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INDIA

SELECTED ISSUES

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January 10, 2014

EXECUTIVE SUMMARY

The background papers for the 2014 Article IV explore key issues affecting the Indian economy, and implications for fiscal, monetary, structural, and financial sector policies.

The first chapter uncovers the factors behind the unprecedented widening of India's current account deficit in terms of the sectoral savings-investment balance. Persistently-high inflation is found to have depressed real returns, prompting a surge in gold imports and a marked deterioration in household financial savings.

The second chapter investigates inward and outward spillovers to and from India. The results show that output shocks emanating in globally-systemic countries have important global effects, but their impact on India is limited. Shocks originating in India have relatively small global implications, but are very important for several South Asian economies.

The third chapter investigates the role of monetary policy in the context of high and persistent food and fuel inflation. As the second-round effects on core inflation are large, in order to durably reduce inflation, monetary policy will need to maintain a tight stance for a prolonged period of time. In addition, progress on structural reforms to raise potential growth is critical to reduce the burden on monetary policy.

The fourth chapter explores progress in poverty reduction and inclusive growth. Robust economic growth has been a major driver of poverty reduction and inclusiveness. Social expenditures, spending on education, and educational attainment rates are important for fostering inclusive growth; while macro-financial stability, with particular attention to inflation risks, is critical for sustaining inclusive growth.

The fifth chapter explores the change in vulnerabilities of India's non-financial corporates which has taken place since the global financial crisis (GFC). Based on four commonly-used indicators of financial strength, vulnerabilities of India's corporate sector are found to be higher than at the trough of the GFC, and at their highest since the early 2000s.

The sixth chapter examines the factors behind the recent investment slowdown in India. The results suggest that in addition to standard macro-financial variables, heightened uncertainty and deteriorating business confidence have played an important role. In contrast, the contribution of interest rates has been minor.

The seventh chapter explores the likely impacts of product and labor market reforms. Analysis suggests that these reforms can increase employment, boost exports, and raise potential growth, thereby helping to harness India's demographic dividend. A package of reforms would reinforce the gains, minimize short-term costs, and increase the acceptability of these politically-difficult reforms.

Approved By
Asia and Pacific Department

Prepared By Paul Cashin, Rahul Anand, Peter Lindner, Mehdi Raissi, Volodymyr Tulin, and Purva Khera.

CONTENTS

INDIA'S CURRENT ACCOUNT DEFICIT FROM THE SAVINGS-INVESTMENT PERSPECTIVE[1]

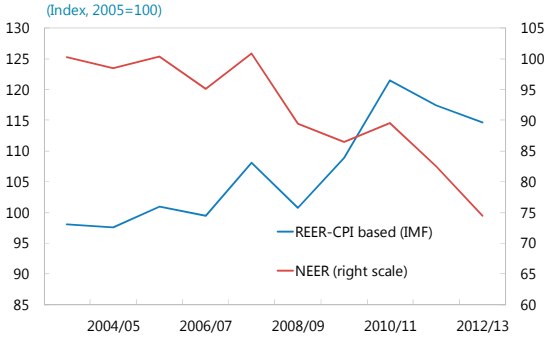
The unprecedented widening of India's current account deficit in recent years is a symptom of underlying macroeconomic imbalances and structural weaknesses (high inflation, large fiscal deficit, and binding supply constraints). Persistently-high inflation has depressed real returns prompting a surge in gold imports and a marked deterioration in household financial savings and the savings-investment balance. In turn, improvement in the public sector's savings-investment balance was achieved through capital spending cuts, as subsidies remained high and fuel price adjustments lagged. Finally, on the back of rising policy uncertainty, the deteriorating business outlook and supply bottlenecks, corporate investment declined.

1. Over the last few years, India's current account balance has deteriorated on the back of a worsening trade balance, reaching a historic high of 4.8 percent of GDP in 2012/13. The balance of payments in India has come under significant pressure since late 2011, with the current account deficit (CAD) reaching 6.5 percent of GDP in 2012Q4.[2] In addition, the trade deficit reached a high of 8.6 percent of GDP in 2012Q4 from an average of 4.9 percent of GDP in 2010/11. At the same time, the merchandize trade deficit widened to 12 percent of GDP from an average of 10.1 percent of GDP in 2010/11.

2. The deterioration of the trade balance has happened even with REER depreciation. The deterioration in the trade balance took place as the real effective exchange rate (REER) depreciated by 5.5 percent cumulatively in 2011/12 and 2012/13, but following a 20.5 percent cumulative appreciation in 2009/10 and 2010/11. Moreover, the nominal effective exchange rate depreciated by 17 percent cumulatively in 2011/12 and 2012/13.

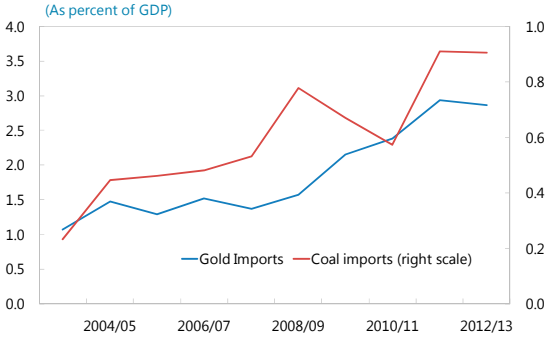
3. The trade deficit has ballooned due to rising gold, coal and oil imports, driven by supply bottlenecks and persistently-high inflation. Gold

India's Real and Nominal Effective Exchange Rates
(Index, 2005=100)



Sources: IMF Information Notice System; and IMF staff estimates.

India's Gold and Coal Imports
(As percent of GDP)



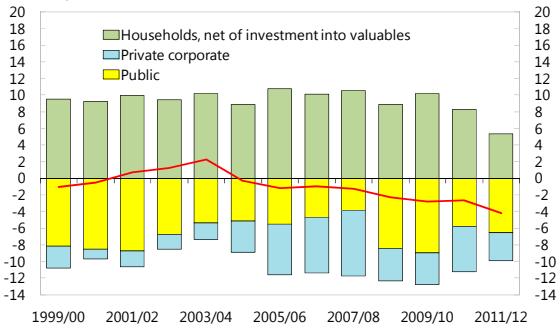
Sources: Haver Analytics; and IMF staff estimates.

[1] Prepared by Rahul Anand and Volodymyr Tulin.

[2] This chapter covers the evolution of the current account deficit up until the end of FY2012/13. While the current account deficit for FY2012/13 came in at about 4.8 percent of GDP, the current account deficit for FY2013/14 is expected to be much narrower at about 3.3 percent of GDP.

imports reached a record high in 2011/12 (US$56.4 billion, or 3 percent of GDP). Despite a slowing economy, growth in net oil imports has been high, and India's coal imports have been rising due to supply bottlenecks in the mining sector.

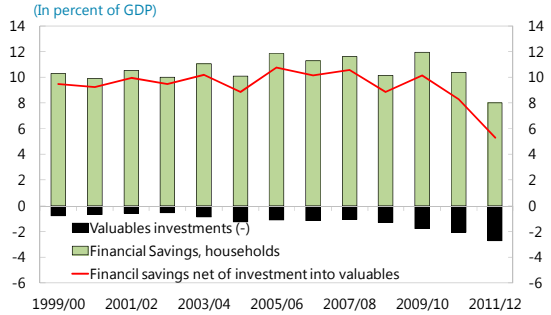
Savings-Investment Balance, By Sector
(In percent of GDP)



Sources: CEIC; and IMF staff calculations.

4. The widening of the current account deficit reflects deterioration in both households' and the public sector's savings-investment balances. Between 2010/11 and 2011/12, the overall savings-investment balance deteriorated by 1.5 percent of GDP. While corporates' savings-investment balance improved by 2 percent of GDP, households' balance deteriorated by 3 percent, and the public sector's balance fell by 0.7 percent of GDP.

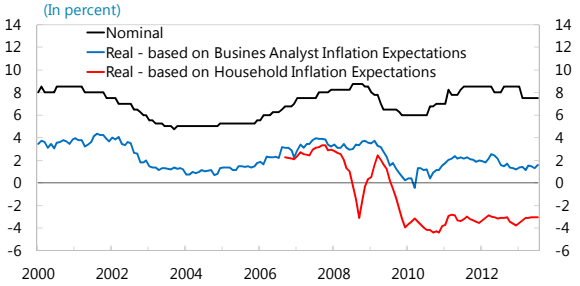
Households' Financial Savings and Investment in Valuables
(In percent of GDP)



Sources: CEIC; and IMF staff calculations.

5. The current account deficit has widened primarily on account of the deterioration in households' savings and investment balance. Households' saving-investment deteriorated by 3 percent of GDP in 2011/12, reflecting a 2.4 percent of GDP decline in financial savings, and a 0.6 percent of GDP increase in investments into valuables, primarily gold.[3] Financial savings have been declining since 2009/10 and are at a decadal low level. Furthermore, households' non-financial savings (mainly housing) have grown rapidly in the last few years. Households' physical saving averaged about 12¼ percent of GDP during 1999/2000–2009/10 but rose to the average of 13¾ percent during 2009/10–2011/12.

Interest Rates on Savings Deposits 1/
(In percent)



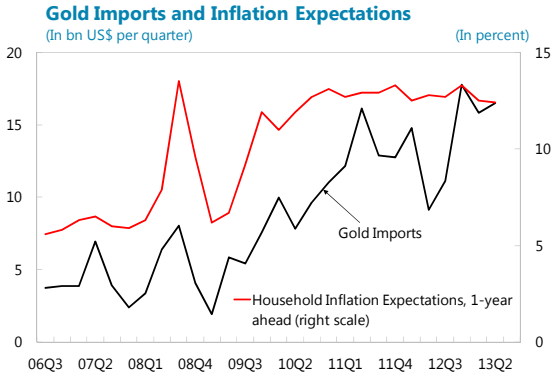
Sources: CEIC; Consensus Economics; Haver Analytics; and IMF staff calculations.
1/ Interest rates on savings deposit of maturities of 1 year and up. Business analyst inflation expectations correspond to CPI-IW next fiscal year inflation expectations from Consensus Economics Surveys. Household inflation expectations correspond to RBI's survey of household expectations for inflation in the next 12 months.

6. Persistently-high inflation has depressed real returns on households' financial savings. Households' financial savings have fallen from an average of 11 percent of GDP in 1999–2010 to only about 8 percent in 2011/12. A fall in broad money as a share of GDP (from 86.5 percent of GDP in 2009/10 to the level of about 83 percent of GDP in 2011/12 and 2012/13) corroborates a decline in domestic financial savings. One clear determinant of the drop in households' savings is the rise in inflation and inflation expectations, resulting in a decline in real interest rates on households' financial savings. As CPI inflation picked up in the spring of 2010

[3] In India's national accounts statistics, households' investment in construction, machinery and equipment is equal to households' physical savings.

to over 15 percent, the real yield on saving deposits turned negative. With inflation remaining elevated, nominal rates on 1-year savings certificates (which are in the range of 8–9 percent per year) continue to imply low real expected returns. Moreover, households' inflation expectations indicated over 12 percent inflation in the next twelve months (as of mid-2013).

7. Households' savings have shifted to non-financial assets, in particular gold. While financial savings have declined, investment into valuables (primarily gold) have risen from the average of 1 percent of GDP in 1999–2010 to 2.7 percent of GDP in 2011/12. Of the several reasons cited for the increased demand for gold, there is strong evidence that gold is increasingly being used as a hedge against inflation.[4] Gold imports are highly correlated with households' inflation expectations (the correlation is 0.83 for the period 2006Q3–2013Q2).



Sources: Haver Analytics; and IMF staff calculations.

8. In turn, the corporate saving-investment balance has improved due to a sharp decline in investment. With slowing growth, corporate savings have moderated. However, the investment decline has been more pronounced on the back of rising uncertainty, deteriorating outlook and supply bottlenecks (Anand and Tulin, 2014). On balance, the savings-investment balance has improved marginally. It may have helped in shoring up the current account deficit, but is likely to adversely affect growth prospects.

9. Public savings have declined; however, public investment has declined even more. Fiscal stimulus following the Global Financial Crisis (GFC) has reduced public savings. Increased fuel subsidies have prevented domestic demand from adjusting to global oil prices. Moreover, to reduce the burgeoning fiscal deficit, the authorities have resorted to capital spending cuts. This has resulted in lower public savings and an even larger decline in public investment, leading to a rise in infrastructure bottlenecks and further weakening of the investment climate.

10. Further efforts to increase financial savings would help reduce the current account deficit sustainably and boost growth. The widening of the current account deficit in India is a symptom of underlying macroeconomic imbalances and structural weakness. Only by tackling these issues (high inflation, large fiscal deficit, and binding supply constraints) can the current account deficit be reduced sustainably. Bolstering households' financial savings requires reducing persistently-high inflation credibly to increase the real rate of return on financial savings. Taming

[4] Other reasons that have been put forward for the increased demand for gold are: i) the increased ease with which loans can be obtained with gold as collateral; ii) reduced incentives for sellers of mutual funds and insurance policies after regulatory changes, which have reduced the growth in these sectors; iii) low real interest rates; iv) rising household income; and v) lack of alternative financial instruments and limited access to formal finance. These explanations are not inconsistent with gold being used as an inflation hedge.

high inflation expectations is also essential to lower gold imports—gold imports have been a key factor behind the recent deterioration of the current account deficit. In addition, while fiscal consolidation can lend support to monetary policy in fighting inflation and thereby reduce the current account deficit, reforming fuel subsidies will directly help in lowering imported-oil demand. Actions on alleviating supply bottlenecks remain a top priority, not only to lower natural resource imports, but to also promote capital formation and raise potential growth.

References

Anand, R. and V. Tulin, 2014, "Disentangling India's Investment Slowdown," IMF Working Paper (forthcoming).

SPILLOVER ANALYSIS: INDIA[1]

This chapter analyzes inward spillovers to India from: (i) macroeconomic shocks in systemic economies (China, the Euro Area, and the United States), (ii) oil price disturbances, and (iii) QE tapering in the United States. Furthermore, it studies outward spillovers from India to other South Asian countries and globally. A Global Vector Autoregression (GVAR) model is used to evaluate the nature and strength of economic linkages between globally-systemic countries and India, and to study the effects of different shocks. Spillovers are transmitted across economies via trade, financial, and commodity price channels. The results show that India is more sensitive to developments in the United States compared to those in the Euro Area and China. Shocks originating in India have smaller global implications (compared to systemic countries), but they are very important for several South Asian economies.

1. A GVAR model is used to determine the size and speed of the transmission of different shocks to/from India. This approach uses a dynamic multi-country framework for the analysis of the international transmission of shocks, and is based on a revised version (tailored toward Asian economies) of the models by Cashin et al. (2012a and 2012b).[2] The framework comprises 31 region-specific models (among which a single Euro Area region comprising 8 of the 11 countries that joined Euro in 1999). Together, these countries account for over 90 percent of global economic output. These individual models are solved in a global setting where core macroeconomic variables of each economy are related to corresponding foreign variables (constructed exclusively to match the international trade pattern of the country under consideration). The model has both real and financial variables: real GDP, inflation, the real equity price, the real effective exchange rate, short and long-term interest rates, and the price of oil. All data are quarterly in frequency, for the period 1979Q2 to 2011Q2.

2. The results show that output shocks emanating in globally-systemic countries have important global effects, but their impact on India is limited (likely due to the specific trade-structure of India, its relatively closed capital account, and narrow financial exposures to the rest of the world. The effects of negative U.S., Euro Area, and Chinese real output shocks on India, other large emerging economies, and systemically-important countries are discussed next. This chapter also studies the macroeconomic consequences of oil-price fluctuations in India by identifying two groups of explanatory factors as the main drivers of the evolution of crude oil prices: (i) fast-growing demand due to high global economic growth; and (ii) declining supply or anticipated production shortfalls in the future. The results indicate that the economic consequences of a supply-driven oil-price shock are very different from those of an oil-demand shock driven by global economic activity. Also shown is that reducing the monthly purchase of assets by the U.S. Federal Reserve (QE tapering) is likely to have a pronounced effect on Indian financial markets.

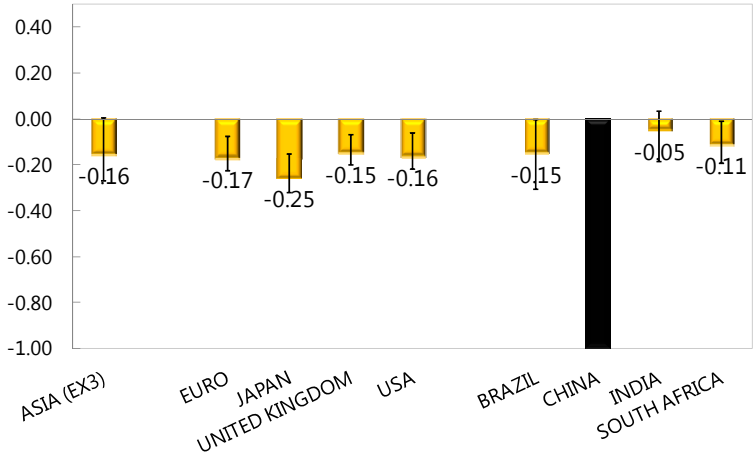
[1] Prepared by Paul Cashin and Mehdi Raissi.

[2] See Cashin et al. (2012a, 2012b), and Mohaddes and Raissi (2013) for more details.

Shock to Chinese GDP

3. A one percent negative GDP shock in China translates into lower overall economic growth globally (Figure 1). In particular, countries with large trade exposures to China are most vulnerable to a slowdown in this country. The effects on the GDP of the Euro Area, Japan, UK, and the United States are generally large (around 0.17, 0.25, 0.15, and 0.16 percent after one year, respectively). Other Asian countries[3] also suffer a decline in economic output, by about 0.16 percent after one year (because some are included in the supply chain of China). Turning to emerging market countries in the BRICS, Figure 1 shows that following a negative GDP shock in China, the output of Brazil, South Africa, and India falls, with the effect on output being 0.15 and 0.11 percent for the first two and only about 0.05 for India. It seems, therefore, that China has a large impact on most countries in our sample apart from India, which has weaker trade links with China. These findings are somewhat to be expected, given the emergence of China as a key driver of the global economy over recent decades.[4]

Figure 1. Responses of Output to a Negative GDP Shock in China



Note: Depicts annual percent change in output of a given country associated with 1% decline in GDP of China, together with the 16th and 84th percentile error bands.

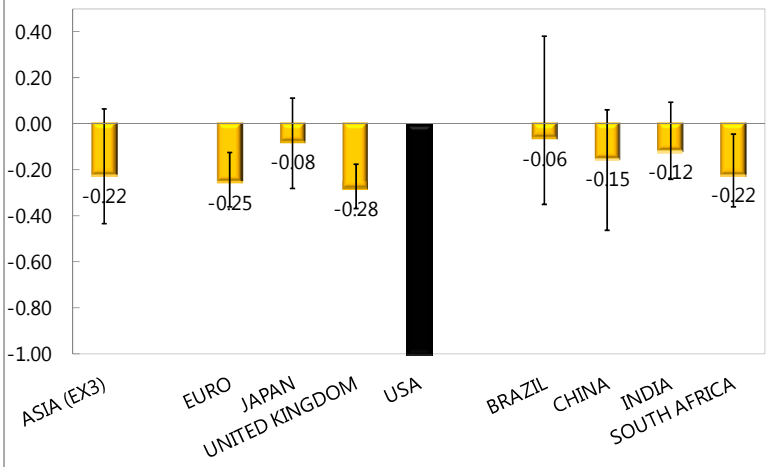
[3] Consisting of Australia, Indonesia, Korea, Malaysia, New Zealand, Philippines, Singapore, and Thailand.

[4] The confidence intervals produced for different sub-groups in this chapter are at times wide, likely due to: model and parameter uncertainties; the possibility of measurement errors in the data (for South Asian countries in particular); and aggregation bias in creating regions. In such cases, the median responses are mainly used for inference as they contain useful information about the direction of the responses and their relative magnitudes (see Cashin et al. 2012a and 2012b for more details).

Shock to U.S. GDP

4. As a result of the dominance of the United States in the global economy, any slowdown in this country can bring about negative spillovers to other economies, as the recent global economic crisis has shown. Lower demand for commodities is one channel through which a negative U.S. shock affects countries. In particular, about one quarter of world oil demand emanates from the U.S., so it is not surprising that in response to the U.S. shock, oil prices and production levels decline. The commodity price channel conveys a negative impact on growth prospects of commodity-exporters (e.g. Gulf Cooperative Council, other oil exporters, and Brazil) and hence lower import-demand by these countries from other emerging market economies (China and India). Specifically, because China and India's export portfolios fit well the import demand of many oil-exporting countries, and given their high trade volume with major oil exporters, we would expect lower import demand by oil exporters (due to income effects) to negatively affect aggregate demand in China and India. Furthermore, the continuing dominance of U.S. debt and equity markets, backed by the still-strong global role of the U.S. dollar, also plays an important role. The results of the GVAR model show that the influence of the U.S. on other economies remains larger than direct trade ties would suggest, owing to third-market effects together with increased financial integration that tends to foster the international transmission of business cycles (Figure 2). For instance, following a negative U.S. GDP shock, the Euro Area, and UK real outputs fall by between 0.25 and 0.28 percent after one year. The median effects of a negative U.S. output shock for Asian countries (including India) are generally negative and range between 0.12 and 0.22 percent.

Figure 2. Responses of Output to a Negative GDP Shock in the U.S.

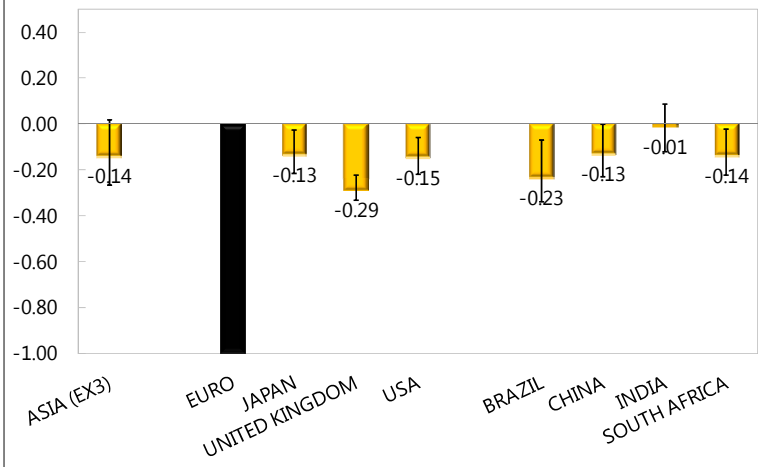


Note: Depicts annual percent change in output of a given country associated with 1% decline in GDP of U.S., together with the 16th and 84th percentile error bands.

Shock to Euro Area GDP

5. The adverse impact on output of a one percent negative GDP shock in the Euro Area is most significant for the United Kingdom, reflecting its geographical proximity to the Euro

Figure 3. Responses of Output to a Negative GDP Shock in Euro Area



Note: Depicts annual percent change in output of a given country associated with 1% decline in GDP of Euro Area, together with the 16th and 84th percentile error bands.

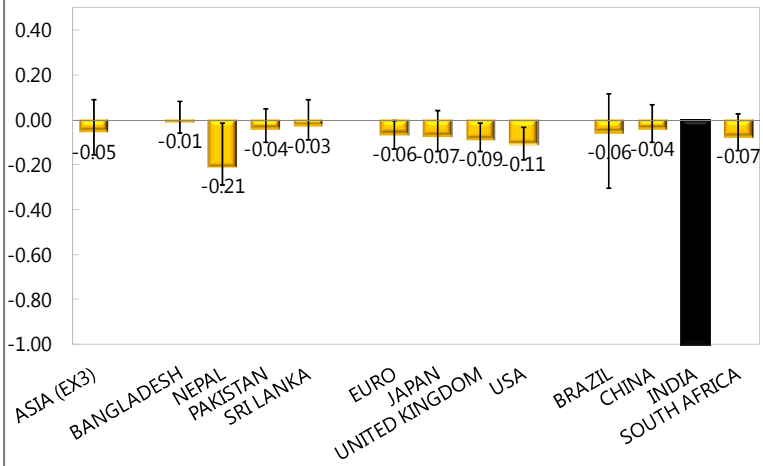
Area, and the strength of its trade linkages with Europe (Figure 3). Beyond the UK, growth spillovers vary from country to country. High dependences are observed for Brazil, with annual output elasticity of about 0.23. Brazil is adversely affected by a downturn in Euro Area via both trade and commodity-price channels. In the case of other emerging market economies in our sample, South Africa and China are significantly affected by a downturn in the Euro Area, while the impact on India is modest due to its smaller trade linkages with the Euro Area (compared to China) and the improvement in the current account arising from lower oil prices. Estimated spillovers from the Euro Area to other systemic countries, which abstract from financial contagion and may therefore understate the magnitude of true spillovers, are nevertheless of meaningful size with output elasticities being between about 0.13 and 0.15 (Figure 3).

Shock to Indian GDP

6. This section assesses outward spillovers from a GDP shock in India to other South Asian economies and the rest of the world. The GVAR results show that output shocks in India matter, particularly for its immediate neighborhood, but also have global implications (albeit to a lesser extent than those of China). A one percent decline in the GDP of India generates significant output losses in Nepal, corresponding to around 0.21 percent after one year. Nepal, with its peg to the Indian rupee, relies heavily on India as a market for exports (nearly 60 percent of Nepal's exports are destined for India), as well as tourism, workers' remittances, and foreign direct investment. A sustained downturn in India could lower remittance flows to Nepal.

7. However, an Indian slowdown only has a modest effect on other South Asian countries (Bangladesh, Pakistan, and Sri Lanka), with the average effect being 0.03 percent (see Figure 4). Output spillovers from India to the South Asia region are transmitted via trade, remittances, foreign direct investment (FDI), and commodity price channels. Direct financial linkages between India and the rest of South Asia and cross-border banking exposures are minor. Most financial sectors in the region are small and relatively closed to global flows. In addition, spillovers from India to other emerging market economies and advanced economies are generally weak.

Figure 4. Responses of Output to a Negative GDP Shock in India

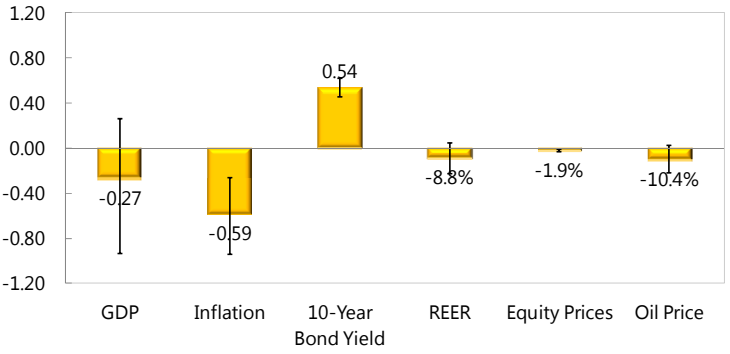


Note: Depicts annual percent change in output of a given country associated with 1% decline in GDP of India, together with the 16th and 84th percentile error bands.

Shock to U.S. Long-term Interest Rates

8. Reducing the monthly purchase of assets by the U.S. Federal Reserve (QE tapering) is likely to have a pronounced effect on Indian financial markets. Tightening of liquidity conditions will make financing of the large current account deficit in India (mainly financed through short-term debt inflows) more difficult, due to potential capital outflows. With policy space significantly more limited than in 2008/09 and corporate balance sheets more stretched, the interaction between external risks and domestic vulnerabilities could create macroeconomic instability—where balance of payments pressures intensify, corporate balance sheets come under stress, and financial institutions' asset quality deteriorates, lowering growth.

Figure 5. Responses of Indian Variables to a Long-term Interest-Rate Shock in U.S.



Note: Depicts annual percent change in REER, Equity Prices, and Oil Price, and annual percentage points change in GDP growth, Inflation, and 10-Year Bond Yield of a given country associated with a 100bps increase in long-term interest rate of U.S., together with the 16th and 84th percentile error bands.

9. Assuming that long-term U.S. government bond yields rise by 100 bps during the first year of the U.S. financial shock (consistent with a 230 bps rise in long-term interest rates on a quarterly basis), this would generate a modest output loss of around 0.3 percentage points in India during the first year, operating through weak direct financial, trade (including through third-market countries), and commodity-price linkages.

10. A widening of the output gap together with higher long-term government bond yields in India (up by about 50 bps) and lower commodity prices (by about 10 percent due to weaker global growth) is likely to moderate inflation slightly by 0.6 percentage points over one year. Equity prices are likely to fall by about 2 percent, reflecting confidence effects and increased risk aversion, while the nominal exchange rate would depreciate significantly (by about 10 percent). On the capital account side, external commercial borrowing and portfolio investment flows would likely shrink, trade credit financing slow, while a drawdown of international reserves would fill any financing gap (see Figure 5).[5]

[5] The magnitude of the effects is broadly in line with what occurred during the summer of 2013. Between May 22 and end-September, the REER depreciated by 7.6 percent, 10-year government bond yield increased by 20 basis points, the SENSEX index fell by 3 percent, and oil prices went up by 7 percent (mainly due to geopolitical events in the Middle East).

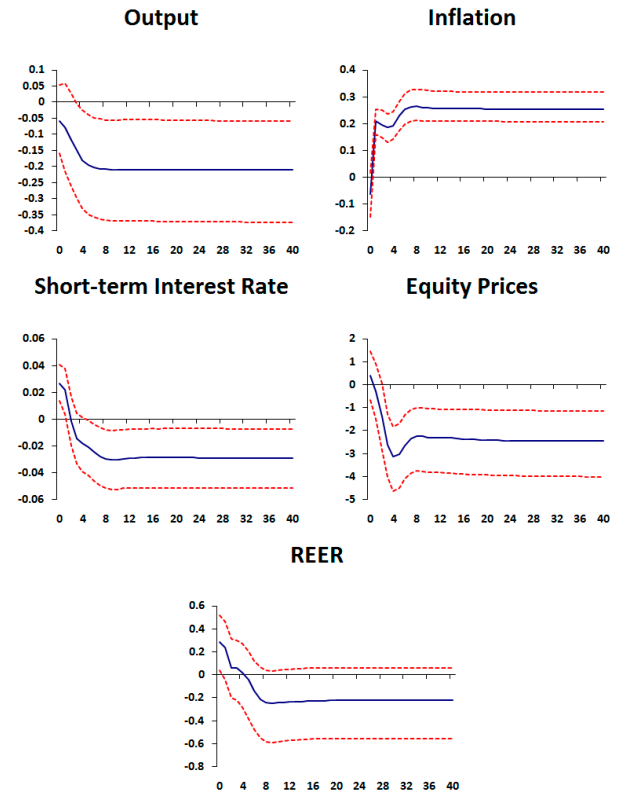
Shock to Oil Prices

11. We discriminate between supply-driven and demand-driven oil-price shocks, and study the time profile of their macroeconomic effects for India. A negative oil supply shock is an exogenous shift of the oil supply curve along the oil demand schedule to the left, lowering oil production, and increasing oil prices. A good example of such a shock would be exogenous oil production disruptions caused by geopolitical tensions in the Middle-East. In contrast, a positive oil demand shock driven by global economic activity (represented by an upward shift of the oil demand curve along the oil supply schedule to the right) is a shock that increases both oil production and prices. The surge in oil demand on the back of strong economic growth in emerging economies would be an example. To identify these shocks, we impose a set of dynamic sign and contemporaneous quantity restrictions on the generalized impulse responses of a Global VAR model (estimated over 1979Q2-2011Q2). More specifically, we require negative oil-supply shocks to be associated with: (i) an increase in oil prices; (ii) a decrease in global oil production levels; and (iii) a decline in the sum of real output across all oil importers during the first year. This scheme is effective in identifying oil-supply disturbances as other shocks cannot move oil prices, oil production levels, and real GDP (across all oil-importing countries in opposite directions. For oil-demand shocks on the other hand, we require an increase in: (i) oil prices; (ii) oil production levels; and (iii) the sum of real output across the 38 countries/regions within the first year. We augment these restrictions with bounds on impact price elasticities of oil demand and oil supply to narrow the set of admissible structural models.

12. Figures 6–7 show the estimated median impulse responses (for up to 40 quarters) of key macroeconomic variables of India to an oil-price shock, together with the 16th and 84th percentile error bands.[5] The results indicate that an oil-supply shock permanently decreases output and creates moderate inflationary pressure in India, due to low pass-through of higher international oil prices to domestic markets. The interest rate responses after an oil-supply shock are generally in accordance with the effects on inflation, i.e. monetary policy is temporarily tightened to stabilize inflation. Equity prices and real effective exchange rates fall. The rising demand for commodities by emerging markets (mainly by China and India, but also the Middle East and Latin America) is a frequently-cited factor in explaining the rise in oil-prices before the global financial crisis and its eventual impact on the global real economic activity (Figure 8). Following an oil-demand shock, India experiences long-run inflationary pressures and a short-run increase in real output. This finding is not surprising given that the oil-price spike is assumed to be determined endogenously by a shift in worldwide economic activity. Output can rise because the country itself is in a boom, or because it indirectly gains from trade with the rest of the world.

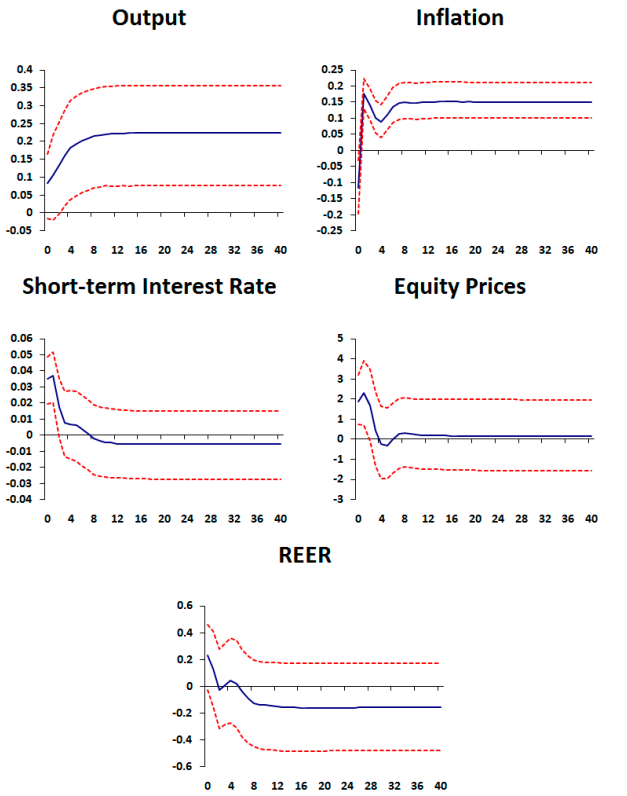
[5] The error bands refer to the fact that there are many models with identified parameters that provide the same fit to the data. They are unrelated to sampling uncertainty, and do not show statistical significance.

Figure 6. Impact of Oil-Supply Shocks on India



Source: IMF staff estimates.

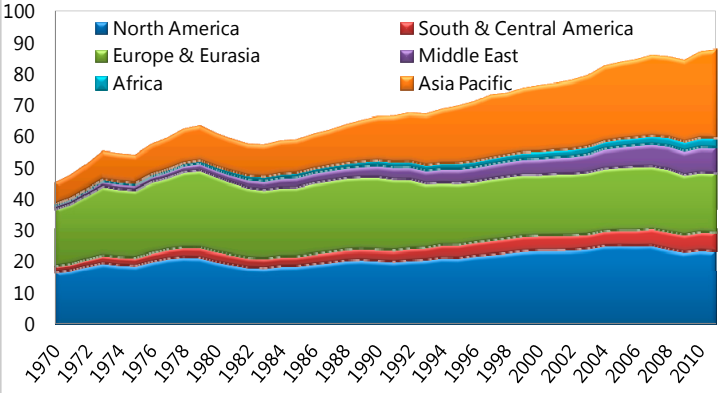
Figure 7. Impact of Oil-Demand Shocks on India



Source: IMF staff estimates.

Figure 8. Crude Oil Consumption by Region, 1970–2011

(In millions of barrels per day)



Source: Cashin et al (2012) based on data from the British Petroleum *Statistical Review of World Energy*.

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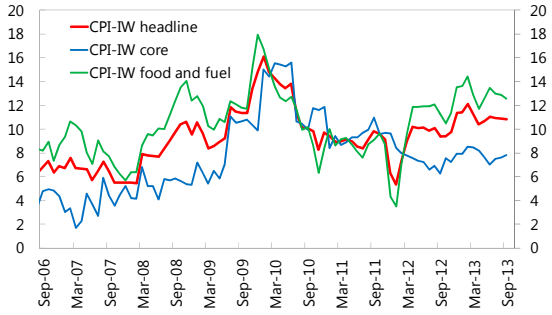
INFLATION DYNAMICS AND MONETARY POLICY IN INDIA[1]

Indian food and fuel inflation has remained high for several years, and second-round effects on core inflation are estimated to be large. In order to durably reduce inflation, the monetary policy stance needs to be tightened. Analysis suggests that the Reserve Bank of India (RBI) may need to raise rates decisively, and maintain a tight stance for a prolonged period of time. Moreover, progress on structural reforms to raise potential growth is critical to reduce the burden on monetary policy.

1. Drawing from a wider mandate, monetary policy in India has evolved to have multiple objectives of price stability, financial stability and growth. The Reserve Bank's approach recognizes that price and financial stability are important for sustaining high levels of growth which is the ultimate objective of public policy (Mohanty, 2012). An appropriate monetary policy stance depends on inflation dynamics, the distribution of exogenous shocks affecting the economy, and the monetary transmission mechanism. India as a small economy (compared to the global economy) faces internal shocks as well as external shocks from the rest of the world.

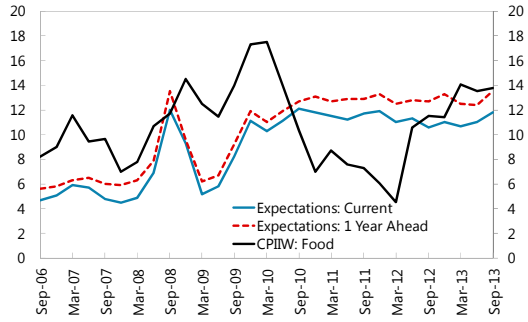
2. Persistent and elevated food inflation presents challenges for monetary management. While it is a widely-held view that central banks should only respond to changes in the underlying core inflation and second-round effects on core inflation of commodity price shocks, there is growing evidence that the dynamics of food price inflation are very different in emerging economies. Unlike advanced economies, food-price inflation shocks are more volatile and persistent, and are propagated strongly into nonfood inflation (Walsh, 2011). Also, they tend to have stronger and longer-lasting effects on inflation in economies with high food shares in the consumption basket, and in economies with less firmly anchored expectations (IMF, 2011). Accordingly, excluding commodity-price inflation in economies where food and fuel represent a large share of household expenditure, and where commodity price changes affect core inflation through second-round effects, may not be appropriate (Catão and Chang, 2010; Walsh, 2011). Anand and Prasad (2010) also

Inflation
(In percent, yoy)



Sources: Haver Analytics; and IMF staff calculations.

Household Inflation Expectations and Food Inflation
(In percent)



Sources: CEIC, Haver Analytics and IMF staff calculations.

[1] Prepared by Rahul Anand and Volodymyr Tulin.

conclude that in an environment of credit-constrained consumers, a narrow policy focus on nonfood inflation can lead to suboptimal outcomes. In sum, ignoring food inflation in monetary policy action may lead to policy mistakes.

3. The dynamics of headline inflation with respect to core inflation in India is assessed to formalize the relationship between food inflation and its pass-through to core inflation. Following Cecchetti and Moessner (2008) and Clark (2001), the following questions are examined:

Does headline inflation revert to core inflation?

If headline inflation reverts quickly to core inflation, then the impact of food and energy price shocks is temporary, and second-round effects are probably limited. On the other hand, if headline inflation does not revert to core, either the shocks are persistent or the second-round effects are large due to higher inflation expectations and accelerating wages. Empirically, the issue is addressed here by examining the following regression estimated on monthly data for 1996M1–2013M9:

$$\pi_t^{headline} - \pi_{t-12}^{headline} = \alpha + \beta\left(\pi_{t-12}^{headline} - \pi_{t-12}^{core}\right) + \varepsilon_t$$

Does core inflation revert to headline inflation?

If core inflation reverts to headline inflation, it would indicate that shocks to headline inflation, such as those caused by commodity-price spikes, feed into inflation expectations and price setting, driving core inflation to catch up with headline inflation. Empirically, the issue is addressed here by examining the following regression estimated on monthly data for 1996M1–2013M9:

$$\pi_t^{core} - \pi_{t-12}^{core} = \delta + \gamma\left(\pi_{t-12}^{core} - \pi_{t-12}^{headline}\right) + \varepsilon_t$$

4. The empirical results suggest that second-round effects may indeed be significant. Specifically, if headline inflation reverts to core inflation, the coefficient β is expected to be negative. The results, however, suggest that the null of $\beta = 0$ can't be rejected, which implies that headline inflation does not revert to core inflation. At the same time, individually both the hypothesis that $\beta = -1$ and that $\beta = -1$ and $\alpha = 0$, i.e. that headline fully reverts to core within a year, are rejected. Therefore, it can be concluded that headline does not revert to core, suggesting that either food shocks are persistent or second-round effects are large. On the other hand, the estimate of γ is -0.7, which is highly statistically significant, suggests that core inflation reverts to headline inflation. At the same time, the null hypothesis of $\gamma = 0$, which corresponds to a situation where core does not revert to headline, is rejected. Moreover, both the hypothesis that $\gamma = -1$ and that $\gamma = -1$ and

$\delta = 0$ cannot be rejected. This suggests that core inflation catches up with headline inflation and reverts to headline quickly. Therefore, large second-round effects are likely to be present.[2]

5. Thus, incorporating the possibility of second-round effects of food price inflation is essential for monetary policy formulation. A practical model that builds on a stylized gap model (each variable is expressed in terms of its deviation from equilibrium, in other words in "gap" terms)[3], tailored to India's fundamentals, is used to estimate second-round effects in a general equilibrium setting. The model features a small open economy including forward-looking aggregate supply and demand with micro foundations, and with stylized (realistic) lags in the different monetary transmission channels. Output developments in the rest of the world feed directly into the small economy as they characterize foreign demand for Indian products. Changes in foreign inflation and/or interest rates affect the exchange rate and, subsequently, demand and inflation in the Indian economy. A New Keynesian Phillips Curve (NKPC), incorporating the effect of the output gap, lagged inflation, exchange rate and inflation expectation on current inflation is estimated in a dynamic small open economy setting. To estimate the second-round effects the model includes the pass-through from headline inflation to core inflation.[4]

6. The baseline model has four behavioral equations: (1) an aggregate demand or IS curve that relates the level of real activity to expected and past real activity, the real interest rate, the real exchange rate, and the foreign output gap; (2) a price setting or Phillips curve that relates core inflation to past and expected inflation, the output gap, and the exchange rate, as well as the pass-through from the headline to core inflation; (3) an uncovered interest parity condition for the exchange rate, with some allowance for backward looking expectations and risk premium; and (4) a rule for setting the policy interest rate as a function of the output gap and expected inflation. Finally, a food and fuel inflation equation prescribes persistent underlying inflation dynamics.

7. The estimated Phillips curve for core inflation is backward looking, and suggests sizable second-round effects:

$$\pi_t^c = 0.2 * \pi 4_{c,t+1} + 0.8 * \pi 4_{c,t-1} + 0.2 * ygap_{t-1} + 0.3 * (z_t - z_{t-1}) + 0.3 * (\pi 4_{t-1} - \pi 4_{c,t-1}) + \varepsilon_t^{\pi,c}$$

where $\pi_t^c 4_{t+1}$ is the four-quarter ahead y-o-y core inflation rate[5], $\pi_t^c 4_{t-1}$ the four-quarter lagged y-o-y core inflation rate, $ygap$ is the output gap, $z_t - z_{t-1}$ the real depreciation, and the $\pi 4_{t-1} - \pi 4_{c,t-1}$ term signifies second-round effects from headline to core. The estimated Philips curve for India is backward looking (the backward-looking component in core inflation is 0.8), suggesting inflation is highly inertial and shocks to inflation are persistent. Patra and Kapur (2010)

[2] The estimates reported correspond to CPI-IW inflation. Conclusions remain the same if WPI inflation is used instead.

[3] See for example, Berg, Karam, and Laxton (2006a, 2006b).

[4] The reported results are based on the CPI-IW inflation.

[5] Core CPI are compiled by staff by stripping out food and energy items from the consumption basket.

have found similar estimates for the forward- and backward-looking components.[6] The estimated parameter on output gap is 0.2, which is in line with the literature estimates of 0.2 – 0.3 (Patra and Kapur, 2010). The pass-through coefficient is estimated to be 0.3. In other words, the gap between headline inflation and core inflation decreases by about three fourths in a year as core inflation catches up with headline inflation. The following factors seem to be responsible for this high pass-through: the share of food in household expenditure is high; food price shocks are persistent and large; and food inflation informs inflation expectations and wages.

8. The estimated aggregate demand equation suggests that expectations about future output and real policy rates matter for economic activity:

$$ygap_t = 0.2 * ygap_{t+1} + 0.6 * ygap_{t-1} - 0.1 * RRgap_{t-1} + 0.02 * zgap_{t-1} + 0.1 * ygap_t^{RW} + \varepsilon_t^{ygap}$$

where $RRgap$ is the real interest rate gap, $zgap$ is the gap of real effective exchange rate, and $ygap^{RW}$ is the output gap in the rest of the world, as proxied by the United States. The coefficient estimate on the lead of the output gap indicates that expectations regarding the future level of the output gap are important. This corroborates the importance of confidence effects in promoting growth (Anand and Tulin, 2014). The negative impact of real rate tightening indicates a trade-off between inflation and growth. Specifically, a one percent increase in the real interest rate is associated with a 0.1 percentage point widening of the output gap in the next quarter. However, the exchange rate impact on the output gap is positive but small, reflecting low short-term trade elasticities.

9. The estimated policy reaction function suggests that the RBI focuses on multiple objectives:

$$RS_t = 0.8 * RS_{t-1} + 0.2 * [RR_t^* + \pi 4_t + 1.7 * (\pi 4_{t+4} - \pi_{t+4}^*) + 0.6 ygap_t] + \varepsilon_t^{RS}$$

There is a high degree of interest-rate (RS) smoothing in India (the coefficient is 0.8), which is in line with the estimates of this parameter by Anand and others (2010). The weight on inflation stabilization is 1.7. The estimate of the coefficient on output gap is 0.6, suggesting that the RBI puts weight on stabilizing real activity. This broadly corresponds to the RBI's multiple objectives approach.

10. Monetary policy needs to respond decisively to tackle India's high and persistent inflation. At the current juncture, with food inflation remaining persistently high for five years, monetary policy needs to be tightened to control generalized inflation. Given elevated and persistent inflation, the analysis suggests that the RBI may need to raise rates decisively to tackle inflation durably. As inflation is mostly backward looking, monetary policy has to maintain a tight stance for a prolonged period of time. As well, given that Phillips curve is relatively flat, progress on structural reforms to raise potential growth is critical to reduce the burden of adjustment on monetary policy.

[6] This is also consistent with the cross-country evidence that finds the co-efficient on expected inflation to be below 0.5 (Berg et al., 2006).

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INDIA: DEFINING AND EXPLAINING INCLUSIVE GROWTH AND POVERTY REDUCTION[1]

Robust economic growth has been a major driver of poverty reduction and inclusiveness in India. Analysis using a new measure of inclusive growth indicates that social expenditures, spending on education, and educational attainment rates are important for fostering inclusive growth; while macro-financial stability, with particular attention to inflation risks, is critical for sustaining inclusive growth.

1. India has achieved notable progress in poverty reduction. High economic growth since the economic reforms of the early 1990s, with GDP growth averaging around 7 percent during 1993/94–2011/12, helped halve the poverty headcount rate from 45.3 percent to 21.9 percent. After growing at an average rate of 6¼ percent during 1993/94–2003/04, growth accelerated to 8½ percent during 2004/05–2009/10. This rapid economic growth has contributed to a substantial reduction in poverty. Poverty, measured by the national poverty line, declined by 1.5 percentage points per year in 2004/05–2009/10, double the rate of the preceding decade. High rates of economic growth have been more broadly shared than ever before across India during this latter period, with many poor states growing at double-digit rates.

Table 1. India: Evolution of Poverty

						Annual Average Decline in Poverty		
		1993/94	2004/05	2009/10	2011/12	1993/94-2004/05	2004/05-2009/10	2004/05-2011/12
Poverty Headcount Ratio	Rural	50.1	41.8	33.8	25.7	0.8	1.6	3.2
In percent	Urban	31.8	25.7	20.9	13.7	0.6	1.0	2.4
	Total	**45.3**	**37.2**	**29.8**	**21.9**	**0.7**	**1.5**	**3.1**
Number of Poor	Rural	328.6	325.8	278.2	216.5	0.3	9.5	15.6
In millions	Urban	74.5	81.4	76.5	52.8	-0.6	1.0	4.1
	Total	**403.7**	**407.2**	**354.7**	**269.3**	**-0.3**	**10.5**	**19.7**

Sources: IMF staff calculations; Press Note on Poverty Estimates, 2011-12, July 2013.

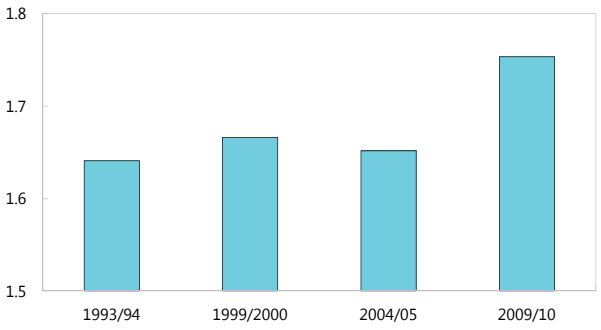
2. However, the period of rapid growth and poverty reduction (2004/05–09/10) was also accompanied by a rise in inequality. During this period the Gini index rose from about 0.27 in rural and 0.35 in urban India to about 0.28 and 0.37, respectively. Inequality also widened between the rural and urban population, as well as across states. In particular, the ratio of urban to rural per capita consumption and the ratio of real per capita income of the richest state to that of the poorest state rose (Figures 1 and 2).

3. Notwithstanding relatively higher growth of average urban consumption, the rural poverty headcount rate declined by more than the urban poverty headcount rate, reflecting a favorable shift in rural consumption distribution. Analysis of poverty reduction during 2004/05–2009/10 using Datt-Ravallion Growth-Inequality Decomposition (1992) reveals that stronger growth

[1] Prepared by Rahul Anand and Volodymyr Tulin. Based on a forthcoming IMF working paper by Rahul Anand, Volodymyr Tulin and Naresh Kumar.

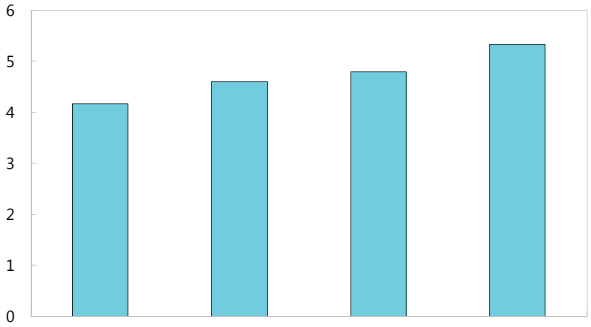
of average urban real consumption compared to rural consumption accounted for about 8 percentage points decline in urban poverty headcount rate compared to about 5 percentage points decline in rural poverty (Figure 3). However, rural poverty decline was boosted by about 3½ percentage points due to a favorable shift in the distribution of rural consumption. In contrast, the deterioration of urban consumption distribution subtracted almost 3 percentage points from urban poverty headcount rate reduction. Moreover, most of the gains from the distribution change in rural poverty headcount occurred among the poorest of rural households. Specifically, nearly half of the impact from the distribution shift in rural poverty reduction could be attributed to the bottom quartile of the rural poor—those with consumption below two thirds of the poverty line in 2004/05. Furthermore, the negative impact of the urban consumption distribution shift affected the poorest urban households disproportionately more. Specifically, about four fifths of the negative impact of the urban distribution shift was concentrated in the bottom quartile of the urban poor, those with expenditures below two thirds of the poverty line.[2]

Figure 1: Ratio of Urban to Rural Real Consumption 1/



Sources: CEIC; and IMF staff estimates.
1/ Ratio in 1993/94 corresponds to nominal consumption.

Figure 2: Real NSDP Per Capita: Ratio of Richest to Poorest States

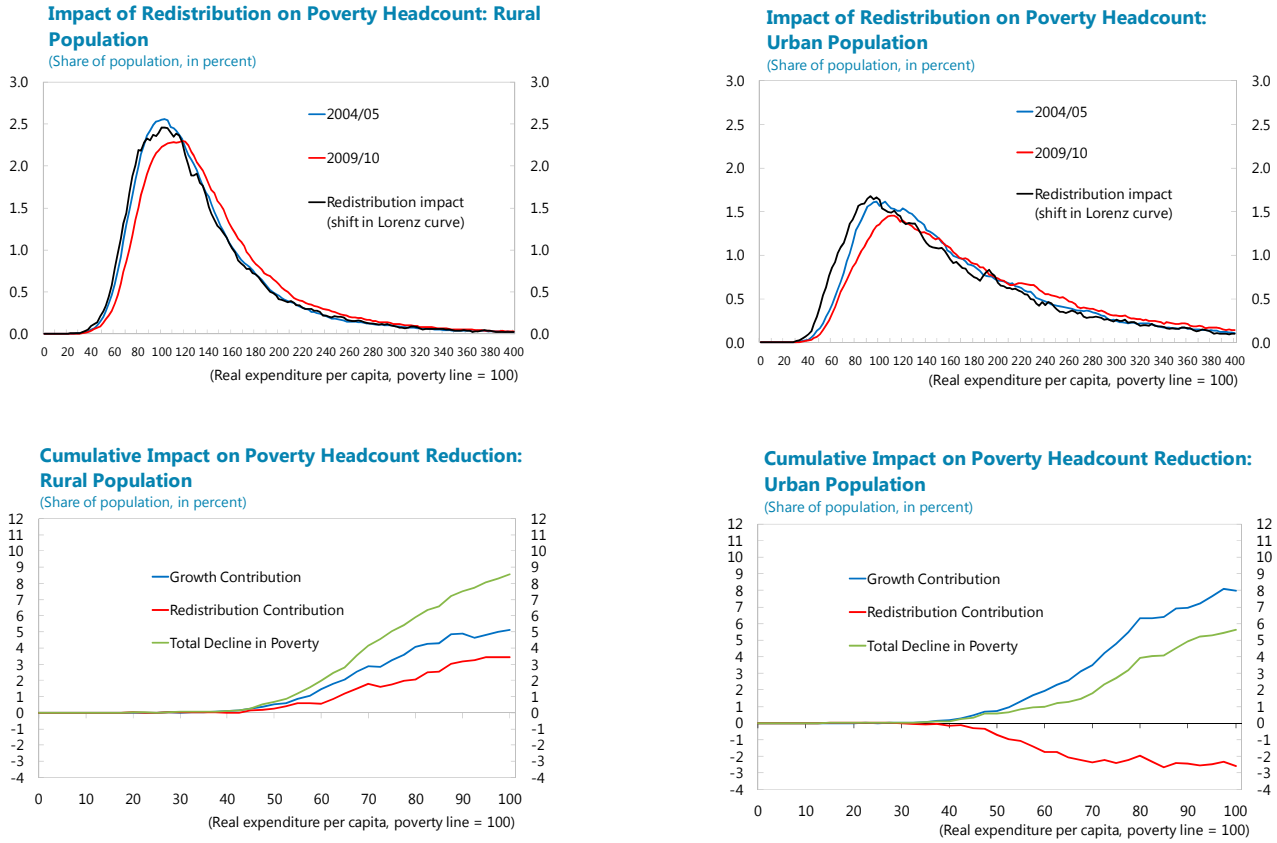


Sources: CEIC and IMF staff calculations.

4. Growth incidence curves reveal a more unequal growth pattern among India's urban population. Rural households experienced a remarkably uniform growth distribution compared with urban households. The two measures of average expenditure growth—a simple average and the average weighted by initial real expenditure levels—reveal the interaction of the initial inequality in 2004/05 and disparity of real expenditure growth over the next five years (Figure 4). The two measures are very close for the rural population, reflecting both a more uniform initial distribution, but indicate further widening of a more unequal initial urban distribution. In addition, rural households with 2004/05 real expenditures near the poverty line (both above and below) experienced above-average growth. In part, this reflects a lower growth of the more well-off rural households. In contrast, growth variation among urban households appears to be very high. Only about the richest five percent of urban population experienced above average growth, while the real consumption growth among households below the poverty line turned out to be much lower.

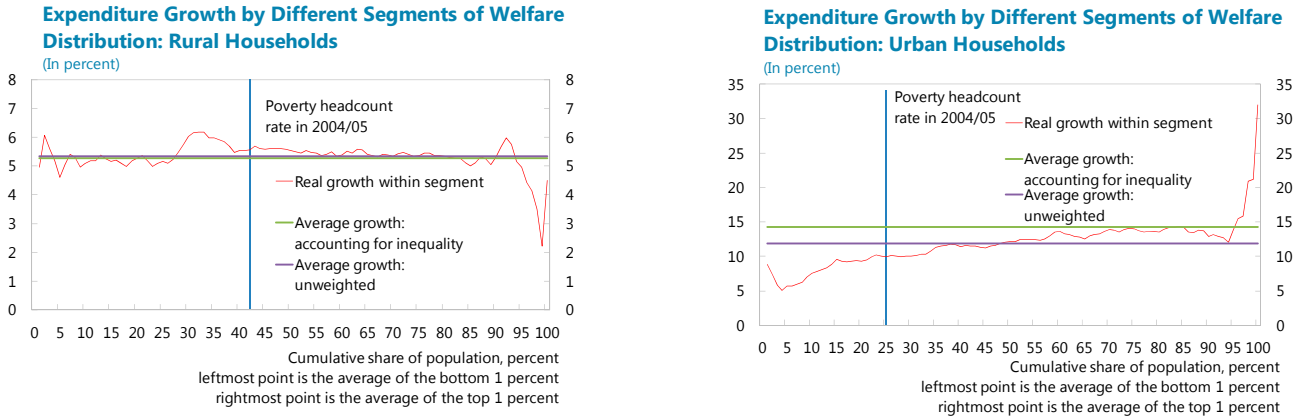
[2] It should be noted that real consumption of all segments of the rural and urban poor grew. The redistribution component of the Datt-Ravallion decomposition reflects differences in the growth rates across households.

Figure 3. Comparison of Growth and Inequality Contributions to Poverty Reduction Between Rural and Urban Households



Source: IMF staff estimates.

Figure 4. Comparison of Growth Incidence Curves Between Rural and Urban Households



Source: IMF staff estimates.

5. Inclusive growth integrates the pace and distribution of economic growth, thus providing a unifying depiction of the evolution of inclusiveness. Given that poverty reduction and promoting inclusive growth are the two most important policy priorities of the government, the measure developed by Anand and others (2013) allows combining analysis of poverty reduction, economic growth and inequality. In a nutshell, the measure represents a weighted average of household consumption growth where relatively poorer households are assigned higher weights. Consequently, one of the properties of this inclusive growth measure is that its value will exceed the average expenditure growth if the inclusiveness component contributes positively as expenditure distribution improves[3]. Staff analysis suggests that India's inclusive growth measures fell short of the growth in average consumption over 2004/05–2009/10, reflecting deterioration of its inclusiveness component, primarily on account of rising urban-rural and intra-urban inequality. The analysis also reveals a positive contribution of the inclusiveness component to inclusive growth in rural India, suggesting a marginal improvement in equity in rural areas. On the other hand, the growing intra-urban inequality was responsible for lower inclusive growth in urban areas.

6. The role of economic policies and macrofinancial conditions in explaining inclusive growth and its components is investigated over 1993/94–2009/10 using state-level panel data.[4] By exploiting the variations across states and over time in financial conditions as well as public policies (e.g., government social spending, educational attainment, and financial system size) and growth inclusiveness outcomes, the factors associated with stronger and more inclusive growth are uncovered. Given the rise in urban-rural inequality, the cross-state inclusive growth performance for urban and rural populations is also conducted separately.

7. Social expenditures, spending on education and educational attainment rates are important for fostering inclusive growth. Robust economic growth is imperative for strong government revenue growth and, as a result, for ensuring adequate fiscal space for developmental spending, in particular social sector spending. Such government expenditures are closely linked to inclusive growth and poverty reduction (Tables 2 and 3). Specifically, our econometric results suggest that boosting social sector spending by about 1 percent of GDP is associated with about 0.5 percentage point decline in the poverty rate.[5] Therefore, going forward with revenue-boosting reforms to create fiscal space for higher public investments and social expenditures, while supporting fiscal consolidation, would help make progress in reducing poverty.

8. A better-educated labor force provides a foundation for robust and inclusive growth as well as for continued poverty reduction. Staff analysis suggests that Indian states that boosted

[3] In the spirit of the Datt-Ravallion decomposition, the inclusive growth measure can be split into contributions of average growth and change in inclusiveness.

[4] The sixteen major states included in the analysis comprise about 90 percent of India's population and national economy.

[5] Based on the social spending coefficient estimate from column (4) in Table 3 and assuming unchanged welfare distribution.

spending on education and those that boosted fundamental educational attainment rates had better inclusive growth outcomes. Furthermore, a positive association between a state's initial literacy rates and inclusive growth outcomes may suggest that raising the quality of the labor force through better access to education can help unlock a virtuous cycle of higher potential growth. Nevertheless, the presence of appropriate labor market policies and continued structural reforms are critical to enable education to enhance and broaden economic growth.

9. Macro-financial stability, with particular attention to inflation risks, is also critical for sustaining inclusive growth. Lower inflation goes hand-in-hand with more inclusive growth and better poverty reduction outcomes (Tables 2 and 3). As staff analysis indicates, states with relatively deeper bank credit achieved better growth, through boosting inclusiveness in particular. Safeguarding financial stability is therefore critical for ensuring continued financial deepening, increasing access to finance, and broadening growth. Finally, anchoring the government's socioeconomic development agenda to a sustainable financial position lays a cornerstone for broad macroeconomic and financial stability.

Table 2. India: Regression Analysis of Growth Inclusiveness: State-Level, Urban and Rural Households

Dependent Variable:	Inclusive growth *In percent per year*		Average expenditure component *In percent per year*		Inclusiveness component *In percent per year*	
	(1)	(2)	(3)	(4)	(5)	(6)
Credit-to-GDP ratio	0.019 **	0.020 **	0.013 *	0.011	0.005	0.009 **
In percent, period average	(0.009)	(0.008)	(0.007)	(0.008)	(0.004)	(0.004)
Real per capita state social sector expenditure	0.026 *	0.023 **	0.022 **	0.016	0.005	0.008
In percent of poverty line, average per year	(0.014)	(0.011)	(0.010)	(0.011)	(0.008)	(0.006)
Inflation rate	-0.724 ***	-0.573 ***	-0.563 ***	-0.444 ***	-0.159	-0.136
In percent per year, period average	(0.209)	(0.207)	(0.183)	(0.193)	(0.103)	(0.093)
Increase in state spending on education	0.096		-0.403		0.510 **	
In percent of NSDP, over previous period's average	(0.425)		(0.359)		(0.227)	
Increase in literacy rate		0.836 ***		0.551 **		0.245 **
In percent per year		(0.278)		(0.224)		(0.117)
Literacy rate, end of previous period		0.061 **		0.066 **		-0.010
In percent of state's rural population		(0.029)		(0.026)		(0.012)
Number of observations	48	48	48	48	48	48
R^2	0.40	0.57	0.30	0.44	0.53	0.60

Source: IMF staff estimates.
Note: Period dummies included, not reported in the table. Robust standard errors in parentheses.
Note: ***,**, * indicates 1,5, and 10 percent statistical significance, respectively.

Table 3. India: Regression Analysis of Poverty Reduction (Datt-Ravallion Decomposition): State-Level, Urban and Rural Households 1/

Dependent Variable:	Poverty Reduction *In percent per year*		Average expenditure component *In percent per year*		Redistribution component *In percent per year*	
	(1)	(2)	(3)	(4)	(5)	(6)
Credit-to-GDP ratio	0.046	0.054	-0.007	-0.031	0.024	0.038
In percent, period average	(0.048)	(0.046)	(0.034)	(0.039)	(0.032)	(0.030)
Real per capita state social sector expenditure	0.069	0.060	0.199 ***	0.153 **	-0.084	-0.069
In percent of poverty line, average per year	(0.125)	(0.110)	(0.058)	(0.062)	(0.081)	(0.072)
Inflation rate	-2.487 **	-1.890 *	-1.265	-0.902	-0.567	-0.375
In percent per year, period average	(1.014)	(1.027)	(0.932)	(0.987)	(0.816)	(0.797)
Increase in state spending on education	0.508		-3.139		1.372	
In percent of NSDP, over the previous period average	(1.918)		(2.312)		(1.482)	
Increase in literacy rate		3.378 ***		1.041		1.507 *
In percent per year		(0.943)		(1.148)		(0.803)
Literacy rate, end of previous period[1]		0.231 ***		0.312 *		0.006
In percent of state's rural population		(0.099)		(0.179)		(0.083)
Number of observations	48	48	48	48	48	48
R^2	0.76	0.79	0.38	0.45	0.80	0.93

Source: IMF staff estimates.

1/ Average expenditure and redistribution components are measured as percentage point contributions to percentage decline in the poverty headcount.

Note: Period dummies included, not reported in the table. Robust standard errors in parentheses.

Note: ***,**, * indicates 1,5, and 10 percent statistical significance, respectively.

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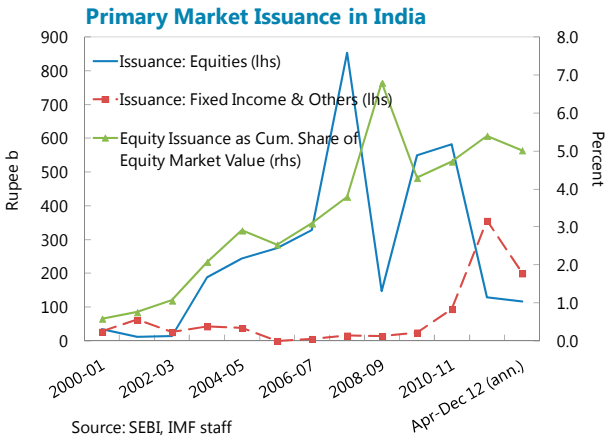
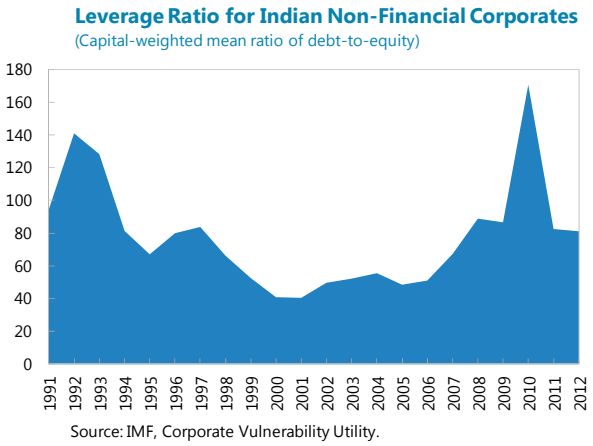
INDIA'S CORPORATE SECTOR: HEALTH AND VULNERABILITIES[1]

Since 2007, the leverage of India's non-financial corporate sector has significantly increased. Based on four standard measures of corporate financial health – interest cover, profitability, liquidity, and leverage – a greater share of Indian corporate debt is owed by firms operating outside the critical boundary with regards to at least one of the four variables. Stress tests of the corporate balance sheets based on four macroeconomic shocks – to domestic and foreign interest rates, the exchange rate, and to profits – show the highest vulnerabilities to the individual shocks since 2002–2003, while exhibiting the highest susceptibility to the combination of all four shocks in the full sample.

1. The eight years before the global financial crisis (GFC) in 2008 were not only a period of notable economic expansion, but also of signicant strengthening of India's corporate balance sheets. Between March 2001 and March 2008, the Bombay Stock Exchange (BSE) Index rose almost four-fold, while the value of BSE-listed equities increased nine-fold. On the back of that, primary market equity issuance became a major means of financing for Indian corporations. Together with the increase in profitability they experienced, leverage declined, particularly in the last few years before the crisis. Although domestic bank credit and external debt grew rapidly before the GFC, equity issuances increased even more, the market-to-book ratio of Indian corporates more than tripled between 2001 and 2006, and the interest cover ratio (ICR) more than doubled. Corporate India's return on equity almost doubled over the same period.[2]



2. However, during the current slowdown, various indicators of corporates' financial health have deteriorated. Domestic credit to corporates continued to rise during and after the GFC, driven notably by public banks' loan provision, notably for infrastructure projects. In addition, external commercial borrowings (ECBs) have risen by 71 percent



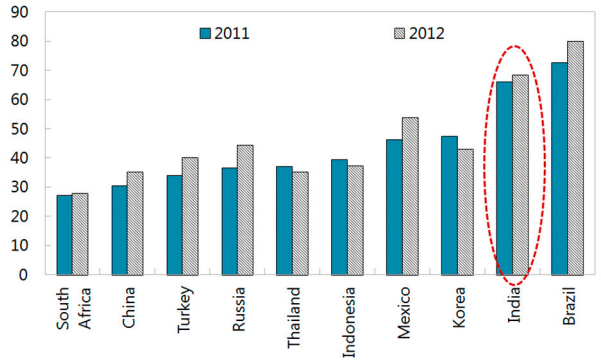
[1] Prepared by Peter Lindner (MCM).

[2] Oura (2008) provides an in-depth discussion of Indian corporates' financial structure before the GFC.

between March 2010 and March 2013. Corporate leverage rose as the equity market saw relatively few issuances after the GFC, and stock price performance was fairly lackluster. The (capital-weighted) mean ratio of debt to equity for Indian nonfinancial companies increased from 40 percent in 2001 to 83 percent in 2012. Indian corporates are now among the most leveraged when compared with their emerging market peers. Furthermore, overall leverage measures disguise substantial differences across sectors—specifically manufacturing and construction (sectors with concentrated lending to infrastructure and the power sector).

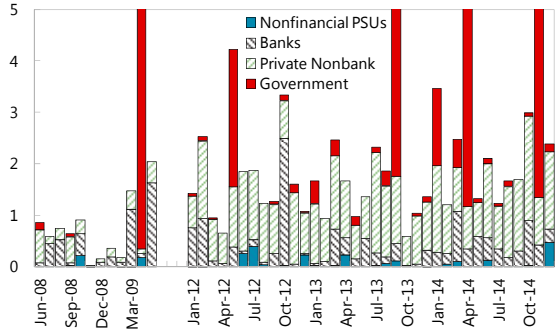
3. External corporate funding creates potential feedback loops between corporate vulnerabilities and external shocks. Indian corporates rely on foreign sources for more than one-fifth of their debt financing, including ECB, trade credits, and bonds. Not only has foreign financing grown, but ECBs have also become concentrated, with about a sixth of approved foreign loans going to only 14 large conglomerates (Credit Suisse, 2013). BIS data show that nearly two-thirds of India's liabilities to BIS reporting banks are borne by nonbank companies, and much of that debt is short-term. In addition, debt service payments over the next two years are forecast to come in at higher levels than during the GFC, and their maturity profile has shortened. About 35 percent of ECBs are hedged with financial instruments, with the scope of 'natural,' business-related hedges difficult to estimate.

Corporates: Median Debt to Equity
(In percent)



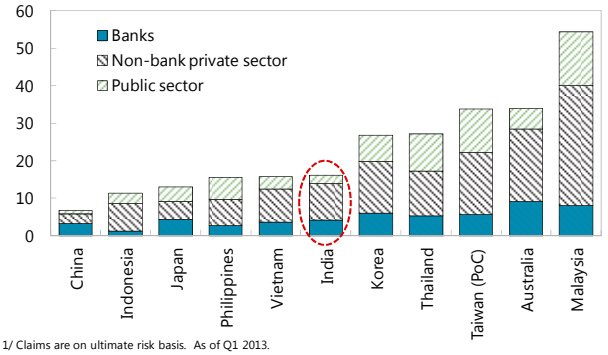
Sources: IMF, Corporate Vulnerability Utility.

Debt Payments
(In billions of US$)



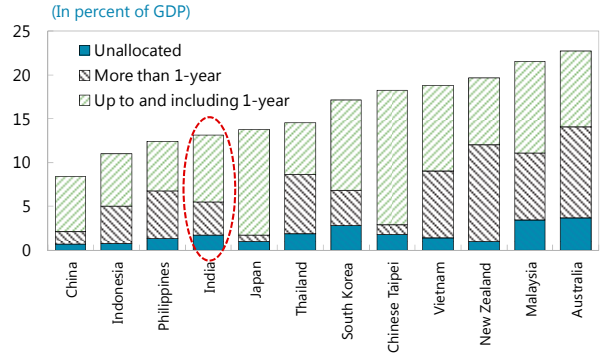
Sources: Dealogic and IMF staff calculations.

BIS Reporting Banks' Foreign Claims on Selected Asian Economies by Sector 1/
(In percent of GDP)



1/ Claims are on ultimate risk basis. As of Q1 2013.
Sources: Bank for International Settlements; Haver Analytics; IMF, *World Economic Outlook*; IMF staff calculations.

BIS Reporting Banks' International Claims on Selected Asian Economies by Maturity 1/
(In percent of GDP)

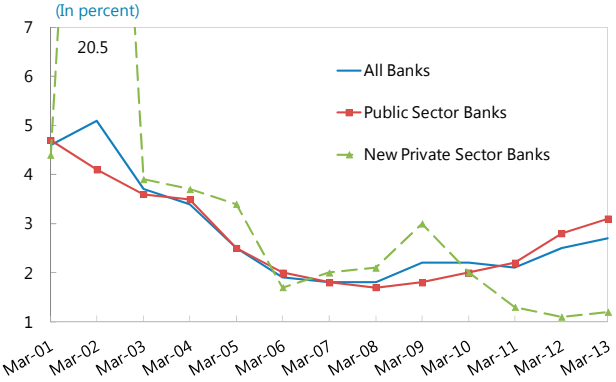


1/ Claims are on immediate borrower basis. As of Q1 2013.
Sources: Bank for International Settlements; Haver Analytics; IMF, *World Economic Outlook*; IMF staff calculations.

4. The deterioration in corporate balance sheets and profitability is being reflected in market-based indicators of credit risk, and increased rates of loans entering non-performing status. Default probabilities as estimated by Moody's KMV[3] have also begun to rise. Notably, even though the KMV default probability for the median firm remains below the levels reached during the GFC, the probability for the 90th percentile exceeds now the levels witnessed during the GFC, pointing to significant stress at the tail of the corporate default distribution. Corporate India's worsening performance is reflected in the share of loans that enter NPA status (slippages), which are at their highest since 2003.

Indian Banks: Slippage Ratios

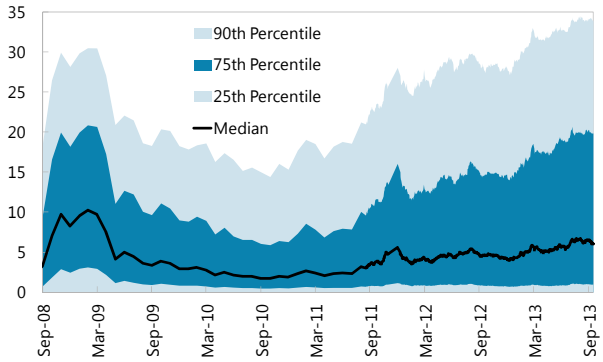
(In percent)



Sources: RBI

Expected Default Frequencies of Indian Corporates

(In percent)



Sources: Moody's KMV and IMF staff calculations.

5. We gauge India's corporate health based on four commonly used indicators: interest-cover ratio (ICR), profitability, liquidity, and leverage. ICR and profitability are dynamic indicators, assessing the degree to which current revenues are able to fund interest expenses, or whether a firm's operations and financial activities are essentially self-funding, respectively. Both measures are essentially snapshots, taken at a particular point in time. An ICR below one, or a lack of profitability, does not indicate that insolvency is imminent. Firms can have investments that can be easily liquidated, unused credit lines, or other sources of funding which could carry them through. Other research has found, though, that the ICR in particular can be a good indicator of vulnerabilities—for example, Jones et al. (2006) found that stress testing applied to the balance sheets of Korean corporations in advance of the Asian crisis of the late 1990s would have shown the degree of financial vulnerabilities present in the country. In India's case, a linear regression of the slippage ratio on the (lagged) share of debt of companies with ICR below 1 results in a coefficient of 0.24, implying an increase in slippages of 0.24 percent during period *t* for each percentage point increase in the share of debt owed by companies with an ICR below one at the end of period *t-1*. The R-squared of that regression is 80 percent, with an autocorrelation- and heteroscedasticity-corrected *t*-value of 5.3 for the slope parameter.

[3] Moody's KMV is a model of default risk based on the Black-Scholes-Merton model, incorporating balance sheet and equity market data. See Moody's (2004).

6. Based on these four indicators, we find that corporate stress in India is at its highest since the early 2000s. The table below suggests that the share of corporate borrowing accounted for by companies with extremely weak financial health indicators (ICR, profitability, liquidity and leverage) has increased. The percentage of debt owed by loss-making firms has reached 17.3 percent. Indian companies whose total debt exceeds five times equity account for more than 18 percent of the borrowing by Indian corporates. These four indicators of corporate health were at their best in FY 2005/06. On an aggregate measure of distress (using the mean absolute deviation of each of the four variables from their FY 2005/06 lows), corporate India's financial health in 2012/13 was at its worst since FY 2002/03.

Interest Cover, Profitability, Liquidity and Leverage for Major Indian Non-Financial Corporates: Share of Debt of Firms below/above Critical Values

	ICR (<1) 1/	Profitability (<0) 2/	Liquidity (<0.5) 3/	Leverage (>5) 4/
		(percent of total borrowings in sample)		
1999/00	13.2	19.0	9.9	26.6
2000/01	12.1	20.4	10.1	29.3
2001/02	10.2	17.6	7.2	27.3
2002/03	8.5	13.2	9.0	25.5
2003/04	5.3	7.0	6.1	16.9
2004/05	3.8	4.5	5.4	4.0
2005/06	1.7	1.9	3.5	2.4
2006/07	1.9	2.8	6.1	3.1
2007/08	2.2	7.1	9.4	3.3
2008/09	5.7	9.7	9.7	16.7
2009/10	3.1	5.9	11.9	5.2
2010/11	2.7	4.1	4.4	6.4
2011/12	8.9	14.9	8.6	14.7
2012/13	6.8	17.3	12.1	18.4

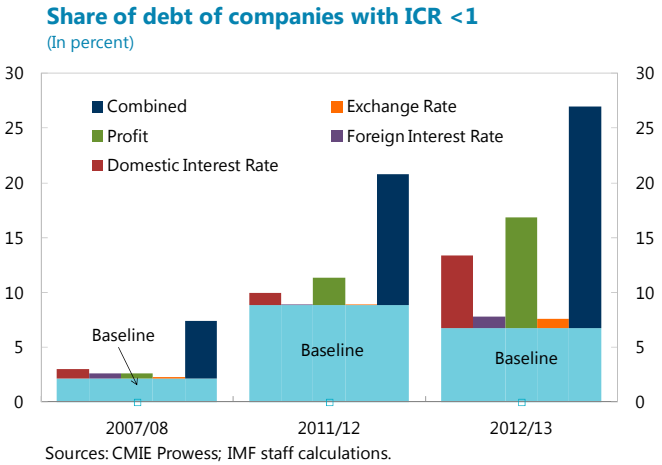
Sources: CMIE Prowess; IMF staff calculations. Sample size about 900 firms.
Note: Critical values are shown in parentheses.
1/ EBITDA / Interest expenses
2/ Profit after tax / Sales
3/ 'Current Ratio' = Current assets / Current liabilities
4/ Total debt / Market capitalization

7. Indian corporates' balance sheet vulnerabilities to financial shocks have increased since the GFC. Against the backdrop of recent financial market pressures in India, a stress test analysis of Indian corporates' balance sheets shows a significant increase in vulnerabilities. Specifically, four financial variables (domestic and foreign interest rates, profitability and exchange rates) were shocked individually and also jointly, and the shares of total debt owed by firms exhibiting an ICR below one were calculated for each of these five scenarios. Three of the four shocks are calibrated to the financial market developments during the summer of 2013, and to the change in profitability experienced in 2009. The shocks include: an increase in domestic interest rates by 250 basis points (bps); an increase in foreign interest rates by 400 bps; a decrease in operating profit by 25 percent ;

and a 29 percent depreciation in the rupee. Comparing baselines in 2007/08 and 2012/13, the debt owed by firms with ICR below one in 2013 is much higher than it was in March 2008. Moreover, the 2012/13 stress tests indicate significantly higher vulnerabilities than the stress tests for 2007/08.[4] Also, over the past year, the vulnerabilities to all four shocks have increased—in particular to the domestic interest rate and the profitability shocks. This indicates that the protracted low-growth environment, coupled with higher leverage, has made India's corporates notably more vulnerable. In particular, under the combined shock scenario (when all four variables are shocked simultaneously) the share of debt affected increases from 7.5 percent in 2007/08 to 27 percent in 2012/13. The combined shock scenario highlights Indian corporates increased vulnerability.

India: Stress-Test Results on the Non-Financial Corporate Sector

Baseline March 2013	Domestic Interest Rate Shock	Foreign Interest Rate Shock	Profits	FX Shock	Combined
	+250 bps	+400 bps	-25 percent	+29 percent	
	Share of debt of companies with ICR <1 in total corporate sector debt				
6.76	13.38	7.80	16.86	7.59	26.97
	Share of the number of companies with ICR <1 in total number of companies				
14.22	16.32	14.55	18.74	14.44	22.93



Sources: CMIE Prowess; IMF staff calculations.

8. Applying the same stress tests to the data since FY 2000/01 reflects the increased vulnerability of India's corporates at the tails. For the domestic rate shock, and the profit shock, the share of affected debt is the highest since 2001; in the case of the combined shock, the share of debt is at its highest level over the full period (see table below). If a subdued economic outlook and

[4] The approach here is based on Oura and Topalova (2009). Comparing the 2007/08 results here with theirs, we find that our baseline is far lower, but also that the increase in the case where an identical shock is used—25 percent decline in profitability—leads to a lower increase in the share of stressed firms. The main reason for this is likely our use of EBITDA rather than EBIT in the definition of ICR, as well as differing samples.

global liquidity tightening combine going forward over a protracted period, further significant deterioration in corporate financial health, and subsequently higher restructured advances and NPAs, can be expected.

Stress-Test Results: India's Non-Financial Corporate Sector

Baseline March 2013	Domestic Interest Rate Shock +250 bps	Foreign Interest Rate Shock +400 bps	Profits -25 percent	FX Shock +29 percent	Combined
Share of debt of companies with ICR <1 in total corporate sector debt					
March 2000 13.23	14.52	13.23	17.21	13.23	23.04
March 2001 12.10	16.20	14.96	18.87	12.10	22.52
March 2002 10.22	11.90	10.29	12.48	10.22	17.69
March 2003 8.54	9.87	8.54	9.69	8.54	15.04
March 2004 5.28	6.00	5.28	6.64	5.28	9.00
March 2005 3.78	4.82	3.78	5.01	3.78	6.13
March 2006 1.68	2.50	1.82	1.94	1.82	2.97
March 2007 1.89	2.21	1.89	2.21	1.89	3.29
March 2008 2.21	3.00	2.62	2.66	2.27	7.46
March 2009 5.68	8.99	6.28	6.89	5.75	11.39
March 2010 3.15	3.30	3.15	5.79	3.15	7.94
March 2011 2.74	3.03	2.74	3.77	2.74	10.08
March 2012 8.88	10.01	8.95	11.36	8.95	20.81
March 2013 6.76	13.38	7.80	16.86	7.59	26.97

Sources: CMIE Prowess; IMF staff calculations

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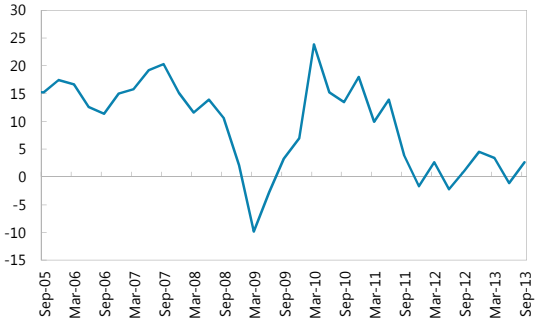
INDIA'S INVESTMENT SLOWDOWN: THE ROLE OF CONFIDENCE AND UNCERTAINTY[1]

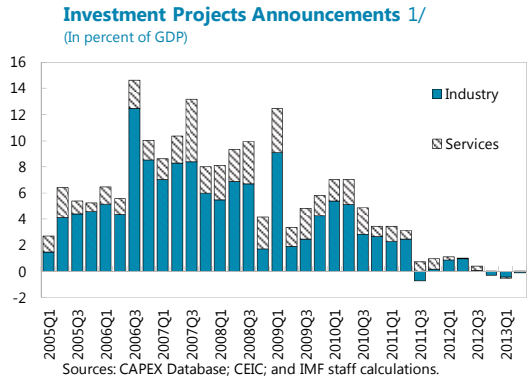
Standard macro-financial variables do not fully explain the recent sharp investment deceleration in India. Using a new measure of economic policy uncertainty, the results suggest that heightened uncertainty and deteriorating business confidence have played an important role in India's recent investment slowdown.

1. The marked accelaration in economic growth experienced in the years preceding the global financial crisis (GFC) was tied to a surge in investment activity. Gross fixed investments as a share of GDP rose from an average of about 24 percent during 1996/97–2003/04 to a peak of nearly 34 percent in 2008Q2. Also, economic growth in non-agricultural sectors of the economy picked up from an average of about 6¾ percent during 1996/97–2003/04 to nearly 10½ percent during 2004/05–2007/08.



Source: Haver Analytics.

2. However, the growth and investment outlook changed dramatically with the arrival of the GFC, but especially so during 2011/12-2012/13. The investment-to-GDP ratio declined to about 32 percent in 2009/10–2010/11, and then fell further to about 30 percent in 2011/12. Moderation in investment activity was accompanied by a gradual decline in the value of newly-announced investment projects, from an average of 10 percent of GDP in 2006/07 to just 1 percent in 2012/13. Furthermore, the share of stalled and shelved investments jumped to over 2½ percent of GDP in mid-2011, after moderating slightly following a spike in early-2009. As the share of stalled projects remains elevated, and the pipeline of new projects is exceptionally thin, concerns about India's growth outlook remain.



Sources: CAPEX Database; CEIC; and IMF staff calculations.
1/ Value of new projects minus value of shelved projects.

3. Several supply-side constraints and confidence factors have been cited as plausible causes of India's weaker growth and investment. Among them, rising policy uncertainty and subdued business confidence, delayed project approvals and implementation, and supply bottlenecks are prominent (see IMF 2013). Higher real interest rates have played only a minor role in the current investment slowdown (RBI, 2013; IMF 2013). In addition, Tokuoka (2012) finds that high and volatile inflation and heightened global uncertainty may have contributed significantly to the slowdown in corporate investment. While monetary easing since the GFC supported corporate investment, the monetary tightening since early 2010 may have hurt corporate investment only marginally. Looking at

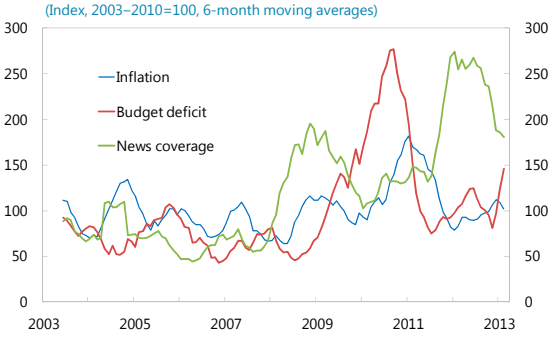
[1] Prepared by Rahul Anand and Volodymyr Tulin.

the determinants of the decline in corporate investment since the GFC in India, Tokuoka (2012) finds that structural factors, in particular, the business environment, have played an important role in explaining corporate investment activity.

4. Standard macro-financial variables do not explain India's recent investment slump. Staff analysis suggests that standard macrofinancial variables (interest rates, external demand, relative prices, global financial market volatility) do not appear to fully explain the recent slump in domestic investment in India. These variables are able to explain only about half of the total investment slowdown witnessed during 2010/11–2012/13, while systematically over-predicting investment in the past two years. This suggests that other factors, such as supply bottlenecks and potentially policy uncertainty, are at play.

5. Measuring economic policy uncertainty, which appears to be an important contributor to the investment slump, is difficult. The index developed by Baker, Bloom, and Davis (2013) is an important advancement in measuring policy uncertainty. It has two underlying components: the dispersion of individual-level forecasts regarding consumer prices and central government budget balances as a proxy for uncertainty, and the quantification of newspaper coverage of policy-related economic uncertainty.

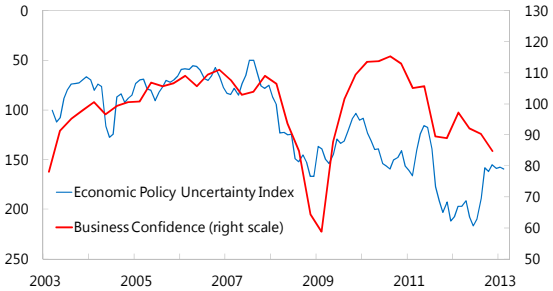
Components of Policy Uncertainty Index
(Index, 2003–2010=100, 6-month moving averages)



Sources: Baker and others (2013); and IMF staff calculations.

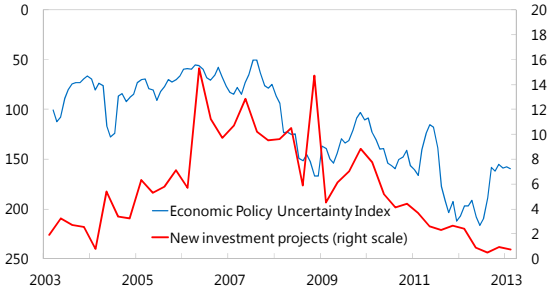
6. India's policy uncertainty has remained high. The index rose sharply from the second-half of 2011, and while a series of structural reforms as well as monetary policy easing since the second half of 2012 has alleviated uncertainty somewhat, its level has remained particularly high over the last ten quarters. Moreover, the current level of uncertainty exceeds its post-Lehman highs, suggesting that uncertainty is primarily driven by India's domestic policy challenges, and not by global uncertainty such as related to changes in expectations about QE tapering.

Overall Business Confidence and Economic Policy Uncertainty
(Index, inverted scale, 3-mma, 2003–2010 = 100) (Index, 2003–10=100)



Sources: Baker and others (2013); NCAER; and IMF staff calculations.

Economic Policy Uncertainty and New Investment Projects
(Index, inverted scale, 3-mma, 2003–2010 = 100 (In percent of GDP)



Sources: Baker and others (2013); CEMI; and IMF staff calculations.

7. Heightened economic policy uncertainty and deteriorating business confidence have played a key role in the recent investment slowdown. It can take some time for the aggregate investment data to uncover the adjustments in investment activity in response to the changes in outlook or its uncertainty, as projects that are well underway may still continue to show up in aggregate investment. Therefore, to provide a more in-depth analysis of investment activity, the focus is on

explaining changes in aggregate investment flows, as indicated by the data on volumes of announced new and shelved investment projects. Staff analysis suggests that heightened policy uncertainty has had a particularly pronounced link with the decline in new investments, and in an increasing share of investments that were postponed or cancelled. After controlling for these factors, financing costs do not appear to be a critical factor in explaining a decline in new investments (Tables 1 and 2).

Table 1. Regression Analysis of New Investments

Dependent Variable: New investment projects (Projects costs as percent of GDP)		
	(1)	(2)
Real interest rate	1.816 ***	0.802
% per annum	(0.365)	(0.560)
Business confidence	0.000	0.041
NCAER index	(0.057)	(0.065)
Economic Policy Uncertainty	-0.063 ***	
EPU Index	(0.014)	
Sample: 2003Q1-2012Q4		
Number of observations	40	40
R ², d.f. adjusted	0.389	0.043

Source: IMF staff estimates.
Note: Interest rate corresponds to the average prime lending rate. Real interest rate is based on inflation expectations for the next fiscal year from Consensus Economics surveys.
Note: Robust standard errors in parenthesis.
Note: ***,**, * indicates 1,5, 10 percent statistical significance.
Note: Controlling for global financial and macroeconomic conditions.

Table 2. Regression Analysis of Stalled Investments

Dependent Variable: Shelved investment projects (Projects costs as percent of GDP)		
	(1)	(2)
Real interest rate	0.071	0.160 ***
% per annum	(0.049)	(0.051)
Business confidence	-0.012 ***	-0.016 ***
NCAER index	(0.003)	(0.003)
Economic Policy Uncertainty	0.005 ***	
EPU Index	(0.001)	
Sample: 2003Q1-2012Q4		
Number of observations	40	40
R ², d.f. adjusted	0.626	0.515

Source: IMF staff estimates.
Note: Interest rate corresponds to the average prime lending rate. Real interest rate is based on inflation expectations for the next fiscal year from Consensus Economics surveys.
Note: Robust standard errors in parenthesis.
Note: ***,**, * indicates 1,5, 10 percent statistical significance.
Note: Controlling for global financial and macroeconomic conditions.

8. Continued progress on structural reforms and resolving supply-side bottlenecks remains critical to shore up confidence and revitalize investments and economic growth. The current investment slowdown is primarily driven by weak business confidence and policy uncertainty, which to some extent may reflect factors not explicitly captured in the regression analysis—for example, persistent supply bottlenecks. In the short term, lowering nominal interest rates may provide some relief in terms of reduced interest burden, especially to corporates with high leverage. However, in the medium term, lower rates with little slack in the economy would stoke inflation further and exacerbate inflation trends across sectors, hurting investment. In addition, simply lowering nominal rates without tackling deep structural issues is unlikely to attract new investment.

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MACROECONOMIC EFFECTS OF LABOR AND PRODUCT MARKET DEREGULATION IN INDIA[1]

Tightly-regulated labor and product markets in India have given rise to a large informal sector, sub-optimal level of employment, and low productivity. Our analysis suggests that reforms can increase employment, improve competitiveness, and boost potential growth. A package of reforms reinforces the gains, minimizes short-term costs, and increases the acceptability of these politically-difficult reforms. These reforms will help harness demographic dividend by absorbing India's rapidly-growing labor force.

1. Despite some progress, product and labor markets remain tightly regulated in India. Although significant progress has been made in liberalizing product markets in India, product market competition remains low. The OECD's product market regulation index (2008) suggests that product markets in India are less competitive compared to other OECD countries (including the emerging market economies within the OECD area, Table 1). Labor market rigidities remain high because of multiplicity of labor laws and high costs of meeting legal requirements. Although the Industrial Disputes Act (IDA) of 1947 is the basis for industrial labor regulations in India (it requires firms employing 100 workers or more

Table 1. Product Market Regulation in India: An International Comparison

	India	OECD Average	OECD Emerging Markets	Euro Area	Eastern Europe	Latin America	United States
Overall Indicator	2.85	1.49	1.98	1.49	1.82	2.08	1.03
State Control	3.47	2.12	2.46	2.40	2.74	2.16	1.19
Barriers to Entrepreneurship	2.57	1.46	1.89	1.43	1.44	1.94	1.20
Barriers to Trade and Foreign Investment	2.56	0.97	1.66	0.75	1.35	2.31	0.73

Source: OECD's product market regulation (PMR) index, 2008.
Notes: The scale of the PMR indicators runs from 0 to 6, representing the least to the most restrictive regulatory regime.

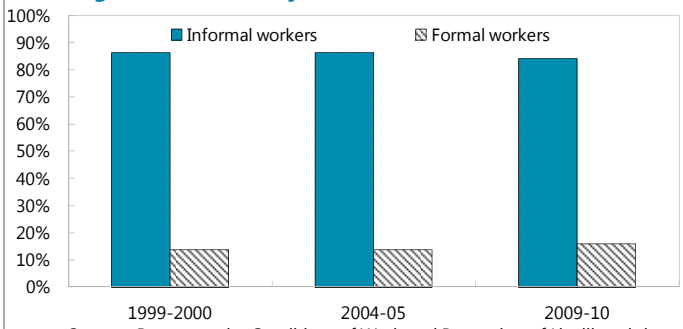
[1] Prepared by Rahul Anand and Purva Khera. Based on R. Anand, P. Khera, Z. Munkacsi, and M. Saxegaard, 2014, "Macroeconomic Effects of Labor and Product Market Deregulation in an Environment of Labor Market Informality: An Application to India and South Africa," IMF Working Paper (forthcoming).

to seek government's permission to dismiss a worker or to close a plant),[2,3] firms are required to comply with numerous laws governing different aspects of the labor market (such as laws governing minimum wages, resolution of industrial disputes, conditions for hiring and firing workers, and conditions for the closure of establishments). In addition to being time-consuming, this implies much higher costs for the firms, which to a large extent determines their size and operations of these firms.

2. High labor and product market rigidities have resulted in a large informal sector in India and sub-optimal employment. The unorganized sector employs nearly 90 percent of the Indian workforce, and contributes almost half of India's GDP (Figure 1). The large size of the informal market has been attributed to tightly regulated formal (organized) sector, which forces firms to remain small and informal to avoid regulations (Ulyssea, 2010 and WTO, 2009). In addition, regulations have encouraged capital-intensive modes of production, resulting in sub-optimal employment, as high costs associated with firing workers have forced firms to hire sub-optimally despite a liberal hiring policy (Kathuria, 2013). Product and labor market rigidities have also constrained the expansion of manufacturing sector, whose share remains low (15 percent of GDP) and has not grown despite many policy incentives (World Bank, 2004).

3. In addition, tight regulations have hurt productivity and labor welfare. On average, value added per worker in India's informal manufacturing sector is about one tenth that of the formal sector.[4] With an incentive to remain in the informal sector (to avoid regulations), firms fail to benefit from economies of scale, and are generally much less productive than formal sector enterprises. Although the informal sector provides employment opportunities, the high level of informality has failed to improve labor welfare (as workers operate in an unregulated environment), negating the very motive of these pro-worker regulations.

Figure 1. Informality in India



Sources: Report on the Conditions of Work and Promotion of Livelihoods in the Informal Sector, National Commission for Enterprises in the Unorganized Sector (based on National Sample Survey Organization (NSSO) data)
Note: The informal (or unorganized) sector, by definition, consists of self-employed, and those working in establishments with less than 10 workers.

4. A dynamic stochastic general equilibrium (DSGE) model with informality and product and labor market rigidities for India is used to study the impact of deregulation. The model—estimated on ten key macroeconomic variables from 1996 to 2008 using Bayesian estimation techniques—adds the

[2] Data from the Ministry of Labor shows that in 2000 there were 533,038 pending cases of labor disputes in India's labor courts, most of which dealt with retrenchment; and of these 28,864 cases have been pending over ten years.

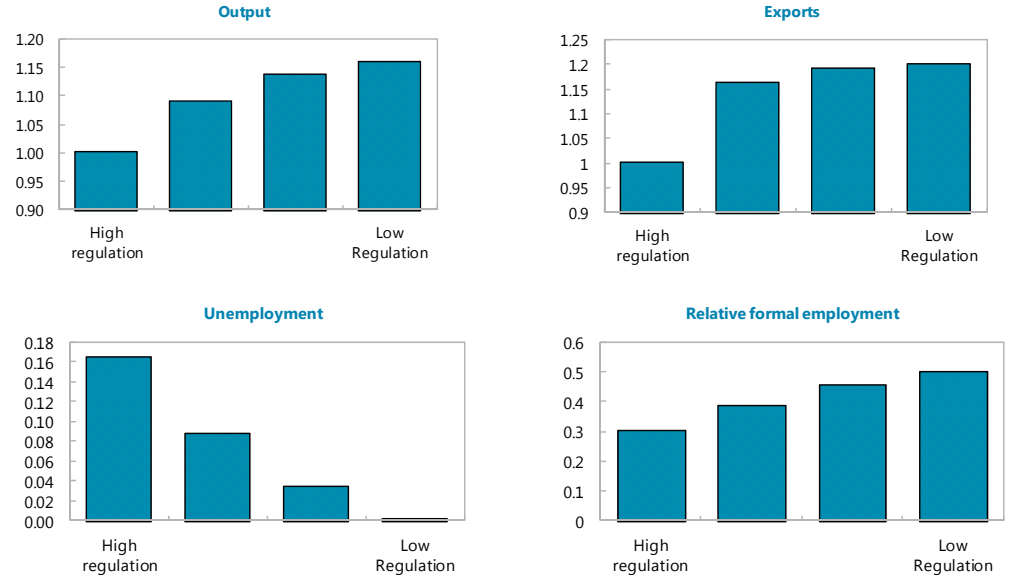
[3] The Act was passed by the central government, and applied equally to all states. This Act has been amended by state governments, which has caused the states to differ markedly in their labor regulation.

[4] Estimates based on National Sample Survey Office (NSSO, 2001) and Central Statistical Organization (CSO, 2001).

informal sector and unemployment in a standard small open economy DSGE model. To capture rigidities in formal product markets, firms in the formal sector face higher entry costs (to set up a new business) and have higher market power (relative to the informal sector firms)[5]. Labor market rigidities are modeled by a higher cost of hiring and firing workers in the formal sector. Also, workers employed in the formal sector have higher bargaining power in the wage determination process (i.e. unionized labor).[6] Only goods produced in the formal sector are exported and only formal sector workers pay taxes.[7]

5. Results suggest that labor market and product market reforms can increase output, exports, employment and formality in the long run. A relaxation of labor market regulations in the formal sector (reduced hiring/firing costs and bargaining power) increases labor hiring by the formal sector firms, higher employment and size of the formal sector (Figure 2). More firms enter the formal sector due to increased output and profitability, increasing competition and lowering the prices of formal goods. This improves the competitiveness of the economy leading to an increase in exports. A relaxation in product market regulations (reduced entry cost and increased competition) stimulates investment and increases output (Figure 3). Increased competition improves the economy's competitiveness and exports. New firm entry also boosts job hiring, leading to an increase in formal sector employment.

Figure 2: Long-Run Effects of Labor Market Deregulation



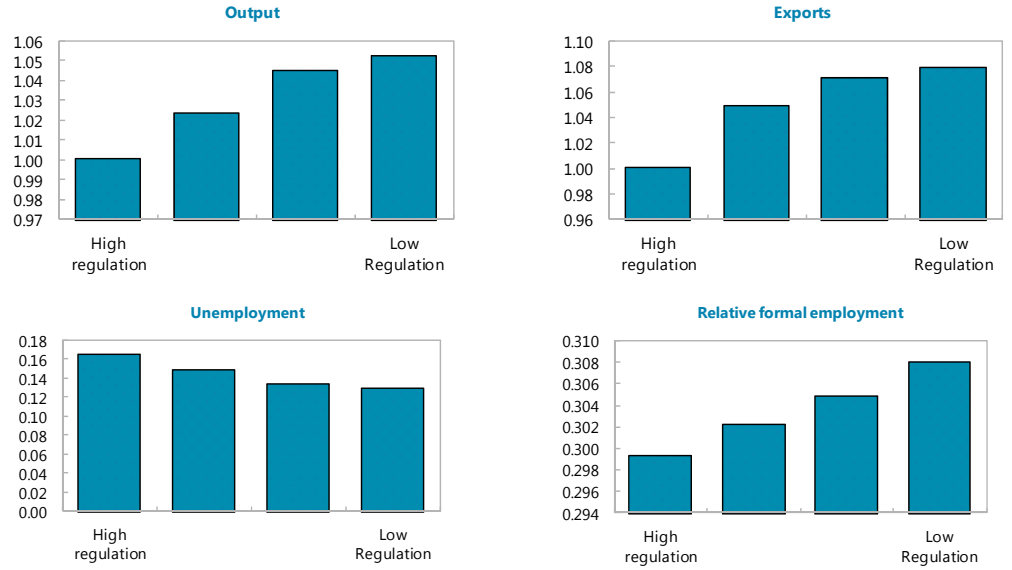
Source: IMF staff estimates.

[5] Higher market power implies less competitive formal goods market.

[6] Households (assumed to be identical) are either employed in the formal sector, employed in the informal sector or unemployed.

[7] Both capital goods and government services are provided solely from the formal sector and the latter are financed by an employment tax.

Figure 3: Long-Run Effects of Product Market Reforms



Source: IMF staff estimates.

6. A package of reforms could minimize the short-term transitional costs associated with individual reforms. While all reforms are found to stimulate GDP and formality in the short run, some of them may temporarily—typically for one to two years—increase economy-wide unemployment (due to frictional unemployment), if implemented in isolation. In particular, the reform leading to a fall in the bargaining power of workers in the formal sector without lowering hiring/firing costs, results in higher unemployment. Increased competition in the product market without reducing entry barriers has similar short-run costs. If policies to lower the bargaining power of workers are implemented simultaneously with policies to reduce hiring and firing costs (which immediately results in increased hiring and reduced unemployment), transitional costs are minimal (and may even be reversed). Similarly, reducing entry costs along with increasing competition minimizes the transitional costs, as reduced entry barriers encourages new firms to enter the formal sector, boosting formal sector employment, leading to a decline in unemployment. In addition, simultaneous reforms to product and labor markets also reduce transitional costs and maximize long-run gains. Compared with individual reforms, a broad package yields a larger income gain, the expectation of which immediately boosts aggregate demand and job hiring.

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