INTERNATIONAL MONETARY FUND

**Emerging from the Global Crisis:
Macroeconomic Challenges Facing Low-Income Countries**

Prepared by the Strategy, Policy, and Review Department, the Research Department, the
Fiscal Affairs Department, and the Monetary and Capital Markets Department

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ABBREVIATIONS AND ACRONYMS

AM	Advanced Market
EM	Emerging Market
EMPI	Exchange Market Pressure Index
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GPM	Global Projection Model
HIPC	Heavily Indebted Poor Country
ILO	International Labor Organization
LIC	Low-Income Country
LIML	Limited Information Maximum Likelihood
MDRI	Multilateral Debt Relief Initiative
NPL	Non-Performing Loan
PRGT	Poverty Reduction Growth Trust
WEO	World Economic Outlook

EXECUTIVE SUMMARY

While the impact of the global crisis has been severe, real per capita GDP growth stayed positive in two-thirds of low-income countries (LICs), unlike in previous global downturns, and in contrast to richer countries. The crisis affected LICs not so much through the terms of trade or global interest rates, but rather through a sharp contraction in export demand, foreign direct investment, and remittances (oil exporters also suffered from a sharp fall in oil prices). LICs saw the sharpest decline in their economic growth rate over the last four decades. However, this slowdown followed a period of strong expansion, and real per capita GDP growth has generally held up in LICs, remaining well above growth in richer countries.

Growth was supported by a countercyclical policy response—a first for LICs in contrast to past crises when the fiscal stance was tightened. Most LICs let their fiscal automatic stabilizers operate, and the median increase in real primary spending was higher than in the previous five years. Moreover, the composition of spending improved in favor of the social sectors and public investment. Empirical analysis suggests that this response allowed vital spending to be preserved, in particular on social sectors and infrastructure, and helped mitigate the negative impact of the global crisis on economic growth and the poor.

Pre-crisis macroeconomic policy buffers, built mainly over the last decade, had created room for this countercyclical response. LICs entered the crisis with stronger macroeconomic positions than in previous downturns, including lower inflation, more manageable fiscal and current account deficits, higher international reserves, and reduced debt. This improvement was supported by sound policies, a more favorable global environment, and debt relief. In turn, LICs with stronger pre-crisis buffers made greater use of countercyclical fiscal policy in 2009.

Sharply higher Fund support also helped LICs to navigate the crisis. The Fund has committed about US$5 billion to LICs in concessional financial support since the beginning of 2009, roughly four times the historical average, in addition to the global SDR allocation. This has reduced liquidity constraints and catalyzed donor support, helping countries supported by an IMF program to boost spending, which increased more than in non-program countries.

Looking ahead, LICs' growth is expected to rebound quickly, driven in part by global recovery prospects, but risks are on the downside. LICs' economic recovery is expected to be faster and more aligned with the rest of the world than in previous crises, reflecting greater trade and financial integration and more robust domestic policies. However, there are important regional differences, with LICs in Latin America, the Caribbean, Middle East, and Central Asia expected to recover more slowly than those in Asia and sub-Saharan Africa. The key downside risk to this favorable outlook is a slower-than-expected recovery in the rest of the world.

LICs are poised to emerge from the crisis with somewhat less comfortable buffers, but are expected to improve their macroeconomic positions over the medium term. During the crisis fiscal and current account deficits widened significantly, while inflation declined, reserves held

up well (partly reflecting the IMF's SDR allocation), and debt increased much less than in richer countries. Under baseline projections, most countries are expected to realign their fiscal and current account positions, partly through the cyclical rebound in exports and revenues. Median real spending is projected to grow by 4.6 percent annually through 2015. A downside scenario of lower world growth suggests that most LICs are moderately vulnerable to another global shock. However, risks differ significantly across countries.

A country's exposure to potential future volatility is an important factor in determining the appropriate macroeconomic policy mix during the recovery phase. In particular:

- Almost half of LICs could absorb another shock with limited or no need for adjustment—some countries would even have scope to expand spending and absorption more rapidly.

- The other half of LICs would face significant vulnerabilities in the event of another sizeable shock. To address this risk, some countries may need to focus on fiscal realignment and others on monetary and exchange rate policy, depending on the nature of the vulnerabilities. A small group would face both significant external and fiscal pressures, suggesting the need for overall adjustment and additional concessional support.

- Inflation appears mostly benign for now, at single digits, suggesting that monetary policy could be accommodative. However, risks to future food and fuel prices are on the upside, and policymakers should be prepared to act against possible second-round effects on inflation should another global price shock occur.

- Across regions, LICs in Latin America and the Caribbean stand out as comparatively vulnerable, with less favorable prospects for growth and weaker policy buffers, suggesting the need to step up the rebuilding of buffers and growth-oriented reforms.

- Many LICs with fixed exchange rate regimes could benefit from somewhat faster consolidation to rebuild reserves. Conversely, some LICs with floating rates appear to have built more than adequate reserves and could raise spending and absorption.

A key challenge is how to rebuild the policy buffers in a way that reinforces efforts to implement growth-enhancing and poverty-reducing reforms. Policy priorities for many LICs include the need to (i) strengthen domestic revenues beyond the cyclical rebound to help create fiscal space while preserving debt sustainability; (ii) continue to increase real spending with a focus on social sectors and infrastructure investment, while improving the efficiency of spending; (iii) balance the use of external non-concessional financing against expanded use of domestic financing and measures to boost domestic savings, supported by developing well-regulated domestic financial sectors and sound debt management frameworks; and (iv) advance structural reforms, in particular those to sustain economic growth in a more volatile and integrated environment. In the process of rebuilding their policy buffers, additional donor support will be an important ingredient for many LICs.
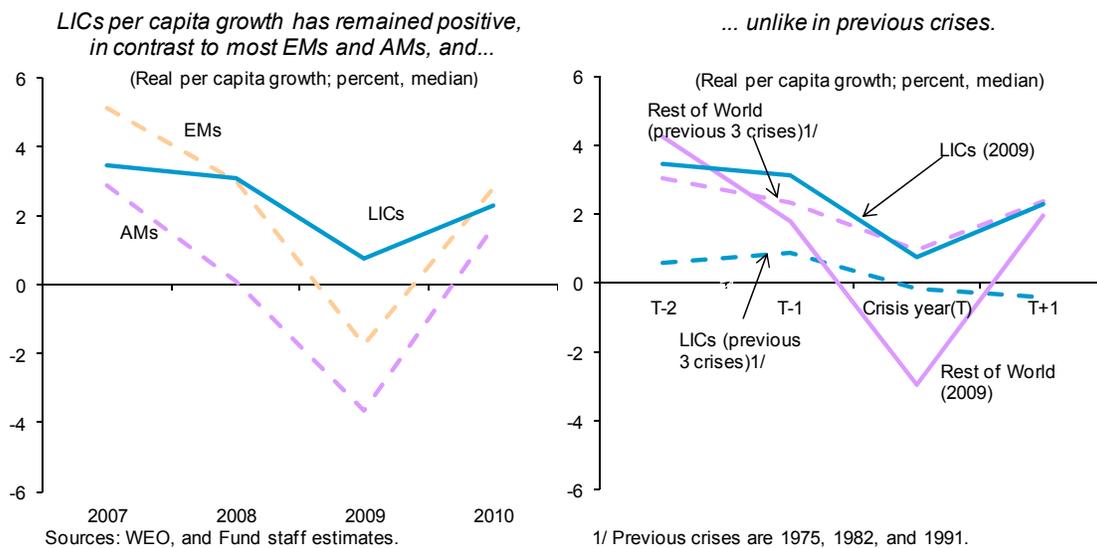
I. How Have LICs Coped with the Crisis?

- *Unlike in previous downturns, when terms of trade shocks and high interest rates played a key role, this crisis affected LICs mainly through a sharp contraction in export demand, foreign direct investment (FDI), and remittances, hitting LICs harder than in the past.*
- *Most LICs reacted, for the first time, with a domestic countercyclical policy response, preserving vital spending and cushioning the impact of the crisis on growth, which has held up better than in most emerging markets (EMs) and advanced market economies (AMs).*
- *The countercyclical policy response has been possible thanks in part to macroeconomic policy buffers LICs have built over the past decade, in particular lower fiscal and current account deficits, reduced debt levels, lower inflation, and comfortable reserves.*

A. Impact of the Crisis

1. **Although the global crisis has hit LICs hard, growth has remained positive in most countries—unlike in previous downturns and in contrast to much of the rest of the world.**[1] The global crisis caused a dramatic collapse in world growth and the most severe global recession since the 1930s. The crisis severely affected LICs, which saw the sharpest decline in economic growth rate over the last four decades (Appendix II). This slowdown followed a period of exceptionally strong expansion, however, with the result that real per capita GDP growth in 2009 still remained close to the average of the last 30 years, and positive in two-thirds of LICs. Across regions, LICs in Latin America and the Caribbean, and those in the Middle East and Europe were relatively more affected, while growth in Asian and sub-Saharan African LICs held up reasonably well, broadly mirroring how the crisis impacted richer countries in these regions.

LICs per capita growth has remained positive, in contrast to most EMs and AMs, and...

... unlike in previous crises.

Sources: WEO, and Fund staff estimates.

1/ Previous crises are 1975, 1982, and 1991.

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[1] Unless indicated otherwise, these LICs refer to the set of 64 countries listed in Appendix I. The analysis is based on the October 2010 *World Economic Outlook* (WEO) data.

During the crisis, fiscal and current accounts deteriorated while inflation pressures eased and reserves held up well. Unlike in richer countries, debt increased only slightly.

(Inflation, median)

LICs
EMs
AMs

(Reserve coverage in months of imports, median)

EMs
(without SDR allocation)
LICs

(Fiscal balance, median, as percent of GDP)

LICs
EMs
AMs

(Fiscal balance, median, as percent of GDP)

LIC Oil Exporters
LIC Oil Importers
All LICs

(Current Account +FDI, median, as percent of GDP)

LIC Oil Exporters
All LICs
LIC Oil Importers

(Public Debt, median, as percent of GDP)

AMs
LICs
EMs
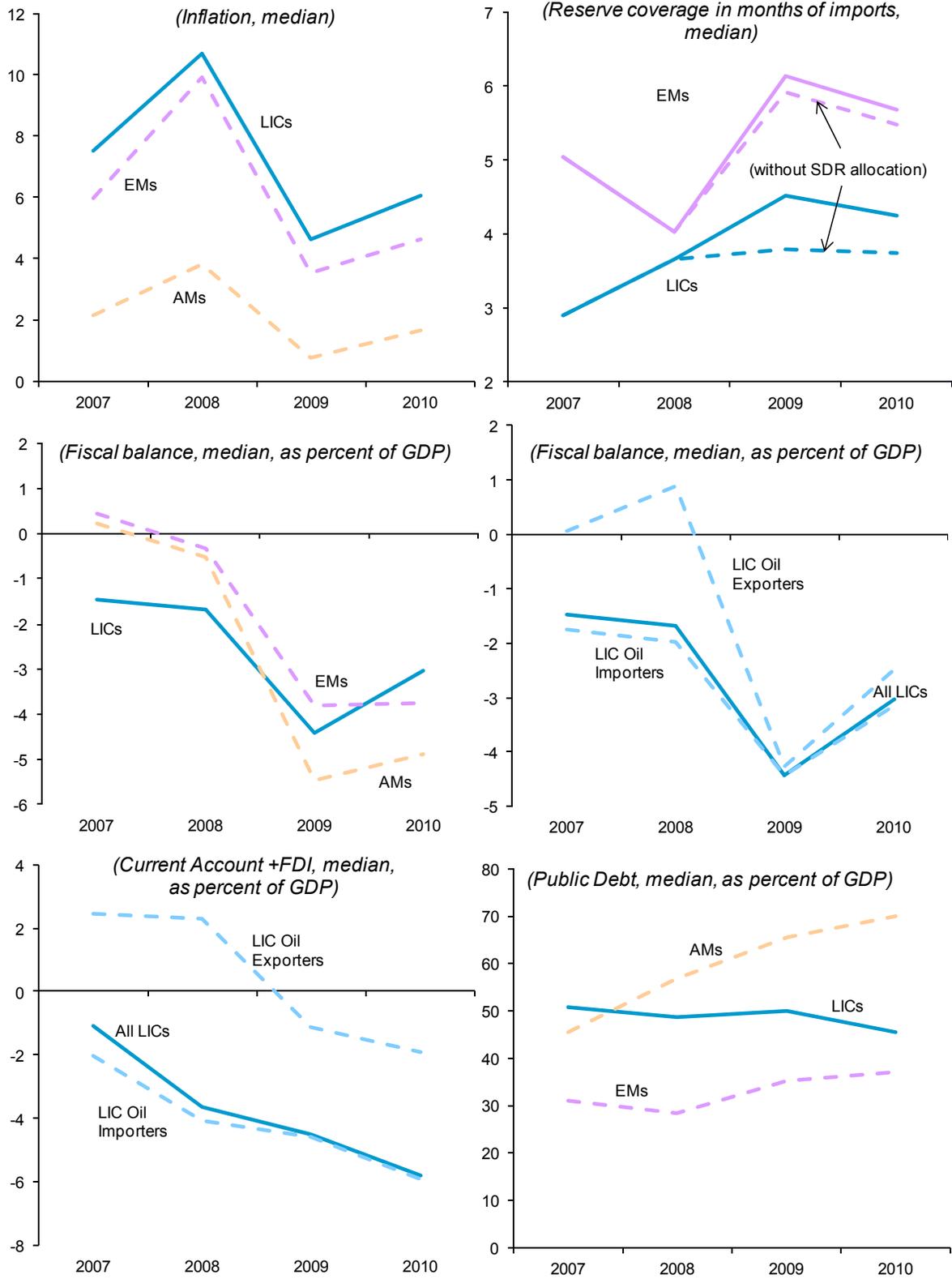
Sources: WEO, and Fund staff estimates.

2.   **Along with the drop in growth, fiscal and current account deficits widened, whereas inflation pressures eased and reserves held up well in 2009** (Appendix III). The impact on the fiscal and current account was felt most by oil-exporting LICs that were affected by the sharp decline in oil prices. Inflation declined in most LICs as the impact of the fuel and food crises waned, with less than one-fourth of LICs still seeing double-digit inflation in 2009, compared to nearly two-thirds in 2008. Reserves held up well during the crisis, in part reflecting the IMF's general SDR allocation.[2]

3.   **Unlike in more advanced economies, for which debt dynamics have become a concern, public debt has deteriorated only slightly in most LICs.** In fact, public debt-to-GDP ratios across LICs have been on a downward trajectory, in part because a number of countries benefited from debt relief under Heavily Indebted Poor Countries (HIPC) Initiative and Multilateral Debt Relief Initiative (MDRI). For LICs reaching the Decision Point or Completion Point under the HIPC initiative in 2008–10, the median public debt ratio fell from 76 percent of GDP to 57 percent over 2007–09.[3] Most non- and post-HIPC LICs saw their gross debt ratios rise during the crisis, although this build-up—by a median 6 percentage points of GDP—was much smaller than in advanced countries, reflecting LICs' significantly higher nominal GDP growth rates, the limited impact of the crisis on their financial sector, and the fact that their deficits were financed partly by drawing down government deposits.

4.   **In contrast to past global downturns, this crisis affected LICs not so much through the terms of trade or global interest rates, but rather through a sharp contraction in demand for their exports, FDI, and remittances.** The histogram below shows that the one-percent decline in real GDP growth of LICs' trading partners in 2009, which was a key transmission channel to LICs, was an unprecedented ("tail") event. The decline in private transfers and FDI was unusually strong. By contrast, the terms-of-trade impact was positive for most LICs, with the exception of oil exporters who saw a significant fall in prices from the heights in 2008. Aid flows held up well, which matches the experience during most previous crises when official transfers did not exhibit a decline during the crisis year itself.

5.   **The combination of shocks associated with the crisis is estimated to have had a severe impact on poverty and employment**. World Bank simulations suggest that the crisis will leave an additional 64 million people in extreme poverty by the end of 2010.[4] This effect is likely to persist and by 2015 the global poverty rate is projected to be 15 percent, compared to the 14.1 percent it would have been without the crisis. While the labor market data needed to assess the employment effects is limited, the International Labor Organization (ILO) estimates that the

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[2] LICs received SDR allocations in August and September 2009 amounting to about SDR 8.2 billion.

[3] Current projections suggest that in 2010 the median debt ratio for this "HIPC/MDRI group" has continued to decrease to 45 percent while for the other LICs it has fallen to 46 percent of GDP.

[4] IMF and World Bank (2010). "Global Monitoring Report 2010: The MDGs after the Crisis."

most severe impact has been in Latin America and the Caribbean region, where the average unemployment rate is estimated to have risen by 1.2 percent in 2009.[5] The crisis had a particularly severe impact on the mining, garment, maquila, and tourism industries.[6]

The 2009 shocks were more severe ("tail events") than in previous downturns

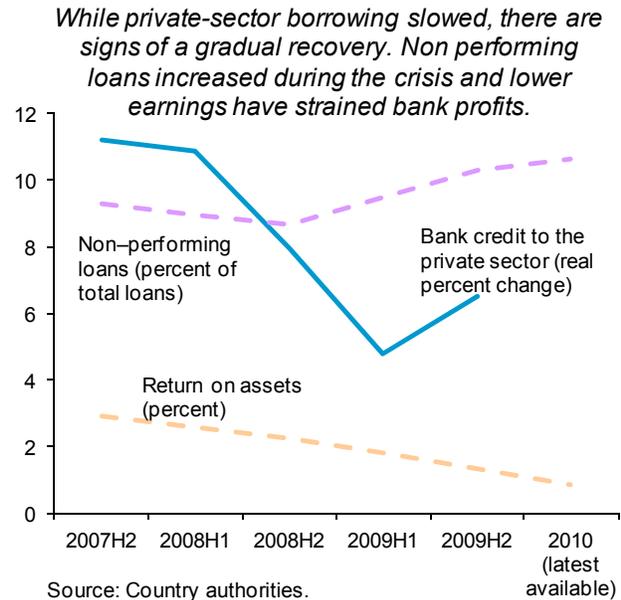(Distribution of Median of Shocks to LICs by Year, 1971–2009)
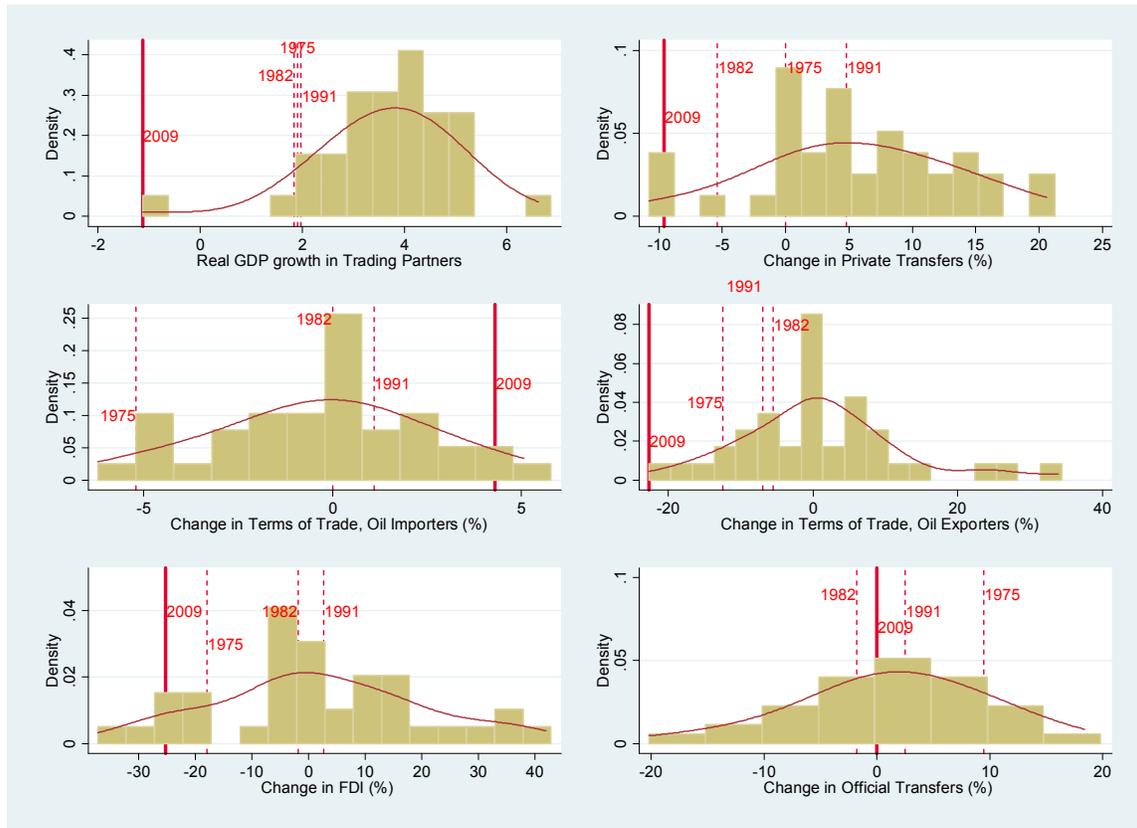
Sources: WEO, and Fund staff calculations.
Note: For each year, the median level of change in the variable was calculated and the histogram of the distribution of those medians was plotted. The red curve represents a smoothed estimate of the probability density function.

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[5] ILO (2010). "Global Employment Trends," January 2010. The ILO estimates unemployment to have risen by about 0.1–0.3 percent in 2009 in sub-Saharan Africa, the Middle East, East Asia, Southeast Asia/Pacific, and South Asia. However, these estimates are based on official unemployment definitions and thus do not take into account the large role of the informal sector in LICs.

[6] For example, Cambodia, with relatively high labor and utility costs and huge exposure to the U.S. market, had lost 40,000 jobs in its garment industry—11 percent of the industry's workforce—by mid-2009 (IMF Country Report No. 09/325, December 2009), while countries with lower costs such as Bangladesh experienced a less pronounced decline. In the Democratic Republic of Congo, three quarters of artisanal miners lost their jobs following the sharp fall in commodity prices, and 44 out of 75 mining companies in Katanga had closed by March 2009. Zambia also lost 10,000 out of 30,000 jobs in the mining sector. The impact on employment in Latin American and Caribbean LICs was particularly strong in the maquila and tourism industries.

6.   **As anticipated in previous studies,[7] the direct impact of the global crisis on LICs' banking sectors has been limited.** Many banks in LICs were characterized by low reliance on capital inflows and wholesale funding. They had generally limited leverage and also maintained relatively high pre-crisis capital adequacy ratios. As a result, banking sectors were shielded from

the initial impact of the crisis, more so than banks in the rest of the world (Appendix IV). However, as the macroeconomic environment continued to deteriorate, banks' portfolios were adversely affected by an increasing volume of non-performing loans (NPLs) and decreasing profitability.[8] Banks responded by tightening credit standards and curtailing lending to the private sector. A number of countries therefore implemented policy measures that mitigated the impact of the crisis on the banking sector,[9] and credit growth appeared to pick up somewhat in the second half of 2009.[10] Nevertheless, higher loan-loss provisions and stronger competition for new deposits appear to have been exerting pressure on banks' earnings.

While private-sector borrowing slowed, there are signs of a gradual recovery. Non performing loans increased during the crisis and lower earnings have strained bank profits.

Source: Country authorities.

7.   **The small number of LICs with access to capital markets were affected by the turmoil in global markets in 2008/09, but have since benefited somewhat from renewed investors' interest in EM bonds.** International capital markets reopened for LICs with Senegal's debut issuance in December 2009 (US$200 million) and Vietnam's issuance in January 2010 (US$1 billion), the first issuances of significant size since the crisis broke. In line with improved cost conditions in international markets, the cost of domestic bond financing has generally declined, although the size and structure of these markets remains limited in LICs. In equity markets, Asian LICs, including Bangladesh and Mongolia, have performed relatively well.

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[7] Fabrizio, Stefania and others (2010). "Coping with the Global Financial Crisis: Challenges Facing Low-Income Countries," IMF April 2010; and IMF (2009). "The Implications of the Global Financial Crisis for Low-Income Countries," March 2009.
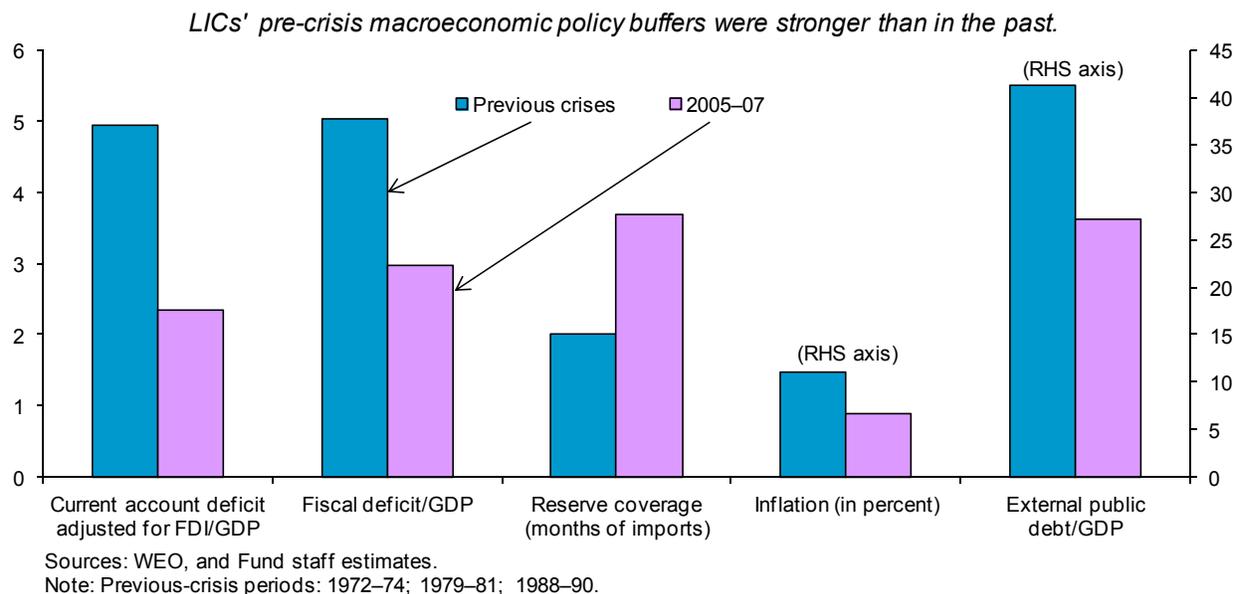
[8] There are indications that NPLs have continued to increase in 2010, albeit at a slower pace.

[9] See section on Monetary, Exchange Rate, and Financial Sector Policies for specific measures for the banking sector implemented in LICs.

[10] Data for credit growth for the second half of 2009 are available for 19 countries.

B. LICs' Pre-Crisis Position

8.   **LICs entered this crisis with much stronger macroeconomic positions than in the past.** Compared with previous downturns (1975, 1982, and 1991), LICs had far smaller fiscal and current account deficits, lower inflation, stronger international reserve coverage, and—thanks in part to debt relief—lower debt burdens. These "policy buffers" were built up mostly during the last decade—supported by sound macroeconomic policies, an enabling global environment, and in some case debt relief—as shown by an overall policy buffer index constructed for this paper.[11]

LICs' pre-crisis macroeconomic policy buffers were stronger than in the past.

Sources: WEO, and Fund staff estimates.
Note: Previous-crisis periods: 1972–74; 1979–81; 1988–90.

9.   **However, the strength of LICs' pre-crisis policy buffers differed across regions, and was generally greater in commodity exporters and countries with Fund programs**. LICs in Latin America and the Caribbean appeared generally less well-prepared for the crisis than others. By contrast, commodity exporters benefited from global price trends since 2004 and on average had more reserves, lower public debt, smaller fiscal deficits, and stronger current account balances than non-commodity exporters, though their inflation was still higher. Countries that had a long-term program engagement with the IMF tended to build up reserves, reduce debt, and contain fiscal and current account deficits more significantly than other LICs.[12]

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[11] The buffer index comprises public debt, the fiscal balance, the current account balance plus FDI (all in percent of GDP), inflation, and reserve coverage in months of imports. Positive values of the buffer index indicate a stronger policy stance. Appendix V describes the methodology.

[12] See IMF (2009). "The Fund's Facilities and Financing Framework for Low-Income Countries— Supplementary Information," March 13, 2009, for a more in-depth description of longer-term macroeconomic trends across LICs.

**Policy Buffer Components by LIC Groups, 2000 and 2007 1/**

	Reserves (months of imports)			Public debt (percent of GDP)			Fiscal balance (percent of GDP)			Current account + FDI (percent of GDP)			Inflation (percent)		
	2000	2007	Change	2000	2007	Change	2000	2007	Change	2000	2007	Change	2000	2007	Change
All LICs	2.8	3.9	1.1	93	46	-47	-3.1	-2.2	0.9	-3.9	-0.9	3.0	5.9	6.9	1.0
Commodity exporters	2.8	4.4	1.6	115	40	-75	-2.9	-1.5	1.4	-3.1	2.1	5.2	7.6	8.3	0.7
Non-commodity exporters	2.9	3.6	0.6	80	49	-31	-3.1	-2.4	0.8	-4.4	-2.9	1.5	4.9	6.3	1.4
Program countries 2/	2.8	3.9	1.1	108	38	-70	-2.9	-1.3	1.6	-4.1	-0.4	3.7	5.6	7.1	1.4
Non program countries	2.9	3.6	0.6	62	64	2	-3.3	-2.7	0.6	-2.2	-3.8	-1.6	6.4	6.2	-0.2
Sub-Saharan Africa	2.9	4.6	1.7	111	49	-62	-2.6	-1.6	0.9	-2.6	-1.7	0.9	5.0	6.3	1.3
Latin America and the Caribbean	2.7	2.9	0.1	67	63	-3	-3.3	-3.8	-0.6	-1.4	-5.4	-4.1	4.2	5.5	1.3
Asia	2.6	4.1	1.5	61	43	-18	-3.5	-0.9	2.7	0.6	2.8	2.2	6.7	6.9	0.2
Middle East and Europe	3.0	3.7	0.7	89	35	-54	-2.7	-2.1	0.6	-2.7	1.7	4.4	13.9	8.9	-5.0

Source: IMF staff calculations.

1/ The 2000 and 2007 values for the flow variables are calculated as the average over 1998–2000 and 2005–07 respectively.

2/ Defined as having a Fund program for at least six years during 1995–2007.

Policy buffers were built up during the last decade, though with differences across countries.

(Composite Policy Buffer Index, all LICs)

Sources: WEO, and Fund staff estimates.
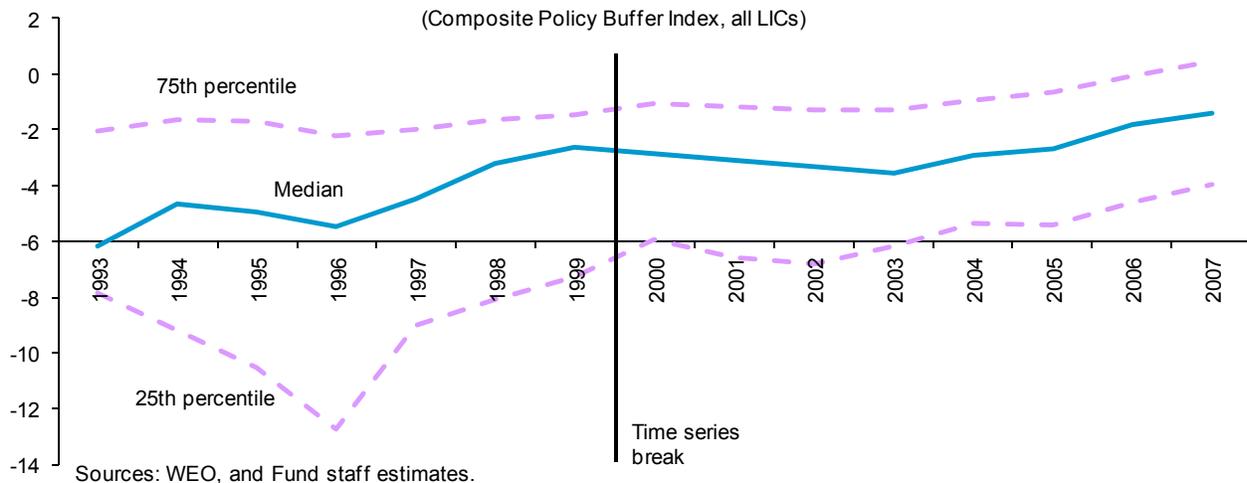
Note: the number of countries differs between the two periods (1993–99 and 2000–07) due to data availability. The 1993 and 1999 buffers were calculated using external public debt rather than total public debt, which was also due to data availability.

10.   **In spite of significant progress made through 2007, LICs approached the crisis with somewhat lower policy buffers than EMs and AMs, in part reflecting their very weak initial conditions**. As of end-2007, EMs had higher international reserves coverage, lower public debt in percent of GDP, and a more comfortable current account position than LICs—somewhat expected given their greater economic development. Fiscal deficits in AMs and EMs were also smaller than those in LICs.

C.   Domestic Policy Responses to the Crisis

Fiscal policy

11.   **Unlike in previous downturns, most LICs could afford to adopt a countercyclical fiscal policy response, and most did so.** As in past downturns, fiscal revenue declined as a result of the crisis, but this time around, most LICs did not curtail spending; indeed, in about half

of LICs, the growth rate of real primary expenditures accelerated. As a result, the median fiscal overall deficit widened by about 2.7 percent of GDP (and the median primary deficit by 1.9 percent of GDP). This countercyclical fiscal policy response was a first for LICs, and was made possible by much stronger pre-crisis macroeconomic policy buffers (in particular stronger fiscal positions) and greater availability of domestic and external financing.[13]

LICs used a countercyclical fiscal response...

... unlike in previous crises.

Sources: WEO, and Fund staff estimates.
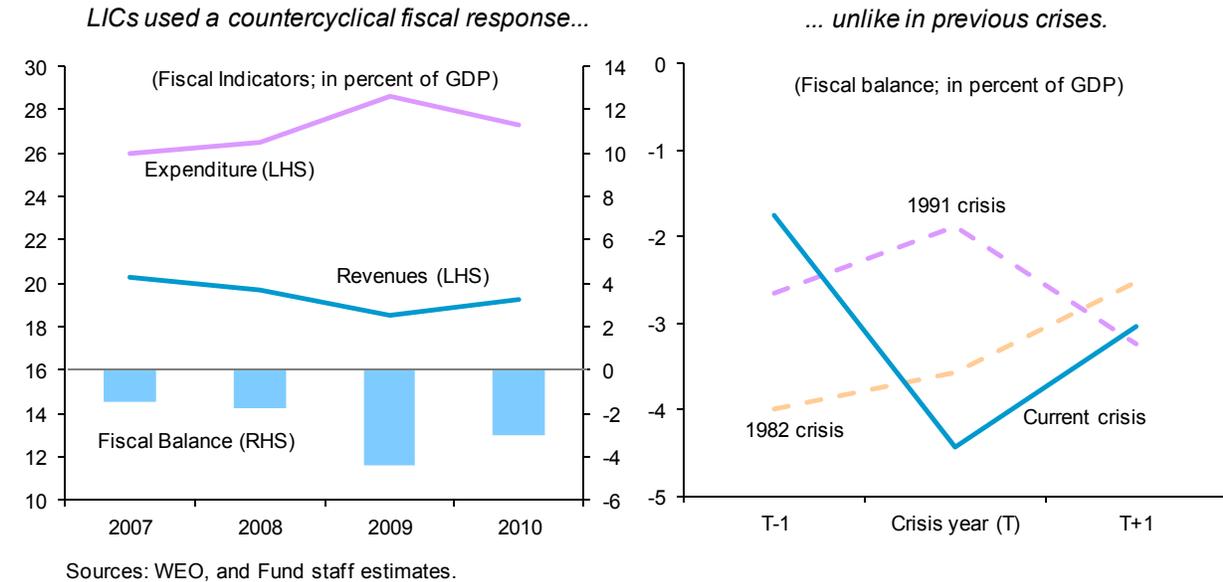
12.   **Most LICs let fiscal automatic stabilizers work and increased real primary spending.** The median decline in revenue in LICs amounted to 0.3 percent of GDP. In about half of LICs, the cyclical drop in revenue was partly offset by revenue-boosting measures reflecting ongoing reforms to strengthen medium- and long-term revenue performance. Commodity exporters were hit hardest, with a median revenue loss of 2.1 percent of GDP. Notwithstanding the lower revenue, real spending grew in LICs during the crisis, with a median increase of

Automatic stabilizers in LICs worked on the revenue side during the crisis.

Sources: WEO, and Fund staff estimates.
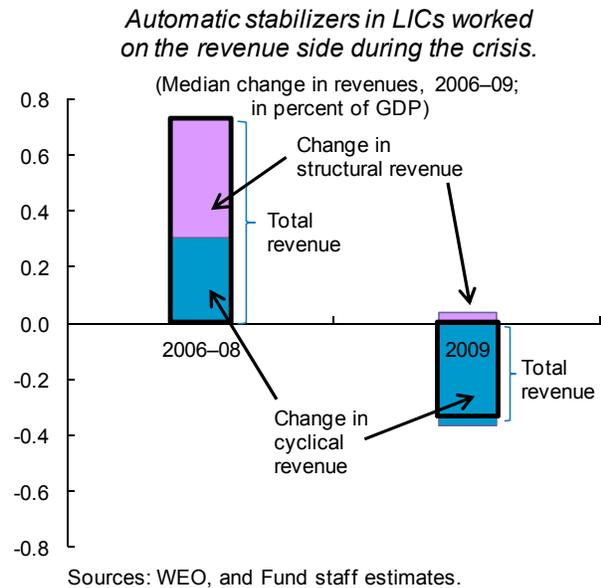
[13] IMF financing played an important role during the crisis, including through the general SDR allocation. Concessional support has totaled US$5 billion (commitments) since the beginning of 2009, compared to the historical average of US$1 billion per year. Greater availability of domestic financing was partly due to higher levels of government deposits, built through more prudent fiscal policies, and somewhat higher liquidity in local financial sectors.

7.4 percent in 2009 in comparison with 7.6 percent over the previous five years.

13. **Pre-crisis policy buffers were the key factor determining the scope for fiscal accommodation in 2009.** Regression analysis suggests that LICs with stronger pre-crisis buffers[14] could better afford widening primary fiscal deficits and responded more forcefully to weakening growth (Appendix VI).[15] While LICs with stronger buffers could afford to increase real spending in 2009, many low-buffer countries were unable to do so.[16] [17] All told, 81 percent of LICs increased expenditures, compared with 88 percent of AMs and less than 69 percent of EMs.

Determinants of Change in Primary Balance to GDP in 2009 1/

Real GDP growth in 2009	0.33*
	(1.67)
Buffer Index in 2008 [2]	-0.42**
	(-2.45)
Constant	-2.84***
	(-4.04)
# of observations	50
R-squared	0.29

1/ Real GDP growth in 2009 is instrumented by real GDP growth in trading partners, change in remittances scaled by GDP in 2008, and change in export deflator. t-statistics are in parenthesis. ***, **, and * denote significance at 1, 5, and 10 percent level, respectively.
2/ An increase in index corresponds to an improvement in performance.

Stronger policy buffers provided scope for higher spending during the crisis.
(Real primary expenditure, median, 2007 = 100)

High/medium buffer

Low buffer
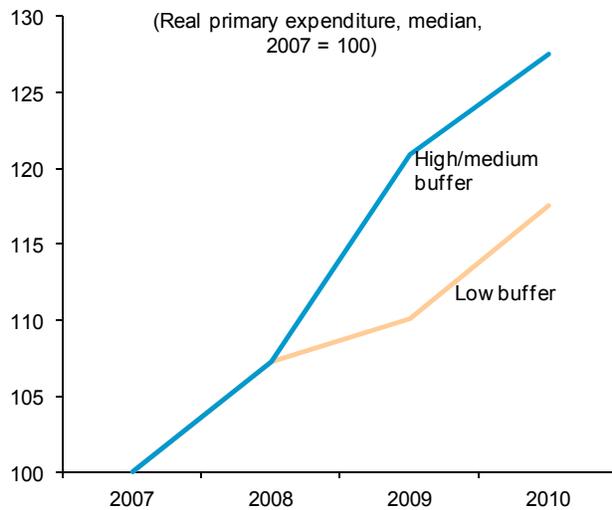
Sources: WEO, and Fund staff estimates.

LICs increased real spending more rapidly in 2009 than AMs and EMs.
(Real primary expenditure, median, 2007 = 100)

LICs

EMs

AMs

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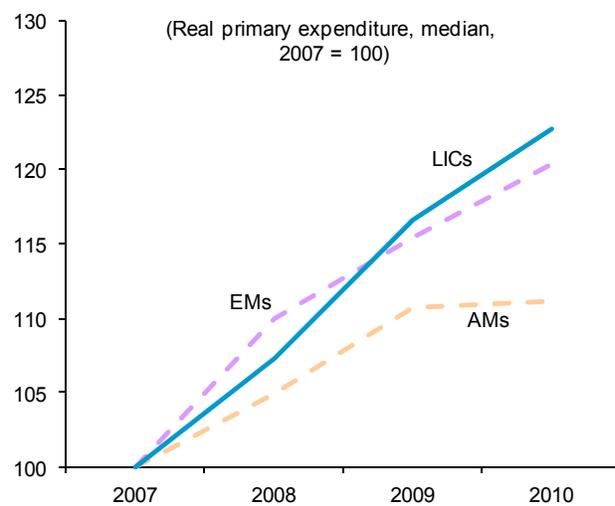
[14] Appendix V describes the criterion used for classifying low-, medium-, and high-buffer countries.

[15] This finding mirrors that for EMs, where a recent study found that higher pre-crisis primary balances and lower initial public debt levels allowed greater fiscal accommodation during the crisis. See IMF (2010). "How Did Emerging Markets Cope During the Crisis?," IMF Policy Paper, June 15, 2010.

[16] Real spending is calculated as nominal spending deflated by the GDP deflator.

[17] While 88 percent of high-/medium-buffer countries were able to increase real primary expenditures, less than 65 percent of low buffer countries did so.

14.   **The composition of spending improved in favor of public investment and social sectors.** [18] Public investment in 2009 increased by 17 percent in real terms. Health and education spending increased in real terms by 10 percent in 2009, while real growth in spending on goods and services slowed during the crisis. The growth in health and education spending was higher in countries with IMF-supported programs. In addition, although LICs' social safety net systems are, in general, not well developed, many countries took steps to strengthen social protection, enhancing or introducing cash transfer programs, with the dual purpose to protect nutrition of young children and provide cash to poor families. A number of LICs also implemented labor-intensive public works programs. [19]

The composition of spending improved in favor of public investment and social sectors.

(Real growth rate of primary expenditure, median, 2006-09; in percent)

■ 2006–08   □ 2009
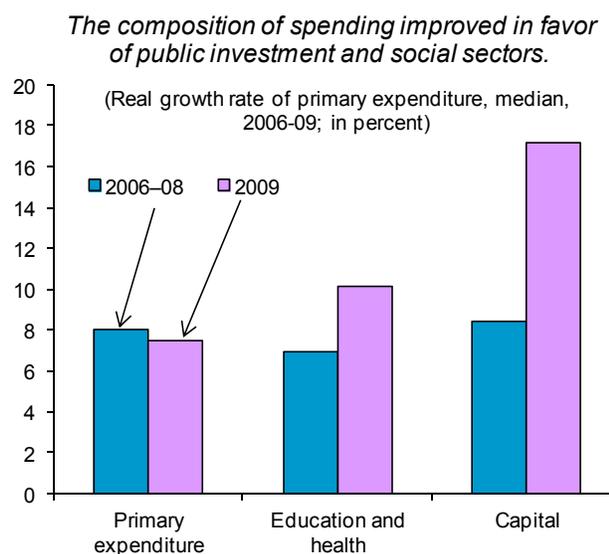
Sources: WEO, and Fund staff estimates.

15.   **Countries supported by a Fund program were able to increase real spending more than non-program countries.** Almost 90 percent of countries with Fund-supported programs ("program LICs") increased real primary expenditures in 2009, compared with 67 percent of countries without Fund-supported programs, as Fund financing reduced liquidity constraints and helped catalyze donors' support. Median real expenditures among program LICs increased by about 8 percent, as compared with 7 percent among non-program LICs.
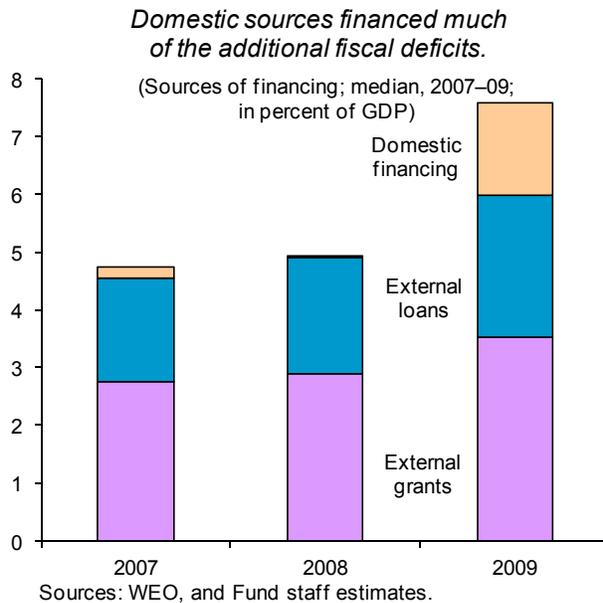
16.   **LICs relied heavily on domestic sources to finance the rising fiscal deficits**. More than half of the additional deficit was financed by domestic sources, which includes borrowing in domestic debt markets, central bank financing, or drawing down government deposits. External loans accounted for much of the remainder, with IMF financing a significant component. Grants increased slightly in 2009.

17.   **Empirical evidence suggests that this countercyclical fiscal response also helped cushion the impact of the global crisis on growth.** Loosening fiscal policy can support growth, in particular, when the economy is sluggish and inflationary pressures are low. The effectiveness of fiscal stimulus would also depend critically on the quality of the fiscal measures and whether

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[18] Data on social and capital spending were available for a limited country sample of 33 and 54 countries, respectively.

[19] Examples of countries which implemented labor intensive public works programs are Bangladesh, Cambodia, Kenya, Tanzania, Yemen, Rwanda, St. Lucia, Lao P.D.R, and Sierra Leone; and countries which strengthened or introduced cash transfer programs include Bolivia, Dominica, Malawi, and Senegal.

debt sustainability is adversely affected. Econometric analysis of the determinants of short-run growth during economic downturns based on the last three crisis periods, including the last one, suggests that loosening fiscal policy has tended to support growth in the short run (see text table and Appendix VII). This suggests that, in many LICs, countercyclical fiscal policy in 2009 helped cushion the adverse growth impact of the crisis, in addition to sustaining adequate spending on social and infrastructure sectors. The latter, in turn, may have helped speed the recovery in 2010 and beyond, though this remains to be seen.

Domestic sources financed much of the additional fiscal deficits.

(Sources of financing; median, 2007–09; in percent of GDP)

Domestic financing

External loans

External grants

2007　　2008　　2009

Sources: WEO, and Fund staff estimates.

Short-term Determinants of Growth during Crisis Episodes 1/

Change in the primary balance to GDP	-0.76**
	(-2.35)
Lagged GDP growth	-0.02
	(-0.09)
Combined Shocks Indicator 2/	0.3***
	(3.06)
Number of observations	161
Number of countries	60

1/ Panel instrumental variable regressions are estimated by Limited Information Maximum Likelihood (LIML). Sample includes downturns (1981–82; 1989–90; 2008–09). Change in primary balance to GDP is instrumented for by lagged values of macroeconomic stability indicator and the current account balance to GDP. t-statistics are in parenthesis. ***, **, and * denote significance at 1, 5, and 10 percent level, respectively.

2/ The combined effect of contemporaneous external shocks to trade, remittances, FDI, and services exports in percent of previous year's GDP. Negative value indicates adverse shocks.

Monetary, exchange rate, and financial sector policies

18. **As in the past, monetary policy remained somewhat passive during the crisis in most LICs.** While almost two-thirds of the 39 LICs for which data are available lowered the nominal policy rate, this decrease was less than the globally-driven fall in inflation could have allowed, resulting in an increase in real rates at the peak of the crisis. Constraints on monetary policy effectiveness, such as weak monetary transmission channels and inefficient monetary policy frameworks, are likely reasons for this muted monetary policy response. Regarding financial sector policies, a number of countries sought to mitigate the impact of the crisis on their banking sectors through measures ranging from enhanced surveillance to intervention and capital injection. Some banks have also benefited from financial support to other sectors (Box 1).

*While many LICs lowered policy
rates when the crisis hit...*

(Number of countries changing
the nominal discount rate)

Pre-crisis

Crisis

Increase

6

22

9

Unchanged

14

24

Decrease

6

2007Q4–2008Q3   2008Q3–2009Q4

Sources: WEO, and Fund staff estimates.
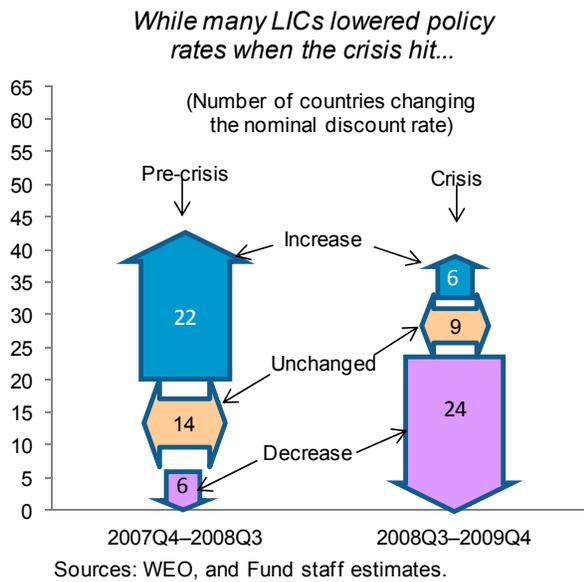
...monetary policy did not respond to the full extent.

(Nominal and real discount rate,
2007–2009; in percent)

Nominal rate

Real rate

2007Q2   2007Q4   2008Q2   2008Q4   2009Q2   2009Q4
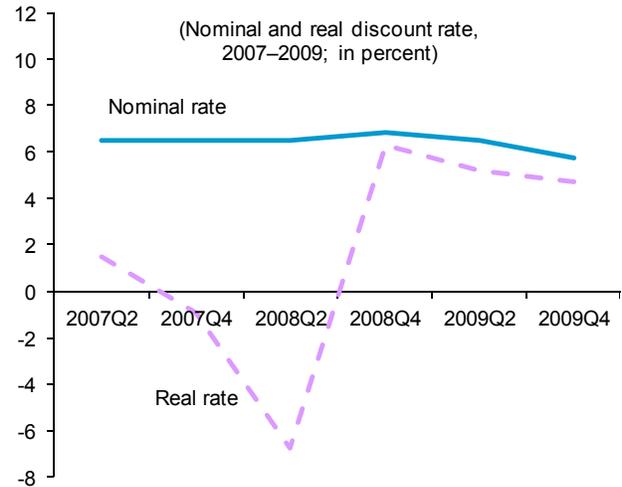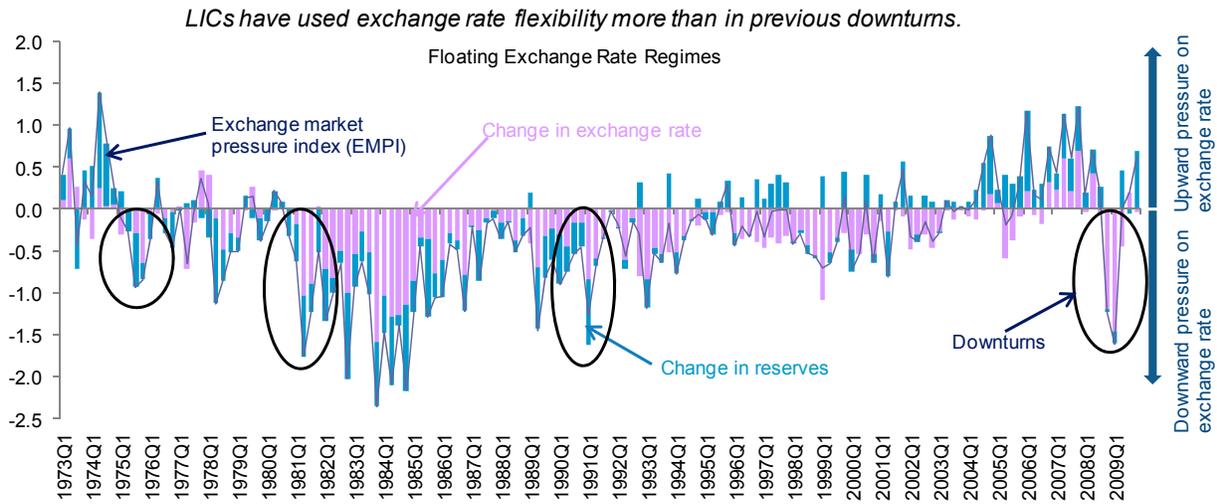

**Box 1. Examples of Crisis Mitigating Measures in the Banking Sector, 2008–09**

- Direct assistance in the form of capital injection or intervention (Kenya, Nigeria, and Uzbekistan).
- Targeted assistance to affected sectors considered key for economic growth, which was to some extent channeled via affected banks (Nigeria, Tanzania, and Uganda). In Tanzania and Uganda, NPLs were concentrated in loans to these sectors. Tightened supervision of banks through, for example, enhanced monitoring of NPLs, and imposing stricter prudential limits (Moldova, Sierra Leone, and Zambia); and strengthened coordination between home/host supervisors and the regulations on cross-border financial flows (WAEMU countries).
- Establishment of special monitoring units (e.g., Tanzania) to identify emerging risks in the financial sector and formulate a coordinated policy response. In Nigeria, a high-level committee was launched (Presidential Steering Committee on the Global Economic Crisis).
- Tightening of exchange rate controls (Nigeria imposed temporary foreign exchange controls to prevent depreciation of the Naira, including: (i) allowing purchases of foreign exchange from the central bank window that could be used only for the purpose of transactions with corporate clients; and (ii) tightening requirements on net open position limits); these controls were removed in July 2009.
- Blanket restructuring of past-due loans and increasing size and flexibility of credit lines to banks (Nicaragua).
- Lowering the costs of the Lombard facility (Tanzania).
- Expanding the mandate of deposit insurance by broadening on-site monitoring function (Tanzania) and exploring the establishment of a deposit insurance fund to boost confidence in the banking sector (Ghana and Malawi).

---

19.   **By contrast, LICs used exchange rate flexibility much more than in previous crises to respond to exchange rate pressures**. Indeed, unlike in previous crises, LICs reacted to downward exchange rate pressures mostly by letting the exchange rate depreciate rather than allowing losses in reserves as in the past (see Appendix VIII). There were, however, some significant differences among sub-groups. Also, although both commodity exporters—including

the hardest hit oil exporters—and non-commodity exporters responded to the downward exchange rate pressures primarily by depreciation, commodity exporters incurred reserve losses as well. The real exchange rate for countries experiencing an adverse terms-of-trade shock in 2009 depreciated relatively more than for countries with an improvement in the terms of trade, and the effect was stronger among floating-exchange rate countries.

LICs have used exchange rate flexibility more than in previous downturns.

Sources: WEO, and Fund staff estimates.
Note: The EMPI combines movements in the exchange rate and international reserves. Negative (positive) values suggest downward (upward) pressure on the exchange rate, to which countries could respond by either letting the exchange rate depreciate (appreciate) or by selling (accumulating) reserves (Appendix VIII).

The real exchange rate reacted more in countries that experienced an adverse terms-of-trade shock, and more among those with a floating exchange rate.

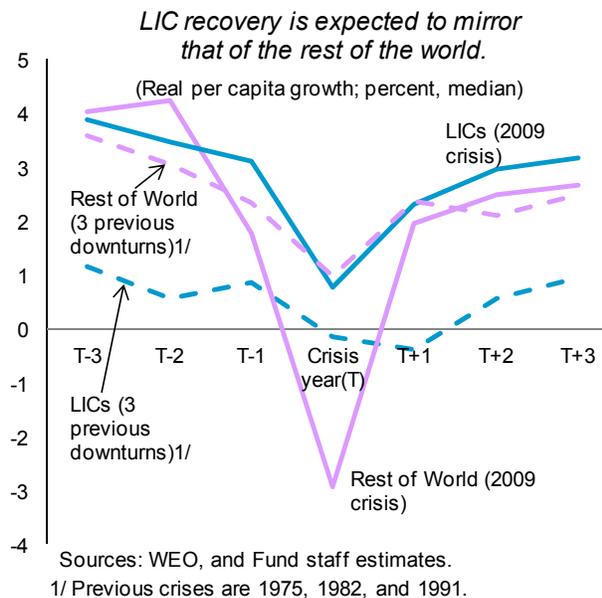Sources: WEO, and Fund staff estimates.
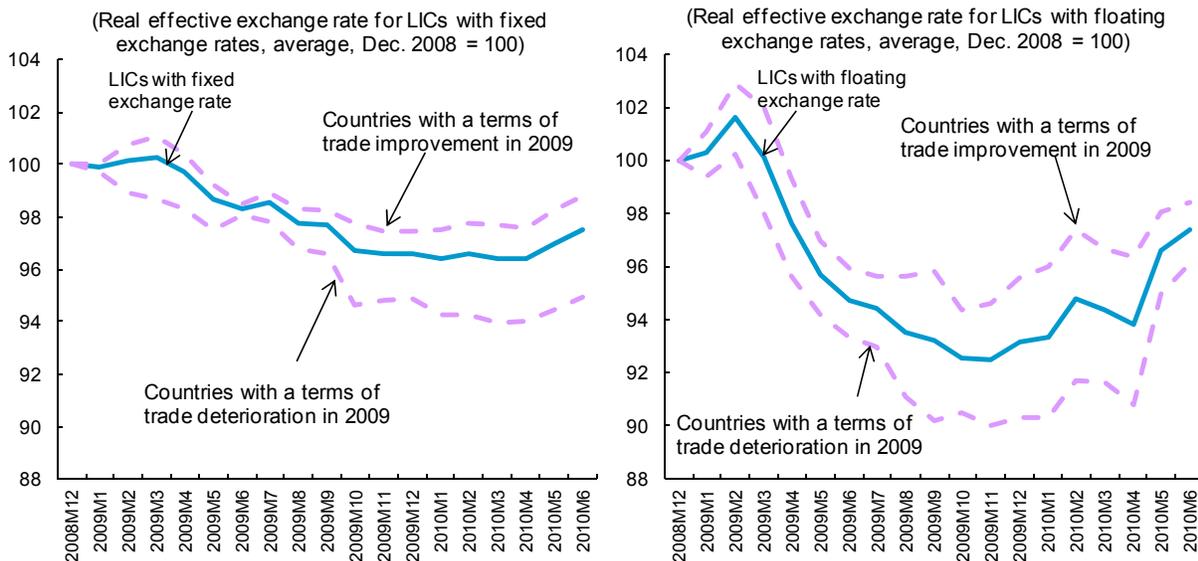
II. EMERGING FROM THE CRISIS—PROSPECTS AND MACROECONOMIC CHALLENGES

- *LICs' economic recovery is projected to be faster and more aligned with the rest of the world than in previous crises, although the pace of recovery will vary across regions.*
- *There are significant downside risks due to uncertain global economic prospects and somewhat weakened policy buffers.*
- *Countries are expected to rebuild their macroeconomic policy buffers as the recovery takes hold, in particular by consolidating fiscal and external positions, but real spending is projected to continue to grow for almost all LICs.*
- *The appropriate pace and extent of rebuilding buffers depends critically on country-specific vulnerabilities and resilience to further shocks.*
- *To rebuild buffers, many LICs should aim to (i) strengthen domestic revenues; (ii) boost priority spending and improve the efficiency and allocation of spending; (iii) pursue cautious external and domestic borrowing strategies, supported by measures to boost domestic savings, develop domestic financial sectors, and prepare debt management frameworks; and (iv) advance structural reforms, in particular to boost growth and manage volatility in an increasingly integrated global environment.*

A. Growth Prospects

20. **Unlike during previous global downturns, the economic recovery in LICs is projected to mirror the growth pick up in more advanced countries.** WEO baseline projections envisage a sharp V-shaped recovery for world growth. The recovery in LIC growth is projected to follow more closely that of the rest of the world, in contrast to the experience in previous global downturns when LICs' recovery dragged on over several years.

21. **The more synchronized recovery of LICs reflects their increased integration in world trade and finance, as well as their more robust domestic policy response during the crisis.** Unlike in previous crises, trade and financial openness is playing a crucial role in the current recovery, which is driven significantly by the pick-up of global demand, FDI, and remittances. As shown in an IMF study, since 1990 global demand and financial flows have become important engines of growth in

LIC recovery is expected to mirror that of the rest of the world.

(Real per capita growth; percent, median)

Sources: WEO, and Fund staff estimates.
1/ Previous crises are 1975, 1982, and 1991.

LICs, and are expected to drive LICs' growth in the future, as globalization continues to increase.[20] Indeed, in 38 percent of LICs for which data are available, the contribution from exports would account for more than half of total real GDP growth in 2010. Nevertheless, in many LICs domestic demand would continue to be a significant factor driving growth as well, in part reflecting the robust domestic policy response that has sustained investment throughout the crisis.[21]

Trade and financial openness have increased and are expected to be drivers of growth recovery.

(Exports, FDI, and remittances prior to crises for LIC regions;
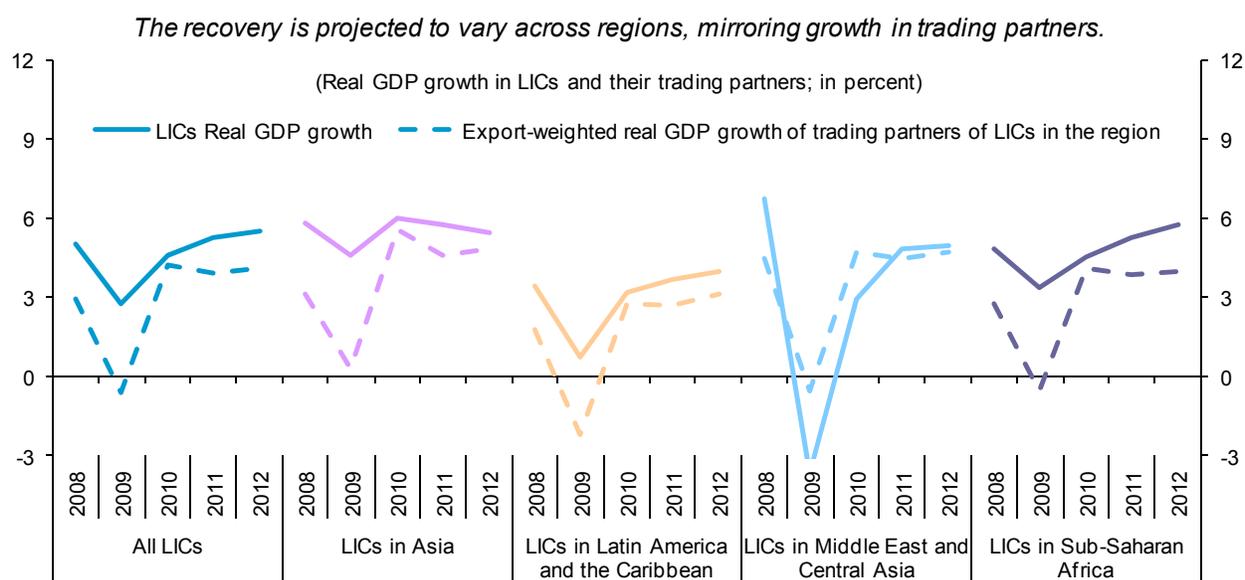median; in percent of GDP)
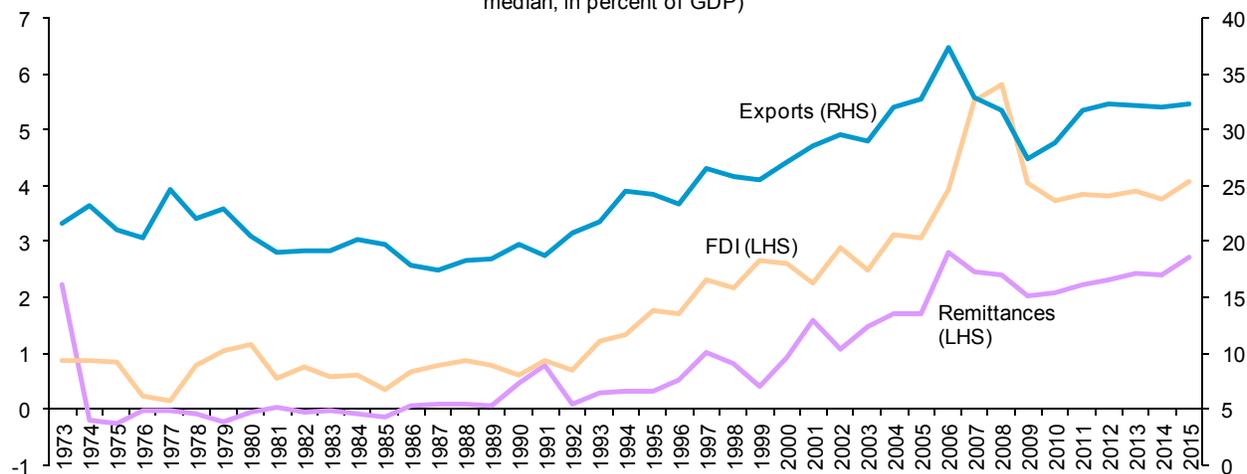
Sources: WEO, and Fund staff estimates.

22.   **The pace of recovery is projected to vary across regions, mirroring growth in LICs' trading partners.** Economic growth in 2010/11 is projected to be fastest in Asian LICs, benefiting from strong regional growth, whereas LICs in Latin America and the Caribbean are facing a much weaker recovery. The "V-shaped" nature of the recovery is generally less pronounced in LICs than in their richer trading partners, with the exception of LICs in the Middle East and Central Asia, the latter partly reflecting idiosyncratic factors.

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[20] Berg, Andrew and others (2010). "The End of an Era? The Medium-and Long-Term Effects of the Global Crisis on Growth in Low-Income Countries," IMF Working Paper 10/205, September, 2010.

[21] Real public capital spending increased by 19 percent in 2009 and is expected to increase by 12 percent in 2010.

The recovery is projected to vary across regions, mirroring growth in trading partners.

(Real GDP growth in LICs and their trading partners; in percent)

——— LICs Real GDP growth   – – – Export-weighted real GDP growth of trading partners of LICs in the region

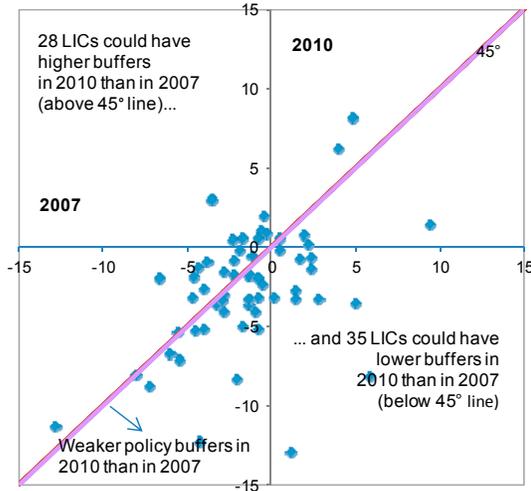| All LICs | LICs in Asia | LICs in Latin America and the Caribbean | LICs in Middle East and Central Asia | LICs in Sub-Saharan Africa |

Sources: WEO, and Fund staff estimates.

23.   **Risks to LICs' overall favorable recovery prospects are weighted to the downside, in particular in the event of a slower-than-expected global recovery.** A slower recovery in advanced and emerging economies could arise for example from a renewed drop in confidence in advanced economies' fiscal sustainability, policy responses, and growth prospects. Such a drop was observed temporarily in mid-summer 2010, casting a cloud over the growth outlook in advanced economies. Risks related to donor support are also on the downside, as advanced countries need to tighten their fiscal positions and may find difficult to meet their aid commitments. Renewed pressure could emerge if the recovery in advanced economies were to be slower than expected. See Section II.C for an illustrative downside scenario.

B. Macroeconomic Outlook: Realigning Policies and Rebuilding Buffers
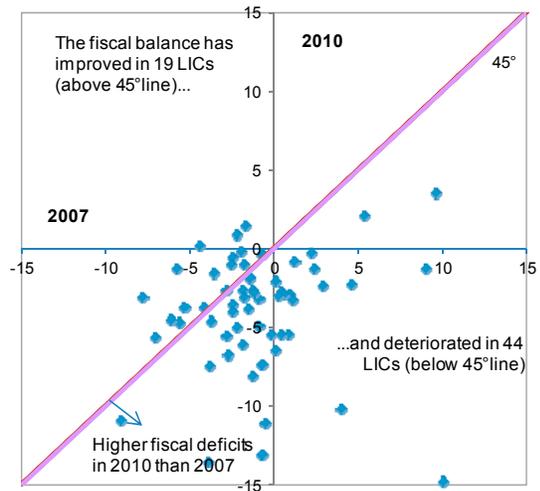
24.   **LICs are poised to emerge from the crisis with somewhat less comfortable buffers, albeit with significant variation across countries**. The baseline WEO projections envisage a gradual consolidation of LICs' macroeconomic positions, with improving fiscal and current account balances, low to moderate inflation, generally adequate reserve positions, and declining debt paths. Almost three-fourths of LICs are projected to improve their macroeconomic policy buffers over the medium term. This rebuilding is most rapid for commodity exporters and Asian LICs, and is least pronounced for those in Latin America and the Caribbean. Reassuringly, countries that had comparatively low buffers in 2009 are, in general, slated to improve their buffers by more than the average, with the result that the number of countries in the "low buffer" category drops from 25 in 2009 to only 11 by 2015.

Policy buffers have been used during the crisis—LICs are emerging in a somewhat weaker position, especially with regard to fiscal and current account balances.
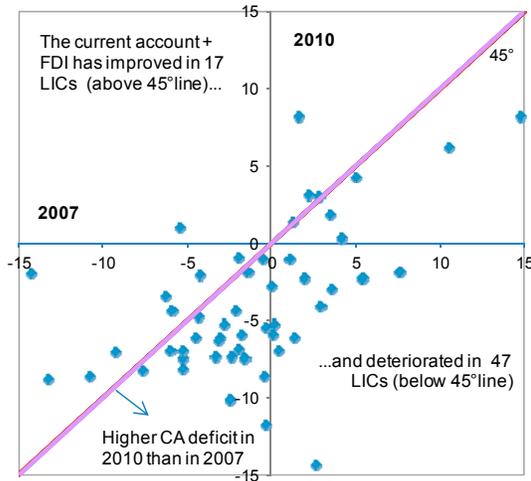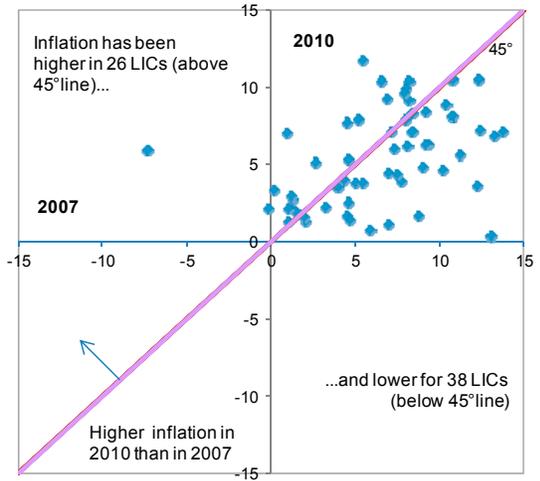
Overall buffer index, 2007 and 2010

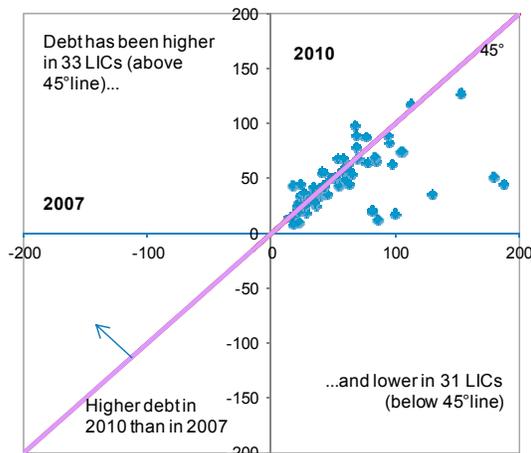28 LICs could have higher buffers in 2010 than in 2007 (above 45° line)...

2010

2007

45°

... and 35 LICs could have lower buffers in 2010 than in 2007 (below 45° line)

Weaker policy buffers in 2010 than in 2007

(Fiscal balance, in percent of GDP)

The fiscal balance has improved in 19 LICs (above 45°line)...

2010

2007

45°

...and deteriorated in 44 LICs (below 45°line)

Higher fiscal deficits in 2010 than 2007

(Current account+FDI, in percent of GDP)

The current account + FDI has improved in 17 LICs (above 45°line)...

2010

2007

45°

...and deteriorated in 47 LICs (below 45°line)

Higher CA deficit in 2010 than in 2007

(Inflation, in percent)

Inflation has been higher in 26 LICs (above 45°line)...

2010

2007

45°

...and lower for 38 LICs (below 45°line)

Higher inflation in 2010 than in 2007

(Debt, in percent of GDP)

Debt has been higher in 33 LICs (above 45°line)...

2010

2007

45°

...and lower in 31 LICs (below 45°line)

Higher debt in 2010 than in 2007

(Reserves, in months of imports of G&S)

Reserves has been higher in 50 LICs (above 45°line)...

2010

2007

45°

...and lower in 14 LICs (below 45°line)

Lower reserves in 2010 than in 2007
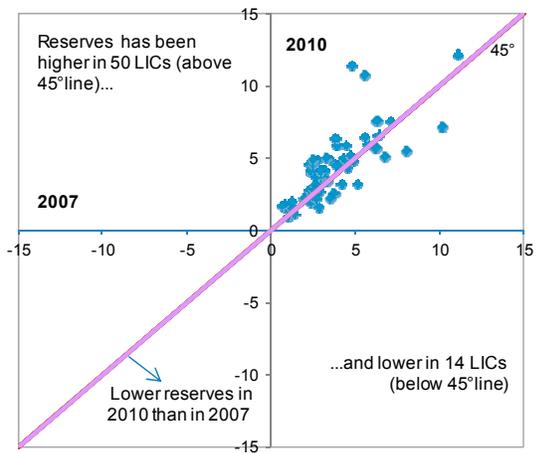
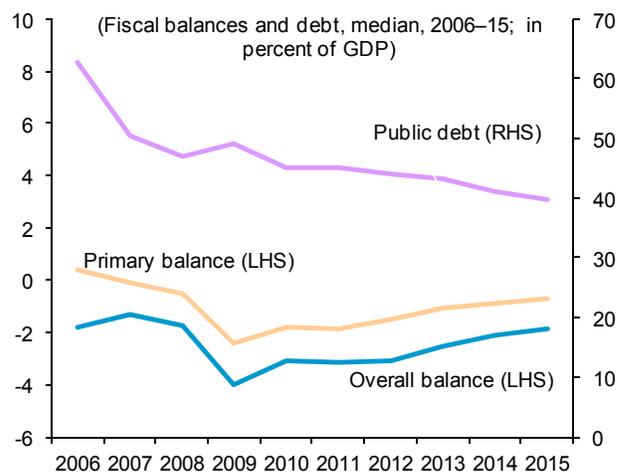Sources: WEO, and Fund staff estimates.

25.   **The baseline WEO outlook suggests that inflation pressures appear to be contained for now, although there are upside risks related to global food and fuel prices.** The forecast is for median LIC inflation to continue to fall from its 2008 peak to about 5 percent over the medium term, reflecting moderate food and fuel price increases and low global inflation. Average inflation among countries with floating exchange rates and commodity exporters would be somewhat higher than that of other LICs. There is also heterogeneity among countries, with 11 out of 64 countries experiencing double-digit inflation in 2010 and another nine near-double digits. Risks to the baseline LIC inflation forecast are on the upside given possible increases in world food and fuel prices (see below).

26.   **Unlike in advanced economies, medium-term debt dynamics are not problematic for most LICs as they rebuild fiscal buffers along the recovery path.** The median improvement in the primary balance is projected at 1.3 percentage points of GDP over five years. The share of countries with fiscal deficits in excess of 5 percent of GDP is projected to drop from almost one-half in 2009 to one-tenth by 2014, while at the other end of the spectrum, almost half of the countries are expected to have fiscal deficits below 2 percent of GDP by 2014, up from one-fourth of countries in 2009. With the projected recovery in growth and the gradual improvement in the fiscal balance, the median public debt ratios in LICs will return to a declining trend, unlike in advanced countries, where, on average, debt ratios are projected to increase over the medium term.[22] By 2015, public debt would be less than 40 percent of GDP in half of LICs, and a fifth would have debt in excess of 65 percent of GDP.
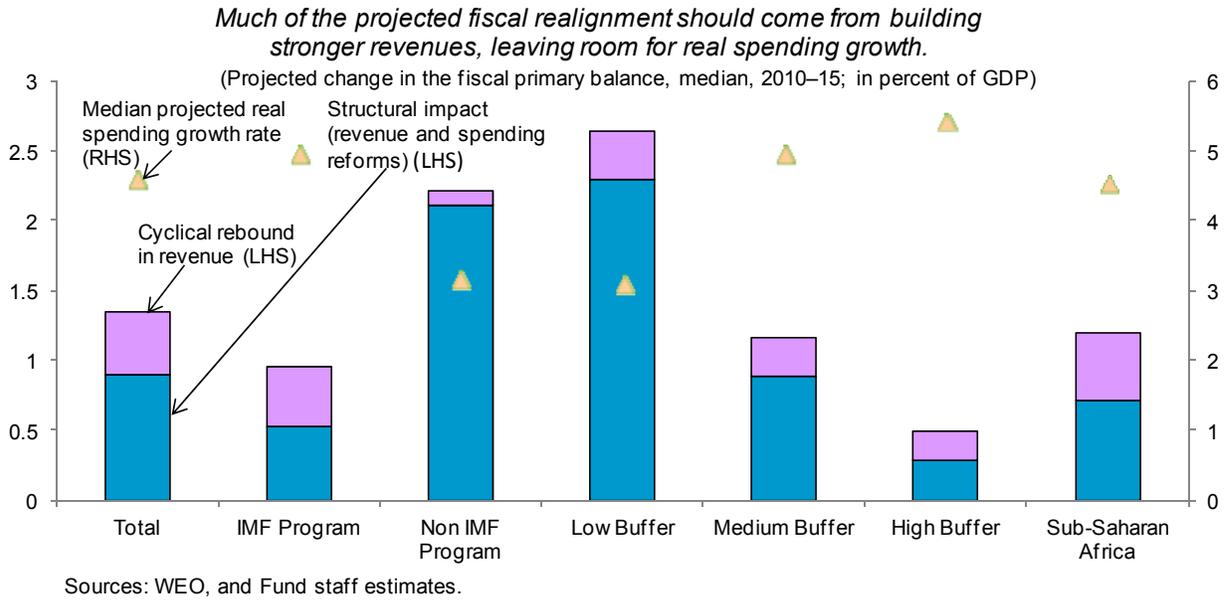
The overall debt outlook seems favorable as fiscal buffers are being rebuilt along with the recovery.

(Fiscal balances and debt, median, 2006–15; in percent of GDP)

Public debt (RHS)

Primary balance (LHS)
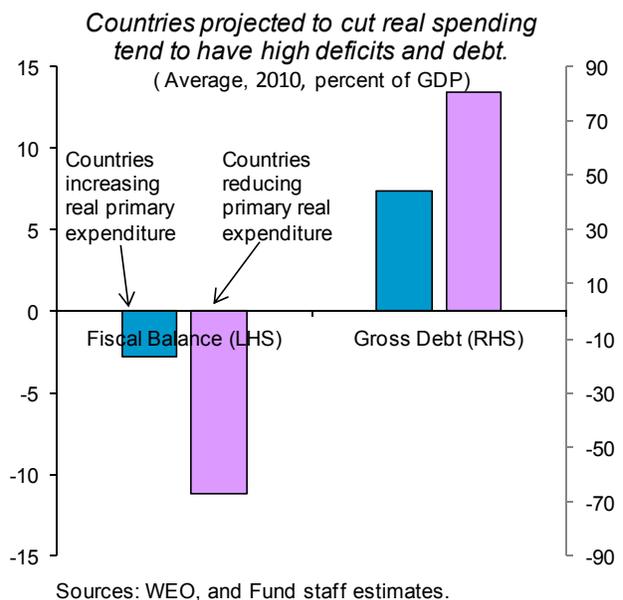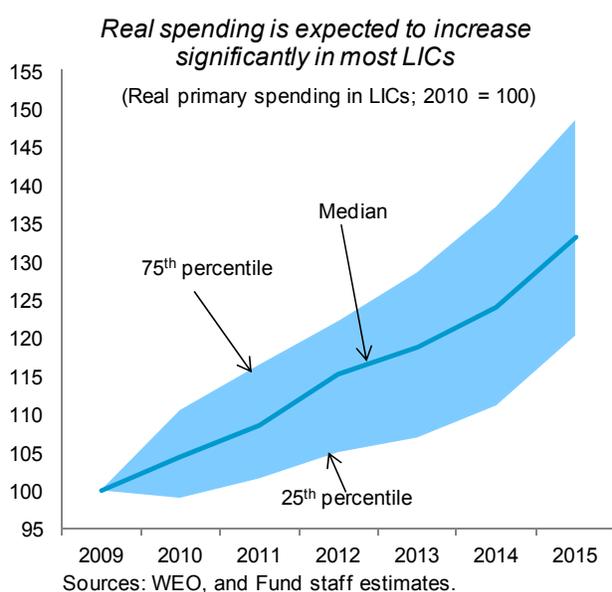
Overall balance (LHS)

Sources: WEO, and Fund staff estimates.

27.   **The expected fiscal realignment is partly driven by automatic stabilizers, as the pick-up in growth generates higher revenues.** About one-third of the projected improvement in the primary balance is expected to come from the cyclical recovery in revenues. The remaining two-thirds comes mainly from measures to boost underlying revenue performance and trim non-priority spending, some of which are part of longer term reform efforts initiated prior to the crisis. In sub-Saharan African LICs, the projected structural fiscal adjustment is estimated at a median just over ½ percent of GDP over five years. In countries with larger projected adjustment, the rebuilding of fiscal buffers would be made easier if additional donor support were forthcoming.

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[22] IMF (2010). "Navigating the Fiscal Challenges Ahead," World Economic and Financial Survey, Fiscal Monitor, May 14, 2010.

*Much of the projected fiscal realignment should come from building
stronger revenues, leaving room for real spending growth.*
(Projected change in the fiscal primary balance, median, 2010–15; in percent of GDP)

Median projected real
spending growth rate
(RHS)

Structural impact
(revenue and spending
reforms) (LHS)

Cyclical rebound
in revenue (LHS)
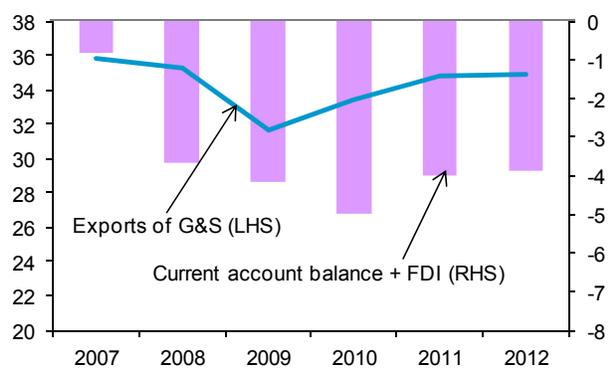
Sources: WEO, and Fund staff estimates.

28.   **Real spending is expected to continue to grow, though with important differences
across countries.** Median real spending is projected to increase by 4.6 percent annually during
2010–15, somewhat lower than in the pre-crisis period, reflecting the need to rebuild buffers by
reducing reliance on domestic financing. The slowdown in spending is lowest in sub-Saharan
African LICs. In fact, in one-fourth of the countries in sub-Saharan Africa the medium-term
projections incorporate a significant fiscal expansion. By contrast, five countries are expected to
cut real spending over this period, mainly reflecting their highly vulnerable fiscal and debt
positions coming out of the crisis and the related need to rebuild policy buffers (see below).
Further progress in tax policy and revenue administration reforms would also support rebuilding
of buffers and higher spending in priority areas.

*Real spending is expected to increase
significantly in most LICs*
(Real primary spending in LICs; 2010 = 100)

Median

75th percentile

25th percentile

Sources: WEO, and Fund staff estimates.

*Countries projected to cut real spending
tend to have high deficits and debt.*
(Average, 2010, percent of GDP)

Countries
increasing
real primary
expenditure

Countries
reducing
primary real
expenditure

Fiscal Balance (LHS)

Gross Debt (RHS)

Sources: WEO, and Fund staff estimates.

29.   **The global recovery is projected to boost demand for LICs' exports and strengthen current account balances, which in turn will help bolster reserve cushions.** After a significant drop in 2009, exports are projected to rebound in the near term, helping to narrow current account deficits, especially among oil producers. Over the medium term, eight LICs would have current account deficits (incl. FDI) in excess of 8 percent of GDP, compared to 16 at the end of 2009. The projected improvement in the external environment would help maintain median reserve coverage at around 4–4¼ months of imports over the medium term, though with significant heterogeneity across countries. In particular, at one end of the spectrum, one-seventh of LICs would have more than six months of import coverage, while on the other end, about one-twentieth of the countries would have less than two months. Also, countries that had relatively low reserve coverage in 2009 (below three months of imports), are expected to improve their coverage somewhat over the medium term, but their median coverage would still be only 2.7 months of imports.

*The current account balance is projected to improve gradually as exports rebound...*

(Exports of goods and services, and current account balance + FDI, average, 2007–12; in percent of GDP)

Exports of G&S (LHS)

Current account balance + FDI (RHS)

Sources: WEO, and Fund staff estimates.

... but reserve cushions would not improve much among LICs with relatively low reserves.

(Reserve coverage by initial coverage in 2009, median, 2007–12; in months of prospective imports of goods and services)

High 2009 coverage (38 countries)

Medium 2009 coverage (8 countries)
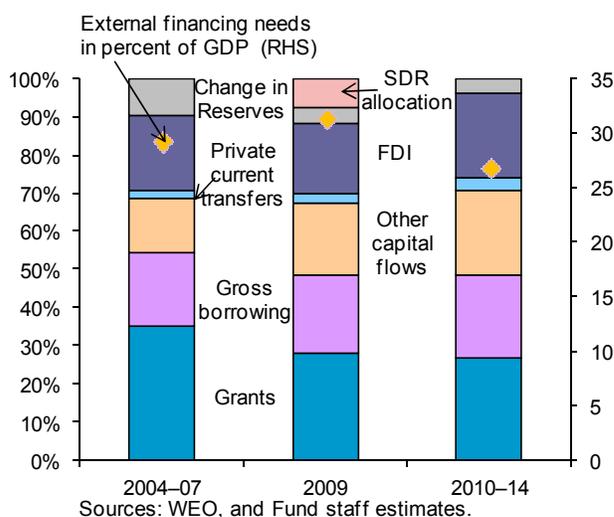
Low 2009 coverage (18 countries)
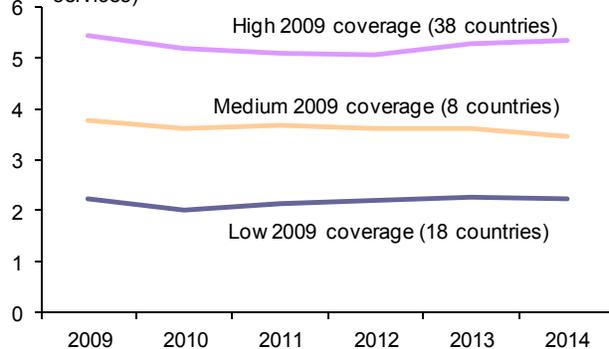
Sources: WEO, and Fund staff estimates.
Note: "Low" is defined as having less than 3 months of reserves coverage; "Medium" as having more than three but less than four months of reserves coverage.

30.   **As current account deficits narrow, LICs' external financing needs are projected to decline gradually in relation to GDP over the medium term.** On average, FDI, grants, and borrowing (largely sovereign borrowing for most LICs) are each expected to fill around a fourth of that financing need, with the balance coming from private transfers and other capital flows. Though grants are projected to increase slightly from around US$30 billion in 2010 to US$32 billion by 2014, their contribution to external financing needs is expected to decline. In contrast,

The composition of external financing is projected to shift slightly from grants to loans in the medium term.
(in percent of total external financing)

External financing needs in percent of GDP (RHS)

Change in Reserves

SDR allocation

Private current transfers

FDI

Gross borrowing

Other capital flows

Grants

Sources: WEO, and Fund staff estimates.

external borrowing is expected to increase both in nominal terms (from around US$38 billion in 2010 to US$48 billion in 2014) and as a share of total financing.

31.   **To summarize, most LICs are projected to improve their fiscal and current account balances, keep debt manageable, reduce inflation, and maintain relatively comfortable reserve cushions; however, policy buffers will remain weak in a few countries over the medium term, absent additional policy adjustment.** Almost half of LICs are projected to have relatively comfortable fiscal and external buffers by 2014. At the other end of the spectrum, almost one-quarter of LICs will have significant fiscal or external vulnerabilities, or both. Cutting across regions, Latin American and Caribbean LICs, which entered the crisis already in a vulnerable position and are particularly exposed to shocks as five out of nine countries are small islands, stand out as the most vulnerable group, as they will continue to have relatively high debt, low reserve coverage, and large current account deficits over the medium term.

C.   How LICs Would Cope With Renewed Stress: An Illustrative Scenario

32.   **The appropriate pace and extent of rebuilding macroeconomic policy buffers depends on country-specific vulnerabilities and cyclical factors.** Although the projected outlook for global growth suggests a fast economic recovery, there are significant risks to the outlook, which on balance are on the downside. If economic activity in the rest of the world did not pick up as expected and LICs, in turn, were to face protracted lower economic growth, how would they cope with such renewed stress? Would they have the policy space to respond to a further shock?

33.   **The purpose of this section is to "stress-test" LICs' exposure to further shocks, based on an illustrative exercise, to inform policy choices with respect to the rebuilding of macroeconomic buffers as LICs emerge from the crisis.** It is intended to bring out some broad policy conclusions about where the main macro vulnerabilities lie, in the wake of the crisis, to provide a sense of how much policy space might remain, and signal what kinds of policy choices LICs will face as a result. What it does not do is provide a blueprint for policy settings in individual countries—hence, the paper does not offer country-specific policy recommendations.

34.   **For this purpose, we simulate a "downside" scenario that is based on a much slower global recovery, under which per capita real GDP growth in LICs would be lower than in the baseline by about 1 percentage point in 2011.** This result was obtained by assuming a hypothetical shock to growth in advanced and emerging economies, and then estimating the spillover effects on LICs' growth, drawing on recent IMF research into the short-run determinants of LIC growth (see Box 2). This shock would widen fiscal and current account deficits of LICs, reduce reserve coverage, and increase public debt.
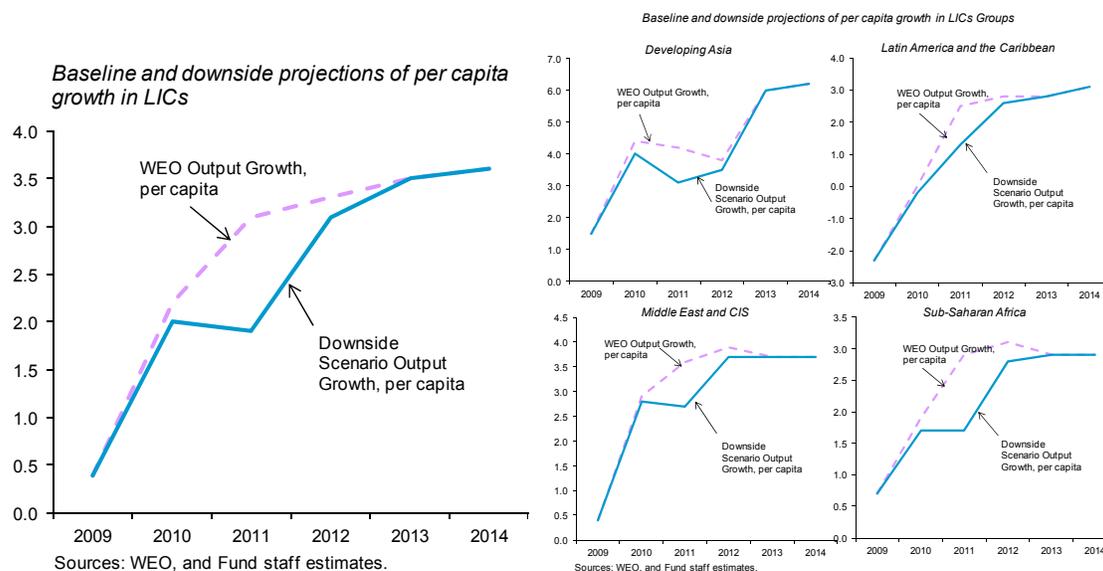
Box 2. A "Downside" Recovery Scenario for LICs

The downside scenario for advanced and emerging economies (accounting for about 87.5 percent of world GDP) is based on the IMF's Global Projection Model (GPM). It assumes shocks to financial conditions and domestic demand in advanced economies as large as those experienced in 2008, and contagion of these shocks to other financial markets where reductions in equity prices dampen private consumption. Given negative financial and trade spillovers, growth is suppressed in other regions as well. As a result, growth in advanced and emerging economies is reduced relative to the baseline by 0.3 percentage points in 2010, 1.4 percentage points in 2011, and 0.2 percentage points in 2012.[1]

Using these projections of growth differences relative to the baseline for advanced and emerging economies as a starting point, the downside scenario for LICs was developed in three steps, applied to each LIC:

- In a first step, the downside growth scenario for advanced and emerging economies was used to calculate by how much GDP growth in LICs' trading partners would be lower relative to the baseline. This calculation made use of information on trading patterns taken from the IMF's *Direction of Trade* statistics.

- In a second step, the difference in trading partners' growth calculated in step one was multiplied by the estimated coefficient on partner country growth from a panel regression that relates growth in LICs to a number of its short-run determinants.[2]

- In a third step, the result of step two was subtracted from the baseline growth forecast.
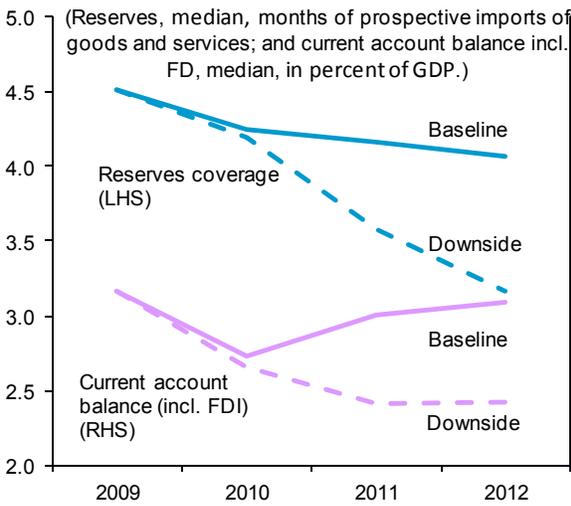
A limitation of the method used to derive the downside scenario for LICs is that it considers only the impact of slower growth in advanced and emerging markets and ignores possible associated effects, such as changes in commodity prices, interest rates, and capital flows. This limitation appears to be acceptable as growth in trading partners has been found to be the most important short-run determinant of growth in LICs.

Baseline and downside projections of per capita growth in LICs

Baseline and downside projections of per capita growth in LICs Groups

Sources: WEO, and Fund staff estimates.

[1] This downside scenario was presented in the July 2010 World Economic Outlook Update, available at http://www.imf.org/external/pubs/ft/weo/2010/update/02/index.htm.
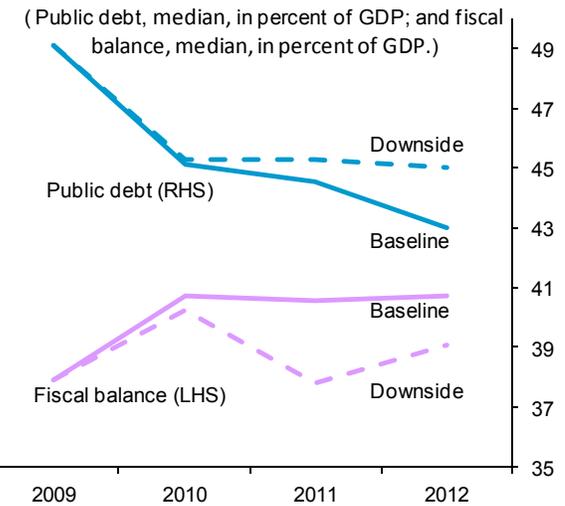
[2] Berg, Andrew, Chris Papageorgiou, Catherine Pattillo, Martin Schindler, Nikola Spatafora, and Hans Weisfeld (2010). "Global Shocks and their Impact on Low–Income Countries: Lessons from the Global Financial Crisis", IMF Working Paper (forthcoming).

Current account balance (incl. FDI) would widen, and
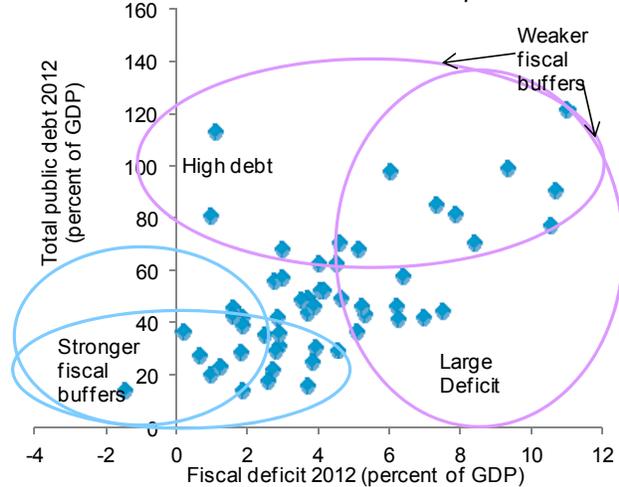reserve coverage decline in the downside scenario.

(Reserves, median, months of prospective imports of
goods and services; and current account balance incl.
FD, median, in percent of GDP.)

Baseline

Reserves coverage
(LHS)

Downside

Baseline

Current account
balance (incl. FDI)
(RHS)

Downside

Sources: WEO, and Fund staff estimates.

Fiscal consolidation would slow down, and
public debt higher in the downside scenario.

(Public debt, median, in percent of GDP; and fiscal
balance, median, in percent of GDP.)

Downside

Public debt (RHS)

Baseline

Baseline

Fiscal balance (LHS)

Downside

35.   **To assess the shock's impact across different countries, an illustrative assessment of
buffers is conducted with a focus on fiscal and external positions.** As described in
Appendix IX, the relative strength of the fiscal position is based on an assessment of public debt
and the fiscal deficit. Similarly, the relative
strength of the external position is based on
an assessment of the current account balance
plus FDI and reserves.[23]

36.   **Although the downside scenario
would lead to weaker fiscal positions and
higher debt, almost half of LICs would
have sufficient policy space to absorb the
impact on their fiscal balances.** The
downside scenario would worsen the median
structural primary deficit of LICs by about
0.5 percent of GDP and increase the public
debt-to-GDP ratio by 3 percentage points by
2015 (excluding those countries with
expected debt relief). There would be a wide

A slower-than-projected recovery would leave
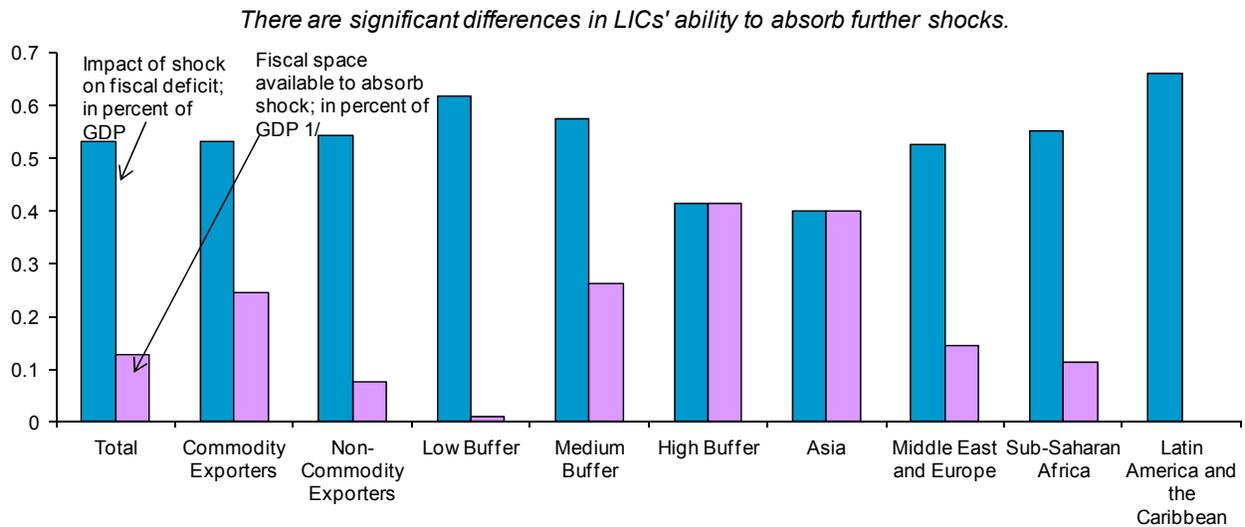some LICs in a vulnerable fiscal position.

Weaker
fiscal
buffers

High debt

Stronger
fiscal
buffers

Large
Deficit

Total public debt 2012 (percent of GDP)

Fiscal deficit 2012 (percent of GDP)
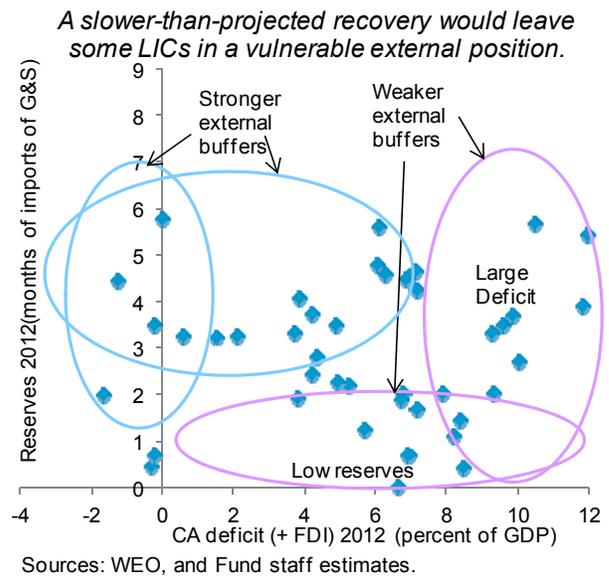
Sources: WEO, and Fund staff estimates.

[23] This pairing of buffers with fiscal and external stocks and flows can facilitate the analysis of a country's capacity
to absorb and respond to future shocks. For instance, a country with very high debt would have very limited scope
for a countercyclical fiscal response, given possible explosive debt dynamics, even if the current fiscal deficit is low.
Conversely, a country with manageable debt but a high fiscal deficit may not be able to respond countercyclically as
raising the deficit further may not be financeable and/or could lead to short-term volatility.

variation across countries in their ability to respond to such a shock (Appendix X).

37.   **Almost half of LICs would emerge from such a shock with still low or moderate debt and deficit levels**. However, a third of LICs would face high debt and/or fiscal deficits. Half of the countries had fiscal vulnerabilities already prior to the current global crisis. Countries with low buffers in 2009 (over a third of LICs) would need to respond to the shock with some fiscal adjustment, while those with medium and high buffers in 2009, including commodity exporters, would generally be able to absorb most of the shock without additional policy adjustment. Across regions, while sub-Saharan African LICs, in general, largely have policy space to accommodate the shock, Latin American and Caribbean LICs would be in a relatively weaker situation. Clearly, if aid commitments, including budget support, were not fully realized, further risks would emerge for most LICs.

There are significant differences in LICs' ability to absorb further shocks.

Sources: WEO, and Fund staff estimates.

1/ Appendix X describes the methodology to calculate the fiscal space available to absorb shocks.

38.   **Regarding the external position, many LICs would still have adequate buffers after the shock, whereas some would face significant external vulnerabilities.** Over a third of LICs would emerge from a shock with relatively comfortable external positions, with broadly adequate reserve coverage and low or moderate current account deficits. Conversely, about a third of countries would face either low reserves or large current account deficits or both. However, more than a third of the countries in this second group had external vulnerabilities already prior to the current global crisis. A closer

A slower-than-projected recovery would leave some LICs in a vulnerable external position.

Sources: WEO, and Fund staff estimates.

look at reserve coverage shows that median LIC reserve coverage could fall by almost one month of imports by 2012, leaving about a quarter of LICs with less than two months of import coverage. Countries with a floating exchange rate regime and with fixed exchange rates would each end up with median reserve coverage of about three months of imports, even though countries with fixed exchange rates would normally be expected to hold more reserves than those with floating exchange rates. Latin American and Caribbean LICs would end up particularly vulnerable, with a median of less than two months of reserve coverage and double-digit current account deficits as a share of GDP.

D. Realigning Policies and Rebuilding Buffers: Policy Recommendations

39.   **The appropriate macroeconomic policy mix in the recovery phase depends critically on a country's exposure to potential future shocks**. A variety of combinations of fiscal, monetary, and exchange rate realignment could help countries rebuild their buffers against future volatility. At a general level, a gradual reduction in fiscal deficits, supported by both the cyclical rebound and continued structural measures, could help keep public debt at manageable levels and allow a supportive or countercyclical response in the event of another shock. At the same time, fiscal adjustment can also support rebuilding external buffers, including a narrowing of current account deficits and the reconstitution of reserves if needed. Similarly, monetary policy could be used to reduce inflation if needed, while also supporting a buildup in reserves and narrowing of the current account deficit.

40.   **The above analysis can provide some general guidance on the choice of the macroeconomic policy mix**. As shown above, some countries are already in a comfortable position to absorb the impact of a further shock, while many others should realign their policies to some extent, as many are expected to do under baseline projections. The illustrative downside scenario above can provide an indication of vulnerabilities to future shocks across countries, and inform the appropriate policy mix as countries exit from the global crisis. In particular:

- About one quarter of LICs could comfortably absorb another sizeable economic shock and can therefore maintain accommodative fiscal and monetary policies, with some scope for additional increases in spending and absorption beyond baseline projections.

- Another quarter of LICs would face moderate vulnerabilities after another shock, and some adjustment may be needed in the event of such a shock, although country specific factors would be critical in determining the appropriate degree and mix of adjustment policies.

- Of the remaining half of LICs, about a third has more comfortable external positions, but relatively large fiscal deficits and/or high public debt, suggesting that more efforts may be needed on medium-term fiscal realignment. Another third of this group has more comfortable fiscal positions, but faces relatively low reserves or large current account deficits (or both), suggesting the need to focus on monetary and/or exchange rate realignment, depending on the exchange rate regime. The final third of this group (eleven countries) faces both

significant external and fiscal vulnerabilities, suggesting the need for both monetary and fiscal adjustment. As their policy options are generally very limited, these countries should focus on addressing their most significant vulnerabilities and would benefit most from additional concessional support.

- Inflation appears mostly benign for now, at single digits, suggesting that monetary policy could be accommodative. However, risks to future food and fuel prices are on the upside, and policymakers should be prepared to act against possible second-round effects on inflation should another global price shock occur.

- Across regions, LICs in Latin America and the Caribbean stand out as comparatively vulnerable, with less rosy prospects for growth and weaker policy buffers, suggesting the need to step up the rebuilding of buffers and reinforce growth-oriented policies.

- Many LICs with fixed exchange rate regimes could benefit from somewhat faster macroeconomic consolidation to rebuild reserves. Conversely, some LICs with floating rates appear to have built more than adequate reserves and could raise spending and absorption.

Fiscal policy

41.   **The challenge for fiscal policy will be to continue to increase real spending in priority areas, while enhancing the resilience of the budget to volatility**. The direct fiscal impact of the crisis in the form of larger deficits and higher debt was manageable in most LICs. However, the crisis exposed vulnerabilities among LICs to future growth shocks and uncertain aid prospects. The fiscal strategy going forward will require strengthening revenue collections, improving the efficiency of spending, and pursuing a careful debt management strategy.

42.   **LICs should aim for a sustained increase in fiscal revenues over the medium term.** LICs' revenue-to-GDP ratios are below their potential. Strengthening domestic resource mobilization would not only help countries improve their fiscal positions after the crisis, but will also create fiscal space to meet critical spending needs. While LICs' low revenue ratios are due in part to structural constraints, including the large share of small-scale agricultural and informal sectors that are hard to tax, most countries can improve their revenue collections by improving tax policy and administration. Estimates prepared in recent years by the Commission on Macroeconomics and Health and the Millennium Task Force point to potential revenue increases in the range of 2–4 percent of GDP. In these countries, the tax bases can be broadened by rationalizing income tax incentives and VAT exemptions. There is also some scope to increase excise taxes on alcohol, tobacco, and fuel, while tapping revenue from property taxes. To improve tax administration, efforts should center on securing revenue from large and medium

enterprises, and tackling tax evasion and abuses of tax privileges through risk-based audits and compliance checks.

43.   **Most LICs have the space to continue raising fiscal expenditures in real terms, and are expected to do so; these increases should be targeted to priority sectors, including health, education, and infrastructure.** The cyclical rebound in revenues, combined with structural revenue measures should generate enough resources to allow for both a consolidation of the fiscal deficits post crisis and continued increases in spending in real terms. Sustained increases in infrastructure and social spending—in some countries introduced in response to the crisis—should help alleviate growth bottlenecks going forward.

44.   **The crisis has also highlighted the desirability of strengthening automatic fiscal stabilizers.** These are weaker in LICs than in advanced economies, mainly reflecting the smaller size of government. This is unlikely to change in the near term. However, in some countries there is scope to strengthen stabilizers by developing the capacity to provide targeted temporary income support—for example, by labor intensive public works programs or cash transfer programs. But most importantly, stronger fiscal buffers would allow countries to let the fiscal position weaken in response to a short-term downturn rather than having to counteract the automatic stabilizers.

45.   **Improving the efficiency of spending can create additional fiscal space for priority spending areas.** Many countries have room to improve the quality and efficiency of expenditures while protecting priority areas. There is significant scope for improving education and health outcomes, for example, at existing levels of expenditure.[24] In addition, subsidies are often costly and poorly targeted, disproportionally benefiting more well-off households. More than one-third of LICs have fuel price subsidies, with these subsidies projected for 2010 to exceed 1 percent of GDP in 6 countries.[25] Strengthening public financial management and promoting transparency also would contribute to improving expenditure efficiency. Key measures include: bolstering treasury management, improving budget preparation and implementation, strengthening the appraisal and selection of infrastructure projects, and moving to medium-term budget frameworks, with recurrent cost of capital investment activities fully reflected in the budget. For some LICs, multiyear fiscal frameworks built around fiscal anchors or rules could help balance a rebuilding of buffers with allocating sufficient budget resources for priority needs.

46.   **A key challenge will be to balance the use of nonconcessional external borrowing against domestic sources of financing and concessional support.** Given the larger post-crisis fiscal deficits and the large infrastructure gap experienced by most LICs, many will be tempted

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[24] Gupta, Sanjeev and others (2008). "Fiscal Management of Scaled-Up Aid," IMF, April 22, 2008.

[25]Coady, David and others (2010). "Petroleum Product Subsidies: Costly, Inequitable, and On the Rise," IMF Staff Position Note No. 2010/05, February 25, 2010.
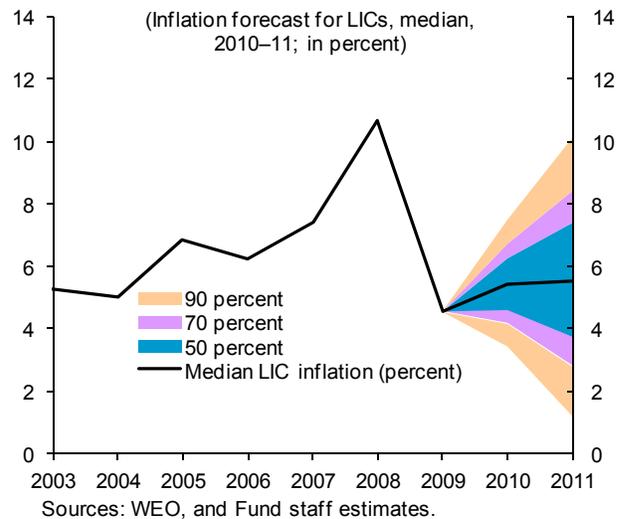
to rely to some extent on nonconcessional external borrowing by the state or public enterprises. Those countries with stronger capacity for effective project selection and debt management may have scope to tap this source, as long as debt vulnerabilities are moderate and carefully monitored. However, the above analysis suggests that most LICs are still vulnerable to shocks, and some have elevated debt levels. Highly concessional donor support will thus continue to be critical in many LICs. Moreover, all LICs face the challenge of raising the currently low level of domestic savings and developing their financial sectors (see below) to avoid an overreliance on capital inflows. As LICs increase their use of market based financing, strengthening capacity to effectively manage the resultant portfolio risks will become a policy priority.

Monetary and exchange rate policies

47. **Monetary policy could be accommodative in most countries from an inflation perspective, but may need to be used proactively in countries with weak external and reserve positions and in the event that global food or fuel prices spike.** A fan chart analysis of median LIC inflation, taking into account uncertainty regarding future oil and food prices, indicates a 25 percent probability that half of LICs could experience inflation that is higher than in the baseline by at least 2 percentage points. This would imply that the number of countries experiencing double-digit inflation could rise from 14 in 2009 to 19 in 2010 and 16 in 2011. This would still leave two-thirds of countries with space to loosen monetary policies somewhat if the external position allows. However, should higher food and fuel prices materialize, monetary and interest rate policies should accommodate the direct impact on the price level, but should counter any second-round effects on inflation and external positions.

Baseline inflation remains moderate, but there are upside risks related to food and fuel prices.

(Inflation forecast for LICs, median, 2010–11; in percent)

90 percent
70 percent
50 percent
Median LIC inflation (percent)

Sources: WEO, and Fund staff estimates.

48. **Exchange rate policies should continue to be used to cushion the effect of future volatility where possible.** The above analysis showed that countries with floating exchange rate regimes largely avoided reserve losses during the crisis, as they let their exchange rates adjust to the shock, whereas countries with pegged exchange rates drew on their reserve buffers. In general, countries with low reserve buffers will need to allow their exchange rates to adjust more flexibly. Conversely, countries with floating rate regimes and high reserve levels should consider whether a somewhat lower level of reserves may have net economic benefits, in light of the cost of holding these reserves.

Financial sector

49.   **The crisis has underscored the importance of adequate financial regulatory frameworks, effective supervision, and sound financial institutions.** Supervisory authorities will need to ensure that credit standards do not deteriorate during times of strong credit growth. Regulatory frameworks should focus on the risks assumed by banks and sources of their business growth to ensure that these are sustainable. Closer supervision to ascertain whether banks are complying with prudential regulations is required, and prompt supervisory actions taken if they are found to be noncompliant. In banks where financial strains have been significant, the balance sheet clean-up should proceed quickly; this would require that losses be recognized and that shareholders inject additional capital as needed.

50.   **Other risk-mitigation reforms that LICs should consider include:**

- *Strengthening crisis management arrangements:* typical measures might include (i) establishing a special regime for bank resolution, (ii) strengthening arrangements for emergency liquidity assistance, and (iii) establishing crisis contingency plans. Stronger financial safety nets should also be considered, including cautious introduction of deposit insurance schemes, with effective public information.

- *Enhancing information-sharing:* information-sharing between home and host supervisors would help to improve the consolidated supervision of foreign financial entities and ensure that banks being considered for licensing are operating in a sound manner in the home country.

- *Continuing with financial sector reforms:* for example, the establishment of credit reference bureaux, as announced by a number of countries, would help to mitigate credit risk and lower the cost of credit.

51.   **Developing domestic debt markets would help to mobilize national savings and increase policy buffers in LICs.** The 2009 crisis showed that domestic financing can help to cushion the impact of the crisis and thus create countercyclical policy space. LICs also have enormous investment needs that are in search of financing. While external financing necessarily ought to remain part of the financing mix, policies to mobilize domestic savings and develop domestic debt markets would broaden the range of available options.

52.   **As LICs strengthen the broader macroeconomic policy framework, a sound debt management framework can catalyze domestic market development** (Box 3). LICs have generally been prudent in limiting their use of domestic debt where costs and rollover risks are relatively high. Countries should continue to actively develop the domestic financial system, including strengthening the local institutional investor base, to facilitate an extension of

maturities on domestic debt issuance while containing costs.[26] A robust debt management framework would also help mitigate the risks associated with greater domestic and external financial integration.

Box 3. Developing Debt Markets: Lessons from Emerging Markets (EMs)

The lessons on debt management and debt market development in EMs are instructive for many LICs. While sustained improvements in macroeconomic conditions are critical, the experience of some EMs (e.g., Brazil and Turkey) illustrates how a sustained plan for market development can help increase the resilience of debt stock to various shocks (rollover, interest, and exchange rate) while containing costs.

After the 2000–02 crisis, and in parallel with a strong macroeconomic program, Turkey adopted debt management strategies targeted at reducing rollover and currency risks. The authorities actively sought opportunities to extend maturities, initially requiring a reliance on floating rate notes, and reduce the share of foreign currency debt. In parallel, the authorities strengthened their primary dealer framework[1] and actively cultivated the domestic institutional investor base. As macroeconomic fundamentals improved, long-term fixed rate instruments were introduced. The improved portfolio resilience helped the authorities weather foreign exchange shocks during the recent global crisis.

The Brazilian experience also emphasizes the importance of sound debt management for market development and policy resiliency.[2] Over the past decade, the authorities have focused their debt management strategy on reducing vulnerability to interest rate and exchange rate shocks. Again, in parallel with a sustained period of sound macroeconomic policies, the authorities focused on increasing the proportion of domestic currency debt, while increasing its average maturity and the share of fixed rate instruments. In this instance, inflation-linked bonds played a significant role in meeting these objectives. A strong domestic institutional investor base (e.g., pension funds) also proved critical in helping weather the impact of foreign investor exit at the height of the crisis. Overall, the improved debt structure provided significant resilience in the face of crisis-related market volatility.

[1] See Undersecretariat of Treasury (Turkey) (2009). "Public Debt Management Report."
[2] See National Treasury (Brazil) and World Bank (2010). "Public Debt: The Brazilian Experience."

Other structural reforms

53. **Reforms that promote economic diversification also have an important role to play in managing macroeconomic volatility and fostering durable economic growth.** This is a broad topic that goes beyond the scope of this paper, but it would need to be considered as part of any comprehensive country development strategy. Promoting economic diversification is likely to involve, in particular, further trade integration, which will require both LICs and their trading partners to undertake further reforms of their trade regimes. Benefiting from new trade opportunities would require, in turn, continuing improvements in the business environment, as well as reforms to improve education, financial depth, labor market flexibility, and firm entry flexibility (see Appendix XI). To the extent that transformation in economic structures leads to social dislocation, it would be important to ensure that effective social safety nets are established to protect vulnerable groups.

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[26] See, for example, IMF and World Bank (2001). "Developing Government Bond Markets: A Handbook," September 21, 2001.

Appendix I. List of LICs

The group of LICs analyzed in this work is formed by the 64 Poverty Reduction and Growth Trust (PRGT)-eligible countries for which data were available,[27] which include, by region:

Sub-Saharan Africa:

Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Republic of Congo, Côte d'Ivoire, Eritrea, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, São Tomé and Príncipe, Senegal, Sierra Leone, Tanzania, Togo, Uganda, and Zambia.

Middle East and Europe:

Armenia, Djibouti, Georgia, Kyrgyz Republic, Moldova, Sudan, Tajikistan, Uzbekistan, and Republic of Yemen.

Asia:

Afghanistan, Bangladesh, Bhutan, Cambodia, Lao People's Democratic Republic, Maldives, Mongolia, Myanmar, Nepal, Papua New Guinea, and Vietnam.

Latin America and Caribbean:

Bolivia, Dominica, Grenada, Guyana, Haiti, Honduras, Nicaragua, St. Lucia, and St. Vincent and the Grenadines.

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[27] The PRGT-eligible countries that were not included in the analysis because of data limitations are Kiribati, Samoa, Solomon Islands, Somalia, Timor-Leste, Tonga, and Vanuatu.

Appendix II. Distribution of Median Real GDP Growth and Change in Real GDP Growth by Year, 1971–2009

Unlike previous global downturns and in contrast to EMs and AMs, LICs' real growth in 2009 remained positive and was close to the average of the last 39 years.
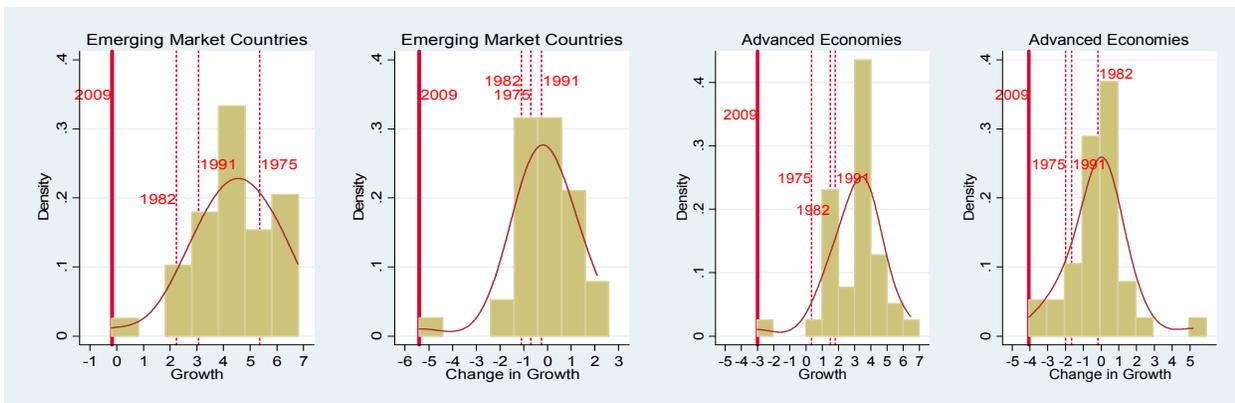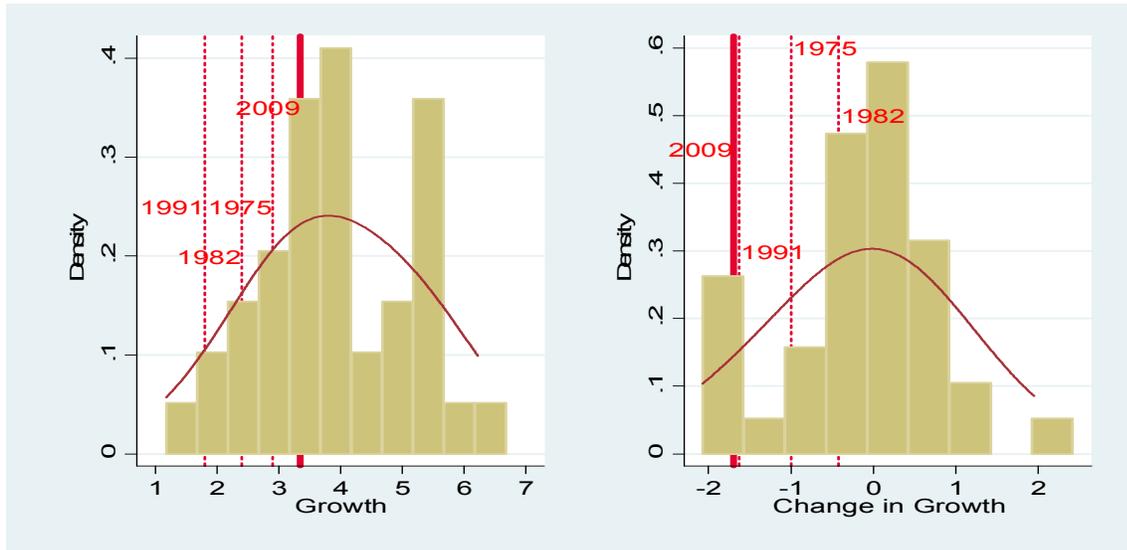
Note: Considering the period 1971–2009, for each year the median level of / change in growth are calculated and the histograms of those medians are plotted to illustrate the distribution over the sample period.

Methodology

Histograms are plotted to illustrate the distribution of each variable over 1971–2009, covering four global recessions including the global crisis in 2009. For each year the median of variable $medX_t$ is calculated over N countries for which data is available as follows:

$$medX_{1971} = median(X) \ for \ country = 1, \cdots, N$$
$$medX_{1972} = median(X) \ for \ country = 1, \cdots, N$$
$$\vdots$$
$$medX_{2008} = median(X) \ for \ country = 1, \cdots, N$$
$$medX_{2009} = median(X) \ for \ country = 1, \cdots, N$$

While LICs are subject to frequent idiosyncratic adverse shocks, examining medians for each year essentially captures the common shocks affecting the majority of LICs. Simple averages are not preferred since they are not robust to outliers. The histograms of medians, $medX_t$, provide a convenient visual illustration of how frequently a certain range for that variable is observed over the sample of 39 years. The objective is to compare the significance of the common shock in 2009 with those in previous global recessions in 1975, 1982, and 1991 as well as over the full sample period of 1971–2009.

These points could be illustrated in the histograms above. For the change in growth in LICs, the range of -1½ to -2 percent is a fat-tail event that includes the medians for two global downturns in 2009 and 1991. Density is plotted in y-axis so that the total area under bars adds up to one. Therefore, with a histogram bin width of 0.5 percent about 13 percent of observations, i.e., about 5 years out of 38, recorded median change in growth in this range. This rather high frequency indicates that LICs were subject to significant common adverse shocks over the sample period. On the other hand, for emerging market countries and advanced economies, the drop in growth rate in 2009 is unprecedented, being the only year in that tail range for emerging market economies and one of the two years out of 38 for advanced economies.

Appendix III. Selected Economic Indicators

Selected Economic Indicators

	GDP growth in percent				Inflation in percent				Reserves months of imports [1]				Fiscal Balance in percent of GDP				Current Acc. Balance + FDI in percent of GDP				Gross Public Debt in percent of GDP			
	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010	2007	2008	2009	2010
Afghanistan, I.S. of	14.2	3.4	22.5	8.9	13.0	26.8	-12.2	0.4	3.2	4.3	5.3	5.6	-1.8	-3.7	-1.2	-0.9	3.4	1.7	-0.4	2.0	21	19	10	11
Armenia	13.7	6.9	-14.2	4.0	4.4	9.0	3.5	7.8	4.2	4.6	6.2	5.1	-2.3	-1.8	-7.8	-4.8	1.2	-3.8	-7.5	-6.0	16	16	41	45
Bangladesh	6.3	6.0	5.6	5.8	9.1	8.9	5.4	8.5	2.7	2.8	4.5	5.0	-3.0	-4.8	-3.5	-2.5	2.1	2.9	4.1	3.2	52	49	47	45
Benin	4.6	5.0	2.5	2.8	1.3	8.0	2.2	2.8	7.0	7.6	7.9	7.7	0.3	-0.1	-3.2	-2.6	-5.4	-5.4	-7.1	-7.3	21	28	28	29
Bhutan	19.7	5.0	6.3	6.8	5.2	8.4	8.7	8.0	11.0	13.4	13.0	12.3	...	...	...	...	18.3	0.3	-8.1	-5.8	68	64	65	69
Bolivia	4.6	6.1	3.4	4.0	8.7	14.0	3.3	1.7	9.7	16.4	15.6	15.3	0.9	-2.0	-3.9	-2.8	14.7	15.2	7.0	8.3	41	37	41	38
Burkina Faso	3.6	5.2	3.2	4.4	-0.2	10.7	2.6	2.3	5.6	5.5	6.4	6.2	-5.6	-4.1	-4.7	-4.6	-3.2	-10.4	-5.3	-6.0	22	24	28	29
Burundi	3.6	4.5	3.5	3.9	8.3	24.4	10.7	7.2	3.8	6.4	6.5	6.0	1.0	-0.7	-7.3	-3.1	-15.7	-11.1	-13.8	-8.2	178	154	52	53
Cambodia	10.2	6.7	-2.0	4.8	7.7	25.0	-0.7	4.0	2.9	4.1	4.5	4.3	0.0	1.0	-3.3	-1.9	7.5	1.0	-0.5	-1.7	31	25	29	30
Cameroon	3.3	2.9	2.0	2.6	1.1	5.3	3.0	3.0	4.3	5.9	6.6	6.0	4.5	2.3	-0.1	-2.1	3.4	-0.3	-1.7	-2.9	58	53	54	51
Cape Verde	8.6	5.6	3.0	4.1	4.4	6.8	1.0	1.8	2.9	3.0	2.7	2.8	-0.8	-1.3	-6.4	-13.0	-0.4	0.7	-2.3	-11.6	75	71	71	90
Central African Rep.	3.7	2.0	1.7	3.3	0.9	9.3	3.5	1.4	2.1	3.5	5.3	4.7	1.2	-1.0	1.1	-0.7	-2.9	-4.1	-5.7	-5.1	79	80	27	23
Chad	0.2	-0.4	-1.6	4.3	-7.4	8.3	10.1	6.0	2.7	3.4	1.4	1.7	9.5	12.2	5.8	3.6	-0.5	0.6	-16.2	-8.5	26	24	31	38
Comoros	0.5	1.0	1.8	2.1	4.5	4.8	4.8	2.6	5.5	5.2	6.0	6.6	-2.0	-2.5	0.8	-2.3	-4.6	-10.2	-5.3	-6.0	62	59	57	46
Congo, Dem. Rep. of	6.3	6.2	2.8	5.4	16.7	18.0	46.2	26.2	0.7	0.7	1.7	1.7	-2.5	-3.0	-4.2	-3.5	2.6	-1.1	-4.4	-14.3	129	136	138	37
Congo, Republic of	-1.6	5.6	7.5	10.6	2.6	6.0	4.3	5.2	4.7	9.5	7.6	11.6	9.4	23.5	4.9	24.7	17.4	21.6	12.4	24.9	99	60	58	19
Côte d'Ivoire	1.6	2.3	3.8	3.0	1.9	6.3	1.0	1.4	3.1	3.2	4.2	4.3	-0.8	-0.6	-1.6	-0.2	1.5	4.0	9.0	8.3	76	72	65	65
Djibouti	5.1	5.8	5.0	4.5	5.0	12.0	1.7	3.9	2.3	3.3	4.6	4.1	-2.6	1.3	-4.9	-0.5	-1.8	-3.8	-7.8	-5.8	64	60	60	59
Dominica	2.5	3.2	-0.3	1.4	3.2	6.4	0.0	2.3	2.7	2.7	3.8	3.6	2.3	0.9	0.9	-1.2	-9.4	-15.3	-20.1	-16.2	94	85	85	84
Eritrea	1.4	-9.8	3.6	1.8	9.3	19.9	34.7	20.5	1.1	1.8	2.1	2.1	-15.7	-21.1	-14.7	-14.6	-5.6	-3.0	-2.4	1.1	152	165	135	130
Ethiopia	11.8	11.2	9.9	8.0	15.8	25.3	36.4	2.8	1.9	1.1	2.2	2.3	-3.6	-2.9	-0.9	-1.5	-2.0	-2.6	-2.3	-0.9	38	33	32	35
Gambia, The	6.0	6.3	5.6	5.0	5.4	4.5	4.6	3.9	4.5	3.7	5.2	4.5	0.5	-1.3	-2.9	-2.8	0.0	-5.9	-3.0	-5.1	57	63	58	58
Georgia	12.3	2.3	-3.9	5.5	9.2	10.0	1.7	6.4	2.2	3.4	4.1	4.2	0.8	-2.0	-6.6	-5.4	-3.3	-10.8	-4.6	-6.2	22	28	37	46
Ghana	5.7	7.2	4.1	5.0	10.7	16.5	19.3	10.6	2.6	2.1	2.7	2.6	-9.2	-14.7	-9.8	-10.8	-6.3	-11.5	5.8	-3.3	52	59	66	69
Grenada	4.9	2.2	-7.7	0.8	3.9	8.0	-0.3	3.6	2.9	3.8	4.5	3.8	-7.9	-5.1	-6.6	-2.9	-18.3	-17.5	-14.4	-13.5	111	102	122	119
Guinea	1.8	4.9	-0.3	3.0	22.9	18.4	4.7	15.4	0.9	1.2	3.1	1.1	0.3	-1.3	-7.2	-5.3	-2.4	-3.5	-1.8	-7.3	92	89	77	91
Guinea-Bissau	0.2	3.6	3.0	3.5	4.6	10.4	-1.6	1.5	6.2	6.3	8.0	7.6	-5.8	-3.8	2.8	-1.2	2.8	3.5	4.3	3.1	187	157	163	47
Guyana	7.0	2.0	3.0	2.9	12.2	8.1	3.0	3.7	2.4	2.9	4.6	4.7	-4.3	-3.6	-3.5	-3.7	-2.3	-3.9	-0.7	-4.3	60	62	61	64
Haiti	3.3	0.8	2.9	-8.5	9.0	14.4	3.4	4.9	1.9	2.3	2.4	2.3	0.2	-3.1	-4.4	-2.9	1.0	-4.0	-2.6	-0.9	35	38	25	26
Honduras	6.2	4.0	-1.9	2.4	6.9	11.5	8.7	4.6	2.6	3.4	2.6	2.5	-1.6	-1.7	-4.6	-3.7	-1.5	-6.5	0.3	-1.8	20	20	24	26
Kenya	6.9	1.3	2.4	4.1	4.3	16.2	9.3	4.1	3.3	3.0	3.7	3.5	-2.8	-3.9	-5.3	-6.6	-0.4	-5.4	-5.2	-5.3	49	46	49	52
Kyrgyz Republic	8.5	8.4	2.3	-3.5	10.2	24.5	6.8	4.8	2.8	3.8	4.4	3.9	-0.6	1.0	-1.2	-11.0	5.3	2.9	6.2	-2.1	57	48	59	70
Lao People's Dem.Rep	7.8	7.8	7.6	7.7	4.5	7.6	0.0	5.4	2.2	2.7	2.7	2.0	-2.5	-3.8	-6.7	-3.9	2.8	-1.0	-3.8	-4.0	62	58	62	59
Lesotho	2.4	4.5	0.9	5.6	8.0	10.7	7.2	6.3	6.3	7.4	7.9	6.8	10.5	3.1	-1.7	-15.2	20.7	15.3	4.7	-18.4	64	58	45	56
Liberia	9.4	7.1	4.6	6.3	13.7	17.5	7.4	7.2	0.7	1.1	2.1	1.9	3.9	-12.9	-12.3	-10.1	-14.4	-25.3	-15.7	-1.9	595	411	224	45
Madagascar	6.2	7.1	-3.7	-2.0	10.4	9.2	9.0	9.0	2.1	3.0	4.0	2.9	-2.7	-1.9	-3.1	-0.9	-2.6	-13.7	-11.6	-10.0	35	30	34	35
Malawi	5.8	8.8	7.5	6.0	7.9	8.7	8.4	8.0	1.3	1.7	0.8	1.6	-4.5	-5.2	-5.8	0.3	1.1	-4.6	-6.0	1.5	33	43	46	43
Maldives	7.2	6.2	-3.1	3.4	7.4	12.3	4.0	4.5	2.4	2.5	2.6	3.0	-5.9	-18.2	-29.3	-22.4	-40.1	-50.2	-30.9	-25.1	66	69	97	99
Mali	4.3	5.0	4.4	5.1	1.5	9.1	2.2	2.1	3.4	3.8	5.5	5.0	-2.3	-0.5	0.6	1.0	-5.4	-9.9	-4.2	-6.9	22	24	24	26
Mauritania	1.0	3.7	-1.1	4.7	7.3	7.3	2.2	6.1	0.9	1.1	1.1	1.1	-3.9	-7.3	-5.9	-7.3	-13.4	-6.2	-11.4	-8.7	97	90	103	64
Moldova	3.0	7.8	-6.5	3.2	12.4	12.7	0.0	7.4	2.8	5.0	4.0	4.2	-0.2	-1.0	-6.4	-5.4	-3.4	-4.9	-6.0	-7.2	27	21	28	33
Mongolia	10.2	8.9	-1.6	8.5	8.2	26.8	6.3	10.5	2.6	2.6	4.2	3.9	2.8	-4.9	-5.4	-2.2	15.9	2.2	2.0	-6.6	39	34	56	57
Mozambique	7.3	6.7	6.3	6.5	8.2	10.3	3.3	9.3	3.8	4.4	4.7	4.5	-2.9	-2.5	-5.6	-5.4	-4.4	-6.0	-3.0	-4.6	22	25	29	35
Myanmar	11.9	3.6	4.9	5.3	32.9	22.5	8.0	7.9	3.2	3.7	4.9	5.1	-2.0	-1.5	-1.9	-2.5	4.1	0.7	1.0	0.4	50	49	51	54
Nepal	3.4	6.1	4.9	3.0	6.4	7.7	13.2	10.5	6.1	6.7	6.2	5.8	-1.5	-1.3	-3.1	-1.7	-0.1	2.8	4.3	-2.7	43	40	39	37
Nicaragua	3.1	2.8	-1.5	3.0	11.1	19.8	3.7	5.7	2.5	3.1	3.6	3.2	2.1	0.0	-2.1	-0.1	-10.9	-14.1	-6.7	-8.5	83	76	81	67
Niger	3.4	8.7	-1.2	3.5	0.1	10.5	1.1	3.4	3.6	3.6	3.0	2.6	-1.0	1.5	-5.3	-3.0	-5.4	-1.9	-9.8	-8.0	16	14	16	18
Nigeria	7.0	6.0	7.0	7.4	5.4	11.6	12.4	11.9	10.1	13.5	9.9	7.2	-1.3	3.5	-10.3	-7.9	22.1	17.9	17.5	15.2	13	12	15	16
Papua New Guinea	7.2	6.7	4.5	8.0	0.9	10.8	6.9	7.1	5.0	4.7	3.5	3.3	9.0	2.5	-7.7	-1.2	5.0	11.4	-5.4	-15.2	34	32	32	29
Rwanda	5.5	11.2	4.1	5.4	9.1	15.4	10.4	6.4	4.7	4.8	5.1	4.9	-1.7	1.0	-2.3	1.6	0.0	-2.7	-5.0	-5.9	27	21	20	21
São Tomé & Príncipe	6.0	5.8	4.0	4.5	18.5	26.0	17.0	12.3	4.1	6.4	5.9	3.3	10.0	-5.3	-19.1	-14.6	14.7	8.2	-11.8	-25.4	104	64	66	77
Senegal	5.0	3.2	2.2	4.0	5.9	5.8	-1.7	0.9	2.8	3.5	4.5	4.3	-3.8	-4.7	-5.2	-4.5	-9.4	-12.3	-7.1	-6.9	24	25	32	38
Sierra Leone	6.4	5.5	3.2	4.5	11.6	14.8	9.2	16.5	4.4	4.6	6.0	4.8	-1.0	-4.7	-3.2	-4.8	0.3	-8.5	-4.4	-6.9	55	54	61	59
St. Lucia	1.5	0.7	-5.2	1.1	1.9	7.2	0.6	1.7	2.5	2.7	3.2	3.0	-0.8	-1.1	-6.1	-7.3	-7.8	-15.4	-11.7	-8.1	67	66	75	80
St. Vincent & Grens.	8.0	-0.6	-1.0	0.5	6.9	10.1	0.4	1.2	2.6	2.5	2.2	2.3	-4.0	-1.7	-3.6	-13.4	-13.5	-14.1	-15.8	-30.1	67	69	75	92
Sudan	10.2	6.8	4.5	5.5	8.0	14.3	11.3	10.0	1.3	1.5	1.1	1.3	-5.4	-1.4	-4.7	-3.7	-6.0	-4.5	-8.1	-4.3	82	70	81	71
Tajikistan	7.8	7.9	3.4	5.5	13.2	20.4	6.5	7.0	0.5	1.0	1.3	1.7	-6.2	-5.9	-5.2	-4.4	-4.3	-1.8	-4.6	-2.0	35	30	33	39
Tanzania	7.1	7.4	6.0	6.5	7.0	10.3	12.1	7.2	4.6	4.4	5.0	5.3	0.0	-5.1	-7.5	-6.4	-6.1	-7.9	-8.1	-6.9	39	38	43	43
Togo	1.9	2.2	3.1	3.3	0.9	8.7	1.9	2.2	3.7	5.1	6.1	6.5	-1.9	-0.9	-2.8	-2.9	-2.1	-5.1	-6.0	-6.8	84	56	55	14
Uganda	8.4	8.7	7.2	5.8	6.8	7.3	14.2	9.4	6.6	5.1	5.8	5.2	-1.3	-3.0	-2.1	-2.5	1.9	2.3	0.7	-2.1	20	23	22	23
Uzbekistan	9.5	9.0	8.1	8.0	12.3	12.7	14.1	10.6	5.5	9.0	10.2	10.9	5.3	10.7	3.2	2.2	10.5	11.2	5.2	6.3	16	13	11	10
Vietnam	8.5	6.3	5.3	6.5	8.3	23.1	6.7	8.4	3.4	4.0	2.4	2.3	-1.9	-0.9	-8.9	-6.0	-0.6	-1.8	-0.9	0.9	46	44	49	52
Yemen, Republic of	3.3	3.6	3.9	8.0	7.9	19.0	3.7	9.8	7.9	9.6	8.0	5.6	-7.2	-4.5	-10.2	-5.5	-1.7	-2.9	-11.4	-7.3	40	36	51	46
Zambia	6.2	5.7	6.3	6.6	10.7	12.4	13.4	8.2	2.4	3.2	5.5	5.0	-1.3	-1.5	-3.2	-2.7	4.9	-0.8	2.3	4.4	26	27	28	26
Medians																								
All LICs	6.0	5.6	3.2	4.5	7.5	10.7	4.6	6.0	2.9	3.7	4.5	4.2	-1.5	-1.7	-4.4	-3.0	-1.1	-3.6	-4.5	-5.8	51	49	50	45
Sub-Saharan Africa	5.0	5.5	3.2	4.5	6.8	10.3	7.2	6.1	3.6	3.7	5.1	4.5	-1.3	-1.9	-3.2	-3.0	-2.0	-4.1	-4.4	-6.0	55	54	49	43
Asia	8.5	6.2	4.9	6.5	7.7	12.3	6.3	7.9	3.2	4.0	4.5	4.3	-1.9	-2.6	-4.5	-2.4	3.4	1.0	-0.5	-2.7	46	44	49	52
Middle East and Europe	8.5	6.9	3.4	5.5	9.2	12.7	3.7	7.4	2.8	3.8	4.4	4.2	-2.3	-1.4	-5.2	-4.8	-1.8	-3.8	-6.0	-5.8	35	30	41	46
Latin American and Caribbean	4.6	2.2	-1.0	1.4	6.9	10.1	3.0	3.6	2.6	2.9	3.6	3.2	-0.8	-1.7	-3.9	-2.9	-7.8	-14.1	-6.7	-8.1	67	66	75	67
Net Oil importers	6.1	5.6	3.0	4.3	7.8	10.6	4.6	5.6	2.8	3.5	4.5	4.2	-1.7	-2.0	-4.4	-3.1	-2.0	-4.1	-4.6	-5.9	52	49	50	46
Net Oil exporters	4.0	5.8	4.2	6.0	6.3	11.2	5.5	6.6	4.5	5.3	5.4	4.9	0.1	0.9	-4.3	-2.5	2.5	2.3	-1.1	-1.9	43	41	50	42
Program Countries	5.5	5.5	3.0	4.1	6.8	10.3	3.5	4.1	3.1	3.7	4.6	4.3	-1.0	-1.8	-4.2	-2.9	-2.0	-4.6	-5.2	-6.0	55	48	52	45
Non-Program Countries	6.3	6.0	3.9	5.0	8.0	11.6	7.2	8.0	2.7	3.4	4.0	3.3	-1.9	-1.6	-4.6	-3.7	-0.5	-1.0	-0.7	-4.0	50	49	49	52

Sources: WEO database, and Fund staff calculations.
[1] Next year's imports of goods and services.

Appendix IV. The Impact of the Crisis on Financial Systems and Credit Developments

LICs' Banking Sectors

Although the situation varies across countries and individual financial institutions, some broad trends for the banking sector in LICs can be discerned in the first half of 2010.

- *Elevated levels of NPLs*. Following several years of rapid credit growth and relaxed credit standards prior to the crisis, overdue loans increased sharply in 2009. Despite implementation of measures to restore the soundness of banks, in a number of countries the pressures on banks' balance sheets persist and NPLs have continued to increase in the first half of 2010, although at a slower pace than in 2009.

- *Declining profitability*. Higher loan loss provisions appear to be exerting pressure on profitability, which continues to decline in mid-2010. Erosion of banks' earnings is also due to stronger competition to attract new deposits and limited room to reduce operating costs in the current macroeconomic environment. With banks becoming more risk averse and shifting their portfolios toward safe instruments in addition to curtailing lending, both net interest and non-interest income growth has decelerated. Spreads between lending and deposit rates have increased as banks sought to preserve profitability and domestic market and economic conditions became more volatile.

- *Restored liquidity in banks.* The initial liquidity pressures observed in a number of LICs appear to have eased and the growth in domestic deposits—the main source of the funding— began to recover in 2010. Liquidity in the banks, measured by excess reserves, has increased in most countries and remains, with a few exceptions, broadly in line with long-term trend. At the same time, the volatility of excess reserves has amplified compared to pre-crisis levels, reflecting larger and more frequent changes in deposits. Many banks in LICs have tended to self-insure against more volatile funding conditions by augmenting liquidity buffers. These buffers have been bolstered by reduced use of foreign credit lines and more restrained lending activity.

Low-Income Countries: Banking Sector Developments, 2007–10

Rapid credit growth pre-crisis, coupled with deteriorating macroeconomic conditions over the crisis, has exerted pressure on banks.	*NPLs increased across all LICs and have remained at elevated levels.*

Credit growth to private sector
(Annual percent changes)

Non–performing loans increased during the crisis and have remained elevated.
(NPLs to total loans; in percent)

Lower earnings strain banks' profitability, which continues to fall.	*Interest rate spreads have increased as banks sought to compensate a loss in profitability and also due to more volatile macro-financial conditions.*

Return on assets; in percent

Spread in interest rates
(Annual percent changes)

Claims of foreign banks on banks in LICs fell sharply during the crisis, but increased slightly in 2009H2, only to decline again in March 2010.	*The growth in domestic deposits, which are the main source of funding for LIC's banks, shows the first signs of recovery.*

Foreign bank claims on the banks in LICs
(in millions of U.S. dollars, quarterly changes)

■ Europe
□ Latin America
■ Middle East
■ Asia Pacific
■ Sub-Saharan Africa

Source: Bank of International Settlements.

Deposit growth
(Annual percent changes)

Sources: Country authorities, International Financial Statistics, and Bank of International Settlements.

In several countries the expansion of banks' activity appears to have resumed. In a number of countries, growth in banking sector assets exceeded that in GDP in 2008–09. Some large banks are continuing their pre-crisis expansion either by opening new outlets across the country (e.g., Ghana, Rwanda, and Tanzania), or cross-border by opening subsidiaries and branches in the region (e.g., Kenya and Nigeria). The number of newly licensed banks has increased significantly in a number of LICs (e.g., in 2009/first half of 2010 Kenya, Tanzania, and Zambia licensed four banks each; between 2007 and 2009 the number of banks operating in Lao P.D.R. rose from 13 to 23, while The Gambia and São Tomé and Príncipe licensed seven and two banks, respectively).

Financial sector reforms in several countries, which were postponed during 2008 and 2009, are now returning to center stage. A number of countries are taking steps to establish credit reference bureaus (Burundi, Kenya, Malawi, Tanzania, and The Gambia), raise the minimum capital requirements for commercial banks (Burundi, São Tomé and Príncipe, Tanzania, The Gambia, Vietnam, and WAEMU countries), adapt supervisory oversight to the changing landscape and broaden access to financial services.

Private and Public Sector Financing Conditions

Resumption of robust credit growth is likely to be gradual, being dependent upon the pace of economic recovery and the clean-up of banks' balance sheets. Both supply and demand factors seem to be constraining growth in credit by the domestic banking sector. On the supply side, slower deposit growth and curtailed external credit lines have restrained lending. Capital losses, driven by declining bank profitability and growing NPLs in a number of banks, have increased risk aversion, and restrained banks' willingness to extend new loans. Countries with a high level of dollarization (thus higher exposures to currency risk) and with a limited availability of hedging instruments have seen a particularly strong increase in NPLs and a sharp decline in assets and capital. On the demand side, the deterioration in the macroeconomic environment heightened uncertainty about the prospects for future projects and the viability of investments, thereby depressing demand for credit.

Prospects for the private sector accessing capital through domestic equity markets are also mixed. In particular, while equity markets in Asian LICs are outperforming (e.g., Bangladesh and Mongolia), suggesting scope to tap these avenues of financing, they have remained relatively flat in many African LICs (e.g., Ghana, Kenya, Nigeria, and Tanzania).

Equity Indices
(Index: January 1, 2007)

Source: Bloomberg.
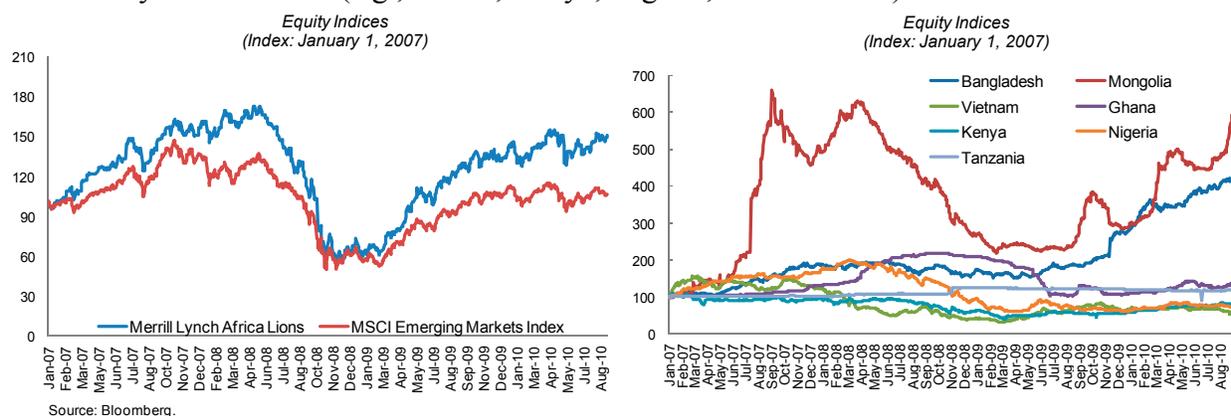
External financing conditions also remain uncertain with the syndicated loans market relatively stagnant. Although clear trends are difficult to determine, private sector syndicated issuance (gross and net) fell in 2010 in most regions. Again, this may reflect some demand factors but, the significant private sector maturities expected in 2011–14 raise concerns about rollover risks.

Public Sector Syndicated Loan Issuance
(in billions of U.S. dollars)

Private Sector Syndicated Loan Issuance
(in billions of U.S. dollars)

Public Sector Maturities Falling Due on Syndicated Loans
(in billions of U.S. dollars)

Private Sector Maturities Falling Due on Syndicated Loans
(in billions of U.S. dollars)

Source: Dealogic.
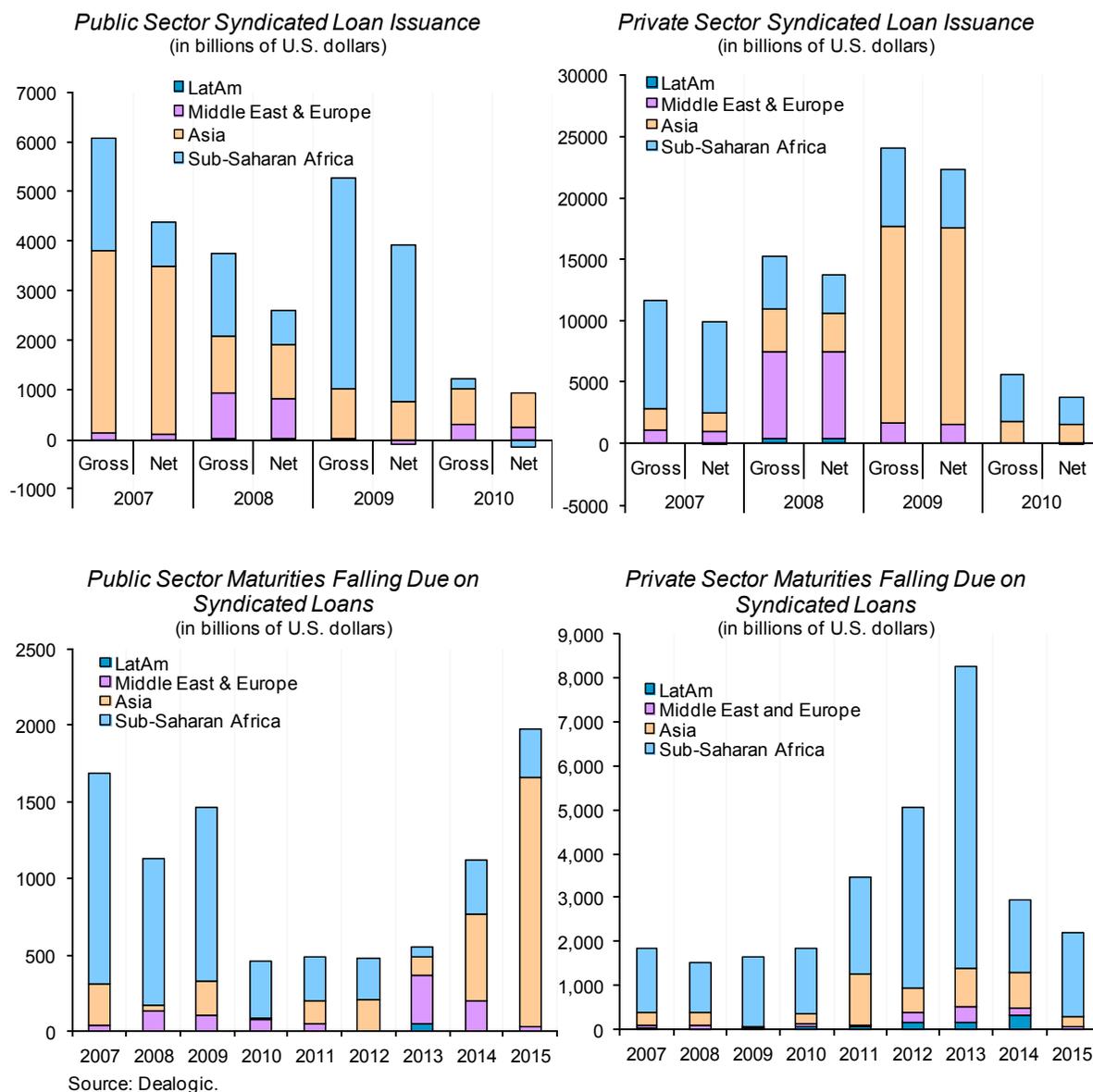
In general, financing conditions for LIC sovereigns continue to improve. Overall, international investor interest in frontier issuers and markets, a pre-crisis feature, appears to be reemerging, with LICs benefitting from the general improvement in external financing conditions for EMs (reflected in the sharp decline in spreads since mid-2009). While overall trends in foreign investor activity are difficult to determine, this renewed foreign investor interest is evident in the issuance by a number of LICs in the international capital markets—with Senegal's debut issuance in December 2009 (US$200 million) re-opening the market for LICs, followed by Vietnam's issuance in January 2010 (US$1 billion), the first of significant size since

the onset of the crisis. In response, several countries are reportedly considering tapping the international capital markets with a number of potential debut issues from Africa in the pipeline—Angola, Kenya, Nigeria, Tanzania, and Zambia are all candidates—and with Ghana considering re-accessing the market.

Selected LICs with Market Access: EMBI Global Sovereign Spreads (bps)

Source: Bloomberg.

Foreign Investors Trading of Debt Instruments 1/

(in billions of U.S. dollars)

Source: Emerging Markets Trading Association
1/ Figures reflect both purchases and sales of assets in the secondary trading
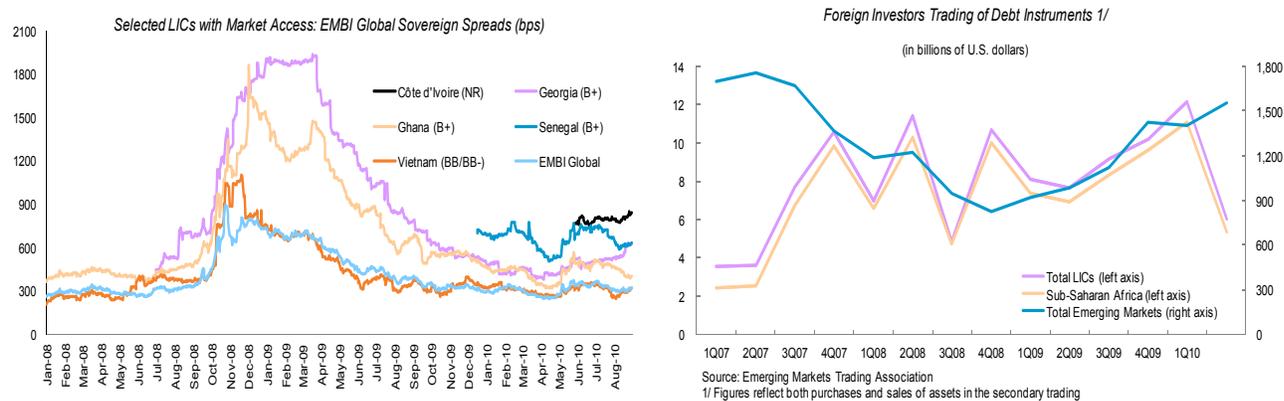
In line with improved cost conditions in international markets, the cost of financing in domestic bond markets has generally declined. In some instances, foreign investors are increasing their presence in domestic markets again. For example, in Ghana, renewed interest has facilitated a push to extend maturities with several successful issuances of 3-year Treasury bonds. In addition, where markets are relatively deep and the domestic institutional investor base is well developed, the domestic market has provided a viable and resilient source of investment financing. For example, Kenya had initially planned to finance part of its 2008/09 budget expenditure through international bond issuance. With the closure of international markets in 2008, Kenya substituted planned external funding for long-term domestic borrowing. However, overall the size and structure of domestic bond markets remains limited in LICs, and enhancing the depth and resilience of the domestic market should remain a policy priority if portfolio risks are to remain contained.

Local Currency Sovereign Bond Markets Indicators in Selected LICs					
Country	LC Debt (% of Total General Government Debt)	LC Debt Outstanding (% of GDP)	LC Debt Maturing in the Next 12 Months (% of GDP)	LC Debt Maturing in the Next 12 Months (% of Total LC Debt)	Weigthed Average Maturity	Weigthed Average Fixed Coupon
Kenya	52.2	23.3	8.5	36.7	2015	10.8
Tanzania	...	7.3	4.5	62.1	2012	9.3
Ghana	46.6	28.1	15.7	55.9	2011	18.2
Nigeria	86.1	13.0	6.0	46.2	2014	9.7
Georgia	10.3	3.8	3.3	85.4	2011	12.7
Armenia	13.8	5.6	1.7	31.1	2014	10.4
Moldova	18.3	5.0	4.9	96.4	2011	0
Bangladesh	...	13.6	0.9	6.4	2015	11.5
Vietnam	14.8	7.3	2.1	29.5	2012	9.8
Bolivia	21.7	8.6	2.4	28.4	2015	5.9
Honduras	35.0	9.1	7.8	86.3	...	...
Source: Bloomberg and IMF staff calculations					

Evolution of the Yield Curve
(in percent)

Bangladesh

Jun-09
Dec-09
Jun-10

(1 month, 3 month, 6 month, 1 year, 5 year, 10 year, 11 year, 12 year, 13 year, 14 year, 15 year, 20 year)

Vietnam

Jun-09
Dec-09
Jun-10

(1 year, 2 year, 3 year, 4 year, 5 year, 6 year, 7 year, 8 year, 9 year, 10 year, 11 year, 12 year, 13 year, 14 year, 15 year)

Ghana

Jun-09
Dec-09
Jun-10

(3 months, 6 months, 1 year, 2 year)

Kenya

Jun-09
Dec-09
Jun-10

(3 months, 6 months, 1 year, 2 year, 3 year, 4 year, 5 year, 6 year, 7 year, 8 year, 9 year, 10 year, 11 year, 12 year, 13 year, 14 year, 15 year, 20 year)

Bolivia

Jun-09
Feb-10
May-10

(3 months, 6 months, 1 year, 2 year, 3 year, 4 year, 5 year, 6 year, 7 year, 8 year, 9 year, 10 year, 15 year, 20 year, 30 year)

Moldova

Jun-09
Dec-09
Jun-10

(1 month, 3 months, 6 months, 1 year)

Sources: Bloomberg, central banks, and Fund staff estimates.

Appendix V. Buffer Index

A country's buffer measure at time t (bi_{it}) is constructed as the sum of five components: overall fiscal balance in percent of GDP (fb_{it}), inflation (inf_{it}), international reserves in months of next year's imports of goods and services (res_{it}), public debt in percent of GDP ($debt_{it}$), and the current account balance plus FDI in percent of GDP (cab_{it}).

Each of the five variables is first standardized by their respective standard deviations calculated for the period 2004–07. Standardizing the five variables renders the buffer measure unit-free and also ensures that the five components of the index (the "scores") have equal sample volatilities so that movements in the index are not driven by the most volatile component.

For index values up to 2007 the three flow variables fb_{it}, inf_{it}, and cab_{it}, country-specific four-year averages are calculated (e.g., the average over 2004–07 is used for $t = 2007$), while for the stock variables res_{it} and $debt_{it}$ the end-period value is used. For index values after 2007, yearly values are used for the flow and stock variables.

The buffer index is thus derived as follows:

$$bi_{it} = \frac{fb_{it}}{\sigma_{fb,2004-07}} - \frac{inf_{it}}{\sigma_{inf,2004-07}} + \frac{res_{it}}{\sigma_{res,2004-07}} + \frac{cab_{it}}{\sigma_{cab,2004-07}} - \frac{debt_{it}}{\sigma_{debt,2004-07}}$$

Note that inflation and public debt to GDP enter the index calculation with a negative sign; therefore, a high value indicates a better policy buffer.

Countries are classified into "low," "medium," and "high" buffer groups using cut-offs corresponding to the 33th percentile and 66th percentile of the buffer index in 2007.

Appendix VI. Estimation of Determinants of Change in Primary Balance to GDP in 2009

Regression analysis suggests that the pre-crisis policy buffers were the key determinant of the fiscal response to the weakening growth in 2009. To properly account for the endogeneity arising from using the real GDP growth as an explanatory variable, the instrumental variable (IV) regressions are estimated. Real GDP growth in 2009 is instrumented by real GDP growth in trading partners, change in remittances scaled by GDP in 2008, and change in export deflator.[28]

Determinants of Change in Primary Balance to GDP in 2009 1/

	All Countries	Oil-Importers	Non-Commodity Exporters
Real GDP growth in 2009	0.33*	0.31**	0.28***
	(1.67)	(2.36)	(3.78)
Buffer Index in 2008 2/	-0.42**	-0.45***	-0.31**
	(-2.45)	(-3.59)	(-1.97)
Constant	-2.84***	-2.71***	-2.25***
	(-4.04)	(-7.75)	(-4.31)
# of observations	50	38	31
R-squared	0.29	0.44	0.40

1/ Instrumental variable regressions are estimated by GMM. Real GDP growth in 2009 is instrumented by real GDP growth in trading partners, change in remittances scaled by GDP in 2008, and change in export deflator. t-statistics are reported in parenthesis. ***, **, and * denote significance at 1, 5, and 10 percent level respectively.
2/ An increase in index corresponds to an improvement in performance.

Methodology

The fiscal response of LICs to weakening growth in 2009 is estimated by IV regressions on a cross-section of annual data composed of 50 LICs. The same specification is also estimated for a subgroup of 38 non-oil exporting LICs and 31 non-commodity exporters. The specification is as follows:

$$\Delta pby_{2009} = \beta_0 + \beta_1 growth_{2009} + \beta_2 buffer_{2008}$$

The dependent variable is the change in the primary balance to GDP (pby) in 2009 ($\Delta pby_{2009} = pby_{2009} - pby_{2008}$). To examine the role of pre-crisis policy stance on the fiscal response, the buffer index in 2008 ($buffer_{2008}$) is also included in covariates. It proves to be an important control variable since if it is omitted from the regression the real GDP growth becomes significant at only 10 percent or becomes insignificant.

The coefficient β_1 captures the fiscal response to contemporaneous growth ($growth_{2009}$). Owing to the reverse causality from fiscal policy to output growth, OLS estimates of this specification would be biased and inconsistent. Therefore, an IV regression is estimated by

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[28] Results are robust to a change in the reference year (to 2007 instead of 2008).

generalized method of moments (GMM). Real GDP growth in 2009 is instrumented for by using real GDP growth in trading partners ($growthtp_{2009}$), change in remittances scaled by the GDP in 2008 ($\Delta remit_{2009}$), and percentage change in export deflator (dpx). The specification for the first stage regression is given by

$$growth_{2009} = \beta_0 + \beta_1 growthtp_{2009} + \beta_2 \frac{remit_{2009} - remit_{2008}}{GDP_{2008}} + \beta_3 dpx_{2009}$$

Using these variables as instruments is justified because they represent exogenous shocks to the economy, are correlated with growth, and their effects on the change in primary balance are likely to be channeled through growth. Real GDP growth in trading partners has been used in the literature as an instrument for GDP growth to estimate whether fiscal policy is procyclical or countercyclical.

When the individual components of the buffer index are included in the regression, the fiscal and the current account balance components turn out significant, indicating the predominant role of the pre-crisis fiscal and external buffers in determining the extent of the fiscal response.

Appendix VII. Growth Regression: Estimating the Impact of Fiscal Policy

This section explores the role of fiscal policy in mitigating the impact of the global crisis on growth in LICs. A model explaining short-run growth dynamics is estimated by instrumental variable (IV) regressions on a panel of annual data composed of 60 LICs. Only the episodes of global recessions and one year prior to these episodes (1981–82, 1990–91, and 2008–09) are considered since fiscal policy is likely to be more effective when output drops below its potential. Country fixed effects (α_i) are included to control for effects of fixed country characteristics, such as institutions, geography, and the initial level of per capita income. The same specification is also estimated for a subgroup of 51 non-oil exporting LICs. The specification is as follows:

$$growth_{it} = \beta_0 + \beta_1 \Delta pby_{it} + \beta_2 combshock_{it} + \beta_3 growth_{it-1} + \alpha_i + \varepsilon_{it}$$

The dependent variable is the GDP growth for country i at year t. The effect of the fiscal policy on growth is examined by including change in the primary balance to GDP (Δpby_{it}) ($\Delta pby_{it} = pby_{it} - pby_{it-1}$). The variable $combshock$ captures the combined effect of contemporaneous external shocks, including shocks to trade ($shocktrade$), remittances ($remit_{it}$), FDI (fdi_{it}), and services exports (xs_{it}), in percent of previous year's GDP:

$$combshock_{it} = shocktrade + \frac{fdi_{it} - fdi_{it-1}}{GDP_{it-1}} + \frac{remit_{it} - remit_{it-1}}{GDP_{it-1}} + \frac{xs_{it} - xs_{it-1}}{GDP_{it-1}}$$

Shocks to trade ($shocktrade$) represent terms of trade shocks and external demand shocks as follows:

$$shocktrade_{it} = \frac{X_{it-1}^{Goods}}{GDP_{it-1}}(dpx_{it} + growthtp_{it}) + \frac{M_{it-1}^{Goods}}{GDP_{it-1}} dpm_{it}$$

The percentage change in export deflator (dpx_{it}) and real GDP growth in trading partners ($growthtp_{it}$) are weighted by the share of exports in GDP in the previous year, thereby the impact of external shocks on exports is expressed in percent of previous year's GDP. Similarly, the percentage change in import deflator is weighted by the share of imports in GDP in the previous year.

The coefficient β_1 represents the short-run impact of fiscal policy on growth. If fiscal policy supports growth, the expected sign of this variable would be negative. However, the value of β_1 is likely to be biased owing to the reverse causality through which policymakers could set expansionary fiscal stance in response to weakening growth. These two opposite effects could lead to an incorrect rejection of a supportive role of fiscal policy on growth. To deal with this endogeneity an IV regression for panel data is estimated. Change in the primary balance to GDP (pby) is instrumented for by using lagged values of macroeconomic (in)stability indicator

($mitot_{it-1}$) and the current account balance in percent of GDP. The specification for the first stage regression[29] is given by

$$\Delta pby_{it} = \beta_0 + \beta_1 mitot_{it-1} + \beta_2 caby_{it-1}$$

A composite indicator of macroeconomic (in)stability ($mitot_{it}$) originating from Jaramillo and Sancak (2009) is used to capture the effect of macroeconomic stability on the fiscal response, i.e., the policymakers' ability to implement countercyclical policies.[30] Bal Gündüz (2009) modified this index by adding the black market premium.[31] The formula for the indicator is given by

$$mitot_{it} = \frac{\ln(\frac{cpi_{it}}{cpi_{it-1}})}{\sigma_{\Delta\ln(cpi)}} + \frac{\ln(\frac{xr_{it}}{xr_{it-1}})}{\sigma_{\Delta\ln(xr)}} - \frac{\frac{res_{it} - res_{it-1}}{mgs_{t-1}}}{\sigma_{\Delta res/mgs_{t-1}}} - \frac{\frac{gbal_{it}}{gdp_{it}}}{\sigma_{gbal/gdp}} + \frac{\ln(1+blackpr_{it})}{\sigma_{\Delta\ln(xr)}}$$

where *mitot* is the macroeconomic (in)stability index for country *i* at time *t*, *cpi* is the consumer price index, *xr* is the exchange rate of national currency to U.S. dollar (increase indicates a nominal depreciation), *res* is the stock of international reserves, *mgs* is the imports of goods and services, g*bal* is the government balance, *gdp* is the nominal GDP, *blackpr* is the black market premium, and σ is the standard deviation of each variable. The weights are the inverse of the standard deviation for each component for all countries over the full sample, after removing the outliers.[32] Higher levels of *mitot* indicate increased macroeconomic instability.

Short-term Determinants of Growth during Crisis Episodes 1/

	All Countries	Oil-Importers
Change in the primary balance to GDP	-0.76**	-0.79**
	(-2.35)	(-2.13)
Lagged GDP growth	-0.02	-0.01
	(-0.09)	(-0.04)
Combined Shocks Indicator 2/	0.3***	0.28***
	(3.06)	(2.9)
# of observations	161	141
# of countries	60	51

1/ Panel instrumental variable regressions are estimated by Limited Information Maximum Likelihood (LIML). Sample includes downturns (1981–82; 1989–90; 2008–09). Change in primary balance to GDP is instrumented for by lagged values of macroeconomic stability indicator and the current account balance to GDP. t-statistics are in parenthesis. ***, **, and * denote significance at 1, 5, and 10 percent level, respectively.

2/ The combined effect of contemporaneous external shocks to trade, remittances, FDI, and services exports in percent of previous year's GDP. Negative value indicates adverse shocks.

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[29] Other exogenous covariates in the main regression are automatically included in the first stage regression.

[30] Jaramillo, Laura and Cemile Sancak (2009). "Why Has the Grass Been Greener on One Side of Hispaniola: A Comparative Growth Analysis of the Dominican Republic and Haiti," IMF Staff Papers, Vol. 56, Issue 2, p. 323–49.

[31] Bal Gündüz, Yasemin (2009). "Estimating Demand for IMF Financing by Low-Income Countries in Response to Shocks," IMF Working Paper 09/263.

[32] Observations above the 95th percentile for inflation and depreciation, above the 97.5[th] percentile or below the 2.5[th] percentile for the change in reserve coverage, and below 5th percentile for government balance to GDP, are considered as outliers.

Empirical work on the estimation of fiscal multipliers in LICs is limited. A recent study by Kraay (2010) estimates small fiscal multipliers in the range of zero to 0.3 for LICs.[33] Quarterly VARs à la Blanchard and Perotti (2002) relying on an identification strategy that imposes a recursive structure that fiscal policy could respond to growth with a lag have been widely used for estimating fiscal multipliers in EMs and AMs.[34] However, this approach is not feasible for LICs owing to unavailability of quarterly data. The same recursive structure would not be valid with annual data. In the IV regression in this paper we make a strong assumption that the instruments (lagged macroeconomic stability indicator and the current account balance to GDP) are uncorrelated with the error term in the structural equation. Finding instruments that would affect growth only through the fiscal policy variable but have no direct effect on growth is difficult. Failure of this restriction, in this case a plausible positive correlation between macro-stability and the error term in the growth equation, would lead to overestimating the fiscal multiplier, i.e., the actual fiscal multiplier would be lower than the estimated one. The qualitative results would remain as long as the short-term effect is mostly channeled through the countercyclical fiscal policy. The other channel through which macroeconomic stability would affect growth is through higher productive efficiency and higher investment. Operation of this channel would most likely require a history of persistent macroeconomic stability, and a macro-stability indicator in a single year, while likely to be correlated with it, may not adequately capture this effect. Moreover, the country fixed effects and the lagged growth in the structural equation are likely to capture the impact of persistent macroeconomic stability on growth.

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[33] Kraay, Aart (2010). "How Large is the Government Spending Multiplier? Evidence from World Bank Lending," World Bank, unpublished manuscript.

[34] Blanchard, Olivier and Roberto Perotti (2002). "An empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output," The Quarterly Journal of Economics, Vol. 117, No. 4, p. 1329–1368.

Appendix VIII. Exchange Market Pressure Index

The Exchange Market Pressure (EMP) index is a combination of movements in the exchange rate and international reserves. An excess demand for foreign exchange could be accommodated by a set of policies that range from allowing the currency to depreciate while leaving the level of reserves unchanged to drawing down reserves to defend the exchange rate. Following the methodology proposed by Carderelli, Elekdag, and Kose (2009),[35] the exchange market pressure index for country in quarter t, denoted EMP_{it}, is defined as

$$EMP_{it} = \frac{1}{\sigma_{\Delta\%er_{it}}} \Delta\%er_{it} + \frac{1}{\sigma_{\Delta res_{it}}} \Delta res_{it}$$

Where $\Delta\%er_{it}$ is quarter-over-quarter percentage change of the nominal bilateral exchange rate of country in quarter t, Δres_{it} is quarter-over-quarter change in net foreign assets (NFA) scaled by the lagged value of the monetary base (MB), and $\sigma_{\Delta\%er_{it}}$ and $\sigma_{\Delta res_{it}}$ are the standard deviations of each component calculated for each year corresponding to quarter t. Hence, these standard deviations will be the same for each quarter of a given year and different over the years. Specifically the components are derived as follows:

$$\Delta\%er_{it} = \frac{er_{it} - er_{it-1}}{er_{it-1}}$$

$$\Delta res_{it} = \frac{NFA_{it} - NFA_{it-1}}{MB_{it-1}}$$

er_{it} is the quarterly nominal bilateral exchange rate of country in quarter t against the U.S. dollar, so an increase implies an appreciation. For fixed exchange rate regimes, the quarterly nominal bilateral exchange rate of the domestic currency against the reference currency is used. NFA_{it} is net foreign assets taken from the IMF's IFS database and its change is scaled by the lagged value of the monetary base, MB_{it-1}.

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[35] Carderelli, Roberto, Selim Elekdag, and M. Ayhan Kose (2009). "Capital Inflows: Macroeconomic Implications and Policy Responses," IMF Working Paper 09/40.

Appendix IX. Illustrative Classification of LIC Policy Buffers

The slower-than-expected ("downside") recovery scenario discussed in Section II.C of the paper is designed to "stress-test" LICs' post-crisis macroeconomic positions in order to derive conclusions as to whether baseline policy plans entail sufficient (or possibly excessive) rebuilding of macroeconomic buffers.

The four policy buffers considered for this exercise are the overall fiscal balance, total public debt, international reserves, and the current account balance plus FDI.[36] For each buffer, countries can be grouped into those with a relatively stronger position, those with a relatively weaker position, and those in an intermediate zone where more detailed country-specific analysis (e.g., DSAs, reserve adequacy analysis, etc.) would be required to determine whether the indicator is sustainable. As no objective criteria are available to split the sample for each buffer, thresholds are derived from the distribution of pre-crisis buffers (2007 stock data and 2004–07 flow data). This approach yields three zones for each of the buffers: a zone with relatively weaker buffers (below the tenth percentile cut-off of the pre-crisis distribution),[37] a zone with relatively stronger buffers (above the median of the pre-crisis position), and a zone that is intermediate (the remainder of the countries).[38]

For the purpose of the exercise, the four buffers are viewed together in two pairs: a "fiscal policy buffer" pair that combines the fiscal balance and public debt positions and can provide information on the fiscal space that countries may have to react to a shock, and an "external policy buffer" pair that combines the current account and reserves positions and can provide a picture of a country's external vulnerabilities. The fiscal policy pair would be considered relatively stronger if both the fiscal balance and public debt buffers were deemed relatively strong based on the pre-crisis distribution or if at least one indicator is considered strong and the other is no worse than intermediate. Conversely, a fiscal policy buffer pair would be considered relatively weak based on the pre-crisis distribution if both the fiscal balance and public debt components are relatively weak, or one is weaker while the other one is intermediate. In all other cases, the fiscal policy buffer pair would be considered "intermediate." The same approach is used to classify the "external policy buffers" pair into relatively stronger, weaker, and intermediate groups.

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[36] Inflation is also a policy buffer but has not been included in the downside scenario, as inflation risks would more likely originate from other sources, such as world oil and food prices shocks.

[37] Pre-completion point HIPC countries were excluded from the pre-crisis country distribution.

[38] This exercise is for illustrative purposes and is not directly related to the Debt Sustainability Framework. No thresholds for public debt are available in the debt sustainability analysis, and those applying to the public external debt are based on present values, making the comparison difficult.

Stylized Classification of External and Fiscal Policy Buffers

Fiscal Policy Buffers

Public Debt (in percent of GDP)

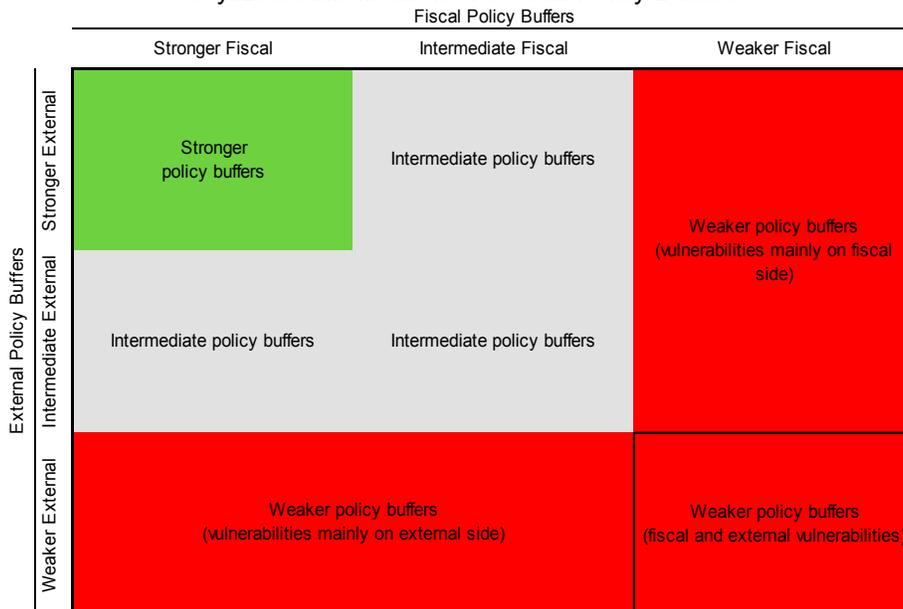|	<=40%	>40% & <=65%	>65%
>=-2%	Stronger Fiscal Buffers	Stronger Fiscal Buffers	Intermediate Fiscal Buffers
<-2% and >=-5%	Stronger Fiscal Buffers	Intermediate Fiscal Buffers	Weaker Fiscal Buffers
<-5%	Intermediate Fiscal Buffers	Weaker Fiscal Buffers	Weaker Fiscal Buffers

Fiscal balance (in percent of GDP)

External Policy Buffers

Reserves Coverage (in months of prospective imports of goods and services)

	>=4 (fix) >=3 (float)	<4 & >=2 (fix) <3 & >=1 (float)	<2 (fix) <1 (float)
>=0%	Stronger External Buffers	Stronger External Buffers	Intermediate External Buffers
<0% and >=-8%	Stronger External Buffers	Intermediate External Buffers	Weaker External Buffers
<-8%	Intermediate External Buffers	Weaker External Buffers	Weaker External Buffers

Current Account Balance incl. FDI (in percent of GDP)

The classification of policy buffers along a fiscal and an external axis can help inform the choice of the macroeconomic policy mix needed to ensure adequate buffers. Countries that score relatively well on both fiscal and external indicators ("green zone," chart below) would be well positioned to withstand downside risk, both on the fiscal and external side, and may have additional policy space (e.g., to raise spending and/or absorption). By contrast, countries that have weaker fiscal or external policy buffers or both ("red zone," chart below) would be relatively vulnerable to further downside risks and would likely need additional adjustment. The appropriate policy mix to achieve this adjustment will depend on whether vulnerabilities are mainly external, fiscal, or both.

Stylized Classification of Overall Policy Buffers

Fiscal Policy Buffers

	Stronger Fiscal	Intermediate Fiscal	Weaker Fiscal
Stronger External	Stronger policy buffers	Intermediate policy buffers	Weaker policy buffers (vulnerabilities mainly on fiscal side)
Intermediate External	Intermediate policy buffers	Intermediate policy buffers	Weaker policy buffers (vulnerabilities mainly on fiscal side)
Weaker External	Weaker policy buffers (vulnerabilities mainly on external side)	Weaker policy buffers (vulnerabilities mainly on external side)	Weaker policy buffers (fiscal and external vulnerabilities)

External Policy Buffers

Appendix X. Methodology to Analyze the Impact of a Negative Growth Shock on the Fiscal Position, Current Account, and Reserves

This appendix describes the methodology used to analyze the impact of an adverse shock to global growth on the fiscal position, reserves, and current accounts of LICs. The downside scenario to global growth was described in Box 2.

Fiscal position

The downside growth shock is assumed to impact both fiscal revenues and expenditures. The lower growth will lead to a temporary (cyclical) decline in revenue collections. This was assessed by estimating the median impact of lower growth on tax and nontax revenues during the 2009 crisis, and then applying these estimates to each country-specific growth shock in the downside scenario. By 2015, revenues in percent of GDP are assumed to return to their baseline level as growth recovers. The level of spending is assumed to be implemented in nominal terms as in the baseline projections. However, as a result of lower growth in the shock scenario, the expenditure path will be higher in percent of GDP.

The growth shock simulation is used to identify countries that have relatively high underlying fiscal vulnerabilities, primarily in terms of their debt outlook. Countries are assumed to fully accommodate the temporary fiscal impact on the revenue side from the growth shock. However, countries with high debt have limited room to fully accommodate a higher fiscal deficit arising from the higher expenditure path (in percent of GDP) in response to the shock. These countries are therefore assumed to require an offsetting adjustment to return to the baseline fiscal path by 2015. By contrast, countries with lower vulnerabilities are assumed to be able to allow their fiscal deficits to widen to accommodate the shock. Fiscal vulnerability of LICs was assessed on the basis of both the debt outlook and the how much fiscal adjustment was already assumed in the baseline. The higher the degree of adjustment during 2010–15 already assumed in the baseline projections (Table AX.1, Columns 1–2, and Tables AX.2–3) and the higher the debt level in 2015 (Column 3), the less room countries have to accommodate a shock-related increase in the fiscal deficit. The impact of the shock will reduce fiscal buffers across LICs. For illustrative purposes, countries with debt level to GDP ratio higher than 40 percent by 2015 (Column 6) are assumed not to have the space to accommodate the fiscal impact of the shock but will have to adjust to offset the structural increase in the deficit arising from the shock (Column 7–8). The adjustment will amount to the increase of spending in GDP terms produced by the shock.

Table A X.1 Downside Growth Shock: Fiscal Impact and Response Given Country Vulnerabilities

	Fiscal Baseline (2010–15)			Growth Shock Scenario: Fiscal Impact and Response 1/				
	Change in fiscal balance:			Cumulative impact of shock 2010–12 2/		Outlook without additional adjustment	Outlook with additional adjustment in vulnerable countries 3/	
	Primary	Struct. Prim.	Debt 2015	Primary	Struct. Prim.	Debt 2015	Add. adjust. in struc. prim. bal.	Debt 2015
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				(in percent of GDP)				
Total	1.3	0.9	40	-1.8	-1.1	43	0.4	40
Commodity Exporter	0.9	0.5	42	-1.8	-1.1	45	0.3	42
Non-Commodity Exporter	1.6	1.2	40	-1.8	-1.1	43	0.5	40
IMF Program	1.0	0.5	39	-1.9	-1.1	43	0.5	40
Non–IMF Program	2.2	2.1	42	-1.6	-1.0	45	0.4	42
Low Buffer	2.6	2.3	50	-1.9	-1.2	53	0.6	51
Medium Buffer	1.2	0.9	39	-2.0	-1.2	41	0.3	40
High Buffer	0.5	0.3	29	-1.5	-0.8	32	0.0	32
ASI	1.6	1.2	33	-1.4	-0.8	35	0.0	35
MEU	0.6	0.4	45	-1.6	-1.1	47	0.4	45
SSA	1.2	0.7	39	-1.9	-1.2	43	0.4	40
LAC	2.0	1.3	78	-2.0	-1.4	83	0.7	79
Net Oil Importer	1.3	0.9	40	-1.8	-1.2	43	0.5	41
Net Oil Exporter	1.5	0.9	33	-1.6	-1.0	36	0.0	36
Floating Exchange Rate	1.6	1.2	40	-1.8	-1.1	43	0.5	40
Fixed Exchange Rate	0.5	0.3	40	-1.9	-1.1	43	0.3	41

Sources: WEO, and Fund staff estimates.

1/ The shock consists of a lower growth scenario, arising from a shock in external aggregate demand qualitatively similar to the one in 2009.

2/ The cumulative deviation of the primary and structural primary balance from the fiscal baseline due to the gowth shock.

3/ Assumes that countries with low or medium fiscal vulnerabilities accommodate the shock whereas countries with high or very high fiscal vulnerabilities offset the structural impact of the shock on the primary balance.

Current account and reserves positions

Coefficients were also derived using the median impact of lower growth on exports, remittances, and foreign direct investment in 2009 and earlier, after separating the LICs into oil-importers and oil-exporters. The impact on reserves was then simulated by applying these estimates to each country-specific growth shock under the assumption that import levels were maintained as under the baseline, and that the shortfall in inflows was fully offset by a decline in reserves (Table AX.4). In practice countries may choose to depreciate or tighten policies rather than run down reserves to this extent, but this stylized exercise can shed light on reserve adequacy in a context where import compression can be difficult or have implications for long-term growth.

The impact on the current account balance of the lower exports and remittances generated by this shock was also assessed (Table AX.5).

Table AX.2 Primary Deficits of Low–Income Countries

(in percent of GDP)

	Baseline				Shock 1/			
	2009	2010	2011	2012	2009	2010	2011	2012
Afghanistan, I.S. of	-1.2	-0.9	-1.3	-1.3	-1.2	-1.0	-2.1	-1.7
Armenia	-7.3	-3.8	-2.6	-1.6	-7.3	-3.9	-3.7	-2.3
Bangladesh	-1.2	-0.7	-1.3	-1.4	-1.2	-0.9	-2.2	-1.8
Benin	-2.7	-1.8	-2.5	-1.4	-2.7	-1.9	-3.3	-1.9
Bolivia	-2.2	-1.3	-0.6	-0.5	-2.2	-1.4	-1.4	-1.1
Burkina Faso	-4.2	-4.1	-3.3	-3.0	-4.2	-4.2	-3.9	-3.4
Burundi	-5.7	-2.1	-3.2	-2.1	-5.7	-2.3	-4.3	-2.9
Cambodia	-3.2	-1.7	-1.9	-1.1	-3.2	-1.9	-2.8	-1.5
Cameroon	0.3	-1.8	-1.4	-0.4	0.3	-1.9	-2.4	-1.1
Cape Verde	-4.9	-11.1	-8.9	-6.1	-4.9	-11.3	-10.5	-7.4
Central African Rep.	2.0	-0.1	-1.3	0.1	2.0	-0.2	-2.2	-0.5
Chad	6.5	4.1	9.6	9.5	6.5	3.8	8.5	8.9
Comoros	1.4	0.5	-1.3	-0.6	1.4	0.4	-2.3	-1.3
Congo, Dem. Rep. of	0.3	-1.1	-7.1	-4.8	0.3	-1.2	-8.2	-5.7
Congo, Republic of	6.5	25.0	28.7	29.5	6.5	24.8	28.0	29.2
Côte d'Ivoire	0.0	1.4	-0.9	-0.6	0.0	1.2	-2.0	-1.4
Dominica	3.0	1.2	1.1	1.8	3.0	1.1	0.1	1.0
Eritrea	-11.5	-11.6	-10.0	-7.5	-11.5	-11.7	-11.1	-8.2
Ethiopia	-0.6	-1.1	-1.9	-1.7	-0.6	-1.2	-2.8	-2.3
Gambia, The	-0.1	0.1	0.1	0.2	-0.1	0.0	-0.5	-0.2
Georgia	-5.6	-4.2	-2.5	-1.8	-5.6	-4.4	-3.5	-2.4
Ghana	-5.1	-5.3	-2.4	-0.7	-5.1	-5.4	-3.5	-1.5
Grenada	-3.8	0.3	2.0	3.3	-3.8	0.1	0.8	2.6
Guinea	-5.1	-3.3	0.0	0.2	-5.1	-3.4	-0.9	-0.3
Guinea-Bissau	4.1	-1.0	-0.8	-0.7	4.1	-1.0	-1.3	-1.0
Guyana	-1.9	-1.9	-2.0	-2.2	-1.9	-2.1	-3.1	-3.0
Honduras	-3.9	-2.7	-1.8	-0.5	-3.9	-3.0	-3.0	-1.2
Kenya	-2.8	-3.9	-2.1	-0.4	-2.8	-4.0	-3.2	-1.1
Kyrgyz Republic	-0.4	-9.8	-7.7	-6.9	-0.4	-10.0	-8.6	-7.5
Lesotho	-0.9	-14.3	-17.1	-8.0	-0.9	-14.5	-18.7	-9.3
Liberia	1.3	1.3	-1.2	-3.2	1.3	1.1	-2.5	-4.3
Madagascar	-2.3	-0.2	-4.4	-5.4	-2.3	-0.3	-5.4	-6.0
Malawi	-2.9	3.2	1.5	2.4	-2.9	3.0	0.4	1.6
Mauritania	-3.9	-5.6	-2.7	-1.6	-3.9	-5.7	-3.7	-2.4
Mongolia	-4.9	-1.5	-4.1	-1.6	-4.9	-1.6	-4.9	-2.1
Mozambique	-5.1	-4.8	-6.4	-5.5	-5.1	-5.0	-7.7	-6.7
Nepal	-2.3	-0.9	-1.0	-1.2	-2.3	-1.0	-1.7	-1.6
Nicaragua	-0.7	1.4	1.1	-0.7	-0.7	1.2	0.1	-1.3
Niger	-5.1	-2.7	-2.2	-1.4	-5.1	-2.9	-3.4	-2.2
Nigeria	-9.2	-6.3	-2.7	-1.7	-9.2	-6.5	-3.8	-2.3
Papua New Guinea	-5.8	0.5	2.4	1.8	-5.8	0.4	1.6	1.3
Rwanda	-1.9	2.0	-0.4	-0.2	-1.9	1.9	-1.3	-0.8
São Tomé & Príncipe	-18.4	-13.8	4.6	-8.3	-18.4	-14.1	3.0	-9.8
Senegal	-4.6	-3.6	-3.9	-3.4	-4.6	-3.8	-4.9	-4.2
Sierra Leone	-1.6	-2.8	-3.0	-2.1	-1.6	-2.9	-4.1	-2.9
St. Lucia	-2.5	-3.2	-1.5	-1.8	-2.5	-3.4	-2.9	-2.9
St. Vincent & Grens.	-0.5	-9.5	-1.1	-1.1	-0.5	-9.7	-2.5	-2.4
Sudan	-3.7	-2.3	-3.0	-3.2	-3.7	-2.4	-3.6	-3.6
Tajikistan	-4.7	-3.9	-4.4	-4.9	-4.7	-4.0	-5.5	-5.6
Tanzania	-6.6	-5.1	-4.7	-4.1	-6.6	-5.3	-5.6	-4.8
Togo	-1.9	-1.8	-1.2	-1.5	-1.9	-1.9	-1.9	-2.0
Uganda	-1.2	-1.4	-2.1	-2.4	-1.2	-1.6	-3.0	-2.9
Uzbekistan	3.4	2.4	2.6	2.3	3.4	2.2	1.8	1.8
Vietnam	-7.5	-4.8	-2.8	-2.2	-7.5	-4.9	-3.7	-2.7
Yemen, Republic of	-7.7	-3.2	-2.6	-2.3	-7.7	-3.3	-3.3	-2.7
Zambia	-1.6	-1.2	-1.8	-2.6	-1.6	-1.3	-2.4	-2.9
Median by Group								
All LICs	-2.4	-1.8	-1.9	-1.5	-2.4	-1.9	-2.9	-2.2
Program	-2.3	-1.8	-1.8	-1.6	-2.3	-1.9	-2.9	-2.3
Non-program	-3.2	-1.9	-2.0	-1.4	-3.2	-2.1	-3.1	-1.8
Net Oil importing	-2.6	-2.0	-1.9	-1.6	-2.6	-2.2	-3.0	-2.3
Net Oil exporting	-1.1	-1.2	-1.3	-0.6	-1.1	-1.3	-2.3	-1.4
Commodity exporting	-2.9	-1.8	-2.0	-1.6	-2.9	-1.9	-3.1	-2.3
Non-commodity exporting	-2.3	-1.8	-1.9	-1.4	-2.3	-1.9	-2.9	-2.2
Fixed exchange rates	-2.1	-1.8	-1.4	-1.4	-2.1	-1.9	-2.6	-1.9
Floating exchange rates	-3.4	-2.2	-2.3	-1.7	-3.4	-2.3	-3.3	-2.4
"Low" 2009 buffer	-3.9	-3.2	-2.4	-2.1	-3.9	-3.4	-3.3	-2.7
"Medium" 2009 buffer	-3.9	-2.7	-2.2	-1.6	-3.9	-2.9	-3.4	-2.2
"High" 2009 buffer	-1.2	-1.2	-1.3	-1.3	-1.2	-1.3	-2.3	-1.7
Asia	-3.7	-1.4	-1.4	-1.0	-3.7	-1.5	-2.2	-1.5
Latin America and Carribean	-2.1	-1.6	-0.8	-0.6	-2.1	-1.7	-1.9	-1.2
Middle East/Europe	-4.7	-3.8	-2.6	-2.3	-4.7	-3.9	-3.6	-2.7
Sub-Saharan Africa	-2.1	-1.8	-2.1	-1.6	-2.1	-1.9	-3.1	-2.3

Sources: WEO, and Fund staff estimates.
1/ The shock scenario assumes an increase in deficits consistent with the low growth scenario set out in Box 2.

Table AX.3 Gross Debt of Low–Income Countries

(in percent of GDP)

	Baseline				Shock 1/			
	2009	2010	2011	2012	2009	2010	2011	2012
Afghanistan, I.S. of	10.1	11.1	12.3	13.4	10.1	11.2	13.2	14.8
Armenia	40.6	44.8	52.0	48.4	40.6	44.9	53.2	50.3
Bangladesh	46.6	45.2	44.3	43.4	46.6	45.3	45.4	44.9
Benin	27.5	28.9	31.6	30.6	27.5	29.0	32.4	31.9
Bolivia	40.5	37.8	36.2	34.6	40.5	37.9	37.0	36.0
Burkina Faso	27.9	28.5	29.7	30.4	27.9	28.6	30.4	31.5
Burundi	52.3	53.3	51.0	47.8	52.3	53.5	52.3	49.8
Cambodia	28.7	30.3	28.9	28.2	28.7	30.5	30.0	29.6
Cameroon	54.1	51.0	48.0	44.6	54.1	51.1	49.2	46.5
Cape Verde	70.8	89.8	95.7	96.9	70.8	90.0	97.5	100.0
Central African Rep.	26.9	22.7	20.7	19.1	26.9	22.8	21.7	20.7
Chad	31.4	37.5	35.9	31.6	31.4	37.8	37.3	33.6
Comoros	56.9	45.9	44.0	41.1	56.9	46.1	45.1	42.9
Congo, Dem. Rep. of	138.3	37.0	63.5	80.2	138.3	37.1	64.7	82.3
Congo, Republic of	57.6	19.4	15.8	13.4	57.6	19.6	16.7	14.7
Côte d'Ivoire	65.0	64.9	62.4	61.3	65.0	65.0	63.7	63.4
Dominica	85.3	84.3	83.1	80.0	85.3	84.4	84.1	81.9
Eritrea	135.0	129.7	125.0	120.6	135.0	129.8	126.2	122.5
Ethiopia	32.1	35.3	41.0	41.5	32.1	35.4	42.0	43.1
Gambia, The	58.3	58.3	57.4	55.7	58.3	58.4	58.1	56.9
Georgia	37.4	46.2	47.8	45.2	37.4	46.4	48.9	46.9
Ghana	66.5	69.0	59.5	56.8	66.5	69.2	60.7	58.9
Grenada	122.3	119.1	116.3	111.8	122.3	119.3	117.7	113.9
Guinea	77.0	91.4	90.5	38.1	77.0	91.5	91.5	39.6
Guinea-Bissau	163.3	46.8	447.0	425.7	163.3	46.9	447.6	426.5
Guyana	60.5	63.9	67.7	69.2	60.5	64.1	69.0	71.2
Honduras	23.7	26.1	27.2	27.7	23.7	26.3	28.6	29.8
Kenya	49.2	52.1	53.3	51.5	49.2	52.3	54.5	53.5
Kyrgyz Republic	59.4	70.0	69.1	70.1	59.4	70.2	70.2	71.7
Lesotho	45.3	56.4	67.2	75.0	45.3	56.6	68.9	78.0
Liberia	224.1	45.0	40.5	34.8	224.1	45.2	41.9	37.2
Madagascar	33.7	35.1	38.5	41.0	33.7	35.3	39.6	42.7
Malawi	45.5	43.5	39.2	35.2	45.5	43.6	40.5	37.4
Mauritania	103.0	64.2	61.1	61.8	103.0	64.3	62.2	63.6
Mongolia	56.4	57.2	57.2	56.7	56.4	57.3	58.0	58.0
Mozambique	29.3	35.1	39.2	42.4	29.3	35.3	40.7	45.1
Nepal	39.4	36.8	35.7	35.4	39.4	36.9	36.4	36.6
Nicaragua	81.3	67.2	67.8	67.3	81.3	67.4	69.0	69.0
Niger	15.8	18.2	20.5	20.7	15.8	18.4	21.8	22.8
Nigeria	15.5	16.3	16.9	14.8	15.5	16.6	18.2	16.7
Papua New Guinea	32.0	28.8	26.5	26.7	32.0	28.9	27.4	28.1
Rwanda	20.2	20.6	22.8	22.1	20.2	20.7	23.9	23.9
São Tomé & Príncipe	65.8	76.7	87.4	88.1	65.8	77.0	89.3	91.6
Senegal	32.0	38.0	40.5	42.2	32.0	38.1	41.6	44.2
Sierra Leone	61.3	59.3	47.4	48.0	61.3	59.5	48.7	50.1
St. Lucia	75.2	80.1	81.8	83.3	75.2	80.3	83.4	85.9
St. Vincent & Grens.	75.0	91.7	97.7	96.1	75.0	91.9	99.4	99.0
Sudan	80.6	71.4	70.0	68.2	80.6	71.4	70.6	69.1
Tajikistan	33.0	38.6	42.6	45.2	33.0	38.7	43.8	47.2
Tanzania	42.8	42.6	41.7	40.3	42.8	42.7	42.7	42.0
Togo	55.2	13.8	16.6	17.0	55.2	13.9	17.4	18.3
Uganda	22.2	22.6	23.5	24.4	22.2	22.7	24.5	25.9
Uzbekistan	11.2	10.4	11.7	13.6	11.2	10.5	12.7	15.1
Vietnam	49.0	52.4	52.0	51.7	49.0	52.5	53.0	53.3
Yemen, Republic of	51.0	45.8	46.1	45.7	51.0	45.8	46.9	46.9
Zambia	27.7	25.7	26.9	28.9	27.7	25.8	27.6	30.0
Median by Group								
All LICs	49.1	45.1	45.2	44.0	49.1	45.3	46.1	45.8
Program	54.1	45.0	47.4	44.6	54.1	45.2	48.7	46.5
Non-program	45.3	45.3	45.4	44.9	45.3	45.3	45.4	44.9
Net Oil importing	46.1	45.1	45.9	44.3	46.1	45.3	47.0	46.0
Net Oil exporting	52.6	41.8	45.1	42.8	52.6	41.9	46.0	44.7
Commodity exporting	52.3	45.8	47.4	45.2	52.3	45.8	48.7	46.9
Non-commodity exporting	45.3	45.0	44.0	42.2	45.3	45.2	45.1	44.2
Fixed exchange rates	50.0	45.5	44.2	44.0	50.0	45.6	45.2	45.7
Floating exchange rates	46.0	44.9	49.4	43.8	46.0	45.1	50.6	46.0
"Low" 2009 buffer	66.5	53.3	59.5	51.7	66.5	53.5	60.7	53.5
"Medium" 2009 buffer	37.4	44.8	47.4	45.2	37.4	44.9	48.7	46.9
"High" 2009 buffer	-1.2	40.0	29.6	30.6	0.0	40.0	29.8	31.4
Asia	39.4	36.8	35.7	35.4	39.4	36.9	36.4	36.6
Latin America and Carribean	75.1	73.6	74.8	74.6	75.1	73.8	76.2	76.6
Middle East/Europe	40.6	45.8	47.8	45.7	40.6	45.8	48.9	47.2
Sub-Saharan Africa	50.7	43.0	41.4	41.3	50.7	43.2	42.4	43.0

Sources: WEO, and Fund staff estimates.

1/ The shock scenario assumes an increase in deficits and debt consistent with the low growth scenario set out in Box 2.

Table AX.4 International Reserves of Low-Income Countries

(in months of prospective imports of goods and services)

	Baseline				Shock 1/			
	2009	2010	2011	2012	2009	2010	2011	2012
Afghanistan, I.S. of	5.3	5.6	5.7	5.8	5.3	4.6	4.1	3.8
Armenia	6.2	5.1	4.6	4.2	6.2	5.0	4.3	3.5
Bangladesh	4.5	5.0	5.0	4.8	4.5	5.0	4.7	4.3
Benin	7.9	7.7	7.3	6.8	7.9	7.7	7.0	6.2
Bhutan	13.0	12.3	11.5	11.3	13.0	12.2	10.9	10.1
Bolivia	15.6	15.3	15.3	15.6	15.6	15.3	14.9	14.8
Burkina Faso	6.4	6.2	6.1	5.9	6.4	6.1	5.9	5.5
Burundi	6.5	6.0	5.9	5.9	6.5	6.0	5.4	4.8
Cambodia	4.5	4.3	4.4	4.1	4.5	4.2	4.0	3.4
Cameroon	6.6	6.0	5.2	5.2	6.6	5.9	4.7	4.0
Cape Verde	2.7	2.8	2.9	3.2	2.7	2.8	2.2	1.7
Central African Rep.	5.3	4.7	4.1	4.4	5.3	4.5	3.1	2.5
Chad	1.4	1.7	3.3	3.9	1.4	1.6	2.1	2.0
Comoros	6.0	6.6	6.5	6.4	6.0	6.5	5.4	4.0
Congo, Dem. Rep. of	1.7	1.7	1.8	1.9	1.7	1.7	1.4	1.2
Congo, Republic of	7.6	11.6	18.0	25.3	7.6	11.5	17.1	23.5
Côte d'Ivoire	4.2	4.3	4.3	4.3	4.2	4.2	3.6	2.8
Djibouti	4.6	4.1	3.7	3.8	4.6	4.0	3.1	2.5
Dominica	3.8	3.6	3.4	3.3	3.8	3.4	2.1	0.5
Eritrea	2.1	2.1	2.7	2.8	2.1	2.0	2.0	1.3
Ethiopia	2.2	2.3	2.3	2.5	2.2	2.3	2.1	2.1
Gambia, The	5.2	4.5	4.1	4.1	5.2	4.4	3.2	2.2
Georgia	4.1	4.2	4.2	3.9	4.1	4.2	3.9	3.3
Ghana	2.7	2.6	2.9	3.5	2.7	2.5	2.6	2.8
Grenada	4.5	3.8	3.4	3.1	4.5	3.6	1.9	0.1
Guinea	3.1	1.1	1.2	1.7	3.1	1.0	0.6	0.7
Guinea-Bissau	8.0	7.6	7.6	7.6	8.0	7.5	6.7	5.7
Guyana	4.6	4.7	5.0	5.1	4.6	4.6	4.4	4.1
Haiti	2.4	2.3	2.3	2.4	2.4	2.2	2.1	2.0
Honduras	2.6	2.5	2.6	2.7	2.6	2.5	2.2	2.1
Kenya	3.7	3.5	3.5	3.4	3.7	3.5	3.2	2.9
Kyrgyz Republic	4.4	3.9	3.8	3.7	4.4	3.9	3.6	3.3
Lao People's Dem.Rep	2.7	2.0	1.8	1.9	2.7	2.0	1.5	1.4
Lesotho	7.9	6.8	5.3	5.5	7.9	6.7	5.0	4.7
Liberia	2.1	1.9	2.0	1.9	2.1	1.9	1.6	1.1
Madagascar	4.0	2.9	3.5	3.0	4.0	2.8	3.1	2.0
Malawi	0.8	1.6	2.5	3.8	0.8	1.6	2.1	3.0
Maldives	2.6	3.0	3.1	3.2	2.6	2.9	2.7	2.1
Mali	5.5	5.0	4.6	4.4	5.5	5.0	4.3	3.8
Mauritania	1.1	1.1	1.3	1.5	1.1	1.0	0.8	0.5
Moldova	4.0	4.2	4.4	4.4	4.0	4.2	4.1	3.9
Mongolia	4.2	3.9	3.9	4.0	4.2	3.8	3.7	3.5
Mozambique	4.7	4.5	4.9	5.3	4.7	4.5	4.6	4.5
Myanmar	4.9	5.1	5.6	6.2	4.9	5.1	5.4	5.8
Nepal	6.2	5.8	5.8	5.9	6.2	5.7	5.7	5.7
Nicaragua	3.6	3.2	3.0	3.0	3.6	3.2	2.6	2.3
Niger	3.0	2.6	2.8	3.8	3.0	2.6	2.2	2.8
Nigeria	9.9	7.2	5.4	4.3	9.9	7.1	4.6	2.8
Papua New Guinea	3.5	3.3	3.7	4.3	3.5	3.3	3.4	3.5
Rwanda	5.1	4.9	4.9	4.9	5.1	4.8	4.5	4.1
São Tomé & Príncipe	5.9	3.3	5.9	5.5	5.9	2.8	1.7	-3.4
Senegal	4.5	4.3	4.1	4.0	4.5	4.2	3.8	3.4
Sierra Leone	6.0	4.8	4.5	4.1	6.0	4.7	3.6	2.3
St. Lucia	3.2	3.0	2.8	2.8	3.2	2.8	1.8	0.8
St. Vincent & Grens.	2.2	2.3	2.4	2.4	2.2	2.2	0.9	-0.9
Sudan	1.1	1.3	1.5	1.5	1.1	1.3	1.1	0.7
Tajikistan	1.3	1.7	1.9	1.9	1.3	1.7	1.7	1.5
Tanzania	5.0	5.3	5.2	5.0	5.0	5.3	4.9	4.5
Togo	6.1	6.5	5.8	5.4	6.1	6.5	5.4	4.6
Uganda	5.8	5.2	5.1	5.1	5.8	5.2	4.8	4.4
Uzbekistan	10.2	10.9	12.8	14.4	10.2	10.8	12.4	13.7
Vietnam	2.4	2.3	2.5	2.6	2.4	2.3	2.1	1.9
Yemen, Republic of	8.0	5.6	4.7	3.7	8.0	5.6	4.5	3.3
Zambia	5.5	5.0	5.0	5.1	5.5	4.9	4.7	4.5
Median by Group								
All LICs	4.5	4.2	4.2	4.1	4.5	4.2	3.6	3.2
Program	4.5	4.2	4.1	4.0	4.5	4.2	3.6	2.9
Non-program	4.5	4.7	4.7	4.3	4.5	4.6	4.4	3.4
Net Oil importing	4.5	4.2	4.1	4.0	4.5	4.2	3.6	3.2
Net Oil exporting	5.1	4.9	4.5	4.3	5.1	4.9	4.0	3.0
Commodity exporting	4.6	4.5	4.5	4.3	4.6	4.5	3.7	3.3
Non-commodity exporti	4.5	4.2	4.1	4.0	4.5	4.2	3.2	2.9
Fixed exchange rates	4.6	4.5	4.2	4.1	4.6	4.4	3.6	3.2
Floating exchange rates	4.3	4.1	4.2	4.1	4.3	4.0	3.5	3.1
"Low" 2009 buffer	2.7	2.6	2.8	3.0	2.7	2.5	2.1	1.5
"Medium" 2009 buffer	4.4	4.2	4.1	4.0	4.4	4.2	3.6	3.0
"High" 2009 buffer	6.0	5.9	5.5	5.4	6.0	5.8	4.9	4.4
Asia	4.9	4.8	4.8	4.9	4.9	4.6	4.4	4.1
Latin America and Carril	3.6	3.2	3.0	3.0	3.6	3.2	2.1	2.0
Middle East/Europe	4.4	4.2	4.2	3.8	4.4	4.2	3.9	3.3
Sub-Saharan Africa	5.1	4.5	4.5	4.3	5.1	4.5	3.6	2.9

Sources: WEO, and Fund staff estimates.
1/ The shock scenario assumes a decline in exports, remittances and FDI consistent with the low growth scenario set out in Box 2, fully offset by a decline in reserves.

Table AX.5 Current Account Balances in Low-Income Countries

(in percent of GDP)

	Baseline				Shock 1/			
	2009	2010	2011	2012	2009	2010	2011	2012
Afghanistan, I.S. of	-1.8	0.6	-0.4	-1.9	-1.8	0.5	-1.0	-2.6
Armenia	-16.0	-14.6	-12.6	-11.7	-16.0	-14.7	-13.8	-13.2
Bangladesh	3.3	2.5	1.1	0.3	3.3	2.5	0.4	-0.4
Benin	-8.5	-9.6	-9.0	-8.1	-8.5	-9.7	-9.8	-9.1
Bhutan	-9.6	-7.2	-13.8	-19.3	-9.6	-7.6	-17.2	-23.4
Bolivia	4.6	6.5	5.2	5.4	4.6	6.4	4.4	4.4
Burkina Faso	-6.3	-6.4	-8.1	-8.1	-6.3	-6.5	-8.7	-8.9
Burundi	-14.5	-9.1	-10.7	-10.5	-14.5	-9.3	-12.6	-12.7
Cambodia	-5.2	-7.3	-9.1	-9.6	-5.2	-7.7	-11.3	-11.8
Cameroon	-2.7	-3.9	-4.1	-2.7	-2.7	-4.1	-5.5	-4.6
Cape Verde	-9.9	-18.6	-18.2	-15.3	-9.9	-19.2	-22.6	-20.8
Central African Rep.	-7.8	-7.6	-8.2	-8.5	-7.8	-7.8	-10.2	-10.9
Chad	-33.7	-32.0	-25.4	-7.4	-33.7	-32.6	-28.3	-9.5
Comoros	-7.9	-8.9	-12.5	-11.8	-7.9	-9.4	-16.9	-17.2
Congo, Dem. Rep. of	-10.1	-20.7	-21.6	-17.2	-10.1	-20.9	-24.1	-20.1
Congo, Republic of	-7.7	4.2	7.9	7.7	-7.7	3.9	5.4	5.3
Côte d'Ivoire	7.2	6.8	2.5	0.1	7.2	6.4	0.0	-3.0
Djibouti	-17.3	-14.3	-18.0	-21.6	-17.3	-14.9	-21.8	-25.8
Dominica	-28.1	-25.4	-23.3	-23.0	-28.1	-26.2	-30.2	-31.7
Eritrea	-5.0	-1.4	3.2	-0.7	-5.0	-1.6	2.0	-2.0
Ethiopia	-5.0	-3.9	-8.0	-8.3	-5.0	-4.0	-8.7	-9.2
Gambia, The	-10.5	-11.1	-10.8	-10.3	-10.5	-11.5	-13.6	-13.6
Georgia	-11.7	-12.0	-12.5	-11.5	-11.7	-12.2	-13.8	-13.0
Ghana	-5.2	-11.6	-9.1	-7.1	-5.2	-11.8	-10.6	-8.9
Grenada	-25.7	-25.0	-26.0	-26.2	-25.7	-26.1	-32.9	-34.9
Guinea	-10.1	-9.7	-9.0	-8.1	-10.1	-9.9	-10.8	-10.2
Guinea-Bissau	3.2	2.0	1.9	2.0	3.2	1.8	-0.4	-0.8
Guyana	-8.6	-11.3	-10.2	-9.9	-8.6	-11.8	-13.2	-13.0
Haiti	-3.2	-2.1	-3.7	-4.1	-3.2	-2.4	-4.7	-5.0
Honduras	-3.2	-6.3	-6.9	-7.1	-3.2	-6.6	-8.8	-8.9
Kenya	-6.7	-6.7	-7.4	-7.3	-6.7	-6.9	-8.4	-8.4
Kyrgyz Republic	2.1	-5.4	-9.4	-6.1	2.1	-5.7	-11.5	-8.3
Lao People's Dem.Rep	-17.6	-10.2	-13.6	-15.4	-17.6	-10.3	-14.8	-16.9
Lesotho	-0.3	-22.0	-22.4	-18.7	-0.3	-22.5	-25.7	-22.4
Liberia	-33.2	-36.7	-55.6	-58.4	-33.2	-37.5	-62.0	-65.6
Madagascar	-20.7	-14.3	-7.1	-8.3	-20.7	-14.6	-8.6	-10.3
Malawi	-8.1	-1.7	-1.6	0.4	-8.1	-1.8	-2.9	-1.0
Maldives	-31.7	-26.0	-17.4	-13.9	-31.7	-26.4	-20.8	-18.4
Mali	-9.6	-8.0	-9.3	-9.3	-9.6	-8.1	-10.4	-10.6
Mauritania	-12.5	-7.6	-8.7	-7.7	-12.5	-7.9	-11.3	-11.0
Moldova	-8.1	-11.2	-11.4	-11.1	-8.1	-11.5	-13.3	-13.4
Mongolia	-9.8	-13.9	-22.9	-22.5	-9.8	-14.0	-24.2	-23.9
Mozambique	-11.9	-13.6	-12.8	-13.5	-11.9	-13.8	-14.4	-15.6
Myanmar	-1.6	-2.4	-2.3	-1.0	-1.6	-2.5	-2.8	-1.6
Nepal	4.2	-2.9	-0.1	0.2	4.2	-2.9	-0.5	-0.2
Nicaragua	-13.7	-16.4	-16.0	-15.3	-13.7	-16.8	-18.7	-18.1
Niger	-23.7	-24.2	-21.1	-12.6	-23.7	-24.5	-22.9	-14.7
Nigeria	14.1	13.0	11.8	11.8	14.1	12.9	10.7	10.5
Papua New Guinea	-6.8	-16.1	-18.5	-16.4	-6.8	-16.4	-21.0	-19.3
Rwanda	-7.3	-7.7	-8.6	-5.4	-7.3	-7.8	-9.5	-6.4
São Tomé & Príncipe	-28.0	-29.1	-36.6	-34.9	-28.0	-31.8	-59.4	-64.1
Senegal	-8.7	-8.7	-9.1	-9.2	-8.7	-8.8	-10.3	-10.7
Sierra Leone	-8.4	-9.3	-9.5	-9.0	-8.4	-9.7	-12.2	-12.3
St. Lucia	-20.0	-21.2	-22.1	-23.9	-20.0	-22.1	-27.7	-30.6
St. Vincent & Grens.	-34.7	-48.3	-33.0	-29.9	-34.7	-49.3	-41.0	-40.1
Sudan	-12.9	-8.9	-7.1	-6.6	-12.9	-8.9	-7.6	-7.1
Tajikistan	-4.9	-3.6	-5.7	-8.3	-4.9	-3.7	-6.8	-9.7
Tanzania	-10.0	-8.8	-8.8	-9.1	-10.0	-8.9	-9.7	-10.1
Togo	-7.0	-7.8	-7.0	-6.7	-7.0	-7.9	-8.4	-8.3
Uganda	-4.0	-6.4	-9.2	-9.7	-4.0	-6.5	-10.2	-11.0
Uzbekistan	2.7	3.8	6.3	5.2	2.7	3.7	5.4	4.1
Vietnam	-8.0	-8.3	-8.1	-7.8	-8.0	-8.7	-10.5	-10.7
Yemen, Republic of	-10.7	-4.9	-4.5	-4.1	-10.7	-4.9	-5.2	-4.9
Zambia	-3.2	-2.4	-3.9	-6.7	-3.2	-2.5	-4.8	-7.7
Median by Group								
All LICs	-8.2	-8.7	-9.1	-8.4	-8.2	-8.9	-10.5	-10.6
Program	-8.7	-8.9	-9.2	-9.1	-8.7	-9.3	-10.8	-10.9
Non-program	-5.2	-7.7	-10.5	-8.9	-5.2	-7.7	-10.5	-8.9
Net Oil importing	-8.6	-9.2	-9.3	-9.2	-8.6	-9.5	-11.0	-11.0
Net Oil exporting	-7.8	-6.3	-5.8	-5.3	-7.8	-6.4	-6.5	-6.0
Commodity exporting	-8.1	-7.7	-8.1	-7.4	-8.1	-7.9	-9.5	-9.5
Non-commodity exporting	-8.5	-8.9	-9.3	-9.6	-8.5	-9.4	-11.3	-11.0
Fixed exchange rates	-8.0	-7.9	-8.8	-8.3	-8.0	-8.0	-10.3	-10.2
Floating exchange rates	-10.0	-9.4	-9.2	-9.4	-10.0	-9.6	-11.3	-11.0
"Low" 2009 buffer	-10.7	-10.2	-9.1	-9.1	-10.7	-10.3	-11.3	-11.0
"Medium" 2009 buffer	-10.1	-11.7	-11.9	-10.7	-10.1	-12.0	-13.7	-13.1
"High" 2009 buffer	6.0	-2.2	-3.4	-4.0	0.0	-2.2	-3.5	-5.1
Asia	-6.8	-7.3	-9.1	-9.6	-6.8	-7.7	-11.3	-11.8
Latin America and Carribean	-13.7	-16.4	-16.0	-15.3	-13.7	-16.8	-18.7	-18.1
Middle East/Europe	-10.7	-8.9	-9.4	-8.3	-10.7	-8.9	-11.5	-9.7
Sub-Saharan Africa	-8.1	-8.7	-9.0	-8.3	-8.1	-8.8	-10.2	-10.2

Sources: WEO, and Fund staff estimates.
1/ The shock scenario assumes a decline in exports and remittances consistent with the low growth scenario set out in Box 2, fully offset by a decline in reserves.

Appendix XI. Estimation of Growth Effect of Trade Openness as a Function of Complementary Reforms

The growth simulations presented in the figure below are based on the analysis of Chang, Kaltani, and Loayza (2009) (CKL hereafter) studying the link between trade openness and economic growth for five-year period averages between 1960 and 2000.[39] The analysis studies the interaction of eight reform areas with trade openness and corroborates the average positive impact of trade openness on growth and the added impact of reforms in this relationship. The econometric analysis of CKL (2009) can be used to assess how well prepared a country is to assume the challenges and opportunities of trade openness. This can be done by calculating the growth impact of a change in openness given the country's level of progress in each area of complementary reform. Moreover, the analysis can serve to highlight the areas where further progress will allow the country in question to increase the positive growth impact of international trade openness. For this purpose, it is necessary to ascertain what the total growth impact of a change in openness is. This requires considering the regression coefficients on both the interaction term and the openness variable itself. Since the total impact depends on the values of the variables with which openness is interacted, it will vary from country to country. Specifically, the total impact on growth is given by the first derivative of the growth equation with respect to the openness variable then multiplied by a predetermined change in openness, here denoted as Δ Openness:

$$\Delta \text{ Growth} = (\beta 2 + \beta 3 * \text{Complementary Reform}) * \Delta \text{ Openness} \qquad (1)$$

where the symbol Δ means change, and $\beta 2$ and $\beta 3$ are the estimated coefficients on, respectively, openness by itself and the interaction term. Here "complementary reforms" are those variables that have a significant interaction with openness in the growth regression. Clearly, the growth effect of a change in openness will be a linear function of each complementary reform. To scale the function at reasonable values, the change in openness is set equal to the average of the openness measure in the period 2010–14, to reflect expected developments in trade as projected by LIC country desks.

The figure in next page plots (or simulates) the function in (1) for the full range of sample values of each of the eight complementary reforms in the most recent period, 2006–08: educational investment, financial depth, telecommunications infrastructure, inflation, governance, labor-market flexibility, firm-entry flexibility, and firm-exit flexibility. While the country coverage in the analysis of CKL (2009) is a combination of advanced, middle-income, and low-income countries, the current analysis has increased the sample of LICs in order to enhance the richness of the result. Therefore, the range of the x-axis in each panel varies and corresponds to that of each complementary reform proxy. Moreover, the proxies for educational

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[39] Chang, Roberto, Linda Kaltani, and Norman Loayza (2009). "Openness Can be Good for Growth: The Role of Policy Complementarities," Journal of Development Economics, 90(1), p. 33–49.

investment, financial depth, telecommunications infrastructure, and inflation are in log form, and thus their ranges may take on negative and positive values. Governance, labor market flexibility, firm entry flexibility, and firm exit flexibility are captured by indices spanning only the positive space.

Growth Effect of Trade Openness as a Function of Complementary Reforms 1/
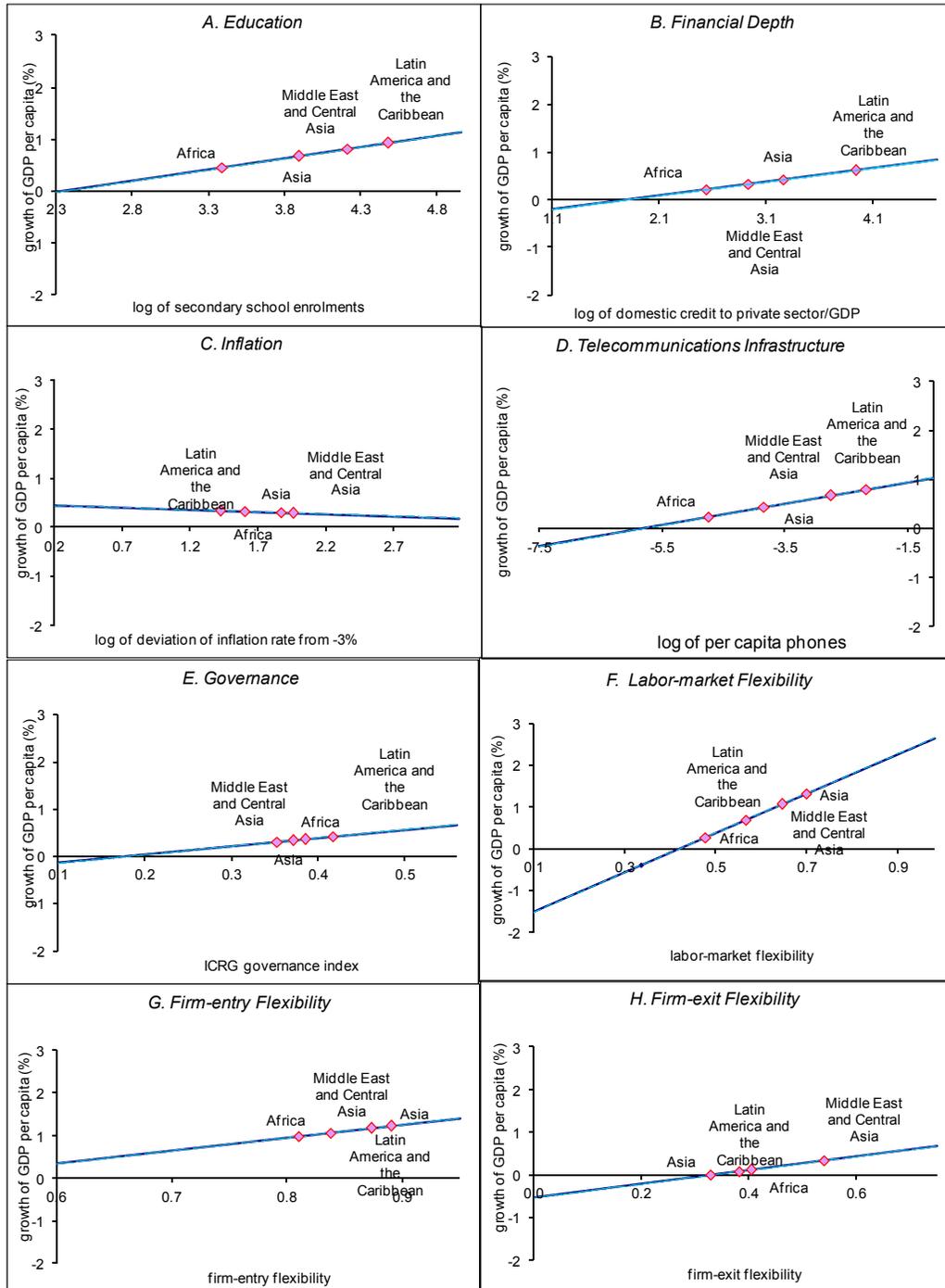
Source: Staff calculations based on Chang, Kaltani, and Loayza (2009).
1/ The size of trade openness used for the growth simulations above is the average trade openness ratio in LIC WEO projections for 2010-14.