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INDIA

SELECTED ISSUES

January 10, 2017

Approved By
Asia and Pacific Department

Prepared by Paul Cashin, Sonali Jain-Chandra, Volodymyr Tulin, Piyaporn Sodsriwiboon, Sonali Das, Purva Khera, Johanna Schauer, Anh Le (all APD), Silvia Iorgova (MCM), Svitlana Maslova (SPR), and Ian Parry, Victor Mylonas, Nate Vernon (all FAD).

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SUMMARY

The background papers for the 2017 Article IV explore key issues affecting the Indian economy, and implications for fiscal, monetary, financial sector and other structural policies.

The first chapter evaluates corporate and banking sector vulnerabilities in India. The analysis shows that while corporate sector risks have subsided, debt repayment capacity remains strained and high leverage levels continue to weigh on corporate resilience, which may pose further risks to banks' asset quality. Public sector banks have stepped up recognition of non-performing assets, but their debt recovery capacity remains weak. Simulations suggest that potential recapitalization needs, at current provisioning levels, should have a modest fiscal impact.

The second chapter assesses a safe public debt level based on the debt intolerance approach. Many countries use debt-to-GDP targets to anchor fiscal policies. This chapter finds that that based on regression analysis, the threshold for the safe level of debt for India falls in the range of 60-65 percent of GDP, taking into account buffers needed to accommodate existing contingent liabilities.

Chapter 3 assesses the extent to which center-state fiscal transfers smooth regional shocks and help income redistribution across Indian states. The analysis suggests that fiscal transfers from the central government to the states offset about twelve percent of permanent shocks to states' income (redistribution effect). However, the analysis also points to the need to improve the stabilization features of India's central government finances, as transfers appear to be pro-cyclical with respect to both idiosyncratic shocks (interregional risk-sharing) and common shocks (macroeconomic stabilization).

The fourth chapter explores the feasibility of universal basic income (UBI) proposals in the Indian context. In India, the existing social protection system—primarily based on subsidies—has flaws. These subsidy schemes are often associated with high administrative costs and ineffectiveness, particularly leakages to non-targeted better-off people. While UBI may help overcome some failures of the current system, concerns on fiscal affordability and political feasibility weigh heavily on policy discussions.

The fifth chapter analyzes India's export competitiveness and examines the recent slowdown of exports. India's trade weakness can be attributed to both external and domestic factors—weak trading partners' demand and real appreciation of the Indian rupee were the key drivers of the export slowdown. India's high tariffs and trade costs have also weighed on its export performance and new investment that is needed to better integrate Indian exports into global value chains.

Chapter 6 discusses recent trends in capital flows and the evolution of capital account openness indices for India. It finds that India's recent capital account liberalization measures have not been reflected in these de jure indices, which have remained unchanged in recent decades. Structural policies, particularly those aiming on strengthening the financial sector and institutions, should

complement capital account liberalization efforts to increase the benefits of capital flows to the economy.

The seventh chapter evaluates the effects of labor and product market deregulation policies in the presence of short-run reform costs. The analysis suggests that with limited policy space, sequencing of reforms should prioritize implementing labor market reforms as they reinforce the long-run gains in potential output and employment, minimize short-term costs, and increase the acceptability of these politically-difficult reforms.

Chapter 8 uses a practical spreadsheet tool to estimate the environmental, fiscal, economic, and incidence effects of a wide range of options for reducing fossil fuel use in India. Progressively increasing the (recently introduced) coal tax would substantially reduce air pollution mortality, raise significant revenue, and ensure India meets its mitigation pledges for the Paris Agreement on climate change. The environmental effectiveness of the coal tax easily exceeds that for a wide range of other mitigation instruments (e.g., emissions trading systems, incentives for energy efficiency and renewables) and is almost as effective as a carbon charge applied to all fossil fuels.

Chapter 9 examines the key macro-financial linkages between gender gaps in access to formal finance and macroeconomic performance in India. Policies that relax financial constraints faced by females are found to increase female entrepreneurship, output and employment. However, to lower gender gaps in labor market outcomes, policies that alleviate labor market rigidities should be implemented simultaneously to maximize long-run gains from greater financial inclusion.

Chapter 10 analyzes the relationship between education and inequality in the Indian economy. It finds that income inequality has increased, while enrollment and learning achievements have lagged behind. It concludes that policies need to aim at increasing returns to education in order to enhance educational achievements, while cash transfers can support liquidity-constrained households and reduce inequality.

The eleventh chapter analyzes developments in per capita incomes across Indian states over the last five decades, and tests whether cross-state income convergence has occurred. It finds some evidence of income convergence during the pre-1990s economic reform period, but Indian state income growth has further widened disparities in the post-1990 economic reform period.

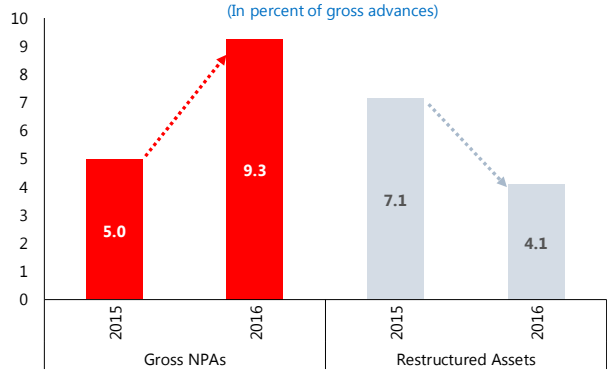
The final chapter focusses on the role of food security and agriculture sector policies in affecting health and nutrition in India. A multi-sectoral approach—including addressing inherent long-term structural bottlenecks within the agricultural sector and improving productivity of pulses (a major source of protein), along with improvements in sanitation and gender equality, is needed to lower the high rates of undernourishment and hunger currently prevalent in India.

CORPORATE AND BANKING SECTOR VULNERABILITIES IN INDIA[1]

The Asset Quality Review (AQR) initiated by the Reserve Bank of India (RBI) has led to an uptick in the recognition of non-performing assets (NPAs) across public sector banks (PSBs). Policy steps to address supply-side bottlenecks—notably in the infrastructure sector—have ameliorated corporate sector vulnerabilities. However, Indian corporates continue to be highly levered. and some sectors are still subject to debt repayment capacity strains. Sensitivity analysis of corporate balance sheets confirm that exposure to potential shocks is still high and, thus, continues to weigh on PSBs' asset quality. Altogether, PSBs are expected to require further capital augmentation in the coming years, but simulations suggest that, at current provisioning levels, its scale should have a modest fiscal impact.

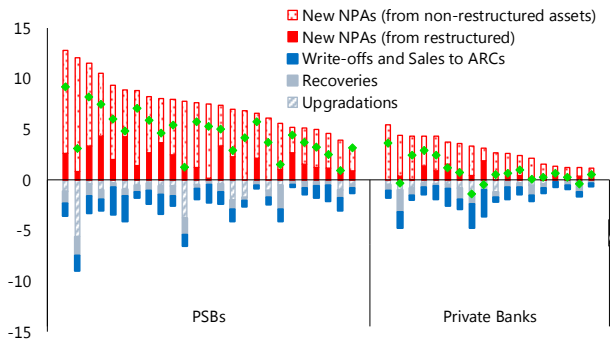
1. A strong policy impetus to enforce robust asset quality recognition across PSBs has induced a considerable uptick in NPAs. The AQR, initiated by the RBI in December 2015, is intended to lead to a full recognition of NPAs by March 2017. As a result, NPA slippages across PSBs have accelerated noticeably, and their aggregate NPA ratio increased to 9.3 percent in FY2015/16, from 5 percent a year earlier.[2] The accumulation of NPAs reflected both an intensified transition of previously restructured loans into NPAs, and a broader recognition of NPAs among previously un-restructured exposures. The brisk re-classification of standard restructured loans into NPAs accounted for a sizable contraction in restructured assets, whose share in total advances receded to 4.1 percent from 7.1 percent a year earlier. Most AQR-related recognition of NPAs appears to have already materialized, albeit with some potential for a further rise in NPAs, due to remaining, still unrecognized, vulnerable accounts.

PSBs: Gross NPAs and Restructured Loans
(In percent of gross advances)



Source: Reserve Bank of India (RBI).

NPA Formation at Indian Banks, end-FY2016
(In percent of standard assets at end-FY2015)

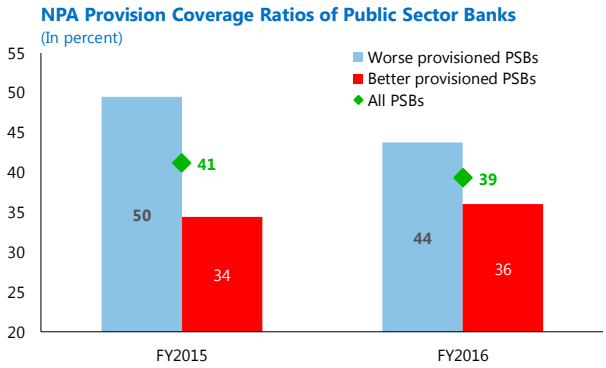


Sources: Reserve Bank of India (RBI); and IMF staff calculations.

[1] Prepared by Silvia Iorgova.

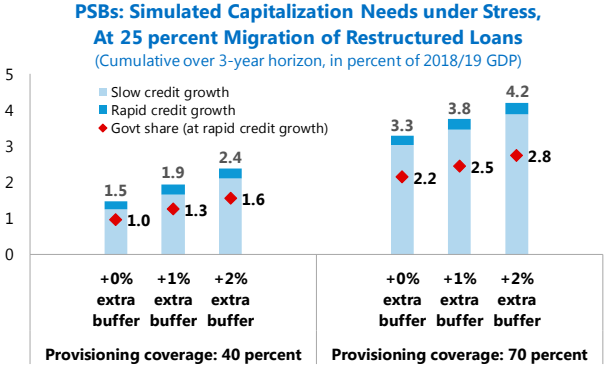
[2] NPA slippages among PSBs, accelerated to 7.2 percent in FY2015/16 from 3.4 percent in the previous year. The NPA slippage ratio is the ratio of gross new NPAs during the year to standard assets at the beginning of the year. Estimates of NPA slippages, and shares of restructured and stressed assets are from RBI data based on OSMOS returns.

2. Low NPA provisioning and weak debt recovery remain key challenges for PSBs. Intensified NPA recognition has led to a considerable uptick in provisioning allocation and a further decline in PSBs' profitability, with return of assets (ROAs) of PSBs turning negative in FY2015/16. However, PSBs' aggregate provision coverage ratio continues to be low, at 39 percent as of end-FY2015/16, raising concerns about the sufficiency of provisioning, particularly in view of weaknesses in the loan resolution process.[3] While banks with less robust provisioning coverage (i.e. those below the PSBs' average in FY2014/15) bolstered provisioning in FY2016, previously better-provisioned banks saw provisioning coverage slip to 44 percent in FY2015/16 from 50 percent a year earlier. Overall, PSBs' loan recovery capacity remains weak. The rise in NPAs in FY2015/16 was offset primarily via write-offs, which accounted for a 1.2 percentage-point offset in NPA slippage rates in FY2015/16, compared to only 0.6 percentage points for loan recoveries, underscoring the need for timely implementation of debt resolution reforms.



Sources: Banks' annual reports; and IMF staff calculations.
Note: PSBs are determined as better or worse provisioned, based on whether they were above or below PSBs' average provisioning coverage ratio of 41 percent in FY2015.

3. Simulations of further PSB asset quality deterioration suggests that potential capitalization needs, under current provisioning levels, should have a modest fiscal impact. The simulations assume a 25 percent transition of restructured advances to NPAs in each year to end-FY2018/19, with a minimum 40 percent and 70 percent provisioning against NPAs.[4] The analysis is carried out on a bank-by-bank basis, with slippage, recovery and write-off rates calibrated to banks' performance in FY2015/16, and using the Tier 1 capital ratio as a hurdle rate (including the 2.5 percent capital conservation buffer (CCB) and additional buffers of up to 2 percent, the latter meant to ensure market confidence). 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 1.5 to 2.4 percent of FY2018/19 GDP, and a government share of 1.0-1.6 percent (cumulatively over four years), with the range reflecting up to 2 percentage-point buffers above the minimum requirement. However, recapitalization costs would be considerably higher if there is a policy shift to more conservative provisioning



Sources: Banks' balance sheets; and IMF staff estimates.
Note: Rapid credit growth assumed at 1.1xGDP growth; and slow at 0.9xGDP growth. Migration refers to the reclassification of restructured loans into NPAs.

[3] The 2017 Financial Sector Assessment Program (FSAP) Update will examine in more detail provisioning across Indian banks.

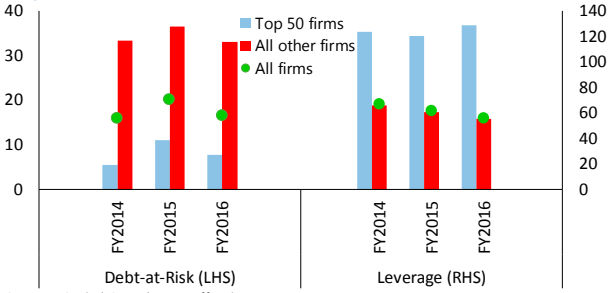
[4] The 25 percent transition rate of restructured assets into NPA is in line with that experienced by PSBs in FY2015/16. The increase of provisioning to 70 percent is motivated by the need for Indian banks to pursue more conservative provisioning, and is aligned with RBI's past minimum provisioning level requirements.

requirements. In case of a rise in the required provisioning ratio to 70 percent, cumulative recapitalization needs would increase to 3.3-4.2 percent of FY2018/19 GDP, with a government share of 2.2-2.8 percent.

4. PSBs continue to be exposed to risks related to the slowly improving, but still elevated, corporate sector vulnerabilities.[5] The link between the financial performance of the banking and corporate sectors in India is strong. With the corporate sector accounting for about 40 percent of banks' (particularly PSBs') credit portfolios, PSB's soundness and their ability to provide effective intermediation in the economy rest on effective debt restructuring and deleveraging in the corporate sector. Corporate vulnerabilities subsided in FY2015/16 on concerted policy efforts to address structural bottlenecks, including delays in environmental clearances and land acquisition permits. Debt-at-risk—the share of debt held by firms with weak debt-repayment capacity (interest coverage ratio below one)—declined to 16.6 percent from 20.2 percent a year earlier, pointing to improved debt-repayment capacity.[6,7] However, the high debt-at-risk and NPAs in some sectors—as high as 36 percent in metals and mining—pose NPA slippage risks for banks.

Corporate Sector Vulnerabilities

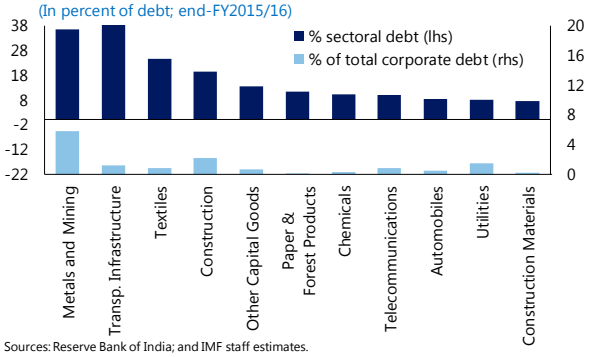
(In percent)



Sources: CapitalIQ; and IMF staff estimates.
Note: Based on a sample of 2,057 firms. Top 50 firms based on total assets. Leverage is the median debt-to-equity ratio within each group, excluding 227 firms with negative equity. Debt-at-risk is the share of debt of firms with interest coverage ratio (ICR) less than 1 in each group's overall debt.

Sectoral Distribution of Debt-at-Risk

(In percent of debt; end-FY2015/16)



Sources: Reserve Bank of India; and IMF staff estimates.
Notes: Debt-at-risk is the debt of firms with interest coverage ratio (ICR) less than 1. Textiles includes apparel luxury goods; construction includes engineering; automobiles includes components; telecommunications includes telecommunication services only.

5. Corporate deleveraging has been slow and uneven, particularly among larger firms and across certain sectors, exposing corporates to elevated risks. In the aggregate, firms' indebtedness has been declining consistently, with the median debt-to-equity ratio falling to 56 percent at end-FY2016, from 67 percent two years earlier. However, leverage levels continue to be high relative to other emerging markets (EMs). The debt of highly-levered firms (debt-to-equity ratios above 150 percent) accounts for about half of outstanding corporate debt, and such concentration of debt at the tail-end of the leverage distribution raises corporate vulnerabilities to shocks. Importantly, leverage is also uneven across sectors and firm size. Certain industries—

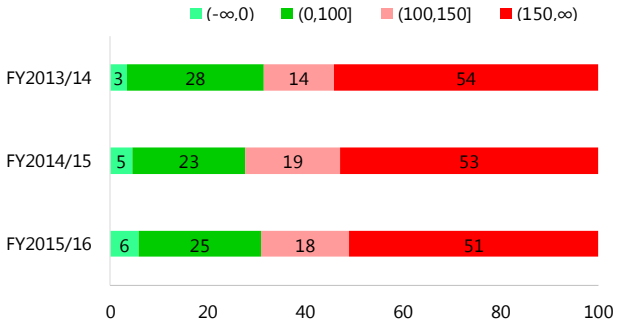
[5] Corporate sector here refers to incorporated entities in the non-priority sectors.

[6] The corporate sector risk analysis is based on a sample of 1,830 to 2,057 firms with data from CapitalIQ available for each of the three years to FY2015/16.

[7] The interest coverage ratio—the multiple of earnings before interest and taxes (EBIT) relative to interest expenses—of a firm measures its debt-repayment capacity (i.e. the availability of profitability buffers to support interest payments on outstanding debt).

including metals and mining, construction and engineering, and transportation infrastructure—which jointly account for a large share of the system's debt-at-risk, also have a high share of debt (more than ¾) in each sector belonging to highly-levered firms (debt-to-equity ratios over 150 percent). India's largest firms (accounting for the top one to three percent of corporate sector assets) have also been persistently more levered than other firms.

Distribution of Corporate Debt by Debt-to-Equity
(In percent; overall and select high leverage sectors)



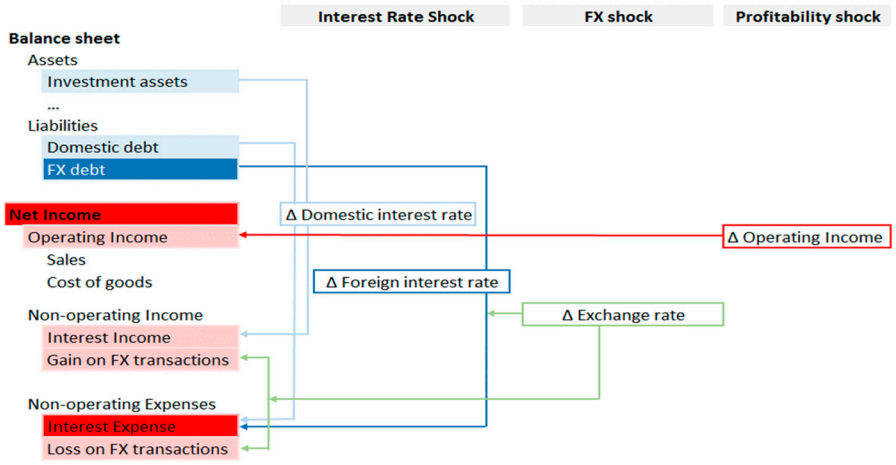
Sources: CapitalIQ; and IMF staff estimates.
Note: Based on a sample of 2,057 firms. Textiles include textiles, apparel and luxury goods.

6. The resilience of the corporate sector to potential domestic and external shocks is assessed via sensitivity tests based on a tail-risk balance sheet approach.[8] Under this approach, the strength of corporates' debt-repayment capacity under extreme stress serves as a gauge of financial soundness. Potential shocks are applied both individually and jointly, and are evaluated under two extremely severe scenarios, entailing: (i) a sharp rise in overseas funding rates (200 and 400 basis points (bps), respectively); (ii) a depreciation of the rupee due to capital outflows (20 and 29 percent); (iii) a rise in the domestic policy rate to defend the currency (200 and 250 bps) (all assumed to impact non-operating income); and (iv) a decline in operating profits (25 percent under both scenarios).[9] With the exception of the profitability shock, the scenario is calibrated based on extreme past movements in the risk factors (the 90+ percentile of joint bilateral distributions of annual changes in risk factors in the first scenario and at unprecedented levels in the second scenario. The shocks were applied to each corporate's balance sheet, and the share of aggregate debt of firms with an ICR below one relative to total corporate sector debt was estimated to assess overall debt repayment capacity.

[8] The approach is similar to that used in IMF, GFSR (2014); Lindner and Jung (2014); and Oura and Topalova (2009). The corporate sector risk analysis is based on a sample of 1,830 to 2,057 firms with data from CapitalIQ.

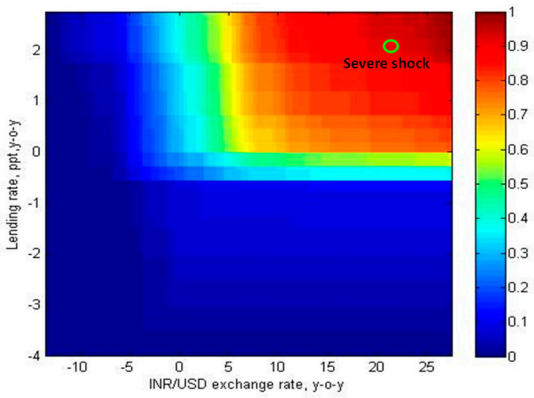
[9] Due to the lack of firm-by-firm data on corporates' foreign currency (FX) liabilities and expenditures, estimates for the aggregate corporate sector were applied in the analysis.

Schematic Overview of the Corporate Sensitivity Analysis Approach

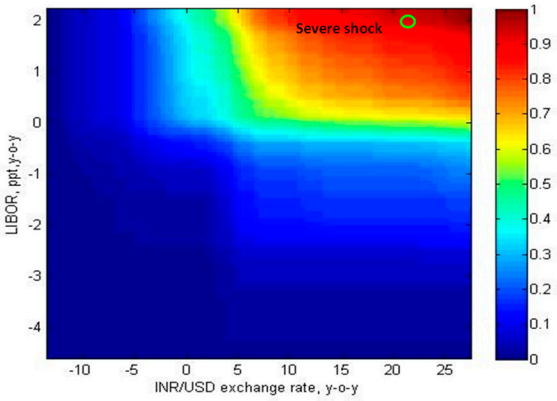


Joint Distribution of Risk Factors

Prime lending rate and INR/USD exchange rate



LIBOR and and INR/USD exchange rate

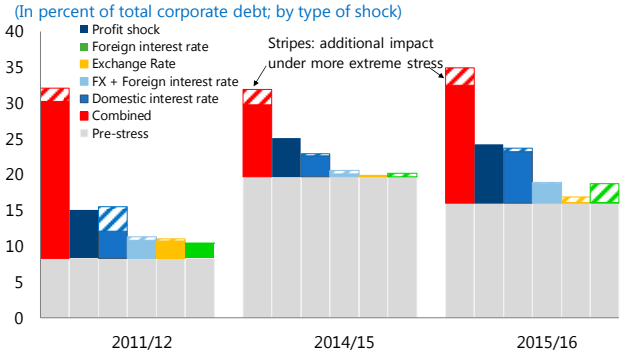


Source: Author's calculations.

7. The sensitivity tests confirm that corporates continue to face potential debt repayment risks. In extreme stress conditions, entailing a confluence of heightened external and domestic risks, the corporate sector's debt-at-risk is expected to rise from 16 percent to up to 35 percent in the more severe scenario. Downward profitability pressures and a potential upward shift in domestic interest rates continue to be key risks for Indian corporates. A 25-percent decline in profitability or a 250 bps rise in domestic rates are associated with a marked uptick in debt-at-risk to 24 percent of overall debt. In the aggregate, Indian firms are less exposed to a sharp foreign currency (FX) depreciation or a rise in LIBOR rates,

Corporate Debt at Risk, Severe and Extreme Stress

(In percent of total corporate debt; by type of shock)



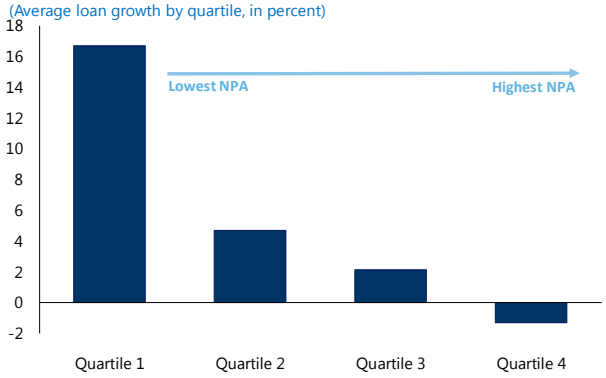
Sources: CapitalIQ; and IMF staff estimates.
Note: Debt at risk is the debt owned by firms with interest coverage ratio (ICR) less than 1. Based on 1,874 corporates with available data for each year in FY2011/12 - FY2015/16.

though the level of vulnerabilities to external risks is reasonably high. A joint materialization of both external-risk factors accounts for a rise in debt-at-risk to 19 percent, a considerably higher level relative to years prior to the most recent rise in corporate vulnerabilities (e.g., FY2011/12). Altogether, the exposure of Indian corporates to all types of financial risks remains elevated.

8. Dependence on external funding continues to expose Indian corporates to potential shocks. Corporates are exposed to rollover risks (of not being able to renew funding), a potential rise in the LIBOR (which underpins ECB funding) or an Indian rupee (INR) depreciation, the latter in case FX funding is insufficiently hedged. Nonetheless, FX hedging across Indian corporates has increased considerably in recent times. RBI data on intentions to hedge ECBs and foreign currency convertible bonds (FCCBs) suggests that the aggregate hedging ratio (excluding natural hedges) rose to about 41 percent of corporate borrowings in the first quarter of FY2015/16 from about 15 percent in FY2013/14. However, uncertainty about the level of corporate hedging over time and about the ability of FX hedging to fully mitigate potential risks—including due to possible maturity mismatches between FX hedges and underlying positions or a potential rise in hedging costs, particularly in case of a large depreciation—leave corporates exposed to FX risks. FX currency risks should be further mitigated by the recent introduction of rupee-denominated ECBs and overseas bonds (Masala bonds) in September 2015.

9. The slow deleveraging and repair of corporate balance sheets and the potential further build-up of NPAs can have negative effects on the real economy. The pace of credit growth has so far been supported by government capital injections in PSBs and a shift of credit demand toward alternatives to bank lending, such as commercial paper (CP) funding. However, the need for capital preservation has led to a marked slowdown of credit growth across PSBs, which, in the aggregate, slowed to 3.7 percent in FY2015/16 from an average of 15 percent in the preceding three years, and contracted particularly for those PSBs with the most problem assets. A larger-than-anticipated rise in new NPA formation due to shocks affecting corporates' debt repayment capacity—e.g., due to weaker demand in certain sectors, or exchange rate or interest rate shocks—or PSBs' inability to raise adequate capital, could further dampen the provision of credit to the real economy and impair growth. While the relatively low credit intensity of the Indian economy reduces the adverse growth effect of muted bank credit growth, the risk of an increase in NPAs is exacerbated by the high corporate leverage levels, which magnify banks' losses in the event of potential shocks, and has already been a drag on domestic investment. Furthermore, the limited monetary and fiscal space in India constrains policymakers' capacity to counteract any additional increase in NPAs.

Loan Growth by NPA quartiles, FY2015-16
(Average loan growth by quartile, in percent)



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

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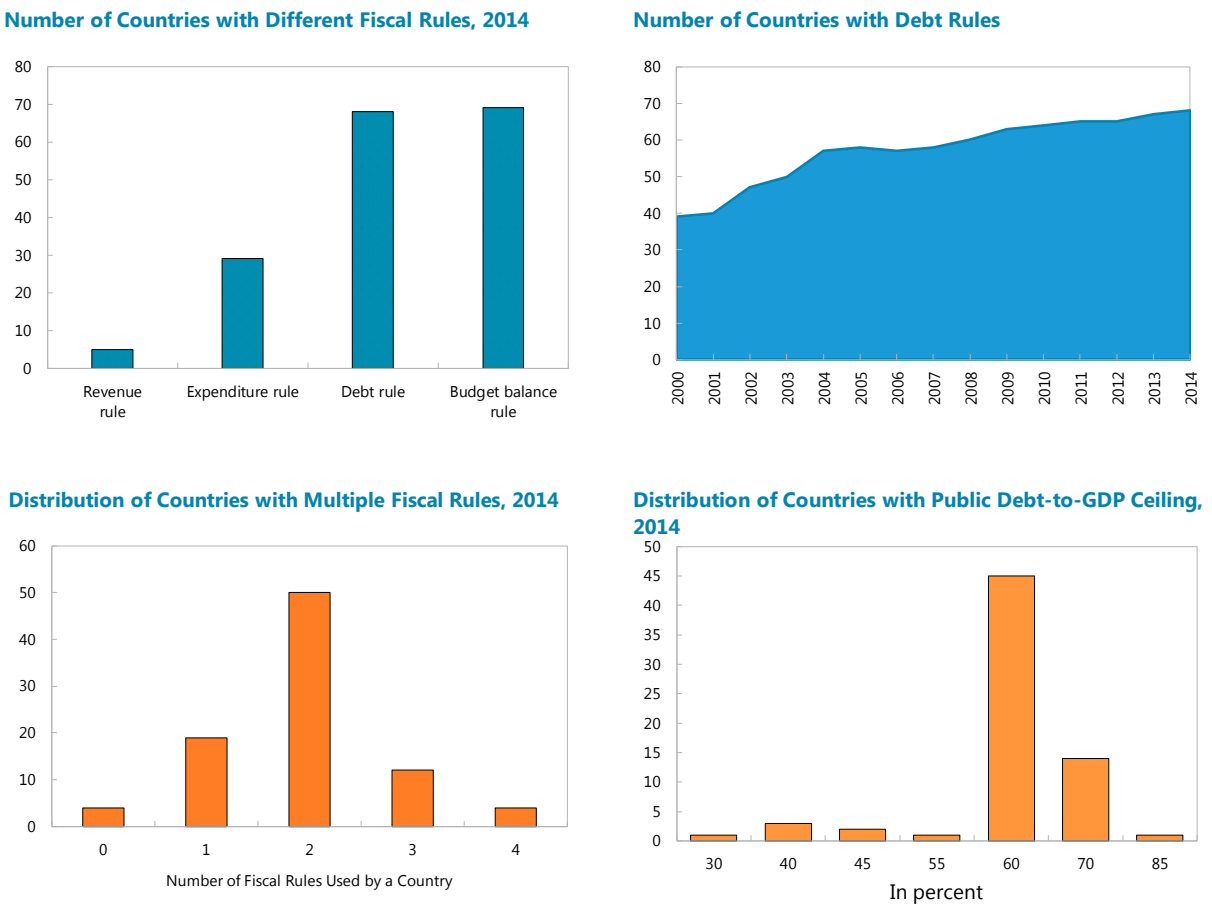
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ASSESSING SAFE DEBT LEVELS FOR INDIA[1]

The Fiscal Responsibility and Budget Management (FRBM) Review Committee constituted in May 2016 is examining the pros and cons behind altering the fiscal rules attached to 2003 FRBM Act. Analysis of fiscal rules used across the world points to rising popularity of a debt rule. Based on the debt intolerance approach, staff assess a safe level of debt for India to be in the range of 60-65 percent of GDP, allowing a buffer for contingent liabilities.

1. Different types of fiscal rules are currently used across countries in order to ensure fiscal sustainability. The popularity of fiscal rules has substantially increased since 2000, and countries mostly target the budget balance, debt, and expenditures. A debt-to-GDP target is the most-widely used, though it is often used in combination with other fiscal targets. The majority of countries target a public debt-to-GDP ratio of 60 percent.

Figure 1. Fiscal Rules: Cross-Country Experience



Source: IMF Fiscal Rules Dataset.

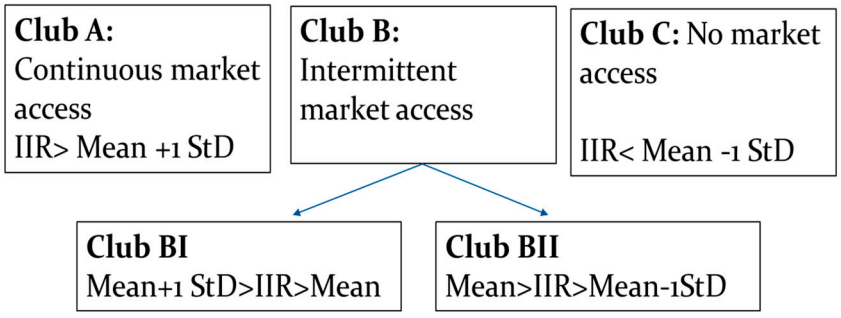
[1] Prepared by Svitlana Maslova.

2. A number of approaches could be used to estimate the appropriate debt target. The approaches vary from estimation of optimal public debt in agent models, to deriving a benchmark level of public debt based on the relationship between the primary deficit and the debt ratio, to determining a benchmark level of public debt based on a country's ability to access capital markets. The various approaches focus on different motives countries could have for debt issuance and the challenges they could face. Agent models derive optimal public debt levels by optimizing the utility of agents with precautionary saving motives and borrowing constraints and are usually calibrated for advanced economies. They provide a wide range of results depending on the underlying assumptions. On the other hand, emerging markets with often relatively less developed domestic investor bases need to attract foreign investors to their debt securities.

3. The approach which focuses on debt intolerance is often used for the assessment of safe debt levels in emerging markets. Debt intolerance is the inability of emerging markets to manage levels of external debt that are manageable by advanced countries (Reinhart *et* al, 2003). Debt intolerance has been found to be explained by a relatively small number of variables: countries' default and inflation histories. The non-monotonic relationship between debt intolerance and public debt-to-GDP ratios suggests the existence of country-specific debt thresholds, at which a country switches from having access to capital markets to not having such access (or the necessity to pay relatively large interest on its debt to achieve the placement).

4. Debt intolerance focuses on the ability of a country to attract investors. It is proxied by the Institutional Investor rating (IIR). It shows a country's attractiveness for investment, with 100 indicating lowest chance for default. We group countries into three clubs: (i) countries with continuous market access (Club A); (ii) countries with intermittent market access (Club B); and (iii) countries with no market access (Club C). The division between clubs is made based on their average rating over the 2000-2014 sample period. The cutoff for any particular country to belong to Group A is a rating above the sample mean of ratings plus one standard deviation, and the cutoff to belong to Group C is a rating below the sample mean of ratings minus one standard deviation. Any country with a rating in between the abovementioned cutoffs belongs to Group B.

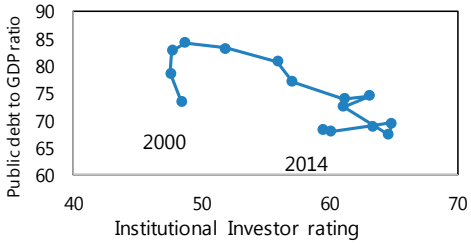
Country Clubs and Market Access



Note: StD denotes one standard deviation.

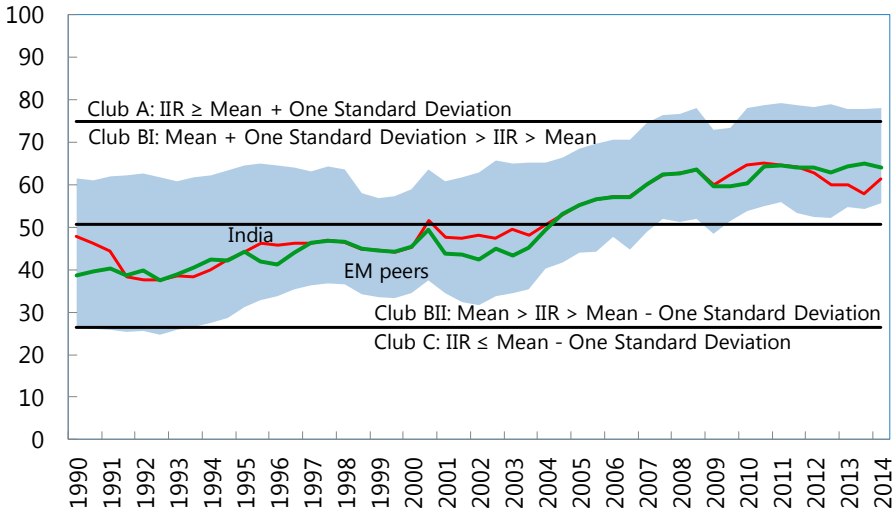
5. India's attractiveness for investors as measured by the IIR has improved as public debt has declined. In the early 2000s, India's IIR worsened with an increase in the public debt-to-GDP ratio. However, the subsequent fiscal consolidation contributed to an improvement in the country's attractiveness to investors. Compared to other countries, India's IIR has broadly moved in sync with the mean rating for the emerging markets, except that it has been slightly below the mean in recent years. India's IIR has moved to the Club BI of countries with an IIR above the mean in 2004, and has stayed there since. However, India's public debt-to-GDP level is relatively high compared to other countries in this club. In our view, as roll-over risks in India are somewhat mitigated by long average maturities and limited exposure to non-residents, these considerations improve the country's attractiveness for investors.

India: Institutional Investor Rating and Government Debt, 2000-2014



Sources: Institutional Investor, Inc.; IMF, World Economic Outlook.

India: Institutional Investor Rating's Developments



Sources: Institutional Investor, Inc. and IMF World Economic Outlook.
Note: Confidence intervals (shaded) show the 10th and 90th percentile of rankings.

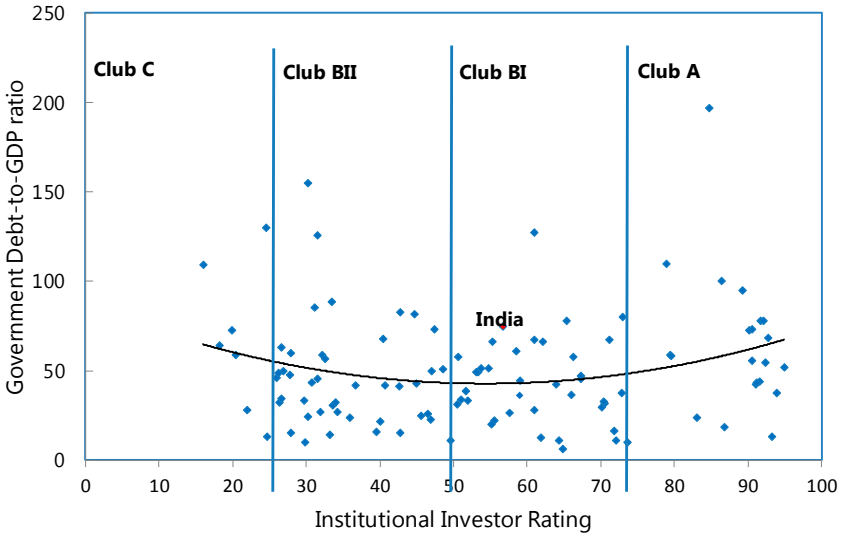
6. An estimate of the relationship between the debt intolerance and debt level was conducted. Given the non-monotonic nature of this relationship, the coefficients are allowed to vary among different clubs. In addition, the regression has an indicator for high inflation over the sample period and a dummy variable for India (as in the equation below, where *i* denotes a country). Regressing the IIR on inflation and the three club's debt levels indicates that the debt intolerance rises with high inflation and debt:

$$IIR_i = \alpha + \beta_1 * ClubA * \left(\frac{Debt}{GDP}\right)_i + \beta_2 * ClubB * \left(\frac{Debt}{GDP}\right)_i + \beta_3 * ClubC * \left(\frac{Debt}{GDP}\right)_i + \beta_4 * infl$$

$$+\beta_5 * INDIA + \varepsilon_i$$

7. The analysis suggests that a safe level of debt for India is in the range of 60-65 percent of GDP. Simulation of the IIR based on different debt-to-GDP ratios suggests that India would stay above the mean of the IIR distribution in a club of countries with relatively good market access (club BI), if its debt-to-GDP ratio is lower than the threshold which lies in the range of 65-70 percent of GDP. Inclusion of some buffer to account for uncertainty (including for the materialization of contingent liabilities) suggests a safe level of debt at 60-65 percent of GDP. That said, results of the debt intolerance approach depend on the specific regression and sample period used, and confidence intervals around these point estimates.

Public Debt and Rating, Cross-Country Perspective



Sources: IMF *World Economic Outlook*; Institutional Investor, Inc.; and author's calculations.

8. The result is largely in line with the estimates for other emerging market economies. Using the above approach, thresholds for India's safe public debt-to-GDP ratio were previously estimated in the range of 40-45 (using a sample of 54 countries) and 70-75 percent (sample of 142 countries). (Topalova and Nyberg, 2010). For Kenya, Everaert (2008) estimated thresholds for its safe public debt-to-GDP ratio in the range of 35-40 percent. Most recently, thresholds for South Africa's safe public debt-to-GDP ratio have been estimated in the range of 50-60 percent (Saxegaard, 2014).

Table 1. Simulation of Debt Benchmark

Debt (in percent of GDP)	Predicted IIR	Club
40	54.67	Club BI
45	53.93	Club BI
50	53.20	Club BI
55	52.47	Club BI
60	51.74	Club BI
65	51.01	Club BI
70	50.27	ClubBII
75	49.54	ClubBII
80	48.81	ClubBII
85	48.08	ClubBII
90	47.35	ClubBII

Source: Author's calculations.

Table 2: Debt Intolerance and Debt 1/

	Model 1	Model 2	Model 3	Model 4
Debt x Club A	0.312***	0.300***	0.311***	0.299***
	[0.053]	[0.054]	[0.053]	[0.054]
Debt x Club B	-0.146***	-0.163***	-0.150***	-0.169***
	[0.054]	[0.054]	[0.054]	[0.055]
Debt x Club C	-0.365***	-0.363***	-0.367***	-0.364***
	[0.077]	[0.077]	[0.077]	[0.078]
Inflation 2/	-15.104***	-0.869***	-15.006***	-0.871***
	[3.471]	[0.214]	[3.489]	[0.214]
India			7.936	11.987
			[14.898]	[14.994]
Constant	60.522***	63.050***	60.551***	63.157***
	[2.837]	[3.140]	[2.848]	[3.148]
R^2	0.590	0.582	0.591	0.585
Adjusted R^2	0.575	0.566	0.572	0.565
N	110	110	110	110

Source: Author's calculations.

1/ Numbers in square brackets are standard errors. *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

2/ Models 1 and 3 have inflation defined as a dummy showing if average inflation exceeds the 75th percentile. Models 2 and 4 use average inflation.

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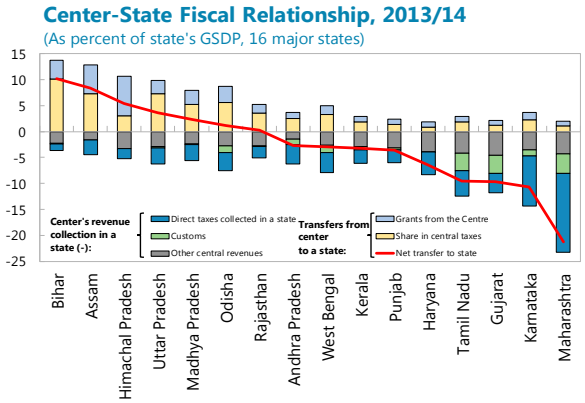
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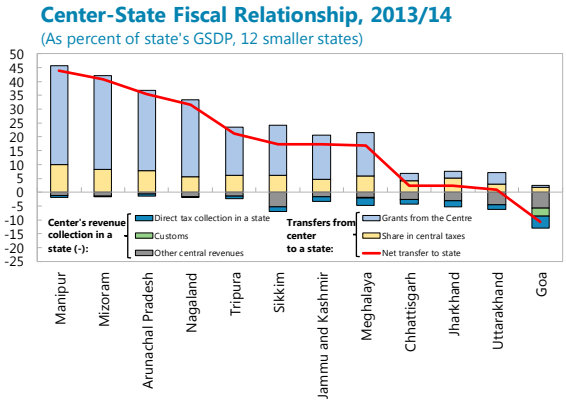
STRENGTHENING INDIAN CENTER-STATE FISCAL FRAMEWORKS[1]

Center-state fiscal arrangements entail a sizable redistribution of resources across the Indian states. They enable achieving the goal of income redistribution from richer to poorer states, as well as partial insurance against regional macroeconomic shocks. However, overall transfers from the center to states appear to be pro-cyclical with respect to both regional and common macroeconomic shocks. There is room to improve the stabilization features of India's central government finance, strengthen the budget frameworks of the states, and rebuild fiscal space to support growth.

1. Center-state fiscal arrangements entail a sizable redistribution of resources across the Indian states. State-wise variation in the size of gross transfers from center to states (as a share of gross state domestic product (GSDP)) primarily comes from the variation in the grants component of gross fiscal transfers, and is largely driven by sizable grants from the center to a handful of smaller states. In turn, for the sixteen major states, which account for over 90 percent of India's population and close to 90 percent of its gross domestic product, most of the variation in gross fiscal transfers appears to be due to differences in their share of the divisible pool of the center's tax revenues. Lastly, the collection of key central government revenue varies significantly across the jurisdictions, with just a handful of states (Gujarat, Karnataka, Maharashtra, Tamil Nadu) as well as the National Capital Territory of Delhi having relatively large ratios of the revenue collected towards the central government (or Union) budget relative to size of their economies, primarily on account of direct tax collection. The financial relationships between the Union and the states continue to evolve, including as a result of the changes to the fiscal devolution as per adoption of the recommendations of the Fourteenth Finance Commission and impending implementation of the Goods and Services Tax, therefore, understanding the economic implications of fiscal federalism will remain a key fiscal policy issue in India.[2]



Sources: CEIC; Central Board of Direct Taxes; Ministry of Commerce and Industry; CMIE States of India database; Haver Analytics; and IMF staff estimates.



Sources: CEIC; Central Board of Direct Taxes; Ministry of Commerce and Industry; CMIE States of India database; Haver Analytics; and IMF staff estimates.

[1] Prepared by Purva Khera and Volodymyr Tulin.

[2] Various aspects of the fiscal transfers from the Union to the states in India have been examined by the Finance Commission, which is a constitutional body established every five years with the primary purpose of determining the sharing of centrally collected tax proceeds between the central and state governments and the distribution of grants-in-aid of revenues across states.

2. Fiscal transfers in federations play several roles, such as closing vertical imbalances, achieving redistribution goals, and insuring states or union territories against macroeconomic shocks. The insurance function could be subdivided in two: insurance against *common* shocks simultaneously hitting all the states of India, and insurance against *idiosyncratic* macroeconomic shocks hitting individual states. They also serve to enhance redistribution from richer to poor states and help ensure convergence of cross-state disposable incomes. Disentangling the redistribution, stabilization, and risk-sharing roles of fiscal transfers is complicated in India as center-state fiscal transfers affect all roles simultaneously.

3. The central government budget of a federation can enhance insurance against macroeconomic shocks. First, it provides a ***stabilization*** function (or intertemporal insurance) to deal with shocks common to all states, and second it pools risks emanating from idiosyncratic shocks across states and enables ***risk-sharing*** (or interregional insurance). The importance of risk-sharing in federations comes from the fact that in the absence of state-specific exchange rates, shocks affecting individual states' incomes cannot be cushioned by changes in their internal terms of trade. In addition, households have limited capacity to smooth regional shocks if markets for production inputs (labor and capital) are not mobile, or if private credit markets do not function properly. Arguments in favor of centralizing counter-cyclical fiscal policy relate to scale economies benefitting the central government in the performance of the stabilization function (easier policy coordination, the public good nature of macroeconomic stabilization). An important factor is the ability of the central government to borrow on better terms than those available to individual states.

4. The strength of various channels of resource redistribution between the center and the states is analyzed in this chapter, following Poghosyan and others (2016). The following econometric specification is estimated on state-level data:

$$\left(\frac{\boldsymbol{T_{it}}}{\boldsymbol{Ypot_{it}}} * \mathbf{100}\right) = \boldsymbol{\alpha} + \boldsymbol{\beta}\left(\frac{\boldsymbol{Y_{it}}}{\boldsymbol{\overline{Y}_t}} * \mathbf{100}\right) + \boldsymbol{\gamma Ygap_{it}} + \boldsymbol{\mu_i} + \boldsymbol{\tau_t} + \boldsymbol{\varepsilon_{it}}$$

where

- $\boldsymbol{T_{it}}$ is transfer variable (net transfers, tax sharing, grants, etc.) of state i in year t; and $\boldsymbol{Ypot_{it}}$ is nominal potential gross state domestic product (estimated with the HP filter).
- $\boldsymbol{\beta}$ measures the ***redistribution*** effect, while $\boldsymbol{Y_{it}/\overline{Y}_t}$ is the trend component of the ratio of each state's per capita GDP relative to the national average per capita GDP, estimated using a quadratic trend. We use the trend component of this ratio to better capture the notion of income convergence, since cyclical movements do not affect income convergence over the long term. For instance, a redistribution coefficient of -0.1 implies that a region with a 100 rupees permanently lower output relative to the national average would have a disposable income that is 90 rupees below the national average, with the remaining 10 rupees covered by permanent transfer of funds from richer regions.
- $\boldsymbol{Ygap_{it}}$ is output gap (HP filter) of state i in year t. The coefficient $\boldsymbol{\gamma}$ measures the extent of the insurance role played by fiscal transfers, that is by how much they offset (or smooth) regional disposable income from temporary shocks to regional output. When estimated

without time fixed effects, $\boldsymbol{\Upsilon}$ covers both the ***risk-sharing*** and ***stabilization*** impacts of transfers. In turn, when time fixed effects are included, $\boldsymbol{\Upsilon}$ measures only the ***risk-sharing*** impacts of transfers. For instance, a coefficient of -0.1 implies a level of insurance of 10 percent such that the disposable income of a given region would fall by 90 rupees in response to a temporary decline in its output by 100 rupees, which in turn could be either relative to the national average output (risk-sharing) or a simultaneous decline in output across all regions (stabilization).

5. Our empirical results point to a sizable redistribution function of fiscal transfers (Table 1). This is mostly achieved through transfers from the center to states, with the center's grants to states playing a key role. The devolution of the center's revenues to states is also supporting redistribution, but the magnitude of the coefficient is smaller when compared to grants (column 3 vs column 4). When it comes to redistribution as a result of state-wise variation in the collection of central government tax revenues (column 1), while the sign of the coefficients is correct (positive), they are not statistically significant. One reason for this lack of econometric evidence could be that direct taxes as a share of GDP are relatively small and just a handful of states provide the lion's share of this revenue (Maharashtra, Delhi, and Karnataka account for over 60 percent of the center's direct tax receipts). For net fiscal flows—that is the difference between transfers to a state and the center's tax revenue collected in a state—the redistribution coefficient is of the expected negative sign, and is statistically significant at close to the 10 percent level.

6. The empirical evidence on insurance motives, with respect to both interregional risk-sharing and macroeconomic stabilization, reveals deficiencies in the design of fiscal transfers.

- **Devolution of central taxes**, which is determined by a formula that entitles each state to a specific share of the total tax revenue pool, translates into a robust interregional risk-sharing mechanism but goes against the stabilization function with respect to common macroeconomic shocks. This is indicated by an estimated $\boldsymbol{\Upsilon}$ of -0.06 (column 3 in a specification with fixed effects).[3] At the same time, estimated $\boldsymbol{\Upsilon}$ is positive in a specification without time fixed effects, which implies a pro-cyclical rather than a counter-cyclical impact with respect to macroeconomic stabilization. However, this result should not be surprising. This is because total central government tax revenues are positively correlated with the economy-wide output gap, which is also a weighted average of the output gaps across states, the devolution to each state then co-moves with economy-wide output gap. Thus, the devolution formula that applies to a large pool of central tax revenues effectively undermines the gain from its risk-sharing structure, as they are offset by the inherent pro-cyclicality of aggregate tax devolution.

[3] Insurance measures the extent to which fiscal transfers offset regional disposable incomes from temporary shocks to regional output. For instance, a coefficient of -0.1 implies a level of insurance of 10 percent that the disposable income of a given region would fall by 90 rupees in response to a temporary decline in its output by 100 rupees. This temporary decline in output could be either relative to the national average output (risk-sharing) or a simultaneous decline in output across all regions (stabilization).

- **Central grants to states** are not supportive of either interregional risk-sharing or intertemporal stabilization (column 4). The Υ coefficient in a risk-sharing specification is positive, indicating pro-cyclicality of grants with respect to state-specific economic conditions (column 4, specification with fixed effects). The coefficient is also positive in the specification without fixed effects, which indicates that central government grants to states are pro-cyclical with respect to the economy-wide and state-specific output gaps.

- **Total transfer to states,** that is a combined effect of tax revenue sharing and grants, however, do not appear to support interregional risk-sharing (column 2). On a net basis, pro-cyclicality of grants to states appears to offset the built-in interregional risk-sharing features of the tax devolution formula. However, as this empirical evidence is largely a reflection of the historical devolution setup, the implementation of the recommendations of the Fourteenth Finance Commission (2014), which has increased the sharable size to the states, may well help interregional risk-sharing but at the expense of less intertemporal risk-sharing.

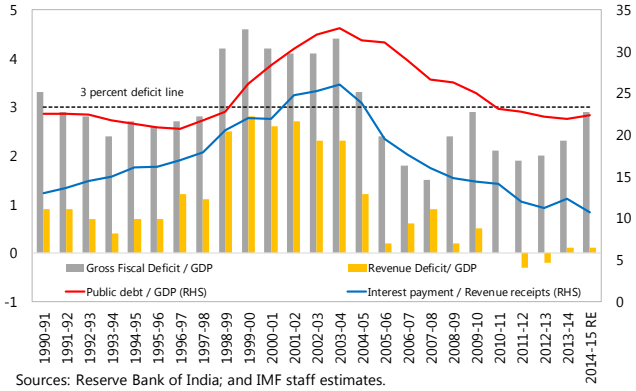
- **Center's revenue collection across states** reveals the presence of interregional risk-sharing (positive Υ in column 1 specification with fixed effects) but no statistically significant link of central taxes to common shocks (insignificant Υ in column 1 specification without fixed effects). This points to a limited link of federal taxes to the national economic cycle. Results for net fiscal flows from the center and the states (column 5) point to their clear pro-cyclical nature with respect to common shocks, and a lack of interregional risk-sharing.

7. Overall, the redistribution impact in India is on par with other federations, while the stabilization function of transfers is more a feature of advanced economies' central budgets. Compared to the results for the fiscal federations of the United States, Canada, and Australia (Table 2), as reported in Poghosyan and others (2016), India's fiscal federalism has a broadly similar impact on redistribution. Canada, for example, has the strongest redistribution channel, where such a mandate is constitutional. However, data coverage for India differs from these federations, specifically as transfers to individuals from the central budget are not available by Indian states as opposed to such data being available for other federations, so the size of the effect of fiscal policies in India may be understated. Finally, inter-regional risk-sharing is present in the United States, but is not found to be statistically significant in either Australia or Canada. The interregional risk insurance role of fiscal transfers may be limited given the synchronized nature of states' business cycles and enhanced private risk-sharing facilitated by fiscal centralization. Overall, stabilization appears to be a feature of advanced economies' central budgets.

8. Indian states' own revenues and expenditures co-move with state economic cycles. Staff analysis suggests that correlation of states' own tax revenues with their economic cycles have declined slightly in the last decade, while states' capital expenditures have become counter-cyclical with respect to their economic cycle, although this link appears to be weak (Table 3). However, a key concern from the viewpoint of states' financial health is the increase in the correlation of states' revenue expenditures with states' economic cycle, as room to compress state revenue expenditures in a downturn may be constrained going forward. Specifically, downward adjustment on non-

developmental revenue expenditures, which are largely precommitted in nature,[4] may be difficult, while reducing developmental and social expenditures may be undesirable. In addition, a potential rise in wage and pension commitments as a result of the recent civil servants' pay review could also further limit downward flexibility of revenue expenditures going forward. Furthermore, greater devolution of central government's tax revenues, which provides states with greater autonomy, makes the case for strengthening states' fiscal responsibility and budget frameworks more compelling.

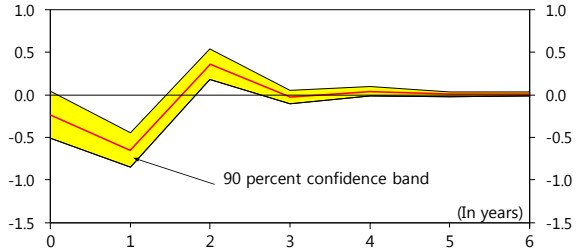
Fiscal Positions of State Governments
(In percent)



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

9. As budget deficits in many states are hovering close to their borrowing limits, the ability of the states to respond to economic shocks may be limited. Even though states have been required to seek approval for market borrowing from the center, some forms of borrowing were not effectively constrained in the past. This enabled a sharp rise in states' debt ratios in the late 1990s, which took considerable time to reverse. The Twelfth Finance Commission helped strengthen the states borrowing regime as the central government stopped intermediating in state borrowings and states followed the center's Fiscal Responsibility and Budget Management framework by adopting fiscal responsibility frameworks and fiscal rules (Simone and Topalova, 2009). However, in the last few years aggregate gross fiscal deficits of the states have generally hovered very close to states' borrowing limits, with aggregate deficits of the states rising towards about 3 percent of GDP. Staff analysis on the basis of a panel Vector Autoregression (VAR) model for Indian states[5] suggests that states' gross fiscal deficit to GSDP ratios deteriorate by about 1 percent of GSDP cumulatively over the two years following a negative one standard deviation shock to GSDP growth. Thus, with limited fiscal space given near-binding borrowing ceilings in many states, in the event of a negative economic shock, states may either breach their borrowing ceilings or may need to engage in pro-cyclical fiscal adjustment.

Response of State's Gross Fiscal Balance to a Negative GSDP Growth Shock
(In percent of GSDP)



Source: IMF staff estimates.
Note: One standard deviation GSDP growth shock is about 5 percentage points which also points to high volatility of states's growth.

[4] Interest payments, administrative services and pensions account for a large portion of non-development revenue expenditure of states.

[5] The panel VAR model fits GSDP growth, state's private and public investment growth, and state's overall fiscal balance. The objective of this analysis is to disentangle the dynamic adjustment of gross fiscal deficits over the first few years after a GSDP growth shock, rather than on identifying long-term adjustment processes. Advantages of a panel VAR approach include the use of the information in the cross-sectional dimension of the data when time series is short while also controlling for heterogeneity.

Table 1. Assessing Stabilization and Risk-Sharing Impacts of Transfers Between Center and States

Variables	(1) Center's revenue collection in states	(2) Total transfers to states	(3) State's share in central taxes	(4) Central grants to states	(5) Net fiscal flows from center to states
	Without time fixed effects (i.e. Y is *risk-sharing* and *stabilization)*				
Relative real per capita income (β)	0.01	-0.01 *	-0.02 *	-0.08 *	-0.12
	[0.02]	[0.01]	[0.01]	[0.05]	[0.07]
State output gap (Y)	-0.02	0.01	0.03 *	0.08	0.11 ***
	[0.03]	[0.01]	[0.02]	[0.05]	[0.03]
	With time fixed effects (i.e. Y is only risk-sharing)				
Relative real per capita income (β)	0.00	-0.01 *	-0.02 *	-0.09 *	-0.12
	[0.02]	[0.00]	[0.01]	[0.05]	[0.07]
State output gap (Y)	0.07 *	0.02 **	-0.06 **	0.16 ***	0.01
	[0.04]	[0.01]	[0.03]	[0.05]	[0.05]

Source: IMF staff estimates.

Note: Covers 27 states and union territories with available data for 1996-2014. Positive output gap signifies excess demand. Estimations are performed using fixed effects OLS estimator, robust standard errors are in parentheses, constant terms not reported.

Table 2. Net Federal Transfers: India vs. Other Federations

Variables	India	USA	Canada	Australia
	Without time fixed effects (i.e. Y is *risk-sharing* and *stabilization)*			
Relative real per capita income (β)	-0.12	-0.13 **	-0.15 ***	-0.14 **
	[0.07]	(2.11)	(16.01)	(3.15)
State output gap (Y)	0.11 ***	-0.28 ***	-0.14 *	-0.23 ***
	[0.03]	(3.13)	(2.12)	(3.91)
	With time fixed effects (i.e. Y is only risk-sharing)			
Relative real per capita income (β)	-0.12	-0.13 ***	-0.15 ***	-0.15 ***
	[0.07]	(3.05)	(8.30)	(4.16)
State output gap (Y)	0.01	-0.12 **	-0.05	-0.04
	[0.05]	(2.50)	(0.92)	(1.05)

Sources: IMF staff estimates, results for other federations from Poghosyan and others (2016).

Note: Covers 27 states and union territories with available data for 1996-2014. Positive output gap signifies excess demand.

Robust standard errors are in parentheses for India, t-statistics for other federations, constant terms not reported.

Table 3. Correlations of Cyclical Components of State's Fiscal Variables with GSDP

Variables	27 States and Union Territories		16 Major States	
	All sample	Post 2004	All sample	Post 2004
Own tax revenues	0.27	0.22	0.29	0.20
Non-tax revenues	0.14	0.09	0.05	0.00
Revenue expenditure	0.22	0.43	0.17	0.42
Capital expenditure	0.10	-0.13	0.11	-0.18

Sources: IMF staff estimates based on methodology of Kaminsky, Reinhart, and Végh (2004).

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INDIA: UNIVERSAL BASIC INCOME PROPOSALS[1]

UBI proposals aim at providing universal and unconditional basic income to all Indians. While UBI may help overcome failures of the current system, concerns on fiscal affordability and political feasibility weigh heavily on public discussions. UBI for India will need to be carefully reviewed, in order to balance its potential benefits and costs while ensuring India's fiscal sustainability.

Universal Basic Income Proposals in India

1. Universal basic income (UBI) is an old idea but has recently received widespread attention in both the developed and developing world. The discussions on basic income developed in the 1970s and 1980s. In particular, the libertarian economist Milton Friedman advocated a minimum guaranteed income in the form of a negative income tax in 1962. More generally, *UBI is often interpreted as an income unconditionally granted to all on an individual basis without means test or work requirement at the level enough to live on even if they do not earn anything* (Ghosh, 2016). In developed countries such as Switzerland, Finland, the Netherlands and Canada, the concept of UBI has caught on with policy makers on the back of decades of stagnant wages, rising inequality, job losses from production relocation and job-killing automation. In the developing world, interest in UBI centers around its ability to reduce poverty and social exclusion.

2. In India, the existing social protection system—primarily delivered through subsidies—has flaws. India has a range of social programs aimed at supporting the income and consumption levels of lower-income households. Some key programs comprise food, fertilizer and fuel subsidies. The Government of India has made strong progress on subsidy reforms in recent years, and as a result, expenditure on subsidies declined to about 1.5 percent of GDP in FY2016/17 from 2.5 percent in FY2012/13. Nonetheless, these subsidy schemes are often associated with high administrative costs and ineffectiveness, particularly leakages of subsidized products to non-targeted better-off people (see Anand et al (2014) and Abdallah et al (2015)).

Table 1. Arguments for and against UBI Scheme

Arguments for	Arguments against
• More transparent and simple welfare system, eliminating leakage, wastage, and corruption. • Administrative efficiency, simple implementation and lower overall cost of the current means-tested social welfare benefits. • More equal system as all citizens are eligible. • Lump-sum transfer gives freedom to spend on what are most needed to welfare recipients. • Help reduce poverty, or even eradicate poverty depending on the basic income level. • Potentially boost consumption and growth.	• Concerns on feasibility and financial viability where the scheme would require significant fiscal costs, thus requiring a complete restructuring of the taxation, social insurance and pension systems. • Should basic income be given at current budget-neutral level, it may be insufficient. • Misuse of basic income for drugs, gambling, and potential enlargement of informal sector. • Non-negligible disincentive to work.

Sources: Bardhan (2016); Banerjee (2016); Ghatak (2016); and Mundle (2016).

[1] Prepared by Piyaporn Sodsriwiboon.

3. UBI is therefore considered as an alternative to help overcome the failures of the current system. Table 1 summarizes the arguments for and against the establishment of a UBI scheme. If carefully designed as part of a strategy to reform an inefficient social protection system, UBI may play a role and help reduce waste and inequality. Nevertheless, concerns related to fiscal costs and affordability also weigh heavily on public discussions.

4. India's UBI proposals are for universal and unconditional basic income with a few variations (Table 2). Bardhan (2016) presents a UBI calculation fixing the unconditional basic income at an inflation-indexed Rs 10,000 at 2014/15 prices, which is about three-quarters of the official poverty line in 2014/15 or 15 percent of the average wage in India. Under this proposal, this amount would be paid annually to each person in India. With a population of 1.25 billion in 2014/15, the cost of UBI comes to about 10 percent of GDP and will be financed by a portion of existing subsidies and the termination of some tax holidays and exemptions. Similar to Bardhan's proposal, Banerjee (2016) proposes a UBI of Rs 250 per week to every adult resident who verifies their identity every week. Alternatively, Ray (2016) has put forward the idea of a social dividend in the form of universal basic income as a fixed share of GDP, but the level will be varied each year. In addition, Gokarn (2016) suggests that UBI include an opt-out option.

Table 2. India's UBI Proposals

	Bardhan (2016)	Banerjee (2016)	Ray (2016)	Joshi (2016)	Gokarn (2016)
Universal coverage	Universal to all Indians	Every adult resident to verify their identity every week	Universal to all Indians	Universal to all Indian households	Universal to all Indians with opt-out option
Unconditional cash transfer	Yes	Yes	Yes	Yes	Yes
Uniform cash transfer	Yes	Yes	Yes	Yes	…
Basic income in rupees/year Total costs in % of GDP	10,000[1/] (10% GDP)	13,000[2/] (12% GDP)	…	17,500 per family or 3,500 per person (3.5% GDP)	…
Basic share of GDP	…	…	Yes		…
Fully-funded scheme:	Yes	…	Yes		Yes
• Existing subsidies both implicit and explicit for central and state governments	Yes	…	Yes		…
• Removals of tax holidays and exemptions	Yes	…	Yes		…
• User charges for services paid out	…	…	…		Yes

Source: Ideas for India, *The Idea of a Universal Basic Income in the Indian Context*.
1/ Three-quarters of the official poverty line at 2014/15 prices.
2/ Rs 250 weekly income.

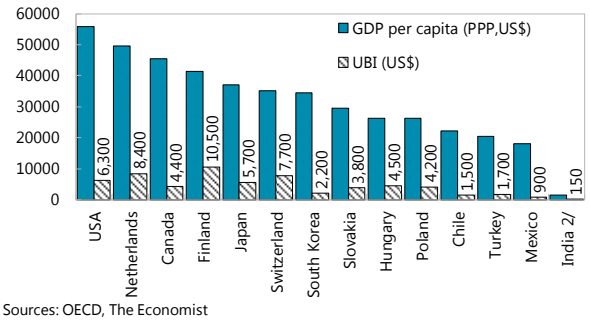
Cross-Country Experiences with UBI

5. There is no clear evidence of cross-country experiences with UBI. Table 3 presents the structure of UBI scheme across countries and the latest status of each scheme. Comparing UBI across countries, India's UBI proposals come closest to that of Switzerland and Brazil, as the scheme is truly universal and unconditional. Nevertheless, UBI in Finland and the Netherlands is much more limited in which basic income will be provided to persons currently receiving government benefits; thereby reshaping the existing welfare system. To date, Switzerland rejected its UBI referendum in June 2016. Finland, the Netherlands, and Ontario province of Canada will begin small-scale experiments of UBI schemes in 2017. Brazil's privately run UBI pilot project is still ongoing. A full assessment of each UBI scheme as yet remains to be seen.

6. A UBI pilot program in an Indian state appears to have helped improve the quality of spending on nutrition, health, education as well as the investment in productive assets. The United Nations International Children's Emergency Fund (UNICEF) and the Self Employed Women's Association (SEWA) established a pilot program for an unconditional cash transfer experiment in rural areas of the Indian state of Madhya Pradesh in 2012 (SEWA, 2014). The basic income was paid every month to all individuals within a village, without any conditionality. The program initially paid Rs 200 per month for each adult and Rs 100 per month for each child, then the amounts were raised to Rs 300 and Rs 200 per month, respectively. These amounts were calculated at between 20 and 30 percent of the income of families in the lower-income scales, or about one third of the 2011/12 poverty line. The program covered 6,000 individuals for a period of 29 months, and the basic income was disbursed through either bank or cooperative accounts. SEWA (2014) finds the basic income scheme helped enhance both food sufficiency and enabled a qualitative shift in the food basket, improved the affordability of health services and education, increased the investment in better sanitation and access to drinking water, as well as reduced the burden of households to fund their health and education services through borrowing.

7. To be able to pay out a meaningful basic income, there is a need to free up significant fiscal space. In this exercise, UBI is calculated according to how much basic income a government could pay out if it scraps its non-health transfer payments and spreads them evenly across the population in an annual single payment. Finland and the Nordic countries, for example, come out among the highest basic income payouts, given relatively large fiscal space that can be available for UBI. For Mexico and some other emerging economies, on the other hand, basic income based on a budget-neutral calculation would yield only a small and insufficient fraction of the country's living standard, or the country would need to raise taxes significantly or borrow extensively. UBI for India, proposed at about Rs 10,000 per year, is the lowest among emerging economies, but its feasibility and affordability has yet to be determined.

Universal Basic Income 1/



Sources: OECD, The Economist
1/ UBI is calculated by how much basic income a government could pay out if it eliminates its non-health transfer payments, and spread them evenly across the population in a single payment.
2/ UBI for India is from the proposal of Rs.10,000 per year.

Table 3. Cross-Country Comparisons of UBI Schemes

Country/UBI scheme	UBI amount	Population (2015)	GNI per capita 1/	Financing sources	Current status of UBI scheme
Switzerland: The Swiss Confederation would provide an unconditional basic income. The federal government would pay every Swiss resident this amount, "regardless of their income and assets."	A basic monthly income of 2,500 Swiss francs, or about US$2,560, to each adult, and 625 francs for each child under 18. About US$30,720 per year for adult.	8.3 million	61,930	n.a.	UBI referendum was rejected on June 5, 2016.
Finland: Persons between 25-58 years old living in Finland who in November 2016 receive basic daily allowance or labor market support under the Unemployment Security Act.	€560 per month, tax free benefit, or about US$7,372 per year.	5.5 million	40,840	About €20 million from 2017 budget	Basic income experiment will be carried out in Finland in 2017-2018, and the results of the study would be assessed in 2019.
The Netherlands: 250 Dutch citizens who are currently receiving government benefits and living in the city of Utrecht and some nearby cities.	€960 per month, or about US$12,638.	16.9 million	48,400	n.a.	A two-year pilot project will begin in January 2017.
Canada: UBI project will be tested in a small community of Ontario, Canada.	CAD$ 30,000 guaranteed annual income (not official).	35.9 million	43,970	CAD$ 25 million from budget	A pilot project will be established by April 2017.
Brazil: UBI independent pilot project started in 2008 in rural Quatinga Velho. UBI cash transfer is universal and unconditional, paid monthly, in cash, to all local residents, at any time they wish to participate in the project, without any discrimination or requirement to reciprocate.	The project pays a monthly amount of 30 Brazilian reals (about US$15) to 27 members of this community for one year. After 15 months, the project pays unconditional income to 67 residents of Quatinga Velho.	207.8 million	15,020	The project is privately financed by a consortium of Natural Persons formed exclusively for this purpose.	Ongoing study

Sources: Ministry of Community and Social Services (2016); Hamilton (2016); Social Insurance Institution of Finland Kela (2016).
1/ PPP US$ in 2015.

Potential Economic Impacts of UBI in India

8. Fiscal costs of UBI for India appear to be considerable and would likely require a significant amount of additional financing (Table 4). Taking Bardhan's proposal as an example, the estimated costs of UBI could reach 10 percent of GDP in 2014/15. While the proposal suggests that UBI can be fully financed without an additional financing requirement and the simplicity of UBI design may help reduce the administrative costs in comparison with current subsidies, the available government budget seems likely to be insufficient to fund this UBI proposal. Total subsidies on food, fertilizers, and fuel account for only 1.5 percent of GDP in FY2016/17; therefore, Bardhan's UBI proposal would require large additional financing needs of about Rs 10 trillion or 8 percent of GDP. This UBI scheme appears unaffordable without significant tax increases or additional government borrowing.

9. Other impacts remain uncertain without more granular details on UBI. The potential impact of UBI will largely depend on the level of basic income provided. If it is too small, the impact on poverty reduction may only be negligible. If it is too large, there may be an impact on labor force participation due to disincentives to work. Cash transfers to the poor (with the highest marginal propensity to consume) may help boost consumption and growth, but their efficacy will also depend on what they spend or invest. Increased spending could also put additional pressure on India's already-high rate of inflation.

Table 4. Fiscal Affordability

	Bardhan (2016)	IMF estimates	IMF estimates
Costs of UBI	10% of GDP	10% of GDP	2% of GDP
Annual basic income in rupees (for all Indians of 1.25 billion persons)	Rs 10,000 (US$150)	Rs 10,000 (US$150)	Rs 2,000 (US$30)
Financing of UBI:			
(i) Removal of subsidies (fertilizers, power, food)	6-7% of GDP 1/	2% of GDP 2/	2% of GDP 2/
(ii) Termination of tax holidays and exemptions	3% of GDP	…	…
Additional financing requirements for UBI	None	8% of GDP	None

Sources: Ideas for India; IMF staff estimates.
1/ Two-third of total subsidies in which the National Institute of Public Finance and Policy estimates total implicit and explicit subsidies of about 14 percent of GDP.
http://planningcommission.nic.in/reports/sereport/ser/stdy_bgdsubs.pdf
2/ From central government budget.

Policy Recommendations

10. The potential introduction of UBI in India needs a thorough ex-ante analysis of its redistributive impacts and fiscal costs. In principle UBI could be beneficial, if it is replacing a social assistance system that is very fragmented and inefficient. However, the design of UBI will have to balance its potential benefits and costs while ensuring India's fiscal sustainability. In particular, it should take into account:

- *Administrative and technical viability:* UBI should provide cheaper means of providing money to poor people than the existing means, and it should encourage them to continue working or participate in the formal labor market and improve their living conditions. UBI should build on the current improved and better-targeted system to provide direct benefit transfers using the JAM (*Jan Dhan Yojana* bank accounts, *Aadhaar* identification and mobile connectivity) trinity to minimize leakages.

- *Fiscal affordability:* UBI should not delay the planned fiscal consolidation, nor add excessively to the public debt level. Any budget re-allocation for UBI should not affect government expenditures on health and education or public investment, all of which will help improve productivity and the economy's long-term potential.

- *Political feasibility:* Bardhan (2016) and Mundle (2016) recognize that financing of UBI based on the elimination of existing subsidies could trigger political tension as the current subsidies, to a large extent, benefit various powerful interest groups. To gain political support, the objectives of any proposed UBI scheme should be clearly stated, and include reaching the most vulnerable and reduce poverty; reduce administrative and inefficiency costs; and increase the competitiveness of the agricultural sector, for example, by reducing inefficient food and fertilizer subsidies. The authorities should also detail the sequencing of any proposed phasing out of current subsidies, and set up an independent body in charge of monitoring and assessing that the objectives of UBI are being met. Finally, the authorities should design a communication plan to inform the general public about the pros and cons of any prospective UBI scheme.

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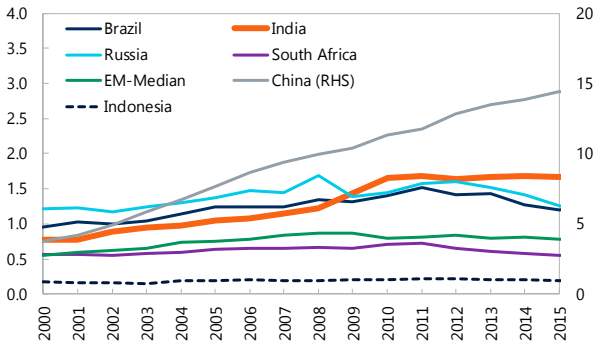
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INDIA'S EXPORTS: WHAT IS BEHIND THE SLOWDOWN?[1]

India's exports have done remarkably well since the early 2000s, but export growth has slowed in recent years. This chapter analyzes India's export competitiveness and explains the slowdown of India's exports. Key factors underpinning the slowdown include weak trading partners' demand and real appreciation of the Indian rupee, while India's high tariffs and trade costs could also affect its export performance. Going forward, steps to further reduce barriers to trade and facilitate a focus on higher value-added products, as well as continued supply-side reforms, are vital to unleash India's export potential.

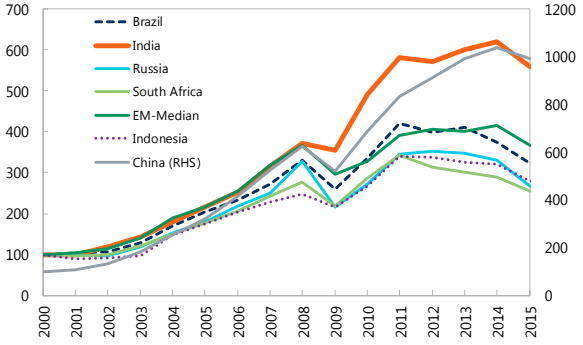
1. India's exports have done remarkably well since the early 2000s, but export growth has slowed in recent years. India's goods and services exports grew robustly during 2000-2011, on average at about 20 percent per year. During that time, India gained significant export market shares in both goods and services exports. Nevertheless, this trend has reversed since 2013, where India's export growth has decelerated significantly. The slowdown of merchandise exports was particularly strong, though services exports have held up so far.

Share of Non-oil Exports
(In percent of World non-oil goods export)



Sources: IMF, World Economic Outlook, and IMF staff estimates.

Growth in Non-oil Goods Exports
(2000=100)



Sources: IMF, World Economic Outlook, and IMF staff estimates.

2. This chapter analyzes India's export competitiveness and explains the factors underpinning the slowdown of its exports. It identifies key features of India's export competitiveness based on quantitative and qualitative measures, using granular data and cross-country comparisons. It then empirically identifies the key drivers of India's goods exports and derives policy recommendations. The chapter focuses on the export performance of India's merchandise exports, given that the slowdown was more evident there and data limitations preclude detailed examination of services exports.

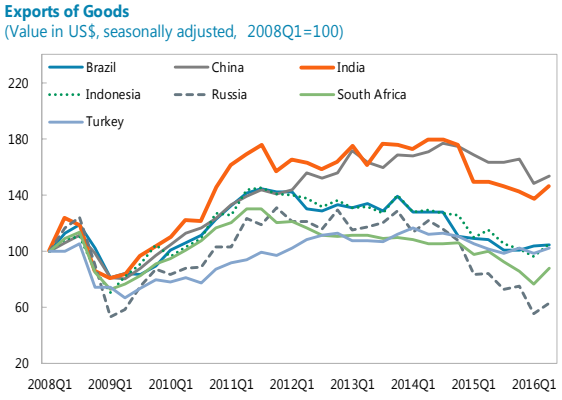
[1] Piyaporn Sodsriwiboon and Anh Le.

3. Despite the recent slowdown, India's export competitiveness has held up well in relative terms. Comparing across emerging economies (EMs), Indian exports have not fallen as much as peers. The resilience of India's export performance benefits from (Figure 1):

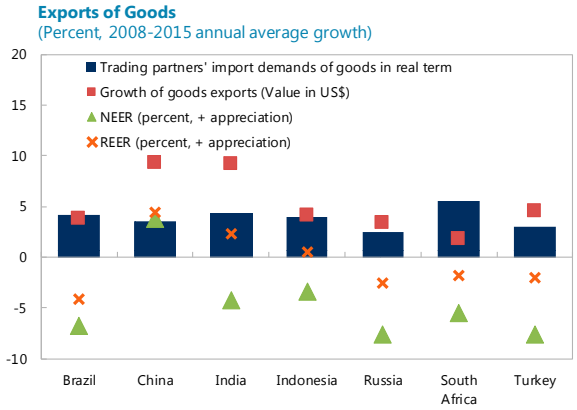
- India's exports are well-diversified across advanced and emerging economies. India's major export markets span from the European Union, the United States, ASEAN, China, and United Arab Emirates (UAE), among others.

- India's export basket is also broad-based, ranging from primary to more sophisticated products. Key export products include energy, machinery and transport goods, but manufactured goods exports are lagging.

- India has also successfully integrated into the global value chain. India's foreign value added—the fraction of country's exports that are part of foreign production—rose from 15 percent of total merchandised exports in 2000 to 22 percent in 2011, although there is still room for improvement compared to the world average.



Sources: Haver Analytic; IMF staff calculations.



Sources: IMF, Global Economic Environment Database; Haver Analytic.

4. India's trade weakness can be attributed to both external and domestic factors. Despite India's diversified export base, weak trade appeared to be a common phenomenon after the global financial crisis of 2008. In particular, the growth of India's trading-partners' import demands in the post-crisis period was only half that of the pre-crisis period. As refined petroleum products made up about one-fifth of the value of India's goods exports, export values fell in line with the collapse in commodity prices during 2015-2016. Historically high inflation vis-à-vis trading partners contributed to the real appreciation of Indian rupee, thus affecting India's price competitiveness. India exports high-quality products, but there is still room for India to converge further with other EMs in manufacturing exports of greater quality and complexity. Moreover, high trade barriers including tariffs and trade costs, as well as administrative burdens, could also have affected Indian export performance. Rigidities in Indian labor and product markets could also have played a role.

5. This study finds trading partners' demand and international relative prices are the key drivers of Indian exports. This study empirically identifies the determinants of export growth, utilizing the framework of Santos-Paulino and Thirlwall (2004) and Morel (2015). The empirical

estimation is based on panel regressions of sixteen emerging economies, using annual data ranging from 1981-2015 (Table 1). The variables include the growth of real non-oil goods exports; the growth of real non-oil goods import demands weighted by the shares of country's exports to trading partners; CPI-based trade-weighted real effective exchange rates; changes in import tariff rates; foreign direct investment inflows as share of GDP; and structural and institutional indicators.[2] In line with Santos-Paulino and Thirlwall (2004), Morel (2015), as well as Raissi and Tulin (2015), this study finds India's export performance largely depends on the strength of trading partners' demand and international relative prices. When analyzing the export growth decomposition during 2013-2015, a decline in import demand from India's export partners and real rupee appreciation explained about 39 percent and 29 percent, respectively, of the slowdown in real non-oil export growth.[3] A trade slowdown caused by weak trading partners' import demand is also a common feature of other emerging economies.

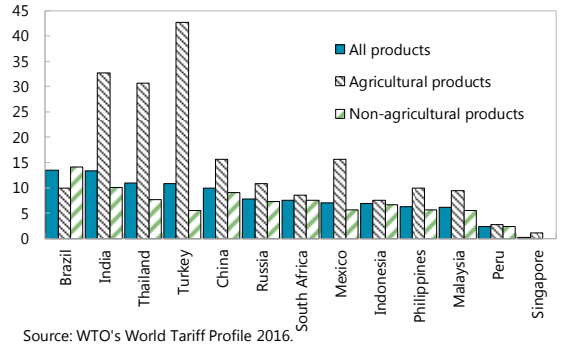
6. Continued efforts to lower trade barriers and reduce trade costs could help boost exports and revive the virtuous cycle of trade and growth. High import tariffs can be costly, as they are likely hurt export performance, employment and growth thus resulting in negative welfare effects (Obstfeld, 2016). Since the 1980s, most countries have made significant progress in reducing tariffs, but the pace of tariff reduction has slowed in recent years (IMF, 2016). In India, import tariffs remain high relative to peer EMs, particularly among food, agriculture, and manufacturing industries.[4] High tariffs and trade costs could discourage exports and new investment needed to better integrate Indian exports into global value chains. The empirical analysis presented in Table 1 emphasizes the role of trade policy—particularly tariffs—on international trade in line with IMF (2016). To illustrate the potential impact of import tariff reductions on exports, a scenario analysis—assuming India's import tariffs are lowered to the level of the EM average—suggests a significant boost of nearly 2 percent to India's export growth over the medium term.

[2] Although oil exports account for a significant share in India's exports, oil exports are excluded from the analysis given the large volatility of commodity prices since the global financial crisis. This also allows the analysis to focus on core (non-commodity) Indian exports and avoids commodity-price movements distorting the results.

[3] The decomposition of real non-oil export growth for India is based on the estimation results of equation 5, as presented in Table 1. Overall, the estimated results explain about 81 percent of India's export slowdown during 2013-2015.

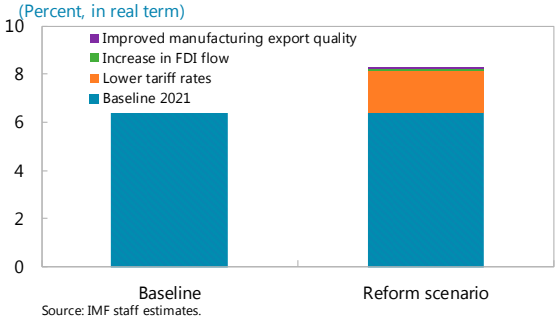
[4] According to the World Trade Organization's *2016 World Tariff Profile*, India's tariff rate (a simple average of MFN tariff rates) is 13.4 percent for all products, 32.7 percent for agricultural products, and 10.7 percent for non-agricultural products—in all three cases India has the second-highest rate among comparator EMs.

MFN Applied Tariff Rates 1/
(In percent)



Source: WTO's World Tariff Profile 2016.
1/ Simple average of most-favored nation (MFN) tariff rates.

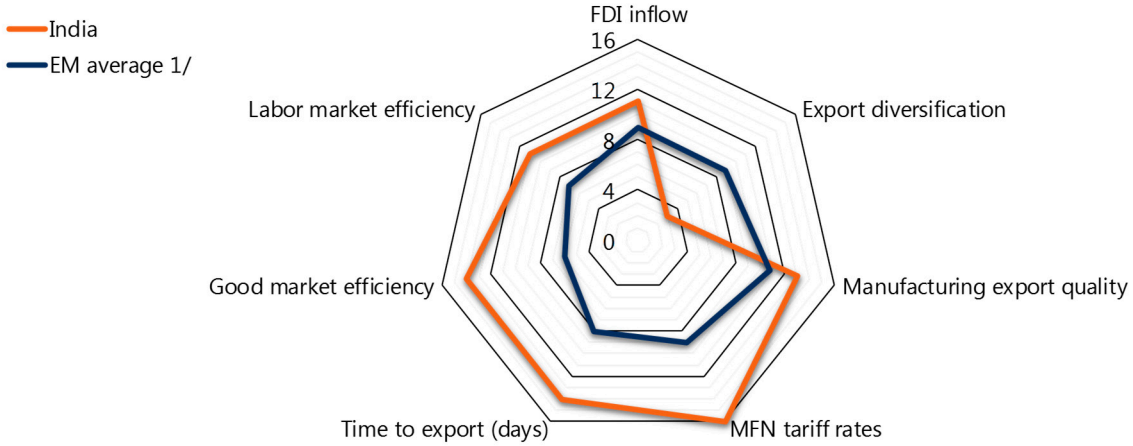
India: Non-Oil Export Growth 1/
(Percent, in real term)



Source: IMF staff estimates.
1/ Reform scenario is to illustrate the impact of various reforms on India's export growth, assuming India's structural indicators to reach the EM average level. Export diversification is not included as Indian exports are more diversified than EMs. The estimates are derived from the panel regression of non-oil export growth equation (5).

7. Removal of structural impediments—supply-side bottlenecks, labor and product market rigidities, and difficulties of doing business—could help India reinforce its productivity gains and support future expansion of exports. An international ranking based on a country's structural and institutional setting shows that structural impediments to both effective product competition and efficient labor markets remain for India. In particular, supply-side constraints and rigidities in product and labor markets can weigh on India's export performance (see Raissi and Tulin (2015); Anand et al (2015)). Taking into account institutional and structural indicators, the estimated results also show that foreign direct investment (FDI) inflows and structural improvements could potentially have positive impacts on exports, although the results are not statistically significant possibly due to the short sample length arising from data limitations.

Emerging Markets' Structural Indicators
(Relative ranking among 16 EMs, lower ranking implies better performer, data as of 2015)



Sources: WITS, GCI, IMF staff calculations.
1/ EM average is the ranking of the simple average of each structural indicators among 16 emerging markets, including Brazil, China, Hungary, India, Indonesia, Malaysia, Mexico, Peru, the Philippines, Poland, Russian Federation, Singapore, Slovak Republic, South Africa, Thailand, and Turkey.

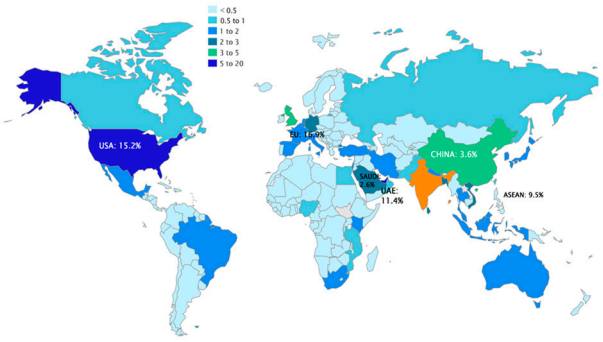
8. Continued supply-side reforms, and steps to further reduce barriers to trade and facilitate a focus on higher value-added products, are vital to unleash India's export potential. India's economy is largely domestically driven and, despite the expansion in exports over the past decade, the contribution of exports to Indian growth remains small. Nonetheless, India's export

potential is large. India's Foreign Trade Policy (FTP) 2015–2020 aims at increasing both manufacturing and services exports to US$900 billion, or a doubling of the current level, by 2020. Nonetheless, the tepid and volatile global outlook suggests weak global trade will likely persist. Given the broad-based slowdown in external demand, the need for continued reform efforts to improve India's competitiveness, further trade and investment liberalization, and improving the quality and complexity of export products, has become even more pressing.

Figure 1. India: Export Structure

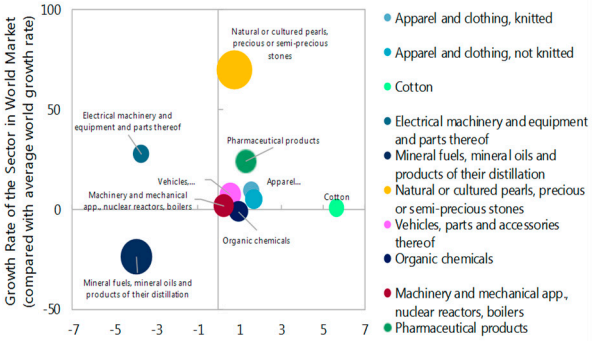
India has done well in diversifying its export markets and product mix.

India's Exports by Trading Partners
(In percent)



Source: IMF, Direction of Trade.

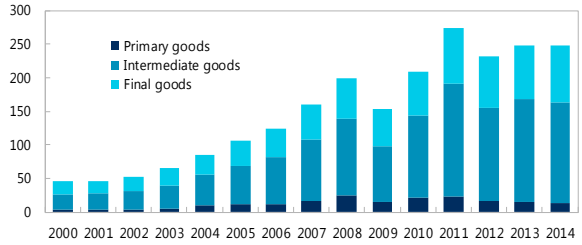
India: Major Goods Exports, 2008-15
(In percent, size of bubble represents share of Indian exports in 2015)



Sources: UN COMTRADE, IMF Staff Calculations.

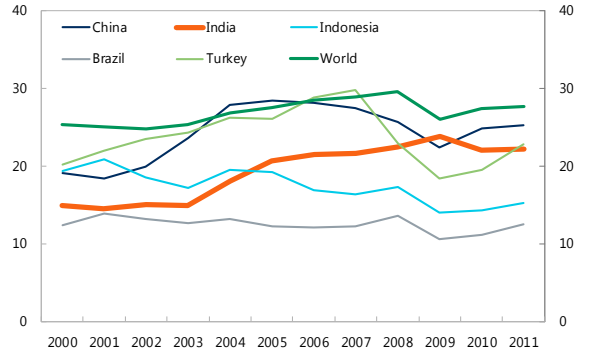
India has made progress in integrating into the global value chain.

India: Merchandised Exports 1/
(Billion of US$)



Sources: Research Institute of Economy, Trade and Industry (RIETI) database; YES BANK
1/ Export value based on BEC classification system in order to classify all of the trade goods by production stage. "Primary goods" are materials to be used for food and beverages and in industrial supplies. "Intermediate goods" are trade goods that represent the intermediate input along the path toward becoming the final product. These goods are manufactured goods (processed or assembled) that are produced from primary goods but still are not yet final products. "Final goods" is defined here as goods used by the producer (as the intermediate input) and goods consumed by households and the government.

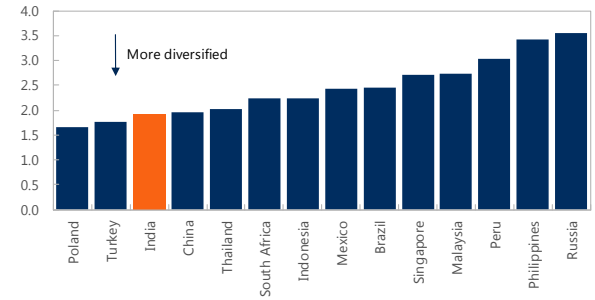
Foreign Value Added
(In percent of Total Merchandised Exports)



Source: Boddin (2016), IMF Working Paper WP/16/206, based on World Input-Output Database.

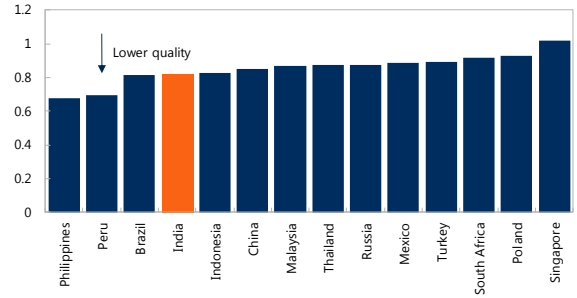
India exports high quality manufacturing products but there is still room to catch up with peers.

Export Diversification Index (Theil Index) 1/
(Data as of 2010, lower value indicates more diversified export basket)



Source: IMF's Export Diversification Database.
https://www.imf.org/external/np/res/dfidimf/diversification.htm
1/Product diversification occurs through introducing new product lines (the extensive margin) or through exporting a more balanced mix of existing products (the intensive margin). The The index is used to measure the extent of diversification across a country's exports.

Export Quality Index in Manufacturing Products 1/
(Data as of 2010, higher value indicates higher quality level)



Source: IMF's Export Quality Database.
https://www.imf.org/external/np/res/dfidimf/diversification.htm
1/Methodology presented in Henn et al (2013) IMF Working Paper WP/13/108. The estimated export quality is based on panel regression for export unit values and quality-augmented gravity equation, in order to decompose for unobservable quality.

Table 1. Drivers of Export Growth in Major Emerging Markets 1/

	Dependent variable: Real non-oil export growth					
	(1)	(2)	(3)	(4)	(5)	(6)
Real effective exchange rate change	-0.221	-0.237	-0.213	-0.211	-0.216	-0.095
	[4.24]***	[4.38]***	[3.01]***	[3.01]***	[3.08]***	[0.60]
Growth of real non-oil goods import demand of trading partners 2/	0.853	0.873	0.844	0.812	0.815	0.739
	[8.76]***	[7.65]***	[6.93]***	[6.17]***	[6.22]***	[4.91]***
Change in MFN tariff rates		-0.141	-0.299	-0.290	-0.286	-0.686
		[0.87]	[2.91]**	[2.80]**	[2.82]**	[0.69]
FDI inflow in percent of GDP			0.200	0.206	0.188	0.217
			[1.21]	[1.40]	[1.30]	[2.15]*
Change in export diversification				0.134	0.134	
				[1.72]	[1.72]	
Change in manufacturing export quality					0.002	
					[0.73]	
Number of documents to export						-2.973
						[1.64]
Change in good market efficiency score 3/						5.916
						[0.82]
Real non-oil export growth, lagged	-0.002	-0.046	-0.033	-0.026	-0.029	-0.178
	[0.05]	[0.92]	[0.63]	[0.50]	[0.54]	[1.57]
Constant	0.513	0.403	-0.268	-0.264	-0.242	16.315
	[0.56]	[0.37]	[0.26]	[0.24]	[0.21]	[1.56]
Adjusted R2	0.35	0.35	0.35	0.35	0.35	0.51
N	328	277	269	269	269	117

Source: IMF staff estimate

1/ To quantify the role of trade slowdown, relative prices, and other factors, the empirical approach estimates a standard model of export demand. The estimated equation is: $$XG_{it} = \alpha_i + \beta_D D_{it} + \beta_P P_{it} + \sum_{j=1}^{j} \beta_j X_{j,it} + \varepsilon_{it}$$

in which XGit, Dit, Pit and Xit denote, respectively, real non-oil export growth, real non-oil import growth of trading partners, relative prices, and a set of structural indicators of country i in year t. Panel regression of real non-oil export growth of 16 emerging economies, including Brazil, China, Hungary, India, Indonesia, Malaysia, Mexico, Peru, the Philippines, Poland, Russian Federation, Singapore, Slovak Republic, South Africa, Thailand, and Turkey. Data are unbalanced panel from 1981-2015. Dependent variable is the growth of non-oil good exports. Standard errors are robust and fixed effects are also included. Significant level is indicated by *** at 1% level, ** at 5% level, and * at 10% level respectively. T-statistics are reported in brackets.

2/ Data are from IMF's Global Economic Environment database. Partners' real non-oil goods import demands are weighted by trade exports to partner countries.

3/ Data are from Global Competitiveness Indicator. The indicator measures the level of market competition, trade barriers, business and tax burdens, and market discipline. The higher the indicator the more efficient the product market is.

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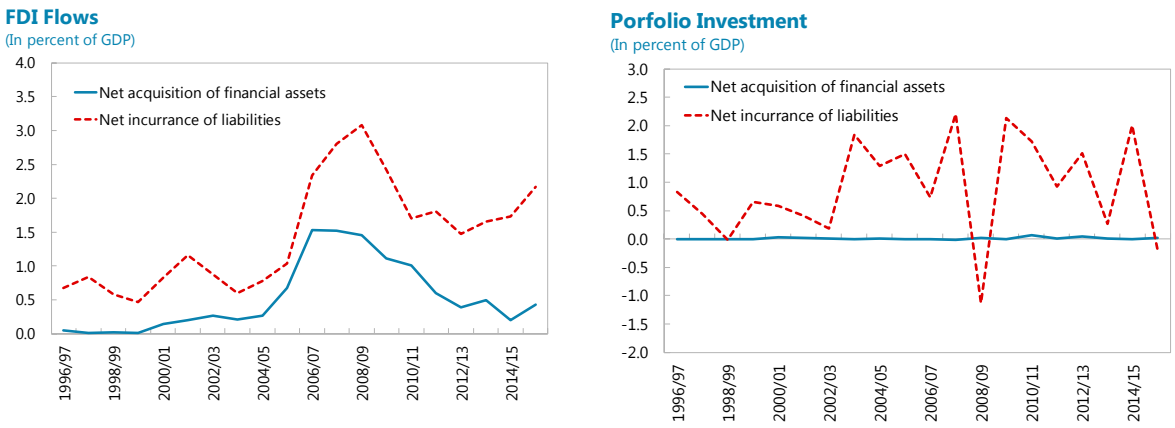
CAPITAL CONTROLS AND CAPITAL FLOWS TO INDIA[1]

The gradual liberalization of the capital account management in India has not been reflected in often-used capital account openness indices. The IMF's recently-developed de jure indices suggest that Indian inflows are more liberalized than outflows. A continuation of policies to carefully open up the Indian capital account to attract stable capital inflows would benefit the Indian economy.

1. India's capital account management has been gradually liberalized over the last past two decades. The pace of liberalization has differed across time and across different types of capital inflows. In the 1980s, India's capital account was closed with limited opportunities for foreign direct investment (FDI) inflows. Following the economic liberalization program of the early 1990s, gradual capital account liberalization was launched, allowing for some FDI and portfolio inflows into the equity markets. Later, some commercial debt operations were also permitted.

2. Helped by this gradual capital account liberalization, capital account flows have significantly increased in India. Indian inflows and outflows have risen across different types of capital account flows over the last two decades (Figure 1). That being said, global events, including the 2008-09 global financial crisis, also had an impact on capital flows.

Figure 1. India: Capital Flows



Sources: IMF, World Economic Outlook; and IMF Balance of Payments and International Investment Position Statistics.

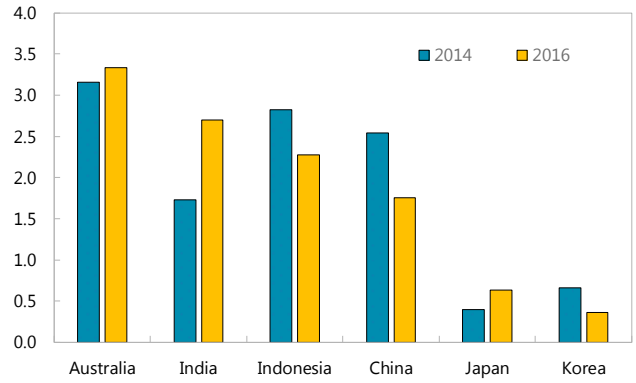
3. Most recently, the Government of India has implemented substantial FDI policy reforms to attract greater FDI flows. FDI flows are governed by the Consolidated FDI Policy (which is revised by the government on a regular basis) and is subject to sectoral laws and regulations on flows into specific industries. The Consolidated FDI Policy defines sectors into which FDI flows are permitted, the aggregate limits on FDI flows into specific sectors, and their approval route. FDI inflows are allowed either under the automatic route (which does not require any approval of the

[1] Prepared by Svitlana Maslova.

government) or government route (which does require prior approval by the government). Over the last two years, the government has relaxed previous caps on foreign investments in different sectors and allowed most of the foreign investments to enter sectors of the Indian economy under the automatic route (Table 1). Most notably, the regulatory changes affected investments in the air services sector, broadcasting, defense, and pharmaceuticals.

4. The recent pickup in FDI flows to India compares favorably with developments in many countries in Asia. Net FDI inflows to India strengthened to 1.7 percent of GDP in fiscal year (FY) 2015/16, and are expected to remain strong this year in FY2016/17, supported by the opening of new sectors for foreign investment. FDI inflows have thus far been concentrated in a few sectors of the economy. Traditionally, most of the FDI equity flows (the majority of FDI flows to India) have been placed in the services sector (about 18 percent of all FDI equity inflows since April 2000). However, in the last two years, the computer sector has started to receive more inflows, more than doubling every year. On the flip side, recent weaknesses in the construction sector have led to a sharp moderation of FDI equity inflows into that sector. Since April 2000, one third of FDI equity inflows have come from Mauritius, benefiting from the 33-year old tax treaty between the two countries which allowed for a capital tax exemption to a Mauritius resident on transfer of Indian securities.[2]

FDI Inflows
(In percent of GDP)

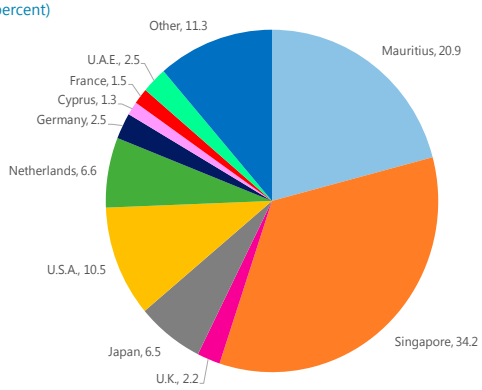


Sources: IMF, World Economic Outlook; IMF staff estimates.

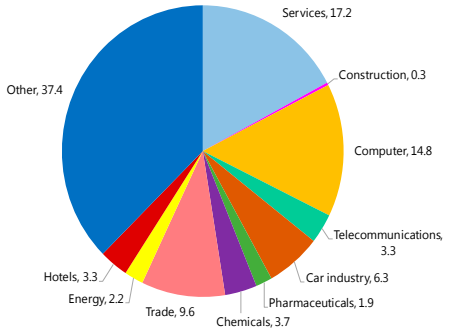
[2] A new tax agreement provides for a two-year transition period up to 31 March 2019, after which tax will be charged at full domestic tax rates. The change could also affect the size of capital inflows from Singapore, the importance of which has been rising in recent years, as capital gains tax exemption under the India-Singapore tax treaty depends on the India-Mauritius tax treaty.

Figure 2. India: FDI Equity Flows

India: Sources of FDI Equity Flows, FY2016
(In percent)



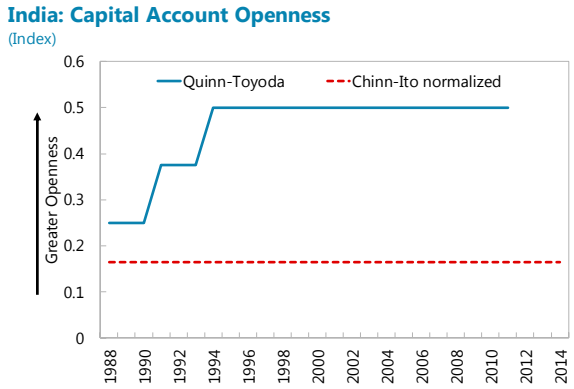
India: Sectoral Composition of FDI Equity Flows, FY2016
(In percent)



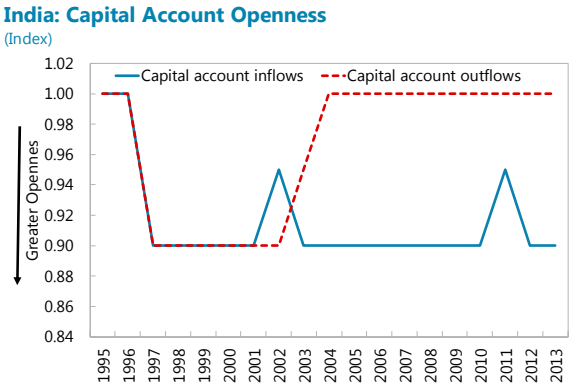
Source: Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India.

5. This gradual liberalization process has not been reflected in traditional indices of capital account openness. The major de jure indices (Chinn-Ito, Quinn) continue to show that India's capital account is quite restrictive and the numerical values of these indices have not moved for a long period of time. This is partly because these traditional de jure indices do not separately measure controls on inflows and controls on outflows. Nonetheless, a recently-developed set of de jure indices (Fernandez et al 2015), which for the first time differentiates between controls on inflows and controls on outflows, demonstrates that India's capital account inflows—most notably, inflows for commercial credits and derivatives— are more liberalized than those on its outflows. However, earlier research found that the effective controls in India are mostly on inflows (Bi, 2016), and controls on outflows are typically not binding. These de jure indices continue to have limitations, as some do not show the intensity of applied capital flow management measures, while others show only a very broad-based picture, not allowing for a differentiation of capital controls by type of flow.

Figure 3. Openness of the Capital Account



Sources: Quinn-Toyoda (2008) and Chinn-Ito (2006).

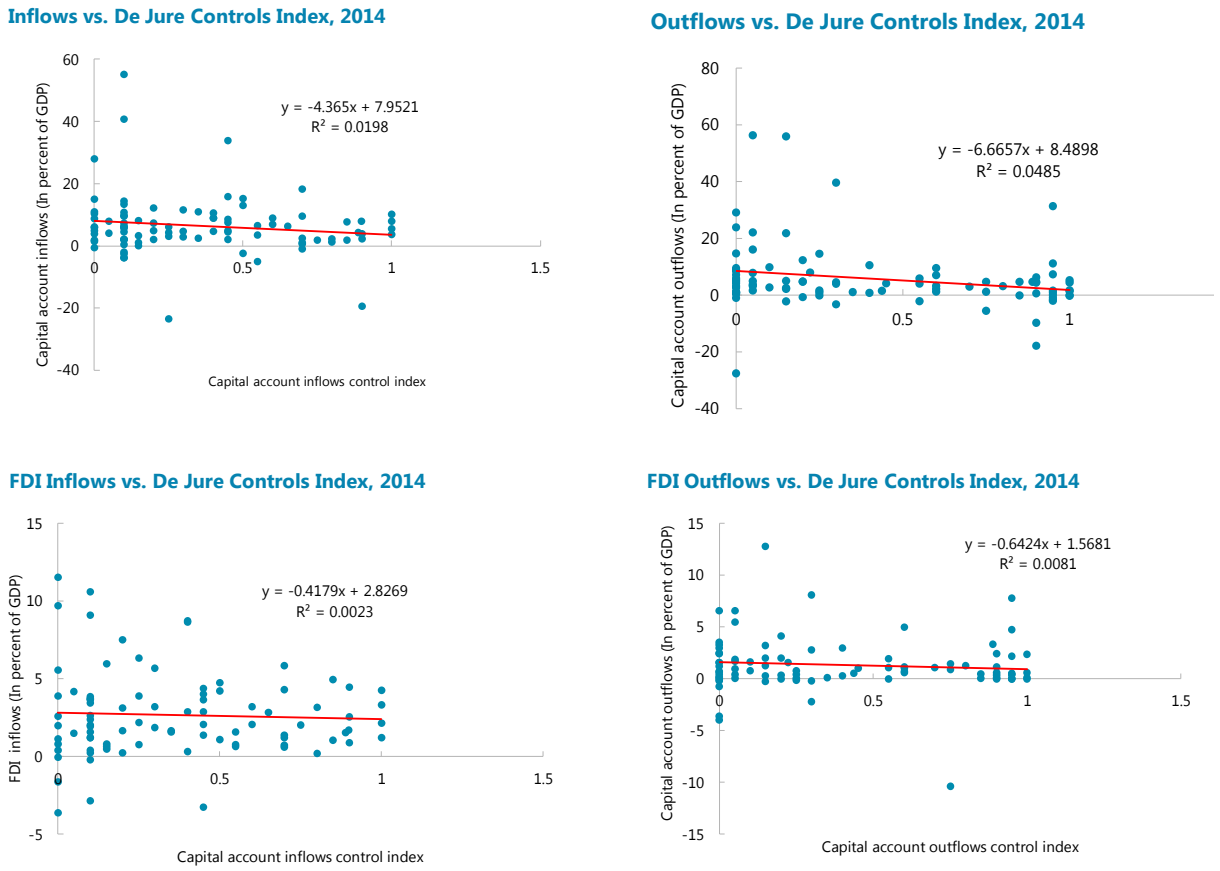


Source: Fernandez et al (2015).

6. The impact of capital controls on capital flows appears to differ between inflows and outflows and among types of flows. Using 2014 capital flow data on more than 80 countries, capital controls (as measured by the de jure indices of Fernandez et al (2015) for 2013) have a larger effect on capital outflows than capital inflows. In addition, the impact of capital controls on FDI flows seem to be smaller than on some other types of capital flows. The earlier empirical research (Montiel and Reinhart, 1999) found that capital controls influence the composition of flows but not their volumes. Moreover, the impact of capital controls was found to change over time and across regions (Asiedu and Lien, 2003).

7. Capital account liberalization should be complemented by structural policies to attract stable, non-debt creating capital flows to India. Capital inflows are essential to support external sustainability in India given its deficit on the current account balance. Given differences in the impact of capital control measures on various types of capital flows, the pace and direction of Indian capital flow liberalization should be carefully assessed based on a cost-benefit analysis. Implementation of structural policies, including those to strengthen the financial sector and institutions, could increase the benefits of capital account liberalization for the recipient economy. Measures to improve the business environment, strengthen the financial sector, and develop financial markets, as recently adopted in India, should continue.

Figure 4. India: Capital Flows and Capital Controls



Sources: Fernandez et al (2015); IMF, Balance of Payments Statistics; IMF, International Financial Statistics; IMF, World Economic Outlook databases; World Bank, World Development Indicators database; Haver Analytics; CEIC Data Company Ltd.

Table 1. India: Changes in FDI Policies Between 2014 and 2016

Sector/Industry	FDI Cap		Approval Route	
	2014 1/	2016 2/	2014 1/	2016 2/
Tea plantation	100%	100%	Government	Automatic
Defense industry subject to industrial license	26%	100%	Government route up to 26%.	Automatic route up to 49%.
Broadcasting carriage services: teleports, direct to home, cable networks, mobile TV, headend-in-the-sky broadcasting service	74%	100%	Automatic up to 49%. Government route between 49% and 74%	Automatic
Cable networks	49%	100%	Automatic	Automatic
Terrestrial broadcasting FM	26%	49%	Government	Government
Uplinking of news and current affairs TV channels	26%	49%	Government	Government
Uplinking of non-news and current affairs TV channels	100%	100%	Government	Automatic
Airports - existing projects	100%	100%	Automatic up to 74%. Government route beyond 74%	Automatic
Scheduled air transport service/domestic scheduled passenger airline	49%	100%	Automatic	Automatic up to 49%. Government route beyond 49%
Non-scheduled air transport service	74% FDI (100% of NRIs)	100%	Automatic up to 49%. Government route between 49% and 74%	Automatic
Ground handling services in civial aviation sector	74%	100%	Automatic up to 49%. Government route between 49% and 74%	Automatic
Satellites-establishment and operations	74%	100%	Government	Government
Duty-free shops		100%		Automatic
Railway infrastructure		100%		Automatic
Asset reconstruction companies	100% of paid-up capital of the company (FDI+FII/FPI)	100%	Automatic up to 49%. Government route beyond 49%.	Automatic
Credit information companies	74%	100%	Automatic	Automatic
Insurance companies	26%	49%	Automatic	Automatic
White label ATM operations		100%	Automatic	
Private security agencies	49%	74%	Government	Automatic up to 49%. Government route beyond 49% and up to 74%.
Pharmaceuticals - brownfield	100%	100%	Government	Automatic route up to 74%. Government route beyond 74%.

1/ Based on Consolidated FDI Policy (effective from April 17, 2014), Department of Industrial Policy and Promotion, Ministry of Commerce and Industry.
2/ Based on Consolidated FDI Policy (effective from June 7, 2016) and Press Note No. 5 (2016 Series) - "Review of FDI policy on Various Sectors", Department of Industrial Policy and Promotion, Ministry of Commerce and Industry.

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OPTIMAL REFORM STRATEGY IN LABOR AND PRODUCT MARKETS: ISOLATED, SEQUENTIAL OR SIMULTANEOUS?[1]

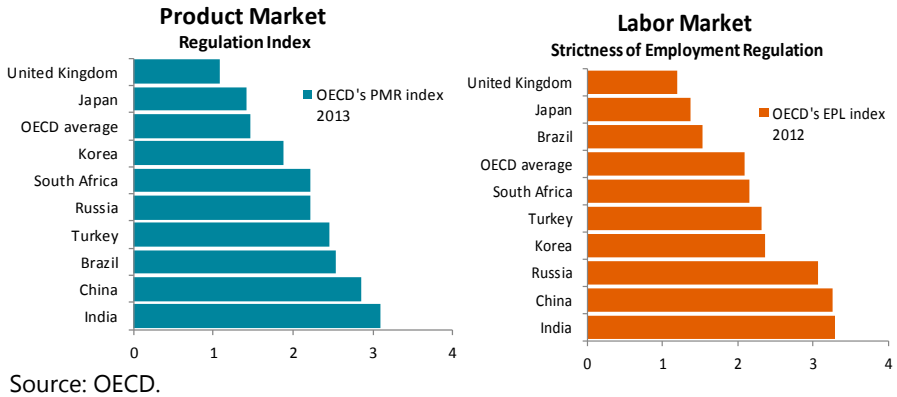
India's tightly-regulated labor and product markets have constrained the expansion of the formal sector of the economy, and have resulted in a sub-optimal level of employment and low productivity. Building on recent progress with product market deregulation, further labor market reforms are urgently needed to enhance the impact of product market reforms and facilitate greater and better-quality job creation.

Rigidities in Indian Labor and Product Markets

1. Tightly regulated product and labor markets in India undermine business competition, constrain the expansion of the manufacturing sector, and result in a large informal sector.

The vast majority of workers in India—more than 90 percent—are employed in informal sector (unorganized) jobs. Rigidities in labor and product markets due to strict regulations have been identified as the main drivers of this large informality, which discourage firms from hiring full-time employees on full benefits.[2] India ranks high on the OECD's employment protection legislation (EPL) index, indicating a lack of flexibility in the labor market due to a multiplicity of labor laws (numbering around 250 at central and state level) and high costs of meeting legal requirements.[3] The challenges of burdensome product market regulation are captured in the World Bank's *2016 Ease of Doing Business Indicators*, which ranked

Product and Labor Market Regulations



Source: OECD.
Note: The scale of the PMR and EPL indicators run from 0 to 6, representing the least to the most restrictive regulatory regime.

[1] Prepared by Purva Khera and Volodymyr Tulin.

[2] See Besley and Burgess (2004); Sharma (2009); and ILO (2012).

[3] Although the Industrial Disputes Act (IDA) of 1947 is the basis for industrial labor regulations in India (requiring firms employing 100 workers or more to seek government permission to dismiss a worker or close a plant), firms are required to comply with numerous laws governing different aspects of the labor market (such as laws governing minimum wages, resolution of industrial disputes, conditions for hiring and firing workers, and conditions for the closure of establishments).

India 130th amongst 189 countries.[1] Product and labor market rigidities have also constrained the expansion of the manufacturing sector, whose GDP share remains low (17 percent of GDP in 2014/15) and has not grown in recent decades despite many policy initiatives.

2. Although significant progress has been made in enhancing the business climate and easing the burden of product market regulation, larger challenges persist in the labor market. As the *Economic Survey 2015–16*[2] pointed out, informal sector jobs were inferior to those in the formal sector—for instance, average wages in the formal sector were 20 times higher than those in informal sector. The key priority is thus enabling a labor market environment that facilitates the transition from informality and leads to higher employment and better quality jobs. Many of the recent reforms, such as easing of FDI norms, "Make in India", as well as introduction of the pan-India GST, will ease product market rigidities and create better business opportunities. However, with limited progress on reforming labor laws, job creation and productivity gains from these reforms are likely to be small.

Short-Run and Long-Run Effects of Deregulation Reforms

3. Staff analysis indicates that lowering rigidities in Indian labor and product markets leads to an increase in GDP, employment, greater product market competition, and lowers informality. The impact of deregulation reforms is examined in this chapter using a small open-economy dynamic stochastic general equilibrium model tailored to India, featuring formal and informal sectors, endogenous firm entry, monopolistic competition and price and wage stickiness in the formal sector. Product market regulation affects firm entry costs and the degree of competition, and labor market regulation affects hiring costs and the bargaining power of workers. An easing of labor market regulations in the formal sector (reduced hiring/firing costs and bargaining power) leads to an increase in hiring of formal sector labor, higher overall employment, and greater output and exports. On the other hand, a relaxation in product market regulations, by reducing formal sector firms' entry costs, leads to more firms setting up in the formal sector, increases competition, investment, exports and output. Entry of new firms also boosts hiring, leading to an increase in formal sector employment in the long run.[3]

4. Despite generating ample benefits over the long-run, deregulation entails short-term costs, posing challenges to reform[4]. As reallocation of resources between the formal and informal sectors following deregulation reforms takes time, economic adjustment entails a temporary fall in output, an increase in unemployment, a decline in formal sector wages, and a rise in informality, which may last up to 4-6 quarters. These short-term costs may reduce incentives for reform, which may be exacerbated by political cycles and the presence of various vested economic and political

[1] This is a slight improvement on the 2015 ranking, where India placed 134th, with the increase in the ranking being due to an increase in the ease and speed of acquiring an electricity connection, and a decrease in redundant inspections.

[2] See http://indiabudget.nic.in/survey.asp

[3] See Anand, R. and P. Khera (2014).

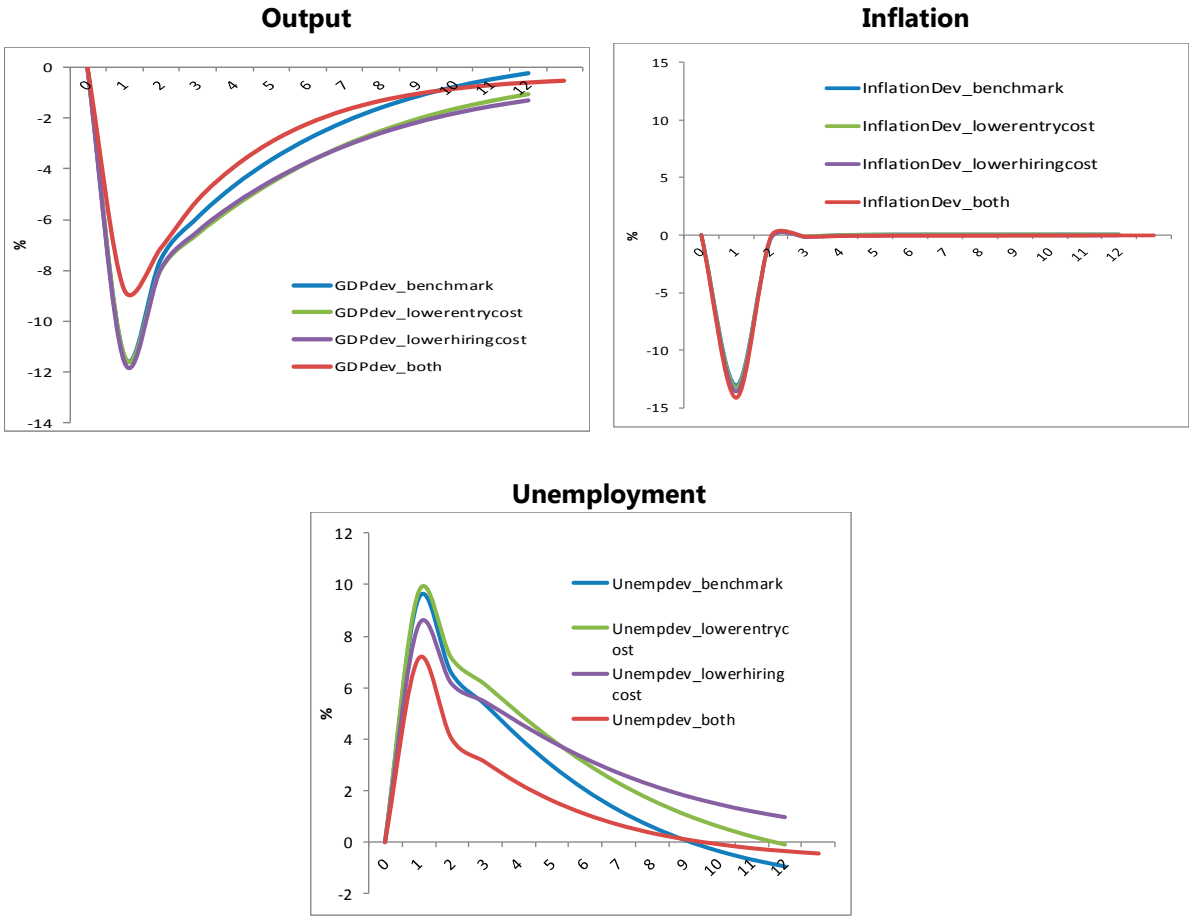
[4] See Anand, R. and P. Khera (2016).

interests. Moreover, labor market reform can face challenges in gaining nation-wide momentum given that labor market regulation falls largely under the purview of the Indian states.

Interplay Between Macroeconomic Policies and Structural Reforms

5. Supportive macroeconomic policies help mitigate short-term costs. Moreover, deregulation improves the transmission and makes demand policies more effective. With a more flexible economy, the trade-off between prices and economic activity improves—a lower decline in output for the same fall in inflation following a monetary policy tightening (Figure 1)—making monetary policy more effective (Anand et al., 2016). In addition, accompanying macroeconomic policy stimulus helps bring forward long-run gains and eases political impediments to such reforms

Figure 1. Monetary Policy is Less Effective Under Tight Regulations



Source: IMF staff calculations.

Note: The impulse response functions shown above are responses to a 50 basis point positive one-period shock to the interest rate. Each variable's response is expressed as the percentage deviation from its original steady-state value.

mainly through two channels: a) a direct impact through an increase in aggregate demand, and b) an indirect impact as higher aggregate demand leads to more hiring by firms in the aftermath of the reforms. However, at the current juncture, any monetary policy support should be calibrated carefully given the Reserve Bank of India's need to bring inflation down towards the medium-term inflation target of 4 percent. On the other hand, given India's limited fiscal space, demand-inducing deficit-neutral fiscal packages could be considered, while continued fiscal consolidation and improvements in tax collection, including as a result of GST implementation, will free up resources which can help towards providing fiscal support for deregulation reforms.

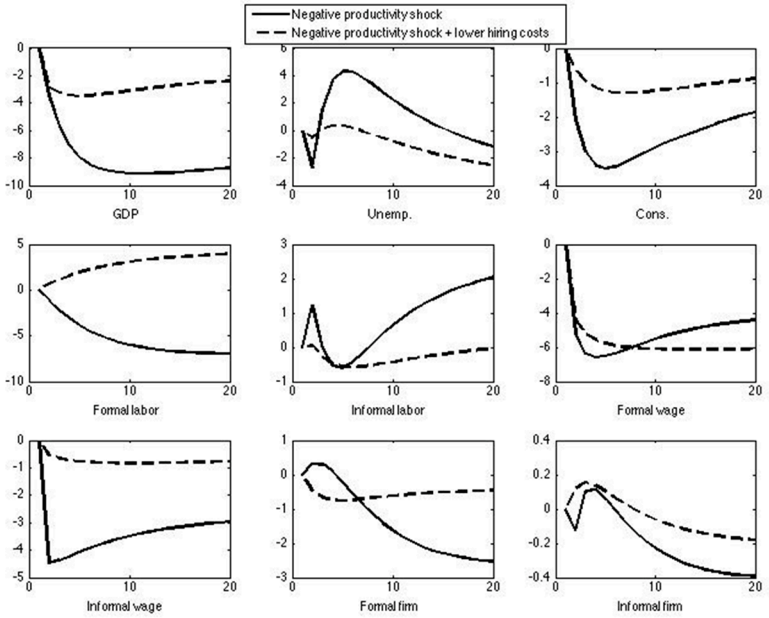
6. Structural reforms can help boost India's ongoing economic recovery. We consider the following policy experiment: the impact of a negative productivity shock in the formal sector at quarter 0 (lasting about 5-6 years for the economy to return to initial steady state) under two scenarios: a) followed by a permanent change in labor market regulation in quarter 1 (black dashed line in Figure 2); and b) no deregulation reform at all (black solid line in Figure 2). Lower aggregate productivity reduces the present discounted value of product and job creation in the formal sector, leading to a fall in the number of producers and hiring in the formal sector, thus leading to lower investment, formality and a fall in GDP below its potential. However, when followed by lowering rigidities in the labor market it induces workers and firms to shift from the informal to the formal sector, which helps mitigate the contractionary impact of a negative productivity shock, resulting in a faster recovery.

Optimal Reform Strategy—Isolated, Sequential or Simultaneous?

7. Which is better—isolated, sequential or simultaneous reforms? Analysis of the optimal strategy for implementing deregulation policies entails comparison of the macroeconomic outcomes across five reform scenarios: two scenarios with either labor or product market reform implemented individually; two scenarios that entail different sequencing of the two reforms; and a scenario with a simultaneous package of reforms. In the case of a sequential approach, the time lag between the reforms is assumed to correspond to India's five-year-long electoral cycle (Table 1).

8. Simultaneous reform packages and sequential deregulation strategies have lower economic costs compared to a single reform outcome. Implementing a complete reform package reinforces the gains when compared to the individual reform scenarios, leading to larger overall macroeconomic gains. While both of the sequential scenarios and the simultaneous reform scenario have the same impact over the long-term, the simultaneous reform scenario results in the lowest costs of transition and also leads to a steady and faster increase in output, investment, exports and formality (Figure 3). These results suggest that prioritizing and sequencing such reforms can be particularly important for optimizing their impact in the current environment of limited policy space in India.

Figure 2. Structural Reforms Help Boost Recovery from a Recession

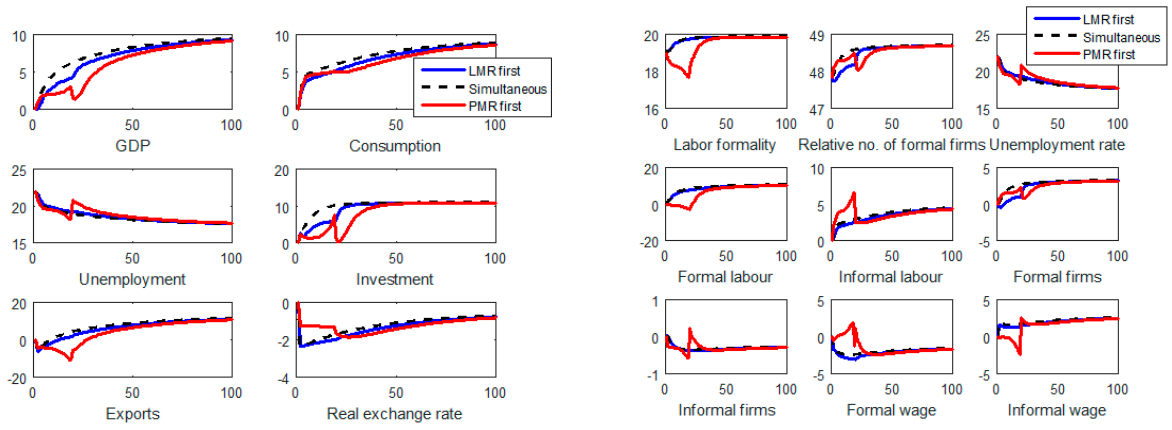


Source: IMF staff calculations.
Note: The impulse response functions shown above are responses to a 10 percent negative productivity shock in the formal sector: a) with no deregulation reform (black solid line); and b) followed by a deregulation reform in the labor market (dashed line). Each variable's response is expressed as the percentage deviation from its original steady-state value.

Figure 3. Sequential versus Simultaneous Reform Scenario

Impact of Reforms on the Overall Economy

Impact of Reforms on Formal–Informal Sector



Source: IMF staff calculations.
Note: The impact is the percentage change in each variable over time where the black dashed line shows the impact of a simultaneous package of reforms; blue solid line shows the impact of implementing labor market reforms first followed by product market reforms; and red solid line shows the impact of implementing product market reforms first followed by labor market reforms.

Table 1. Macroeconomic Impact of Various Reform Strategies

Policy Sequencing	Policy	Year	Variables (% change) GDP	Cons.	Exports	Inv.	Unemp	Formality
Labor market reforms (LMR) first	LMR only	1 year	1.1	3.4	-4.8	2.1	-6.5	1.2
		5 years	4.2	5.1	1.6	5.9	-12.5	4.0
	PMR & LMR	6 years	5.8	5.6	3.7	9.8	-13.3	4.3
	(% change from previous period)		1.5	0.5	2.0	3.6	-0.9	0.3
Product market reforms (PMR) first	PMR only	1 year	1.7	3.9	-4.1	1.8	-9.6	-2.8
		5 years	3.0	5.1	-11.1	7.8	-17.1	-7.0
	LMR & PMR	6 years	2.4	5.0	-2.4	2.2	-8.9	-0.1
	(% change from previous period)		-0.6	-0.1	9.7	-5.2	9.9	7.4
Simultaneous implementation		1 year	2.8	4.4	-2.7	5.3	-8.8	1.4
		5 years	6.3	6.0	4.3	10.2	-14.2	4.2
	Long run impact	20 years	9.1	8.6	10.7	11.0	-19.4	4.6

Source: IMF staff estimates.
Note: Cons. is real consumption, Inv. is real investment, Unemp. is unemployment, and formality is relative share of formal labor

Policy Recommendations

9. Labor market reforms are a top priority. In the context of India's large informal sector, staff analysis suggests that in terms of maximizing macroeconomic gains and minimizing short-run economic costs, beginning with labor market reform is preferred to other policy scenarios. There are three key factors driving these results:

- Even though product market reform leads to an increase in the share of formal sector output, it does not necessarily generate greater formal sector employment, as unchanged regulations and high costs of hiring labor in the formal market encourage firms to increase their capital intensity and hire labor on an informal basis. On the other hand, when labor market reforms are implemented first, formal sector employment increases even in the short-run and stays at higher levels throughout. This in turn leads to higher profits and investment in the formal sector, and faster and greater gains in unemployment, consumption and GDP.

- While a fall in net exports in the short-run is present in all policy scenarios—arising from a moderate real appreciation—a recovery is quicker when labor market reform is implemented first, as lower labor costs gradually increase export competitiveness. This result is consistent with Raissi and Tulin (2015) who find: (i) a positive link between Indian exports and their price competitiveness that is being dampened by labor market rigidities; and (ii) a positive long-run relationship between labor market flexibility and exports.

- The short run costs of product market reforms are alleviated when implemented in a more flexible labor market environment, thus leading to a steady and smooth transition towards the new steady state. However, implementing labor market reforms well after goods market reforms carries with it some undesirable adjustment costs. Reforming product markets first increases

formal sector wages, which may result in greater opposition to any subsequent labor market reforms.

Therefore, the policy agenda should be geared toward enabling greater labor market flexibility. This will help India achieve its manufacturing potential, and meet its demographic transition and income-raising challenges.

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ENERGY POLICY REFORM IN INDIA: ASSESSING THE OPTIONS[1]

A progressive increase in the recently introduced coal tax (raising it by Rs 150 per year from 2017 to reach Rs 2,500 per ton of coal in 2030) prevents over 270,000 air pollution deaths during its phase-in, and in 2030 raises approximately 1 percent of GDP in new tax revenue, reduces carbon dioxide (CO_2) emissions by 12 percent, and generates net economic benefits (domestic environmental benefits less economic costs) of approximately 1 percent of GDP. A more aggressive coal tax (with twice the annual tax increases) has about 75 percent greater environmental and fiscal effectiveness. A carbon tax (applied to all fossil fuels) generates only modest extra health and CO_2 benefits compared with a coal tax, while an emissions trading system is less effective (and would add administrative complications). Other measures (e.g., road fuel taxes, renewable and energy efficiency incentives) are considerably less effective. The rising coal tax is mildly progressive, imposing a burden relative to total consumption of about 0.14 and 0.18 percent for the poorest and wealthiest quintiles respectively in 2020 (compensating the former would use about 6 percent of the new revenues) while raising costs for the 10 percent of most vulnerable industries by 1.1 percent on average.

1. India has recently made considerable progress in reforming energy prices. Gasoline prices were liberalized in 2010, and diesel and natural gas prices in 2014. Additionally, India has introduced an excise tax on coal production and imports, currently Rs 400 (about US$6) per ton of coal.

2. There are nonetheless reasons why policymakers may wish to continue the direction of recent fuel price reforms. Further reform can be in India's own interests as it complements efforts to address rising mortality from exposure to urban air pollution, while also providing an easily collected source of revenue. In addition, reform helps India make headway on its 'nationally determined contribution' (NDC) for the 2015 Paris Agreement of reducing the greenhouse gas intensity of Indian GDP 33-35 percent by 2030 relative to 2005 levels[2]. Going forward, countries are required to submit revised NDCs every five years starting in 2023, which are expected to be progressively more stringent.

3. It is widely recognized that fiscal instruments are the most efficient policies for reducing the environmental costs of fuel use. If appropriately targeted, these policies can exploit the full range of potential behavioral responses across households, firms, and sectors for reducing pollution; if tax levels are set efficiently they can balance environmental benefits and economic costs; and productive use of the revenues offsets costs to the economy from higher energy prices.

[1] Prepared by Ian Parry, Victor Mylonas, and Nate Vernon.

[2] See http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx .

4. To choose among instruments, design them, and communicate their case to legislators and the public, policymakers need a quantitative framework for comparing options against key metrics. A background paper for the 2017 Article IV Consultation[3] uses a practical spreadsheet model parametrized for India to compare the environmental, fiscal, economic, and distributional incidence impacts of a wide range of fiscal and regulatory policies applied to the energy sector. The model starts with data on fuel use by sector, projects this forward in a 'business as usual' (BAU) scenario (with no new policy changes)[4], and then estimates the effects of different policies relative to the BAU using evidence (from empirical studies and other modelling results) on the price responsiveness of fuel use and the health impacts of air pollution exposure.[5] Incidence analysis is conducted by linking the policy-induced impacts on energy prices from the spreadsheet tool to an input-output model to trace the price impacts on different industries and consumer goods, while combining that with survey data on spending on energy and other products by different household groups in India. There is considerable uncertainty surrounding BAU projections and fuel responsiveness, but the qualitative ranking of policies is robust to different scenarios.

5. In the BAU, the CO_2 intensity of GDP in 2030 is 29 percent lower than in 2005, implying (modest) policy intervention is needed to meet the NDC for CO_2 (Figure 1a).[6] Declining emissions intensity primarily reflects a progressive decline in the energy intensity of GDP (due to improving energy efficiency, gradually rising fuel prices which dampen growth in fuel demand, and an assumption that energy products are necessity goods). However, coal still accounts for half of projected primary energy use in 2030. Estimated premature deaths from outdoor air pollution from fossil fuel combustion rise from about 200,000 in 2015 to 400,000 in 2030 with greater coal use and rising urban population exposure to pollution.[7]

6. Progressively raising the coal tax is an effective way to reduce CO_2 emissions (Figure 1b). Aggressively increasing the coal tax by Rs 300 (about US$4.50) per ton of coal each year from 2017 to 2030, bringing the total tax in 2030 to Rs 4,600 (about US$69) per ton of coal, equivalent to Rs 2,460 (about US$37) per ton of CO_2, reduces CO_2 emissions by 7 and 21 percent below BAU levels in 2020 and 2030 respectively. A 'modest' version of this policy, with annual tax increases of Rs 150 (about US$2.25) per ton of coal bringing the total 2030 tax to Rs 2,500 (about US$38) per ton of coal, cuts emissions by 4 and 12 percent in 2020 and 2030 respectively (this is more than sufficient to meet the current NDC, which requires a reduction in projected emissions of 4–6 percent in 2030). A carbon tax (with the same CO_2 charge as in the aggressive coal tax applied to natural gas and oil products as well as coal) is only slightly more effective than a coal tax (as coal accounts for over

[3] See Parry and others (2017).

[4] Projected energy use and emissions are somewhat higher than those for India in IEA (2016), Annex A, 'Current Policies Scenario', mainly due to assumptions that energy prices rise more gradually.

[5] The latter are updated from Parry and others (2014).

[6] CO_2 emissions (primarily from fossil fuel combustion) were about 70 percent of India's greenhouse gas emissions in 2012 (http://data.worldbank.org/indicator/EN.ATM.GHGT.KT.CE?locations=IN&view=chart).

[7] Indoor air pollution deaths are larger still at 340,000 in 2015 though they rise more slowly with the progressive substitution of electricity for residential biomass combustion.

70 percent of fossil fuel CO_2 emissions in the BAU and it is significantly more responsive to carbon pricing than other fossil fuels). An aggressive emissions trading system (ETS) applied to power generation and large industrial emissions sources has about 75 percent of the effectiveness of the carbon tax (for the same emissions price), and would involve significant new investment in administrative capacity. Other policies (road fuel taxes, renewables subsidies, energy efficiency policies for different sectors, electricity taxes) are significantly less effective.

7. The relative performance of different policies in reducing air pollution deaths follows a similar pattern to the relative reductions in CO_2 emissions (Figure 1c). For example, coal taxes are marginally less effective at reducing deaths than corresponding carbon taxes, while the ETS is about 70 percent as effective. The aggressive variant of the coal tax would save about 490,000 lives as it is phased in over the 2017–2030 period, the equivalent carbon tax about the same amount and the equivalent ETS about 340,000, while the modest coal tax would save about 270,000 lives.

8. Higher coal taxes also raise substantial revenues (Figure 1d). The modest coal tax raises revenues of about 0.3 and 1.0 percent of GDP in 2020 and 2030 respectively (in excess of revenues collected with no change in the tax rate), while the aggressive coal tax raises about 70 percent more revenue. The carbon tax raises about 40 percent more revenue than the equivalently scaled coal tax (due to its significantly larger tax base) while the ETS—if allowances are auctioned—and the electricity tax raise revenues of about 60 and 45 percent respectively compared with the equivalently priced carbon tax (the ETS, for example, does not raise revenue from road transportation and small industrial and household energy users).

9. The modest coal tax generates a net economic benefit of 1 percent of GDP in 2030. The tax results in an economic welfare cost of about 0.1 percent of GDP (due to coal users consuming less than they would otherwise prefer) but this is easily outweighed by domestic (i.e., excluding climate change) environmental benefits of about 1.1 percent of GDP (primarily local air pollution benefits).

10. Fuel tax reform imposes a larger relative burden on higher income households (Figure 1e). The modest coal tax is mildly progressive, imposing a burden relative to total consumption of about 0.14 and 0.18 percent for the poorest and wealthiest quintiles respectively in 2020 (in part reflecting higher rates of vehicle ownership and grid access among higher income households). A carefully designed expansion, and improved targeting, of social safety nets (the Public Distribution System and the Mahatma Gandhi National Rural Employment Guarantee Act public works program), especially if combined with improved *Aadhaar*-based targeting, could help to compensate the poorest households for higher energy prices[8] and need use only around 6 percent of coal tax revenues.

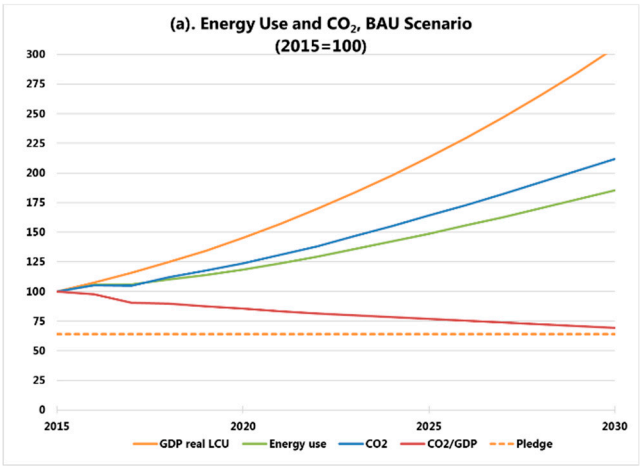
[8] See Abdallah and others (2015). Subsidies for a 'subsistence' amount of electricity consumption, or for clean fuel technologies (e.g., solar water heaters) used by the poor, may also have a role.

11. The modest coal tax raises costs across all industries by on average about 0.2 percent in 2020, or for the 10 percent of most vulnerable industries (e.g., iron and steel) by on average about 1.1 percent (Figure 1f). These figures are an upper bound on any temporary compensation that might be provided to firms to ease transitions as, at least for industries competing in domestic markets, most (if not all) of the cost increases are likely passed forward in higher consumer prices and for those competing in global markets there is less need for compensation if other countries progress on their Paris pledges.

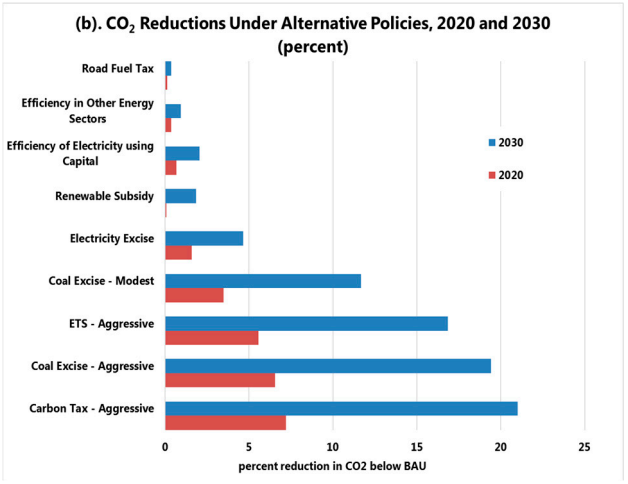
12. Continued fuel tax reform promotes sustainable economic growth by ameliorating increasingly acute environmental challenges and providing revenues for socially productive investments. Moreover, by contributing to coordinated efforts from the international community to slow global warming, fuel tax reform will also reduce the negative impacts climate change will have in India, such as pressures on agriculture and coastal resources. Given the very large domestic benefits from fuel tax reform, India could move ahead unilaterally without waiting for other countries to act.

Figure 1. The Large Benefits from Higher Coal or Fossil Fuel Taxes

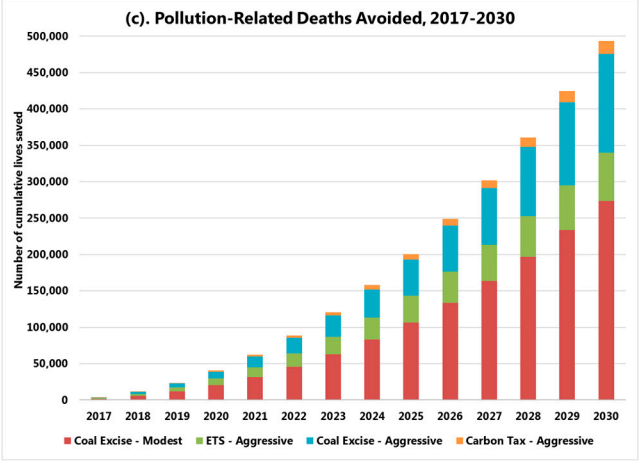
CO_2 intensity of GDP is projected to decline 29 percent over 2005–30, though is about 4-6 percentage points higher than India's Paris target.



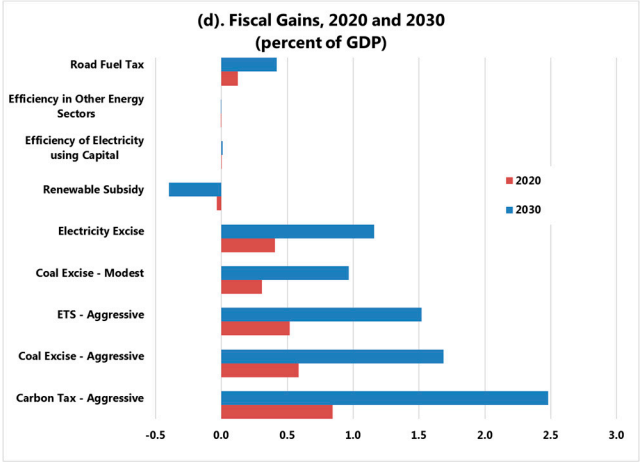
A coal tax effectively reduces CO_2 emissions…



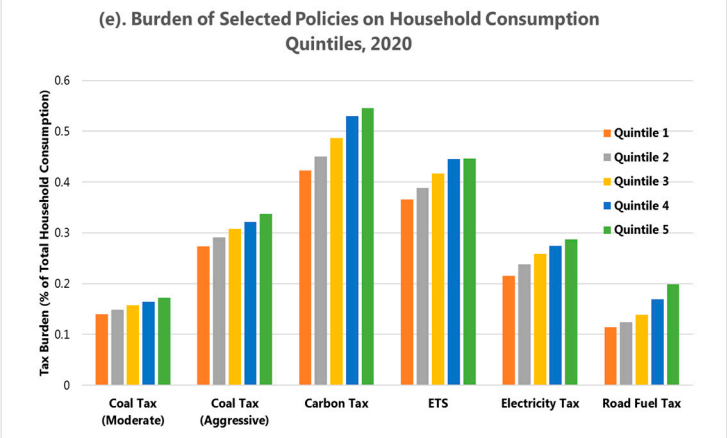
…while substantially reducing deaths from fossil fuel air pollution…



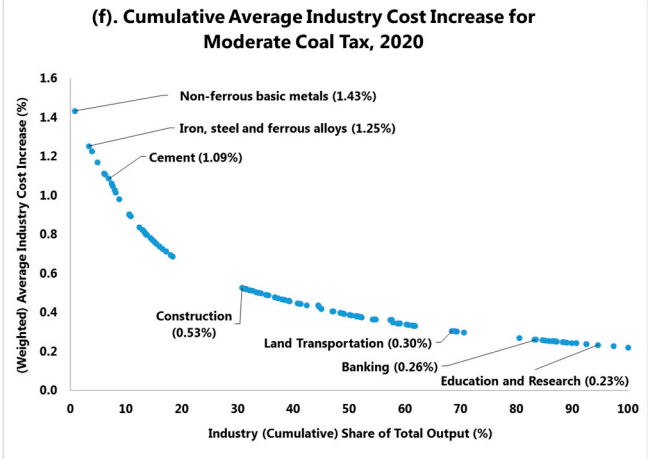
…and also generating large fiscal revenues…



…and imposing a larger burden on higher income households…



…and modest cost burdens on most industries.



Source: Parry and others (2017).

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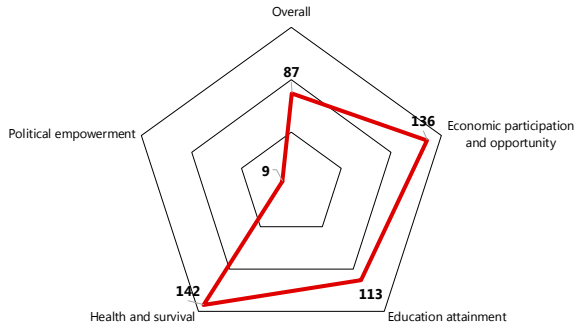
MACRO-LINKAGES BETWEEN GENDER GAPS IN ACCESS TO FINANCE AND LABOR MARKET OUTCOMES[1]

Gender gaps in womens' economic opportunities—both labor market and entrepreneurship—have remained high in India. Lack of adequate collateral limits women entrepreneurs' ability to access formal finance, leaving them to rely on informal sources, which is the key barrier to the growth of women-owned enterprises. The analysis in this chapter suggests that an increase in female entrepreneurs' access to formal finance can increase employment, entrepreneurship, improve competitiveness, and boost potential growth. However, single-sector interventions have a limited impact since women face multiple and intertwined constraints. A multi-dimensional approach—using a range of fiscal, legal and structural measures—could be used to maximize long-run economic gains and to promote greater economic participation of women.

1. Despite rapid economic growth, gender disparities in women's economic participation have remained deep and persistent. The 2016 World Economic Forum's Gender Gap Index ranked India 136th out of 144 countries on economic participation and opportunity, indicating large gender gaps in labor force participation (LFP), wages, and senior managerial and technical positions. Moreover, female labor force participation (FLFP), which is at one-third of male labor force participation, has been falling over time. Informal sector employment constitutes more than 90 percent of total employment, and females are largely employed in low productivity informal jobs in the agriculture and services sector. In addition, they receive lower wages for equal work, have lower average years of schooling, and are responsible for a much larger share of household-related work in comparison to males (Figure 1).

2. Gender gaps in entrepreneurship and access to formal finance remain high. Women entrepreneurs comprise about 10 percent of the total number of entrepreneurs in India[2], and they are largely skewed towards smaller sized firms (98 percent of women-owned businesses are micro-enterprises) with approximately 90 percent of them operating in the informal sector. Access to formal finance is the key barrier to growth of women-owned enterprises, leaving them to rely on informal sources of finance (over 90 percent).

Global Gender Gap (India ranking out of 144 countries)



Source: Global Gender Gap Report (2016), World Economic Forum.

[1] Prepared by Purva Khera.

[2] Collectively contributing 3 percent to India's industrial output and employ over 8 million people.

3. Lack of adequate collateral remains a key constraint in women entrepreneur's ability to access finance. On the demand side, limited awareness and social restrictions around inheritance and land ownership rights, as well as limited financial awareness, turn female entrepreneurs towards finance from informal sources. On the supply side, banks generally consider women-owned enterprises as a high-risk sub-segment, as these enterprises operate mostly in the informal sector and are usually micro in scale. Moreover, absence of collateral causes banks to avoid this sub-segment.

Empirical Evidence for Determinants and Economic Impact of Gender Gaps

4. What explains these gender disparities? Empirical evidence identifies various demand and supply side constraints specific to females' economic participation that can be classified under three main categories. First, gender differences in time use, primarily resulting from differences in care responsibilities due to social norms (Eswaran et al, 2013). Second, gender differences in access to productive inputs—land, credit and skills (Gonzales et al, 2015). Lastly, gender differences stemming from market and institutional failures—lack of basic infrastructure and safety, lack of implementation of laws against gender-based discrimination amongst others (World Bank, 2011; Ghani, 2013).

5. What drives the formal-informal dichotomy in Indian labor and goods markets, and how is it linked to females' economic participation? In addition to the above constraints faced by females, lack of employment opportunities in the formal (organized) sector is also an important contributor to the declining trend in FLFP (Khera, 2016a, 2016b; Das et al, 2015; Chatterjee et al, 2015). The large size of the informal sector has been attributed to tightly regulated formal sector which encourages firms to: a) remain small and informal to avoid regulations; and b) hire labor on an informal basis to avoid high costs of hiring and firing (see Besley and Burgess, 2004; Sharma, 2009).

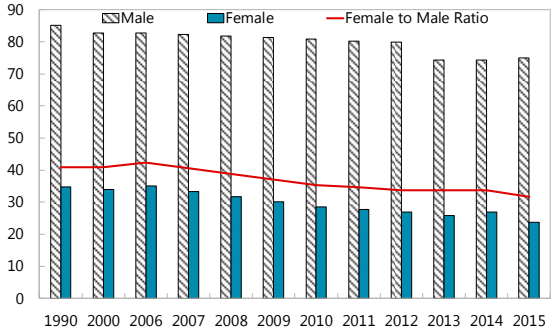
6. Why should policymakers care? Economic growth and development depend upon successful utilization of the entire workforce, both male and female. The evidence that gender inequality is impeding economic growth is growing, and the potential gains from greater inclusion of women in the Indian economy are estimated to be large. According to Cuberes and Teignier (2016), closing the gender gap in India could boost GDP by 27 percent. Although, in terms of relative magnitudes, India's gains should be and are indeed found to be larger than most countries, this may be an overestimate as their results are based on a model simulation that does not take into account the large informal sector in India resulting from high rigidities in the formal labor and goods market, which would dampen the gains from any gender-based reforms (see Khera, 2016b).

Figure 1. Gender Inequality: Labor Market, Access to Finance, Entrepreneurship

Female labor force participation is one-third of male labor force participation and has been declining over time.

Female versus male labor force participation

(In percent)

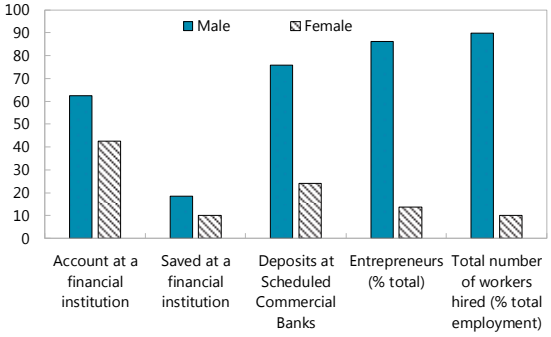


Source: National Sample Survey Organisation.

Gender gaps in entrepreneurship and access to finance remain high…

Entrepreneurship & Access to Finance

(In percent)

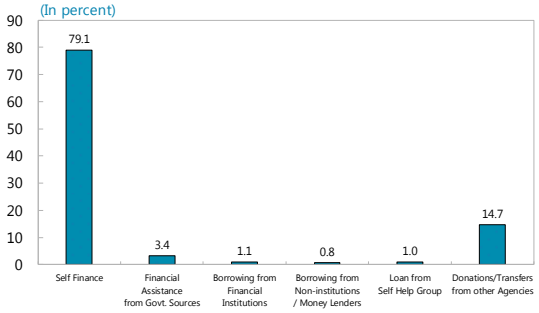


Source: World Bank, Sixth Economic Census (2014).

…leaving female entrepreneurs to rely on self-finance and informal sources of finance.

Distribution of Number of Establishments under Women Entrepreneurs by Major Source of Finance

(In percent)

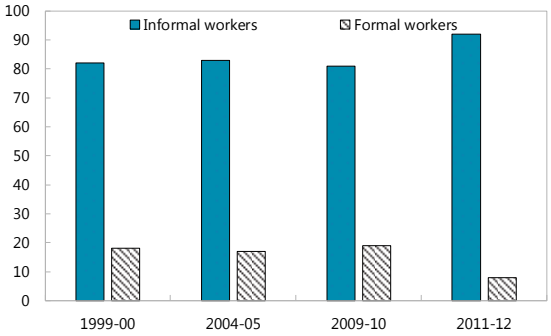


Source: World Bank, Sixth Economic Census (2014).

More than 90 percent of the workforce is employed informally with higher female representation than male…

Share of informality in labor market

(In percent)

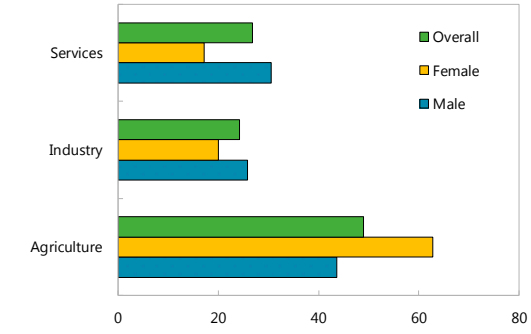


Sources: National Sample Survey (NSS), International Labor Organization.

…and female employment is largely concentrated in informal jobs and self-employment in the agriculture sector.

Sectoral Composition of Employment

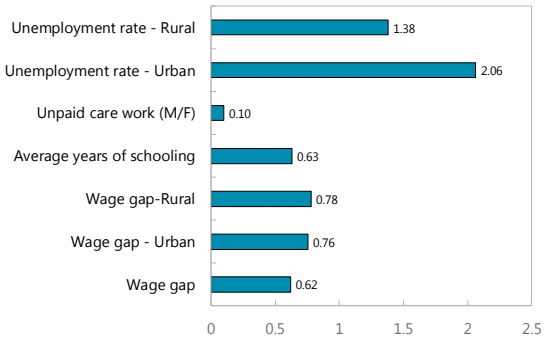
(In percent)



Source: National Sample Survey (NSS - 68th round) 2011-12.

In addition, there are gender gaps in wages, education, and unpaid care work.

Female-to-Male Ratio



Sources: Census of India (2011); National Sample Survey (NSS - 68th round).

Evidence from India's General Equilibrium Framework

7. The effects of the following policies are analyzed in this chapter. What is the impact of an increase in female entrepreneurs' access to formal finance (i.e. no gender gaps in financial access) on: i) gender gaps in business opportunities (entrepreneurship); ii) gender gaps in the labor market (female labor force participation, female informality in employment, and wage gaps); and on iii) macroeconomic outcomes (GDP, unemployment, and overall formality)? In addition, we also study the impact of the former under two scenarios: a) combined with lower regulations (i.e. higher flexibility) in the formal sector labor market; and b) combined with skill development policies (i.e. no gender gap in skills).

8. A small-open economy dynamic stochastic general equilibrium (DSGE) framework provides a comprehensive analysis and captures the macro-linkages between India's labor market, financial market and overall economic performance. The theoretical framework is an extension of the framework presented in Khera (2016), to which we add financial micro-foundations (i.e. a banking sector) to analyze the problem of gender-specific financial frictions and their macroeconomic implications. The economy consists of: a) households with male and female members; b) male and female owned enterprises; c) capital producers who invest in new capital; c) banks that provide loans to firms; d) the government who taxes formal wage income to fund social spending and sets the interest rate; and e) the rest of the world. The model features two sectors—regulated formal sector and unregulated informal sector—where the key distinctions between the two are summarized in Table 1. To capture rigidities - firms in the formal sector face higher entry costs (to set up a new business), higher costs of hiring and firing workers, and workers employed formally have a higher wage bargaining power (i.e. unionized labor). In addition, the size of informal finance in the economy is positively related to: i) the degree of financial frictions in the formal sector; and ii) the overall share and size of informal firms (which is linked to the extent of regulations in the formal sector).

Table 1. Characterizing Informality

	Formal Sector	Informal Sector
Labor & Product Market	Regulated	Not regulated
- Wage bargaining	High	Low
- Hiring/ firing cost	High	Low
- Entry cost	High	Low
Financial Market - LTV ratio	High	Low
Traded	✓	✗
Taxation	✓	✗

9. Gender issues are introduced in the model via heterogeneity in access to finance, skills, safety, social norms, contribution to household activities, and discrimination (Table 2). Female and male owned enterprises in each sector hire male and female workers and rent capital (financed by bank loans) to produce final goods which are sold domestically or exported to the rest of the world. Financial frictions appear because both types of entrepreneurs face a collateral constraint when borrowing from the bank, and credit limits are affected by the quantity and value of this collateral.[5]

Table 2: Characterizing Gender Inequality

	Male	Female
Access to productive inputs		
- Credit	High	Low
- Skills (average years of schooling)	High	Low
Time use: Household care responsibilities	Low	High
Institutional failure and social norms:		
- Wage bargaining power	High	Low
- Safety/ mobility	High	Low
- Discrimination (male owned firms)	✗	✓

10. The main contribution of this study is to analyze the effect of financial frictions faced by female entrepreneurs on their labor market outcomes and on macroeconomic performance in India. Although the theoretical and empirical literature on FLFP is vast, the effect of gender-based resource restrictions on women's labor market outcomes has been less explored. In addition, we also model the inter-linkages of these gender gaps with the informal sector, which has largely been ignored in previous studies (see Khera, 2016b).[6]

11. Results indicate that an increase in female entrepreneurs' access to formal finance (i.e. no gender gaps in access to finance) leads to an increase in their entrepreneurship and FLFP, which leads to higher GDP and lower unemployment. Gender gaps in entrepreneurship fall as female entrepreneurs, who now have higher access to formal sources of finance, replace male entrepreneurs in the formal sector who move to the informal sector instead ("Financial access" in Figure 2). Gender gaps in LFP also improve: increase in overall entrepreneurship leads to higher employment and LFP, and females participate more in comparison to males due to their higher likelihood of getting employed in high productivity jobs by the larger share of female entrepreneurs in the formal sector (who do not discriminate).

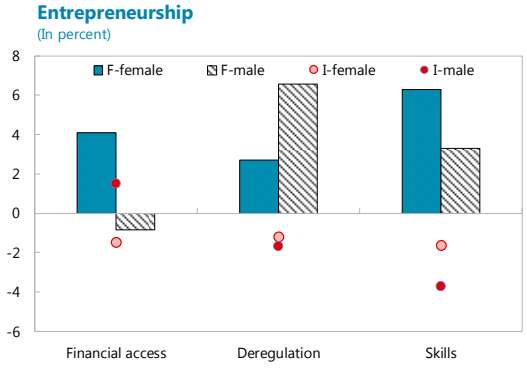
12. However, unless accompanied by reforms to lower labor market rigidities, increased access does not generate sufficient formal sector job creation. Although an increase in access to formal finance leads to a greater number of entrepreneurs operating in the formal sector resulting in a higher share of formal sector output, due to stringent labor market regulations, new firms hire workers informally, thus leading to an increase in informality in the labor market. Hence, a large

[5] Physical capital is used both as collateral to obtain loans and as an input to production. A shock that reduces the productive capacity of entrepreneurs also reduces their ability to borrow, forcing them to cut back on their investment expenditures and, thus, on their demand for capital. This situation can spill over to the subsequent periods, reducing revenues, production and investments even further.

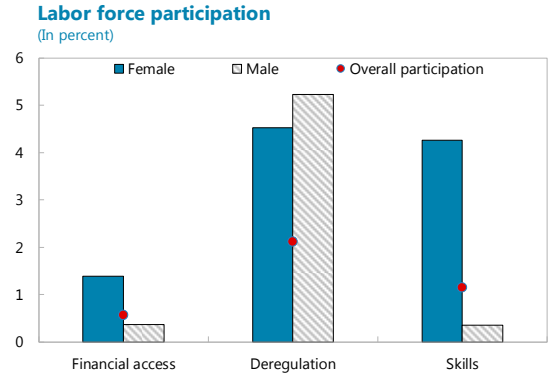
[6] Previous studies in the literature include Klasen, 1999; Dollar and Gatti, 1999; Klassen and Lamanna, 2009; and Barro and Lee, 2013 among others.

Figure 2. Impact of an Increase in Female Entrepreneurs' Access to Formal Finance Under Three Scenarios

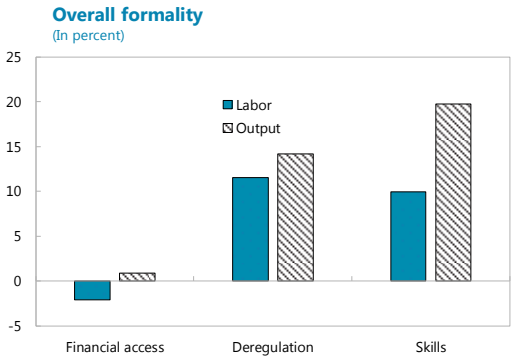
Both female and overall entrepreneurship in the formal sector is higher…



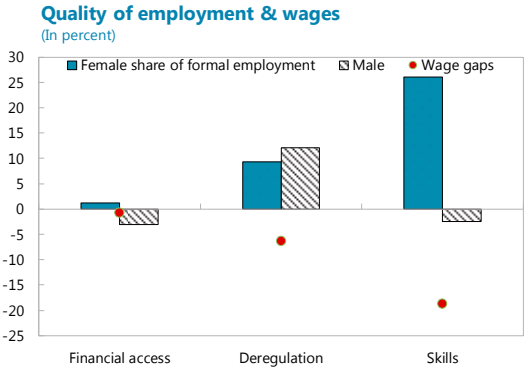
…and increase in hiring by new entrepreneurs leads to an increase in overall LFP and lower gender gaps.



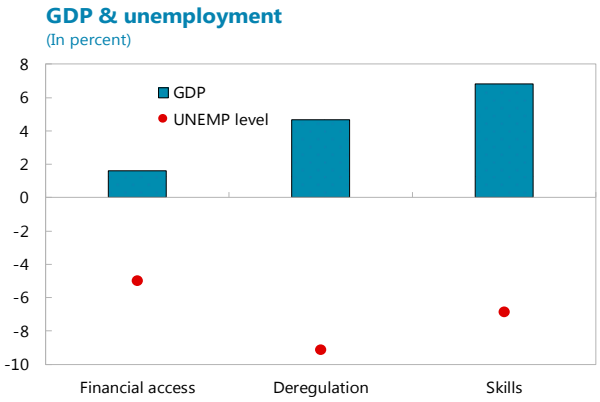
However, unless accompanied by reforms to decrease labor market rigidities and increase in skills training, it does not generate sufficient formal sector job creation…



…resulting in a large proportion of the increased female participants getting employed in low productivity informal jobs.



Moreover, a multi-dimensional policy approach leads to significantly higher gains in GDP and unemployment



Source: Author's calculations.

Note: Financial access in the figure refers to an increase in access to formal finance for female entrepreneurs (i.e. no gender gaps in access to formal finance); Deregulation refers to lower hiring costs in the formal labor market along with no gender gaps in financial access; Skills refers to an increase in females' average years of schooling (i.e. no gender gaps) along with no gender gaps in access to finance.

share of the new labor market participants find employment in low paying informal jobs. However, when labor markets are more flexible (i.e. lower regulations in the labor market), closing gender gaps in access to finance not only leads to higher share of formal sector employment for both females and males, but also leads to larger gains in GDP and unemployment ("Deregulation" in Figure 2).

13. Similarly, improved access to credit for females without improving their skills will have limited positive impact. Simultaneously closing the gender gaps in financial access and in skills gives the Indian economy a substantially larger boost, while also leading to higher gender parity in LFP, wages and formal sector employment ("Skills" in Figure 2).

Policy Recommendations

14. What can policymakers do? A range of fiscal and structural measures could be used to promote greater economic participation of women in India. A multi-dimensional policy approach—such as improving financial literacy (especially in rural areas) to boost females' demand for financial services; spreading awareness of females' land inheritance to mitigate resource restrictions on women's access to finance; effective and more targeted implementation of skill training programs for women to enhance their employability across various industries; and easing labor market regulations to promote the creation of formal sector jobs—is needed to help raise female entrepreneurship, FLFP, and formal sector employment that has significant prospective growth and development implications. On the fiscal front, rural infrastructure spending on access to clean water, sanitation and transportation could also reduce the time women spend on domestic tasks and facilitate their access to markets. Continued fiscal consolidation efforts will free up resources for higher infrastructure spending and for higher investment in education and skills training programs, and the government's push towards business climate reforms (including timely implementation of the GST) will help boost women's economic participation.

15. Recent financial sector initiatives of the government have seen some success in enhancing various aspects of financial inclusion. More than 240 million previously unbanked individuals, among whom about 47 percent are females, have gained access to bank accounts since the launch of the *Pradhan Mantri Jan Dhan Yojana* (PMJDY)[7] in August 2014. Moreover, the *Pradhan Mantri MUDRA*[8] *Yojana* (PMMY) scheme has been successful in enabling women-led businesses to access collateral-free finance.[9] However, women face multiple and intertwined constraints, and hence single-sector interventions have limited impact. The government should measure the success of its interventions by the extent of rise in females' formal entrepreneurship, mobility of their firms to medium and large sizes, and by the extent of improvement in females' labor market participation.

[7] See Ministry of Finance website at: http://pmjdy.gov.in/.

[8] Micro Units Development and Refinance Agency.

[9] Womens' businesses accounted for about one-half of the total amount lent under the scheme, and about four-fifths of the number of loans, in part reflecting scheme's support to new business undertakings led by women.

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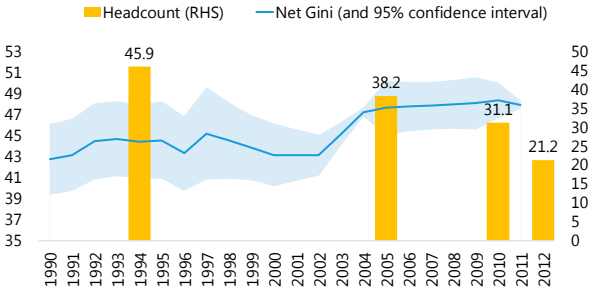
INEQUALITY AND EDUCATION IN INDIA: TACKLING THE EQUITABLE GROWTH CHALLENGE[1]

Despite India's impressive growth performance and progress in eradicating extreme poverty, income inequality has been on the rise. This chapter investigates the contribution of inequality in education levels and the resulting high skill premium to this increase in income inequality. It documents important aspects of the Indian economy and educational sector using detailed household survey data. Based on these findings, a model is developed to simulate the direct and indirect effects of potential policies on inequality, schooling decisions and output. The main finding is that while targeted transfers work well in lowering income inequality, increasing returns to education has the most pronounced impact on measures of educational attainment.

Stylized Facts

1. Despite India's impressive economic growth performance and progress in eradicating extreme poverty, income inequality has been on the rise. Over the last two decades, India's GDP per capita (in PPP terms) grew on average by 11 percent per year. While this rapid growth was able to lift many people out of extreme poverty, income inequality has drastically increased. While Gini estimates for India diverge strongly, all of them show a clear increase of around 5 points since the early 1990s.[2] The latest estimate in the Standardized World Income Inequality Database (SWIID) for the Gini coefficient places India with a value of 47.9 far above the simple world average of 37.3, and at second place in Asia, just after China.

India: Development of Inequality and Poverty
(In percent)



Source: SWIID Version 5.1, PovcalNet.
Note: Headcount refers to the percentage of the population living in household with consumption per person below the poverty line. The poverty line is $1.90 per day at 2011 PPP. The Net Gini refers to post-tax and post-transfer income.

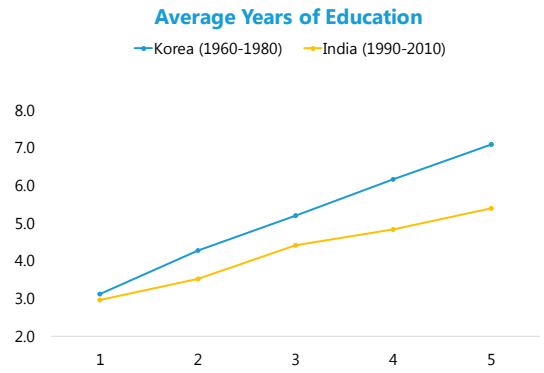
2. Comparing India's experience to Korea's episode of "growth with equity" suggests that education could be part of the explanation. From the 1960s to early 1980s, Korea grew rapidly while maintaining an equitable income distribution, in contrast to the experience of other countries where there appeared to exist a trade-off between growth and inequality. The literature has attributed this Korean success to various factors, a prominent one being the simultaneous rapid expansion of educational levels and employment opportunities. Indeed, comparing Korean and Indian education achievements displays striking differences. Average years of schooling of the adult

[1] Prepared by Sonali Jain-Chandra and Johanna Schauer.

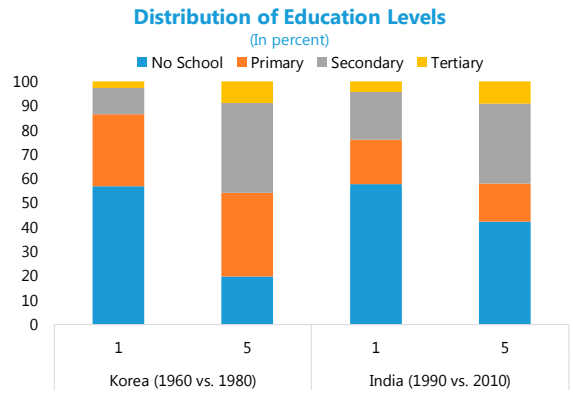
[2] World Bank's PovcalNet reports for India a consumption based Gini coefficient of 33.9 for 2010 and 35.5 for 2012, while Solt's Standardized World Income Inequality Database (SWIID) aiming for comparability across countries, estimates an income-based Gini coefficient of 47.9 for 2011. The Gini coefficient is an inequality measure ranging from 0 to 100, where 0 signifies that everyone has the same income (very equal distribution) and 100 implies that the richest person has all the income (very unequal distribution).

population (above the age of 25) were at similar levels in Korea in 1960 and India in 1990. However, over the subsequent twenty years they diverged, with Korea outperforming India on educational attainment. Additionally, while India has kept up with regard to attainment of secondary and tertiary education, it has mainly been the share of primary schooling that has fallen behind.

3. More recent data on dropout rates suggest that primary school attendance is improving in India. Recent IHDS data[3] hints towards an improvement in primary school attendance

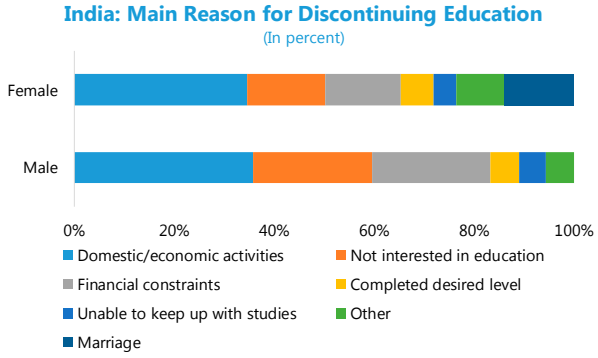


Source: Barro and Lee v. 2.1 (2016)



Source: Barro and Lee v. 2.1 (2016)

and completion, as more children attend and complete primary school. Of the age cohort of 15-19 year olds in 2011/12, only 5.5 percent left school before completing 5th grade. However, 20.3 percent had left before completing 10th grade. The 2014 Indian National Sample Survey (NSS) asked persons from age 5 to 29 for the major reason for discontinuing education. Most respondents report leaving school because of economic or domestic activities or financial constraints, suggesting that outside opportunities and borrowing constraints seem to play a crucial role in determining educational choices. Furthermore, the share arguing that they are not interested in education could imply low quality of the offered education or lack of knowledge with regards to the returns of education.



Note: Major reason for discontinuance for persons of age 5-29 who had ever been enrolled but were currently not attending.
Source: National Sample Survey (NSS), 71st round, 2014.

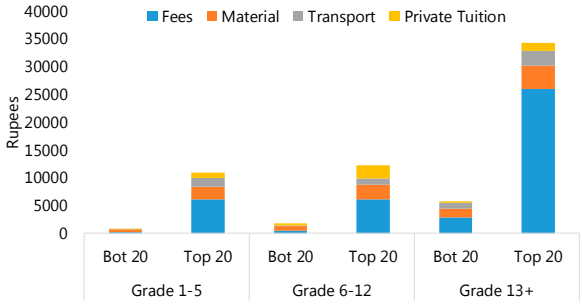
4. Public expenditure on education in India is similar to peer countries, but is more directed towards advanced levels of schooling. Public expenditure on Indian education as a share of GDP has increased from 3.1 percent in 2006 to 3.8 percent in 2012, which is higher than that of Korea in the 1970s. Yet, it is slightly lower than that of China (4 percent) and the average of the rest

[3] The India Human Development Survey (IHDS) is a nationally representative panel survey organized by researchers from the University of Maryland and the National Council of Applied Economic Research in New Delhi (see Desai and Vanneman, 2016). It has been used by the Luxembourg Income Study, the World Bank's Povcalnet, and many other researchers (see http://ihds.info/papersusing-ihds-public-data).

of the BRICS countries (5.37 percent) in 2012. Furthermore, while the government of Korea was spending between 81 percent (1960) and 54 percent (1979) of their educational budget on primary education, India only spent on average around 30 percent between 1999 and 2012 with the remainder mostly going towards secondary and tertiary education.

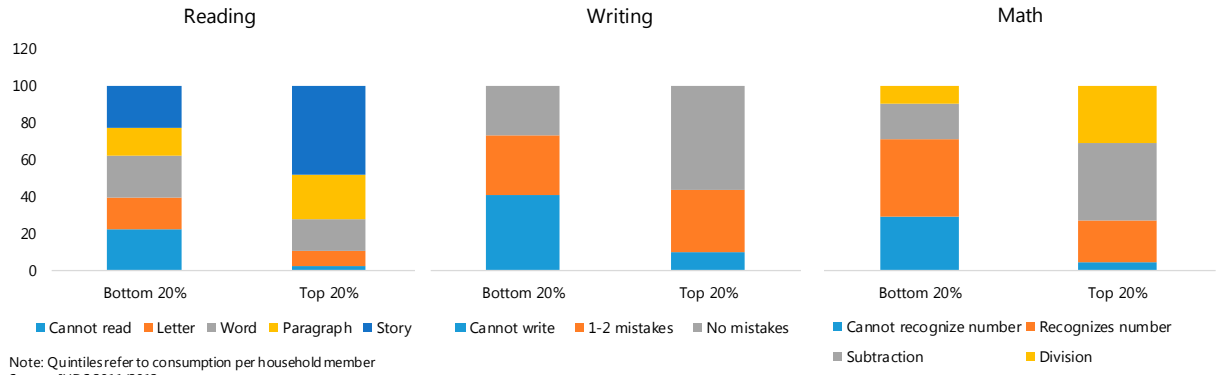
5. Large differences in private expenditure on education translate into substantial differences in the quality of education achieved. IHDS data suggests that private expenditure on education varies substantially for different schooling and consumption levels. The top 20 percent in the consumption distribution spend 13 times as much as the bottom 20 percent on primary education, which declines to 6 times as much for tertiary education. Using the IHDS' test of basic reading, writing and math skills for 8 to 11 year olds as proxies for educational quality suggests that these spending differences have far-reaching implications. Among the poorest 20 percent of households, 22.4 percent of children were not able to read at all, while this was at only 2.25 percent for the richest 20 percent. Even higher for both groups, 40.7 percent (10.1 percent) of the bottom 20 percent (top 20 percent) were not able to write.

India: Average Annual Education Expenditure by Level of Education



Note: Quintiles refer to consumption per household member.
Source: IHDS 2011/2012.

India: Abilities 8-11 year olds (In percent)



Note: Quintiles refer to consumption per household member
Source: IHDS 2011/2012.

6. India's educational distribution is characterized by a dual structure of modern and traditional enterprises and employment. The IHDS allows for the division of households along two main dimensions of economic activity: modern vs. traditional and entrepreneurs vs. workers.[4] This classification suggests that more than 42 percent of households rely mainly on entrepreneurial income, most of them being traditional. For households relying on income from employment, two thirds are traditional workers. Educational attainment of the household's main bread winner diverges substantially between the occupations. Modern workers achieve the highest mean years of schooling with 9.9 years, while traditional workers on average do not even complete primary school.

India: Occupational Distribution

	Share in Total Households	Average Years of Education	Average Income (normalized)	Share of Poor Households
Modern Entrepreneur	5.4%	8.5	100	6.7%
Modern Worker	19.5%	9.9	99	6.3%
Traditional Entrepreneur	37.0%	5.7	45	17.1%
Traditional Worker	38.1%	4.4	38	26.5%

Source: IHDS, 2011/2012.

Policy Experiments

7. We develop a model to simulate the effect of different policy interventions on income inequality, schooling decisions and output. In particular, we are aiming to highlight and understand the effect of cash transfers, educational quality and industrial policy.

8. A heterogeneous agent DSGE model is developed to simulate the direct and indirect effects of potential policies on inequality, schooling decisions and output. Based on the empirical findings a heterogeneous agent DSGE model similar to Mestieri et al. (2016) is developed, in which agents can endogenously choose their occupations and their child's educational level and investment, while being financially constrained. Time spent in school and private and public investment in education determine the level of human capital an individual can accumulate. The human capital production function allows for different returns to education by schooling level, and previous investments in education influence the returns to subsequent investments. Occupational choices allow agents to become unskilled or skilled workers or traditional or modern entrepreneurs. The model also features a government sector that directly funds education through public expenditure and supports households through subsidies. It finances itself through taxes on entrepreneurial profits and wages.

9. The model is calibrated to represent the Indian economy, using the most recent data from 2011/12. The baseline of the model is calibrated to the most recently available data as the chapter aims to evaluate the general equilibrium effects of different policies. Some of the parameters are chosen from the standard macro literature[5], assuming that they are invariant across

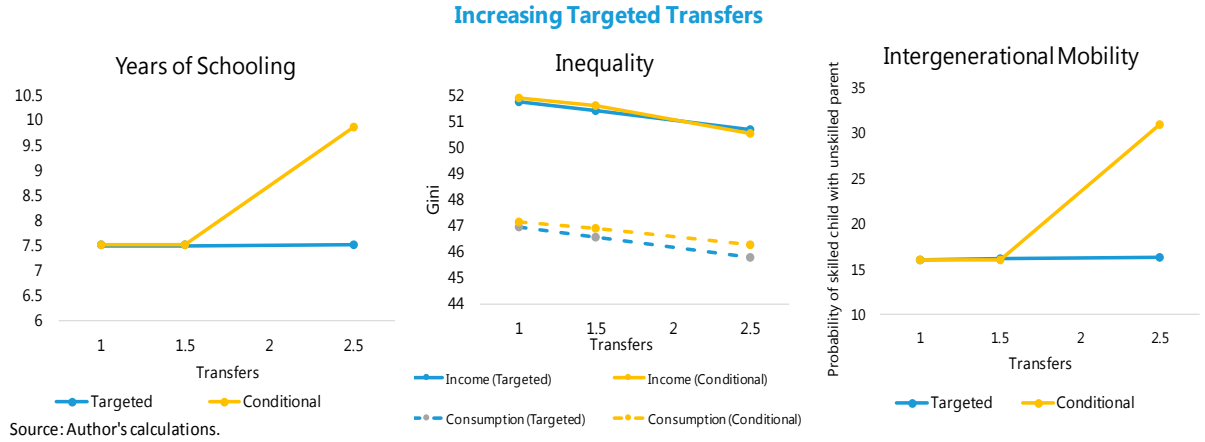
[4] See Jain-Chandra and Schauer (2017) for a detailed definition.

[5] For example, the discount rate is taken from Stokey and Rebelo (1995) and the degree of relative risk aversion from Attanasio et al. (1999).

countries and time. The other parameters are obtained from the IHDS and various data sources, and by matching moments in order to represent the Indian economy during 2011/12.

10. Policy experiments compare the changes to the benchmark. The policy experiments range across various measures such as the impact of different kinds of cash transfers, raising educational quality and supporting the development of the manufacturing sector, some of which are being implemented or considered by the Indian government. All the experiments are comparisons of steady states and should thus be interpreted as long-run outcomes. Moreover, as government expenditure changes with household's income, the generosity of the transfer program and the level of schooling, we adjust taxes accordingly to finance these changes.

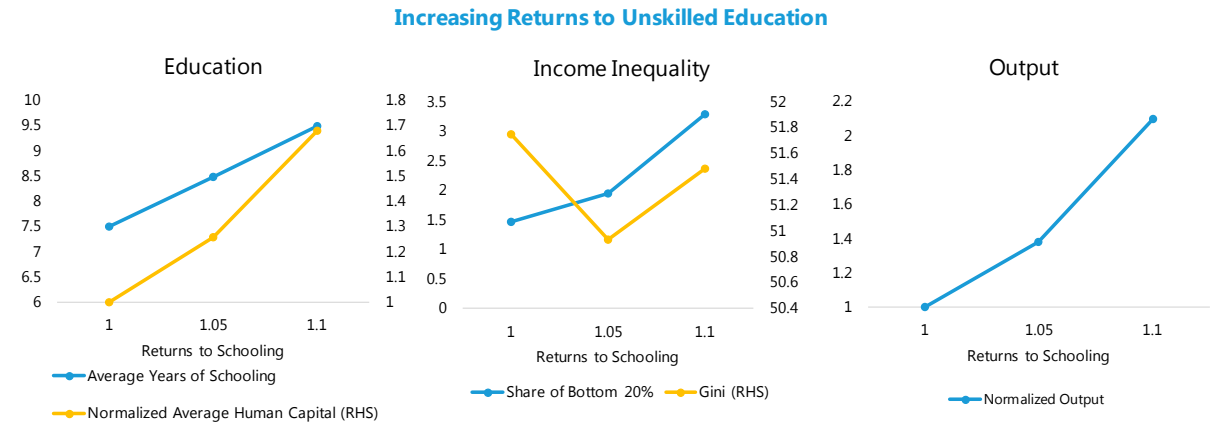
11. Targeted cash transfers lead to lower income inequality, but conditioning on school attendance appears to be necessary to affect educational decisions significantly. The model includes a targeted cash transfer to households, which is a function of income received during that period. Thus, the higher the income of a household, the lower the government support it will receive until it passes a fixed threshold and does not receive any subsidy at all. The function for the baseline is calibrated using the volumes of government support received and reported by households in the IHDS data. Increasing these subsidies by substantial amounts has no effect on average years of schooling, but does increase the average level of human capital slightly. Additionally, inequality as measured by the Gini coefficient decreases and the share of the bottom 20 percent increases in



Source: Author's calculations.

consumption and income distributions. Conditioning the transfers on children's school attendance can have large effects on average years of schooling and educational intergenerational mobility, which we define as the probability of a child to become skilled if its parent was unskilled. However, the transfer needs to be large enough as households face a trade-off between the loss of children's earnings today and future higher earnings from higher schooling levels. In addition, despite higher average years of schooling, average human capital only increases slightly suggesting that longer school attendance does not necessarily imply higher productivity. Thus, higher public spending might be necessary to reap the benefits of expanded school attendance. Output fluctuates marginally as various channels seem to offset each other.

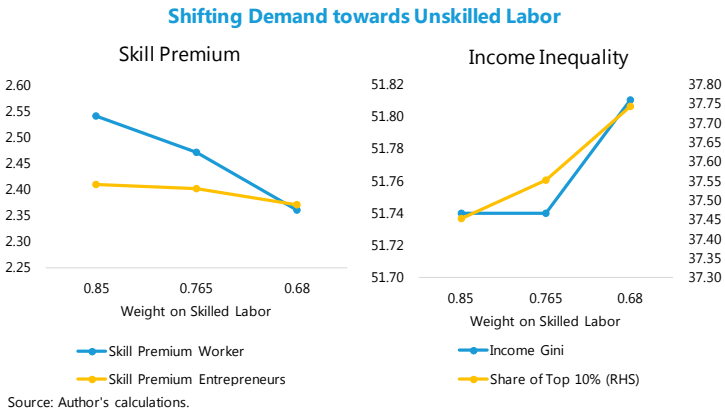
12. Increasing returns to education raises output and educational achievements. The previous analysis of children's abilities suggests that the quality of education might be a major concern, which has also been highlighted by other observers (e.g., Annual Status of Education Report, 2015). While it is difficult to define and subsequently translate improved educational quality, we interpret it as an increase in returns in the production function for education, i.e. for the same amount of time spent in school and money invested, a higher level of human capital will be achieved. The policy experiment focuses on an increase in returns for the first 8 years, which we



Source: Author's calculations.

classify as unskilled education. Increases by up to 10 percent would lead to significant increases in years of schooling and average human capital obtained, with a large drop in the share of the population not acquiring any schooling from 23 percent to 4 percent. While the effect on inequality as measured by the Gini appears to be non-monotonic, the bottom 20 percent of the income distribution manage to steadily grow their income share from 1.4 percent to 3.3 percent. The effect on output is large, and it more than doubles as entrepreneurs and workers achieve higher productivity through improved education and even decide to spend more time in school. As a caveat, the model does not allow us to model the potential costs of such a policy, which also need to be taken into account.

13. Shifting demand towards unskilled labor decreases the skill premium, but does not lower inequality. The Government of India's initiative "Make in India", launched in September 2014, has been aiming to "drive investment, foster innovation and develop skills" in specific manufacturing sectors of the economy.[6] A variety of policies have and are being developed to achieve these goals, including the



Source: Author's calculations.

[6] See www.makeindia.com/about

formulation of a framework to facilitate doing business, the opening up of sectors for investment and the development of industrial corridors. As these policies are geared toward manufacturing, they might be able to raise the demand for unskilled labor in the modern sector. In our model, shifting the weight from skilled to unskilled labor in the production function for modern sector entrepreneurs does decrease the skill premium for workers. However, this does not translate into lower inequality as measured by the Gini coefficient, on account of the top 10 percent gaining income share as they profit from unskilled labor replacing costlier skilled labor in the production function. Despite some wage gain for unskilled workers the income share of the bottom 20 percent remains constant at 1.45 percent. The magnitudes considered do not affect the average years of schooling and only slightly increase average human capital. If these policies were to additionally affect productivity or access to finance then wages and profits might increase more strongly, thereby raising the returns to education and the incentives to invest in it.

14. The above policy experiments illustrate the complex interactions and effects that need to be taken into account when designing policies to tackle inequality in income and education. Simple cash transfers do work well in decreasing inequality through redistribution, but might not have significant effects on average schooling levels. Conditioning transfers on school attendance can increase average years of schooling. However, if school quality is low it does not necessarily improve the productivity of students who cannot afford to invest much of their own money in education. Increasing the returns to education could have a strong effect on attendance, productivity and thus output by increasing the incentives to spend time and money on education, however it is probably also the most challenging policy initiative to define and implement as it goes beyond simple investment in infrastructure into more qualitative questions such as curricula, teaching and evaluation methods. Industrial policy aimed at a shift towards demand for unskilled labor alone could decrease the skill premium, but might not have significant effects on overall inequality as entrepreneurs would also gain.

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ECONOMIC GROWTH IN THE STATES OF INDIA[1]

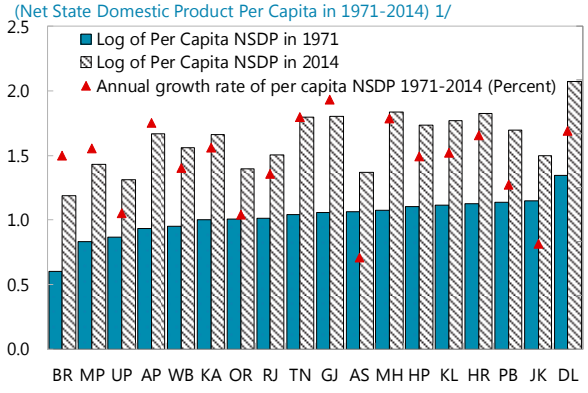
India's strong economic growth has been a striking feature of its economic development over the past several decades. At the state level, however, India's economic growth appears unbalanced and income disparity has widened. This chapter analyzes developments in per capita incomes across Indian states, and tests whether cross-state income convergence exists. It finds some evidence of income convergence during the pre-1990s reform period, but disparities in Indian state income growth have widened in the post-1990 economic reform period.

1. Achieving fast rates of growth has been a striking feature of India's economic development over the past several decades. The reform process in India traces back to the late 1970s, when the process of economic liberalization started. The subsequent reforms in the 1990s had significantly transformed the Indian economy into a more open and market-oriented economy, with a larger role for private sector participation. As these reforms began to bear fruit, Indian growth has accelerated and the poverty rate has declined. In particular, the average growth rate of real gross national income per capita during 2010–2015 was about nine times of that in 1970s. Similarly, the number of people in poverty as a share of the total population dropped from 45.3 percent in 1993 to 21.9 percent in 2011. Notwithstanding its high growth rate, India's income per capita remains low when compared to other emerging economy peers.

2. At the state level, India's economic growth appears unbalanced and income disparities have widened. While states' growth rates of per capita income have risen, the dispersion of the growth rates across states has also increased. A number of initially-poor states have not been able to catch up with initially-rich ones, as the growth performance of those poor states was generally worse than average. Moreover, the ratio of the top-to-bottom net state domestic product per capita has increased to more than ten times in 2014/15 from about four times in 1980/81.

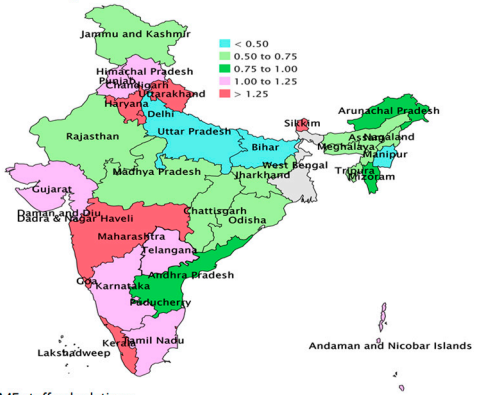
India: State Income Development

(Net State Domestic Product Per Capita in 1971-2014) 1/



Sources: CMIE States of India database and IMF staff calculations.
1/ See Table 3 for derivation of state acronyms.

India: Income Disparity in 2014/15 1/



Sources: CEIC, IMF staff calculations.
1/ Ratio of each states' net domestic product per capita to median net state domestic product per capita. Data are at 2011/12 constant prices. Gray area reflects states where data are not available.

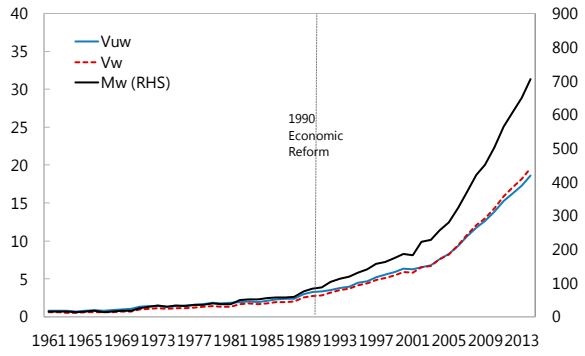
[1] Prepared by Piyaporn Sodsriwiboon and Paul Cashin.

3. This study analyzes the developments in per capita incomes across Indian states and tests whether cross-state income convergence has occurred. There are two criteria for income convergence—where initially-poor states grow faster and catch up with initially-rich states (β-convergence) and where the dispersion of states' per capita incomes narrows over time (σ-convergence). The analysis is based on traditional convergence tests and is complemented by panel unit root tests, and utilizes state-based measures of dispersion of per capita income for 32 Indian states and Union territories during 1961–2015 (see Annex 1).[2]

4. Some evidence of income convergence during the pre-1990s reform period is found. Neo-classical growth model regressions suggest there is little evidence of absolute convergence in per capita incomes across Indian states over the past five decades (Table 1). There is some evidence of absolute convergence during the 1961-1991 period, as found in Cashin and Sahay (1996) and Kalra and Sodsriwiboon (2010), but disparities in Indian state income growth widened in the post-1990 economic reform period.[3] Conditional convergence across Indian states exists after controlling for various policy variables such as the economic sector composition, financial development and access, demographics and education (Table 2). Furthermore, the results of panel unit root tests confirm the above findings (Table 3).[4] There is no evidence of convergence for the whole period (1961–2015) but is evidence of convergence in the sub-period of the pre-1990s (1961–1991).

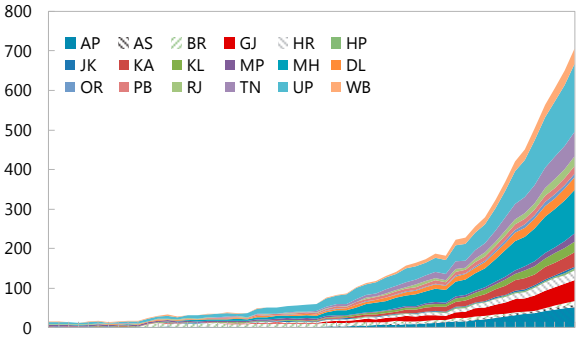
5. State-based measures of income dispersion have also increased, especially since the 1990s. The analysis using state-based measures of income dispersion (Vuw, Vw, Mw, see Annex 1 for details) suggest cross-state dispersion of per capita incomes increased throughout the period studied (1961 onwards). State income dispersion widened sharply in the post-1990s, consistent with the above results based on neoclassical growth model regressions. In particular, income and growth in initially-poor states appeared to be more volatile than average and contributed greatly to the widening dispersion.

India: State Income Dispersion
(Unit, data include 18 states)



Sources: CSO, IMF staff calculations.

India: State Income Dispersion
(State contribution to Mw) 1/



Sources: CSO, IMF staff calculations.
1/ See Table 3 for derivation of state acronyms.

[2] See also P. Sodsriwiboon and P. Cashin (2017).

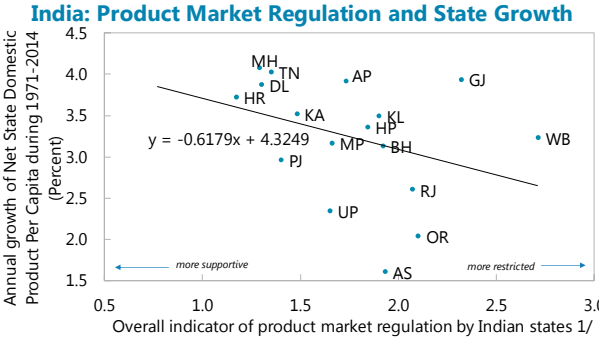
[3] The simple correlation between the log of per capita income in 1961 and the 1961-91 growth rate is -0.16, thereby reflecting β-convergence in state per capita incomes over this period.

[4] See Table 3 for derivation of state acronyms.

6. Differences in states' policies and economic structure appear to contribute to the disparities in income and growth performance across Indian states. Conditional income convergence among Indian states, taking into account states' policies and economic structure reflects wide gaps in individual states' steady-state or long-run income potential (Table 2). In line with Purfield (2009), a larger share of higher value-added economic sectors, greater investment and access to credit, as well as higher spending on health and education, are found to have a positive impact on states' per capita income growth.

7. Better functioning product and labor markets could help improve states' income potential. Rigid product and labor market regulations appear to have a negative impact on growth. Based on OECD measures of the degree to which state policies are supportive of market competition, these Indian states that have a relatively less supportive regulatory framework for market competition would likely grow slower than those that have pro-competitive product market regulations. As an indication, the rank correlation between product market regulation and state growth is negative and high at -0.46. Likewise, more rigid labor market regulation could hinder job creation and therefore be detrimental to state growth. The rank correlation between a measure for the degree of labor market regulation burden and state growth is negative at -0.03.[5]

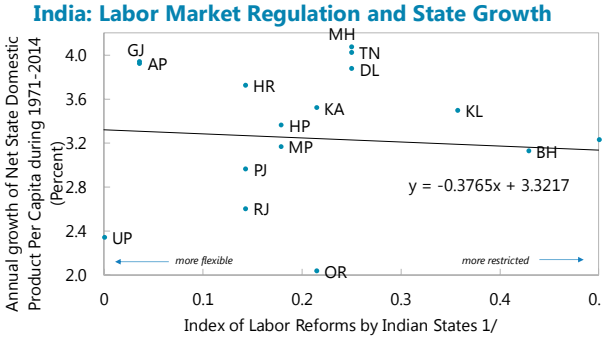
India: Product Market Regulation and State Growth



Sources: OECD, States of India Database, IMF staff calculations.

1/ Conway and Herd (2009) presents the indicator for product market regulation that measures tl degree to which policies promote or inhibit competition in areas of the product market where competition is viable. They measure the economy-wide regulatory and market environments in 2 States of India. Data are as of 2009. Higher indicator indicates the less supportive regulatory framework for market competition.

India: Labor Market Regulation and State Growth



Sources: OECD, States of India Database, IMF staff calculations.

1/ Dougherty (2008) presents the OECD index of state-level labor reforms in India. The index identifies the areas in which Indian states have made specific discrete changes to the implementa and administration of labor laws. The index of labor reforms in the chart shows the reversed order Dougherty (2008) index. Higher score can be interpreted as the state is less advanced in implementing labor reform.

8. Continued sound macroeconomic policies and comprehensive structural reforms are needed to boost India's long-term growth and lessen income equality. Greater investment, better credit allocation to the most productive sectors, as well as policies to facilitate the states' transition into higher value-added services or industry could help create more jobs and boost growth. Spending on health and education by states is also important to help improve the quality of human capital. Wide-ranging product and labor market reforms will help boost competitiveness and productivity, thereby improving states' long-term growth potential.

[5] The labor market regulation index is from the OECD, and indicates the reform progress on labor market regulation at the Indian state level and is the only set of indicators available. However, the index may not fully capture the core problems in the Indian labor market, particularly segmented labor markets and informality, and short samples from data limitation preclude a more formal analysis. Therefore, the negative relationship found between labor market regulation and growth is only for indicative purposes.

Table 1. Income Convergence for the States of India: Cross-Sectional Results

	Growth rate of income per capita during			
	1961-1991	1961-2001	1961-2011	1961-2014
Log of initial income per capita	-0.11	0.05	0.05	0.05
	(0.08)	(0.04)	(0.02)***	(0.02)***
Constant	-1.01	-0.47	-0.46	-0.49
	(0.80)**	(0.36)	(0.18)***	(0.19)**
Adjusted R-squared	0.02	0.03	0.21	0.23
No. of observations	30	30	30	30
States	15	15	15	15

	Growth rate of income per capita during			
	1971-1991	1971-2001	1971-2011	1971-2014
Log of initial income per capita	0.08	0.03	0.05	0.05
	(0.12)	(0.05)	(0.02)*	(0.03)*
Constant	-0.76	-0.26	-0.40	-0.42
	(1.14)	(0.50)	(0.24)	(0.26)
Adjusted R-squared	-0.02	-0.02	0.07	0.08
No. of observations	36	36	36	36
States	18	18	18	18

	Growth rate of income per capita over 20 years			
	1971-1991	1981-2000	1991-2010	2001-2014
Log of initial income per capita	0.08	0.17	0.11	0.19
	(0.12)	(0.08)**	(0.09)	(0.12)
Constant	-0.76	-1.66	-0.93	-1.92
	(1.14)	(0.78)**	(0.91)	(1.23)
Adjusted R-squared	-0.02	0.09	0.01	0.05
No. of observations	36	36	36	36
States	18	18	18	18

	Growth rate of income per capita	
	5-year window	10-year window
Log of initial income per capita	2.27	2.57
	(0.32)***	(0.38)***
Constant	-18.92	-21.46
	(3.06)***	(3.67)***
Adjusted R-squared	0.22	0.32
No. of observations	183	97
States	18	18
Period	1961-2015	1961-2015

Source: IMF staff estimates.

Note: Significance level is indicated by *** at 1% level, ** at 5% level, and * at 10% level respectively, with standard errors reported in parentheses.

Table 2. Income Convergence for the States of India: Panel Results 1/

	Dependent variable: Growth of income per capita 2/						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Initial income per capita	-3.617	-3.62	-3.493	-3.761	-3.173	-2.933	-3.814
	[4.16]***	[4.00]***	[2.35]**	[2.47]**	[2.10]**	[2.14]**	[1.80]*
Share of industry sector		2.648	4.1	6.205	3.267	2.002	4.643
		[0.77]	[1.07]	[1.46]	[0.73]	[0.43]	[0.76]
Share of services sector		6.751	7.841	8.593	7.853	5.649	7.259
		[2.82]***	[2.85]***	[3.22]***	[2.49]**	[1.77]*	[1.68]
Working-age population ratio, change			0.838	0.804	0.553	0.188	0.546
			[0.92]	[0.79]	[0.54]	[0.19]	[0.59]
Social spending					0.019	0.024	
					[0.29]	[0.34]	
Credit growth						0.067	
						[2.86]***	
Net in-migration ratio							0.127
							[1.26]
Constant	42.322	38.113	40.827	48.374	43.259	42.704	54.63
	[4.36]***	[3.61]***	[2.59]**	[2.96]***	[2.44]**	[2.56]**	[2.27]**
Adjusted R-squared	0.77	0.77	0.7	0.72	0.66	0.67	0.74
Fixed Effect	yes	yes	yes	yes	yes	yes	yes
Time Effect	yes	yes	yes	yes	yes	yes	yes
N	152	146	102	99	75	74	81

Source: IMF staff estimates.

1/ Data are unbalanced panel of 32 Indian states and territories from 1961-2015, with data at annual frequency. Standard errors are robust and fixed effects are also included. Significance level is indicated by *** at 1% level, ** at 5% level, and * at 10% level respectively, with *t*-statistics reported in brackets.

2/ Growth calculated as the differential of the logs of income per capita in the two periods divided by the time elapsed between the two periods multiplied by 100. This table presents the results for the sub-interval of ten-year periods, but analyses of different sub-intervals (for example, five years) do not alter the conclusions.

Table 3. Panel Unit Root Tests of Income Convergence for Indian States 1/

18 states	1961-2015			1961-1991			1991-2015		
	Test Statistics	p-val	Convergence	Test Statistics	p-val	Convergence	Test Statistics	p-val	Convergence
Levin-Lin ADF-stat	3.06	1.00	No	-0.84	0.20	No	1.42	0.92	No
IPS ADF-stat (large sample adjustment values)	1.63	0.95	No	-2.27	0.01	Yes	-0.14	0.45	No
Bootstrapped IPS ADF-stat	1.22	0.89	No	-2.52	0.01	Yes	-2.00	0.02	Yes
Bootstrapped Fisher stat (MW method)	31.35	0.69	No	52.67	0.04	Yes	46.09	0.12	No

32 states	1961-2015			1994-2015		
	Test Statistics	p-val	Convergence	Test Statistics	p-val	Convergence
Levin-Lin ADF-stat	3.16	1.00	No	6.40	1.00	No
IPS ADF-stat (large sample adjustment values)	1.05	0.85	No	3.35	1.00	No
Bootstrapped IPS ADF-stat	0.39	0.65	No	2.37	0.99	No
Bootstrapped Fisher stat (MW method)	62.26	0.54	No	57.48	0.70	No

Source: IMF staff estimates.

1/ The Table presents test statistics of panel unit root tests as described in Annex 1. Data are unbalanced panel of 32 Indian states and territories from 1961-2015. The results are presented for whole sample, sub-groups of Indian states, and sub-periods of pre- and post-1990s. Of which, 18 old Indian states and Union territories include Andhra Pradesh (AP), Assam (AS), Bihar (BH), Gujarat (GJ), Haryana (HR), Himachal Pradesh (HP), Jammu & Kashmir (JK), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), NCT of Delhi (DL), Odisha (OR), Punjab (PJ), Rajasthan (RJ), Tamil Nadu (TN), Uttar Pradesh (UP), and West Bengal (WB). In addition, 14 new Indian states and Union territories comprising Andaman & Nicobar (AN), Arunachal Pradesh (AR), Chandigarh (CH), Chhattisgarh (CT), Goa (GA), Jharkhand (JH), Manipur (MN), Meghalaya(MG), Mizoram (MZ), Nagaland (NG), Puducherry (PD), Sikkim (SK), Tripura (TP), and Uttarakhand (UT) are added to the analysis.

Annex 1. Tests of Convergence for the States of India

I. β-convergence

a) **Neoclassical growth model** as in Barro and Sala-i-Martin (1992), Cashin and Sahay (1996), Kumar and Subramanian (2012):

- $\frac{1}{T}.log\left(\frac{y_{i,t_0+T}}{y_{i,t_0}}\right) = B - \left(\frac{1-e^{-\beta T}}{T}\right).\log\left(y_{i,t_0}\right) + u_{i,t_0,t_0+T}$

Absolute convergence exists when all states converge to the same steady-state capital-labor ratio, output per capita and consumption per capita and have the same growth rate. On the other hand, conditional convergence allows states to differ in the their steady-state ratios, but as long as they have the same population growth rate then all their level variables, capital, output, consumption, etc., will eventually grow at that same rate.

b) **Group-mean convergence** based on panel unit root test, as in Pedroni and Yao (2006), Kalra and Sodsriwiboon (2010):

- $\Delta(y_{it} - \bar{y}_t) = \mu_i + \beta_i(y_{i,t-1} - \bar{y}_{t-1}) + \sum_{k=1}^{K_i} \emptyset_{i,k}\, \Delta(y_{i,t-k} - \bar{y}_{t-1t-k}) + \varepsilon_{it}$

Panel Unit Root Tests			
Levin-Lin-Chu test	Pooled within-dimension	H_0: $\beta_i=0$ for all i H_1: $\beta_i<0$ for all i	$Z^{LLC} \Rightarrow N(0,1)$
Im-Pesaran-Shin test	Group mean between-dimension	H_0: $\beta_i=0$ for all i H_1: $\beta_i<0$ for some i	$Z^{IPS} \Rightarrow N(0,1)$
Maddala-Wu test	Accumulated marginal significance	H_0: $\beta_i=0$ for all i H_1: $\beta_i<0$ for some i	$P_\lambda \Rightarrow \chi^2_{2N}$

The failure to reject the null hypothesis can be taken to imply that no subset of the members of the panel are converging toward one another.

II. σ-convergence

State-based measures of income dispersion follow Cashin and Strappazzon (1998):

a) Unweighted coefficient of variation, V_{uw}

$$V_{uw,t} = \left[\sum_{i=1}^{N} (y_{it} - \bar{y}_t)^2 N^{-1}\right]^{\frac{1}{2}} (\bar{y}_t)^{-1}$$

b) Population-weighted coefficient of variation, V_w

$$V_{uw,t} = \left[\sum_{i=1}^{N} (y_{it} - \bar{y}_t)^2 N^{-1}\right]^{\frac{1}{2}} (\bar{y}_t)^{-1}$$

c) Population-weighted absolute deviations of income relative to mean, M_w

$$M_{w,t} = \left[\sum_{i=1}^{N} |y_{it} - \bar{y}_t| f_i n^{-1}\right] \quad 100(\bar{y}_t)^{-1}$$

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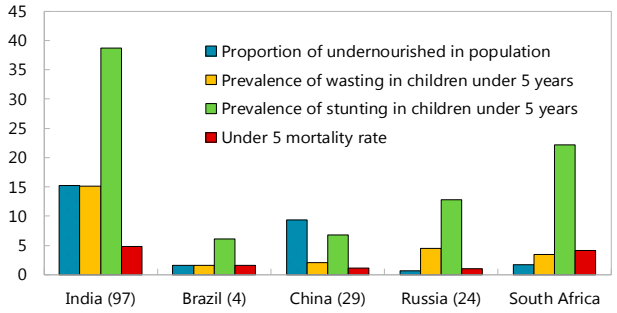
IMPROVED NUTRITION FOR A BILLION: ROLE OF FOOD SECURITY AND PULSES[1]

Despite economic growth and increase in production and distribution of food commodities, the prevalence of undernourishment and hunger remains high in India. Rising prices of pulses (grain legumes), which are a key source of protein for a large share of the Indian population, have been one of the key drivers of food inflation in recent years, leading to a nutrient poor diet. Complementing food security policies by addressing inherent long-term structural bottlenecks and improving productivity within the agricultural sector is needed for India to achieve its Sustainable Development Goal of ending all forms of malnutrition by 2030.

Hunger and Malnutrition

1. While India has achieved its Millennium Development Goal (MDG) target of reducing poverty by half, it has fallen short of achieving the target for reducing hunger. India ranked 97th out of 118 countries on the International Food Policy Research Institute's Global Hunger Index (GHI) in 2016, lagging behind most of its peers. Although India is one of the world's largest producers of rice and wheat, its proportion of undernourished, prevalence of wasting (low weight for height) and stunting (low height for age) in children and the under-five mortality rate—the three indices which form the basis of the GHI index—are considerably higher than all other BRICS economies.

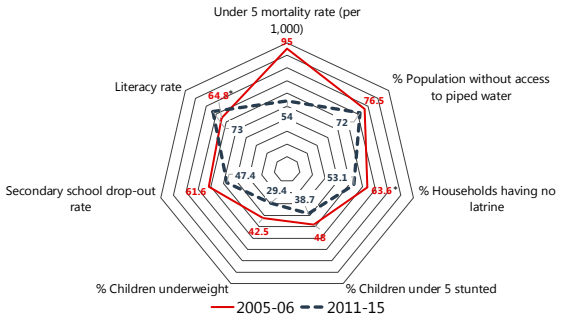
Global Hunger Index (GHI), 2016



Source: International Food Policy Research Institute (IFPRI).
Note: The numbers in the brackets refer to the GHI ranking which is based on a GHI score, ranging from 0 (best score) to 100 (worst score).

2. Undernutrition and malnutrition in India is caused by a nutrient poor diet, infectious diseases from low quality water, sanitation, and health services, lack of appropriate child care, and poor implementation of health-related government schemes. Current social protection programs (implemented at the state-level) aimed at improving the nutritional status of the population—distribution of subsidized food (through the Targeted Public Distribution System (TPDS)), targeted food supplementation (through the Integrated Child Development Services), and provision of a cooked meal once a day (through the National Mid-Day Meals Program)—have not led to a substantial decline in undernutrition. Typical problems associated with these programs include inadequate identification and

India's Progress on Various Development Indicators



Sources: UNICEF, WHO/UNICEF Water Supply Statistics; Census of India, 2001 and 2011; National Family Health Survey (NFHS); Rapid Survey on Children (RSOC), Ministry of Women and Child Development; Ministry of Human Resource Department.
Note: Asterisk refers to data in 2011.

[1] Prepared by Purva Khera.

reach of targeted groups; skewed consumption towards a cereal-dominant diet due to its subsidized price leading to inadequate nutrition; corruption and leakage of food in the PDS; and inadequate storage facilities for food grains (Banik, 2011). Gender inequality is another contributing factor—low levels of female education, early marriage and child bearing compromise the quality of child care.

3. Undernutrition entails substantial economic costs associated with poor learning outcomes and low productivity. According to a World Bank (2005) report, direct productivity losses from undernutrition are estimated at more than 10 percent of lifetime individual earnings, and entail about a 2-3 percent loss in GDP. Indirect losses are associated with deficits in cognitive development and schooling, and increased costs of health care (Spears, 2012).

Food Safety Net Programs

4. The Government of India passed the National Food Security Act (NFSA) in September 2013, one of the largest safety net programs in the world.[2] This scheme provides subsidized food grains through the TPDS to 67 percent of the population (75 percent of the rural population and up to 50 percent of the urban population). While the NFSA will help increase caloric availability, overcoming distortions in previous schemes (which could be achieved through direct cash transfer of the food subsidy via direct benefit transfer (DBT) mode or by increasing access to a diverse set of food crops) is essential for creating a balanced diet.[3] In addition, periodic monitoring by putting in place a comprehensive nutritional data collection system is needed for its success.

5. Increasing protein consumption is a policy priority, and hence pulses have been included in the National Food Security Mission (NFSM), along with wheat and rice. For a majority of low-income and vegetarian households, pulses are a major source of protein, cheaper than fish and meat (National Sample Survey (NSS) 68th round). India is the world's largest producer, consumer and importer of pulses (grain legumes). It accounts for about 33 percent of the global acreage area, 25 percent of total world production, and 27 percent of world consumption of pulses.

[2] This Act also has special provisions for nutritional support to women and children.

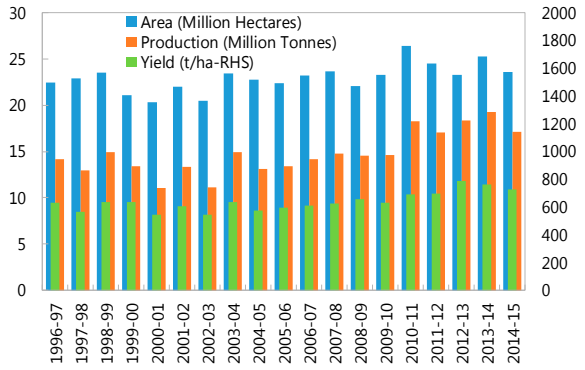
[3] Amongst the 32 States and Union Territories implementing the Act at present, only Chandigarh and Pondicherry are implementing the Act in DBT mode.

Pulses: Production and Price Volatility

6. Despite being the world's largest producer of pulses (grain legumes), India has consistently fallen short of meeting its own domestic demand. The area under cultivation of pulses has not increased much and yields have remained stagnant for a long time. This is because of the large risk and uncertainty in production and prices (pulses are typically grown in rain-fed areas[4] with high incidence of pests), which has led farmers to move away from pulse cultivation to other crops with better return and lower risk (such as rice, wheat and cash crops). The excess demand for pulses is estimated at about 3–5 million tons per year, and while imports help fill this excess demand, they come at a cost as the global supply of pulses is limited compared with India's needs, which then pushes up world prices (see Joshi et al, 2016). Moreover, demand for pulses are expected to keep growing, due to changing food demand patterns with rising incomes (see Gokarn, 2011).

7. Rising prices of pulses have been one of the key drivers of food—and overall—inflation in recent years, also leading to a nutrient poor diet. Short-term government interventions to keep prices low, and thereby benefit consumers, end up hurting them in the long run as production and availability of pulses remain unaddressed. Large hikes in the Minimum Support Prices (MSP) for rice and wheat, combined with the government's massive cereal stockpiling, have resulted in a shortfall in the production of pulses and high food inflation. In addition, hikes in the MSP for pulses have not been effective in stimulating pulses production due to technological and market constraints, and a failure to back up price support policies with sufficient and effective procurement. Bans on exports and forward markets, and stock limits have undermined price discovery, thus also de-incentivizing farmers.

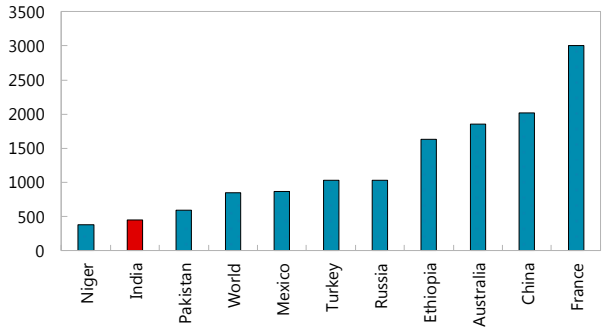
Trend in Area, Yield, and Production of Pulses



Source: Directorate of Economics and Statistics, Ministry of Agriculture, Government of India.

Yield for Pulses

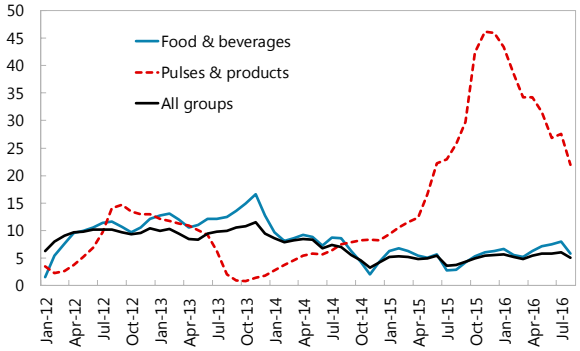
(In kg/ha)



Source: FAOSTAT (2014).
Note: As an aggregate category, pulses includes the following crops: Dry Beans, Broad beans, Chick peas, Cow peas, Lentils, Pigeon peas, Bambara beans, Lupins, Dry Peas, Pulses, Nes, and Vetches.

Inflation in Consumer Prices, Food and Pulses

(In percent)



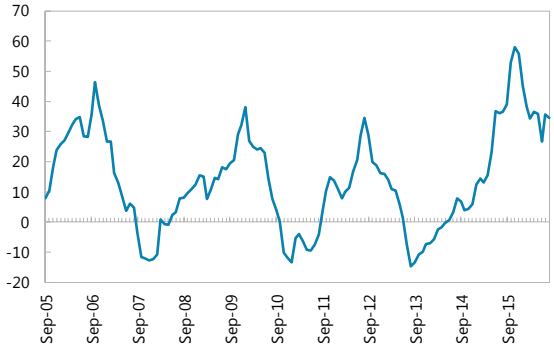
Source: Haver Analytics.

[4] Less than 15 percent of the area under pulses has assured irrigation (DES, Ministry of Agriculture).

Policy Priorities: Way Forward

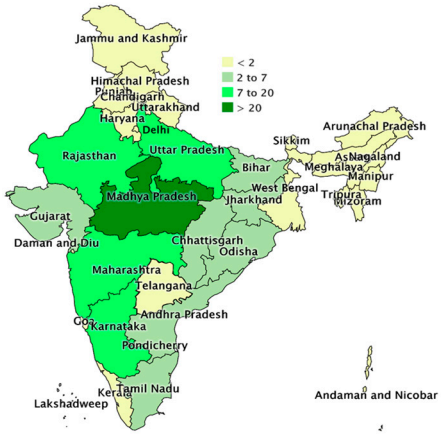
8. A national strategy on agriculture and pulses should be undertaken involving both the Union and state governments. Close to 90 percent of public investment in agriculture is at the state level. Hence, for any government measures to be effective, coordination at the national and state level is essential. In addition, pulses production is highly concentrated in a few states, where five states—Maharashtra, Rajasthan, Karnataka, Madhya Pradesh, Andhra Pradesh—typically account for more than 70 percent of Indian production. Investment in logistics, marketing infrastructure, and roads can help create efficient supply chains linking the farmer to the consumer across states. The Prime Minister launched a common electronic trading platform for National Agriculture Market (e-NAM)[5] in April 2016, which aims to integrate 585 wholesale markets across India.[6] This is expected to improve competitiveness in marketing through larger participation of buyers and yield a more transparent system of bidding. To reduce weather-dependent production risks, providing affordable and wide coverage of insurance and provision of irrigation will help make supply more responsive to increase in prices. The assured irrigation initiative under the *Pradhan Mantri Krishi Sinchayee Yojana* (PMKSY)[7] program launched in July, 2015 and the crop insurance scheme, *Pradhan Mantri Fasal Bima Yojana* (PMFBY), launched in February, 2016 should target pulse-producing areas. Ultimately, public policies should ensure market-driven diversification in agriculture and reduce the dependence of farmers on the current system of MSP and public procurement.

Volatility in Prices of Pulses (WPI)
(In year-on-year percentage change)



Source: Haver Analytics.

States' Share in Pulses Production - 2011
(In percent)



Source: Ministry of Agriculture, Government of India.

9. Moreover, complementing food policies with improvements in sanitation and reforms to agricultural policies is important for enabling a balanced diet and for disease control. A multi-sectoral approach aimed at better sanitation, health and gender equality, along with addressing inherent long-term structural bottlenecks and improving productivity within the agricultural sector, is needed for India to achieve its Sustainable Development Goal of ending all forms of malnutrition by 2030, including achieving by 2025 the internationally-agreed targets on stunting and wasting in children under five years of age.

[5] See http://www.enam.gov.in/NAM/home/index.html

[6] Karnataka government launched a unified online agricultural market in 2014. A total of 105 markets spread across 27 districts have been brought under the Unified Market Platform (UMP) as of March 2016.

[7] See Ministry of Agriculture and Farmers website at: http://pmksy.gov.in/

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