INTERNATIONAL MONETARY FUND

IMF Country Report No. 16/76

INDIA

SELECTED ISSUES

March 2016

This Selected Issues paper on India was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on January 29, 2016.

Copies of this report are available to the public from

International Monetary Fund • Publication Services
PO Box 92780 • Washington, D.C. 20090
Telephone: (202) 623-7430 • Fax: (202) 623-7201
E-mail: publications@imf.org Web: http://www.imf.org
Price: $18.00 per printed copy

International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

INDIA

SELECTED ISSUES

January 29, 2016

Approved By
Asia and Pacific Department

Prepared By Paul Cashin, Volodymyr Tulin, Purva Khera (all APD), Silvia Iorgova (MCM), Ran Bi and Katsiaryna Svirydzenka (both SPR).

CONTENTS

SUMMARY

The background papers for the 2016 Article IV explore key issues affecting the Indian economy, and implications for fiscal, monetary, financial sector and other structural policies.

The first chapter evaluates the build-up of corporate and banking sector vulnerabilities in India, linked to the past macroeconomic slowdown and supply-side bottlenecks, particularly in the infrastructure sector. It finds that low profitability, coupled with high leverage, has put a strain on firms' debt repayment capacity. Stress tests of corporate balance sheets suggest that their exposure to potential shocks has continued to increase. Importantly, the weaker position of domestic corporates has also accounted for a substantial deterioration of banks' asset quality. Stress test simulations suggest that potential capitalization needs should be manageable, but may require additional fiscal outlays.

The second chapter evaluates the nature, scope and effectiveness of macroprudential policies in India. It finds that in conjunction with concurrent monetary policy steps, countercyclical policies in the past were effective in dampening credit growth to targeted sectors, but did not arrest a rise in broader corporate sector vulnerabilities. Going forward, macroprudential policies would be best supported by the further development of a robust analytical framework for the identification of systemic risks and better data collection.

The third chapter analyzes the potential costs and benefits of gold monetization schemes in India, including gold savings accounts and sovereign gold bonds. It emphasizes that the feasibility of the new schemes is linked to their ability to garner sufficient demand, an important hurdle that led to the failure of previous similar schemes. Estimates suggest that, if successful, the schemes can have a positive impact on economic growth by reducing the dependence of the jewelry industry on imported gold. Simulations also show that the schemes entail nontrivial valuation and exchange rate risks, emphasizing the need for effective hedging by banks and the government.

The fourth chapter compares two recent episodes of financial market volatility—the taper tantrum of the summer of 2013 and the China spillover episode of the summer of 2015. It compares the impact of these two bouts of volatility on emerging markets (EMs), with a focus on India's economic performance during these two periods of turmoil. While India was hit hard by the taper tantrum, it was less affected than many other EMs during the China spillover episode, due to its reduced vulnerabilities.

The fifth chapter examines the effectiveness of India's capital controls using an arbitrage-based approach. Effective capital controls can give rise to persistent and one-sided price gaps between a country's onshore and offshore asset prices—measuring such price gaps is a way to gauge the extent of capital controls. A comparison of such price gaps in India with those of its peers suggests that India's capital account is not as closed as suggested by traditional measures.

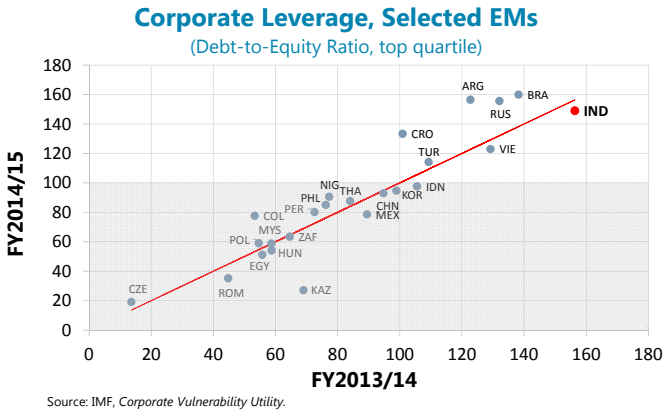
The sixth chapter examines the relationship between Indian and international market prices of cereals. It finds that international commodity prices influence domestic Indian farm gate prices, both in the short- and the long-run. They also serve as an important input into the government's decision making on the level of minimum support prices for cereals. Nonetheless, minimum support price increases do not appear to have a lasting impact on domestic cereal inflation.

The seventh chapter employs a micro-founded general equilibrium model to examine the impact of various policies on female labor force participation, female formal employment, gender wage gaps, as well as on aggregate economic activity in India. It finds that simultaneously implementing gender-specific policies that lower constraints females face in the labor market combined with policies that boost formal job creation, not only improves the overall labor market outcomes of females, but also leads to larger macroeconomic gains.

CORPORATE AND BANKING SECTOR VULNERABILITIES IN INDIA[1]

Past deterioration in macroeconomic conditions and supply-side constraints—most notably in the infrastructure sector—have led to the build-up of corporate vulnerabilities in India. Firms' debt repayment capacity has weakened, while leverage is among the highest across emerging market economies. Stress tests of corporate balance sheets confirm that exposure to potential shocks has continued to rise. The weaker position of domestic corporates has also translated into a substantial deterioration of banks' asset quality. Stress-test simulations suggest that public sector banks (PSBs) may require capital injections in the coming years. Potential recapitalization needs should be manageable, even though they may require further fiscal outlays.

1. The sizable rise in corporate investment needs in the mid- to late-2000s was accompanied by an upsurge in corporate credit and the build-up of high leverage after the global financial crisis. Large capital investment requirements—particularly for infrastructure—were funded via a significant expansion of corporate lending by public sector banks (PSB). Bank credit to domestic corporates increased by an average of close to 30 percent a year during the mid- to late-2000s, while corporate lending by PSBs was up by 18 percent a year between end-FY2008/09 and end-FY2013/14. Prior to the global financial crisis (GFC), strong equity market performance also provided a good opportunity for corporates to raise financing via primary equity issuance.[2] The slowdown of equity markets in the aftermath of the GFC and the rise in external commercial borrowings (ECB)—up by 107 percent between end-FY2009/10 and end-FY2013/14—coupled with continued credit growth, accounted for an increase in corporate leverage. Indian corporates now are some of the most leveraged across emerging markets (EMs). At end-FY2015, the median debt-to-equity ratio of the most leveraged Indian corporates (the top quartile) stood at 149 percent (Figure). While it has edged down marginally relative to end-FY2013/14 (156 percent), it is still higher than in most other emerging market economies.



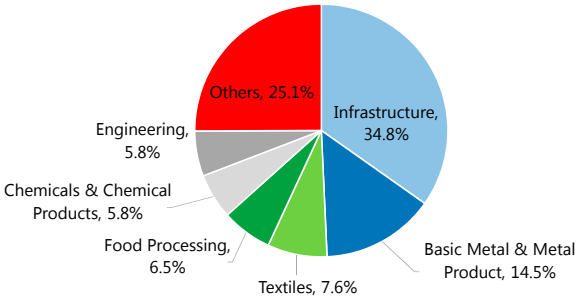
Source: IMF, *Corporate Vulnerability Utility*.

[1] Prepared by Silvia Iorgova.

[2] Bombay Stock Exchange Sensex Index (BSE) increased more than five-fold between end-FY2002 and end-FY2008. See Oura (2008) for more on this.

2. The high aggregate leverage masks considerable differences across sectors and types of corporates. Both debt levels and leverage are highly skewed toward large corporates and select key sectors. The top one percent of firms in India accounts for about half of overall debt, as do corporates in two sectors: infrastructure (including power, telecommunications and roads) and metals (including iron and steel) (Figure).[3] Both sectors were subject to strong credit growth in recent years, with loans rising by an average of 27 and 22 percent a year, respectively, between FY2008/09 and FY2012/13.[4] Leverage in infrastructure-related industries—including construction; and gas, water and electricity—and in metal-related sectors has been higher than for other firms (Figure 1, left panel). At end-FY2014/15, the median debt-to-equity ratios in the three sectors fell in the 134 to 240 percent range, against 52 to 107 percent for other sectors. The leverage of the largest corporates (accounting for the top one percent in aggregate corporate sector assets) has also been persistently higher than for other firms. The median debt-to-equity ratio of the top corporates has been at more than 175 percent each year since FY2008/09, relative to less than 130 percent for other firms (245 percent and 113 percent, respectively, at end-FY2014/15) (Figure 1, right panel).

Corporate Debt, by Industry, end-2015
(In percent)

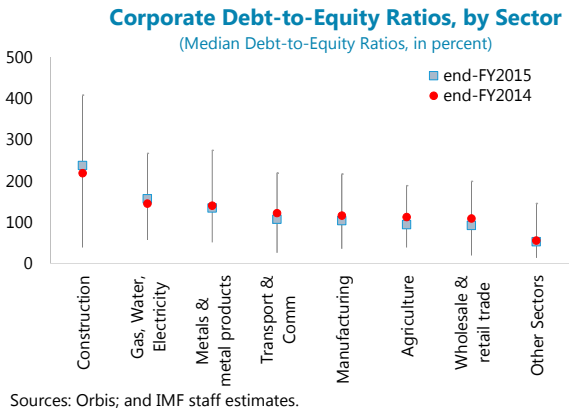


Sources: Reserve Bank of India; and IMF staff estimates.

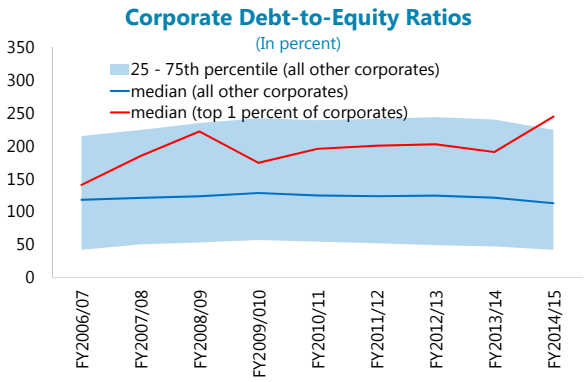
[3] The share of debt of the top one percent of Indian firms (by assets) in aggregate corporate debt accounted for 48 percent at end-FY2014/15, based on a sample of 2,848 firms with available balance sheet data, and 54 and 52 percent at end-FY2011/12 and end-FY2013, based on larger samples of 20,280 and 18,811 firms, respectively (based on data from Orbis – Bureau van Dijk). Under a smaller sample with consistent firm coverage between end-FY2010/11 and end-FY2013/14 (2,314 firms with available data for each year in this period), the top one percent accounts for 46-47 percent between end-FY2010/11 and end-FY2014/15.

[4] Estimates are based on data from the Reserve Bank of India, "Handbook of Statistics on the Indian Economy".

Figure 1. Corporate Leverage, by Sector and Size



Sources: Orbis; and IMF staff estimates.



Sources: Orbis; and IMF staff estimates.

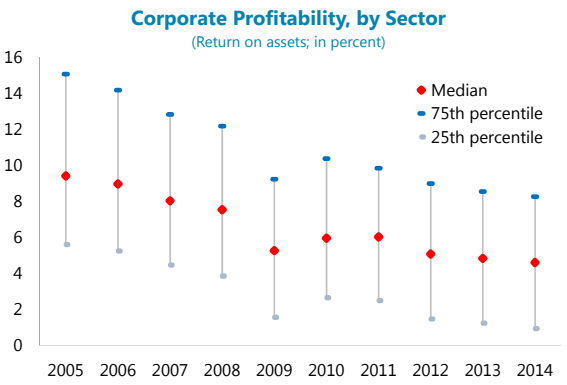
3. Supply-side bottlenecks and weak past economic growth have continued to account for high corporate vulnerabilities. The bottlenecks, particularly in infrastructure and the iron and steel sector, are largely structural in nature—including delayed project approvals; land acquisition hurdles; and previously coal supply disruptions—and have continued to affect negatively corporate profitability. The median return on assets (ROA) of Indian corporates continued to decline in FY2014/15 and, at 4.6 percent, was the lowest over the past decade (Figure 2, left panel). Corporates' debt-repayment capacity also showed signs of marginal deterioration, following an improvement in FY2013/14. Corporate debt-at-risk—the share of debt owed by firms with an interest coverage ratio (ICR) below one—edged up to 10.8 percent in FY2014/15, following an improvement to 10.2 percent in FY2013/14.[5] Market-based indicators of credit risk also continue to indicate elevated risks for vulnerable firms. Moody's KMV default probabilities show a broad decline and leveling off of perceived risks in FY2014/15, but at a high level (an average 20 percent) for the weakest corporates (the 90th percentile of distribution) (Figure 2, right panel).[6] [7]

[5] All statistics of corporates' debt repayment capacity and stress test results are based on a sample of 1,542 firms with consistently available balance sheet and income statement data between FY2010/11 and FY2014/15 (sourced from the Orbis - Bureau van Dijk database) to avoid coverage and survivorship bias.

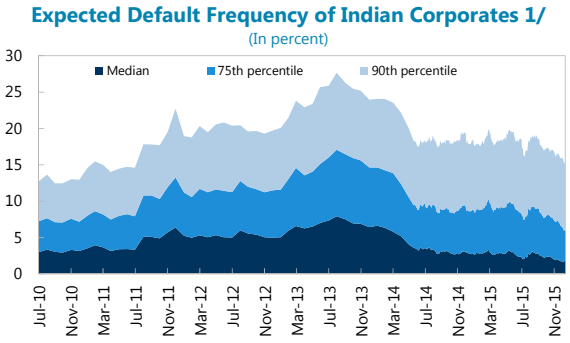
[6] Moody's KMV default probabilities are estimated based on the Black-Scholes-Merton (BSM) model. For a detailed description of the methodology, see Moody's (2004).

[7] Moody's KMV default probabilities, thus, also confirm the high concentration of risks among a small share of domestic corporates. Conceivably, the dip in market perceptions of corporate risks in the second half of FY2013/14 may also be related to rising equity prices and lower volatility, rather than balance sheet fundamentals. The decline in default probabilities in late 2015 likely reflects positive market reactions to the authorities' steps to relax existing bottlenecks.

Figure 2. Corporate Health Indicators

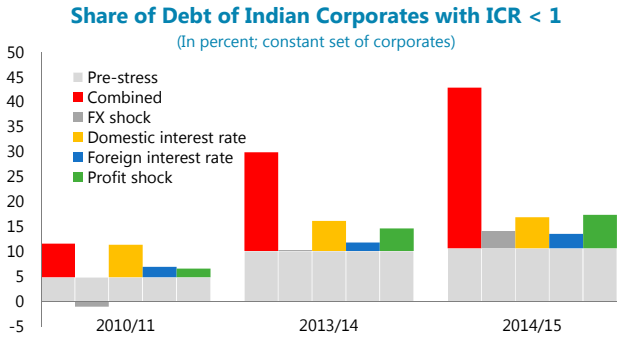


Source: IMF, Corporate Vulnerability Utility.



Source: CreditEdge.
1/ The Expected Default Frequency (EDF) is the probability of corporate default within one year. A default is measured as a failure to make a scheduled debt payment. *EDF9 percentiles.*

4. Stress tests, based on tail-risk balance sheet approach, are used to assess the soundness of India's corporate sector.[8] The approach evaluates debt-repayment capacity (i.e. the availability of profitability buffers to fund interest payments on outstanding debt) under financial stress. Potential shocks were applied both individually and jointly, and include a rise in domestic and foreign interest rates, a depreciation of the Indian rupee, and a decline in profitability.[9] As in Lindner and Jung (2014), three of the four shocks were calibrated to mimic the impact of the "taper tantrum" of the summer of 2013, and the decline in profitability in the immediate aftermath of the global financial crisis (FY2008/09). The shocks include a 250 basis-point (bps) increase in domestic interest rates; a 400 bps increase in foreign interest rates; and a 29 percent rupee depreciation (all assumed to affect non-operating income); and a 25 percent decline in operating profits. The debt repayment capacity of the corporate sector under each shock was assessed based on the share of aggregate debt of firms with an ICR below one relative to total corporate sector debt.



Source: Orbis and IMF staff estimates.
Note: Based on data for 1,542 corporates with available data for all years between FY2011 and FY2015.

5. The stress tests of corporate balance sheets confirm that exposure to potential shocks continues to be high. In extreme stress conditions—captured by the unprecedented combination of extreme adverse shocks calibrated to India's experience in the aftermath of the global financial crisis and the 2013 "taper tantrum"—the corporate sector's debt-at-risk could reach 42 percent (Figure). An upward

[8] The approach is akin to that used in IMF, GFSR (2014); Lindner and Jung (2014); and Oura and Topalova (2009). The analysis is based on data from Orbis (Bureau van Dijk), most recently as of end-FY2015, and covers about 2,000 companies.

[9] Due to the lack of firm-by-firm data on corporates' foreign currency (FX) liabilities and expenditures, estimates for the aggregate corporate sector were applied in the analysis.

shift in domestic interest rates continues to be a key risk for Indian corporates, with the share of debt-at-risk estimated to increase to 17 percent in case of a 250 basis point rise in domestic rates. Indian firms are now also more vulnerable to profitability, foreign currency (FX) and foreign interest rate shocks. Importantly, corporate sector risks continue to be considerably higher than in the aftermath of the Global Financial Crisis, when debt-at-risk even under the largest risk factor (domestic interest rates) was at levels comparable to the FY2014/15 baseline.

6. Dependence on external funding continues to expose Indian corporates to foreign currency shocks, despite an increase in hedging activity. FX-denominated funding—including external commercial borrowings (ECBs), trade credits, and bonds—accounts for about one-fifth of total corporate funding.[10] Corporates are, thus, exposed both to rollover risks (of not being able to renew funding) and to the risk of rupee depreciation, if FX funding is insufficiently hedged. FX hedging across Indian corporates has increased considerably over the past year, now up to about 45 percent, from approximately 15 percent in July-August 2014. This increase largely reflects regulatory efforts by the Reserve Bank of India (RBI) to incentivize hedging through higher regulatory provisioning and capital requirements for banks' exposures to entities with unhedged FX exposures (see Reserve Bank of India, 2014). However, uncertainty about the ability of FX hedging to fully mitigate potential risks—including due to possible maturity mismatches between FX hedges and underlying positions; a potential rise in hedging costs, particularly in cases of large depreciations; and the recent decline in natural hedges in view of the recent weakening in exports—leaves corporates exposed to FX risks.

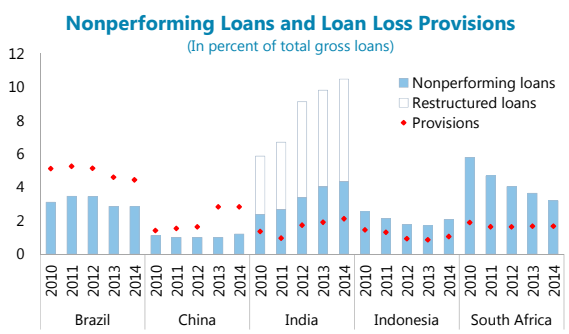
7. The weaker position of domestic corporates has also translated into a substantial deterioration of banks' asset quality in view of the strong corporate–bank nexus in India. Corporate credit accounts for a high share (over 80 percent) of Indian banks' (particularly PSBs') lending portfolios, pointing to a tight link between banking sector soundness and the financial performance of the corporate sector. The weakening of corporates' debt repayment capacity has, thus, accounted for a significant rise in PSBs' stressed assets, whose share in total advances increased to 13.5 percent at end-FY2014/15 (of which NPAs of 5.4 percent) from 11.9 percent a year earlier. Indian banks' asset quality is now weaker than in peer EMs (Figure 3, left panel).[11] A large share of stressed loans—more than 41 percent—is in the infrastructure, and iron and steel sectors, which have been affected adversely by the domestic supply-side issues and by export headwinds (Figure 3, right panel). With recent reform measures to address structural bottlenecks, new NPA formation may decelerate. However, the accumulation of restructured loans, which accounted for 6.4 percent at end-FY2014/15, poses a challenge. These loans, while not classified as non-performing, have modified terms to ameliorate possible borrower debt-repayment difficulties, and hence imply substandard quality. Further transition of restructured loans to an NPA status, and the

[10] IMF staff estimates based on data from Haver Analytics, Dealogic, and CEIC.

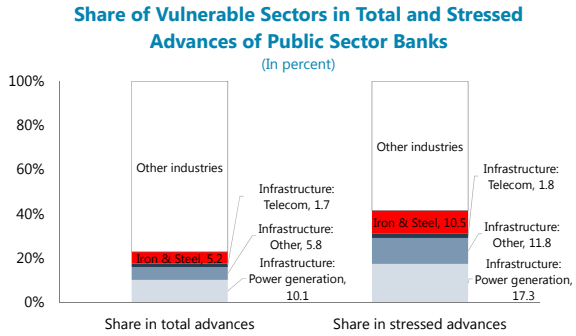
[11] Stressed assets include gross non-performing assets (NPAs) and restructured assets. Asset quality deteriorated further between March 2015 (end-FY2014/15) and September 2015. At end-September 2015, stressed assets were up to 14.1 percent (of which NPAs of 6.2 percent), compared to 13.5 at end-March 2015 and 12.9 percent at end-September 2014.

need to provision new restructured loans at the NPA provisioning rate are expected to require capital injections in the PSBs in the coming years.

Figure 3. Bank Asset Quality

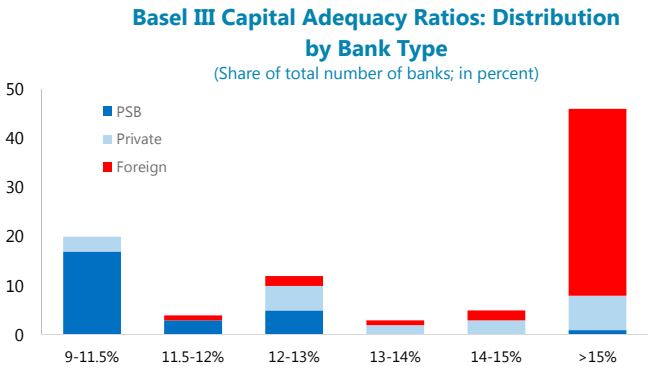


Source: IMF, Financial Soundness Indicators.



Source: RBI based on RBI supervisory returns.

8. The phase-in of Basel III capital requirements would also necessitate further capital infusions. Implementation of the Basel III capital framework is progressing and is expected to be completed by end-March 2019.[12] All banks currently meet the minimum 8 percent capital requirement under Basel III and its Indian equivalent of 9 percent (Figure). However, the agreed introduction of a 2.5 percent capital conservation buffer (CCB), coupled with potential changes in risk weights would require further capital infusions. Under a baseline scenario of ongoing implementation of Basel III, the needed cumulative capital injection is estimated to be at 0.8 percent of FY2018/19 GDP over four years, with a 0.3 percent government injection in line with its ownership stakes in PSBs.[13]



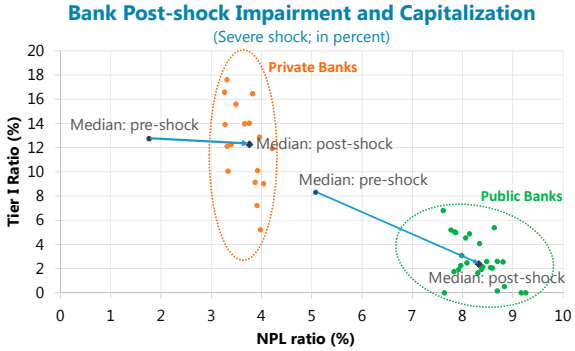
Sources: Reserve Bank of India; and IMF staff estimates.

9. Simulations of the impact of further PSB asset quality deterioration suggests that potential capitalization needs should be manageable, but may require further fiscal outlays. The simulations assumed a 15 percent transition of restructured advances to NPAs in each year to end-FY2018/19, and minimum 60 percent provisioning against NPAs. The analysis was carried out on a bank-by-bank basis, with slippage, recovery and write-off rates calibrated on banks' most recent performance (in FY2013/14 and FY2014/15), and using the Tier 1 capital ratio as a hurdle rate

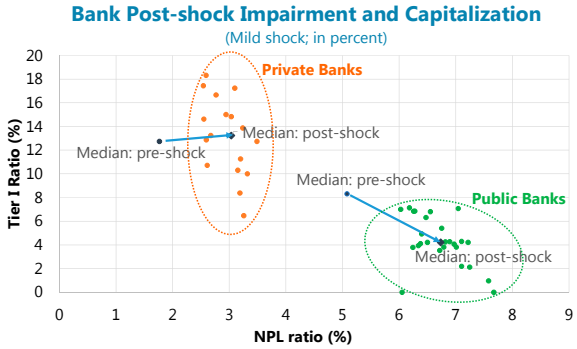
[12] A recent assessment under the Regulatory Consistency Assessment Programme (RCAP) of the Basel Committee on Banking Supervision finds India's framework for implementation of the Basel risk-based capital standards compliant with Basel III regulatory requirements (see BCBS, 2015). An important remaining element on credit risk is the need for banks' adoption of the Internal Ratings-Based (IRB) approach.

[13] This estimate, as well as the subsequent simulations assumes no dilution of government ownership in PSBs, currently at about 61 percent.

(including the 2.5 percent capital conservation buffer (CCB) and additional buffers of up to 2 percent). Even in a severe scenario of continuous deterioration of PSBs' asset quality on a scale commensurate with their recent experience, recapitalization costs should be manageable, at 2.9 percent of FY2018/19 GDP (cumulatively over four years, including a 2 percent extra buffer; left panel, Table 1). Costs are more modest, at 1.8 percent of FY2018/19 GDP, in the case of further reforms (right panel, Table 1). Altogether, potential stress is associated with an about 6 percentage-point decline in PSBs' median Tier 1 ratio and a 3.2 percentage-point rise in the median NPL ratio (4 and 1.7 percentage points under milder stress—see Figures). However, these estimates may be subject to downward bias, given some remaining forbearance on the classification of certain restructured loans.



Sources: Orbis; and IMF staff estimates.



Sources: Orbis; and IMF staff estimates.

Table 1. India: Bank Capitalization Needs

Public Sector Banks: Capitalization Needs under Severe Stress
(In percent of 2018/19 GDP)
(Minimum Common Equity Tier 1 (CET-1) Capital + CCB)

	Assumed Credit Growth		
	Slow	**Base**	**Fast**
	(0.9 x GDP growth)	(1 x GDP growth)	(1.1 x GDP growth)
	Government Share		
6.125 - 8 (0)	1.31	1.39	1.50
7.125 - 9 (1)	1.61	1.71	1.83
8.125 -10 (2)	1.91	2.02	2.16
	Total Bank Recapitalization		
6.125 - 8 (0)	1.95	2.07	2.24
7.125 - 9 (1)	2.40	2.55	2.74
8.125 -10 (2)	2.86	3.03	3.24

Source: IMF staff estimates based on FitchRatings; Bankscope; World Economic Outlook; and bank annual reports.
Note: Column to the left shows range of minimum CET-1 + CCB requirements.

Public Sector Banks: Capitalization Needs under Milder Stress
(In percent of 2018/19 GDP)
(Minimum Common Equity Tier 1 (CET-1) Capital + CCB)

	Assumed Credit Growth		
	Slow	**Base**	**Fast**
	(0.9 x GDP growth)	(1 x GDP growth)	(1.1 x GDP growth)
	Government Share		
6.125 - 8 (0)	0.63	0.71	0.81
7.125 - 9 (1)	0.94	1.03	1.14
8.125 -10 (2)	1.24	1.34	1.47
	Total Bank Recapitalization		
6.125 - 8 (0)	0.91	1.03	1.18
7.125 - 9 (1)	1.37	1.51	1.68
8.125 -10 (2)	1.82	1.98	2.18

Source: IMF staff estimates based on FitchRatings; Bankscope; World Economic Outlook; and bank annual reports.
Note: Column to the left shows range of minimum CET-1 + CCB requirements.

References

Basel Committee on Banking Supervision, 2015, "Regulatory Consistency Assessment Programme (RCAP) Assessment of Basel III risk-based capital regulations – India," June 2015. www.bis.org/bcbs/publ/d320.pdf

International Monetary Fund, 2014, *Global Financial Stability Report: Moving from Liquidity- to Growth-Driven Markets*, April 2014, (International Monetary Fund: Washington).

Lindner, P. and S. Jung, 2014, "Corporate Vulnerabilities in India and Banks' Loan Performance," IMF Working Paper WP/14/232 (International Monetary Fund: Washington).

Moody's, 2004, "MOODY'S KMV™ RISKCALC™ V3.1 UNITED STATES," June 1, 2004. https://riskcalc.moodysrms.com/us/research/docs/Americas/RiskCalc_v3_1_US.pdf.

Oura, H., 2008, "Financial Development and Growth in India: A Growing Tiger in a Cage?" IMF Working Paper WP/08/79 (International Monetary Fund: Washington).

Oura, H. and P. Topalova, 2009, "India's Corporate Sector: Coping with the Global Financial Tsunami," *India: Selected Issues*, IMF Country Report No. 09/186 (International Monetary Fund: Washington).

Reserve Bank of India, 2014, "Capital and Provisioning Requirements for Exposures to Entities with Unhedged Foreign Currency Exposure," RBI/2013-14/448, January 15, 2014. https://www.rbi.org.in/scripts/NotificationUser.aspx?Id=8694&Mode=0.

MACROPRUDENTIAL POLICIES IN INDIA[1]

India has employed a wide range of macroprudential policies, targeting the build-up of risks related to cyclical fluctuations in the provision of credit; the interdependence across institutions; and cross-border spillovers. Our analysis shows that, in conjunction with monetary policy, countercyclical policies in the past were effective in reducing credit growth to targeted sectors, but did not arrest the rise in broader corporate sector vulnerabilities more recently.

1. Over the years, the Indian authorities have taken on a multifaceted approach to contain the potential build-up of financial vulnerabilities. The range of applied macroprudential tools have included countercyclical, cross-sectional and cross-border measures to moderate excess credit growth and contain potential spillover of risks across financial institutions and with markets. The measures have been mostly applied to banks, in view of the latter's critical importance for domestic financial stability (in the aggregate, banks account for about ⅔ of assets and 80 percent of loans in the financial system; see Table 1). Non-banking financial companies (NBFCs) have been targeted directly only to a very limited extent—via limits on the loan-to-value (LTV) ratios that NBFCs can apply to loans secured against gold jewelry.[2] However, macroprudential measures have addressed directly the risk of potential spillovers from NBFCs to the banking system.

2. Countercyclical measures have been largely capital-based and have targeted specific sectors subject to strong credit procyclicality. Time-varying risk weights and dynamic provisioning norms on standard assets were applied extensively during the strong economic expansion preceding the global financial crisis (2004 to 2008). They targeted specific sectors deemed to be subject to excessively high credit growth, including commercial real estate (CRE), non-banking financial companies (NBFC), housing, retail loans and capital markets. An LTV cap—differentiated by loan size, and property value and location—was also introduced in November 2010 to dampen potential housing loan-related risks. In addition, a range of policies to constrain interconnectedness among institutions and linkages to markets have set limits on cross-institutional funding and capital holdings, and on banks' reliance on external funding.

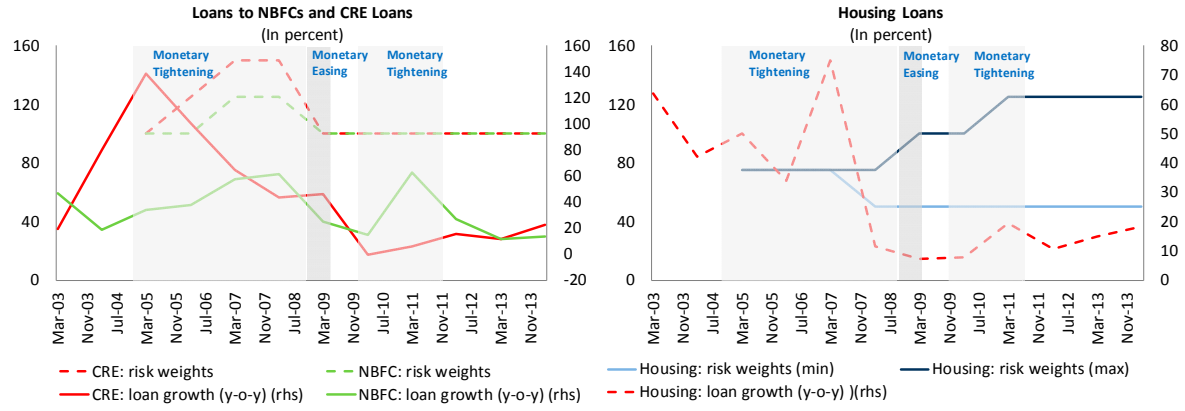
3. In conjunction with concurrent monetary policy steps, the countercyclical policies were effective in dampening credit to the targeted sectors. Between end-2004 and 2008, sector-specific risk weights and provisioning requirements were raised step-wise in tandem with monetary tightening that was meant to curb inflation and aggregate demand more broadly (Figure 1). The growth of credit to the targeted sectors, particularly to the CRE and housing sectors, slowed

[1] Prepared by Silvia Iorgova.

[2] NBFCs' LTV ratios on lending against gold jewelry were most recently reduced to 60 percent in March 2012 to curb excess growth of gold-backed credit (see Reserve Bank of India, 2013).

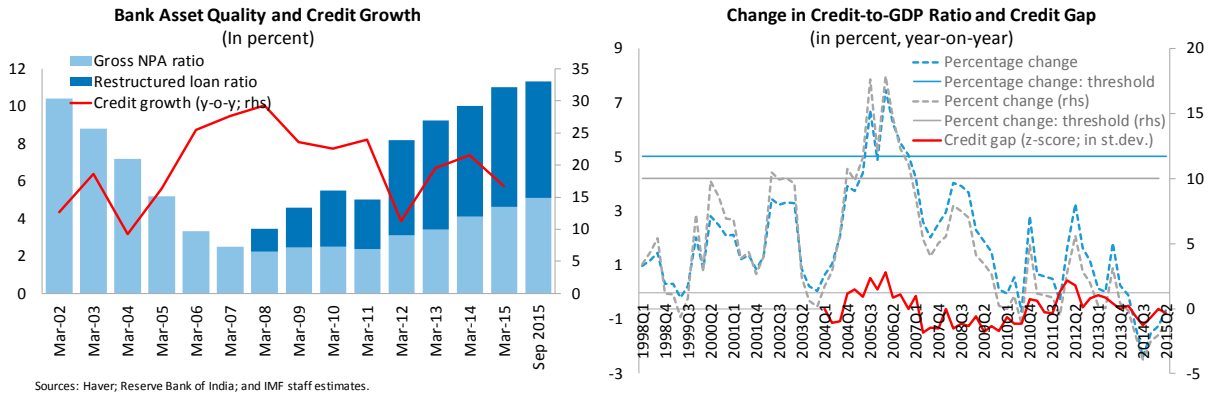
considerably. The annual change in banks' advances to the CRE sector, for example, turned negative in FY2009/10 from close to 140 percent at its peak in FY2004/05. The countercyclical measures were unwound, jointly with monetary policy easing, in October 2008 to mitigate the economic downturn in the aftermath of the global financial crisis**.**

Figure 1. Countercyclical Macroprudential Measures and Sectoral Loan Growth



Sources: Reserve Bank of India; and IMF staff estimates.

Figure 2. Credit Indicators and Bank Asset Quality



Sources: Haver; Reserve Bank of India; and IMF staff estimates.

Notes: NBFCs denotes non-bank financial companies; CRE denotes commercial real estate.

4. However, past countercyclical measures were less effective in averting a rise in broader corporate sector vulnerabilities. In recent years, public sector banks (PSBs) have experienced a sharp rise in stressed loans—in particular to the infrastructure, and iron and steel sectors—which now account for about 11 percent of banks' outstanding loans (Figure 2, left panel).[3] The deterioration in corporates' debt-repayment capacity and PSBs' asset quality was preceded by high domestic credit growth, with credit expanding by an average of 25 percent a year between FY2005/06 and FY2010/11. No countercyclical macroprudential measures (apart from monetary policy tightening) were applied to arrest broad credit growth. Traditional metrics—including changes

[3] Stressed loans include non-performing assets (NPAs) and restructured advances (i.e. loans that have been subject to stress and are thus more likely to turn into NPAs).

in the credit-to-GDP ratio and the credit gap—point to "excessive" credit growth in the mid-2000s and possibly early-2012 (Figure 2, right panel). Exclusive application of credit gap metrics can certainly be punitive for structurally transforming economies with relatively low level of financial deepening, such as India, which require credit-driven development.[4] However, it points to the need for expanding the set of systemic risk leading indicators to account both the need for more extensive availability of credit to support economic growth, and the potential for a build-up of vulnerabilities (e.g., a rise in corporate leverage).

5. The further development of a robust analytical framework for the early identification of risks and better data collection are key for effective countercyclical policy. The Reserve Bank of India (RBI) relies on varied tools for systemic risk monitoring—including macrofinancial stress tests; corporate and banking stability maps and indicators; and expected and unexpected shortfalls.[5] In the context of Basel III, it has also expanded the criteria for the potential trigger of banks' countercyclical buffers (CCCB) beyond the estimated credit gap, taking into account movements in gross nonperforming assets (NPA) (Reserve Bank of India, 2014). Further development of a robust framework of systemic risk analytics would benefit considerably the early identification of risks and inform macroprudential policies. This process is contingent on the build-up of sufficiently long and granular time-series and cross-sectional data. The recent initiative on systematic and extensive data collection via the envisaged Financial Data Management Center (FDMC) should address these challenges, particularly if data collection efforts are linked closely with the requirements of a potential systemic risk monitoring framework.[6]

6. The use of cross-sectional mechanisms to curb financial system interconnectedness and limit banks' exposures to external funding has been extensive. Cross-sectional tools have included a broad array of restrictions on banks': (i) aggregate interbank liabilities; (ii) access to the uncollateralized funding markets; (iii) investments in other financial institutions' capital; (iv) exposures to NBFCs; (v) capital market exposures; (vi) investments in liquid schemes of debt-oriented mutual funds; (vii) foreign borrowing (except for export funding); and (viii) open FX positions, as well as banks' ability to recognize immediately profits on securitization-related asset sales (thus limiting banks' "originate and distribute" activities). Banks are also required to hold a large share (currently 21.5 percent) of their net demand and time liabilities in the form of liquid domestic sovereign securities as part of a statutory liquidity ratio (SLR) requirement. The use of cross-sectional mechanisms is warranted to avert shocks due to interlinkages with financial institutions and markets. However, if too extensive and restrictive, it can impair the capacity of financial sector to expand

[4] Also see Reserve Bank of India (2014).

[5] See chapter on the soundness and resilience of financial institutions (Chapter II) in the RBI's latest financial stability report (RBI, 2015). Tools for measuring the potential build-up of countercyclical risks are also complemented by an assessment of cross-sectional risks across institutions via network analysis.

[6] The FDMC is expected to function under the Financial Stability and Development Council (FSDC).

access to further sources of capital (domestic and foreign), lower funding costs, and intermediate funds toward productive economic activities, with a negative impact on long-term growth prospects.

7. India's institutional arrangements for macroprudential policy rely on inter-agency coordination across various regulatory bodies. The FSDC, set up in 2010 in the aftermath of the global financial crisis, has an express mandate to safeguard financial stability and play a role in supervising macroprudential policies, while ensuring inter-regulatory coordination. Chaired by the Minister of Finance (MOF), it also comprises the heads of all domestic regulators, including the Reserve Bank of India (RBI), as well as top MOF policymakers.[7] A sub-committee of the FSDC—chaired by the Governor of RBI and including separate technical groups on various issues—supports the Council and meets on an ongoing basis. The scope of the Council's meetings is broad and covers various aspects of macroeconomic and financial policy, including financial inclusion and local markets development. Overall, the institutional framework is evolving, and it will be important to ensure that enhancements to policy coordination continue, and that the effectiveness of the institutional arrangements for implementing policy decisions continues to improve.

Table 1. India: Financial Sector Lending[1/]

	(in billions of INR)				(in percent of GDP)			
	FY2012	FY2013	FY2014	FY2015	FY2012	FY2013	FY2014	FY2015
Banks	**48,033**	**55,253**	**62,821**	**68,821**	**54.4**	**55.3**	**55.4**	**54.9**
Scheduled commercial banks	46,869	53,895	61,232	66,972	53.1	54.0	54.0	53.4
o/w: public sector banks	35,618	40,711	45,981	49,283	40.3	40.8	40.5	39.3
o/w: SBI group	10,466	12,481	13,906	14,809	11.8	12.5	12.3	11.8
o/w: nationalized banks	25,152	28,230	32,075	34,474	28.5	28.3	28.3	27.5
o/w: private sector banks	8,865	10,538	12,213	14,334	10.0	10.5	10.8	11.4
o/w: foreign banks	2,386	2,646	3,038	3,355	2.7	2.6	2.7	2.7
Regional rural banks	1,164	1,359	1,589	1,848	1.3	1.4	1.4	1.5
Non-Bank Financial Companies	**7,234**	**8,500**	**9,844**	**11,784**	**8.2**	**8.5**	**8.7**	**9.4**
o/w: deposit-taking institutions	841	919	1,374	1,601	1.0	0.9	1.2	1.3
o/w: non-deposit-taking institutions	6,392	7,581	8,471	10,183	7.2	7.6	7.5	8.1
Cooperative Institutions	**--**	**6,294**	**6,688**	**--**	**--**	**6.3**	**5.9**	**--**
o/w: Urban cooperative banks (UCBs)	--	1,810	1,997	--	--	1.8	1.8	--
o/w: Scheduled UCBs	--	840	939	--	--	0.8	0.8	--
o/w: Unscheduled UCBs	--	970	1,057	--	--	1.0	0.9	--
o/w: Rural cooperative institutions	3,581	4,483	4,691	--	4.1	4.5	4.1	--
Short-term	*3,261*	*4,166*	*4,358*	--	3.7	4.2	3.8	--
o/w: Primary Agricultural Credit Societies (PACS)	912	1,394	1,301	--	1.0	1.4	1.1	--
o/w: District Cooperative Central Banks (DCCBs)	1,572	1,840	2,027	--	1.8	1.8	1.8	--
o/w: State Cooperative Banks (StCBs)	776	933	1,031	--	0.9	0.9	0.9	--
Long-term	*320*	*317*	*333*	--	0.4	0.3	0.3	--
o/w: Primary Cooperative Agriculture and Rural Development Banks (PCARDB)	126	130	129	--	0.1	0.1	0.1	--
o/w: State Cooperative Agriculture and Rural Development Banks (SCARDB)	194	187	204	--	0.2	0.2	0.2	--

Source: Reserve Bank of India (RBI); and IMF staff estimates.
1/ Includes outstanding loans & advances working capital, and total overdues.

[7] Apart from the RBI, the regulatory bodies that are part of FSDC include the Insurance Regulatory and Development Authority (IRDA), the Pension Fund Regulatory and Development Authority (PFRDA), and the Securities and Exchange Board of India (SEBI).

References

International Monetary Fund, 2014, "Staff Guidance Note on Macroprudential Policy". http://www.imf.org/external/np/pp/eng/2014/110614.pdf.

Reserve Bank of India, 2015, "Financial Stability Report," December 2015. https://rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=835.

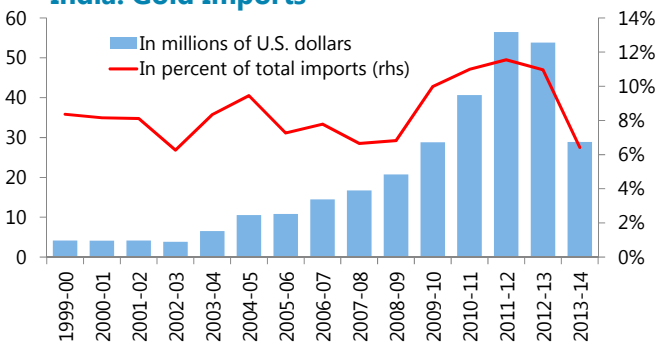
Reserve Bank of India, 2014, "Report of the Internal Working Group on Implementation of Counter-cyclical Capital Buffer," July 2014. https://www.rbi.org.in/scripts/PublicationReportDetails.aspx?UrlPage=&ID=797.

Reserve Bank of India, 2013, "Report of the Working Group to Study the Issues Related to Gold Imports and Gold Loans NBFCs in India," February 2013. https://www.rbi.org.in/scripts/PublicationReportDetails.aspx?ID=699.

GOLD MONETIZATION SCHEMES IN INDIA[1]

The recently introduced gold monetization schemes seek to curb the Indian public's high propensity to hold physical gold, release liquidity towards productive investments, and moderate demand for gold imports. Our estimates suggest that, if successful, the schemes can spur economic growth, including by reducing the dependence of the jewelry industry on imported gold. However, the viability of these schemes is linked to their ability to attract sufficient demand, an important hurdle to the success of previous similar schemes. Moreover, the Indian government and banks need to be mindful of valuation and exchange rate risks, which our simulations show to be nontrivial.

1. The proposed introduction of gold monetization schemes by the Indian government reflects a long-standing concern about the need to release the liquidity currently locked in gold holdings, and curb the high share of gold in imports. India is the world's second-largest consumer of gold (about ¼ of world demand), and depends heavily on imported gold, which meets about 90 percent of domestic demand. Gold has accounted for an average of 10 percent of domestic imports since 2009, thus contributing significantly to India's current account deficit (Figure). The sizable domestic demand reflects a long-standing deep cultural and religious affinity for gold and residents' perception of gold as a "safe" asset. The perception of safety, coupled with limited availability of alternative investment opportunities, has contributed to a concentration of household savings in gold-related investments, with a recent survey of Federation of Indian Chambers of Commerce and Industries (FICCI) putting these at 22 percent of annual savings.[2] Gold demand has been relatively inelastic relative to price movements, and gold purchases—particularly in the aftermath of the global financial crisis—continued to rise sharply despite the increase in global gold prices.



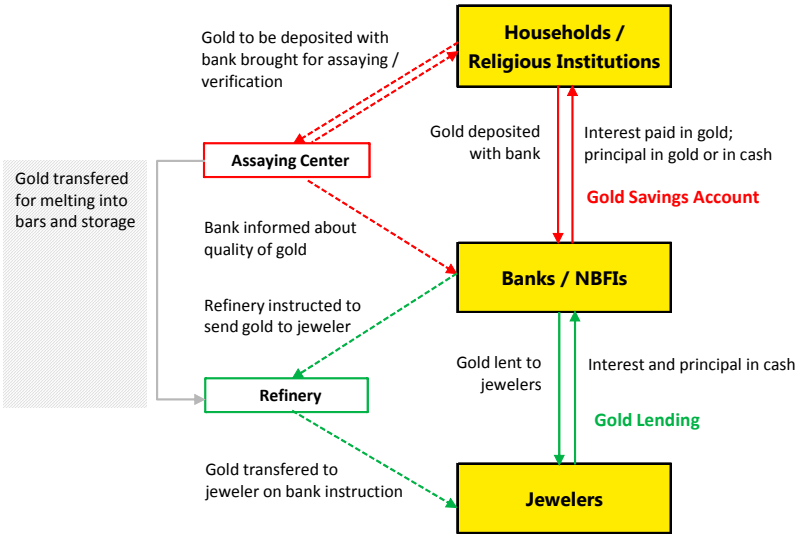
Sources: Reserve Bank of India; and IMF staff estimates.

[1] Prepared by Silvia Iorgova.

[2] See FICCI and World Gold Council (2014).

2. The schemes are intended to channel gold holdings into gold saving accounts and convert demand for gold into sovereign gold bond (SGB) holdings. Under the first scheme, banks are expected to mobilize pools of gold, currently held by the public, into deposits and extend these as gold loans to the jewelry sector (Figure). Under the second scheme, the Reserve Bank of India (RBI) is expected to issue SGBs on behalf of the government, with the redemption value of these bonds on maturity equivalent to the market value of gold over the preceding week. The schemes are motivated by the desire to increase the circulation of gold in the economy (the first scheme), and introduce a paper substitute for gold holdings (the second scheme). The proposed gold savings accounts are not dissimilar from existing gold savings deposit types. They entail a process of initial verification of gold quality prior to opening of the account, and have maturities of more than one year, interest payments in gold and principal redemption in gold or cash. The deposited gold can be lent to jewelers, converted to coins for sale, or sold at domestic commodity exchanges or to obtain foreign currency. The key difference to existing schemes is the smaller size of the permitted minimum investment, which is set at 30 grams per households, down from 200 grams previously. The SGBs will be issued in small gold denominations (in units of 1 gram, up to 500 grams per investor per year), at tenors of eightyears (with an exit option on interest payment dates after the fifth year), and at an interest rate of 2.75 percent.

Gold Monetization Scheme: Gold Savings Account



3. A key concern about the feasibility of the new schemes is that they may be unable to attract sufficient demand. Previous similar initiatives—including the gold deposit scheme (GDS) introduced in 1999 and the sovereign gold bonds issued in the 1960s and in the early 1990s—garnered limited demand.[3] The conceivable reasons for the inadequate takeoff of these schemes appear linked to: (i) the public's exclusive trust in the value of own physical gold holdings; (ii) perceptions of inadequate return on investment and/or high transaction costs; (iii) mismatches

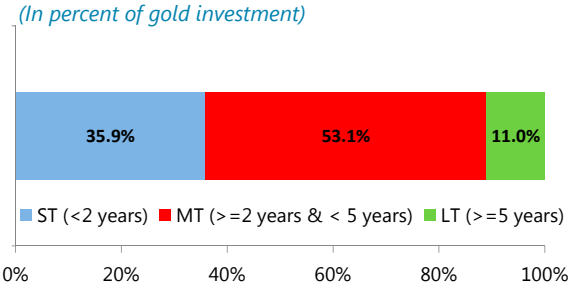
[3] The 1999 GDS was similar in design to the currently proposed deposit scheme, albeit with a higher minimum limit of 200 grams per deposit. Under the scheme, deposits had a maturity of 3 to 7 years and annual interest of 3–4 percent, and were exempted from taxes on interest and capital gains. India issued sovereign gold bonds on several occasions: three times in the early 1960s and once in 1993. Demand was limited, with GDS attracting about 8 tons of gold and the bond schemes—a maximum of 41 tons in 1993. For more on these schemes, see Reddy (2002).

between contract maturities and ability to obtain liquidity; (iv) insufficient confidence in the gold assays or the need to prove the origin of gold acquisition; and (v) lack of sufficient distribution channels through the banking system. In this context, the contract design of the new schemes is critical for their potential success. Importantly, there are indications that the public attitude to alternative gold holdings may be changing. The FICCI survey indicates that roughly half of city-based Indian households may be willing to deposit gold coin / bullion with a bank, with 41 percent showing preference to cash settlement on maturity.[4] However, the extent of such shift in sentiment is unclear, as the survey encompasses only city dwellers and does not capture attitudes towards melting of jewelry, which accounts for 63 percent of gold demand.

4. The ability to garner adequate demand hinges on establishing the needed infrastructure, providing acceptable investment returns, aligning maturities with investor preferences, and supporting sufficiently liquid secondary markets for SGBs. First, the attractiveness and payoffs of the gold savings scheme depend on participants' trust in the quality of the exchanged gold. However, gold quality and pricing in India is still not sufficiently standardized, affecting adversely efficiency in the market and hindering broad-based monetization. Further expansion of existing infrastructure, including assaying and quality verification (BIS-approved hallmarking) of facilities would be critical in this regard. Second, gold monetization schemes should provide sufficiently liquid investment options, given that Indian households show a distinct preference for shorter-term instruments and ready availability of liquidity (40 percent of respondents in the FICCI survey liquidated gold to meet emergencies). A large share of households (36 percent) holds gold for less than 2 years and close to 90 percent for less than 5 years (Figure). The existence of a sufficiently liquid secondary market for SGBs (which have an envisaged maturity of 5 to 7 years) will allow investors to manage liquidity needs more easily and thus support stronger investor demand. Last but not least, the feasibility of the schemes would ultimately depend on the expected real payoffs, which by design are left to the issuers.

India: Time Horizon of Gold Investment

(In percent of gold investment)

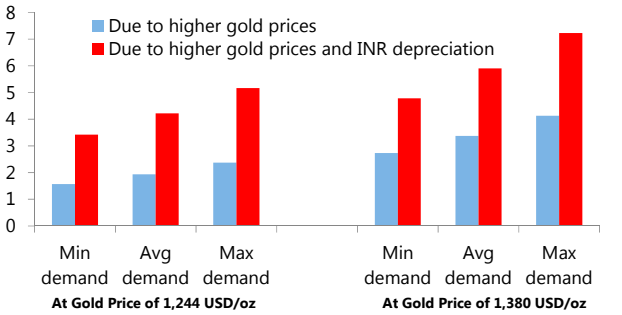


Source: Federation of Indian Chambers of Commerce and Industries (FICCI) .

[4] The FICCI survey included 5,000 respondents in 33 cities across India. Seventy-three percent of respondents also indicated that they would be willing to deposit gold coin/bullion even if they were to obtain different coin/bullion on maturity.

5. The monetization schemes also entail valuation risks, whose mitigation is contingent on the ability of domestic banks and the Indian government to hedge effectively their positions. For example, the gold savings account scheme exposes banks to potential asset-liabilities mismatches, given that interest payments to depositors are in gold, while interest to be received from jewelers is in cash. Banks also face valuation and exchange rate risks in case of cash redemptions of principal. Similarly, the guaranteed redemption price of gold under the SGB scheme can expose the government to potentially high fiscal costs in case of a large increase in global gold prices and/or a sharp rupee depreciation, if insufficiently hedged. The potential impact on government expenditures is assessed via simple simulations, assuming: (i) no hedging; (ii) an increase in global gold prices to 1,244 USD/oz and 1,380 USD/oz over a year, and an additional rupee depreciation of 22.5 percent; and (iii) formation of demand for gold-linked bonds in line with minimum, average and maximum annual demand for gold.[5] Results of the simulation suggest that the SGB-related costs may account for 1.6 to 4.1 percentage point rise in fiscal expenditure as a result of a gold-price increase, and for 3.4 to 7.2 percentage points, in case of a concurrent sharp rupee depreciation (Figure).[6] Thus, to contain potential costs, it is important to hedge against potential gold price volatility (both domestically and in international commodity exchanges), and increase the predictability of the import duty regime to support banks' ability to hedge effectively.

India:Potential Fiscal Costs under Valuation and Exchange Rate Shocks
(In percent of projected fiscal expenditure)



6. If successful, the gold monetization and SGB schemes can have a positive impact on the Indian economy. If sufficiently broad, the channeling of domestic gold deposits to jewelers under the gold savings scheme can provide a boost to economic growth by reducing the dependence of the jewelry fabrication industry on imported gold. IMF staff estimates suggest that a mobilization of 5 percent of the 22,000 tons of gold, currently believed to be held by the Indian public, can boost economic growth by 1 to 1.5 percentage points through an increase in jewelry production and reduction in imports.[7]

[5] The assumed increase in gold prices corresponds to the 75th and 90th percentiles of the distribution of annual price changes since 1995, with the later also identical to the average gold price between 2010 and 2014. The demand for gold-linked bonds is assumed to be equivalent to 3 to 5 percent of aggregate gold holdings. Gold holdings of Indian households are currently estimated to be at 22,000 tons (FICCI and World Gold Council, 2014).

[6] The potential for fiscal costs in government-led schemes to expand considerably has precedents in other countries. For example, under a similar scheme in the late 1970s—known as "Giscard"—the French government faced a five-fold increase in redemption value after the introduction of the scheme. These mismatches may prove difficult to manage in the absence of effective hedging market for gold domestically.

[7] The range reflects an assumption that between 50 to 75 percent of gold deposits would be channeled as loans to gold jewelers. The assessment is based estimates of gross-value added (GVA) that use mark-up values and

References

Federation of Indian Chambers of Commerce and Industries (FICCI), and World Gold Council, 2014, "Why India Needs a Gold Policy". http://www.gold.org/download/file/3613/Why_India_Needs_a_Gold_Policy.pdf.

PricewaterhouseCoopers, and World Gold Council, 2013, "The Direct Economic Impact of Gold". http://www.gold.org/download/file/3208/PWC_direct_economic_impact_of_gold.pdf.

Reddy, Y. V., 2002, "Evolving Role of Gold – Recent Trends and Future Direction," Address at a conference organized by the World Gold Council, New Delhi, 21 March 2002. http://www.gold.org/download/file/3208/PWC_direct_economic_impact_of_gold.pdf.

Reserve Bank of India, 2015, "Gold Monetisation Scheme, 2015," Master Direction No.DBR.IBD.No.45/23.67.003/2015-16. https://www.rbi.org.in/scripts/NotificationUser.aspx?Id=10084&Mode=0

turnover/GVA ratios from PricewaterhouseCoopers and World Gold Council (2013). Hence, it does not account for a change in mark-ups and turnover that may occur as a result of the lower cost base of the domestic jewelry industry due to the availability of cheaper gold loans.

CHINA SPILLOVER VERSUS TAPER TANTRUM: HOW IS INDIA DIFFERENT THIS TIME AROUND?[1]

How does the China spillover episode of the summer of 2015 compare to the taper tantrum of the summer of 2013 in terms of the impact on emerging markets (EMs)? How did India fare following both bouts of global financial volatility, and how did India's performance compare with those of other EMs? While India was badly affected by the taper tantrum, this Chapter finds that India was less affected than many other EMs during the China spillover episode, in part due to reduced vulnerabilities. India is also better positioned to weather future volatility, but further actions are needed to address elevated corporate-banking sector vulnerabilities and continued fiscal consolidation is key.

1. The recent episode of China-driven volatility differs from the taper tantrum in its nature of shock and transmission channels (Figure 1). The taper tantrum—following the May 22, 2013 U.S. Congress testimony about the possible tapering of the Federal Reserve's asset purchase program—was mainly a financial shock, inducing a tightening of global financial conditions.[2] In contrast, the China spillover—with the first stock market correction on June 10, 2015, the move to new exchange rate regime on August 11, and a second stock market correction on August 24—was mainly a real shock, affecting the global economy through commodity price and the trade channels. Nevertheless, the China shock also had financial spillovers, resulting in a sharp, albeit short-lived, spike in VIX (Chicago Board Options Exchange volatility index), as well as sizeable capital outflows from EMs and increased VIX-EM spreads.

2. A somewhat different group of EMs was affected this time around than in the taper tantrum of 2013, with India being among the least affected (Figure 2).[3] In the China spillover episode of 2015, the most affected EMs include Colombia, Malaysia, Kazakhstan, as well as Brazil, South Africa, and Turkey, which were also among the most affected during the taper tantrum of 2013. India, in contrast, was one of the least affected EMs following the China spillover episode. Market differentiation during the China spillover episode is found to largely reflect a country's commodity dependence (in percent of its total exports), direct trade exposure to China, and macroeconomic fundamentals, such as inflation and current account imbalances. India is a net commodity importer and has small trade exposure to China, hence is not directly affected via the commodity price or trade channels. Importantly, since the taper tantrum, India has made significant

[1] Prepared by Ran Bi and Katsiaryna Svirydzenka.

[2] See also Bi (2015) for an earlier analysis of India and EM responses to the 'taper talk' of mid-2013.

[3] In Figure 2, ER denotes exchange rate; EMBI denotes emerging market bond index; TT denotes 'taper tantrum'. India is denoted by a diamond with red label of IND (China spillovers) or blue label of IND (taper tantrum).

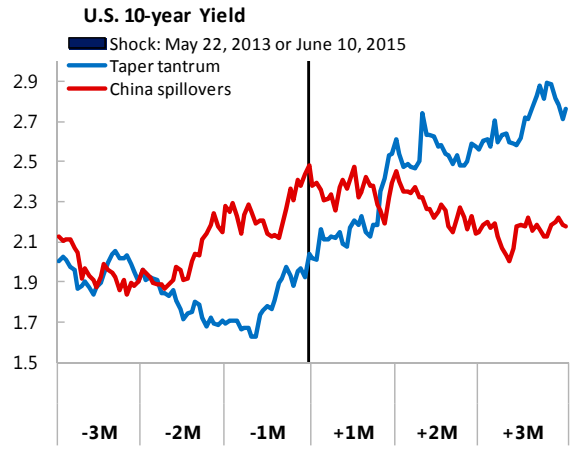
progress in reducing inflation and its current account deficit—as a result, much reduced domestic and external vulnerabilities also played a role in shielding India from this bout of market volatility.

3. EMs entered the China spillover episode with weaker macroeconomic positions and more limited policy space than during the taper tantrum period—while India is better positioned now, vulnerabilities remain (Figure 3).[4] Many EMs now have negative output gaps and lower inflation gaps than in the taper tantrum period, limiting the scope for tighter monetary policies to stem capital outflows and alleviate depreciation pressures. External imbalances remain sizeable in many deficit EMs as most of them have suffered a negative terms of trade shock—India is again a notable exception as a net commodity importer. Financial risks have also built, especially in Malaysia and Thailand, with credit rising from already high levels. While this is not a concern in India, its financial vulnerabilities lie in elevated corporate leverage and stressed assets, as well as eroded banking sector buffers. Moreover, non-financial corporate (NFC) U.S. dollar-denominated debt (in percent of GDP) has increased in a number of EMs, raising balance sheet risks as the dollar strengthens. Compared to their peers, Indian NFCs have a relatively small share of U.S. dollar-denominated debt. Finally, fiscal space to support growth appears more constrained in EMs. Many have either paused their consolidation plan or have provided stimulus, with less remaining space to counter future shocks. India also delayed its consolidation plan but shifted expenditure more toward public investment to upgrade its infrastructure. This improvement is welcome, but fiscal consolidation should continue as India's public debt level and fiscal deficit remain high.

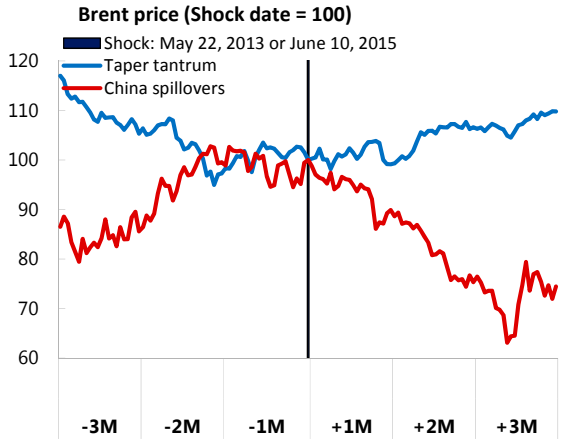
[4] In Figure 3, TT denotes taper tantrum; CAB denotes current account balance; and PB denotes primary balance. In the top left panel of Figure 3, India is denoted by a diamond with red label of IND (China spillovers) or blue label of IND (taper tantrum); in rows 2 and 3 of Figure 3, India is denoted by a diamond with red label IND.

Figure 1. Global Environment

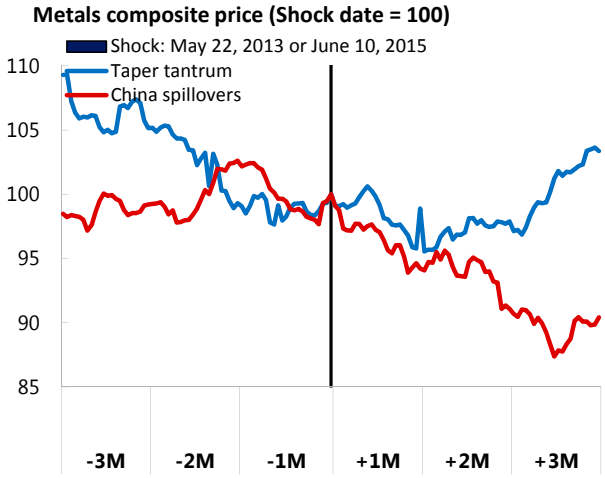
The taper tantrum was a financial shock, manifested in a tightening of global financing conditions…



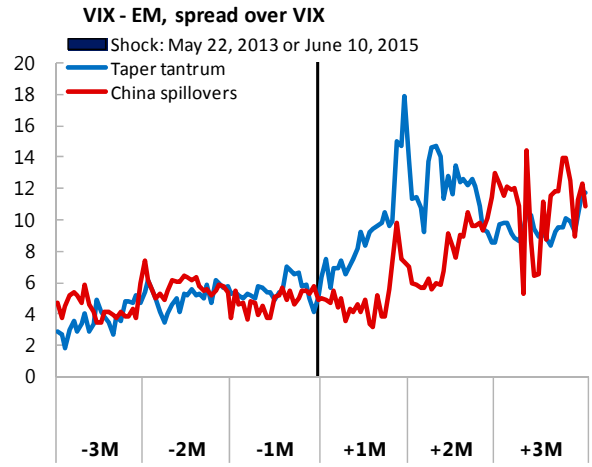
…while China-driven volatility was mainly a real shock, affecting commodity prices, such as oil…



… and metals, as expected commodity demand from China falls.



The China shock also resulted in financial volatility spikes, though to a lesser extent than the taper tantrum.

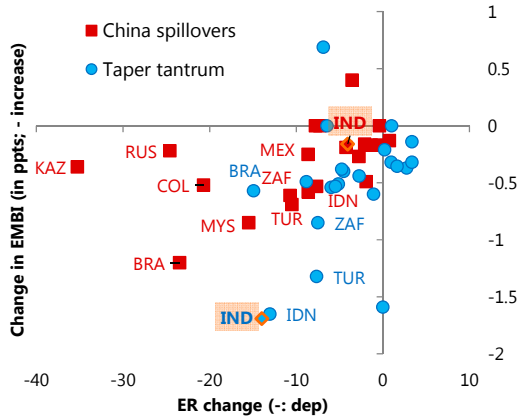


Source: IMF staff calculations.

Figure 2. Impact on Emerging Markets

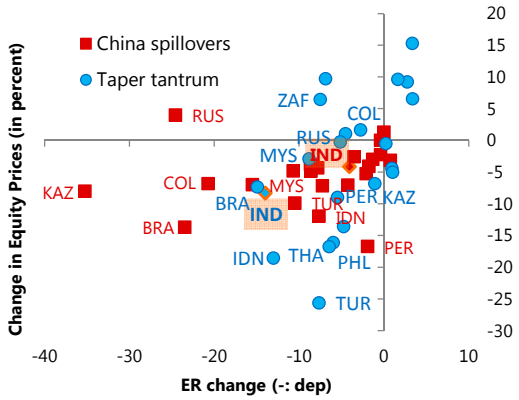
Compared to the taper tantrum, the affected group shifted somewhat…

Change in ER and EMBI: 3 Month



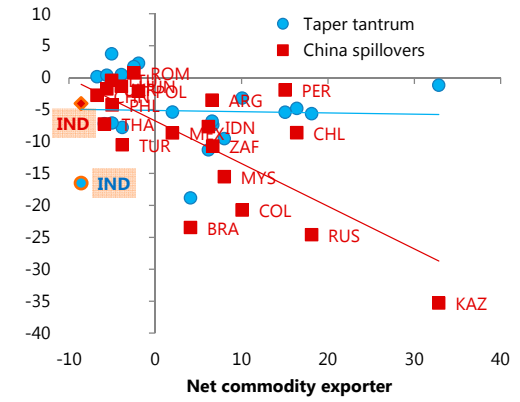
….with India being among the least affected EMs, in contrast to its experience during the taper tantrum.

Change in ER and Equity Price: 3 Month



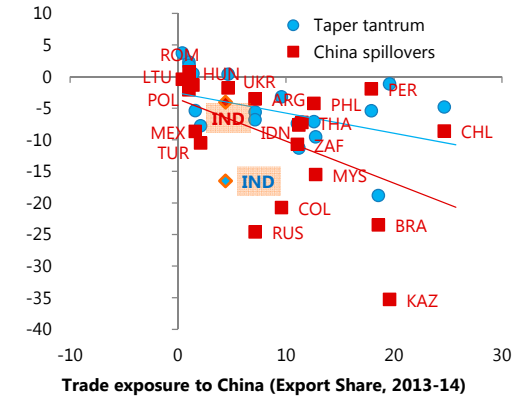
This time around, market differentiation across countries reflects commodity dependence …

ER change, 3 months since shock



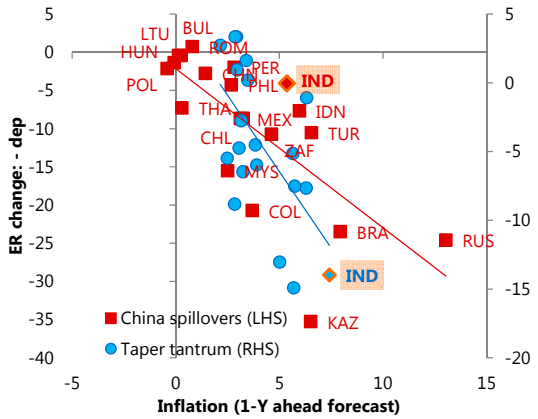
…exposure to China, …

ER change, 3 months since shock



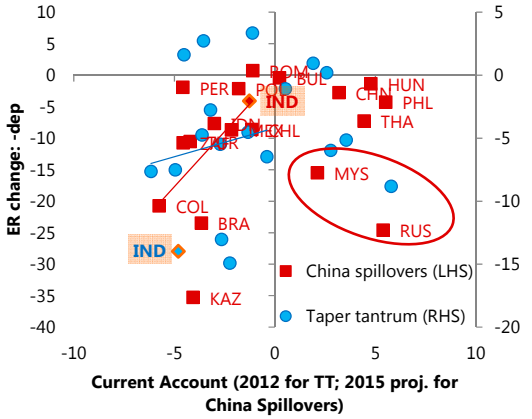
… and country fundamentals, such as inflation.

ER Change and Inflation



Current account imbalances seem to matter, but surplus countries with other headwinds also affected (Malaysia, Russia.)

ER Change and Current Account Balance

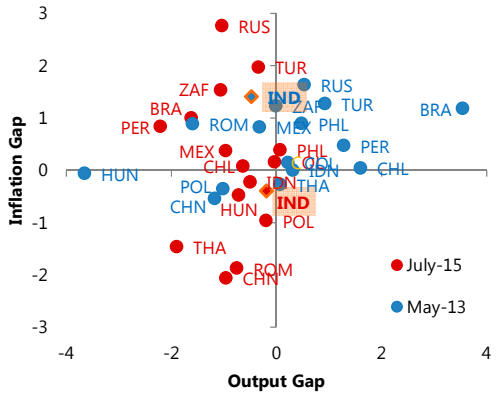


Source: IMF staff calculations.

Figure 3. Which Countries Are Better Positioned to Weather Future Market Volatility?

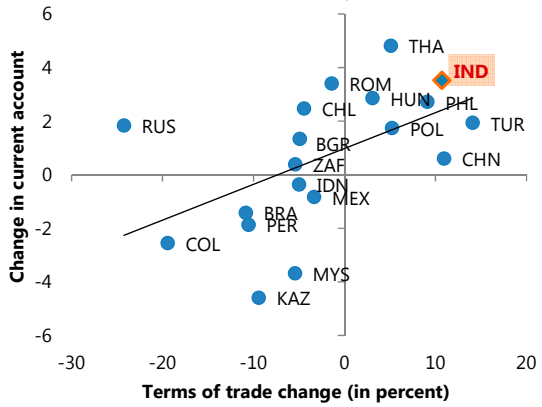
EMs started in weaker cyclical positions than before the TT, limiting the scope of monetary tightening.

Output and Inflation Gaps, Jul-15 vs. May-13
(in percent)



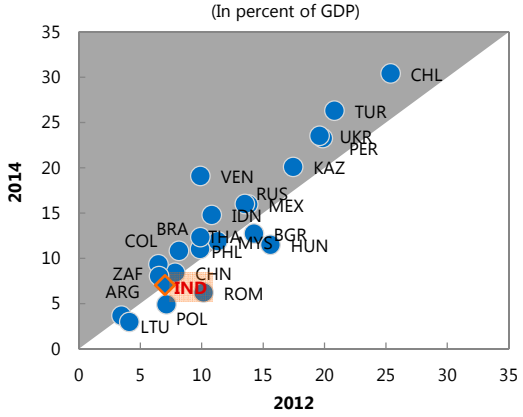
...as many of them had a negative terms of trade shock.

Current Account and Terms of Trade 2012 vs. 2015 (proj.)



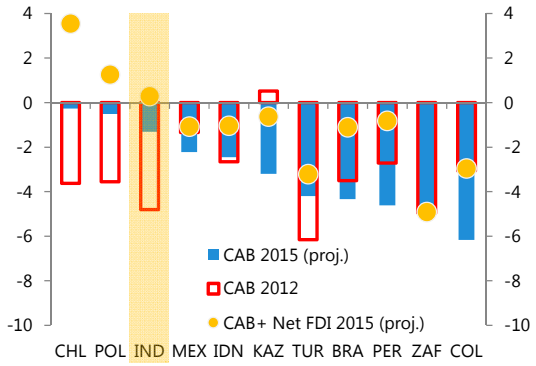
... compounded by increasing balance sheet risks.

Non-Financial Corporate FX Debt in USD
(In percent of GDP)



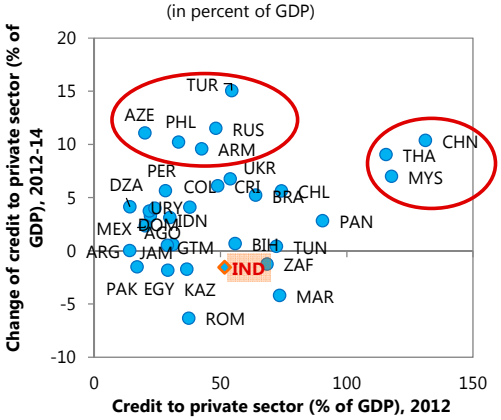
Majority of deficit EMs did not improve their current account since the TT, with India a key exception...

Deficit EMs: Current Account Balance in percent of GDP: 2012 vs. 2015 (proj.)



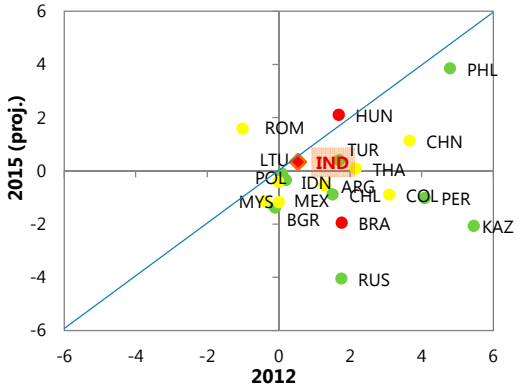
Financial risks are on the rise, with credit booms in a few EMs since TT, some from already high levels...

Credit to private sector
(in percent of GDP)



While fiscal space appears far more constrained.

Fiscal gap (=PB minus debt stablizing PB): 2012 vs. 2015 (proj.)



Source: IMF staff calculations.

References

Bi, R., 2015, "Effectiveness of Emerging Market Policy Responses Since the Taper Talk," Chapter VII of *India: Selected Issues*, IMF Country Report No. 15/62 (Washington: International Monetary Fund).

HOW OPEN IS INDIA'S CAPITAL ACCOUNT? AN ARBITRAGE-BASED APPROACH[1]

Traditional measures of capital account openness rank India as among the countries with the most closed capital accounts. However, recent capital flows in and out of India seem to suggest at least some openness. This chapter examines the effectiveness of India's capital controls using an arbitrage-based approach: effective capital controls can give rise to a persistent and one-sided price gap between onshore and offshore asset prices—measuring such price gaps is a way to gauge the effectiveness of capital controls. A cross-country comparison suggests that India's capital account is not as closed as suggested by traditional measures. Most importantly, the sign of the price gaps indicate that the remaining binding controls in India are mainly on inflows, rather than on outflows.

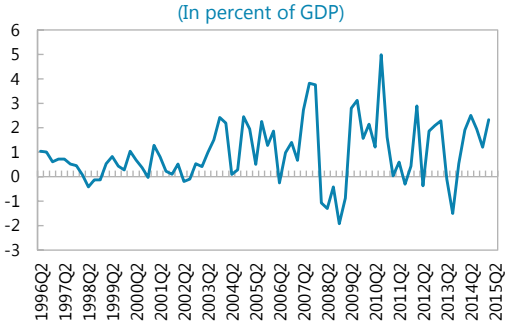
1. India has made significant progress in liberalizing its capital account since the 1980s. India had a closed capital account throughout most of the post-independence period, and a gradual liberalization was initiated after the 1991 balance of payments crisis. Bearing in mind the experiences from the Latin American debt crisis and the Asian financial crisis, India has undertaken a gradual approach by prioritizing certain types of flows (e.g., non-debt flows such as FDI) in the liberalization process. Notably, FDI inflows are now almost universally allowed. Portfolio inflows have also been liberalized significantly—while caps remain on certain types of foreign institutional investments (FIIs), they have been relaxed more recently. Other inflows, however, are subject to more restrictions.[2] All legislative restrictions on non-residents are for inflows, which, once in, can flow out freely. On residents, there is still legislative restriction on outflows, but the limit has been raised to a level that is unlikely to be binding.[3] Capital account liberalization, together with India's increasing financial integration and attractiveness as an investment destination, has resulted in a pickup in non-resident portfolio inflows in the 2000s, followed by sizeable outflows during the global financial crisis and more volatile capital flows afterwards. Resident portfolio investment abroad was nil in the 2000s, but such outflows have increased more recently, especially during bouts of financial market volatility (see Figure).

[1] Prepared by Ran Bi.

[2] See Gupta and Sengupta (2013) for a more in-depth discussion of India's gradual approach of capital account liberalization.

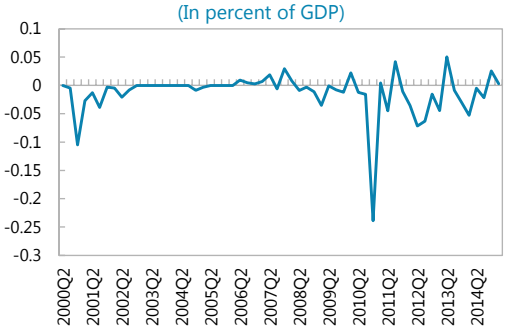
[3] See the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The limit on resident individuals, effective June 1, 2015, is US$250,000, significantly higher than India's per capita GDP, which is about US$1,600.

Non-resident Flows: Portfolio Investment in India
(In percent of GDP)



Sources: Haver Analytics; and IMF staff calculations.

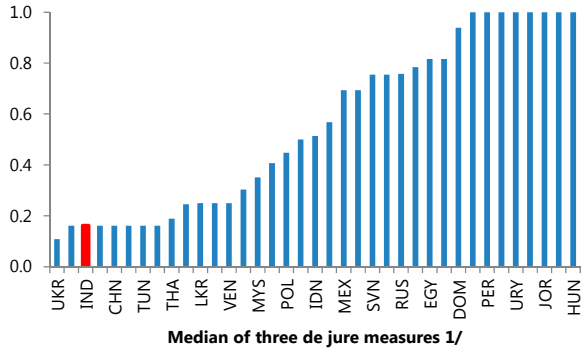
Resident Flows: Portfolio Investment by India
(In percent of GDP)



Sources: Haver Analytics; and IMF staff calculations.

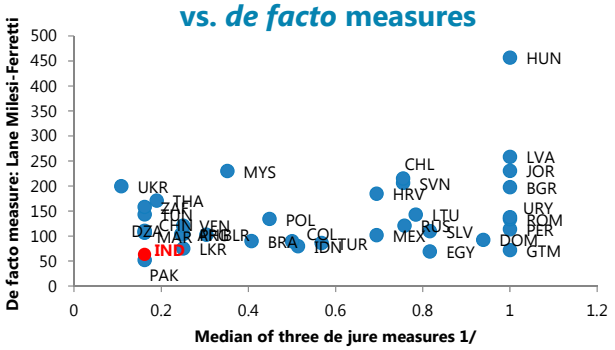
2. However, traditional measures of capital account openness do not capture this liberalization. Two principal types of measures—*de jure* measures which reflect legislated controls and *de facto* measures which capture the effectiveness of controls—both rank India as among countries with the most closed capital accounts. Moreover, the most commonly-used *de jure* measures, such as the Chinn-Ito, Quinn and IMF share indices (all based on information from the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions, or AREAER), have barely moved in the last four decades for India, which seems to be at odds with both the legislative changes and actual capital flows to India discussed above. In addition, the traditional measures have a few more limitations: (i) the traditional *de jure* measures do not separate controls on inflows and outflows, even though the detailed information provided in the AREAER's text allows it; (ii) the traditional *de facto* measures (e.g., the Lane and Milesi-Ferretti index) indicate financial integration rather than capital controls, since they reflect factors related

Cross-Country Comparison: *De jure* measures



1/ The three de jure measures include Chinn-Ito index, Quinn index and IMF share. They are normalized via min-max approach and a higher value indicates more open capital account.

Capital Account Openness: *de jure* vs. *de facto* measures

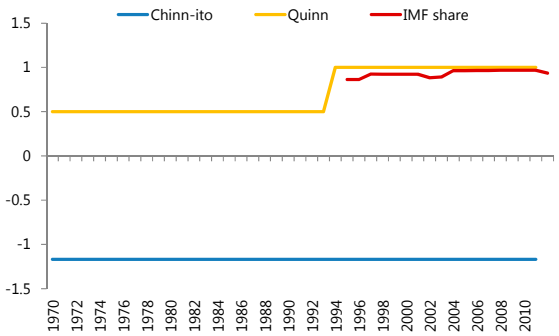


1/ The three de jure measures include Chinn-Ito index, Quinn index and IMF share. They are normalized via min-max approach and a higher value indicates more open capital account.

to financial development and market access, which may not be directly linked to capital controls.[4] Finally, *de jure* and *de facto* measures are not correlated at all—even though they are expected to differ as they measure different concepts, a complete lack of correlation complicates the task of assessing the actual degree of capital account openness in an economy, especially in a dynamic economy such as India.

3. In light of the limitations of traditional indicators, this chapter approaches the issue from a different angle. It aims to measure the *de facto* capital controls (or effective or binding controls) in India, but instead of measuring the impact of controls on the quantity of capital flows, as the Lane and Milesi-Ferretti index attempts to do, we measure the *price* impact on assets. In principle, for the same asset class, their onshore and offshore prices should be the same in a world of free capital flows. In practice, there are always frictions that can give rise to price gaps between onshore and offshore markets, but in countries with more open capital accounts, such price gaps should be small and should close relatively quickly as capital flows to eliminate arbitrage opportunities. However, if persistent and one-sided price gaps arise, it is an indication of *de facto* capital controls. In addition, the sign of the price gaps provide information on the direction of capital controls—if the return of an asset is persistently higher onshore than offshore, then the controls are on inflows, and vice versa. This arbitrage-based approach, however, also has its limitations. It requires the existence of functioning offshore markets, such as the non-deliverable forward (NDF) market, which by itself is an indication of the existence of capital controls. Also, this requirement narrows our country sample significantly—only a few major emerging markets (mainly in Asia) and advanced economies (mainly Korea) have NDF markets. Finally, this approach assumes that the only factor that drives the onshore-offshore price differences is capital controls—this could be a strong assumption especially during crisis episodes when asset prices move dramatically due to various reasons such as the lack of liquidity in certain markets. As a result, we focus on the price gaps in non-crisis periods, and in doing so we follow the approach developed in Ma and McCauley (2013).

India: *De jure* Measures of Capital Account Openness



[4] A hypothetical case can clarify this point: consider a country with no legislated capital controls but it is also not financially integrated to the global economy (e.g., due to the lack of domestic financial market and hence no interest from external investors)—in this case, the *de facto* measures would mistakenly suggest full capital controls.

4. This chapter assesses India's effective capital controls by examining the onshore-offshore price gaps in two asset prices—forward exchange rate and short-term interest rate.[5] The two price gaps are defined below:

- *Onshore-offshore forward exchange rate gap* is defined as:

$$\text{Forward rate gap}_t = (F_t - NDF_t)/S_t$$

where F_t is the onshore forward, NDF_t is the non-deliverable offshore forward, and S_t is the onshore spot exchange rate, all expressed as domestic currency per U.S. dollar. Therefore, a positive forward rate gap indicates that the domestic currency is more depreciated (or less appreciated) onshore than offshore, suggesting controls on inflows. We examine both 3-month and 12-month forward rate gaps for robustness.

- *Onshore-offshore short-term interest rate gap* is defined as the difference between the onshore interbank rate and the offshore rate. Since we do not always observe offshore short-term rate, we can infer it from NDFs, assuming that they are priced off of U.S. dollar LIBOR. Covered interest parity then suggests:[6]

$$NDF_t = S_t * (1+i_t) / (1+r_t^{\$})$$

where i_t is the implied offshore interest rate, and $r_t^{\$}$ dollar LIBOR. Rearranging terms, the implied offshore interest rate is:

$$i_t = NDF_t * (1+ r_t^{\$}) / S_t - 1 .$$

The onshore-offshore short-term interest rate gap is defined as $(r_t - i_t)$, where r_t is the directly observable onshore three-month bank rate. Again, a positive interest rate gap suggests higher returns from onshore money market instruments, and hence the existence of controls on inflows.

Onshore-offshore Forward Exchange Rate Gap

5. Figure 1 illustrates how onshore-offshore forward exchange rate gaps could reflect a country's effective capital controls in this market. For example, China tends to have more persistent and one-sided price gaps than Brazil, indicating more effective capital controls in China. India appears somewhere in between—India's forward rate gaps move in both directions but the gaps are more persistent than those in Brazil, especially before the global financial crisis (GFC). Before the GFC, India had a couple of extended periods of negative forward rate gaps (e.g., from 2001 to early 2003, and in 2006-07), suggesting effective controls on outflows. During the GFC, there was a short-lived large negative gap. As argued above, dramatic price changes during crises could be due to multiple reasons and it is difficult to determine to what extent this is due to capital controls. After the GFC, the forward rate gaps are more volatile and in the more recent period since

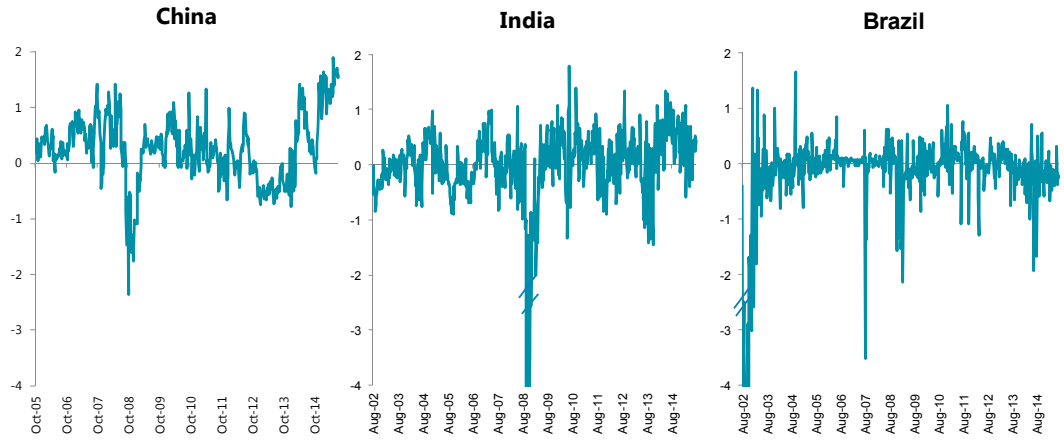
[5] In principle, one could also calculate the onshore-offshore price gaps of bond yields as well as equity prices but data limitations further narrow our country sample, making a comparison of India with its peers more difficult.

[6] There is a debate on whether the covered interest parity still holds after the global financial crisis—see Baba and Packer (2009). Therefore, results for the post-GFC period from this approach should be interpreted with caution.

2014 the gaps for India appear largely positive, suggesting that controls are more binding on inflows.

Figure 1. Onshore-offshore Price Gaps of 3-month Forward Exchange Rate

(In percent)

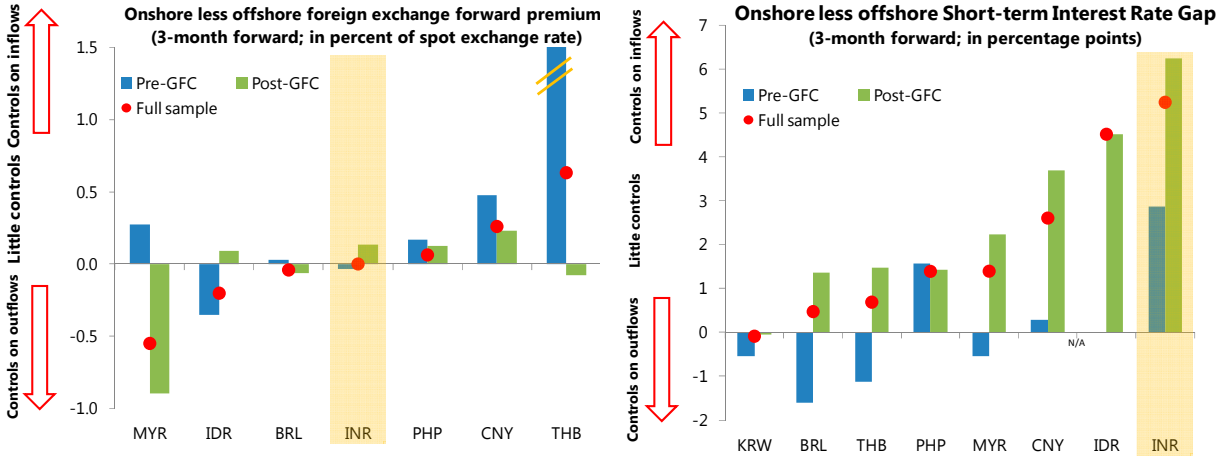


Source: Author's calculations.

6. A cross-country comparison confirms that India has relatively small forward rate gaps compared to its peers, and the current binding controls are mostly on inflows. As this analysis can only be applied to countries with functioning NDF markets, our sample covers mainly Asian peers (China, Indonesia, Malaysia, Philippines, Thailand and Korea) as well as Brazil. This cross-country comparison confirms that India's average onshore-offshore forward rate gap over the entire sample period is relatively small, comparable to levels seen in Brazil and Korea (Table 1), both of which are typically considered to have much more open capital accounts than India. This result is robust when using 12-month forward rate and by using absolute values of the price gaps. Moreover, India has, on average, smaller price gaps than most Asian peers. Finally, while India's controls on outflows seem to be less binding after the GFC, controls on inflows appear more binding despite recent relaxation of the ceilings on inflows. This could in part be due to the fact that inflows are sometimes increasing faster than the relaxation of the ceilings on inflows.

Onshore-offshore Short-term Interest Rate Gap

7. India has much larger onshore-offshore short-term interest rate gaps than its peers, suggesting more binding controls in this market, but again the effective controls are on inflows (Table 2)**.** India's short-term interest rate gaps are significantly above those in its peers and also much higher post-GFC than before. But again, the gaps are all positive, indicating tight controls on inflows to this market. This is in line with India's approach in limiting short-term "hot money" in its overall capital account liberalization process.



Source: Author's calculations.

8. In conclusion, while India still has substantial legislative restrictions on capital flows, especially on residents, the *effective* controls are mostly on inflows and the degree of controls differ across markets. India seems to have much less binding controls than most Asian peers on the forward exchange market, but tighter controls on the short-term money market. This reflects India's gradual approach toward capital account liberalization by prioritizing more "productive" flows while limiting "hot money". Moreover, the remaining effective controls are mostly on inflows rather than on outflows—this has implications for the next steps of liberalization and also on India's self insurance strategy in preparation for future external shocks. Finally, while the arbitrage-based approach is useful, it has its limitations because it is based on the assumption that capital controls are the only reason underlying the onshore-offshore price wedges, which could be a strong assumption in some circumstances. Data constraints also limit the country sample that can be used for cross-country analysis. Therefore, results from this analysis should be used together with other approaches to form an overall assessment of the extent of capital account openness.

Table 1. Onshore Less Offshore Foreign Exchange Forward Premiums 1/
(As a percentage of the spot)

	3-month				12-month			
	Pre-GFC	During GFC	Post-GFC	Full sample	Pre-GFC	During GFC	Post-GFC	Full sample
Simple average								
MYR	0.2730	-0.7603	-0.9005	-0.5514	0.6392	-1.6693	-0.9388	-0.4999
IDR	-0.3527	-4.7852	0.0878	-0.2036	0.2819	-6.3721	0.1801	-0.0080
KRW	-0.1504	0.0717	-0.0321	-0.0634	-0.1559	-0.1794	-0.0474	-0.0837
BRL	0.0287	-0.2282	-0.0638	-0.0421	0.1039	-0.5903	0.0116	0.1039
INR	**-0.0365**	**-2.4540**	**0.1358**	**-0.0009**	**-0.0113**	**-4.7557**	**0.2213**	**-0.0125**
PHP	0.1668	-2.1110	0.1235	0.0619	0.4910	-4.2282	0.4454	0.3033
CNY	0.4736	-1.0242	0.2291	0.2591	N/A	N/A	-0.3789	-0.3789
THB	2.4201	-0.8095	-0.0771	0.6316	1.6326	-2.0034	-0.2521	0.2428
Benchmark								
KRW	-0.1504	0.0717	-0.0321	-0.0634	-0.1559	-0.1794	-0.0474	-0.0837
Average of absolute value								
BRL	0.1516	0.4594	0.23830	0.2202	0.3785	0.7349	0.49672	0.4700
KRW	0.2889	0.9047	0.37128	0.3648	0.3005	1.0109	0.35854	0.3632
PHP	0.5283	2.1110	0.35680	0.4655	0.9442	4.2282	0.79447	0.9526
INR	**0.3283**	**2.5259**	**0.43539**	**0.4735**	**0.5694**	**4.7557**	**0.79343**	**0.8595**
CNY	0.4924	1.0715	0.46391	0.4927	N/A	N/A	0.43060	0.4306
THB	2.7465	0.8095	0.21551	0.9782	2.1397	2.0034	0.61315	1.1075
IDR	1.1988	4.7852	0.80392	1.0523	1.7993	6.3721	1.32327	1.6310
MYR	0.4969	0.8470	2.14814	1.6201	0.7798	1.7118	2.45634	1.9395
Benchmark								
KRW	0.2889	0.9047	0.3713	0.3648	0.3005	1.0109	0.3585	0.3632

1/ A positive gap suggests that onshore forward rate is less appreciated/more depreciated than offshore rate, hence indicating capital controls on inflows.
Source: Author's calculations.
Notes: MYR denotes Malaysian ringgit, IDR denotes Indonesian rupiah, KRW denotes South Korean won, BRL denotes Brazilian real, INR denotes Indian rupee, PHP denotes the Philippine peso, CNY denotes Chinese renminbi, and THB denotes Thai baht.

Table 2. Deviation from Covered Interest Parity 1/

	3-month			
	Pre-GFC	During GFC	Post-GFC	Full sample
Simple average				
KRW	-0.5442	3.0125	-0.0554	-0.0872
BRL	-1.6031	-0.3898	1.3650	0.4731
THB	-1.1280	-0.0366	1.4675	0.6886
PHP	1.5665	-0.6600	1.4206	1.3902
MYR	-0.5389	0.3524	2.2367	1.3943
CNY	0.2885	-0.1143	3.6860	2.6037
IDR	N/A	N/A	4.5145	4.5145
INR	**2.8638**	**4.7975**	**6.2371**	**5.2425**
Benchmark				
KRW	-0.5442	3.0125	-0.0554	-0.0872
Average of absolute value				
KRW	1.4140	3.0125	0.4843	0.8315
BRL	1.6092	0.6387	1.3724	1.4136
THB	1.4221	0.4818	1.4918	1.4377
PHP	1.5935	1.5723	1.4766	1.5126
MYR	0.9453	0.8101	2.2420	1.8295
CNY	1.7819	0.8600	3.7184	3.0778
IDR	N/A	N/A	4.5619	4.5619
INR	**2.8638**	**5.0961**	**6.2371**	**5.2527**
Benchmark				
KRW	1.4140	3.0125	0.4843	0.8315

1/ A positive gap indicates that onshore money market rate is higher than offshore, hence suggesting capital controls on inflows.

Source: Author's calculations.

Notes: MYR denotes Malaysian ringgit, IDR denotes Indonesian rupiah, KRW denotes South Korean won, BRL denotes Brazilian real, INR denotes Indian rupee, PHP denotes the Philippine peso, CNY denotes Chinese renminbi, and THB denotes Thai baht.

References

Baba, N., and F. Packer, 2009, "Interpreting Deviations from Covered Interest Parity During the Financial Market Turmoil of 2007–08," *Journal of Banking and Finance* 33 (11), 1953-1962.

Gupta, A.S. and R. Sengupta, 2013, "Management of Capital flows in India", Asian Development Bank South Asia Working Paper Series No. 17, March 2013.

Ma, G. and R.N. McCauley, 2013, "Is China or India More Financially Open?" *Journal of International Money and Finance* 39, 6-27.

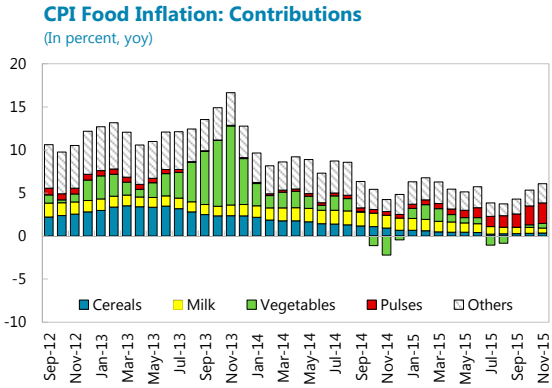
International Monetary Fund, 2012, "Liberalizing Capital Flows and Managing Outflows," International Monetary Fund, Washington D.C.
http://www.imf.org/external/pp/longres.aspx?id=4645

International Monetary Fund, 2015, "Assessing Reserve Adequacy—Specific Proposals," IMF Policy Paper, International Monetary Fund, Washington D.C.
http://www.imf.org/external/pp/longres.aspx?id=4947

INDIAN CEREAL INFLATION AND INTERNATIONAL COMMODITY PRICES[1]

Indian prices of cereals co-move with prices in the international market. Minimum support prices should support alignment of domestic and international market prices along the long-term trends and help guard against excessive domestic price volatility.

1. Minimum support prices for rice and wheat have often been singled out as key drivers of Indian inflation. Cereals have a combined weight of about 10 percent in the Indian CPI basket and their inflation has been a key contributor to Indian inflation in recent years. India's agriculture regulatory framework allocates a central role to the state in the market of cereals. Its key regulatory pillar is the Essential Commodities Act which empowers the central and state governments to regulate and control production, distribution and pricing of commodities identified as essential for consumers. Instruments for market intervention include minimum support prices (MSPs), buffer stocks and the Targeted Public Distribution System. Although minimum support prices are intended to provide a floor for market prices, in practice in part due to an open ended procurement policy, substantial increases in minimum support prices in recent years were generally followed by rising inflation in key agricultural crops (Rajan, 2014; Anand and Cashin, 2016).



Sources: CEIC; and IMF staff calculations.

2. International market prices are an important input into government decisions on minimum support price increases. Fixed by the government, MSPs are decided on the recommendations of the Commission for Agricultural Costs and Prices (CACP), which in formulating its recommendations takes into account a large number of factors, key among which are domestic cereal production costs as well as the international price situation. Indeed, the Food Corporation of India was established in 1965 against the backdrop of India's major shortage of grains and a massive grain import bill. Over time, as production increased substantially, India has emerged as a net cereal exporter and the largest exporter of rice in the world. Nonetheless, India's policy measures to isolate domestic cereal prices from volatility of international market prices suggest that international market price dynamics remain non-trivial. In addition, domestic prices are also affected by generally high import tariffs, occasional product-specific export bans and export subsidies, as well as budgetary support for agricultural inputs and infrastructure.

3. Indian domestic prices of wheat and rice co-move with prices in international markets. Econometric analysis using vector-error correction models of average domestic farm gate

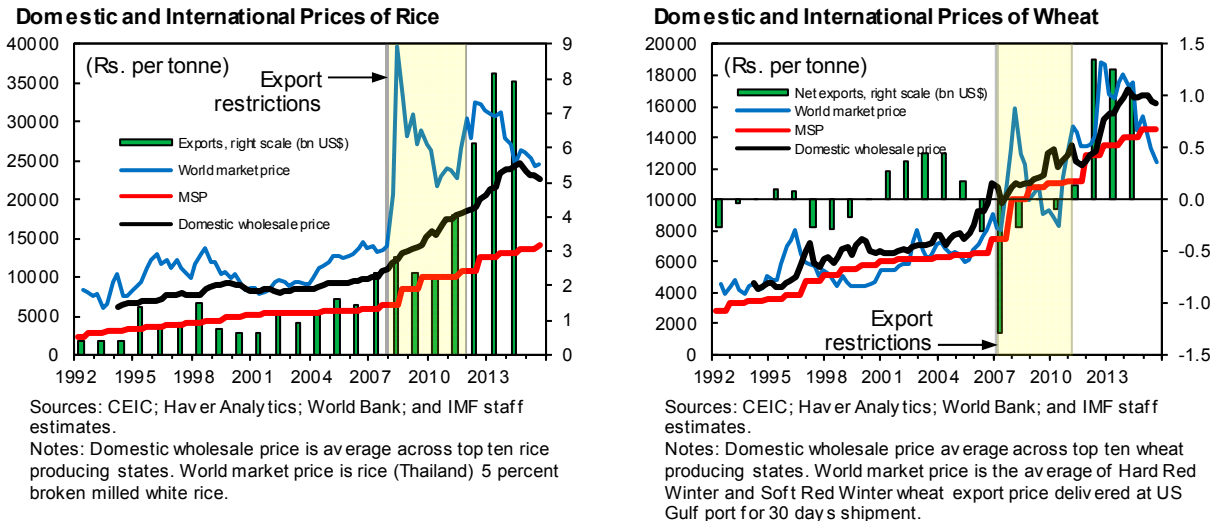
[1] Prepared by Volodymyr Tulin.

(wholesale) and international market prices (converted into rupees) and post-1992 data indicates that for both rice and wheat, the coefficients on the domestic price in the long-term relationship are statistically significant and are close to one (0.97 for rice and 1.07 for wheat). International market prices are found to be weakly exogenous to domestic prices, while the estimated error correction terms for domestic prices are statistically significant and are about 0.06 for rice and 0.08 for wheat. In addition, alternative econometric specifications with MSPs as measures of domestic prices yield similar results. This suggests that international prices appear to be an important input into the government's decision on MSPs and they influence domestic market prices, both in the short- and the long-run.

4. However, hikes in MSPs for cereals appear not to have a lasting impact on cereal inflation. Vector-error correction models of domestic farm gate prices and MSPs indicate that farm gate prices of both wheat and rice are weakly exogenous to their MSPs, which suggest that MSPs rather than domestic market prices tend to adjust to short-term deviations from their long-term relationships. In addition, impulse responses of farm gate prices for both rice and wheat to hikes in MSPs do not indicate the presence of a lasting impact on cereal inflation. On the contrary, the responses of MSPs for both cereals to shocks to wholesale prices are statistically significant, covering on average about ¾ of the wholesale prices shock over one year. The empirical evidence thus suggests that except in the short-term, MSPs tend to react to changes in wholesale prices, rather than the other way around. This implies that the inflationary impact of MSP hikes may be rather trivial. Moreover, as MSPs and domestic wholesale prices of cereals are influenced by and move in line with international prices, the global market price will remain important in defining Indian cereal prices in the long-term.

5. The guiding principle for MSPs should be alignment of domestic and international prices along the long-term trends, while guarding against excessive domestic price volatility through temporary safeguards, as has been advocated by the CACP. The international commodity price outlook suggests that Indian cereal inflation is likely to remain in check. In addition, off-loading of excessive cereal buffer stocks into open markets or through exports could have an additional softening impact on prices. Nonetheless, domestic cost challenges remain, including on account of two consecutive unfavorable monsoons, and they could also chip away at rural demand recovery. In addition, the impact of the collapse of global oil prices on Indian cereal production costs is likely to be limited (estimated at only around 1 percentage point). Indeed, in response to a drop in global wheat prices, Indian authorities have recently imposed a wheat import duty (25 percent) for the first time in nearly a decade. Indian cereal yields are subpar in international comparison and the variation in yields across Indian states is also large. Therefore, price and income support, such as the recent increase in Mahatma Gandhi National Rural Employment Act (MGNREGA) working days for drought-affected rural areas, and stabilization policies would need to be complemented by policies to enhance agricultural productivity, including along the lines of the Food Corporation of India Restructuring Committee Report.

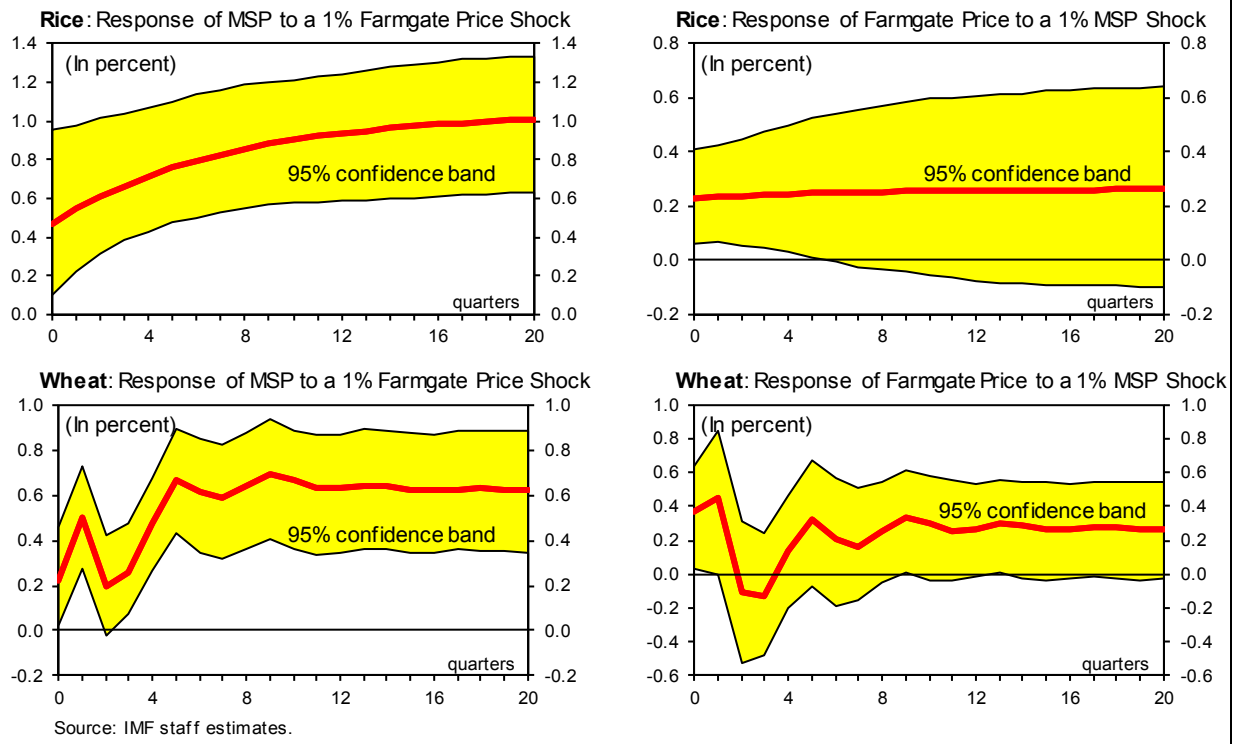
Figure 1. India: Domestic and International Prices of Cereal Crops



Sources: CEIC; Haver Analytics; World Bank; and IMF staff estimates.
Notes: Domestic wholesale price is average across top ten rice producing states. World market price is rice (Thailand) 5 percent broken milled white rice.

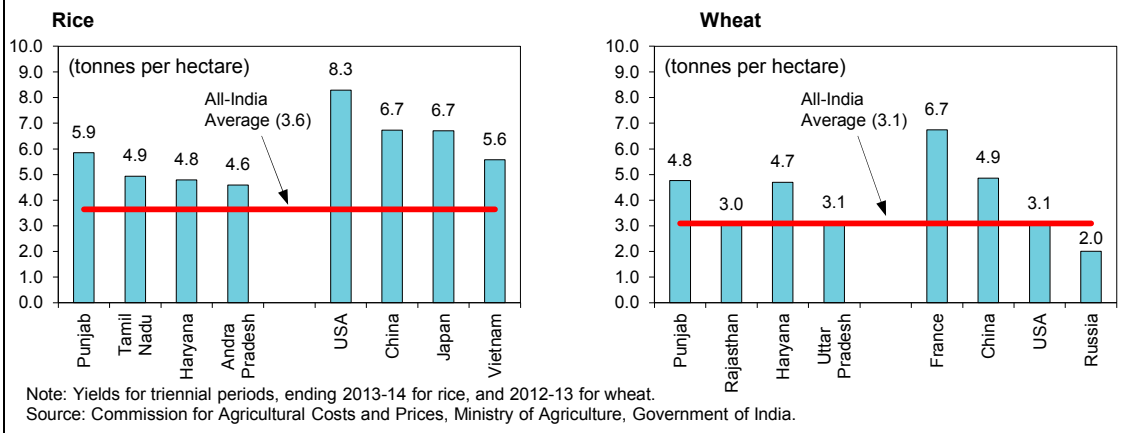
Sources: CEIC; Haver Analytics; World Bank; and IMF staff estimates.
Notes: Domestic wholesale price average across top ten wheat producing states. World market price is the average of Hard Red Winter and Soft Red Winter wheat export price delivered at US Gulf port for 30 days shipment.

Figure 2. Generalized Impulse Responses: Domestic Farmgate Prices and Minimum Support Prices (MSPs) for Rice and Wheat



Source: IMF staff estimates.

Figure 3. International and Indian State-Wise Productivity of Cereals Crops



Note: Yields for triennial periods, ending 2013-14 for rice, and 2012-13 for wheat.
Source: Commission for Agricultural Costs and Prices, Ministry of Agriculture, Government of India.

References

Anand, R., N. Kumar, and V. Tulin, 2016, "Understanding India's Food Inflation: The Role of Demand and Supply Factors." IMF Working Paper 16/2 (International Monetary Fund: Washington).

Anand, R. and P. Cashin. 2016, *Taming Indian Inflation*. International Monetary Fund: Washington, forthcoming.

Government of India, Commission for Agricultural Costs and Prices (CACP), 2013, "Price Policy for Rabi Crops. The Marketing Season 2014–15", July 2013.

Rajan, R., 2014, "Fighting Inflation", Inaugural Speech at FIMMDA-PDAI Annual Conference 2014, on February 26, 2014 at Mumbai.

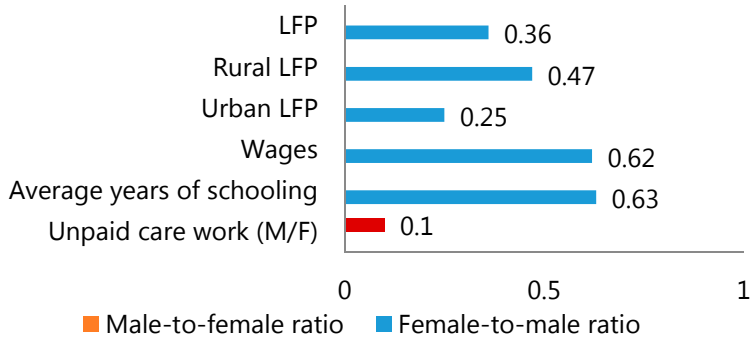
Report of the High Level Committee on Reorienting the Role and Restructuring of Food Corporation of India, 2015, Government of India.

MACROECONOMIC IMPACTS OF GENDER INEQUALITY AND INFORMALITY IN INDIA[1]

This chapter employs a dynamic stochastic general equilibrium model to analyze the macroeconomic impact of gender-targeted policies on labor market outcomes of females and on aggregate economic activity in India. These policies are found to increase female labor force participation and output. To help lower gender gaps in formal employment and wages, gender-targeted policies should be implemented simultaneously with policies focused on alleviating labor market rigidities. Otherwise, a lack of sufficient formal job creation could result in an increase in overall unemployment and informality and could further widen gender gaps.

1. A lack of decent jobs in the formal sector is an important factor leading to low and falling female labor force participation rates in India. India's female labor force participation (FLFP) is the third lowest in the South Asia region and has been declining—it fell from 34.1 percent in 1999–00 to 27.2 percent in 2011–12. It is less than one-third of male labor force participation which has remained relatively stable at around 80 percent. Females also receive lower wages, are overrepresented in informal and unpaid domestic work, and gender gaps exist along several other dimensions including education, access to productive inputs, and bargaining power at home (Figure 1). In addition to factors such as social norms, education, safety, infrastructure, and gender discrimination, lack of employment opportunities in the formal (organized) sector is also an important contributor to this trend in FLFP (see Das et al, 2015; and Chatterjee et al, 2015). More than 80 percent of the workforce in India works in the informal (unorganized) sector, and women constitute only 20 percent of total formal employment (Census, 2011).[2] Rigidities in the labor market due to strict regulations have been identified as the main drivers of this large informality (see Besley and Burgess, 2004; Sharma, 2009; and ILO, 2012).

Figure 1. Gender Inequality Remains High in India



Sources: World Bank, 2010; Global Gender Gap Report, 2013; NSSO, 2009-10.

2. A considerably vast and growing literature finds a negative impact of gender inequality in employment and education on economic growth. Increase in FLFP and employment

[1] Prepared by Purva Khera, based Khera (2016).

[2] The majority of females work in the agricultural and non-agricultural informal sector, with the share of female agricultural workers 16 percent higher than that of males.

is shown to raise growth through an increase in average human capital (as females invest more in children's education relative to males), increase in household income, and a move from unpaid domestic work (unaccounted for in GDP) to paid market work (e.g. Klasen, 1999; Dollar and Gatti, 1999; Klasen and Lamanna, 2009; and Barro and Lee, 2013). However, in India where women are more likely to be engaged in insecure, low paid jobs in the informal sector, FLFP only provides a partial analysis of women's work. Hence, policy recommendations based on increasing FLFP alone can be misleading as the impact of policies on the quality of female employment, wages, and unemployment reinforces a virtuous cycle of gender dynamics.

3. **The following question is analyzed**: What is the optimal strategy for implementing policies to improve labor market outcomes of females (in particular, FLFP, females' access to formal employment, and gender wage gaps), while also contributing to aggregate economic activity (GDP, aggregate unemployment, and formality in the labor market)? We study the impact of gender-targeted policies such as an increase in female education, stronger enforcement of laws against gender discrimination in employment, improvements in public provisions (including childcare), and an increase in female safety and mobility. In addition, the impact of lower regulations in the formal sector, i.e. higher labor market flexibility, is also estimated.

4. **A dynamic stochastic general equilibrium (DSGE) model with both informality and gender inequality is estimated for India.** The two-sector model—estimated on nine key macroeconomic variables from 1996Q1 to 2012Q1 using Bayesian estimation techniques—adds gender inequality and informality in the labor market to a standard small open economy DSGE model. Households consist of males and females, where the labor supply decision of each individual is an outcome of an optimal allocation among paid market-good production, unpaid home-good production,[3] job search, and leisure; while also being driven by their relative intra-household bargaining power.[4] Gender inequality is modeled as various frictions on demand for female labor and on female supply where constraints on supply include higher safety and mobility constraints, social norms and lack of public provisions (infrastructure, childcare etc.), whereas constraints on female labor demand entail lower education (i.e. lower worker skill) relative to males and gender discrimination in employment. To capture rigidities in the labor market, firms in the formal sector face a higher cost of hiring and firing workers; and workers employed in the formal sector have higher bargaining power in the wage determination process (i.e. unionized labor). In addition, female

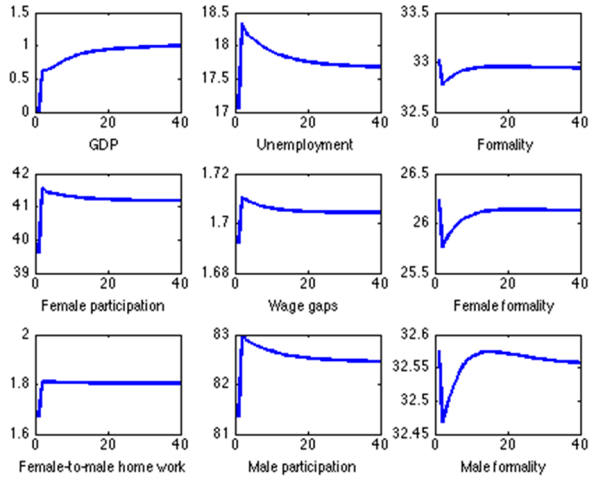
[3] According to the OECD Gender Data Portal, routine housework (cooking, cleaning, home maintenance etc.), and care for household members makes up the greatest proportion of India's unpaid home-work.

[4] Intra-household bargaining power of females is an increasing function of relative female-to-male earnings which captures the feedback effect of females' labor market outcomes on their bargaining position at home.

workers have lower bargaining power due to male domination of labor unions in India (ILO's Trade Union Membership Statistics, 2011).

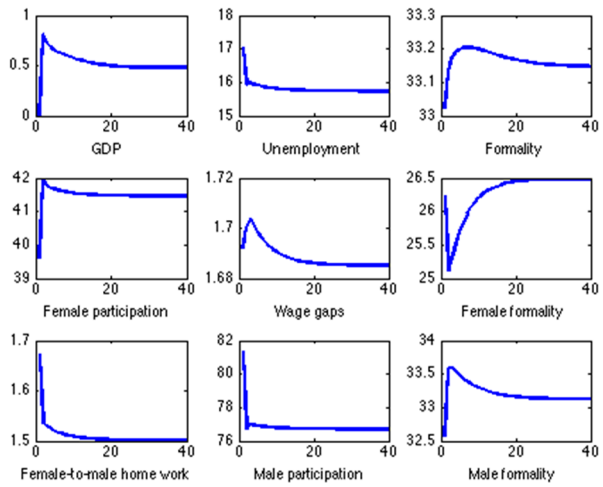
5. While gender-targeted policies boost FLFP and output, lack of adequate formal job creation leads to higher unemployment and informality and further widens gender wage gaps. By lowering constraints on female labor supply, both increase in female safety and mobility (Figure 2)[5] and improvements in public provisions boost FLFP, leading to gains in GDP as females move from unpaid home-work unaccounted for in GDP (and leisure) to market-work. However, as a result of labor market rigidities, these policies do not generate sufficient job creation in the formal sector, resulting in a large proportion of the increased female participants either getting employed in low paying informal jobs or staying unemployed. This further widens gender gaps in wages and informal employment, thus worsening gender inequality, while also increasing aggregate informality and unemployment in the economy.[6] However, we do find one exception with the policy of an increase in female education, which by increasing female workers' efficiency in employment directly leads to an increase in females' formal employment (Figure 3). This in turn increases the overall productivity and size of the formal sector, leading to the creation of more formal jobs for both males and females. However, due to slow reallocation of workers to the formal sector, female formality falls and gender wage gaps widen in the short-run.

Figure 2. Increase in Female Safety and Mobility



Source: Author's calculations.

Figure 3. Increase in Female Education



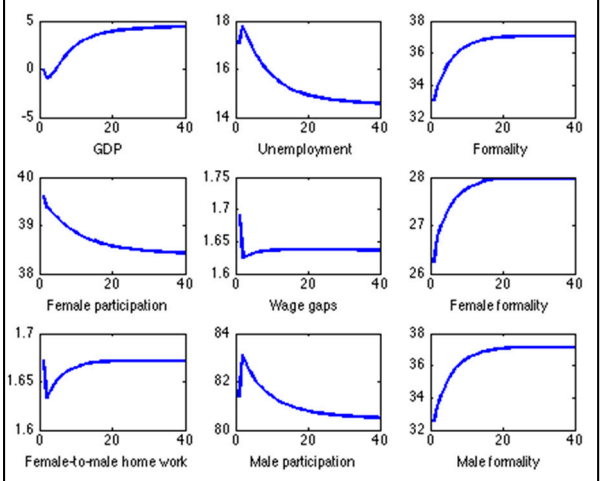
Source: Author's calculations.

[5] For GDP (real output), all figures in this chapter (Figures 2–6) show a percentage deviation from the initial steady state, while for the rest of the variables the levels (%) are shown. Formality is the percentage of formal workers among the employed. Similarly, female (male) formality is the percentage of female (male) workers employed formally among the ones employed. Wage gap is the ratio of male-to-female average wage. Ratio of female-to-male home-work reflects gender gaps in unpaid care work.

[6] Females' home-work burden also increases, as females substitute out of leisure into market-work and home-work. On the other hand, policy of increasing public provisions directly lowers females' home-work burden and we instead see a fall in female-to-male home-work ratio.

6. Lowering regulations in the formal labor market allows more women and men to be employed in the formal sector, however, males gain more and there is a fall in FLFP. Relaxing regulations lowers hiring cost and bargaining power of formal workers, leading to an increase in formal employment of both males and females, a fall in unemployment and an increase in real output (Figure 4). However, male workers gain more, as unchanged constraints on female labor supply and demand along with a positive household income effect, both lower FLFP (as opposed to increasing in the short-run and falling marginally in the long-run for males) and lead to a smaller increase in female formality in comparison to males. In addition, slow reallocation of workers from the informal to the relatively rigid formal sector increases unemployment and lowers real output in the short-run.

Figure 4. Lower Regulations in the Formal Labor Market



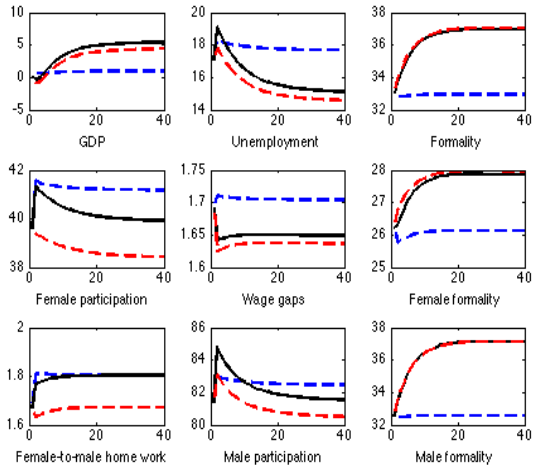
Source: Author's calculations.

7. Simultaneously implementing gender-targeted policies that lower constraints on FLFP combined with policies that boost formal job creation not only improves gender equality in the labor market, but also leads to significantly higher gains in aggregate economic activity. Figure 5 (black solid line) shows the effect of a simultaneous reform package combining an increase in female safety and mobility (blue dashed line) with deregulation in the formal labor market (red dashed line). Better female safety and mobility outside the home directly increases their labor participation with these females now being able to find high paying formal jobs as the formal sector expands due to lower labor market rigidities. Expansion of the formal sector also increases male formality in employment, which leads to higher male labor participation as their return from job search is now higher. Thus, real output (GDP) increases by more in this scenario. Moreover, it also increases in the short-run as opposed to when only the deregulation reform is implemented.[7] We find similar results (black solid line) when the policy of increase in female safety and mobility (blue dashed line) is combined with an increase in female education (red dashed line) in Figure 6.[8] Hence, policies should be designed to prioritize getting females into paid work outside the home (i.e. lower

[7] However, there is a larger short-run increase in unemployment caused by two factors: increase in both male and female participation, and slower creation of jobs in the formal relative to the informal sector.

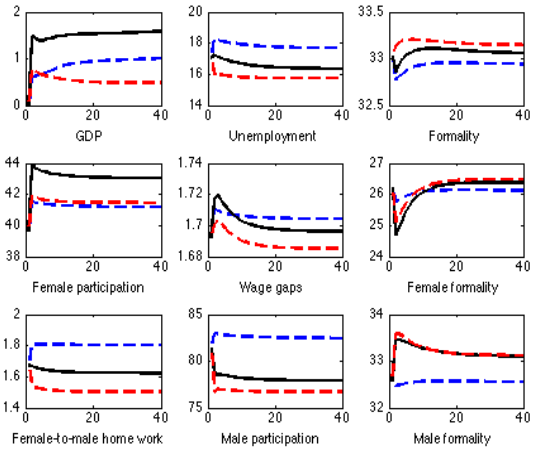
[8] These results also hold true for the following combination of policies: i) increase in female education and stronger laws against gender discrimination in employment; ii) increase in public provisions and labor market deregulation; iii) increase in public provisions and increase in female education.

Figure 5. Increase in Female Safety and Lower Formal Regulations



Source: Author's calculations.

Figure 6. Increase in Female Education and Safety



Source: Author's calculations.

constraints on female labor supply), while at the same time making sure that there are enough formal job opportunities (i.e. lower formal labor market rigidities), and that females have access to these formal jobs (i.e. lower constraints on female labor demand).

References

Barro, R.J. and J.W. Lee, 2013, "A New Data Set of Educational Attainment in the World, 1950-2010," *Journal of Development Economics*, 104, 184–198.

Besley, T. and R. Burgess, 2004, "Can Labor Regulation Hinder Economic Performance? Evidence from India," *The Quarterly Journal of Economics*, 119: 91-134.

Chatterjee U., R. Murgai, and M. Rama, 2015, "Job Opportunities along the Rural-Urban Gradation and Female Labor Force Participation in India," Policy Research Working Paper 7412. World Bank, September 2015.

Das, S., S. Jain-Chandra, K. Kochhar, and N. Kumar, 2015, "Women Workers in India: Why So Few Among So Many?," IMF Working Paper, WP/15/55 (International Monetary Fund: Washington DC).

Dollar, D. and R. Gatti, 1999, "Gender Inequality, Income, and Growth: Are Good Times Good for Women?," Policy Research Report on Gender and Development Working Paper Series, No. 1, May 1999.

International Labour Organization, 2010, *Women in Labor Markets: Measuring Progress and Identifying Challenges*. Geneva: ILO.

International Labour Organization, 2012, *Statistical Update on Employment in the Informal Economy*. ILO, Department of Statistics. June 2012.

Khera, P., 2016, "Macroeconomic Impacts of Gender Inequality and Informality in India," IMF Working Paper, WP/16/16 (International Monetary Fund: Washington DC).

Klasen, S., 1999, "Does Gender Inequality Reduce Growth and Development? Evidence from Cross-Country Regressions," Policy Research Report on Gender and Development Working Paper Series, No. 7, November 1999.

Klasen, S. and F. Lamanna, 2009, "The Impact of Gender Inequality in Education and Employment on Economic Growth: New Evidence for a Panel of Countries," *Feminist Economics*, 15(3), 91-132.

Sharma, S., 2009, "Entry Regulation, Labor Laws, and Informality," Working Paper, Enterprises Analysis Unit, World Bank.