9.3	–7.2	–2.1	–7.8	–11.5	–5.4
Tuvalu	6.9	–11.9	–36.5	17.2	1.2	19.3	7.6	–4.4	–5.4	–3.9	–0.7
Vanuatu	–7.9	–5.4	–8.1	–6.5	–3.3	–0.3	–9.2	–12.1	–14.9	–12.6	–4.7
Vietnam	–6.5	–3.8	0.2	6.0	4.5	5.1	0.5	4.7	4.1	3.4	0.6
Emerging and Developing Europe	**–3.4**	**–5.0**	**–6.3**	**–4.4**	**–3.6**	**–2.9**	**–2.0**	**–1.9**	**–2.8**	**–2.8**	**–2.8**
Albania	–15.9	–11.3	–13.2	–10.1	–10.8	–12.9	–10.8	–12.1	–13.7	–13.0	–9.5
Bosnia and Herzegovina	–6.4	–6.1	–9.5	–8.7	–5.3	–7.4	–5.7	–5.6	–6.3	–6.3	–4.3
Bulgaria	–8.3	–1.7	0.3	–0.9	1.3	0.1	–0.1	4.2	2.3	2.0	–0.8
Croatia	–5.1	–1.1	–0.7	–0.1	1.0	2.1	5.1	3.9	2.8	1.8	0.3
Hungary	–0.8	0.3	0.7	1.8	3.8	2.1	3.4	4.3	3.7	3.0	1.0
Kosovo	–9.2	–11.6	–12.7	–5.8	–3.6	–7.0	–8.5	–9.7	–10.8	–11.1	–9.7
FYR Macedonia	–6.8	–2.0	–2.5	–3.2	–1.6	–0.5	–2.1	–3.1	–1.8	–2.0	–3.0
Montenegro	–27.9	–22.7	–17.6	–18.5	–14.5	–15.2	–13.3	–19.1	–22.0	–25.6	–17.1
Poland	–4.1	–5.4	–5.2	–3.7	–1.3	–2.1	–0.6	–0.3	–1.7	–1.8	–2.7
Romania	–4.8	–5.1	–4.9	–4.8	–1.1	–0.7	–1.2	–2.4	–2.8	–2.5	–2.7
Serbia	–6.2	–6.4	–8.6	–11.5	–6.1	–6.0	–4.7	–4.0	–4.0	–4.0	–3.8
Turkey	–1.8	–5.8	–8.9	–5.5	–6.7	–4.7	–3.7	–3.8	–4.7	–4.6	–3.5

Table A12. Emerging Market and Developing Economies: Balance on Current Account *(continued)*

(Percent of GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	2018	2022
Latin America and the Caribbean	**–0.8**	**–1.9**	**–2.0**	**–2.4**	**–2.8**	**–3.2**	**–3.5**	**–2.1**	**–2.1**	**–2.3**	**–2.5**
Antigua and Barbuda	–13.9	–14.6	–10.3	–14.8	–15.1	–12.5	–5.2	–5.9	–9.8	–9.6	–9.6
Argentina	2.5	–0.3	–0.8	–0.2	–2.0	–1.4	–2.7	–2.6	–2.9	–3.4	–4.2
The Bahamas	–10.3	–10.1	–15.1	–17.9	–17.5	–22.0	–16.0	–11.4	–13.1	–10.8	–6.9
Barbados	–6.6	–5.4	–12.4	–8.7	–8.6	–9.5	–5.9	–4.5	–4.0	–4.0	–4.4
Belize	–4.9	–2.5	–1.1	–1.2	–4.6	–7.5	–9.9	–11.0	–7.5	–5.9	–3.4
Bolivia	4.3	3.9	0.3	7.2	2.4	1.4	–5.6	–5.4	–3.9	–2.6	–3.4
Brazil	–1.6	–3.4	–2.9	–3.0	–3.0	–4.2	–3.3	–1.3	–1.3	–1.7	–1.9
Chile	1.8	1.4	–1.7	–4.0	–4.1	–1.7	–1.9	–1.4	–1.4	–1.7	–2.3
Colombia	–2.0	–3.0	–2.9	–3.0	–3.2	–5.1	–6.4	–4.4	–3.6	–3.3	–2.7
Costa Rica	–1.8	–3.2	–5.3	–5.1	–4.8	–4.6	–4.5	–3.5	–3.8	–4.0	–4.3
Dominica	–22.7	–15.9	–14.1	–17.3	–9.7	–9.5	–8.0	–7.8	–9.5	–10.3	–8.3
Dominican Republic	–4.8	–7.5	–7.5	–6.4	–4.1	–3.3	–2.0	–1.5	–1.9	–2.5	–3.9
Ecuador	0.5	–2.3	–0.5	–0.2	–1.0	–0.6	–2.2	1.1	0.9	–0.1	–1.1
El Salvador	–1.5	–2.5	–4.8	–5.4	–6.5	–5.2	–3.6	–2.5	–3.2	–3.3	–5.0
Grenada	–24.3	–23.7	–23.6	–21.1	–23.2	–17.5	–17.7	–17.6	–18.7	–18.5	–20.0
Guatemala	0.7	–1.4	–3.4	–2.6	–2.5	–2.1	–0.3	0.8	0.6	0.1	–2.1
Guyana	–9.1	–9.6	–13.0	–11.6	–13.3	–9.6	–5.7	3.5	–2.7	–3.5	1.5
Haiti	–1.9	–1.5	–4.3	–5.7	–6.6	–8.5	–3.1	–0.9	–2.6	–2.4	–2.1
Honduras	–3.8	–4.3	–8.0	–8.6	–9.6	–7.3	–6.2	–3.8	–3.8	–4.7	–3.9
Jamaica	–11.0	–8.0	–12.2	–11.1	–9.2	–7.5	–3.0	–2.7	–3.1	–3.3	–3.2
Mexico	–1.0	–0.5	–1.2	–1.4	–2.5	–2.0	–2.9	–2.7	–2.5	–2.7	–2.3
Nicaragua	–8.7	–9.0	–12.1	–10.5	–10.9	–7.7	–8.2	–9.5	–9.4	–8.5	–8.3
Panama	–0.8	–10.8	–13.2	–10.5	–9.8	–13.7	–7.3	–5.3	–4.7	–4.4	–3.0
Paraguay	3.0	–0.3	0.4	–2.0	1.7	–0.4	–1.1	0.6	–1.4	–0.5	0.5
Peru	–0.5	–2.4	–1.9	–2.7	–4.4	–4.4	–4.9	–2.8	–1.9	–2.0	–2.7
St. Kitts and Nevis	–25.2	–20.4	–13.0	–7.6	–11.1	–7.8	–8.5	–14.5	–18.3	–18.1	–14.6
St. Lucia	–11.6	–16.3	–19.0	–13.5	–11.1	–8.9	–2.6	–6.7	–8.8	–9.3	–9.2
St. Vincent and the Grenadines	–29.2	–30.6	–29.4	–27.6	–30.9	–25.1	–21.2	–18.9	–18.4	–17.5	–14.9
Suriname	2.9	13.0	9.8	3.3	–3.8	–7.9	–16.6	–4.4	2.8	1.2	2.0
Trinidad and Tobago	8.6	18.8	7.0	–10.7	12.9	1.4	–1.0	–5.5	–4.1	–3.7	–2.7
Uruguay	–1.2	–1.8	–2.7	–5.1	–5.0	–4.5	–2.1	–1.0	–1.5	–1.6	–2.5
Venezuela	0.2	1.9	4.9	0.8	2.0	1.7	–7.8	–2.4	–3.3	–2.1	–1.8
Middle East, North Africa, Afghanistan, and Pakistan	**1.4**	**6.1**	**12.7**	**12.4**	**10.1**	**5.3**	**–4.1**	**–3.4**	**–1.1**	**–0.8**	**–0.8**
Afghanistan	13.1	6.7	5.2	5.3	8.5	2.2	2.9	7.1	4.5	2.3	–1.2
Algeria	0.3	7.5	9.9	5.9	0.4	–4.4	–16.6	–16.4	–12.3	–10.2	–7.3
Bahrain	2.4	3.0	8.8	8.4	7.4	4.6	–2.4	–4.7	–3.6	–3.6	–3.1
Djibouti	–6.6	2.8	–13.1	–18.8	–21.5	–25.1	–31.8	–28.6	–21.6	–19.0	–17.6
Egypt	–3.8	–1.9	–2.5	–3.6	–2.2	–0.8	–3.7	–5.6	–5.3	–3.9	–1.6
Iran	2.2	4.4	10.6	6.1	7.0	3.8	2.4	6.3	5.3	5.1	2.8
Iraq	–11.5	1.6	10.9	5.1	1.1	2.6	–6.5	–7.3	–4.4	–4.9	–1.0
Jordan	–5.2	–7.1	–10.3	–15.2	–10.3	–7.3	–9.1	–9.4	–8.6	–7.4	–6.1
Kuwait	26.7	31.8	42.9	45.5	39.9	33.4	5.2	2.7	8.2	7.1	5.1
Lebanon	–11.9	–20.7	–15.5	–23.0	–26.7	–28.1	–18.4	–16.0	–15.5	–14.9	–12.4
Libya[3]	16.7	19.9	8.2	26.7	14.1	–34.5	–61.7	–40.7	–10.6	–13.3	–18.4
Mauritania	–13.4	–8.2	–5.0	–24.1	–22.0	–27.3	–19.7	–16.2	–15.1	–10.2	–6.3
Morocco	–5.4	–4.4	–7.6	–9.3	–7.6	–5.7	–2.2	–3.9	–2.6	–2.0	–1.1
Oman	–1.0	8.3	13.0	10.1	6.6	5.8	–15.5	–15.5	–12.3	–11.1	–6.7
Pakistan	–5.5	–2.2	0.1	–2.1	–1.1	–1.3	–1.0	–1.1	–2.9	–3.0	–2.1
Qatar	6.5	19.1	31.1	33.2	30.4	24.0	8.4	–2.2	0.7	0.6	2.6
Saudi Arabia	4.9	12.7	23.6	22.4	18.1	9.8	–8.7	–3.9	1.5	2.0	1.0
Sudan[4]	–9.6	–2.1	–0.4	–9.3	–8.7	–7.0	–7.8	–5.8	–4.7	–4.3	–3.2
Syria[5]	–2.9	–2.8	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Tunisia	–2.8	–4.8	–7.4	–8.3	–8.4	–9.1	–8.9	–9.0	–8.6	–8.1	–6.1
United Arab Emirates	3.1	4.3	12.7	19.8	19.1	10.0	3.3	2.4	3.5	3.9	4.8
Yemen	–10.1	–3.4	–3.0	–1.7	–3.1	–1.7	–5.5	–5.6	–4.2	–3.1	–3.3

Table A12. Emerging Market and Developing Economies: Balance on Current Account *(continued)*

(Percent of GDP)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	2018	2022
Sub-Saharan Africa	**–2.8**	**–0.9**	**–0.8**	**–1.8**	**–2.4**	**–3.9**	**–6.0**	**–4.0**	**–3.8**	**–3.7**	**–4.1**
Angola	–10.0	9.1	12.6	12.0	6.7	–3.0	–10.0	–4.3	–3.8	–3.2	–3.5
Benin	–8.3	–8.2	–7.3	–7.4	–7.4	–8.6	–8.4	–7.2	–9.1	–7.4	–5.1
Botswana	–6.3	–2.6	3.1	0.3	8.9	15.4	7.8	14.7	1.8	–1.0	4.2
Burkina Faso	–4.7	–2.2	–1.5	–7.0	–11.3	–8.1	–8.0	–7.7	–7.2	–7.0	–6.5
Burundi	–6.0	–12.2	–14.5	–18.6	–19.7	–19.2	–22.0	–17.1	–14.1	–14.2	–12.3
Cabo Verde	–14.6	–12.4	–16.3	–12.6	–4.9	–9.1	–4.4	–7.1	–8.5	–8.0	–4.7
Cameroon	–3.5	–2.8	–3.0	–3.6	–3.9	–4.3	–4.1	–3.6	–3.1	–3.0	–1.6
Central African Republic	–9.1	–10.2	–7.6	–4.6	–3.0	–5.6	–9.0	–8.9	–7.6	–9.9	–4.8
Chad	–8.2	–8.5	–5.8	–7.8	–9.1	–8.9	–12.3	–8.8	–4.7	–6.2	–4.5
Comoros	–6.2	–0.2	–4.9	–7.2	–8.1	–8.6	0.6	–9.3	–10.1	–10.6	–13.7
Democratic Republic of the Congo	–6.1	–10.5	–5.2	–4.6	–5.2	–5.0	–3.9	–4.4	–3.8	–2.9	–2.4
Republic of Congo	–14.1	7.8	–3.1	17.7	1.7	–11.6	–42.9	–28.5	–4.7	12.1	7.6
Côte d'Ivoire	6.6	1.9	10.4	–1.2	–1.4	1.4	–1.0	–2.2	–4.0	–3.5	–1.9
Equatorial Guinea	–18.1	–29.2	–2.1	–3.9	–0.5	–5.5	–13.4	–17.3	–10.6	–10.0	–7.1
Eritrea	–7.6	–5.6	0.6	2.3	–0.1	0.6	–2.2	–0.1	0.5	0.1	–1.3
Ethiopia	–6.7	–1.4	–2.5	–6.9	–5.9	–6.4	–11.6	–9.9	–10.0	–9.1	–7.8
Gabon	4.4	14.9	21.0	17.7	7.1	7.4	–5.4	–9.0	–8.3	–6.3	3.2
The Gambia	–12.5	–16.3	–12.3	–7.9	–10.2	–10.8	–15.0	–10.1	–10.9	–10.6	–9.0
Ghana	–5.5	–8.6	–9.0	–11.7	–11.9	–9.6	–7.7	–6.4	–6.0	–4.9	–4.2
Guinea	–8.2	–9.3	–24.8	–26.0	–17.2	–17.6	–20.2	–12.9	–14.2	–12.2	–15.6
Guinea-Bissau	–5.3	–8.6	–4.2	–11.9	–7.2	–2.8	–0.5	2.7	–3.4	–4.6	–2.2
Kenya	–4.4	–5.9	–9.2	–8.4	–8.8	–9.8	–6.8	–5.5	–5.8	–5.7	–5.3
Lesotho	3.1	–8.5	–13.0	–8.9	–9.2	–7.8	–8.0	–7.7	–6.9	–3.7	–10.4
Liberia	–23.2	–32.0	–27.4	–21.5	–30.1	–26.9	–35.2	–25.1	–26.6	–28.0	–23.4
Madagascar	–21.1	–9.7	–6.9	–6.9	–5.9	–0.3	–1.9	–2.3	–3.7	–4.2	–4.0
Malawi	–10.2	–8.6	–8.6	–9.2	–8.4	–8.4	–9.4	–15.5	–12.5	–9.1	–7.5
Mali	–10.8	–10.7	–5.1	–2.2	–2.9	–4.7	–7.3	–8.0	–8.0	–6.3	–5.9
Mauritius	–7.4	–10.3	–13.8	–7.3	–6.3	–5.7	–4.9	–4.3	–8.1	–5.6	–2.1
Mozambique	–10.9	–16.1	–25.3	–44.7	–42.9	–38.2	–39.4	–38.9	–34.8	–64.3	–140.8
Namibia	–1.5	–3.5	–3.0	–5.7	–4.0	–10.7	–12.7	–11.2	–4.2	–4.6	–5.5
Niger	–24.4	–19.8	–22.3	–14.7	–15.0	–15.4	–18.1	–15.4	–18.1	–18.7	–12.3
Nigeria	4.7	3.6	2.6	3.8	3.7	0.2	–3.2	0.6	1.0	1.0	0.4
Rwanda	–7.0	–7.2	–7.4	–11.2	–8.7	–11.8	–13.4	–14.5	–10.9	–11.8	–10.7
São Tomé and Príncipe	–24.7	–22.9	–27.7	–21.9	–13.8	–21.8	–12.9	–7.9	–8.4	–6.7	–5.2
Senegal	–6.7	–4.4	–8.1	–10.8	–10.4	–8.9	–7.4	–7.1	–7.8	–7.7	–6.9
Seychelles	–14.8	–19.4	–23.0	–21.1	–12.1	–23.0	–18.8	–17.2	–19.1	–18.7	–16.6
Sierra Leone	–13.3	–22.7	–65.0	–31.8	–17.5	–18.2	–16.3	–19.3	–17.8	–17.5	–12.3
South Africa	–2.7	–1.5	–2.2	–5.1	–5.9	–5.3	–4.4	–3.3	–3.4	–3.6	–3.8
South Sudan	. . .	. . .	18.2	–15.9	–3.9	–1.6	–7.2	6.2	0.0	–8.7	–2.5
Swaziland	–11.4	–8.6	–6.9	3.3	5.3	3.4	10.8	–5.2	–1.0	–1.9	–1.4
Tanzania	–7.6	–7.7	–10.8	–11.6	–10.6	–10.1	–8.0	–6.3	–7.2	–7.0	–6.3
Togo	–5.6	–6.3	–8.0	–7.5	–13.2	–9.9	–11.1	–9.8	–9.1	–8.4	–5.4
Uganda	–5.7	–8.0	–10.0	–6.7	–6.9	–8.3	–6.6	–5.9	–7.0	–8.1	–7.9
Zambia	6.0	7.5	4.7	5.4	–0.6	2.1	–3.6	–5.5	–3.2	–2.5	1.3
Zimbabwe[6]	–43.6	–13.3	–22.2	–14.6	–17.6	–14.9	–8.3	–1.6	–0.7	–2.2	–0.1

[1]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.
[2]Starting in 2014 data exclude Crimea and Sevastopol.
[3]See country-specific notes for Libya in the "Country Notes" section of the Statistical Appendix.
[4]Data for 2011 exclude South Sudan after July 9. Data for 2012 and onward pertain to the current Sudan.
[5]Data for Syria are excluded for 2011 onward owing to the uncertain political situation.
[6]The Zimbabwe dollar ceased circulating in early 2009. Data are based on IMF staff estimates of price and exchange rate developments in U.S. dollars. IMF staff estimates of U.S. dollar values may differ from authorities' estimates.

Table A13. Summary of Financial Account Balances

(Billions of U.S. dollars)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	Projections 2018
Advanced Economies										
Financial Account Balance	22.3	–85.0	–196.7	–120.3	241.9	422.9	582.1	459.7	335.7	215.7
Direct Investment, Net	312.0	351.8	370.3	122.2	182.0	210.4	210.9	137.4	322.3	298.4
Portfolio Investment, Net	–375.3	–744.4	–899.7	–201.4	–357.0	–145.5	5.2	183.3	–132.9	–284.7
Financial Derivatives, Net	–91.8	–118.2	0.7	–92.2	33.5	–34.7	–35.6	95.1	27.6	35.9
Other Investment, Net	–287.4	64.2	–44.8	–223.5	231.2	256.7	174.3	–20.3	18.0	84.1
Change in Reserves	469.7	352.8	350.7	273.5	153.0	134.8	226.6	63.1	102.5	83.2
United States										
Financial Account Balance	–231.0	–437.0	–515.8	–440.5	–391.0	–287.4	–195.2	–406.5	–522.9	–672.6
Direct Investment, Net	159.9	95.2	183.0	135.2	117.7	136.1	–30.8	–77.7	34.0	–10.0
Portfolio Investment, Net	18.5	–620.8	–226.3	–498.3	–30.7	–119.2	–97.0	–250.2	–546.8	–701.1
Financial Derivatives, Net	–44.8	–14.1	–35.0	7.1	2.2	–54.3	–25.4	22.0	–16.1	–22.2
Other Investment, Net	–416.9	100.9	–453.4	–89.0	–477.1	–246.3	–35.8	–102.5	6.0	60.8
Change in Reserves	52.3	1.8	15.9	4.5	–3.1	–3.6	–6.3	2.1	0.0	0.0
Euro Area										
Financial Account Balance	6.1	–62.6	–153.8	185.3	562.3	437.6	329.5	433.7	. . .	. . .
Direct Investment, Net	42.9	85.5	131.6	58.2	36.0	83.3	270.0	308.3	. . .	. . .
Portfolio Investment, Net	–347.7	–113.7	–444.7	–185.3	–36.1	91.6	118.0	490.5	. . .	. . .
Financial Derivatives, Net	15.7	–4.4	5.5	38.9	42.2	60.4	95.2	28.7	. . .	. . .
Other Investment, Net	237.2	–44.0	139.2	254.6	513.9	196.4	–165.6	–410.6	. . .	. . .
Change in Reserves	58.1	14.1	14.7	19.0	6.2	5.8	11.7	16.8	. . .	. . .
Germany										
Financial Account Balance	184.4	123.7	167.7	185.8	291.6	323.9	249.7	294.3	280.5	280.0
Direct Investment, Net	43.0	60.6	10.3	33.6	28.1	105.6	62.6	61.5	72.5	67.4
Portfolio Investment, Net	119.2	154.1	–51.4	66.8	212.8	180.6	220.3	237.6	192.9	217.6
Financial Derivatives, Net	–7.5	17.6	39.8	30.9	31.9	42.1	28.7	33.0	33.8	33.1
Other Investment, Net	17.4	–110.7	165.1	52.7	17.7	–1.0	–59.6	–37.8	–18.8	–38.1
Change in Reserves	12.4	2.1	3.9	1.7	1.2	–3.3	–2.4	0.0	0.0	0.0
France										
Financial Account Balance	–30.7	–34.2	–74.6	–48.0	–19.2	–10.0	–7.8	–24.6	–20.7	–9.1
Direct Investment, Net	70.3	34.3	19.8	19.4	–13.9	47.9	–2.1	2.0	5.8	9.6
Portfolio Investment, Net	–328.7	–155.0	–333.7	–50.6	–79.3	–23.8	60.1	41.6	35.3	39.0
Financial Derivatives, Net	23.6	–34.8	–19.4	–18.4	–22.3	–31.5	12.0	15.2	18.2	21.9
Other Investment, Net	212.0	105.1	240.3	–3.6	98.2	–3.6	–85.7	–85.5	–82.1	–81.8
Change in Reserves	–5.5	7.7	–7.7	5.2	–1.9	1.0	8.0	2.2	2.2	2.2
Italy										
Financial Account Balance	–51.8	–111.2	–89.6	–13.1	16.9	58.2	28.4	62.5	38.8	34.1
Direct Investment, Net	–0.2	21.3	17.2	6.8	0.9	3.1	0.9	–8.0	5.6	6.1
Portfolio Investment, Net	–53.1	58.4	15.9	–31.3	–17.5	–4.7	99.3	167.3	35.0	19.9
Financial Derivatives, Net	–6.9	6.6	–10.1	7.5	4.0	–4.8	3.7	5.5	0.0	0.0
Other Investment, Net	–0.4	–198.9	–113.9	2.1	27.5	65.9	–76.2	–100.7	–1.7	8.1
Change in Reserves	8.8	1.4	1.3	1.9	2.0	–1.3	0.6	–1.6	0.0	0.0

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of U.S. dollars)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	Projections 2018
Spain										
Financial Account Balance	–72.8	–58.9	–43.4	0.5	41.6	14.0	24.8	32.7	27.0	28.4
Direct Investment, Net	2.7	–1.9	12.8	–27.2	–24.6	10.7	32.6	32.6	31.6	32.0
Portfolio Investment, Net	–69.6	–46.6	43.1	53.7	–83.6	–13.5	11.2	–42.3	–40.3	–39.7
Financial Derivatives, Net	8.4	–11.4	2.9	–10.7	1.4	0.2	–1.4	0.0	0.0	0.0
Other Investment, Net	–20.4	0.0	–116.2	–18.2	147.8	11.6	–23.3	42.4	35.7	36.1
Change in Reserves	6.0	1.1	13.9	2.8	0.7	5.1	5.6	0.0	0.0	0.0
Japan										
Financial Account Balance	168.8	247.3	158.4	53.9	–4.3	58.6	174.8	268.5	199.1	207.4
Direct Investment, Net	61.2	72.5	117.8	117.5	144.7	118.3	131.0	134.6	120.5	123.0
Portfolio Investment, Net	211.7	147.9	–162.9	28.8	–280.6	–42.2	131.7	283.6	197.5	188.1
Financial Derivatives, Net	–10.5	–11.9	–17.1	6.7	58.1	34.0	17.7	–16.2	–7.9	–8.1
Other Investment, Net	–120.9	–5.5	43.4	–61.1	34.8	–60.1	–110.7	–127.8	–121.0	–106.1
Change in Reserves	27.2	44.3	177.3	–37.9	38.7	8.5	5.1	–5.7	10.0	10.5
United Kingdom										
Financial Account Balance	–45.4	–46.8	–37.6	–83.7	–122.9	–129.5	–102.7	–147.3	–82.8	–74.9
Direct Investment, Net	–61.0	–10.1	53.4	–34.9	–11.2	–193.4	–115.2	–267.5	–109.6	–66.3
Portfolio Investment, Net	–48.5	21.3	11.4	338.3	–86.8	–204.4	–415.8	–256.1	0.0	0.0
Financial Derivatives, Net	–45.5	–39.4	4.8	–58.6	18.1	–1.0	–48.6	35.9	–7.8	–0.1
Other Investment, Net	100.6	–28.0	–115.1	–340.6	–50.7	257.5	444.7	331.5	22.9	–20.4
Change in Reserves	9.0	9.4	7.9	12.1	7.8	11.7	32.2	8.8	11.7	12.0
Canada										
Financial Account Balance	–41.6	–58.3	–49.4	–62.7	–56.9	–43.5	–53.4	–49.1	–46.8	–45.4
Direct Investment, Net	16.9	6.3	12.5	12.8	–12.0	1.4	25.5	32.7	13.0	10.5
Portfolio Investment, Net	–91.0	–109.9	–104.3	–63.8	–27.1	–26.2	–35.8	–111.3	–51.1	–48.4
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	22.3	41.4	34.3	–13.4	–22.5	–24.0	–51.6	23.9	–8.7	–7.4
Change in Reserves	10.2	3.9	8.1	1.7	4.7	5.3	8.5	5.6	0.0	0.0
Other Advanced Economies[1]										
Financial Account Balance	150.9	288.8	290.2	250.4	373.5	367.1	372.1	330.8	360.8	361.9
Direct Investment, Net	21.9	95.3	–5.0	–33.5	26.6	–11.3	–85.7	47.9	29.1	11.4
Portfolio Investment, Net	–106.9	–50.7	39.9	139.2	130.8	185.3	317.6	206.2	156.4	162.7
Financial Derivatives, Net	20.0	–17.9	41.0	–28.8	–28.7	–21.9	–17.3	2.9	11.4	12.2
Other Investment, Net	–114.0	–17.1	89.4	–101.7	144.4	108.1	–19.9	30.0	90.1	119.8
Change in Reserves	332.5	279.3	125.1	274.7	101.3	106.3	175.9	43.1	75.7	56.9
Emerging Market and Developing Economies										
Financial Account Balance	59.7	122.3	236.2	104.2	38.5	–16.6	–283.4	–347.1	–49.7	–59.9
Direct Investment, Net	–326.8	–454.9	–534.0	–483.3	–473.3	–414.9	–345.4	–265.3	–206.1	–182.1
Portfolio Investment, Net	–86.9	–238.5	–145.1	–260.2	–149.3	–127.2	114.5	26.7	3.6	23.4
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–46.4	–20.3	163.9	419.2	81.4	396.1	466.3	362.6	259.5	34.0
Change in Reserves	519.8	835.3	749.0	431.4	584.1	128.1	–520.4	–466.5	–100.6	70.1

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of U.S. dollars)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	Projections 2018
Regional Groups										
Commonwealth of Independent States[2]										
Financial Account Balance	28.7	75.5	100.7	50.6	19.3	–4.1	60.2	9.1	53.0	61.0
Direct Investment, Net	–15.5	–8.5	–15.2	–27.6	4.5	19.6	6.8	–27.0	–5.2	2.0
Portfolio Investment, Net	–7.8	–15.7	19.8	–7.1	15.5	25.6	8.0	1.3	–0.8	6.2
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	38.2	37.4	62.4	53.8	21.3	64.6	52.6	26.1	30.4	18.2
Change in Reserves	10.6	60.5	31.9	30.0	–22.4	–114.0	–6.8	9.3	29.3	35.4
Emerging and Developing Asia										
Financial Account Balance	210.0	140.9	65.1	10.4	32.5	148.8	85.9	–20.9	146.5	137.1
Direct Investment, Net	–114.1	–224.3	–277.3	–221.8	–273.0	–204.8	–142.3	–25.5	2.3	38.9
Portfolio Investment, Net	–67.0	–93.3	–58.0	–115.6	–64.7	–124.0	83.2	46.9	23.0	31.2
Financial Derivatives, Net	. . .	0.2	–0.3	1.5	–2.0	0.7	–1.5	–1.2	–1.2	–1.2
Other Investment, Net	–67.8	–103.5	–28.8	207.9	–78.4	281.5	462.4	340.2	245.4	50.1
Change in Reserves	461.6	562.9	431.5	139.5	450.5	195.1	–316.0	–381.2	–122.6	18.9
Emerging and Developing Europe										
Financial Account Balance	–51.4	–89.1	–107.1	–65.4	–61.7	–42.5	–8.2	–13.3	–38.0	–38.1
Direct Investment, Net	–30.6	–26.7	–39.8	–27.5	–25.8	–32.3	–33.3	–29.7	–26.9	–28.7
Portfolio Investment, Net	–10.1	–45.8	–53.5	–70.0	–40.0	–19.3	24.8	–5.8	–16.2	–12.9
Financial Derivatives, Net	0.9	0.0	1.6	–2.9	–1.4	0.3	–1.7	0.3	0.1	0.1
Other Investment, Net	–42.5	–52.5	–30.1	7.3	–13.0	9.0	12.3	–1.9	–4.6	–7.3
Change in Reserves	31.0	35.9	14.6	27.8	18.5	–0.2	–10.4	23.8	9.7	10.8
Latin America and the Caribbean										
Financial Account Balance	–32.3	–124.5	–127.6	–162.2	–204.5	–223.0	–209.4	–111.9	–108.2	–128.7
Direct Investment, Net	–73.5	–112.3	–146.9	–150.9	–148.3	–138.7	–133.6	–142.0	–127.9	–133.6
Portfolio Investment, Net	–25.5	–107.6	–107.8	–96.3	–108.1	–118.2	–62.1	–46.4	–38.6	–31.1
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	11.5	3.8	14.2	26.1	44.6	–7.9	13.1	60.9	51.6	33.1
Change in Reserves	54.7	90.9	110.5	59.6	6.4	38.0	–33.3	17.2	6.9	3.1
Middle East, North Africa, Afghanistan, and Pakistan										
Financial Account Balance	–46.8	121.1	318.0	285.5	306.8	181.8	–133.0	–147.7	–53.2	–37.5
Direct Investment, Net	–64.0	–49.3	–23.1	–25.8	–8.6	–32.5	–11.4	–19.4	–20.4	–25.4
Portfolio Investment, Net	32.0	24.3	73.4	57.1	70.3	130.9	74.7	50.5	50.1	42.8
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	15.9	60.4	129.4	99.6	116.6	65.7	–57.3	–51.9	–57.2	–54.2
Change in Reserves	–30.7	85.7	138.2	154.6	128.4	17.7	–139.1	–126.8	–25.7	–0.7
Sub-Saharan Africa										
Financial Account Balance	–48.5	–1.6	–13.0	–14.6	–53.7	–77.5	–78.9	–62.4	–49.8	–53.6
Direct Investment, Net	–29.2	–33.7	–31.7	–29.8	–22.1	–26.2	–31.7	–21.7	–28.0	–35.2
Portfolio Investment, Net	–8.5	–0.4	–19.2	–28.4	–22.4	–22.3	–14.1	–19.8	–13.9	–12.8
Financial Derivatives, Net	–0.2	–0.2	–1.7	–1.7	–0.8	–1.5	–0.4	1.0	0.0	0.0
Other Investment, Net	–1.6	34.0	16.8	24.6	–9.5	–16.8	–16.9	–11.0	–6.1	–5.8
Change in Reserves	–7.5	–0.6	22.3	19.8	2.7	–8.5	–14.8	–8.7	1.9	2.6

Table A13. Summary of Financial Account Balances *(continued)*

(Billions of U.S. dollars)

	2009	2010	2011	2012	2013	2014	2015	2016	Projections 2017	Projections 2018
Analytical Groups										
By Source of Export Earnings										
Fuel										
Financial Account Balance	7.6	247.0	503.9	439.7	354.3	200.6	–106.6	–127.1	7.7	29.3
Direct Investment, Net	–59.0	–29.2	–28.8	–41.1	3.9	–8.8	–11.7	–42.2	–19.0	–16.8
Portfolio Investment, Net	7.5	17.9	84.1	32.9	69.4	153.3	79.2	49.3	53.5	51.5
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	108.2	139.8	248.7	207.1	173.8	156.9	14.7	12.5	–16.1	–16.3
Change in Reserves	–51.7	117.0	198.7	240.0	106.7	–101.5	–190.5	–145.5	–10.1	11.6
Nonfuel										
Financial Account Balance	54.5	–123.0	–267.7	–335.5	–315.8	–217.2	–176.8	–220.0	–57.4	–89.2
Direct Investment, Net	–265.2	–423.4	–505.2	–442.3	–477.2	–406.1	–333.7	–223.1	–187.1	–165.3
Portfolio Investment, Net	–94.7	–256.3	–229.2	–293.1	–218.7	–280.5	35.3	–22.7	–50.0	–28.1
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–154.7	–159.8	–84.8	212.2	–92.4	239.2	451.6	350.1	275.6	50.3
Change in Reserves	571.7	717.3	550.3	191.4	477.4	229.6	–330.0	–321.0	–90.5	58.5
By External Financing Source										
Net Debtor Economies										
Financial Account Balance	–199.7	–290.2	–386.2	–432.0	–411.1	–405.1	–298.0	–206.5	–214.7	–243.8
Direct Investment, Net	–202.4	–223.2	–283.8	–278.0	–261.3	–286.8	–284.4	–289.0	–291.3	–315.1
Portfolio Investment, Net	–62.7	–216.9	–185.1	–216.2	–168.2	–204.6	–50.1	–47.7	–69.9	–61.2
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–79.7	–87.3	–65.1	–53.2	–34.3	–29.7	36.5	44.6	85.9	46.1
Change in Reserves	147.5	238.6	145.0	117.4	56.8	113.4	–2.5	90.9	66.1	91.0
Net Debtor Economies by Debt-Servicing Experience										
Economies with Arrears and/or Rescheduling during 2011–15										
Financial Account Balance	–18.6	–15.8	–26.6	–50.5	–21.9	–43.3	–28.6	–31.7	–11.6	–11.4
Direct Investment, Net	–18.1	–18.6	–20.4	–26.5	–14.3	–15.7	–15.9	–15.6	–20.0	–24.2
Portfolio Investment, Net	14.1	–11.2	1.0	–1.4	7.4	–5.8	–3.2	0.8	–2.9	–0.2
Financial Derivatives, Net	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Other Investment, Net	–2.1	2.4	5.0	–3.3	–12.4	–10.0	–17.1	–16.8	11.7	–1.5
Change in Reserves	–12.1	11.7	–11.7	–21.2	–1.9	–11.1	8.3	1.6	1.9	15.6
Memorandum										
World										
Financial Account Balance	81.9	37.4	39.5	–16.1	280.4	406.3	298.7	112.5	285.9	155.8

Note: The estimates in this table are based on individual countries' national accounts and balance of payments statistics. Country group composites are calculated as the sum of the U.S. dollar values for the relevant individual countries. Some group aggregates for the financial derivatives are not shown because of incomplete data. Projections for the euro area are not available because of data constraints.

[1]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

Table A14. Summary of Net Lending and Borrowing

(Percent of GDP)

	Averages								Projections		
	1999–2008	2003–10	2011	2012	2013	2014	2015	2016	2017	2018	Average 2019–22
Advanced Economies											
Net Lending and Borrowing	–0.8	–0.7	0.0	0.1	0.5	0.5	0.6	0.8	0.7	0.4	0.3
Current Account Balance	–0.8	–0.7	–0.1	0.0	0.5	0.5	0.7	0.8	0.7	0.4	0.3
Savings	22.4	21.5	21.0	21.4	21.6	22.2	22.4	22.3	21.8	21.8	22.0
Investment	23.0	22.2	21.1	21.0	20.9	21.2	21.1	20.8	21.1	21.4	21.7
Capital Account Balance	0.0	0.0	0.1	0.0	0.0	0.0	–0.1	0.0	0.0	0.0	0.0
United States											
Net Lending and Borrowing	–4.6	–4.5	–3.0	–2.7	–2.2	–2.3	–2.6	–2.6	–2.7	–3.3	–3.4
Current Account Balance	–4.6	–4.6	–3.0	–2.8	–2.2	–2.3	–2.6	–2.6	–2.7	–3.3	–3.4
Savings	18.3	16.7	15.7	17.7	18.3	19.2	19.1	18.6	17.3	17.3	17.5
Investment	22.4	21.2	18.5	19.4	19.8	20.0	20.3	19.7	20.0	20.6	21.0
Capital Account Balance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Euro Area											
Net Lending and Borrowing	–0.5	0.1	0.4	1.4	2.4	2.5	2.9	3.4	. . .	. . .	. . .
Current Account Balance	–0.6	0.0	0.2	1.3	2.2	2.4	3.0	3.4	3.0	3.0	2.9
Savings	23.1	22.7	22.4	22.3	22.3	22.9	23.6	23.9	23.7	23.9	24.2
Investment	22.8	22.3	21.5	20.1	19.6	19.9	19.9	19.9	20.0	20.2	20.6
Capital Account Balance	0.1	0.1	0.1	0.1	0.2	0.1	–0.1	0.1	. . .	. . .	. . .
Germany											
Net Lending and Borrowing	2.7	5.0	6.1	7.0	6.7	7.3	8.3	8.5	8.2	8.0	7.6
Current Account Balance	2.7	5.0	6.1	7.0	6.7	7.3	8.3	8.5	8.2	8.0	7.6
Savings	23.5	24.6	27.2	26.3	26.2	27.0	27.6	27.6	27.3	27.2	27.0
Investment	20.9	19.6	21.1	19.3	19.5	19.8	19.2	19.1	19.1	19.2	19.4
Capital Account Balance	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
France											
Net Lending and Borrowing	1.5	0.2	–0.9	–1.2	–0.8	–1.0	–0.1	–1.0	–0.9	–0.4	0.3
Current Account Balance	1.5	0.1	–1.0	–1.2	–0.9	–1.1	–0.2	–1.1	–0.9	–0.5	0.2
Savings	23.8	22.6	22.2	21.4	21.4	21.4	22.2	21.7	21.2	21.4	22.1
Investment	22.4	22.5	23.2	22.6	22.3	22.5	22.4	22.8	22.2	21.9	21.9
Capital Account Balance	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Italy											
Net Lending and Borrowing	–0.5	–1.5	–2.9	–0.1	1.0	2.1	1.8	2.8	2.1	1.9	1.2
Current Account Balance	–0.6	–1.6	–3.0	–0.4	1.0	1.9	1.6	2.7	2.0	1.8	1.1
Savings	20.6	19.5	17.5	17.5	17.9	18.9	18.9	19.8	19.4	19.4	19.4
Investment	21.2	21.1	20.5	17.9	17.0	17.0	17.3	17.0	17.3	17.6	18.3
Capital Account Balance	0.1	0.1	0.1	0.2	0.0	0.2	0.2	0.1	0.1	0.1	0.1
Spain											
Net Lending and Borrowing	–5.3	–6.0	–2.8	0.3	2.2	1.6	2.0	2.7	2.2	2.2	2.4
Current Account Balance	–6.1	–6.6	–3.2	–0.2	1.5	1.1	1.4	2.0	1.5	1.6	1.8
Savings	22.3	21.7	18.7	19.8	20.2	20.5	21.4	22.4	22.1	22.2	22.6
Investment	28.4	28.4	21.9	20.0	18.7	19.4	20.1	20.4	20.5	20.6	20.8
Capital Account Balance	0.7	0.6	0.4	0.5	0.6	0.5	0.7	0.7	0.7	0.7	0.7
Japan											
Net Lending and Borrowing	3.0	3.5	2.1	0.9	0.7	0.7	3.0	3.7	4.1	4.2	4.3
Current Account Balance	3.2	3.6	2.1	1.0	0.9	0.8	3.1	3.9	4.2	4.3	4.3
Savings	28.5	27.3	24.2	23.6	24.1	24.6	27.0	27.2	27.7	27.9	28.4
Investment	25.3	23.7	22.1	22.7	23.2	23.9	23.9	23.4	23.5	23.7	24.0
Capital Account Balance	–0.1	–0.1	0.0	0.0	–0.1	0.0	–0.1	–0.1	–0.1	–0.1	–0.1
United Kingdom											
Net Lending and Borrowing	–2.2	–2.3	–1.8	–3.7	–4.4	–4.7	–4.3	–4.5	–3.3	–2.9	–2.4
Current Account Balance	–2.1	–2.3	–1.8	–3.7	–4.4	–4.7	–4.3	–4.4	–3.3	–2.9	–2.4
Savings	15.9	14.9	14.1	12.4	12.0	12.7	13.0	12.6	13.4	13.7	14.7
Investment	18.1	17.2	15.9	16.1	16.7	17.4	17.2	17.0	16.7	16.6	17.1
Capital Account Balance	0.0	0.0	0.0	0.0	0.0	0.0	–0.1	–0.1	–0.1	–0.1	–0.1

Table A14. Summary of Net Lending and Borrowing *(continued)*

(Percent of GDP)

	Averages								Projections		
	1999–2008	2003–10	2011	2012	2013	2014	2015	2016	2017	2018	Average 2019–22
Canada											
Net Lending and Borrowing	1.4	0.1	–2.5	–3.6	–3.2	–2.4	–3.4	–3.3	–2.9	–2.7	–2.1
Current Account Balance	1.4	0.1	–2.8	–3.6	–3.2	–2.4	–3.4	–3.3	–2.9	–2.7	–2.1
Savings	23.1	22.9	21.4	21.3	21.7	22.2	20.4	19.5	19.5	19.7	20.3
Investment	21.7	22.7	24.2	24.9	24.9	24.7	23.8	22.9	22.4	22.4	22.5
Capital Account Balance	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Advanced Economies[1]											
Net Lending and Borrowing	3.7	4.2	4.2	4.2	5.3	5.2	5.7	5.8	5.4	5.2	4.8
Current Account Balance	3.8	4.2	4.2	4.3	5.2	5.4	5.9	5.9	5.5	5.3	4.9
Savings	29.8	30.2	30.7	30.4	30.6	30.7	31.1	30.6	30.7	30.6	30.4
Investment	25.8	25.8	26.3	26.1	25.2	25.2	24.8	24.6	25.1	25.2	25.3
Capital Account Balance	–0.1	0.0	0.1	0.0	0.1	–0.1	–0.2	–0.1	–0.2	–0.1	–0.1
Emerging Market and Developing Economies											
Net Lending and Borrowing	2.5	2.9	1.5	1.3	0.7	0.5	–0.1	–0.2	–0.1	–0.2	–0.3
Current Account Balance	2.4	2.9	1.4	1.2	0.6	0.5	–0.2	–0.3	–0.3	–0.3	–0.4
Savings	28.6	31.3	33.4	33.3	32.6	33.0	32.7	32.0	31.7	31.7	31.7
Investment	26.4	28.7	32.1	32.2	32.1	32.6	32.9	32.2	32.0	32.0	32.0
Capital Account Balance	0.2	0.2	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Regional Groups											
Commonwealth of Independent States[2]											
Net Lending and Borrowing	6.6	5.0	4.1	2.2	0.6	0.6	2.8	–0.2	1.6	1.8	2.4
Current Account Balance	7.0	5.3	4.1	2.3	0.6	2.1	2.8	–0.2	1.6	1.8	2.4
Savings	27.7	26.8	27.6	25.9	22.5	24.9	26.4	26.2	24.9	25.7	25.9
Investment	20.9	21.5	23.5	23.5	21.7	22.7	23.3	25.9	23.1	23.7	22.9
Capital Account Balance	–0.4	–0.3	0.0	–0.2	0.0	–1.5	0.0	0.0	0.0	0.0	0.0
Emerging and Developing Asia											
Net Lending and Borrowing	3.5	4.1	0.9	1.0	0.8	1.6	2.0	1.4	0.9	0.7	0.5
Current Account Balance	3.4	4.0	0.8	0.9	0.7	1.5	2.0	1.3	0.8	0.7	0.4
Savings	37.0	41.5	43.8	43.6	43.1	43.6	42.5	41.1	40.6	40.1	38.9
Investment	34.0	37.7	42.9	42.6	42.3	42.0	40.6	39.8	39.8	39.4	38.5
Capital Account Balance	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0
Emerging and Developing Europe											
Net Lending and Borrowing	–4.6	–5.1	–5.5	–3.4	–2.5	–1.7	–0.7	–1.2	–2.0	–1.9	–2.0
Current Account Balance	–4.9	–5.5	–6.3	–4.4	–3.6	–2.9	–2.0	–1.9	–2.8	–2.8	–2.7
Savings	19.6	19.6	20.4	20.5	21.5	22.1	22.8	22.7	22.1	22.3	22.7
Investment	24.2	25.1	26.6	24.9	25.0	24.9	24.7	24.5	24.9	25.1	25.3
Capital Account Balance	0.3	0.4	0.8	0.9	1.1	1.3	1.3	0.7	0.8	0.9	0.7
Latin America and the Caribbean											
Net Lending and Borrowing	–0.4	0.2	–2.0	–2.4	–2.7	–3.2	–3.5	–2.1	–2.1	–2.3	–2.4
Current Account Balance	–0.5	0.0	–2.0	–2.4	–2.8	–3.2	–3.5	–2.1	–2.1	–2.3	–2.5
Savings	19.7	20.9	20.3	19.8	19.0	17.9	18.5	17.3	17.2	17.2	18.4
Investment	20.4	21.0	22.2	22.3	22.3	21.8	22.2	19.5	19.3	19.6	20.9
Capital Account Balance	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Middle East, North Africa, Afghanistan, and Pakistan											
Net Lending and Borrowing	8.5	9.1	12.7	11.9	10.0	5.8	–3.5	–3.0	–0.8	–0.4	–0.1
Current Account Balance	8.8	9.5	12.7	12.4	10.1	5.3	–4.1	–3.4	–1.1	–0.8	–0.8
Savings	33.9	35.9	38.6	37.5	35.4	33.1	24.9	24.1	26.5	26.7	27.6
Investment	25.5	27.1	25.9	25.5	25.0	26.8	27.9	26.8	26.7	26.1	26.4
Capital Account Balance	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1
Sub-Saharan Africa											
Net Lending and Borrowing	2.0	2.3	–0.2	–0.6	–1.8	–3.4	–5.5	–3.5	–3.4	–3.3	–3.6
Current Account Balance	0.7	0.8	–0.8	–1.8	–2.4	–3.9	–6.0	–4.0	–3.8	–3.7	–4.0
Savings	19.3	20.6	19.4	19.0	18.3	17.4	15.0	15.4	15.1	15.5	16.2
Investment	18.5	19.6	20.1	20.7	20.8	21.3	20.8	19.1	18.9	19.1	20.1
Capital Account Balance	1.2	1.5	0.6	1.2	0.5	0.5	0.5	0.4	0.4	0.4	0.4

Table A14. Summary of Net Lending and Borrowing *(continued)*

(Percent of GDP)

	Averages								Projections		
	1999–2008	2003–10	2011	2012	2013	2014	2015	2016	2017	2018	Average 2019–22
Analytical Groups											
By Source of Export Earnings											
Fuel											
Net Lending and Borrowing	9.1	9.2	9.8	8.5	6.8	3.8	–1.7	–1.4	0.7	1.0	1.4
Current Account Balance	9.4	9.6	9.8	8.9	6.9	4.3	–2.0	–1.7	0.5	0.7	0.9
Savings	32.4	32.9	34.2	32.9	30.0	29.4	25.9	24.4	25.2	25.5	26.1
Investment	23.4	23.9	24.3	24.3	23.4	25.1	27.3	25.4	24.0	23.7	23.7
Capital Account Balance	0.0	0.0	0.0	–0.1	0.0	–0.7	–0.1	0.0	0.1	0.1	0.1
Nonfuel											
Net Lending and Borrowing	0.6	1.1	–1.0	–0.8	–1.0	–0.3	0.3	0.1	–0.3	–0.4	–0.6
Current Account Balance	0.4	0.8	–1.2	–1.1	–1.2	–0.5	0.1	0.0	–0.4	–0.5	–0.7
Savings	27.6	30.8	33.2	33.4	33.3	33.9	34.2	33.5	33.1	33.0	32.8
Investment	27.3	30.1	34.3	34.4	34.4	34.4	34.1	33.5	33.5	33.6	33.5
Capital Account Balance	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
By External Financing Source											
Net Debtor Economies											
Net Lending and Borrowing	–1.1	–1.1	–2.7	–2.9	–2.6	–2.4	–2.1	–1.6	–1.7	–1.8	–2.0
Current Account Balance	–1.3	–1.5	–2.9	–3.2	–2.9	–2.7	–2.5	–1.7	–1.9	–2.0	–2.2
Savings	21.6	23.1	23.5	22.9	22.4	22.4	22.3	22.6	22.6	22.9	23.8
Investment	23.2	24.7	26.2	26.0	25.2	25.0	24.7	24.3	24.5	24.9	26.0
Capital Account Balance	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Net Debtor Economies by Debt-Servicing Experience											
Economies with Arrears and/or Rescheduling during 2011–15											
Net Lending and Borrowing	–0.2	–1.3	–4.2	–5.9	–5.8	–3.8	–4.8	–5.3	–4.8	–4.7	–5.0
Current Account Balance	–0.7	–1.9	–4.7	–6.6	–6.2	–4.3	–5.3	–5.4	–5.0	–5.0	–5.2
Savings	20.8	20.9	16.0	14.3	13.4	13.9	12.7	12.7	13.5	14.9	17.0
Investment	22.1	22.8	20.7	20.9	19.6	18.3	18.0	18.1	18.4	19.7	22.1
Capital Account Balance	0.5	0.6	0.5	0.7	0.4	0.5	0.5	0.1	0.2	0.3	0.2
Memorandum											
World											
Net Lending and Borrowing	0.0	0.3	0.5	0.5	0.6	0.5	0.3	0.4	0.4	0.2	0.1
Current Account Balance	0.0	0.2	0.4	0.5	0.5	0.5	0.3	0.4	0.3	0.1	0.0
Savings	23.9	24.3	25.6	25.9	25.9	26.4	26.5	26.0	25.7	25.8	26.2
Investment	23.9	24.1	25.0	25.2	25.3	25.6	25.8	25.2	25.4	25.6	26.1
Capital Account Balance	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0

Note: The estimates in this table are based on individual countries' national accounts and balance of payments statistics. Country group composites are calculated as the sum of the U.S. dollar values for the relevant individual countries. This differs from the calculations in the April 2005 and earlier issues of the *World Economic Outlook,* in which the composites were weighted by GDP valued at purchasing power parities as a share of total world GDP. The estimates of gross national savings and investment (or gross capital formation) are from individual countries' national accounts statistics. The estimates of the current account balance, the capital account balance, and the financial account balance (or net lending/net borrowing) are from the balance of payments statistics. The link between domestic transactions and transactions with the rest of the world can be expressed as accounting identities. Savings (*S*) minus investment (*I*) is equal to the current account balance (*CAB*) ($S - I = CAB$). Also, net lending/net borrowing (*NLB*) is the sum of the current account balance and the capital account balance (*KAB*) ($NLB = CAB + KAB$). In practice, these identities do not hold exactly; imbalances result from imperfections in source data and compilation as well as from asymmetries in group composition due to data availability.

[1]Excludes the G7 (Canada, France, Germany, Italy, Japan, United Kingdom, United States) and euro area countries.

[2]Georgia, Turkmenistan, and Ukraine, which are not members of the Commonwealth of Independent States, are included in this group for reasons of geography and similarity in economic structure.

Table A15. Summary of World Medium-Term Baseline Scenario

	Averages				Projections		Averages	
	1999–2008	2009–18	2015	2016	2017	2018	2015–18	2019–22
				Annual Percent Change				
World Real GDP	**4.2**	**3.3**	**3.4**	**3.1**	**3.5**	**3.6**	**3.4**	**3.7**
Advanced Economies	2.5	1.4	2.1	1.7	2.0	2.0	2.0	1.7
Emerging Market and Developing Economies	6.2	4.9	4.2	4.1	4.5	4.8	4.4	5.0
Memorandum								
Potential Output								
Major Advanced Economies	2.1	1.3	1.4	1.3	1.5	1.6	1.4	1.5
World Trade, Volume[1]	**6.6**	**3.0**	**2.7**	**2.2**	**3.8**	**3.9**	**3.1**	**3.9**
Imports								
Advanced Economies	5.6	2.6	4.4	2.4	4.0	4.0	3.7	3.7
Emerging Market and Developing Economies	10.0	3.9	–0.8	1.9	4.5	4.3	2.4	4.7
Exports								
Advanced Economies	5.6	2.8	3.7	2.1	3.5	3.2	3.1	3.5
Emerging Market and Developing Economies	8.8	3.6	1.4	2.5	3.6	4.3	2.9	4.3
Terms of Trade								
Advanced Economies	–0.5	0.3	1.8	0.9	–0.5	0.1	0.6	0.0
Emerging Market and Developing Economies	2.8	–0.5	–4.2	–1.2	1.3	–0.4	–1.2	0.0
World Prices in U.S. Dollars								
Manufactures	1.8	0.0	–2.4	–5.4	2.8	1.7	–0.9	1.5
Oil	22.2	–5.5	–47.2	–15.7	28.9	–0.3	–13.0	0.1
Nonfuel Primary Commodities	6.2	–0.7	–17.4	–1.9	8.5	–1.3	–3.5	–0.3
Consumer Prices								
Advanced Economies	2.2	1.4	0.3	0.8	2.0	1.9	1.2	2.0
Emerging Market and Developing Economies	7.5	5.2	4.7	4.4	4.7	4.4	4.5	4.2
Interest Rates				*Percent*				
Real Six-Month LIBOR[2]	1.5	–0.7	–0.6	–0.3	–0.6	0.7	–0.2	1.6
World Real Long-Term Interest Rate[3]	2.1	0.8	1.3	0.5	–0.3	0.3	0.4	0.8
Current Account Balances				*Percent of GDP*				
Advanced Economies	–0.8	0.3	0.7	0.8	0.7	0.4	0.7	0.3
Emerging Market and Developing Economies	2.4	0.5	–0.2	–0.3	–0.3	–0.3	–0.3	–0.4
Total External Debt								
Emerging Market and Developing Economies	32.2	27.8	28.3	29.7	29.3	28.7	29.0	27.4
Debt Service								
Emerging Market and Developing Economies	9.3	9.8	12.0	10.5	10.0	9.8	10.6	9.5

[1]Data refer to trade in goods and services.
[2]London interbank offered rate on U.S. dollar deposits minus percent change in U.S. GDP deflator.
[3]GDP-weighted average of 10-year (or nearest-maturity) government bond rates for Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

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IMF EXECUTIVE BOARD DISCUSSION OF THE OUTLOOK, APRIL 2017

The following remarks were made by the Chair at the conclusion of the Executive Board's discussion of the Fiscal Monitor, Global Financial Stability Report, *and* World Economic Outlook *on April 4, 2017.*

Executive Directors broadly shared the assessment of global economic prospects and risks. They welcomed the positive developments since the second half of 2016: global economic activity has accelerated, headline inflation has generally risen following a rebound in commodity prices, and financial market sentiment has strengthened. Global growth is expected to pick up further in 2017–18, reflecting a stronger-than-expected recovery in many advanced economies and projected higher growth in many emerging market and developing economies, including from improved conditions in several commodity exporters. However, growth momentum is still modest and downside risks continue to dominate, with heightened policy uncertainty and persistent structural headwinds. Directors underscored the importance of using all policy tools at the national level and strengthening multilateral cooperative efforts to sustain a stronger recovery, ward off downside risks, safeguard hard-won gains in global integration and financial stability, and promote inclusion.

Directors noted that the balance of risks remain tilted to the downside, especially over the medium term. In advanced economies, while the ongoing cyclical recovery is encouraging, output remains below potential and unemployment above precrisis levels in many countries. Population aging, low labor productivity growth, and crisis legacies are weighing on growth potential. In emerging market and developing economies, medium-term prospects are closely linked to developments in commodity markets, global financial conditions, the ongoing economic transition in China, and progress in resolving domestic imbalances and structural challenges in some economies.

Directors observed that elevated political and policy uncertainties in many parts of the world pose difficult challenges to the economic outlook and financial stability. They cited, among other things, faster-than-expected normalization of interest rates; a rollback of financial regulation, which could spur excessive risk taking; and a potential rise in protectionist and inward-looking policies.

Against this backdrop, Directors emphasized the need for comprehensive, consistent, and well-communicated policy actions to achieve strong, sustainable, and balanced growth; enhance resilience; and ensure that the benefits of economic integration and technological progress are shared more widely. Policy priorities vary across individual economies depending on cyclical positions, structural challenges, and vulnerabilities facing them. Multilateral cooperation is as essential as ever to complement national efforts as well as tackle common challenges, including preserving a rules-based, open trading system; ensuring a level playing field in international taxation; and strengthening the global financial safety net. Multilateral efforts are also needed to address the withdrawal of correspondent banking relationships and the refugee crisis. Both deficit and surplus countries should implement appropriate policies to reduce persistent global excess imbalances.

Directors agreed that a common challenge across advanced economies is to boost potential output, through fiscal and structural reforms that target country-specific priorities, including to upgrade public infrastructure where needed; improve labor force participation and skills; eliminate product market distortions; and reform corporate income taxation to promote private investment, research and development, and resource reallocation to productive areas. Resisting a retreat from global economic integration must also be part of the agenda to secure strong, sustainable global growth.

Directors saw a need to tackle the adverse side effects of technological change and trade integration with appropriate policies. In this context, they noted the staff's finding that technological progress appears to be the main factor explaining the decline

in labor income share in advanced economies, while trade integration—which has contributed to significant improvements in living standards and poverty reduction around the world—seems to be the dominant driver in emerging market economies. Directors stressed that the design of inclusive fiscal policies, such as transfer and tax instruments, should strike the right balance between promoting redistribution and maintaining incentives to invest and work. They also emphasized the importance of improving education, training, health services, social insurance, and pension systems. In some cases, active labor market policies could be an effective tool in the short term.

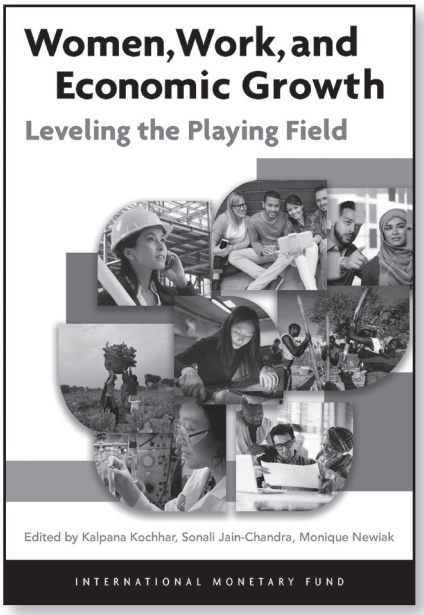
Directors agreed that strengthening the recovery remains a priority in many economies, requiring support from both monetary and fiscal policies, combined with growth-enhancing structural reforms. Where core inflation is persistently low and/or the risk of deflation remains tangible, unconventional monetary policies remain appropriate to support economic activity and lift inflation expectations, while their potential negative consequences on financial stability should be closely monitored. Fiscal policy can play an important role, particularly when monetary policy has become less effective. Directors agreed that, as a general principle, fiscal policy should be countercyclical, be growth friendly, and promote inclusion, anchored in a credible medium-term framework that ensures debt sustainability. Depending on country-specific circumstances in terms of economic slack, fiscal space, and debt levels, policy choices range from discretionary fiscal support to budget recomposition and rebuilding of fiscal buffers.

Directors concurred that, while emerging market and developing economies can retain influence over their domestic financial conditions, many could face elevated risks that arise from external negative spillovers, including a sudden reversal of market sentiment and sharp volatility in capital flows and exchange rates. Directors urged policymakers in these countries to be prepared for less favorable external conditions. Specifically, it will be critical to maintain sound policies and strong frameworks, including exchange rate flexibility and a robust macroprudential toolkit, while capital flow management measures may be used temporarily as warranted, though not as a substitute for warranted macroeconomic adjustment. For many countries, priorities include proactively monitoring vulnerabilities and addressing weaknesses in the corporate and banking sectors, improving corporate governance, and reducing infrastructure bottlenecks and barriers to entry. These should be complemented by measures to enhance resilience, such as developing a local investor base, fostering depth and liquidity in the equity and bond markets, and upgrading the tax system to promote efficient use of resources.

Directors stressed that solidifying improvements in financial stability and market expectations requires concerted efforts across countries. In the United States, where tax reform and financial deregulation could have a significant impact on the financial and corporate sectors globally, authorities should be vigilant to the increase in leverage and deterioration in credit quality and should take preemptive measures against excessive risk taking. In Europe, where important progress has been achieved, further efforts are still needed to adjust bank business models, facilitate the disposal of nonperforming loans, and remove structural impediments to bank profitability. In China, where major reforms to the financial system are taking place, special attention should be paid to the rapid growth in assets among smaller banks, the increasing reliance on wholesale funding, and the close interconnections between shadow products and interbank markets. At the global level, completing the regulatory reform agenda remains important, and a rollback of regulatory standards should be resisted.

Directors observed that commodity-exporting low-income developing countries have faced a difficult adjustment process since the commodity cycle turned in 2014. In light of rising debt and weaker external positions in several of these economies, Directors called for intensified policy efforts to mobilize revenue, improve tax administration, enhance spending efficiency, and contain the buildup of debt. For many diversified countries, the priorities are to build fiscal buffers while growth remains relatively strong and to achieve a better balance between meeting social and developmental needs and securing debt sustainability. A common challenge across all low-income developing countries is to maintain progress toward attaining their sustainable development goals.

Highlights from IMF Publications



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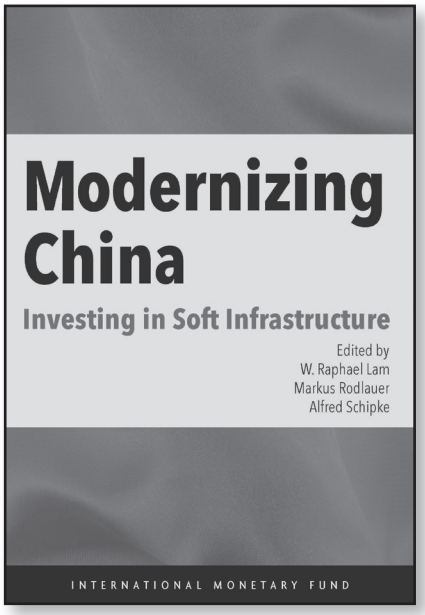

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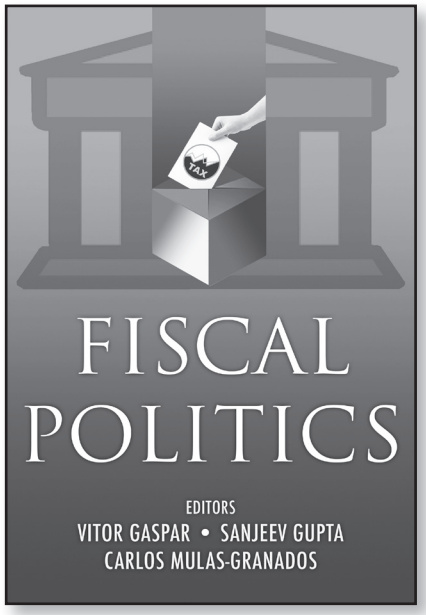

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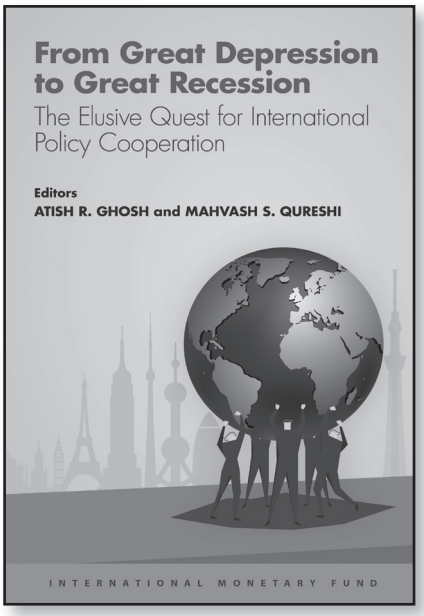

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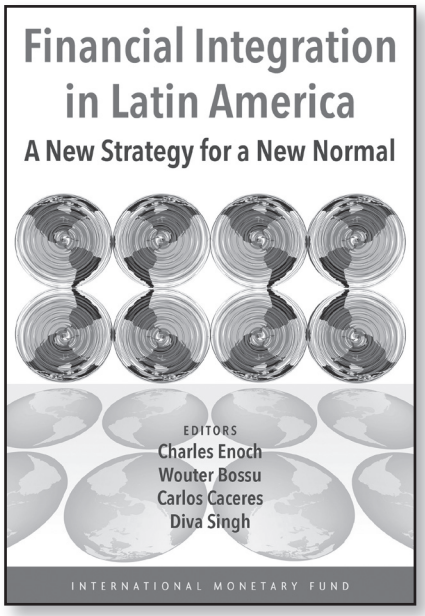

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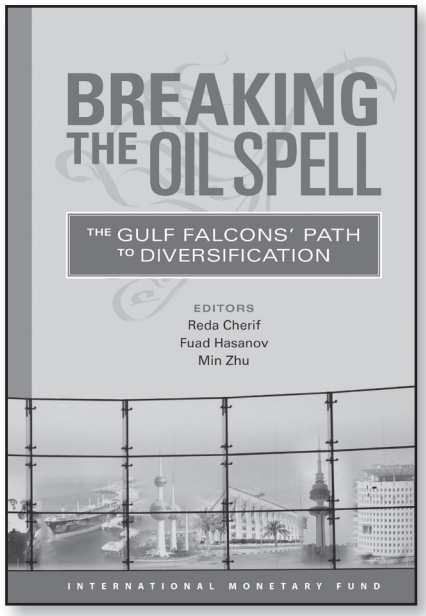

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