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GOVERNOR'S STATEMENT

Governor's Statement

*Governor's Statement**

Shaktikanta Das

In my statement of May 4, 2022, I had mentioned that as we navigate through this difficult period, it is necessary to be sensitive to the new realities and incorporate them into our thinking. The war in Europe is lingering and we are facing newer challenges each passing day which is accentuating the existing supply chain disruptions. As a result, food, energy and commodity prices remain elevated. Countries across the world are facing inflation at decadal highs and persistent demand-supply imbalances. The war has led to globalisation of inflation. Not surprisingly, central banks are reorienting and recalibrating their monetary policies. Emerging market economies (EMEs) are facing bigger challenges from increased market turbulence, monetary policy shifts in advanced economies (AEs) and their spillovers. The process of economic recovery in EMEs is also getting affected.

During these difficult and challenging times, the Indian economy has remained resilient, supported by strong macroeconomic fundamentals and buffers. The recovery has gained momentum despite the pandemic and the war. On the other hand, inflation has steeply increased much beyond the upper tolerance level. A large part of the rise in inflation is primarily attributed to a series of supply shocks linked to the war. In these circumstances, we have started a gradual and orderly withdrawal of extraordinary accommodation instituted during the pandemic.

Similar to our resolute and timely actions to limit the economic damage emanating from the COVID-19 pandemic, the Reserve Bank will continue to be proactive and decisive in mitigating the fallout of the ongoing geopolitical crisis on our economy. We have already reprioritised our policies to control inflation, without losing sight of the growth requirements. Our approach underscores a commitment to move towards normal monetary conditions in a calibrated manner. We will remain focused on bringing down inflation closer to the target and fostering macroeconomic stability.

Decisions and Deliberations of the Monetary Policy Committee

Against this background, the Monetary Policy Committee (MPC) met on 6th, 7th and 8th June 2022. Based on an assessment of the macroeconomic situation and the outlook, the MPC voted unanimously to increase the policy repo rate by 50 basis points to 4.90 per cent, with immediate effect. Consequently, the standing deposit facility (SDF) rate stands adjusted to 4.65 per cent; and the marginal standing facility (MSF) rate and the Bank Rate to 5.15 per cent. The MPC also decided unanimously to remain focused on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

Let me now explain the MPC's rationale for its decisions on the policy rate and the stance. The protracted war in Europe and the accompanying sanctions have kept global commodity prices elevated across the board. This is exerting sustained upward pressure on consumer price inflation, well beyond the targets in many economies. The ongoing war is also turning out to be a dampener for global trade and growth. The faster pace of monetary policy normalisation undertaken by systemic advanced economies (AEs) is leading to heightened volatility in global financial markets. This is reflected in sharp corrections in major equity markets, sizeable swings in sovereign bond yields, US dollar appreciation, capital outflows from EMEs and even from some AEs. The EMEs are also witnessing depreciation of their currencies. Globally, stagflation concerns are growing and are amplifying the volatility in global financial

* Governor's Statement - June 8, 2022.

markets. This is feeding back into the real economy and further clouding the outlook.

The MPC noted that, in such a challenging global environment, domestic economic activity is gaining traction, while inflation pressures have intensified further. The upside risks to inflation as highlighted in the April and May 2022 policies have materialised earlier than anticipated – both in terms of timing and magnitude. Inflationary pressures have become broad-based and remain largely driven by adverse supply shocks. There are growing signs of a higher pass-through of input costs to selling prices. The MPC noted that inflation is likely to remain above the upper tolerance band of 6 per cent through the first three quarters of 2022-23.

In this context, supply side measures taken by the government in reducing excise duties on petrol and diesel, along with the other measures would help in mitigating the inflationary pressures to some extent. The MPC also recognised that sustained high inflation could unhinge inflation expectations and trigger second round effects. It, therefore, judged that further monetary policy measures are necessary to anchor the inflation expectations. Accordingly, the MPC decided to increase the policy repo rate by 50 basis points to 4.90 per cent. The MPC also decided to remain focused on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth. It may be noted in this context that the repo rate still remains below its pre-pandemic level.

Assessment of Growth and Inflation

Growth

According to the provisional estimates released by the National Statistical Office (NSO) on May 31, 2022, India's real gross domestic product (GDP) growth in 2021-22 is estimated at 8.7 per cent. The level of real GDP in 2021-22 has exceeded the pre-pandemic (2019-20) level. On the supply side, major categories also surpassed the 2019-20 levels.

Available information for April and May 2022 indicates that the recovery in domestic economic activity remains firm, with growth impulses getting increasingly broad based. Manufacturing and services purchasing managers' indices (PMIs) for May point towards further expansion of activity. This is also corroborated by movements in railway freight and port traffic, domestic air traffic, GST collections, steel consumption, cement production and bank credit. While urban demand is recovering, rural demand is gradually improving. The contact-intensive services related to trade, hotels and transport have recovered in Q4:2021-22. Going by the early results of our surveys, capacity utilisation (CU) in the manufacturing sector increased further to 74.5 per cent in Q4:2021-22 from 72.4 per cent in Q3:2021-22. Capacity utilisation is also likely to increase further in 2022-23. Investment activity is thus expected to strengthen, driven by rising capacity utilisation, government's capex push and deleveraged corporate balance sheets. Improvement in investment activity is also reflected in pick-up in demand for bank credit and persisting growth in imports of capital goods. Merchandise exports have remained buoyant with double digit growth for the fifteenth successive month in May, while high growth of non-oil non-gold imports is indicative of recovery in domestic demand conditions.

Looking ahead, real GDP is expected to broadly evolve on the lines of the April 2022 MPC resolution. The forecast of normal south-west monsoon should boost kharif sowing and agricultural output. This will support rural consumption. The rebound in contact-intensive services is expected to sustain urban consumption. Our surveys suggest further improvement in consumer confidence and households' optimism for the outlook a year ahead. Business sentiment remains upbeat according to early results of our surveys. Nevertheless, the negative spillovers from geopolitical tensions; elevated international commodity prices; rising input costs; tightening of

global financial conditions; and slowdown in world economy continue to weigh on the outlook. Taking all these factors into consideration, the real GDP growth for 2022-23 is retained at 7.2 per cent, with Q1 at 16.2 per cent; Q2 at 6.2 per cent; Q3 at 4.1 per cent; and Q4 at 4.0 per cent, with risks broadly balanced.

Inflation

The CPI headline inflation in April registered a further sharp increase to 7.8 per cent. It was the fourth consecutive month when inflation touched or was above the upper tolerance level of 6 per cent. The surge in headline inflation was seen across all major categories.

The global geopolitical situation remains fluid and commodity markets remain on the edge, rendering heightened uncertainty to the domestic inflation outlook. Certain positive developments on the prices front in recent weeks may help to ease the acute price pressures to some extent. These would include expectations of a normal south-west monsoon and kharif agricultural season; the recent supply side measures taken by the government and the unfolding of their impact; lifting of the palm oil export ban by Indonesia; and signs of moderation in global industrial metal price indices. Our quick survey of urban households undertaken after the excise duty cuts on petrol and diesel on May 21, 2022 shows a significant moderation in their inflation expectations: declines of 190 basis points in their three months ahead expectations and 90 basis points in one year ahead expectations. In such a scenario, further reduction of State VATs on petrol and diesel across the country can certainly contribute to softening of the inflationary pressures as well as expectations.

Notwithstanding these positive developments, upside risks to inflation do persist. These risks emanate from elevated commodity prices; revisions in electricity tariffs across many states; high domestic poultry and animal feed costs; continuing trade and supply chain bottlenecks; rising pass-through of input costs to selling prices in the manufacturing and services sectors; the recent spike in tomato prices which are adding to food inflation; and most important of all, the elevated international crude oil prices. With the assumption of a normal monsoon in 2022 and average crude oil price (Indian basket) of US$ 105 per barrel, inflation is now projected at 6.7 per cent in 2022-23, with Q1 at 7.5 per cent; Q2 at 7.4 per cent; Q3 at 6.2 per cent; and Q4 at 5.8 per cent, with risks evenly balanced. It may be noted that around 75 per cent of the increase in inflation projections can be attributed to the food group. Further, the baseline inflation projection of 6.7 per cent for 2022-23 does not take into account the impact of monetary policy actions taken today.

Between February and April, headline inflation has increased by about 170 basis points. With no resolution of the war in sight and the upside risks to inflation, prudent monetary policy measures would ensure that the second-round effects of supply side shocks on the economy are contained and long-term inflation expectations remain firmly anchored and inflation gradually aligns close to the target. The monetary policy actions including withdrawal of accommodation will be calibrated keeping in mind the requirements of the ongoing economic recovery.

Liquidity and Financial Market Guidance

I would now like to touch upon liquidity and financial market conditions. It may be recalled that in April we introduced the Standing Deposit Facility (SDF) as the floor of the liquidity adjustment facility (LAF) corridor at an interest rate of 3.75 per cent. This was effectively a rate hike of 40 basis points over the fixed rate reverse repo of 3.35 per cent. As a result, the weighted average call money rate (WACR) – the operating target of monetary policy – moved from an average of 3.32 per cent in March 2022 to 3.54 per cent during April 8-30. Following the repo rate hike

of 40 bps on May 4, the WACR has further increased, averaging 4.07 per cent during May 5-31.

In line with the emphasis on gradual withdrawal of accommodation articulated in the April and May MPC resolutions, systemic liquidity has moderated in the recent period. Surplus liquidity, as reflected in average daily absorption under the liquidity adjustment facility (LAF) – that is, the absorption under SDF and variable rate reverse repo (VRRR) of 14 days and 28 days – at ₹5.5 lakh crore during May 4-May 31 was lower than ₹7.4 lakh crore during April 8-May 3, 2022. Nevertheless, the overhang of excess liquidity has resulted in overnight money market rates, on an average, trading below the policy repo rate. At the longer end of the money market term structure, interest rates on 91-day treasury bills, commercial papers (CPs) and certificates of deposit (CDs) firmed up post the rate hike in May. Yields on AAA rated 5-year corporate bonds have also increased. The rate hike also triggered an upward adjustment in the benchmark lending rates by banks. The term deposit rates of banks have increased and will augment stable funding resources amidst increasing credit demand.

Going ahead, while normalising the pandemic related extraordinary liquidity accommodation over a multi-year time frame, the Reserve bank will ensure availability of adequate liquidity to meet the productive requirements of the economy. The Reserve Bank will also remain focussed on orderly completion of the government's borrowing programme.

A direct fallout of the geopolitical tensions and the rapid pace of policy normalisation by AEs is the exodus of portfolio capital flows from most of the EMEs. Several EME currencies have thus faced depreciation pressures. Safe haven demand for the US dollar has increased. Amidst all these, the Indian Rupee has moved in an orderly fashion and has depreciated by 2.5 per cent against the US dollar during the current financial year so far – faring much better than many of its EME peers.

The Indian banking system also remains strong and its health has improved in recent years as reflected in key indicators – capital adequacy, asset quality, provisioning coverage and profitability. Bank credit offtake has gradually improved in the recent months, supported by both resilience of the banking system and progressive normalisation of economic activity. The strength of the banking sector and deleveraged corporate balance sheets will help us in sustaining the economic recovery.

External Sector

India's exports have performed exceptionally well despite weakening recovery across major trading partners. The impact of rising crude oil prices on petroleum, oil and lubricants (POL) import bill has been partly offset by export of petroleum products, which also benefitted from better price realisations in recent months. Optimism on exports of both goods and services and remittances should help contain the current account deficit (CAD) at a sustainable level, which can be financed by normal capital flows. As on June 3, 2022, India's foreign exchange reserves were of the order of US$ 601.1 billion, which are further supplemented by a healthy level of net forward assets of the RBI.

Additional Measures

I shall now announce certain additional measures, the details of which are set out in the statement on developmental and regulatory policies (Part-B) of the Monetary Policy Statement. The additional measures are as follows.

Regulatory Measures – Cooperative banks

Considering the importance of cooperative banks in promoting inclusive growth, three measures are being announced for the cooperative banking sector:

i. The limits for individual housing loans being extended by Urban Cooperative Banks (UCBs) and Rural Cooperative Banks (RCBs-

State Cooperative Banks and District Central Cooperative Banks) which were last fixed in 2011 and 2009 respectively are being revised upwards by over 100 per cent taking into account increase in house prices. This will facilitate better flow of credit to the housing sector.

ii. In line with the dispensation available to Scheduled Commercial Banks (SCBs) and UCBs, it is now proposed to permit Rural Cooperative Banks (RCBs- State Cooperative Banks and District Central Cooperative Banks) to extend finance to 'commercial real estate – residential housing' (i.e. loans for residential housing projects), within the existing aggregate housing finance limit of 5% of their total assets. This measure will further augment credit flows from the cooperative banks to the housing sector.

iii. It has also been decided to permit UCBs to extend doorstep banking services to their customers. This will enable UCBs to meet the needs of their customers, especially senior citizens and differently abled.

Margin Requirements for Non-Centrally Cleared Derivatives (NCCDs)

With the objective of strengthening the resilience of OTC derivative market and in line with G20 reforms, the Reserve Bank is putting in place margin requirements for non-centrally cleared OTC derivatives. In the first phase, the Directions on the Exchange of Variation Margin (VM) for NCCDs were issued on June 1, 2022, after consultation with stakeholders. In the second phase, it is now proposed to mandate the requirements for exchange of Initial Margin (IM) for such derivatives. To garner feedback from stakeholders on these requirements, Draft Directions on Exchange of Initial Margin for NCCDs will be issued shortly.

e-Mandates on Cards for Recurring Payments – Limit Enhancement

The framework for processing of e-mandate based recurring payments was introduced by the Reserve Bank, keeping in mind the benefits of convenience, safety and security to the users. Under this framework, over 6.25 crore mandates have been registered in favour of a large number of domestic and over 3,400 international merchants. To further facilitate recurring payments like subscriptions, insurance premia, education fee, etc. of larger value under the framework, the limit is being enhanced from ₹5,000 to ₹15,000 per transaction. This will further leverage the benefits available under the framework and augment customer convenience.

Unified Payments Interface (UPI) – Linking of RuPay Credit Cards

UPI has become the most inclusive mode of payment in India with over 26 crore unique users and 5 crore merchants on the platform. In May 2022 alone, about 594 crore transactions amounting to ₹10.4 lakh crore were processed through UPI. At present, UPI facilitates transactions by linking savings/current accounts through users' debit cards. It is now proposed to allow linking of credit cards on the UPI platform. To begin with, the Rupay credit cards will be linked to the UPI platform. This will provide additional convenience to users and enhance the scope of digital payments.

Review of Payments Infrastructure Development Fund Scheme

The Payments Infrastructure Development Fund (PIDF) Scheme was operationalised by the Reserve Bank in January 2021 to incentivise the deployment of payment acceptance infrastructure such as physical Point of Sale (PoS), mPoS (mobile PoS), Quick Response (QR) codes in Tier-3 to 6 centres and North Eastern States. Beneficiaries of PM SVANidhi Scheme in Tier-1 and 2 centres were included in August 2021. As at

end-April 2022, over 1.18 crore new touch points have been deployed under the Scheme against a target of 90 lakh touch points to be deployed over three years (till end-2023). It is now proposed to make modifications to the PIDF scheme by enhancing the subsidy amount, simplifying the subsidy claim process and other steps. This will further accelerate and augment the deployment of payment acceptance infrastructure in the targeted geographies.

Concluding Remarks

Experience teaches us that preserving price stability is the best guarantee to ensure lasting growth and prosperity. Our actions today will impart further credibility to our medium-term inflation target, which is the central tenet of a flexible inflation targeting framework. India's recovery is proceeding apace, offering us space for an orderly policy shift. While we will continuously assess the evolving situation to tailor our responses, our actions must demonstrate the commitment to keep inflation and inflationary expectations under check. Therefore, monitoring and assessing inflation pressures and balancing risks to growth will be crucial for judging the appropriate policy path as we move ahead.

The road we have travelled during the recent past has indeed been very arduous, but we gathered faith, focus and fortitude along the way. Our actions today are in continuation of several measures that have been taken recently to achieve price stability. Given the elevated uncertainties of the current period, we have remained dynamic and pragmatic rather than being bound by stereotypes and conventions. As the Reserve Bank works tirelessly in its pursuit of macro-financial stability, I am reminded of what Mahatma Gandhi said long ago: "If we want to overtake the storm that is about to burst, we must make the boldest effort to sail full steam ahead".[1]

Thank you. Stay safe. Stay well. Namaskar.

[1] Source: The Collected Works of Mahatma Gandhi (Electronic Book), New Delhi, Publications Division, Government of India, 1927, Volume 40.

MONETARY POLICY STATEMENT FOR 2022-23

Resolution of the Monetary Policy Committee (MPC) June 8, 2022

Monetary Policy Statement, 2022-23 Resolution of the Monetary Policy Committee (MPC) *

On the basis of an assessment of the current and evolving macroeconomic situation, the Monetary Policy Committee (MPC) at its meeting today (June 8, 2022) decided to:

- Increase the policy repo rate under the liquidity adjustment facility (LAF) by 50 basis points to 4.90 per cent with immediate effect.

Consequently, the standing deposit facility (SDF) rate stands adjusted to 4.65 per cent and the marginal standing facility (MSF) rate and the Bank Rate to 5.15 per cent.

- The MPC also decided to remain focused on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

These decisions are in consonance with the objective of achieving the medium-term target for consumer price index (CPI) inflation of 4 per cent within a band of +/- 2 per cent, while supporting growth.

The main considerations underlying the decision are set out in the statement below

Assessment

Global Economy

2. Since the MPC's meeting in May 2022, the global economy continues to grapple with multi-decadal high inflation and slowing growth, persisting geopolitical tensions and sanctions, elevated prices of crude oil and other commodities and lingering COVID-19 related supply chain bottlenecks. Global financial markets have been roiled by turbulence amidst growing stagflation concerns, leading to a tightening of global financial conditions and risks to the growth outlook and financial stability.

Domestic Economy

3. According to the provisional estimates released by the National Statistical Office (NSO) on May 31, 2022, India's real gross domestic product (GDP) growth in 2021-22 was 8.7 per cent. This works out to 1.5 per cent above the pre-pandemic level (2019-20). In Q4:2021-22, real GDP growth decelerated to 4.1 per cent from 5.4 per cent in Q3, dragged down mainly by weakness in private consumption on the back of the Omicron wave.

4. Available information for April-May 2022 indicates a broadening of the recovery in economic activity. Urban demand is recovering and rural demand is gradually improving. Merchandise exports posted robust double-digit growth for the fifteenth month in a row during May while non-oil non-gold imports continued to expand at a healthy pace, pointing to recovery of domestic demand.

5. Overall system liquidity remains in large surplus, with the average daily absorption under the LAF moderating to ₹5.5 lakh crore during May 4 - May 31 from ₹7.4 lakh crore during April 8 - May 3, 2022 in consonance with the policy of gradual withdrawal of accommodation. Money supply (M3) and bank credit from commercial banks rose (y-o-y) by 8.8 per cent and 12.1 per cent, respectively, as on May 20, 2022. India's foreign exchange reserves were placed at US$ 601.4 billion as on May 27, 2022.

6. CPI headline inflation rose further from 7.0 per cent in March 2022 to 7.8 per cent in April 2022, reflecting broad-based increase in all its major constituents. Food inflation pressures accentuated, led by cereals, milk, fruits, vegetables, spices and

* Released on June 8, 2022.

prepared meals. Fuel inflation was driven up by a rise in LPG and kerosene prices. Core inflation (i.e., CPI excluding food and fuel) hardened across almost all components, dominated by the transport and communication sub-group.

Outlook

7. The tense global geopolitical situation and the consequent elevated commodity prices impart considerable uncertainty to the domestic inflation outlook. The restrictions on wheat exports should improve the domestic supplies but the shortfall in the *rabi* production due to the heat wave could be an offsetting risk. The forecast of a normal south-west monsoon augurs well for the *kharif* agricultural production and the food price outlook. Edible oil prices remain under pressure on adverse global supply conditions, notwithstanding some recent correction due to the lifting of export ban by a major supplier. Consequent to the recent reduction in excise duties, domestic retail prices of petroleum products have moderated. International crude oil prices, however, remain elevated, with risks of further pass-through to domestic pump prices. There are also upside risks from revisions in the prices of electricity. Early results from manufacturing, services and infrastructure sector firms polled in the Reserve Bank's surveys expect further input and output price pressures going forward. Taking into account these factors, and on the assumption of a normal monsoon in 2022 and average crude oil price (Indian basket) of US$ 105 per barrel, inflation is now projected at 6.7 per cent in 2022-23, with Q1 at 7.5 per cent; Q2 at 7.4 per cent; Q3 at 6.2 per cent; and Q4 at 5.8 per cent, with risks evenly balanced (Chart 1).

8. The recovery in domestic economic activity is gathering strength. Rural consumption should benefit from the likely normal south-west monsoon and the expected improvement in agricultural prospects. A rebound in contact-intensive services is likely to bolster urban consumption, going forward. Investment activity is expected to be supported by improving capacity utilisation, the government's capex push, and strengthening bank credit. Growth of merchandise and services exports is set to sustain the recent buoyancy. Spillovers from prolonged geopolitical tensions, elevated commodity prices, continued supply bottlenecks and tightening global

Chart 1: Quarterly Projection of CPI Inflation (y-o-y)

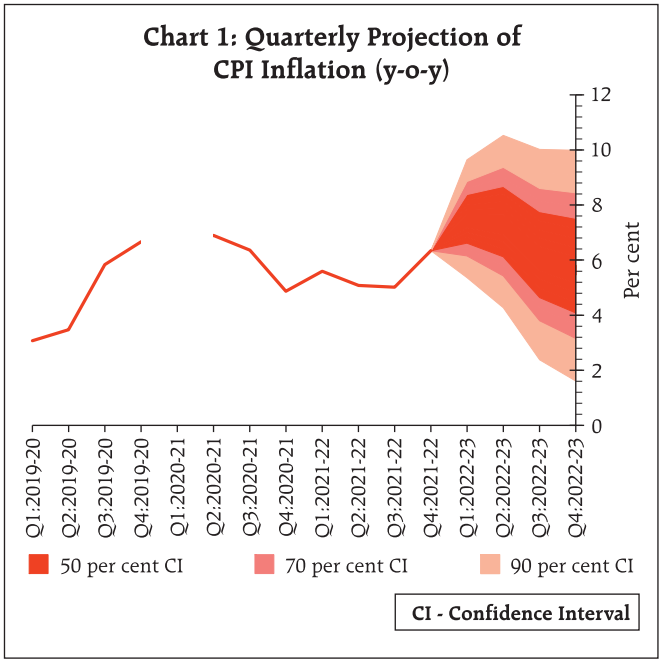
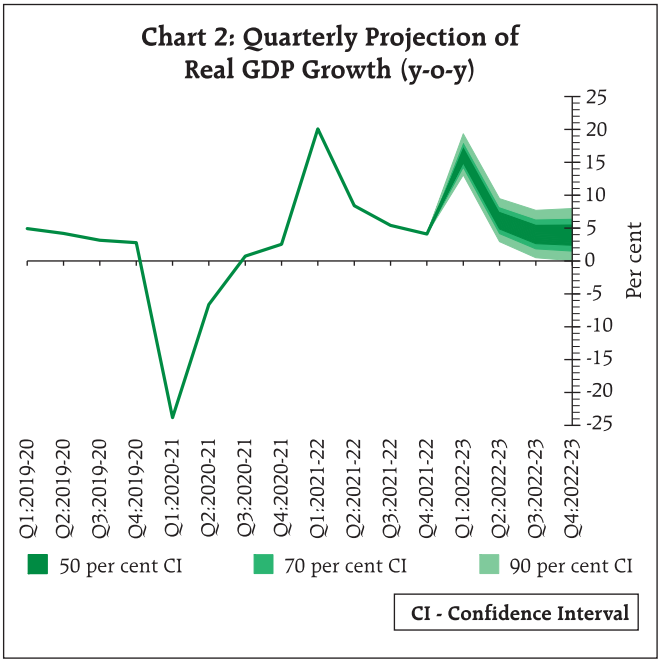


Chart 2: Quarterly Projection of Real GDP Growth (y-o-y)



financial conditions nevertheless weigh on the outlook. Taking all these factors into consideration, the real GDP growth projection for 2022-23 is retained at 7.2 per cent, with Q1 at 16.2 per cent; Q2 at 6.2 per cent; Q3 at 4.1 per cent; and Q4 at 4.0 per cent, with risks broadly balanced (Chart 2).

9. Inflation risks flagged in the April and May resolutions of the MPC have materialised. The projections indicate that inflation is likely to remain above the upper tolerance level of 6 per cent through the first three quarters of 2022-23. Considerable uncertainty surrounds the inflation trajectory due to global growth risks and geopolitical tensions. The supply side measures taken by the government would help to alleviate some cost-push pressures. At the same time, however, the MPC notes that continuing shocks to food inflation could sustain pressures on headline inflation. Persisting inflationary pressures could set in motion second round effects on headline CPI. Hence, there is a need for calibrated monetary policy action to keep inflation expectations anchored and restrain the broadening of price pressures. Accordingly, the MPC decided to increase the policy repo rate by 50 basis points to 4.90 per cent. The MPC also decided to remain focused on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

10. All members of the MPC – Dr. Shashanka Bhide, Dr. Ashima Goyal, Prof. Jayanth R. Varma, Dr. Rajiv Ranjan, Dr. Michael Debabrata Patra and Shri Shaktikanta Das – unanimously voted to increase the policy repo rate by 50 basis points to 4.90 per cent.

11. All members, namely, Dr. Shashanka Bhide, Dr. Ashima Goyal, Prof. Jayanth R. Varma, Dr. Rajiv Ranjan, Dr. Michael Debabrata Patra and Shri Shaktikanta Das unanimously voted to remain focused on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

12. The minutes of the MPC's meeting will be published on June 22, 2022.

13. The next meeting of the MPC is scheduled during August 2-4, 2022.

STATEMENT ON DEVELOPMENTAL AND REGULATORY POLICIES

Statement on Developmental and Regulatory Policies

Statement on Developmental and Regulatory Policies

This Statement sets out various developmental and regulatory policy measures relating to (i) Regulation; (ii) Financial Markets; and (iii) Payment and Settlement systems.

I. Regulation and Supervision

1. Individual Housing Loans by Cooperative Banks – Enhancement in Limits

Extant guidelines prescribe prudential limits on the amount of individual housing loans that can be extended by Primary (Urban) Co-operative Banks (UCBs), and Rural Cooperative Banks (RCBs - State Cooperative Banks and District Central Cooperative Banks) to their customers. These limits were last revised for UCBs in 2011 and for RCBs in 2009. Taking into account the increase in housing prices since the limits were last revised and considering the customer needs, it has been decided to increase the existing limits on individual housing loans by cooperative banks. Accordingly, the limits for Tier I /Tier II UCBs shall stand revised from ₹30 lakh/ ₹70 lakh to ₹60 lakh/ ₹140 lakh, respectively. As regards RCBs, the limits shall increase from ₹20 lakh to ₹50 lakh for RCBs with assessed net worth less than ₹100 crore; and from ₹30 lakh to ₹75 lakh for other RCBs. A detailed circular will be issued separately.

2. Permitting Rural Co-operative Banks (RCBs) to Lend to Commercial Real Estate - Residential Housing (CRE-RH) Sector

As per the extant guidelines, State Co-operative Banks (StCBs) and District Central Co-operative Banks (DCCBs) are prohibited from extending loans to the commercial real estate sector. Considering the growing need for affordable housing and to realise their potential in providing credit facilities to the housing sector, it has been decided to allow StCBs and DCCBs to extend finance to Commercial Real Estate – Residential Housing (CRE-RH) within the existing aggregate housing finance limit of 5 per cent of their total assets. A detailed circular will be issued separately.

3. Permitting Urban Cooperative Banks (UCBs) to Offer Door-step banking

In order to attain harmonization of regulatory framework across REs and to provide convenience of banking services to the customers at their door-step, it has been decided to permit UCBs to extend doorstep banking services to their customers on par with scheduled commercial banks. A detailed circular will be issued separately.

II. Financial Markets

4. Margin Requirements for Non-centrally Cleared Derivatives (NCCDs)

Well-established variation and initial margining requirements for over the counter (OTC) NCCD transactions contribute to financial stability and are a key component of the post-crisis G20 recommendations for these markets. With the objective of strengthening the resilience of OTC derivative market, the Reserve Bank had earlier issued a discussion paper to implement global practices related to margin requirements for OTC derivatives. The promulgation of the Act for Bilateral Netting of Qualified Financial Contracts, 2020, ensuring legal recognition for bilateral netting of an OTC derivative transaction, has put in place a significant enabler for efficient margining. Against this backdrop, Directions on exchange of Variation Margin (VM) for NCCDs were issued on June 1, 2022. Draft Directions on exchange of Initial Margin (IM) for NCCDs are being issued for public feedback separately.

III. Payment and Settlement Systems

5. e-Mandates on Cards for Recurring Payments – Enhancement of Limit

The framework on processing of e-mandate based recurring payments, inter-alia, provides for an Additional Factor of Authentication (AFA) during registration, sending a pre-debit notification, subsequent recurring transactions to be executed without AFA, and an easier avenue to withdraw such mandates. Benefits of convenience, safety and security are available to the users. The system also benefits from users' confidence. Major banks are providing the facility and the transaction volumes are seeing good traction. Till date, over 6.25 crore mandates have been registered under this framework, including for over 3,400 international merchants. Requests have been received from stakeholders to increase the limit under the framework to facilitate payments of larger value like subscriptions, insurance premia, education fee, etc. To further augment customer convenience and leverage the benefits available under the framework, it is proposed to enhance the limit from ₹5,000 to ₹15,000 per recurring payment. Necessary instructions will be issued shortly.

6. Enhancements to Unified Payments Interface (UPI) – Linking of RuPay Credit Cards

UPI has become the most inclusive mode of payment in India. Currently, over 26 crore unique users and 5 crore merchants are onboarded on the UPI platform. In May 2022 alone, 594.63 crore transactions amounting to ₹10.40 lakh crore were processed through UPI. UPI currently facilitates transactions by linking Savings / Current Accounts through Debit Cards of users. The interoperability of PPIs has also facilitated access of PPIs to the UPI payment system for undertaking transactions. In order to further deepen the reach and usage, it is proposed to allow linking of credit cards to UPI. To start with Rupay credit cards will be enabled with this facility. This arrangement is expected to provide more avenues and convenience to the customers in making payments through UPI platform. This facility would be available after the required system development is complete. Necessary instructions will be issued to NPCI separately.

7. Review of Payments Infrastructure Development Fund Scheme

The Payments Infrastructure Development Fund (PIDF) Scheme was operationalised by the Reserve Bank in January 2021 to incentivise the deployment of payment acceptance infrastructure such as physical Point of Sale (PoS), mPoS (mobile PoS), Quick Response (QR) codes in Tier-3 to 6 centres and North Eastern States. The Scheme had targeted 90 lakh Points of Sale (PoS) terminals and Quick Response (QR) codes to be deployed over three years (till end-2023). Beneficiaries of PM SVANidhi Scheme in Tier-1 and 2 centres were included in August 2021. As at end-April 2022, over 1.18 crore new touch points have been deployed under the Scheme.

It is now proposed to make modifications to the PIDF Scheme by, inter-alia, enhancing the subsidy amount, simplifying the subsidy claim process, etc. This is expected to further accelerate and augment the deployment of payment acceptance infrastructure in the targeted geographies. The amendments will be notified shortly.

SPEECHES

Indian Business: Past, Present and Future
Shaktikanta Das

Inaugural Address by Governor
Shaktikanta Das

*Indian Business: Past, Present and Future**

Shaktikanta Das

It is a great pleasure to address such an august gathering in this event organised by the Central Board of Indirect Taxes and Customs (CBIC), Department of Revenue, Government of India as part of the Iconic week of Azadi ka Amrit Mahotsav celebrations. The topic I have chosen for my address today, namely, "Indian Businesses: Past, Present and Future" will resonate with the audience here. Businesses form the bedrock of an economy and on an occasion like this, it would be worthwhile to look at how Indian businesses have evolved over the years. The current context of transformative changes that are altering the business landscape in India and across the world is yet another reason for choosing this theme.

I have structured my talk in the following order. I shall start by recounting the historical evolution of Indian businesses to draw lessons for the future. I will then turn to the current scenario where I propose to highlight the tremendous opportunities that are available today for Indian businesses and the challenges that they would have to contend with. I also propose to highlight aspects of corporate governance and related issues that are indispensable for a sustained performance by any entity or business.

Historically, businesses have been the creators of wealth by bringing innovation in production and trading activities which facilitated higher productivity and better standard of living of the people. Apart from creating growth and employment opportunities, thriving businesses generate vital resources through tax payments for the government to undertake welfare measures. Thus, both from growth and welfare standpoints, businesses play a crucial role in overall economic development. In the words of Nobel Laureate in literature T. S. Eliot, "Only those who will risk going too far can possibly find out how far one can go."[1] The underlying theme of business is to explore opportunities and capitalise on them.

In India, business and entrepreneurship have always had a special place in our society. The history of Indian business is a fascinating story and one that is closely intertwined with the political and economic history of our country. Traditionally, Indian businesses were rooted in local knowledge and resources that were greatly admired all over the world. During the colonial period, however, many of our businesses were faced with existential challenges. Showing resilience and capacity to innovate and improvise, Indian business has over the years not only survived but is now well-positioned to take India's growth story forward. Indeed, this could just be the moment of India's arrival as a global growth driver.

A Peep into History

The history of Indian business is fairly long. India was a key hub of scientific innovation from its very early history which lent India a pole position in several areas like medicines, mathematics, astronomy and metallurgy. During the medieval period, India was a prominent economy having trade relations with the rest of the world. India was central to the Silk Route and the Cotton Road. India's indigenous craftmanship was world renowned.

In 1700 AD, India's share in world GDP was 24.4 per cent, ahead of China's share at 22.3 per cent (Maddison, 2001). Even so, large scale domestic business was restricted by the fragmented nature of political landscape coupled with infrastructural

* Address by Shri Shaktikanta Das, Governor, Reserve Bank of India - June 9, 2022 - Delivered on the occasion of Iconic Week of Azadi ka Amrit Mahotsav Celebrations organised by the Central Board of Indirect Taxes and Customs in Mumbai.

[1] Preface to 'Transit of Venus', a 1931 book of poems by Harry Crosby

bottlenecks. While trading and money lending were the hallmark of business, manufacturing, which was primarily small scale was largely left to artisans. In short, trade was the face of Indian business alongside a flourishing banking and exchange business offered by merchants.

Colonial Period

The advent of imperial powers and the discovery of new trading routes completely changed the face of Indian business during the colonial period. The onset of the industrial revolution in the late 18th century had catapulted England into a position of leading industrial power. British tariff policy encouraged exports of raw materials to the detriment of India's domestic industrial development and local enterprise. A Reserve Bank of India Survey in 1948 estimated that of all foreign capital invested in India, only 28 per cent was in the manufacturing industry, whereas 37 per cent was invested in merchandising and transport, and 20 per cent in tea, coffee, and rubber plantation.[2] Clearly , the thrust was to promote British interests.

Despite adverse circumstances, Indian business managed to hold its own amidst the nationalistic fervour of the times. With British industrial power on a decline due to war preoccupations, several Indian industries such as textiles, jute, iron and steel, paper and cement consolidated their position. Considering the stagnation in the previous decades, the post-World War I spurt in industrial activity was significant. Notably, Indian businessmen also remained alive to the socio-political atmosphere of the time by pursuing and propagating the nationalistic agenda.

Aftermath of Independence

The initial decades after independence brought in changes to the Indian business environment with economic policy focussed towards capital-intensive production structure. Indian businesses were unshackled from the confines and constraints that reduced them to be just raw material producers.

In the subsequent period, shocks such as wars (1962, 1965 and 1971), droughts (1965-66) and the OPEC oil crisis (1973) revealed the underlying vulnerabilities of the Indian economy. In hindsight, excessive regulations stifled entrepreneurial growth and led to inefficiencies that reflected in macroeconomic imbalances of the period. As a result, a new vision of political economy driven by markets and private enterprise started to evolve steadily.

Reforms and After

In the 1980s, the Open General License (OGL) list for imports was expanded, industrial controls were somewhat eased, limited external borrowings were allowed, and an early version of indirect tax reforms began. The external payments crisis, as we entered the 1990s, culminated in the path-breaking economic reforms of 1991.

The economic reforms of 1990s were wide-ranging and were essentially based on the trinity of liberalisation, privatisation and globalisation. They entailed deregulation; the end of the licence-permit raj; increased outward orientation; and willingness to let market forces play their role. The financial system and the external sector also underwent fundamental reforms relating to strengthening of prudential norms and the supervisory system; operational flexibility of the banking sector; taxes and tariffs; exchange rate; and capital flows. The reforms aimed to bring competition to promote efficient markets that deliver growth, create wealth and reduce poverty.

In the years since the initiation of economic reforms, Indian business has witnessed various transformational changes. In several sectors spanning information technology, telecom, pharmaceuticals,

[2] Sabyasachi Bhattacharya, Business and the Raj, Indian Business through the Ages, FICCI, 1999.

automobiles, hotels, textiles, engineering goods and entertainment, our businesses have created global reputation. Indian business entities have shown a great deal of flexibility in an environment of rapid technological changes. This has led to a shortening of product lifecycles and innovation and technology have become key sources of competitive strength. The country now commands a diversified industrial base that has shown resilience in the face of multiple challenges posed by shocks such as the Global Financial Crisis, the recent COVID-19 pandemic and now the war in Europe.

New Opportunities and Challenges

The last few years have seen several policy measures and reforms that have created conducive conditions for Indian businesses to grow more rapidly. There has been a clear focus on improving ease of doing business, simplifying procedures and creating incentives to enable business and industry to take a quantum leap. The Make in India and the Production Linked Incentive (PLI) schemes aim to establish India as a world class manufacturing centre. The historic reform of goods and services tax (GST) unified various central and state tax laws and provided relief to businesses from cascading of taxes. Despite initial teething troubles, the new system has removed tax barriers across states and created a single common market thereby facilitating free flow of goods and bringing efficiency gains across sectors.

A few states have rationalised labour laws to simplify procedures and ease restrictions of entry and exit. The Insolvency and Bankruptcy Code (IBC), 2016 is a ground-breaking reform to help time-bound resolution of stressed assets that will free up scarce capital to drive growth. To bridge the infrastructure deficit, several measures including the National Infrastructure Pipeline (NIP), National Monetisation Pipeline (NMP) and the PM Gati Shakti have been taken up. All these measures are expected to create a conducive business eco-system in India.

Policy actions taken by the Government and the Reserve Bank since the onset of the pandemic in early 2020 have mitigated the disruptive effects of the pandemic while restoring market confidence and ensuring quick revival in economic activity. Alongside, businesses are going through a redefining phase and are adapting to the new realities emerging from the pandemic. Adoption of digital technologies and Artificial Intelligence (AI) is getting accelerated across firms/businesses/sectors. These disruptive technologies offer opportunities to young enterprises to create their own niche in markets dominated by incumbents. A reflection of this is seen in the emergence of several start-ups in the Indian business landscape as young entrepreneurs experiment with ideas in digital payments, online retail, on-demand delivery, education, software and more. The number of unicorns, or new businesses valued at over USD 1 billion, is rising very fast. These start-ups are supported by a new ecosystem of angel and venture funding, incubators and accelerators – as well as new patterns of consumption in society. A word of unsolicited advice to these young entrepreneurs and start-ups: they should constantly evaluate the build-up of risks and vulnerabilities in their businesses. I recognise that many of them may already be doing it and risk taking is a part of their business model, but nonetheless these are things which should always be kept at the back of one's mind for long term sustainability of any business.

Now we are in a situation where it has become imperative even for well-established firms to adopt technology solutions if they wish to remain competitive. The advent of new technologies is fundamentally changing all aspects of business. Decision making is increasingly supported by insights from data analytics, artificial intelligence and deep learning. Now there is almost a real-time assessment of customer needs, innovations and market trends that is helping manufacturers to manage production

capacities, save costs, reduce risks and meet evolving customer needs more quickly. We are in the age of data-driven smart manufacturing. If Indian businesses aspire to remain competitive and attain world-class status, it is important that they gear up to make the right investments sooner than later. I believe the pandemic-induced changes in strategy, management, operations and priorities are going to stay. Therefore, the success of Indian entrepreneurs will depend on how quickly and efficiently they are able to make necessary adjustments in their business models.

Corporate Governance, Ethics, Accounting Transparency and Business Models

Corporate Governance

I would now like to draw your attention to the single most important aspect that determines the long-term success of a business and that is corporate governance. The thrust of sound corporate governance is to help build an environment of trust, transparency and accountability in business entities. These are prerequisites for fostering long-term investment, business stability and integrity. It is important to remember that trust is the most valuable asset of a business; and good governance aims to protect and preserve that trust in the organisation. Good governance entails effective and collective oversight by the board and senior management of a company. This would also include control layers of risk management and internal audit. These need to be based on a proper risk appetite with the purpose of inculcating appropriate risk culture. Ethical conduct, accounting transparency and appropriate business models are various components of the broader governance framework. Organisational culture can exert substantial influence on both ethical conduct and transparency practices.

Ethical Conduct

Former Associate Justice of the U.S. Supreme Court Potter Stewart once stated: "Ethics is knowing the difference between what you have the right to do and what is right to do". Ethics denotes the conduct of responsible professional behaviour within the mission of a business by managing risks professionally and pursuing profits legitimately. It is essential that the board and senior management of a business instil a strong sense of ethics in their organisation by setting up a comprehensive internal code of conduct which is easily and clearly observed, continuously communicated and disseminated across the organisation. The strength and viability of a business entity directly draws from its organisational culture and ethics.

Transparency in Accounting

A robust corporate governance frame+work would require that businesses follow prudent accounting practices and provide transparent disclosures. Sufficient information should be made available to the market participants to enable them to make informed judgments about the health and viability of a business entity. Creative and aggressive accounting techniques and policies tend to overstate financial strength and would be detrimental to the long term sustainability of a business. The Board of Directors and the Audit Committee should ensure that integrity of the financial statements is not compromised in any manner. Entities with robust corporate governance and high transparency get rewarded by the investors with higher valuation metrics and are also able to raise capital at a much cheaper cost.

The Reserve Bank has mandated a host of disclosures for its regulated entities to ensure that they make full and fair disclosure of all material information in their financial statements. This would make them relevant, reliable, comparable and transparent.

Business Models

Business models and business strategies of individual entities should be conscious choices, that

are adopted following a robust strategic discussion in the Board, after considering all relevant aspects. Businesses should avoid aggressive short-term reward seeking culture, without regard for the build-up of excessive risks in the balance sheet. The common characteristics of some inappropriate business models or strategies that are observed include:

- Inappropriate funding structure;
- Building asset liability mismatches which are highly risky and not sustainable;
- Unrealistic strategic assumptions, particularly excessive optimism about capabilities, growth opportunities and market trends which may lead to poor strategic decisions that imperil business model viability; and
- Over-focus on business considerations with neglect of risk, control and compliance systems.

As I said earlier, risk taking is the essence of doing business. What I am now emphasising is the need to carefully weigh the upsides and downsides of every risk before embarking upon it.

Conclusion

India has a long history of industrious entrepreneurs and businesses. In a sense, the evolution of Indian economy is essentially a reflection of the transformation seen in Indian businesses over the years. The story of Indian entrepreneurship is fascinating and now we are witnessing a new generation of entrepreneurs who are the flag-bearers of epochal changes in the conception, organisation and operation of businesses. In my speech today, I have attempted to highlight certain important aspects which are essential features of successful and sustainable businesses.

At the Reserve Bank, we do recognise the role of existing as well as emerging businesses for economic progress. Long term success of any business is directly linked to its quality of governance, internal control systems and the robustness of its risk and organisational culture. The Reserve Bank has been pushing for improvements in the governance and compliance culture of its regulated entities through a series of measures.

Indian business is now at a critical juncture with both opportunities and challenges. The macroeconomic and geopolitical environment is fast changing and there is a greater need to remain alert. I am confident of our dynamic entrepreneurs having ample capacity to deal with the challenges, capitalise on the opportunities and leap forward. Let me end by recalling what Steve Jobs said about the role of perseverance in success: "If you really look closely, most overnight successes took a long time."[3]

My best wishes to you all on this great occasion of the Iconic week of Azadi Ka Amrit Mahotsav.

Thank you. Stay Safe. Stay Well. Namaskar!

[3] Interview about Pixar, Emeryville, California, 2007.

*Annual Statistics Conference of the Department of Statistics and Information Management (DSIM), RBI-Inaugural Address by Governor**

Shaktikanta Das

Good morning!

I am delighted to be here in Guwahati, the gateway to North-Eastern India. The 'Annual Statistics Conference - 2022' of the Department of Statistics and Information Management (DSIM), which is being held after a hiatus[1] is an important event in the calendar of activities of the RBI. The earlier conference, which was scheduled here in March 2020 was cancelled a day before it was to commence due to the onset of COVID-19 pandemic.

The ancient name of the city of Guwahati, *i.e.* Pragjyotishpura means 'the abode of light in the east'. The enlightened and vibrant environment here will certainly provide the right backdrop for deliberations on sharing work-learnings. It will help refine the processes and plan strategies for future work agenda of central and regional offices. Such conferences provide refreshing and valuable impetus to our work in an informal setting with professional peers.

I am glad that many academicians[2] are participating in today's event to provide feedback on the research work done by our officers. Their presence means a lot, especially for our younger officers, in their pursuit of high quality research work.

The focus of Statistics Department in a central bank is always on compiling reliable data and statistical analysis for assessment of important developments; provide inputs for future policies; and monitor progress of policies and operations. Accordingly, in today's talk, I propose to focus on three core aspects of the working of DSIM, *viz.*, (a) statistical data, (b) statistical methods and (c) communications in statistics.

A. Statistical Data

The need for good data may seem self-explanatory, especially for an audience of statisticians. The key ingredients in building our good reputation on statistics have been: (i) transparent dissemination of good quality information; (ii) use of robust analytical methods; and (iii) keeping pace with changing times and global standards. The fact that we have been synthesising information from large number of reporting entities with diverse levels of technology platforms, adds credence to the effort.

Central banks are both producers and users of data. In our case, the stakes are very high as our decisions impact the lives of over a billion people, who place trust in us for a stable financial intermediation environment and protection from adverse macroeconomic conditions. As financial markets are getting more integrated, robust information systems provide comfort on data guided policy and supervision. It is important to always maintain the rigour and quality of data and analytical studies. The entire process has to be reliable and not susceptible to small errors, which can turn out to give disproportionate misleads.

Statisticians create value by integrating and correlating information from various sources and systems; but even well-collected data may fall short of answering some critical questions, as changes in

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* Inaugural Address By Governor, Shri Shaktikanta Das at the Annual Statistics Conference of the Department of Statistics and Information Management (DSIM), Reserve Bank of India in Guwahati on June 10, 2022.

[1] The last Annual Statistics Conference was held during May 9-11 2019.

[2] (i) Prof. Anil K. Ghosh, Indian Statistical Institute, Kolkata.
(ii) Prof. Amit Choudhury, Gauhati University.
(iii) Prof. Sangeeta Barthakur, Cotton University, Guwahati.
(iv) Prof. Pradip K Das, Indian Institute of Technology (IIT), Guwahati.
(v) Prof. Jiten Hazarika, Dibrugarh University.

context often pose new challenges. For example, the global financial crisis (GFC) of 2008 showed in a hard way the importance of better coverage and granularity of data especially on (a) build up of risk in the financial sector; (b) cross-border spillover; and (c) vulnerability of domestic economies to shocks. These aspects were later addressed through the G-20 Data Gap Initiative.

Compilation of statistics requires cooperation from reporting agencies and other respondents. There is need for constant feedback loop between producers and users of data. In our case, while regulatory powers guarantee unhindered cooperation from regulated entities, our goodwill also ensures cooperation from others, for example, in the case of our enterprises and households surveys.

The COVID-19 pandemic shock highlighted the need to go beyond the standard offering for assessment of macroeconomic conditions. Critical official statistics faced disruptions in compilation. Even regular macroeconomic statistics at times pose unique challenges as they often cease to reflect economic dynamics.

Accordingly, newer data sources[3] that have higher frequency than the traditional macro statistics are now used to assess movements in critical variables, such as, consumption and production. There is a need to augment the array of alternative statistics, to complement the regular aggregates. The unconventional data sources, and even micro voluminous data collected as part of traditional statistical systems - falling under the general ambit of Big data, has gained traction. We are past the stage of asking "if or whether we should use" to "how efficiently and effectively we can use" them.

I would like to suggest to our statistics teams to make a detailed assessment of the quality of such high-frequency indicators as advance signals of economic activity.

[3] For example: internet searches, mobility trends.

A recent Bank for International Settlements(BIS) study highlights the impact of the pandemic on official statistics globally. In this context, I am glad to note that the Reserve Bank's past investment in technology for information management and handholding of bankers stood in good stead during the pandemic period and (i) supported the 'work from home (WFH)' set up within the Bank; and (ii) provided continuity of information flow for public dissemination even during the lockdown periods.

In our pursuit of transparency of statistics and research, it is better to demonstrate trustworthiness by (i) making more data easily available; (ii) remain transparent about compilation and caveats; and (iii) ensure that our data remain credible on statistical criteria of consistency, coverage, quality and timeliness. At the same time, we acknowledge the extremely valuable guidance received from external experts in our data collection and compilation exercises. We will continue to seek their support and guidance in our professional endeavours.

B. Statistical Methods

Research inputs provide the essential base for policymaking. As you are aware, a substantial portion of RBI's research is placed in the public domain. I often rely on our internal research work in decision making and my public interactions. Our researchers have stepped up enquiries and analysis into the structural changes taking shape during the pandemic. This meant frequent revisits and refinements in forecast and nowcast models to derive the short-term outlook on macro financial and economic aggregates. Officers of the Department of Statistics and Information Management (DSIM) should delve deeper in their respective domains and constantly strive to compete with the best in the world.

Central banks have not exactly been at the forefront of the Big Data revolution, which has brought us tools and techniques for rapid processing, but the

picture is now changing. A number of central banks are using the methodological advances in domains such as economic analysis, agriculture, environmental protection, marketing, etc. At the Reserve Bank, we are making headway in text mining, nowcasting, on-line data based indices and the use of Big data analytics and machine learning algorithms.

I am happy to note that RBI compares well with the advanced economies and emerging market economies in the 2020 survey of "Use of Big data sources and applications for Central Bank" conducted by the Irving Fisher Committee on Central Bank Statistics (IFC) at the BIS. At the same time, we need to intensify our efforts in newer areas.

As statistics gains more prominence in the context of increasing availability and complexity of data and advances in methods, research must strive to unlock their full potential in addressing policy and operational issues. Research entails a strong mindset to explore and willingness to get deeper into the subject domain. I would like this orientation to percolate down to the newer and younger officers with right kind of mentoring.

C. Communication in Statistics

The late US politician Daniel Moynihan once famously said, "Everyone is entitled to their own opinion, but not their own facts". Analysts often offer different answers to the same question from same data set. In such situations, the role of statisticians becomes critical in communicating precise information to minimise any noise emanating from diverse analytical approaches. In statistical terms, as you are aware, it is termed as non-standard error, as opposed to standard error which creeps in due to variability within data sets.

Communication of statistics is indeed a tricky issue. As central bankers, we need to balance and be mindful of different audiences. For example, how experts and general public perceive our communication of, say, forecasts in terms of fan charts or survey results told in terms of net-responses.

An effective communication for explaining a technical and complex matter requires clarity in understanding and ability to speak or write in a manner that the listeners understand.

I often note that the compilers, who have expertise in their statistics, leave its analysis and presentation to others. A method scientist like statistician can handle methodological aspects in any domain but she/he also needs to acquire domain knowledge to provide more robust advice. I see a large number of young officers participating here and my advice to them would be to strengthen their knowledge base, especially in the areas of economics and finance. It will enable them to gain more confidence to excel in the organisation as well as derive satisfaction in their professional life.

As we build and maintain integrated information infrastructure of national importance, data security remains a top priority. Constant tracking of developments and assessing the associated technologies will facilitate holistic assessment of threats and business continuity. We must constantly update ourselves with technological advances and ensure that our information systems are not compromised.

Learning and pursuit of excellence have no boundaries. As we move ahead, each one of you has to be a leader in your own domain and student in other domains. The reputation of any individual or team or institution is built with hard and sustained efforts. I am sure you will continue to enrich your knowledge, enhance your presentation skills, lead your teams and ensure best possible work delivery. You must constantly strive to produce good statistics, analysis and research by investing in yourself.

I wish the conference all success. Enjoy the stay at Guwahati. Thank you.

ARTICLES

*State of the Economy**

Downside risks to global growth have accentuated with the risk of commodity price driven inflation turning more generalised. Despite global headwinds, domestic macroeconomic conditions continued to strengthen. With a growth rate of 8.7 per cent in 2021-22, India's gross domestic product (GDP) surpassed its pre-pandemic (2019-20) level by 1.5 per cent and the recovery remains robust in 2022-23 so far. The y-o-y Consumer Price Index (CPI) inflation print for May was lower than the previous month after seven months of continuous rise.

Introduction

Since the publication of last month's edition of the State of the Economy, domestic economic activity has been gaining traction in spite of formidable headwinds from external developments. The protracted war in Europe and resulting sanctions have kept global commodity prices elevated while dampening global trade and growth. Concurrently, the faster pace of monetary policy normalisation in response to record high inflation is heightening volatility in global financial markets. In its June 2022 issue of the Global Economic Prospects, the World Bank has cautioned that the combination of feeble growth and elevated inflation raises the risk of stagflation with potentially harmful consequences for low and middle-income countries.[1]

In the midst of these global adversities, the Indian economy is consolidating the path of recovery. Gross domestic product (GDP) for 2021-22 surpassed its pre-pandemic (2019-20) level by 1.5 per cent and activity is gaining strength in 2022-23 so far as gauged from high frequency indicators. In the job market, the unemployment rate dropped in May 2022 for both urban and rural constituents. Revenue collection under the goods and services tax (GST) stood at ₹1.4 lakh crore, reflective of the gathering pace of business activity.

With inflationary pressures from firming global commodity prices becoming accentuated, the Government has taken a number of steps to ease domestic prices. They, *inter alia,* include export restrictions on wheat and sugar, cut in the import duty on edible oils, waiver of import duty on raw materials for steel industry and a cut in the central excise duty on petrol and diesel. The latest round of the inflation expectations survey (IES) of the Reserve Bank incorporated an extension survey of urban households undertaken after the excise duty cuts on petrol and diesel and the results show a significant moderation in their inflation expectations post the excise duty cut.

Headline inflation breached the tolerance level of 6 per cent during 2022 so far. As the upside risks to inflation as highlighted in the April and May 2022 policies materialised earlier than anticipated both in terms of timing and magnitude, the Monetary Policy Committee (MPC) judged that further monetary policy measures are warranted to anchor inflation expectations.

In his interaction with the press post the announcement of the monetary policy decision of June 8, 2022 to increase the policy interest rate by 50 basis points, Governor Shri Shaktikanta Das drew attention to a stark feature of recent inflation developments - "75 per cent of the increase in our inflation projection, compared to what we had made in April, is attributed to food inflation…primarily the food inflation spike is linked to external factors, namely, the war in Europe.

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* This article has been prepared by GV Nadhanael, Yogesh, H.C., Kunal Priyadarshi, Harshita Keshan, Satyarth Singh, Prashant Kumar, Rishabh Kumar, Rohan Bansal, Priyanka Sachdeva, Yuvraj Kashyap, Amit Pawar, Jibin Jose, John V. Guria, Sakshi Awasthy, Ramesh Kumar Gupta, Aayushi Khandelwal, Akash Kovuri, Vineet Kumar Srivastava, Samir Ranjan Behera, Deba Prasad Rath and Michael Debabrata Patra. Views expressed in this article are those of the authors and do not necessarily represent the views of the Reserve Bank of India.

[1] https://www.worldbank.org/en/news/press-release/2022/06/07/stagflation-risk-rises-amid-sharp-slowdown-in-growth-energy-markets

He also stated that "we believe that our actions will have an impact on bringing down inflation and inflation expectations…. Inflation must come down. Economic recovery also must continue."

It is worthwhile to communicate with clarity as to what the RBI seeks to achieve with the recent monetary policy action. The idea is to share with the public a common set of expectations so that monetary policy serves as an anchor for the Indian economy.

There is no doubt that the first impact of a food and fuel price shock to inflation lies outside the realm and remit of the RBI - especially with food and fuel prices constituting 60 per cent of the CPI and the food shock emanating from external sources, in this case, the war in Europe.

But what happens next? First, households' inflation expectations tend to be backward looking. They tend to look at recent food and fuel prices which are salient items in the average consumption basket and they form their opinion about what inflation would be in the future, say three months or a year from now. If households believe that inflation will go up and stay up, they are in effect saying that it is better to prepare for that difficult situation.

Second, as households and firms increasingly share this view, they will build it into price mark-ups, wage negotiations, rents on houses, transportation costs and the prices of services more generally such as personal services like housekeeping, medical and education fees, entertainment and bus, train and auto fares. With households accounting for two third of India's GDP in the form of private consumption expenditure, this will mean that inflation will become entrenched in the Indian psyche, and will become persistent and generalised.

This would imply an adverse outlook for the economy. Businesses will stop investing, wages and costs will go up, export competitiveness will be damaged and savings in banks will be pulled out and put into assets like gold - that age old repository of value - which actually means capital flight from India since 98 per cent of gold demand is met from abroad for which foreign exchange has to be paid.

Here comes the sun - monetary policy. Inaction by the Reserve Bank will be seen as accommodating the inflation shock and such a perception may lead to a belief that inflation is getting out of control. On the other hand, if the Reserve Bank increases interest rates and tightens monetary and liquidity conditions, it will (a) demonstrate that the RBI cares about people's expectations and is determined not to let matters slip away; (b) anchor people's faith in the RBI's commitment to price stability and strengthen the foundations of growth; (c) prevent the second-round effects of food and fuel prices described earlier from getting entrenched; and (d) deter discretionary spending so that even if people's spending on food and fuel goes up because of the price shock, they will adjust their expenditure on other items which will have a moderating impact on overall inflation. In effect, the RBI's actions will cause inflation other than that related to food and fuel, or what is called core inflation, to ease and this will bring down headline inflation.

Foreign investors are particularly sensitive to such monetary policy actions. They tend to see it as Indian policy authorities being resolute in their intent of protecting the value of Indian assets and so they will not pull out their investments in India and, in fact, they will invest more with the assurance of this intent to preserve macroeconomic and financial stability. Depreciation pressure on the rupee that is being experienced now will ease and this, in turn, will curb imported inflation.

What the RBI is trying to do is to stabilise the price situation when the economy is able to bear it because in the longer run, price stability is beneficial

for growth. The RBI kept interest rates and liquidity conditions low and easy through all of 2020-21 and 2021-22. The Indian economy registered a growth rate of 4.1 per cent as a result in the quarter January to March 2022, when several advanced and emerging economies fell into contraction. In the first quarter of 2022-23, available indicators of economic activity have strengthened. Unlike the rest of the world, India is recovering and getting resilient and stronger. This is the best time to put the stabilising effects of monetary policy into action so that the costs to the economy are minimised.

Will these monetary policy actions exorcise the evil spirit of inflation? Who knows till when the war in Ukraine would last? But the RBI has to act. Monetary policy is usually unsung and unseen; but when the dark clouds gather over the Indian economy, the Reserve Bank has to rise from the anonymous depths it usually inhabits and act with everything at its command in defence of the Indian economy.

This is the role of monetary policy.

Set against this backdrop, the remainder of the article is structured into four sections. Section II captures the rapidly evolving developments in the global economy. An assessment of domestic macroeconomic conditions is presented in Section III. Section IV reviews financial conditions in India, while the last Section concludes the article.

II. Global Setting

The global economy remains on the edge as positive sentiments from improvements in supply chain pressures as well as relaxations in lockdown measures in some parts of the world are offset by continued commodity prices pressures and monetary policy tightening. In its latest Economic Outlook released on June 8, 2022, the Organisation for Economic Co-operation and Development (OECD) has revised down the global growth forecast for 2022 by 1.5 percentage points from its December 2021 projections (Table 1). The Global Economic Prospects of the World Bank released in June 2022 slashed global growth projection for 2022 down by 1.3 percentage points from its January release.

Table 1: GDP Growth Projections for 2022 – Select AEs and EMEs

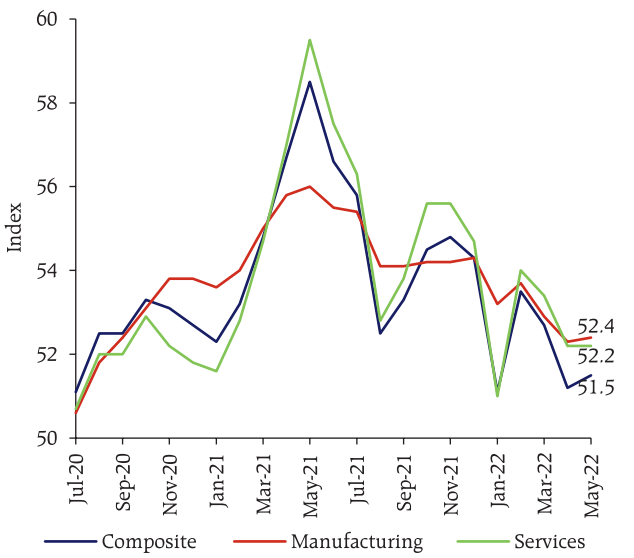
(Per cent)

Country	OECD		World Bank	
	Dec 2021	Jun 2022	Jan 2022	Jun 2022
World*	4.5	3.0	4.4	3.1
Advanced Economies (AEs)				
US	3.7	2.5	3.7	2.5
UK	4.7	3.6		
Euro area	4.3	2.6	4.2	2.5
Japan	3.4	1.7	2.9	1.7
Emerging Market Economies (EMEs)				
Brazil	1.4	0.6	1.4	1.5
Russia	2.7	-10.0	2.4	-8.9
India	8.1	6.9	8.7	7.5
China	5.1	4.4	5.1	4.3
South Africa	1.9	1.8	2.1	2.1

*: PPP weighted.
Sources: OECD and World Bank.

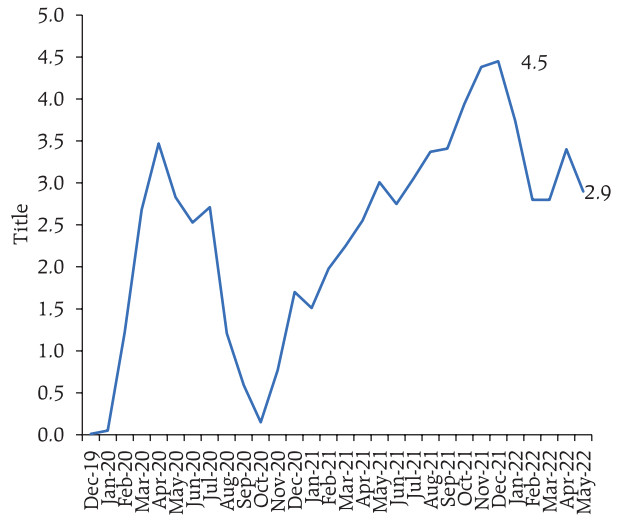
Among high frequency indicators, the global composite purchasing managers' index (PMI) picked up marginally to 51.5 in May from 51.2 a month ago as growth of new business gained pace while new export business declined (Chart 1). The manufacturing PMI exhibited a modest increase whereas the services PMI remained unchanged at April's three-month low of 52.2. Country-wise PMIs suggest that economic activity continued to expand in major economies

Chart 1: Global PMIs



Source: IHS Markit.

Chart 3: NY Fed Global Supply Chain Pressure Index

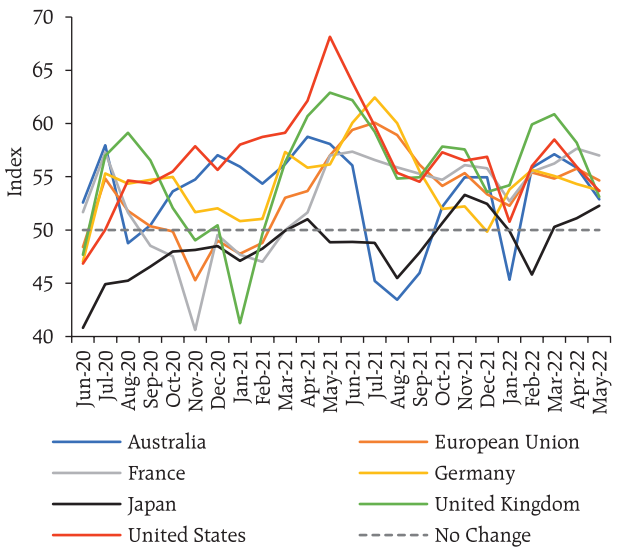


Source: New York Fed.

of the world although the pace of expansion has moderated significantly in the US, Australia and the UK in recent months (Chart 2).

There are also signs emerging that supply disruptions may be easing. The New York Fed's global supply chain pressure index (GSCPI) eased in May, after having edged up in April (Chart 3).

Chart 2: PMI Composite Indices

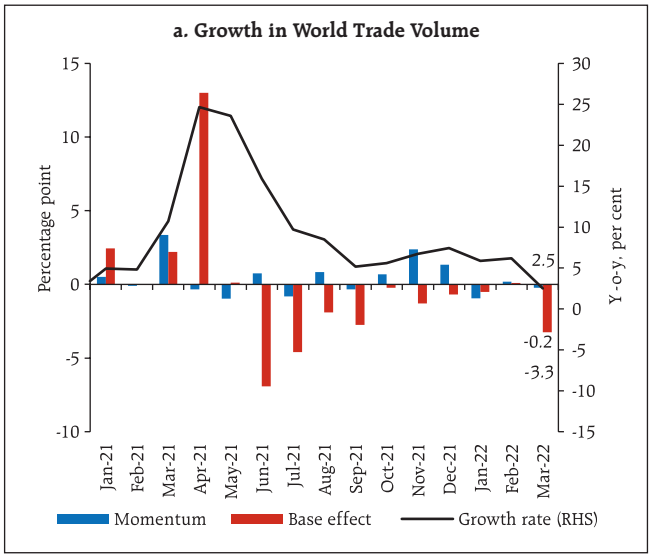


Source: Bloomberg.

On the external front, the May 2022 release of the World Trade Organisation's Goods Trade Barometer - a forward-looking composite of real-time indicators - remained flat at 99.0 for March 2022 (previous reading of 98.7 for February) and below the baseline value of 100. The growth of merchandise trade volume decelerated to 2.5 per cent (y-o-y) in March from 6.2 per cent in February on a negative monthly momentum as well as an unfavourable base effect (Chart 4a). The Baltic Dry Index – a measure of shipping charges for dry bulk commodities – increased by 6.7 per cent in May. The trajectory, however, remains volatile with a sharp increase in the first half of the month followed by moderation in the last week (Chart 4b).

The Bloomberg commodity price index hit a fresh 8-year high in early June (Chart 5a). Crude oil prices gained momentum, averaging US$ 123 per barrel in June 2022 (till June 6) due to extremely tight supply conditions amidst soaring demand as mobility restrictions eased in China and the European Union's sanctions targeting Russian oil imports likely to take full effect by the end of the calendar year. Crude prices have notched up a 60 per cent gain year to date (up to June 6, 2022). The Organization of the Petroleum

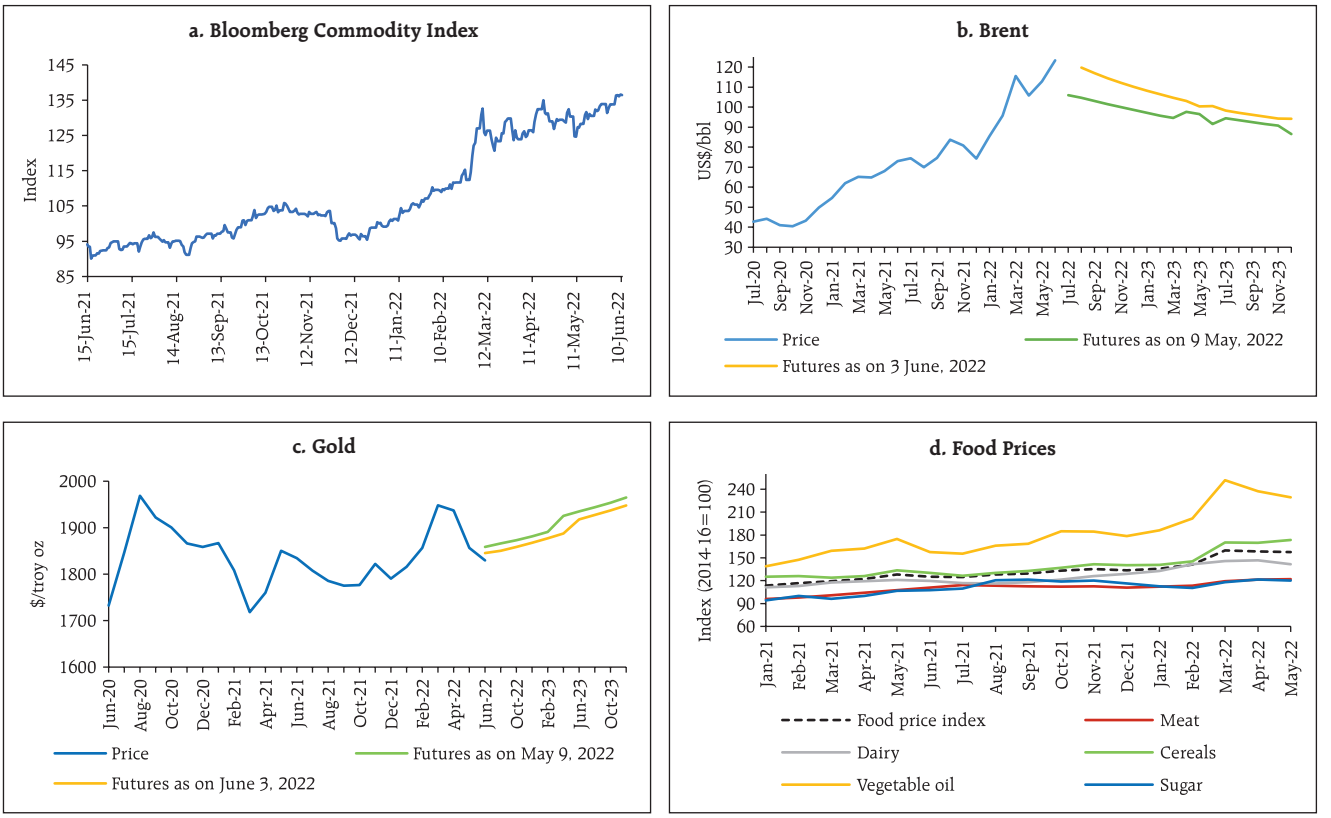
Chart 4: World Trade and Shipping Costs



Sources: CPB Netherlands; and Bloomberg.

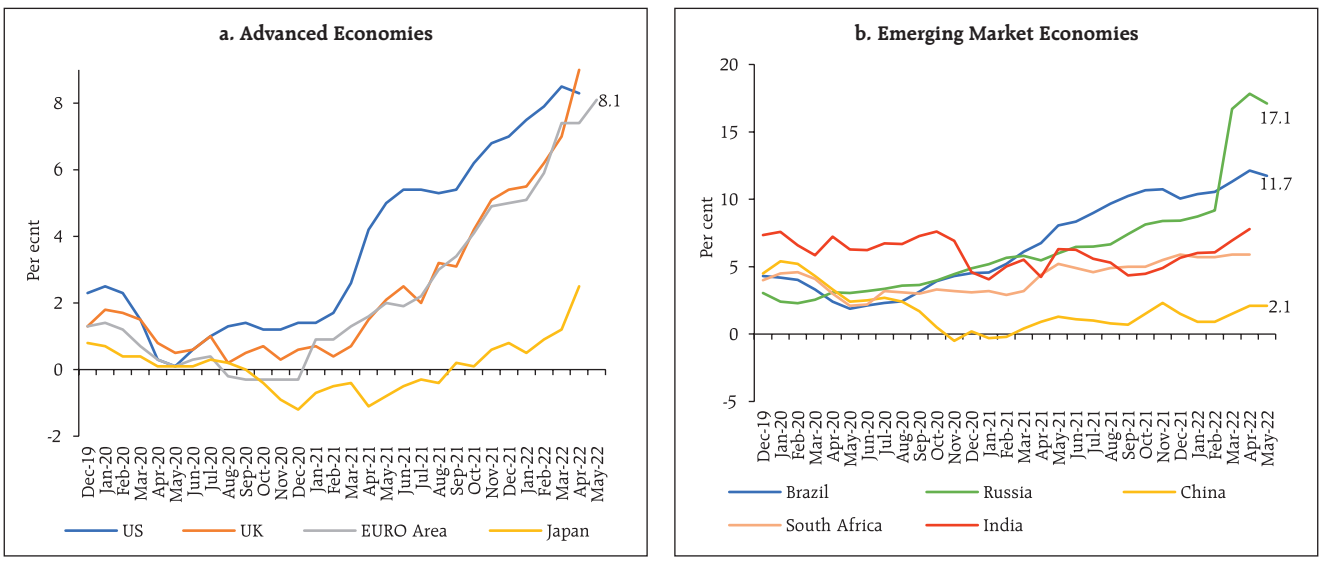
Exporting Countries (OPEC) plus's agreement to accelerate output increases over the next two months could not provide any significant breather to rising prices as Saudi Arabia sharply increased prices for

Chart 5: Commodity and Food Prices



Sources: Bloomberg; World Bank Pink Sheet; and FAO.

Chart 6: Inflation



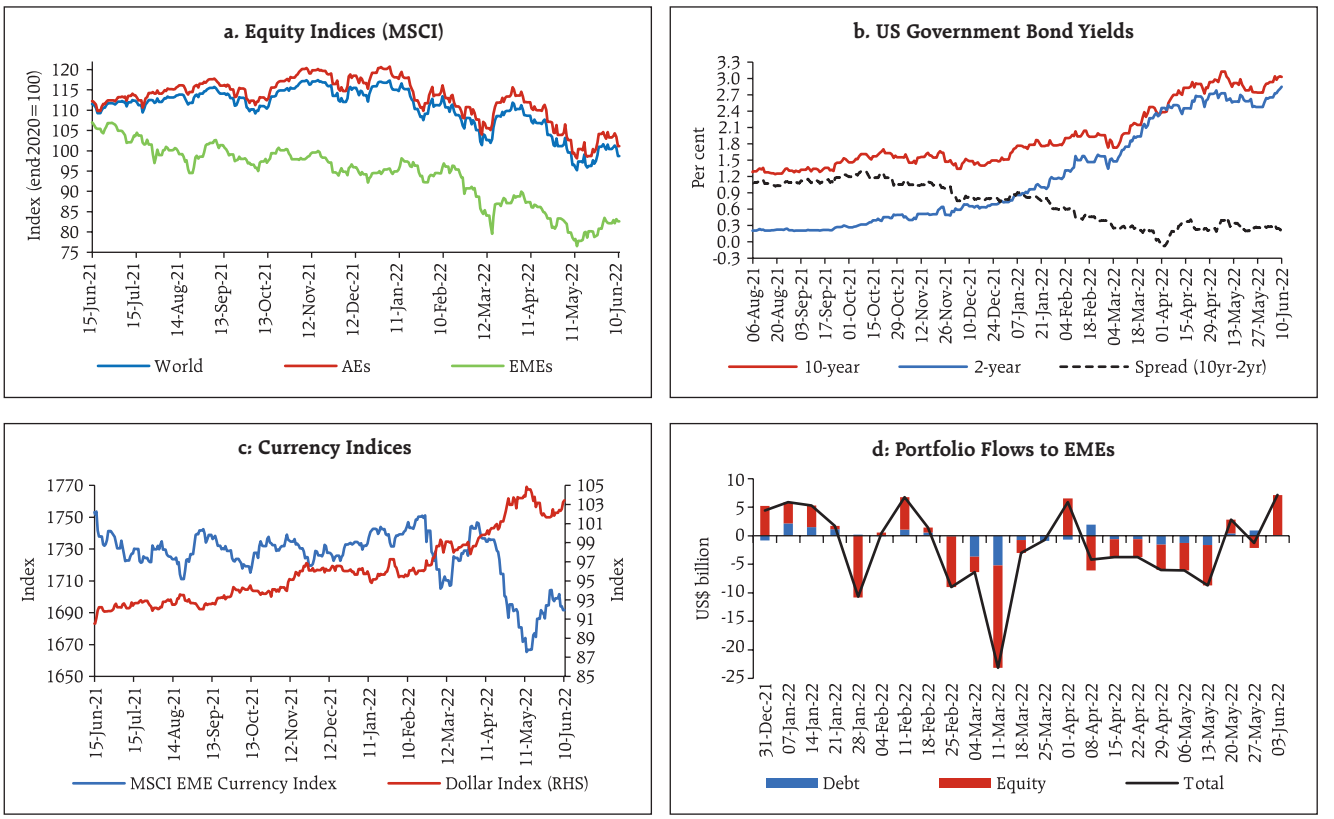
Source: Bloomberg.

its crude sales in July, highlighting extremely low inventories (Chart 5b). Gold prices faced headwinds as bond yields hardened and the US dollar strengthened (Chart 5c). The Food and Agriculture Organization (FAO) food price index retreated marginally for the second successive month to 157.4 in May from the all-time high registered in March due to moderation in vegetable oil and dairy prices while meat and cereal prices continued to increase (Chart 5d). Despite a correction by about 9 per cent over March 2022 levels, the vegetable oil index remained higher by 32 per cent above its levels witnessed in May 2021.

Inflation continues to soar in several economies, with price pressures hardening on escalating commodity prices while becoming increasingly broad-based (Chart 6). Inflation in the US measured by the y-o-y change in the personal consumption expenditure (PCE) price index decelerated to 6.3 per cent in April 2022 from 6.6 per cent in March with a monthly momentum of 0.2 per cent – the lowest since November 2020. Core PCE inflation also moderated to 4.9 per cent in April 2022 from 5.2 per cent a month ago as the monthly momentum of 0.3 per cent was cloaked by a favourable base effect. US CPI inflation, however, accelerated to 8.6 per cent in May 2022 from 8.3 per cent a month ago with a high monthly momentum of 1.0 per cent. The Euro area annual inflation also soared to a new record of 8.1 per cent in May, primarily driven by energy and followed by food, alcohol and tobacco. Among BRICS economies, inflation in Brazil at 11.7 per cent in May remained in double digits for the ninth consecutive month while in China, it remained constant at 2.1 per cent in May as in the previous month (Chart 6b). In Russia, following sanctions and a sharp depreciation in the rouble, inflation remained high at 17.1 per cent in May, *albeit* a moderation from 17.8 per cent in April.

Global financial markets, though volatile, have recovered some lost ground, stabilising during the second half of May and finishing the month with modest gains, mostly driven by EMEs. As a result, the MSCI World Equity Index shed 0.1 per cent in May as the AE equity index declined by 0.2 per cent while the EME equity index increased by 0.2 per cent (Chart 7a).

Chart 7: Financial Markets

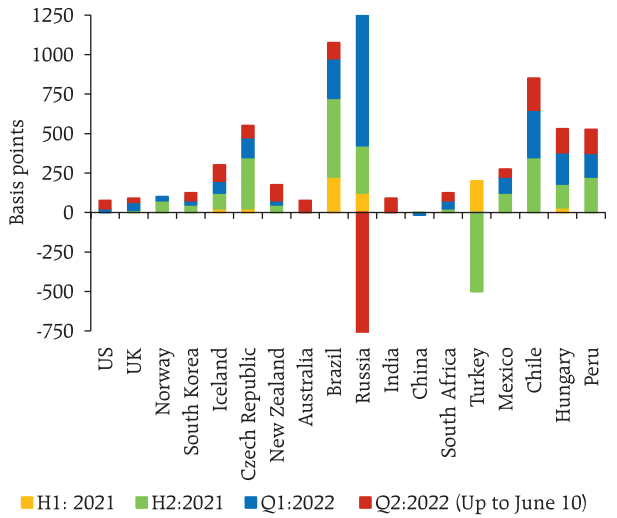


Sources: Bloomberg; and IIF.

In the bond markets, the US Treasury yields broadly softened, averaging 2.80 per cent in the second half of May for the 10-year benchmark as markets priced in less aggressive Fed tightening than previously anticipated. Furthermore, short term rates have also moved in tandem so that the yield spread has stayed flat (Chart 7b). Yields registered high volatility, however, gyrating in response to incoming data. The dollar index hit a two-decade high in the second week of May before weakening in the latter half of the month on mixed economic news and shifting sentiments (Chart 7c). Most EME currencies recorded modest gains with net capital inflows supporting them (Chart 7d).

Monetary policy stances continue to tighten concurrently for most economies, both AEs and EMEs. The Federal Reserve's balance sheet tightening commenced from June 1, as enunciated in the Federal Open Market Committee (FOMC) meeting on May 4, 2022. In view of heightened inflation risks, the European Central Bank (ECB) Governing Council met on June 9, 2022 and decided to take further steps in normalising its monetary policy which includes ending of net asset purchases under its asset purchase programme (APP) as of 1 July 2022. The Governing Council also intends to raise the key ECB interest rates by 25 basis points (bps) at its July monetary policy meeting and expects to raise rates again in September. The Reserve Bank of New Zealand and the Bank of Canada also raised their policy rates by 50 bps each in May and June, respectively. The Bank of Japan has reiterated its current monetary easing stance, given its negative output gap, and therefore remains in direct contrast to its peers. Most EME central banks have continued with policy tightening, including Hungary

Chart 8: Rate Actions of Central Banks of Select Countries since 2021



Source: Central bank websites.

and South Africa hiking their benchmark rates by 350 bps and 100 bps, respectively, in 2022 so far. The central banks of Philippines and Malaysia have also commenced raising their policy rates in May by 25 bps each – the first rate hike in their current tightening cycle. On the other hand, the Bank of Russia reduced its policy rate by 300 bps in May taking the cumulative reduction to 900 bps in the last two months, almost reversing the emergency rate action post the outbreak of the war. The People's Bank of China reduced the 5-year loan prime rate (LPR), the mortgage reference rate, by 15 bps to 4.45 per cent and retained the policy rate *i.e.*, the 1-year LPR at 3.7 per cent (Chart 8).

To sum up, the downside risks to global growth have accentuated as most economies are swiftly withdrawing their accommodative policy stance given the risk of commodity price driven inflation turning more generalized. In the meanwhile, continued uptrend in energy prices keeps inflation risks to the upside, especially for the net importing countries including India.

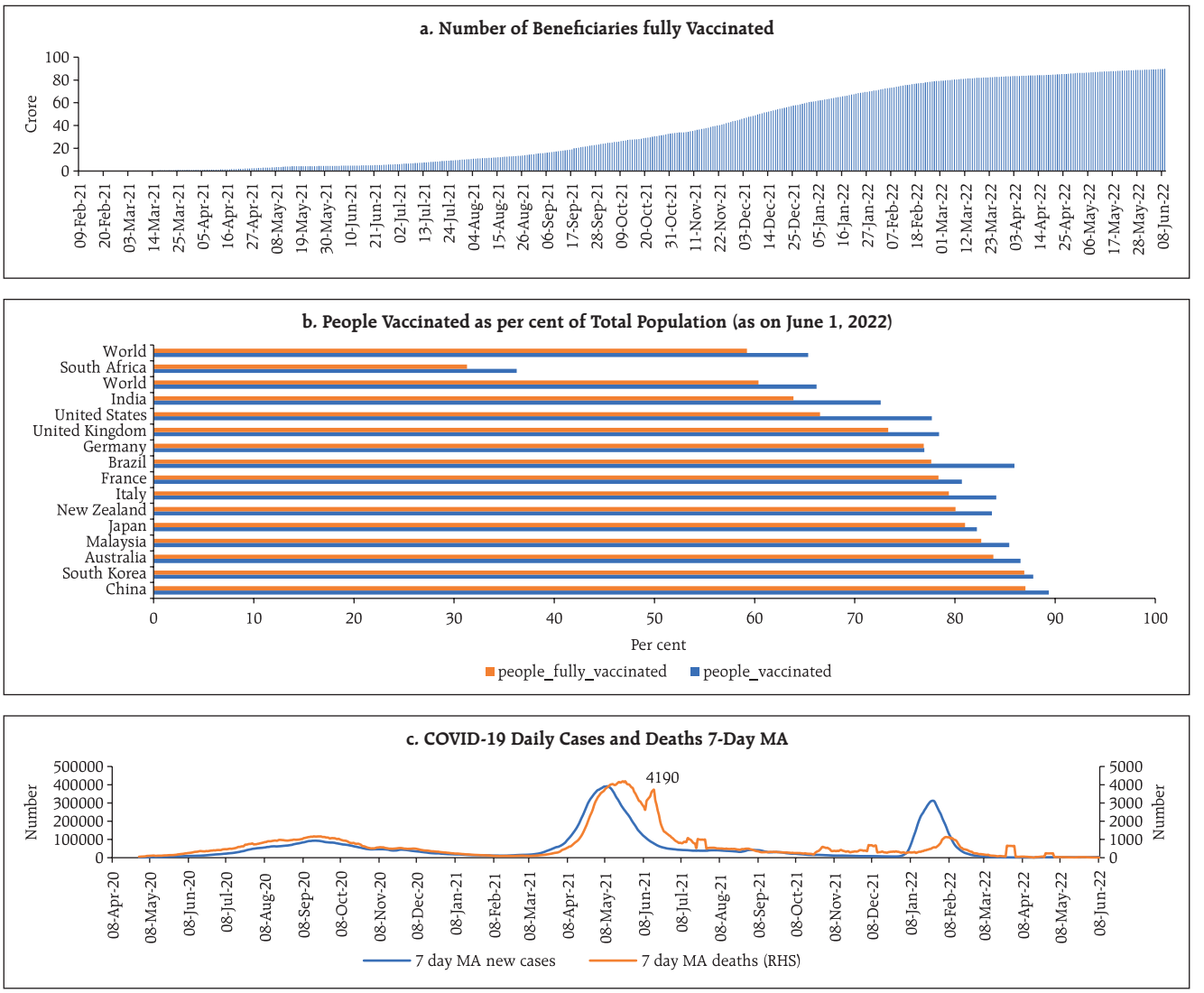
III. Domestic Developments

Domestic macroeconomic conditions strengthened further in May 2022 in spite of headwinds from adverse global developments. Although COVID-19 infections are rising again in some parts of the country, the proactive and aggressive vaccination drive has played a critical role in reducing hospitalisation. Total vaccination doses crossed 194 crore as on June 9, 2022 (Chart 9a). Over 87 per cent of the adult population (83 crore) and more than 4.6 crore children in the 15-18 year age group are fully vaccinated, while 3.4 crore children in the 12-14-year age group have been inoculated with the first dose and 1.8 crore children have taken the second dose. The pace of inoculation in India is comparable with the rest of the world, with the total per cent of the population that is vaccinated being above global average (Chart 9b). Daily infections increased to 7,584 as on June 9, 2022 from 1,829 as on May 17, 2022 while the daily positivity rate edged up to 2.26 per cent from 0.42 per cent during the same period (Chart 9c).

The overall pick-up in economic activity is also evident from the trends in mobility, with the google mobility index normalising above baseline pre-pandemic levels for most activities in June (till June 9). While mobility around grocery, pharmacy and parks were 50 per cent above the baseline, mobility around residential units remained higher than the baseline metric, reflecting work-from-home/ hybrid models of work. (Chart 10).

With the opening of contact-intensive services sector outlets, electricity demand increased strongly in recent months. With increased cooling demand amidst early onset of summer, rising temperatures and heat wave conditions continuing to prevail in several parts of the country, power demand also recorded a further increase in May 2022. This has put pressure on electricity distribution companies (DISCOMs), leading

Chart 9: COVID-19 Daily Cases and Vaccinations

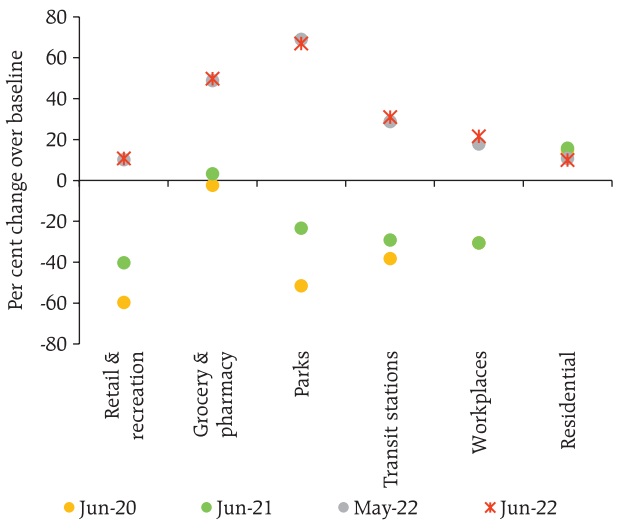


Source: Ministry of Health and Family Welfare (MoH&FW), Our World in Data.

to an increase in daily peak shortages during the first week of May (Chart 11a). Since then, however, the situation has stabilized, owing to a strong increase in generation surpassing its pre-pandemic level and the levels recorded a month ago (Chart 11b).

The level of coal stocks at power plants remains low for 96 thermal power plants (as of June 8, 2022). The risk of coal shortages for thermal power companies, however, remains as low stocks coincide with low production due to seasonal factors (Chart 11c). To ease off the domestic supply pressure, the Government has mandated minimum blending of imported coal to the extent of 10 per cent. In terms of availability, preferential access on coal import after the recent interim agreement with Australia (a major coal exporter) is expected to help India in meeting its growing energy needs. As global coal prices are higher than the Coal India Limited notified prices, increasing

Chart 10: Mobility Changes



Sources: Google; IHS Markit, MOSPI, CEIC.

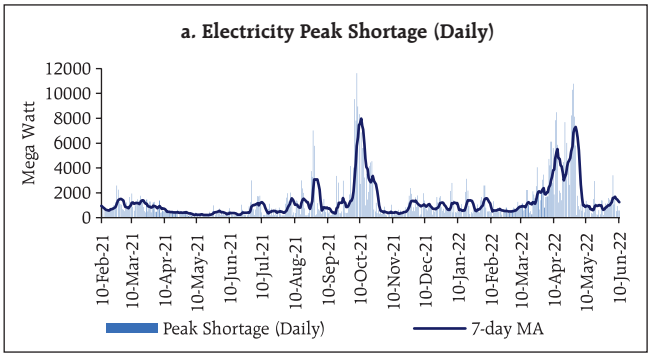
imports of coal to meet the blending requirement by power generation companies may further add to the cost of energy generation.

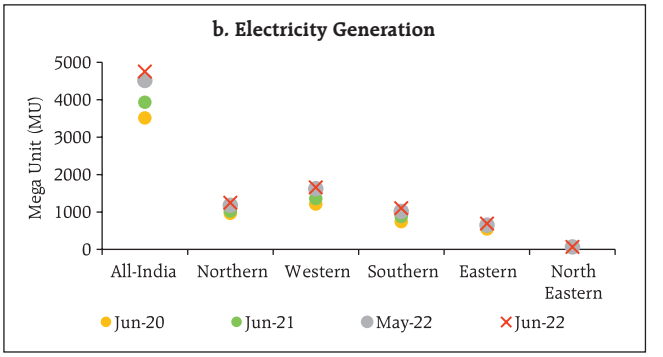
Aggregate Demand

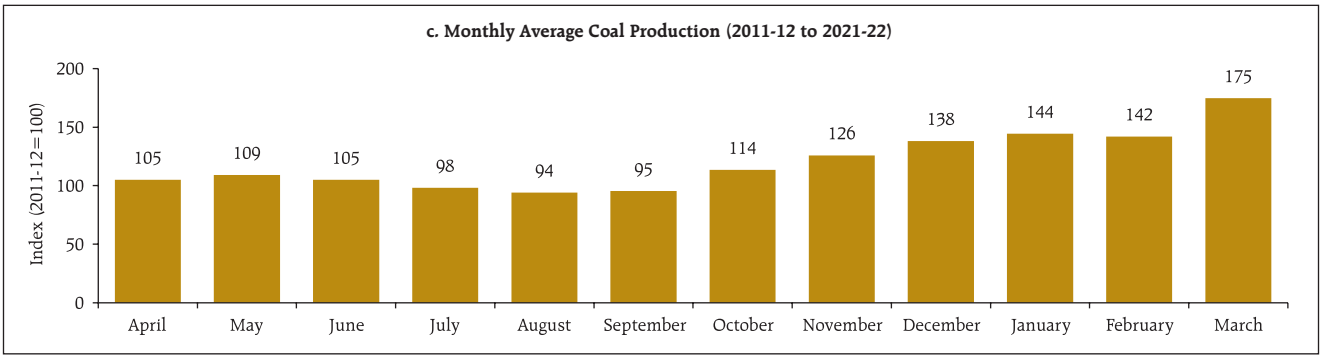
As per the provisional estimates (PE) of annual national income released by the National Statistical Office (NSO) on May 31, the Indian economy recorded a growth of 8.7 per cent in 2021-22, a downward revision of 20 basis points from the second advance estimates (SAE). A growth rate of 4.1 per cent was clocked in Q4:2021-22, weathering headwinds from the Omicron wave in January 2022 and the ongoing conflict in Europe (Chart 12). Private consumption moderated in Q4:2021-22 owing to the third wave of the pandemic restraining contact-intensive activities, coupled with higher inflationary pressures. With construction activity gaining traction, fixed investment growth surged to 5.1 per cent in Q4:2021-22. Both exports and imports maintained a steady momentum to register double-digit growth in Q4:2021-22.

E-way bills generation in May 2022 was the third highest recorded since the series began in

Chart 11: Peak Shortage, Electricity Generation, and Coal Production

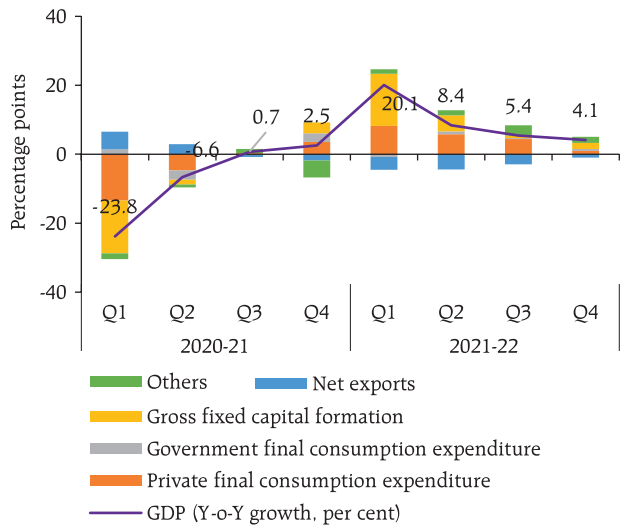






Note: Coal Production (sub-index of Eight Core Industries) is taken as a monthly average from 2011-12 to 2021-22
Source: Power System Operation Corporation Limited; Office of Economic Advisor; Author's own calculations

Chart 12: Weighted Contribution to GDP Growth



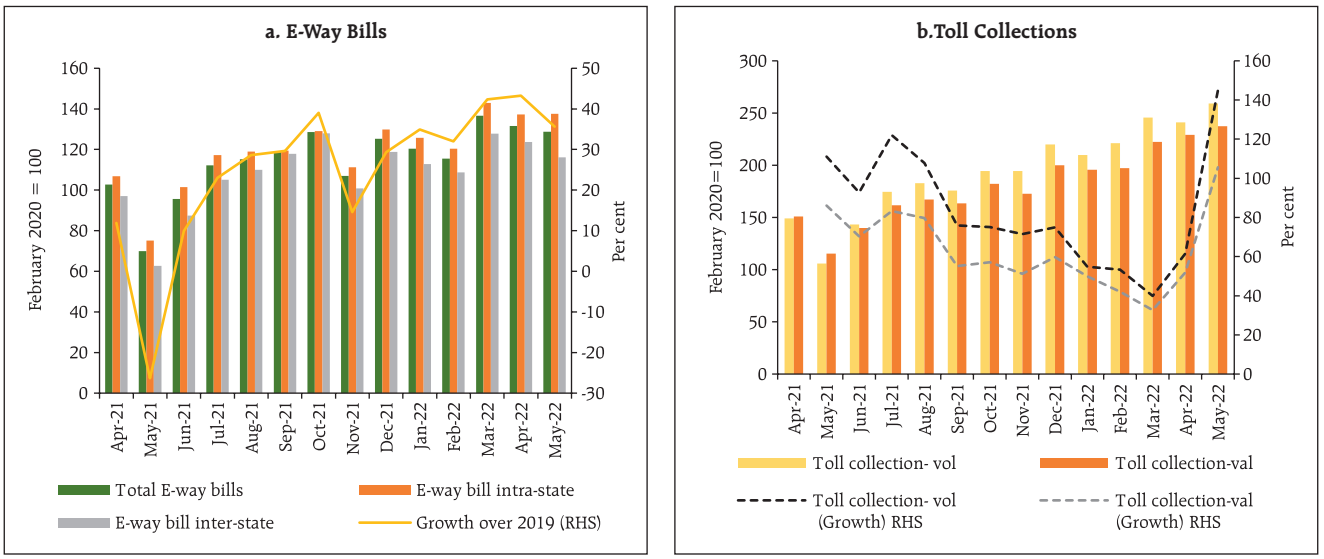
Note: Others include change in stocks, valuables and statistical discrepancies.
Source: NSO.

April 2018 with a y-o-y increase of 84.1 per cent. There was a marginal decline in inter-state trade even as intra-state trading improved (Chart 13a). Toll collections also increased in value and volume terms y-o-y as well as on a sequential basis, indicating a sustained momentum in trade and transport activity (Chart 13b).

Fuel consumption increased on the back of a surge in summer travel and the start of the harvesting season, aided by cut in excise duties on petrol and diesel. While petrol and diesel consumption remained above pre-pandemic levels for the third and fourth consecutive month, respectively, consumption of aviation turbine fuel (ATF) recovered to about 90 per cent of pre-pandemic levels (Chart 14a). Taking into consideration, additional aviation indicators of domestic and international passenger and cargo freight, the aviation sector is expected to have near normalised.

The automobile industry also recorded recovery in May 2022, with sales increasing y-o-y on a low base of lockdown marred activity in May last year. Sales were driven by marriage season demand and a pick-up in rural demand on the back of expectations of a normal monsoon. All segments recorded positive year-on-year growth, with passenger vehicles continuing to rise over pre-pandemic levels and sales of two-wheelers near normalised at 97 per cent of pre-pandemic sales. Three wheelers, continued to lag *albeit* with sequential recovery in sales (Chart 14d). Recovery in sales of two-wheelers and motorcycles came on the back of easing supply disruptions and offices and educational

Chart 13: E-way Bills and Toll Collections

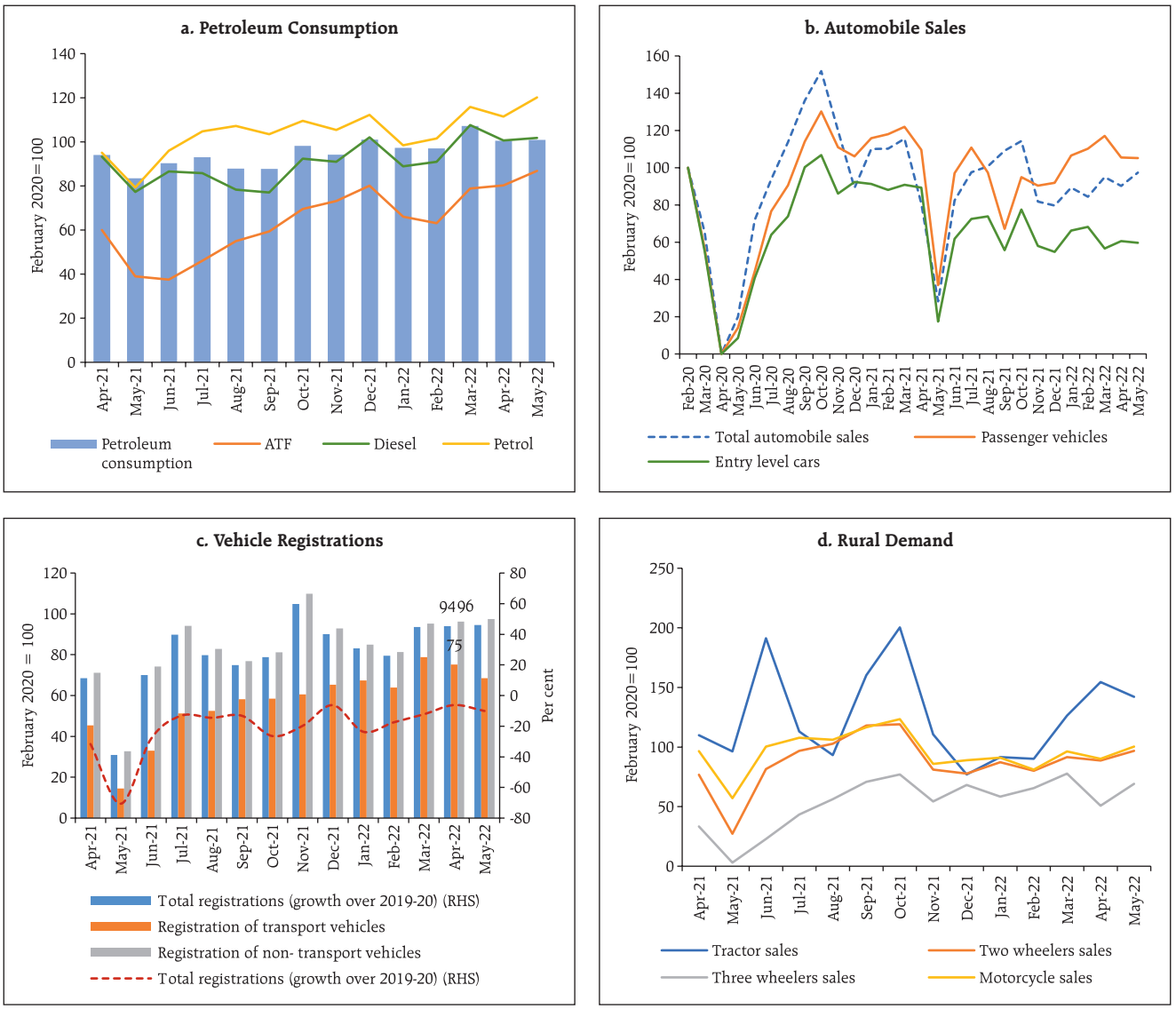


Sources: GSTN; Reserve Bank of India; and Authors' own calculations.

institutions shifting back to physical presence. Retail sales of automobiles also inched up, led by increase in registration of transport vehicles. Over pre-pandemic level, however, registrations continued to record contraction (Chart 14c).

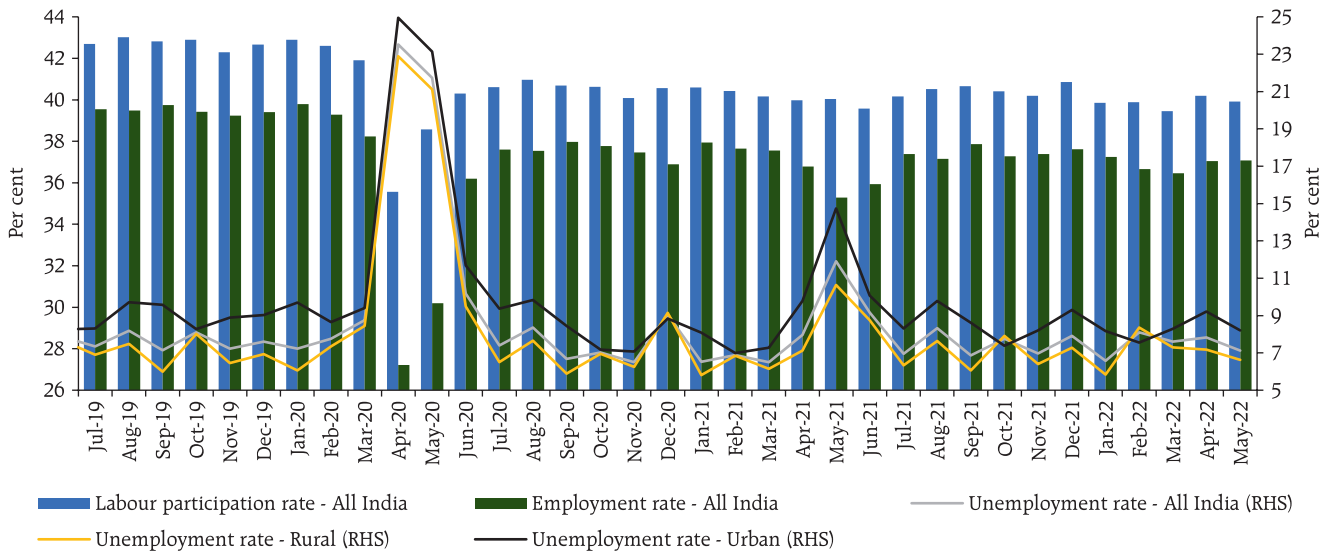
The entry level car segment (micro and mini cars in the range of under 3600 mm) underperformed other segments, with its share in total sales falling to 17 per cent in May from the long run average of 20 per cent. Price sensitive consumers delayed purchases as regulations on safety and emissions, coupled with inflationary pressures, increased prices (Chart 14b). Rural demand picked up as the forecast of a normal monsoons buoyed sentiments which was reflected in an increase in domestic sales of two wheelers, motorcycles and tractors (Chart 14d).

Chart 14: Transport Sector Indicators



Sources: SIAM; and TMA; and Authors' own calculations.

Chart 15: Employment, Unemployment and Labour Participation Rates



Source: CMIE.

The FMCG industry registered a sequential decline in demand in May 2022 from both urban and rural pockets as consumers tempered purchases in the face of rising prices. Sales of smaller packs substituted larger packs, indicating that price hikes were having an adverse impact on consumption.

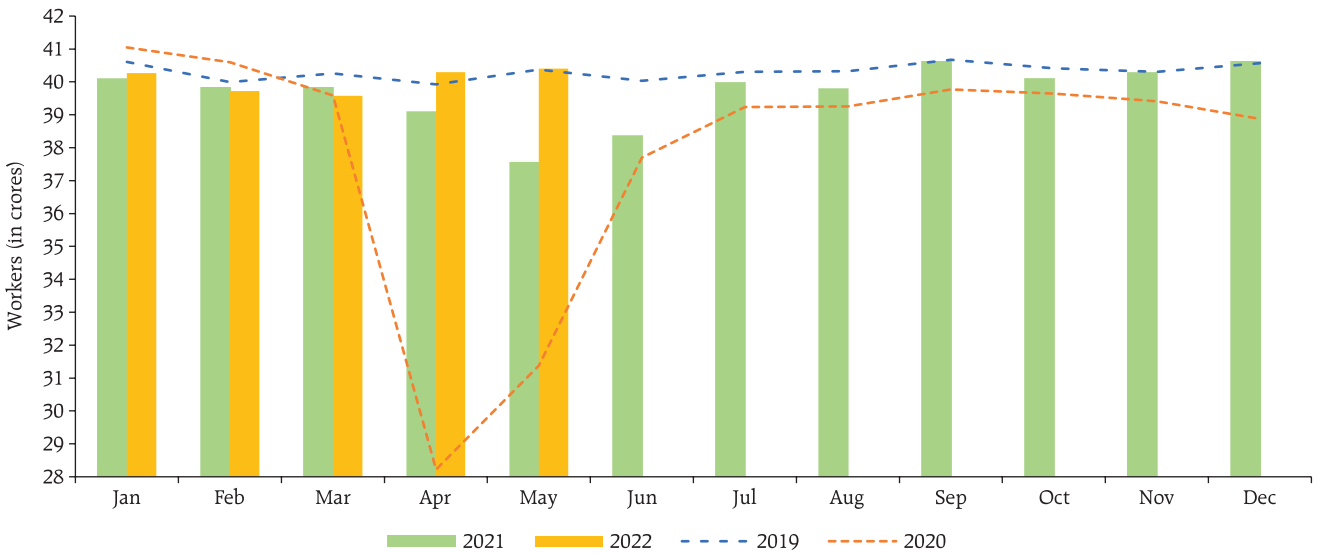
As per the household survey of the Centre for Monitoring Indian Economy (CMIE), the labour participation rate fell marginally to 39.9 per cent in May 2022 from 40.2 per cent last month. The employment rate, however, maintained its level from a month ago, registering a value of 37.1 per cent in May. This led to a fall in the labour market slack, as indicated by the decrease in the unemployment rate from 7.8 per cent in April to 7.1 per cent in May (Chart 15).

The CMIE's employment statistics shows that the total number of employed workers increased over both last month and y-o-y by 1.0 million and 28.3 million respectively, in May 2022. Over its pre-pandemic level in May 2019, they increased by 0.3 million (Chart 16). This indicates continued strengthening of the labour market, despite the turbulence caused by the ongoing supply chain disruptions.

The PMI, which is a survey-based indicator, shows that the employment conditions in the manufacturing and services sector diverged in May 2022. While the employment sub-index for the manufacturing sector expanded from 50.5 in April to 51.0 in May, the services sector shows a reversion to contraction, *albeit* marginally, at 49.8 in May from 50.8 a month ago (Chart 17).

Net subscriber addition data for the Employees' Provident Fund Organisation (EPFO), the Employees' State Insurance Corporation (ESIC) and the National Pension System (NPS) was released for March 2022. Under the EPFO, the average monthly net subscriber additions increased from 6.5 lakh in 2019-20 to 10.2 lakh in 2021-22 while under the ESIC, it turned around from a contraction of 4.2 lakh subscribers to an addition of 2.0 lakh subscribers. Average monthly

Chart 16: Number of Workers in Employment and LFPR



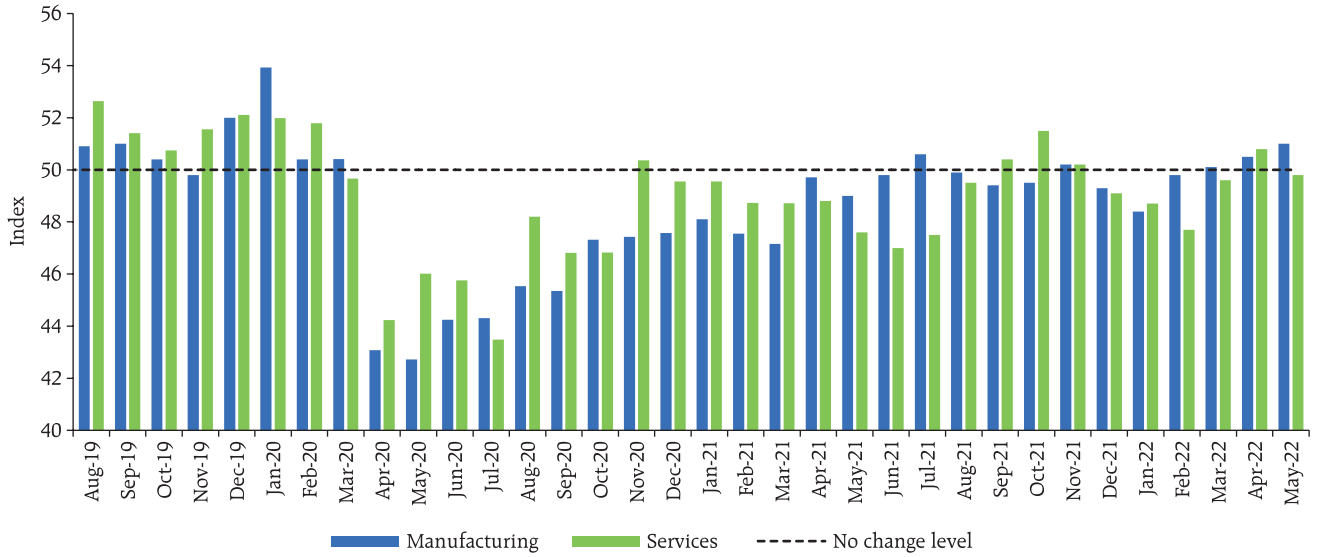
Source: CMIE.

subscribers under the NPS increased from 61,095 in 2019-20 to 64,700 in 2021-22 (Chart 18).

India's merchandise exports grew by 20.6 per cent in May 2022, a moderation over the previous month (Chart 19). Exports have stayed above US$ 30 billion over the past 15 months.

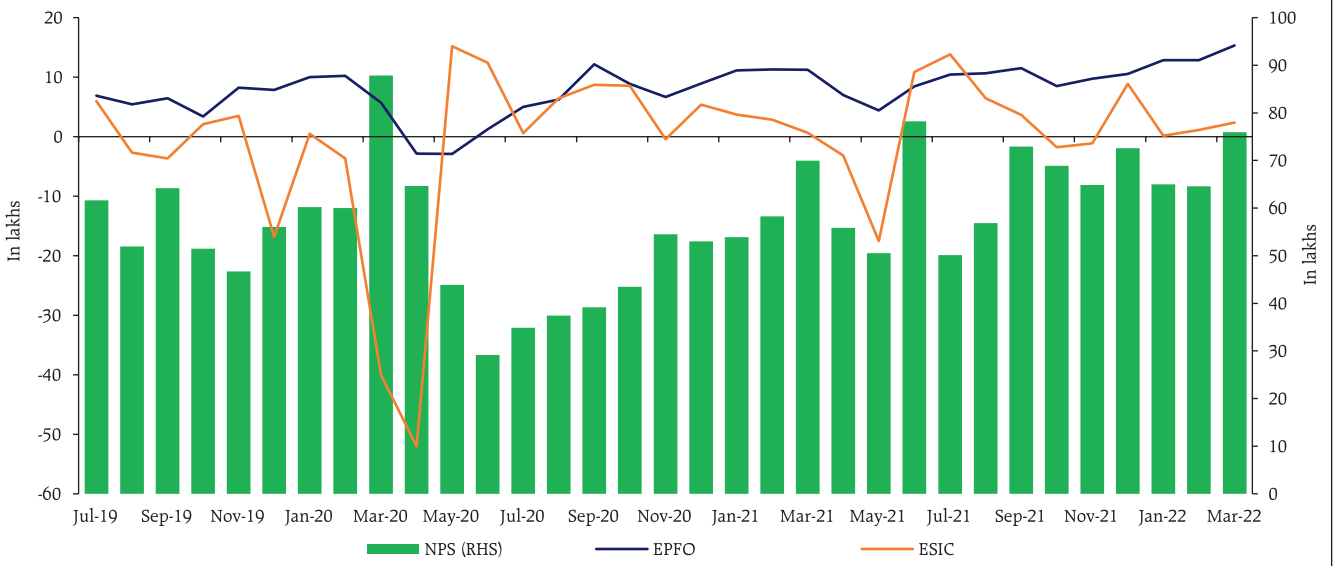
The moderation in trade momentum reflects rising uncertainty due to the escalation of the Russia-Ukraine war and aggravating supply chain disruptions. While global trade flows in manufacturing deteriorated, with new export orders dropping, down for the third straight month, India

Chart 17: PMI Employment Indices



Source: IHS Markit.

Chart 18: Net Subscriber Additions under EPFO, ESIC and NPS



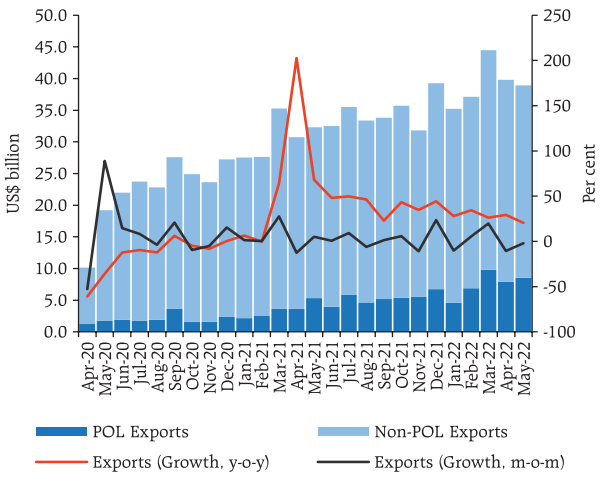
Source: Ministry of Statistics & Programme Implementation; Ministry of Labour and Employment.

registered robust growth in May 2022 for new manufacturing export orders (Chart 20).

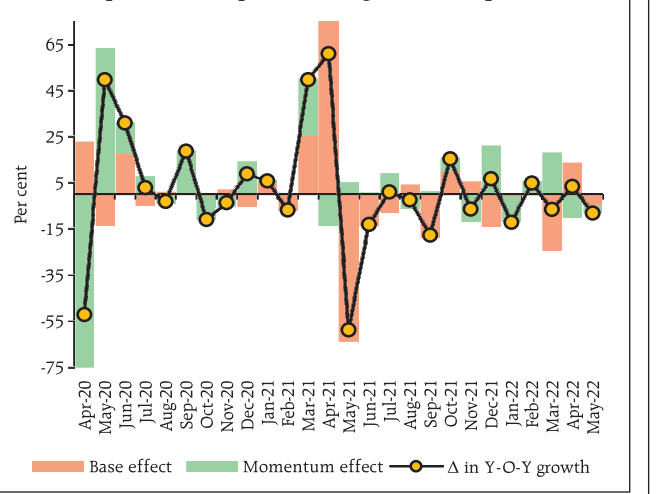
Export growth was broad-based, as 8 out of 10 major commodity groups accounting for more than 75 per cent of exports grew on a y-o-y basis in May 2022. The improvement in export performance stemmed from the higher value of shipments of petroleum products, engineering goods and electronic goods (Chart 21a). Around half of export growth in May 2022 was on account of petroleum products (Chart 21b). Merchandise exports recorded contraction, however, on a sequential basis across all major exporting segments. Engineering goods export growth moderated to 12.7 per cent (y-o-y) in May 2022. In

Chart 19: India's Merchandise Exports – May 2022

a. Trend in India's Merchandise Exports

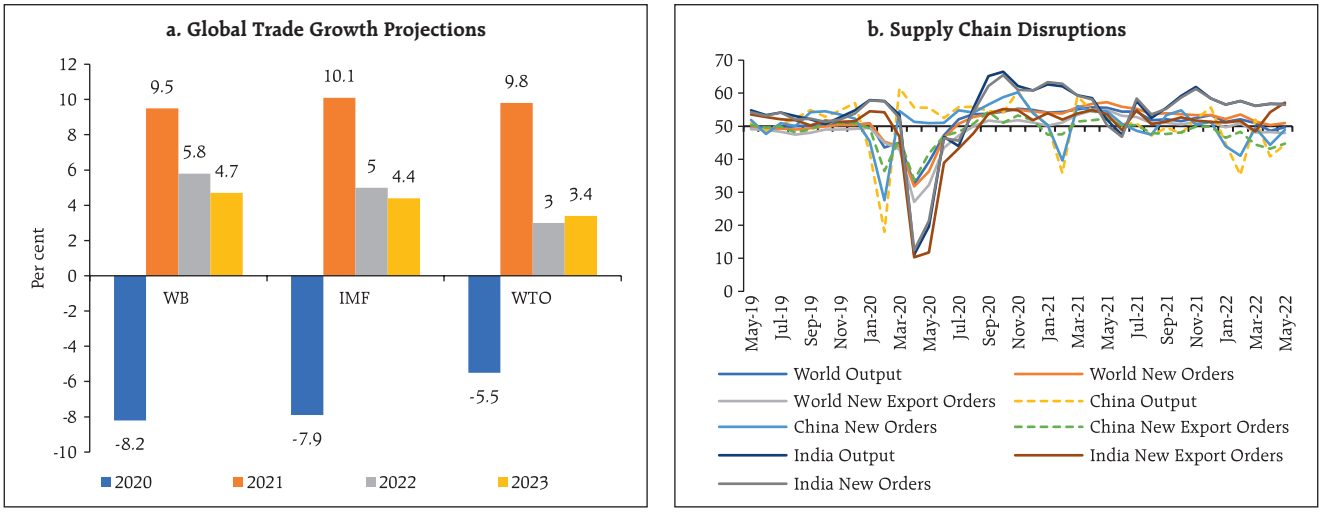


b. Decomposition of Sequential Change in Y-o-Y Export Growth



Note: Analysis based on Preliminary data.
Sources: PIB; DGCI&S; and Authors' own calculations.

Chart 20: Slowing Global Trade Growth and Supply Chain Disruptions



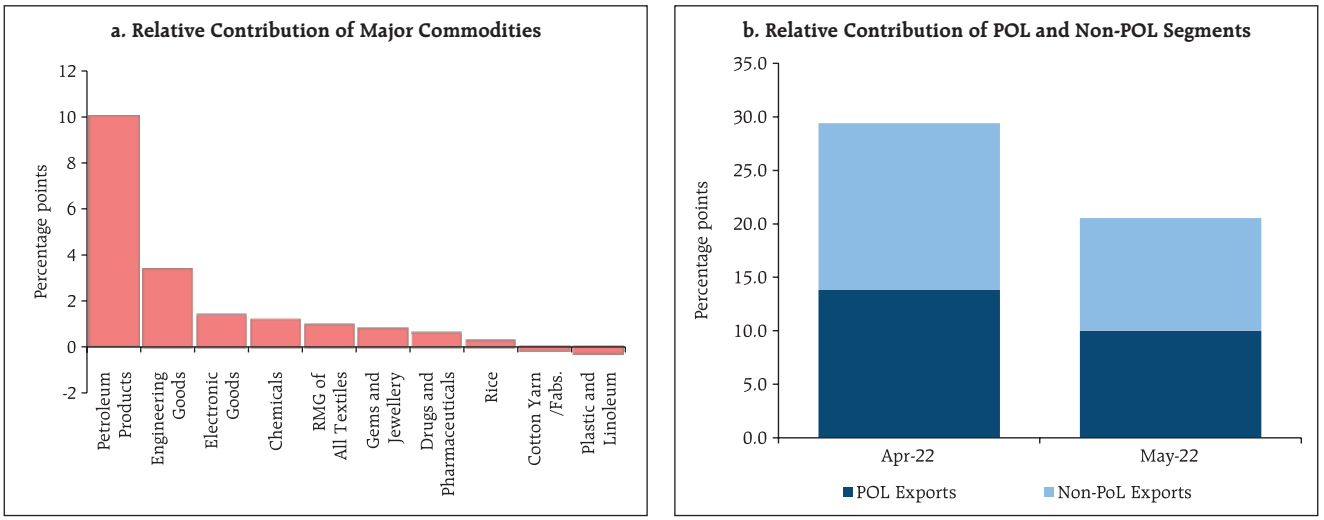
Note: (i) WB provides projections for world trade volume of goods and nonfactor services.
(ii) IMF projects world trade in goods and services and WTO's projection is for merchandise trade.
Source: World Bank; IMF; WTO and S&P Global.

volume terms, wheat exports, which grew by 235.7 per cent on y-o-y basis in 2021-22, are expected to fall as the Government of India temporarily restricted wheat exports to ensure domestic food security and to control rising price pressure locally.

Merchandise imports at US$ 63.2 billion remained above US$ 60 billion mark for the third consecutive month, reflecting strong domestic demand as well as the impact of higher commodity prices. Imports registered a robust growth of 62.8 per cent on y-o-y basis and witnessed sequential growth of 5.0 per cent (Chart 22).

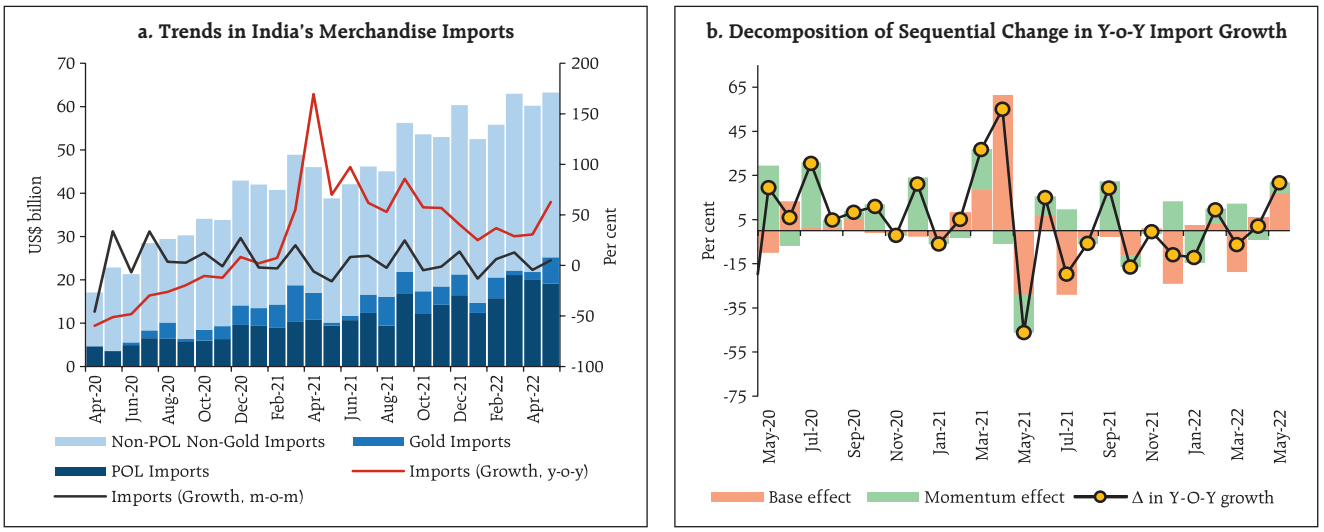
Import growth remained broad-based as all 10 major commodity groups accounting for more than 80

Chart 21: India's Merchandise Exports – Relative Contribution to Export Growth (May 2022 over May 2021)



Sources: PIB; DGCI&S; and Authors' own calculations.

Chart 22: India's Merchandise Imports and Drivers of Growth– May 2022

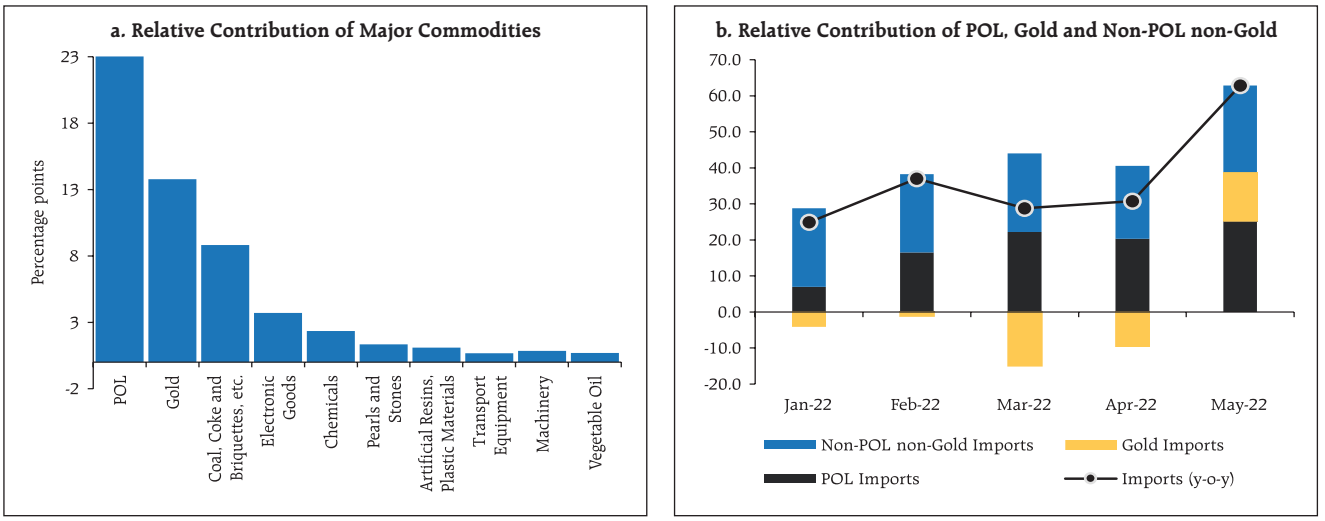


Note: Analysis based on Preliminary data.
Sources: PIB; DGCI&S; and Authors' own calculations.

per cent of imports witnessed expansion on y-o-y basis in May 2022 (Chart 23a). Petroleum products remained the leading driver of import growth, followed by gold which contributed positively for the first time in 2022 (Chart 23b).

International oil prices reacted sharply to geopolitical developments and the Covid trajectory in China. Drawdowns in US fuel stockpiles and expectations of tighter sanctions on Russia pushed prices upwards. Oil prices fell by about US$ 7 per

Chart 23: India's Merchandise Imports – Relative Contribution to Import Growth (May 2022 over May 2021)

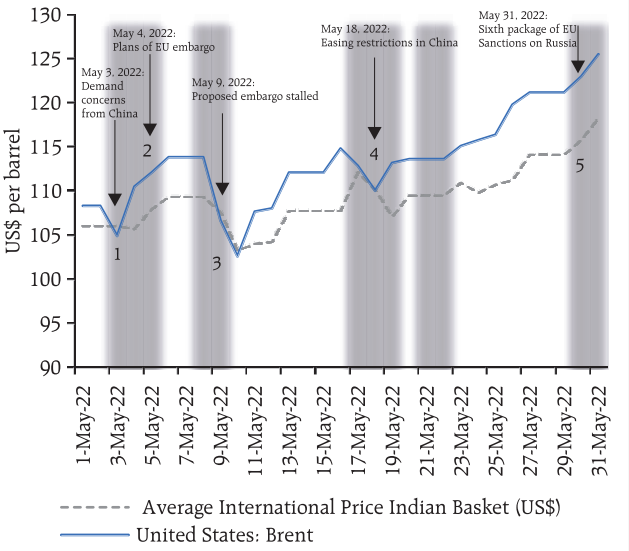


Sources: PIB; DGCI&S; and Authors' own calculations.

barrel after failure of the EU to announce an embargo on Russian oil in the second week of May.[2] Towards the second half of May 2022, easing restrictions in China and the official EU embargo completely banning seaborne crude oil exports of Russia[3] further provided momentum to the benchmark index Brent which reached US$ 125.53 on May 31, 2022 (Chart 24).

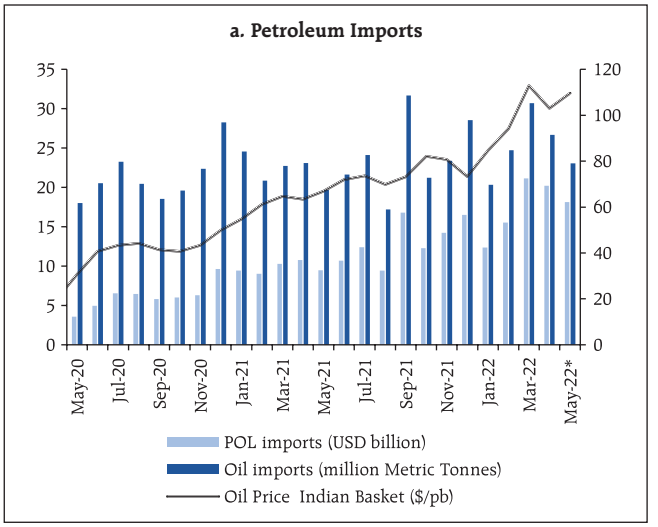
With 63.6 per cent rise in price of Indian basket of crude oil (at US$ 109.5/bbl), India's oil imports at US$ 19.2 billion grew by 102.7 per cent in value terms and 23.9 per cent in volume terms on y-o-y basis (Chart 25a). Oil supply may improve in the coming months following the OPEC+ announcement on June 2, 2022, to raise output by 648,000 barrels per day in July and August, most of which is anticipated to be supplied by Saudi Arabia and UAE owing to capacity constraints faced by other members.[4] Gold imports surged to a 9-month high at US$ 5.8 billion (Chart 25b). Sharp rise in gold imports were driven by volume as gold prices largely remained range bound.[5]

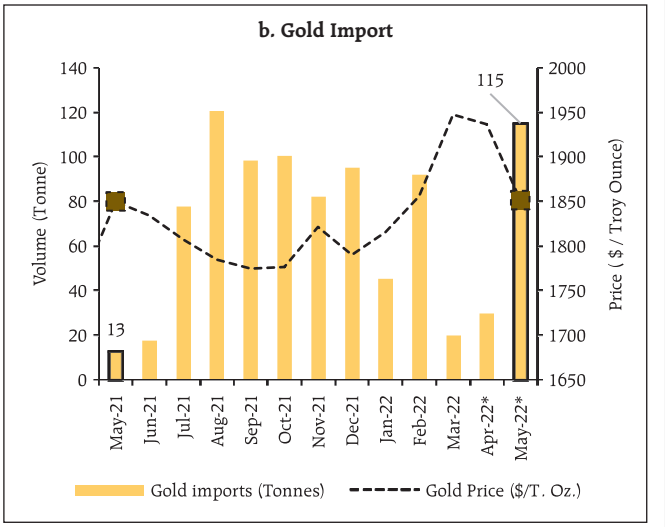
Chart 24: Oil Prices and Key Developments



Source: CEIC and News Reports.

Chart 25: India's Oil and Gold Imports





*: Estimated.
Sources: PIB; DGCI&S; and Authors' own calculations.

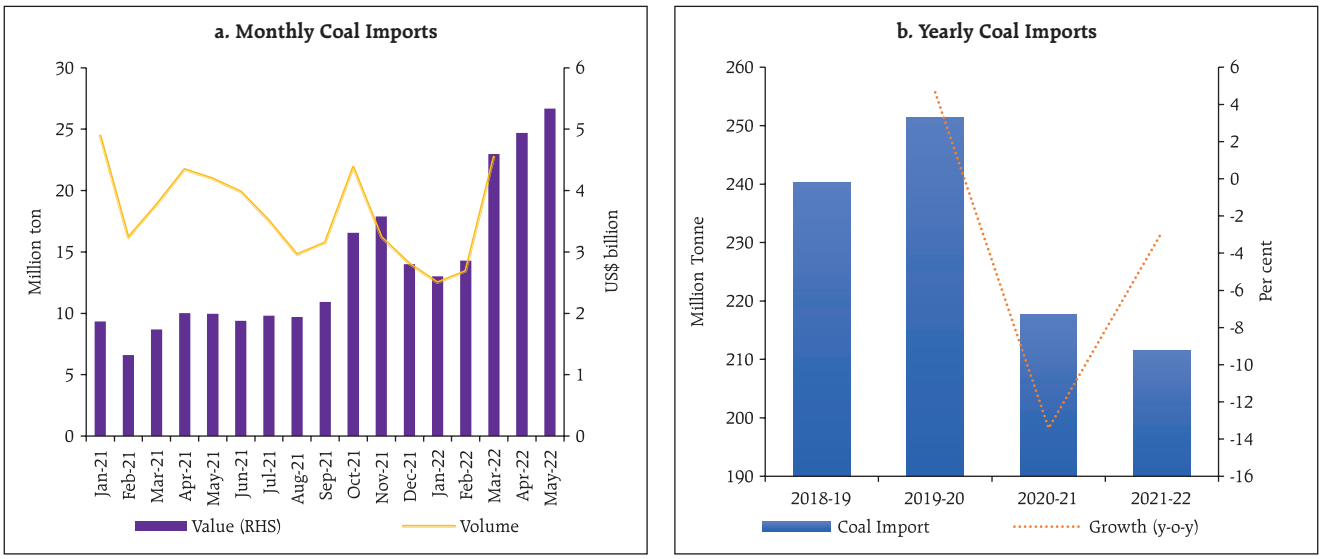
[2] https://www.bloomberg.com/news/articles/2022-05-09/eu-drops-plan-to-stop-tankers-moving-russian-oil-to-other-buyers

[3] EU Sanctions against Russia following the invasion of Ukraine: https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world/eu-solidarity-ukraine/eu-sanctions-against-russia-following-invasion-ukraine_en#energy-sector

[4] https://www.ft.com/content/bb130bb9-4b75-4626-961a-2c1ed9b0e7f9

[5] Gold imports in volume terms are estimated to have crossed 100 tonnes in May 2022.

Chart 26: India's Coal Imports



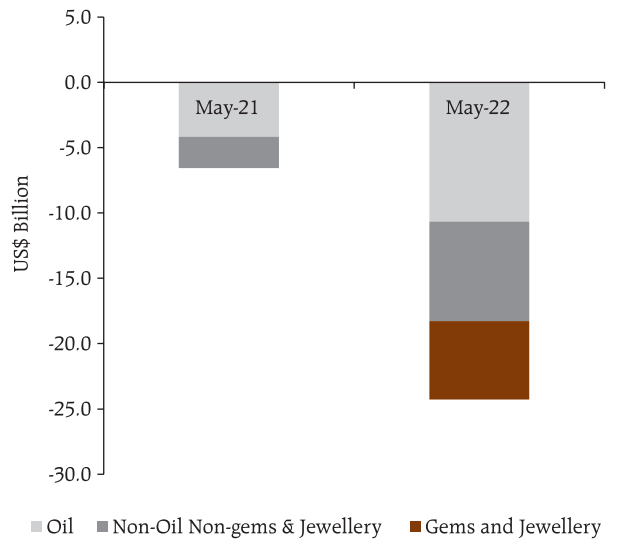
Sources: PIB; DGCI&S; and Authors' own calculations.

Rising domestic demand following easing of COVID-19 restrictions, revival of contact intensive activities as well as higher inflation were the factors driving gold imports.

India's coal, coke and briquettes imports at US$ 5.4 billion reached another historical high in May 2022, growing by 172.1 per cent on a y-o-y basis (Chart 26a). However, annual imports of coal have fallen for the second consecutive year and recorded contraction of 2.9 per cent on a y-o-y basis (Chart 26b). International coal prices have risen to record high levels. The Australian coal price rose to US$ 385.7/mt in May 2022, increasing by 288.6 per cent and 27.1 per cent on a y-o-y and m-o-m basis, respectively. Import of vegetable oil has decelerated in May 2022. In order to augment domestic supply to reign in price pressures, the Government has allowed 20 lakh metric tonnes (LMT) of duty and cess free import of crude soyabean/sunflower oil for 2022-23 and 2023-24. The government also revised downwards the base import prices of crude and refined palm oil.

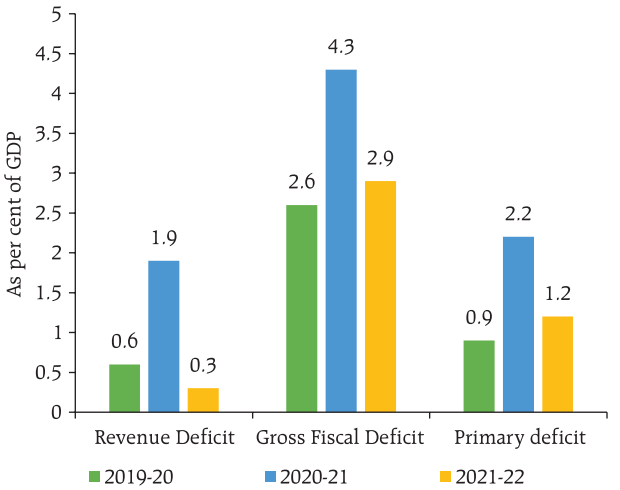
India's trade deficit at US$ 24.3 billion increased to its highest monthly level in May 2022. Around 70 per cent of the increase in the trade deficit was on account of petroleum and its products; and gems and jewellery (Chart 27).

Chart 27: Decomposition of India's Trade Balance



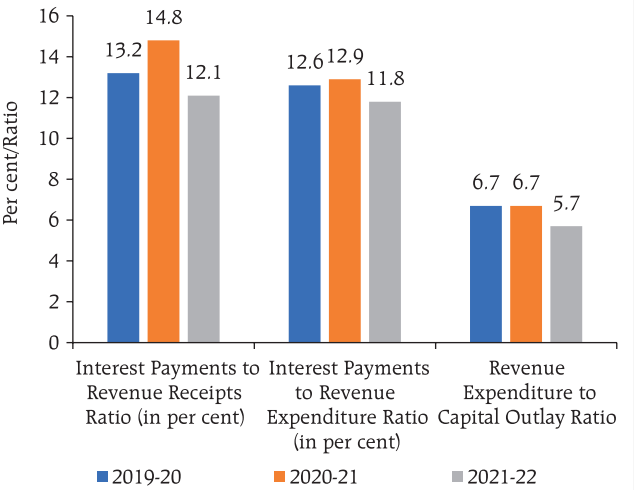
Source: DGCIS.

Chart 28: Trend in Key Deficit Indicators of the States/UTs



Source: Budget documents of the states; Comptroller and Auditor General of India; and RBI.

Chart 29: Trend in Key Fiscal Performance Indicators of the States/UTs



Source: Budget documents of the states; Comptroller and Auditor General of India; and RBI.

The consolidated gross fiscal deficit of states/UTs declined sharply to around 2.9 per cent of GDP[6] in 2021-22 from 4.3 per cent a year ago[7] (even lower than the budgeted ratio of 3.7 per cent for 2021-22) (Chart 28). This sharp decline was driven by higher revenue receipts, led by tax and non-tax revenue, coupled with a reduction in revenue expenditure. At the same time, capital outlay has remained strong, supporting the economic recovery. Various fiscal performance indicators such as interest payment to revenue receipts, interest payment to revenue expenditure and revenue expenditure to capital outlay have improved in 2021-22 *vis-à-vis* 2020-21 (Chart 29).

Aggregate Supply

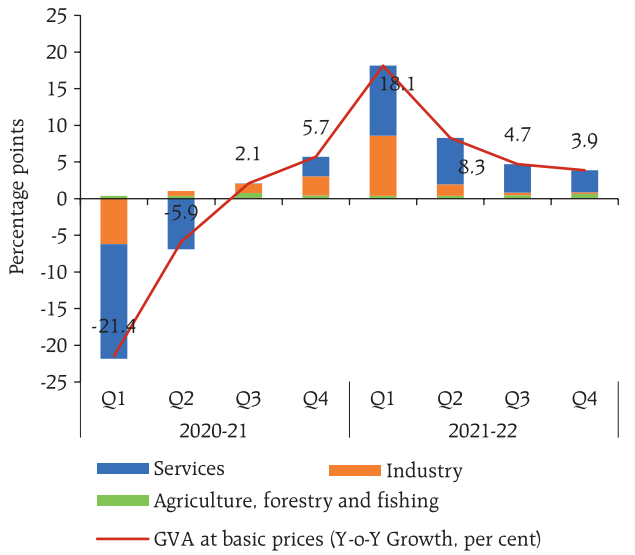
On the supply side, aggregate supply, as measured by gross value added (GVA) at basic prices, increased by 8.1 per cent in 2021-22, as against a contraction of 4.8 per cent a year ago. Apart from the agriculture sector exhibiting resilience, a sustained revival in the industry and the services sectors facilitated this acceleration. GVA of all the sectors, barring trade, hotels, transport, communication and services related to broadcasting, have surpassed their respective pre-pandemic levels in 2021-22.

Real GVA growth stood at 3.9 per cent in Q4:2021-22, on the back of resilience of agriculture and recovery in the services sector, while the industrial sector exhibited moderation (Chart 30). Manufacturing registered a marginal contraction owing to pressures emanating from higher input costs and supply side disruptions. Within the services sector, there was a broad-based resurgence with the third wave receding.

[6] The data for 2021-22 has been compiled by combining the latest available accounts (A) data for 23 states from the Comptroller and Auditor General (CAG) of India and Budget Estimates (BE) for remaining eight states/UTs for 2021-22 (based on the states/UTs' budget 2021-22).

[7] The data for 2020-21 has been compiled by combining the accounts data from states' budget 2022-23 for 23 states, latest available accounts data from CAG for 5 states and Revised Estimates (RE) from the states/UTs' budget 2021-22 for remaining 3 states/UTs.

Chart 30: Weighted Contribution to GVA Growth



Source: NSO.

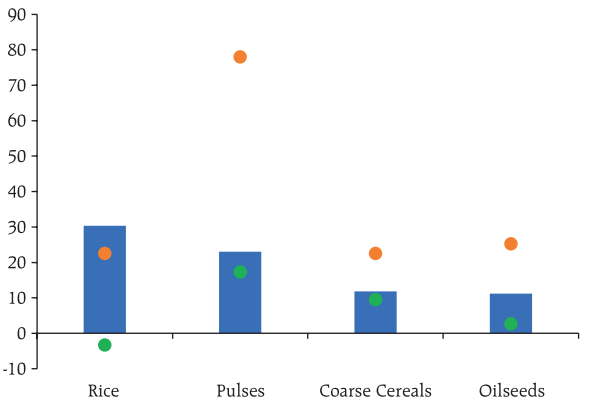
The early onset of Southwest Monsoon (SWM) on the Indian mainland 3 days ahead of the scheduled date and the forecast of normal monsoon rainfall by the India Meteorological Department (IMD) has raised prospects for the forthcoming *Kharif* season. The progress of the monsoon has however, become slow, with activity weakening over the Arabian Sea, as on June 10, 2022, although it has covered most of Karnataka and Tamil Nadu.

Summer or *Zaid* crops sown between March and May have covered an area of 76.4 lakh hectares as on May 27, 2022. It is 5.1 per cent higher than a year ago attributable to substantial increase over the normal acreage under pulses (78.0 per cent higher than normal) (Chart 31a). The total live storage in 140 major reservoirs as on May 26, 2022, was higher at 32 per cent of the full reservoir level (FRL) as compared to 30 per cent of FRL during the previous year and the decadal average of 23 per cent of FRL (Chart 31b).

The third advance estimates (3rd AE) of agricultural production (released on May 20, 2022) placed the foodgrains production in 2021-22 at 314.5 million tonnes, touching a record level for the sixth consecutive year (higher by 1.2 per cent over the final estimates of 2020-21) [Chart 32]. Rice achieved record production for the sixth consecutive year. The estimate for wheat production has been revised downwards by 2.9 per cent to 106.4 million tonnes, mainly on account of yield loss due to persistent heat waves since March 2022. Maize marked a record

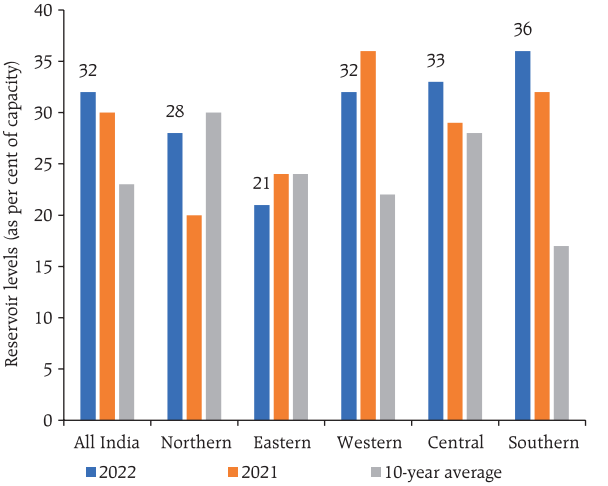
Chart 31: Progress of Summer Cropping Season

a. Area Coverage (as on May 27, 2022)



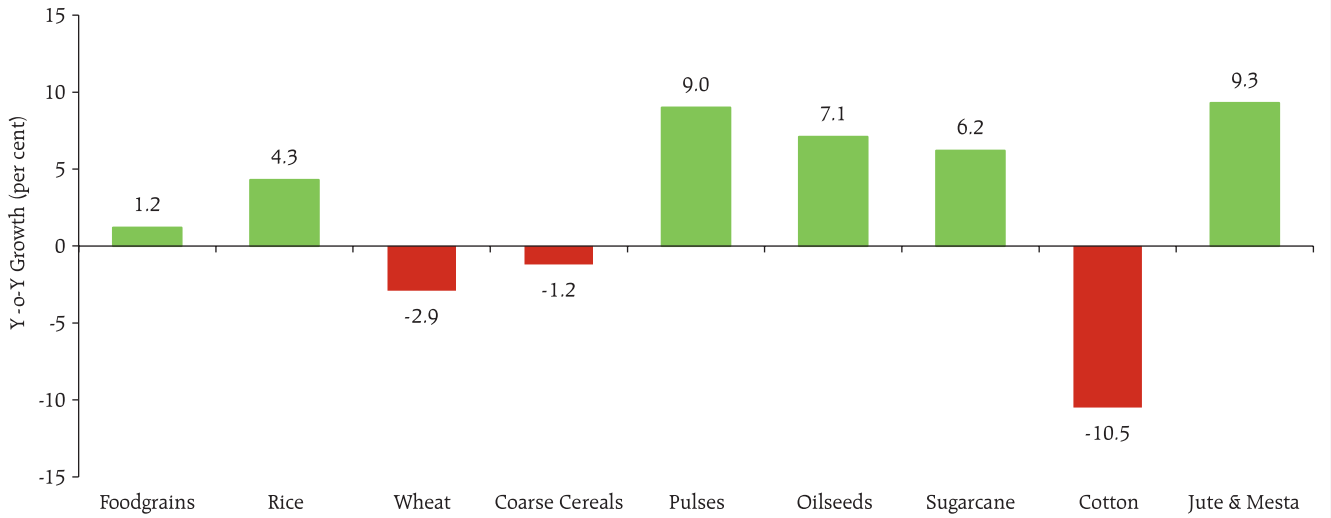
Normal refers to average of last five years.
Source: Ministry of Agriculture and Farmers Welfare.

b. Reservoir Position (as on May 26, 2022)



Source: Ministry of Jal Shakti.

Chart 32: Agricultural Production: Third Advance Estimates (3rd AE) for 2021-22

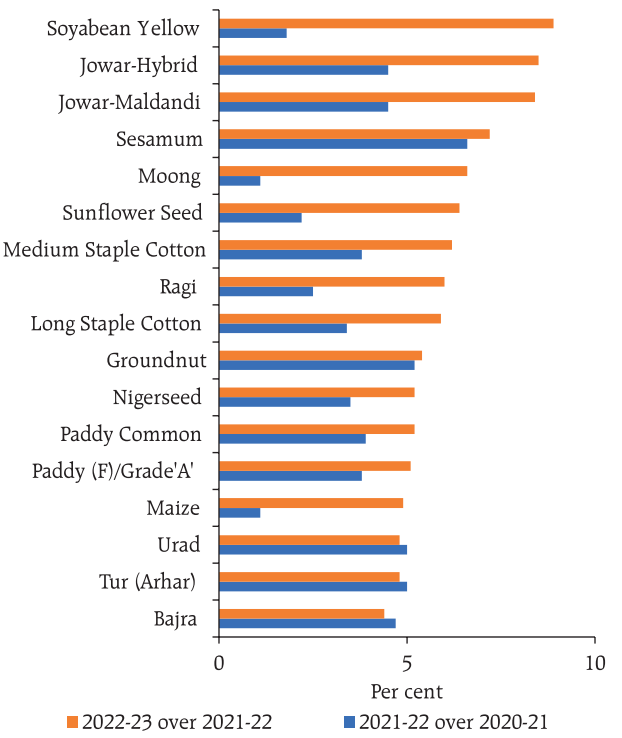


Foodgrains comprise of rice, wheat, coarse cereals, and pulses.
Source: Ministry of Agriculture and Farmers Welfare.

production of 33.2 million tonnes with y-o-y growth of 4.8 per cent over the previous year. With record production, total pulses are estimated 9.0 per cent higher than a year ago. Except production of moong which is lower by 7.8 per cent y-o-y, other major pulses remained higher than in the previous year, including a record production of gram (17.4 per cent over the previous year). Among the commercial crops, oilseeds (including rapeseed and mustard) and sugarcane recorded highest ever production, showing y-o-y growth of 7.1 per cent and 6.2 per cent, respectively. Cotton production was lower by 10.5 per cent than in the previous year.

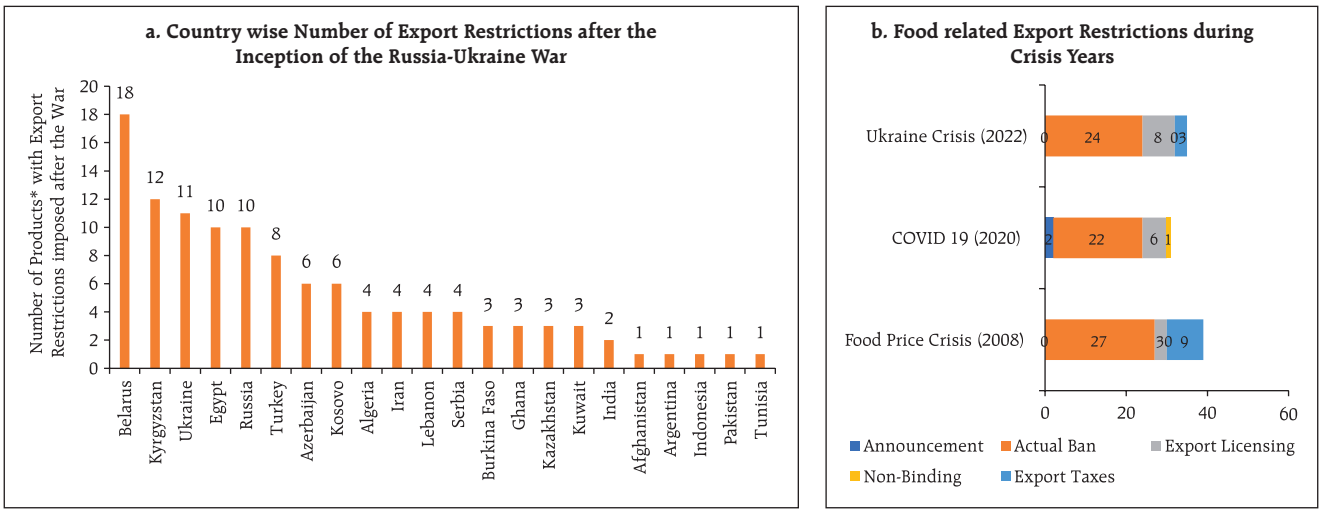
The Government of India announced the Minimum Support Price (MSP) for 14 major *kharif* crops for the marketing season of 2022-23 on June 8, 2022. MSPs have been revised upwards in the range of 4.4 – 8.9 per cent with an average of 6.1 per cent (Chart 33). The highest y-o-y growth of MSPs is seen in the case of soyabean (8.9 per cent), followed by jowar (8.5 per cent) and sesamum (7.2 per cent). On the other hand, the lowest growth is recorded in the case of *bajra* (4.4 per cent), followed by urad and maize. Except for *Urad*, *Tur* and *Bajra*, the magnitude of increase has been higher than in the previous year.

Chart 33: Change in MSP for *Kharif* crops



Source: Press Information Bureau, Authors' calculations.

Chart 34: Growing Food and Fertiliser Protectionism across the Globe

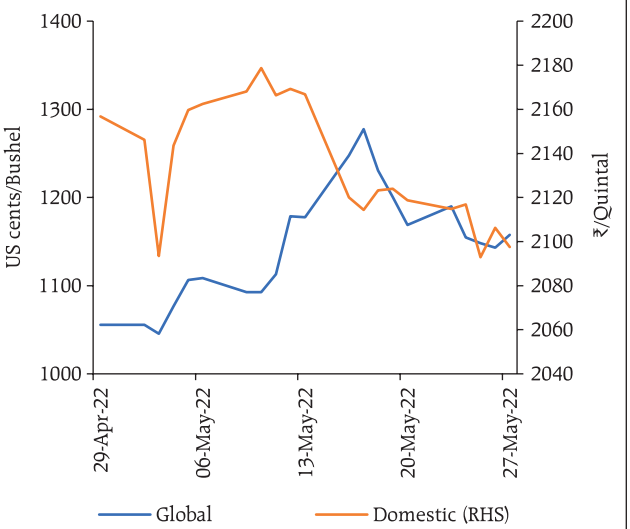


*: For some of the countries the classification is not available at the product level, so the broad categories (like cereals, fruits and vegetables) have been considered as individual products.
Source: International Food Policy Research Institute.

Recent developments in global agricultural markets have also raised fresh concerns over food security across the globe. Many countries have been using trade measures (including both export restrictions and licensing) to overcome shortages and curb price spikes (Chart 34a). The total number of restrictions imposed currently is almost at par with those during the outbreak of COVID-19 (2020) and the global food crisis (2008) [Chart 34b]. India imposed restrictions on the export of two commodities *viz.*, wheat and sugar. Following the imposition of these restrictions on May 13, 2022 global wheat prices firmed up temporarily but reverted to the pre-restriction level within a week. Domestic prices, however, continued to moderate post export restrictions (Chart 35). On the import front, the Government has allowed duty free import of 20 lakh tonnes each of crude soybean oil and crude sunflower oil annually for the current year as well as the next year (2023-24).

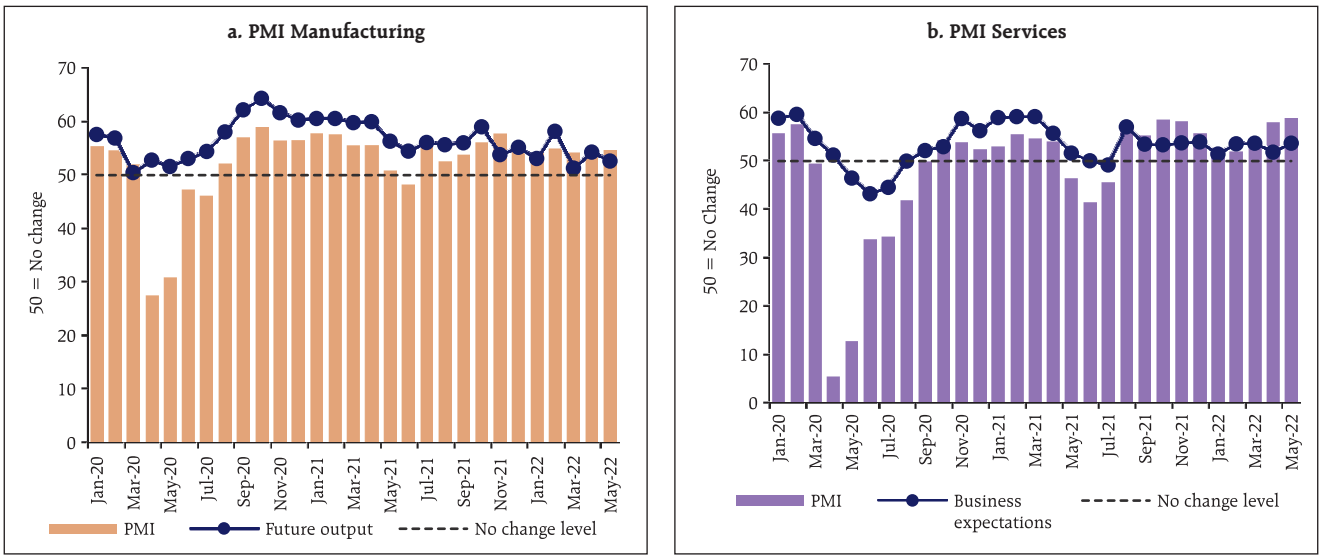
Apart from downward revision in wheat output, the supply of other crops (mainly mangoes and tomatoes) has also been significantly affected in terms of both quantity and quality. Procurement of rice was 2.7 per cent higher, whereas that of wheat was 55.3 per cent lower on a y-o-y basis (as on June 11, 2022). As of May 31, 2022 the stock of rice and wheat stood at 3.7 and 4.2 times the quarterly buffer norms. Therefore, recent policy measures, along with adequate buffer stocks, allay any food security concerns in India at the current juncture.

Chart 35: Wheat Price Movements – Domestic and Global



Source: Bloomberg and Centre for Monitoring Indian Economy (CMIE).

Chart 36: Purchasing Managers' Index



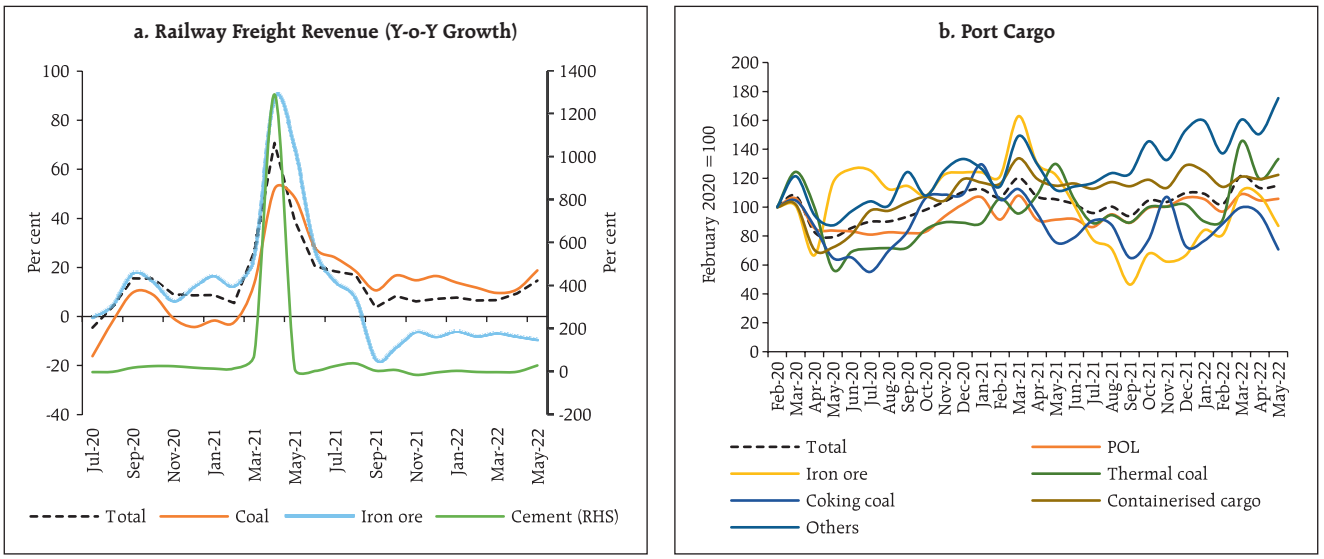
Source: IHS Markit.

In the industrial sector, the headline manufacturing PMI index maintained its improvement at 54.6 in May 2022 from 54.7 last month. While the expansion is led by an increase in factory orders and sales, increase in input cost pressures remains a point of concern, leading to a decline in business expectations from 53.4 in April to 52.6 in May. PMI services, on the other hand, further accelerated to 58.9 in May 2022 from 57.9 last month, marking a solid recovery in the services sector. With further strengthening in economic recovery amidst opening up of services sector outlets, the index was driven by fast increases in new business and output. The business expectations index (BEI) for services expanded for the tenth successive month in May 2022, but it remains below the long-run average due to large increases in input prices (Chart 36).

In the services sector, transport indicators recorded growth, with railways freight traffic increasing by 14.6 per cent (y-o-y) in May 2022 despite a high base last year (Chart 37a). An increase in freight was recorded in coal, cement, food grains, fertilisers and POL (Petroleum, oil and lubricants). Cargo at major ports recorded marginal improvement in May 2022 as compared to April 2022. On y-o-y basis, it showed a growth of 8.9 per cent in May 2022. The improvement was on account of increase in commodities of non-containerised cargo, POL, fertiliser and raw materials which together account for 46 per cent of total cargo (Chart 37b).

The contact intensive services sector remained on a sustained recovery path. Hotel occupancy rates in April 2022 increased beyond pre-pandemic levels in April 2019, and at 65.9 per cent, it was the highest recorded since the outbreak of the pandemic. The average room rate and revenue per available room inched up, surpassing pre-pandemic average rates in 2019 (Chart 38 a and b). As per Ormax Media and GroupM reports, audience footfall has increased in cinemas, and revenues from ticket sales in January-April 2022 surpassed corresponding pre-pandemic period levels. The total box office collections in 2022 are also projected to cross collections in 2019 as people throng to cinemas in revenge consumption.

Chart 37: Railway and Cargo Traffic

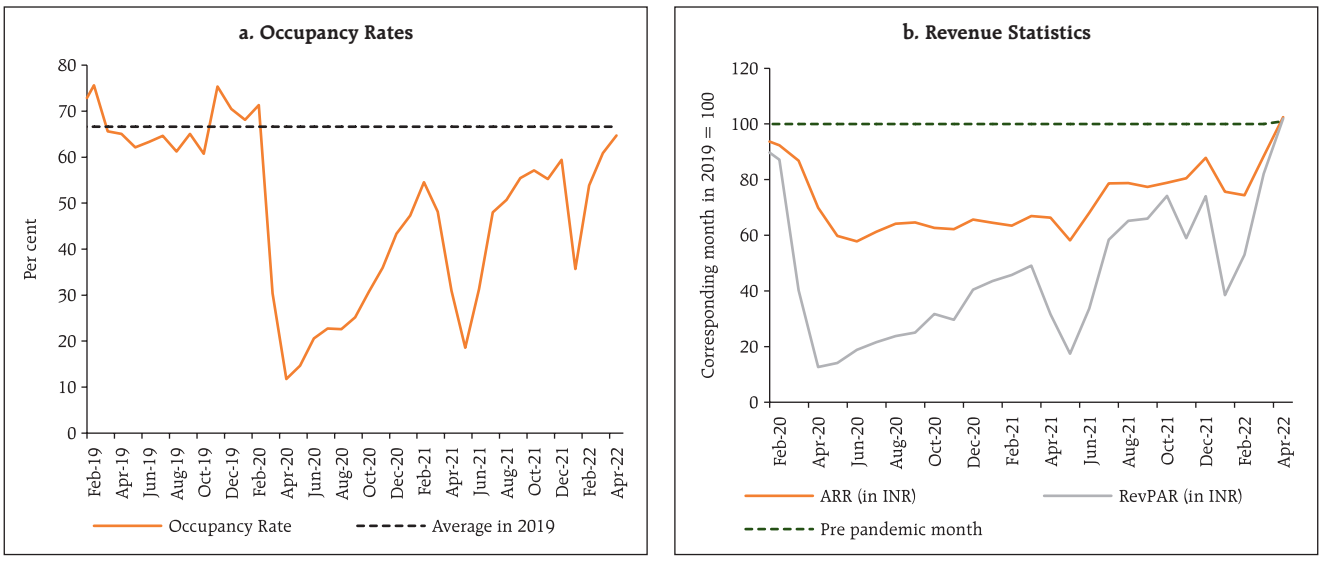


Source: Indian Ports Association.

Activity in the construction sector picked up during April- May 2022, with cement production and steel consumption recording expansion over the pre-pandemic month. While cement production declined sequentially in April due to year-end effects, growth in steel consumption moderated in May on account of an adverse base effect (Chart 39). The sustained pick-up comes despite increasing prices, as demand picks up on the back of robust infrastructure activity in the economy.

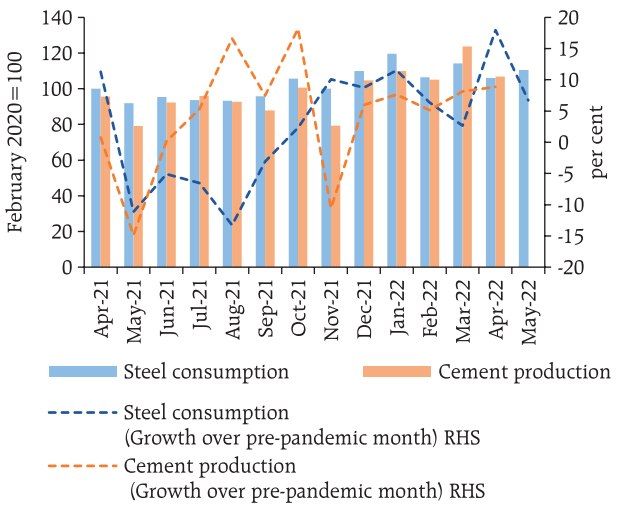
The aviation sector picked up in May 2022, with both passenger and cargo segments recording growth on a y-o-y basis and sequentially. Daily domestic airport footfalls averaged 7.3 lakh per day – an

Chart 38: Hotel Industry Statistics



Source: HVS Anarock.

Chart 39: Steel Consumption and Cement Production



Sources: Joint Plant Committee; and Office of the Economic Advisor, Ministry of Commerce and Industry.

expansion by 5.4 per cent over the preceding month. International airport footfalls increased by 10.9 per cent sequentially, while the cargo segment increased by 4.0 per cent for domestic cargo and contracted by 0.8 per cent for international cargo. In the first eight days of June, domestic airport footfalls increased by 1.3 per cent over the corresponding period in May, while international airport footfalls increased by 14.4 per cent.

In the services sector, activity gained momentum, echoed in high frequency economic indicators of trade and transport sectors. Contact intensive aviation and tourism sectors also recorded sequential improvement, but recovery remains lagged. Decline in rural demand was reflected in the two wheelers and tractors segments (Table 2).

Table 2: High Frequency Indicators - Services

Sector	Indicator	High Frequency Indicators- Services Growth (y-o-y, per cent)						Growth over pre-pandemic month		
		Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Mar 22/ Mar 19'	Apr 22/ Apr 19	May 22/ May-19
Urban Demand	Passenger Vehicles Sales	-13.3	-8.1	-6.5	-3.9	-3.8	185.1	-4.2	1.6	10.6
Rural Demand	Two Wheelers Sales	-10.8	-21.1	-27.3	-20.9	15.4	253.2	-17.8	-29.9	-27.4
	Three Wheelers Sales	27.0	-8.5	-1.1	0.5	51.1	2161.6	-51.6	-54.7	-44.7
	Tractor Sales	-27.5	-32.6	-31.3	-14.3	40.6	47.4	17	55.5	41.1
Trade, hotels, transport, communication	Commercial Vehicles Sales	0.9	26.0					-0.1		
	Railway Freight Traffic	7.2	7.7	6.6	6.7	9.4	14.6	16.3	20.9	25.5
	Port Cargo Traffic	-0.4	-2.9	0.0	0.7	5.6	10.2	7.7	8.1	11.4
	Domestic Air Cargo Traffic	2.0	-6.1	-6.3	-1.0	7.9		-4.4	2.7	
	International Air Cargo Traffic	10.5	5.2	-0.4	1.1	-0.9		-10.7	-5.2	
	Domestic Air Passenger Traffic	53.3	-16.2	-1.0	37.7	87.9		-5.3	-1.5	
	International Air Passenger Traffic	121.7	67.5	66.6	105.7	155.6		-43.8	-36.6	
	GST E-way Bills (Total)	11.6	9.5	8.3	9.7	28.0	84.1	42.4	43.3	35.6
	GST E-way Bills (Intra State)	13.4	11.4	10.3	11.8	28.4	83.3	49	50.8	45.5
	GST E-way Bills (Inter State)	8.9	6.6	5.3	6.6	27.4	85.5	33	32.9	21.8
	Tourist Arrivals	235.5	140.4	141.8	177.9	465.8		-81.9	-77.9	-65.0
Construction	Steel Consumption	-8.3	0.5	-5.3	0.7	1.2	20.2	2.7	18.0	6.7
	Cement Production	14.2	14.3	5.0	8.8	8.0		8.1	8.9	
PMI Index	Manufacturing	55.5	54.0	54.9	54.0	54.7	54.6			
	Services	55.5	51.5	51.8	53.6	57.9	58.9			

Sources: CMIE; CEIC data; IHS Markit; SIAM; Airports Authority of India; and Joint Plant Committee.

Inflation

Inflation as measured by year on year (y-o-y) changes in the all India consumer price index (CPI), moderated to 7.0 per cent in May 2022 from 7.8 per cent in April as per the provisional data released by the NSO [Chart 40a]. Over the previous month, the index increased by 94 bps which was more than offset by strong favourable base effects (month-on-month change in prices a year ago) of 165 bps, leading to a decline in headline inflation by 75 bps between April and May.

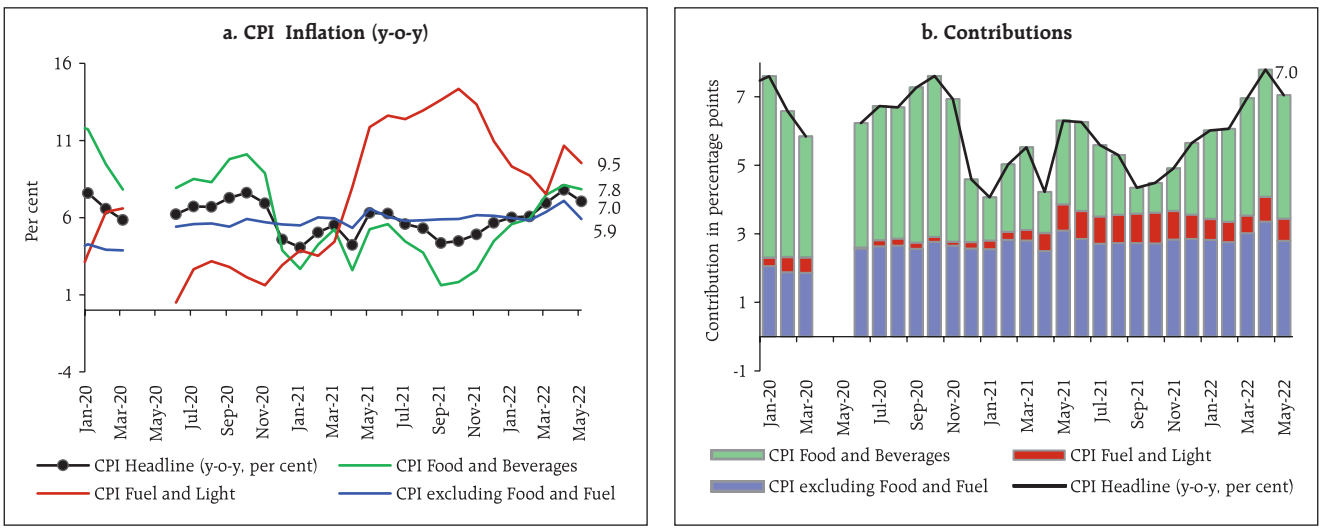
The increase in prices in May was largely driven by the food and beverages and fuel and light groups which increased by 1.5 per cent and 1.4 per cent, respectively, over their levels a month ago while core CPI had a much lower momentum of 0.4 per cent. Significant price pressures were witnessed in respect of vegetables, meat and fish, and spices within the food group and liquified petroleum gas (LPG) in the fuel group, whereas the cut in petrol and diesel excise duties led to a decline in prices of those items.

In terms of annual inflation, all the three major components of CPI exhibited a moderation in inflation in May (Chart 40b). Food and beverages group exhibited a moderation to 7.8 per cent in May from 8.1 per cent in April. Within this category, inflation softened in case of cereals, eggs, edible oils, fruits, pulses, sugar, spices and non-alcoholic beverages, while it edged up for meat and fish, vegetables and milk.

The fuel group (weight of 6.84 per cent in the CPI basket) contributed to around 9.2 per cent of headline inflation in May. Over the previous month, fuel inflation moderated sharply from 10.7 to 9.5 per cent in May, primarily on account of a deepening of deflation in electricity prices to an all-time low of (-) 2.2 per cent, which was driven by the base effect. Inflation in LPG and kerosene, however, accelerated.

Inflation excluding food and fuel fell sharply to 5.9 per cent in May from 7.1 per cent in April. The decline in inflation within this group was also broad based as sub-groups like pan, tobacco and intoxicants, clothing and footwear, transport and communication

Chart 40: CPI Inflation



Note: CPI inflation for April-May 2021 was computed based on imputed CPI indices for April-May 2020.
Sources: National Statistical Office (NSO); and RBI staff estimates.

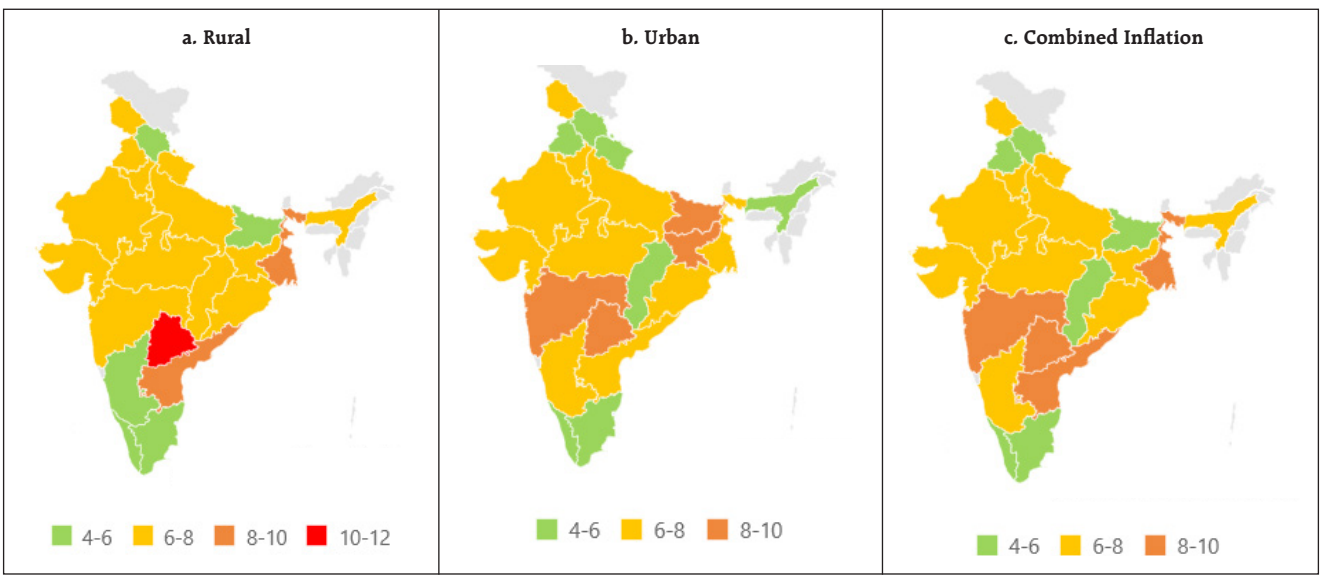
(reflecting the partial impact of the cut in excise duties in May), recreation and amusement, household goods and services, health and personal care and effects (due to decline in gold/silver prices) registered moderation. Inflation in the housing group, however, edged up marginally even though it remained low at 3.7 per cent.

In terms of the regional composition of inflation, almost all of the decline in inflation in May has come from rural inflation which declined from 8.4 per cent in April to 7.0 per cent in May. Urban inflation, however, remained steady at 7.1 per cent. There has also been a wide variation of inflation across different states in India (Chart 41). Andhra Pradesh, Maharashtra, Telangana and West Bengal witnessed CPI inflation in excess of 8 per cent while Kerala recorded inflation of below 5 per cent.

High frequency food price data from the Ministry of Consumer Affairs, Food and Public Distribution (Department of Consumer Affairs) for June so far (June 1-13, 2022) indicate an increase in cereals prices, primarily on account of a surge in retail prices of wheat. Pulses and edible oil prices, however, registered a decline, with the fall in mustard oil prices being the major contributor for the latter. Among key vegetables, tomato and potato prices rose sharply, while onion prices have remained steady in June so far (Chart 42).

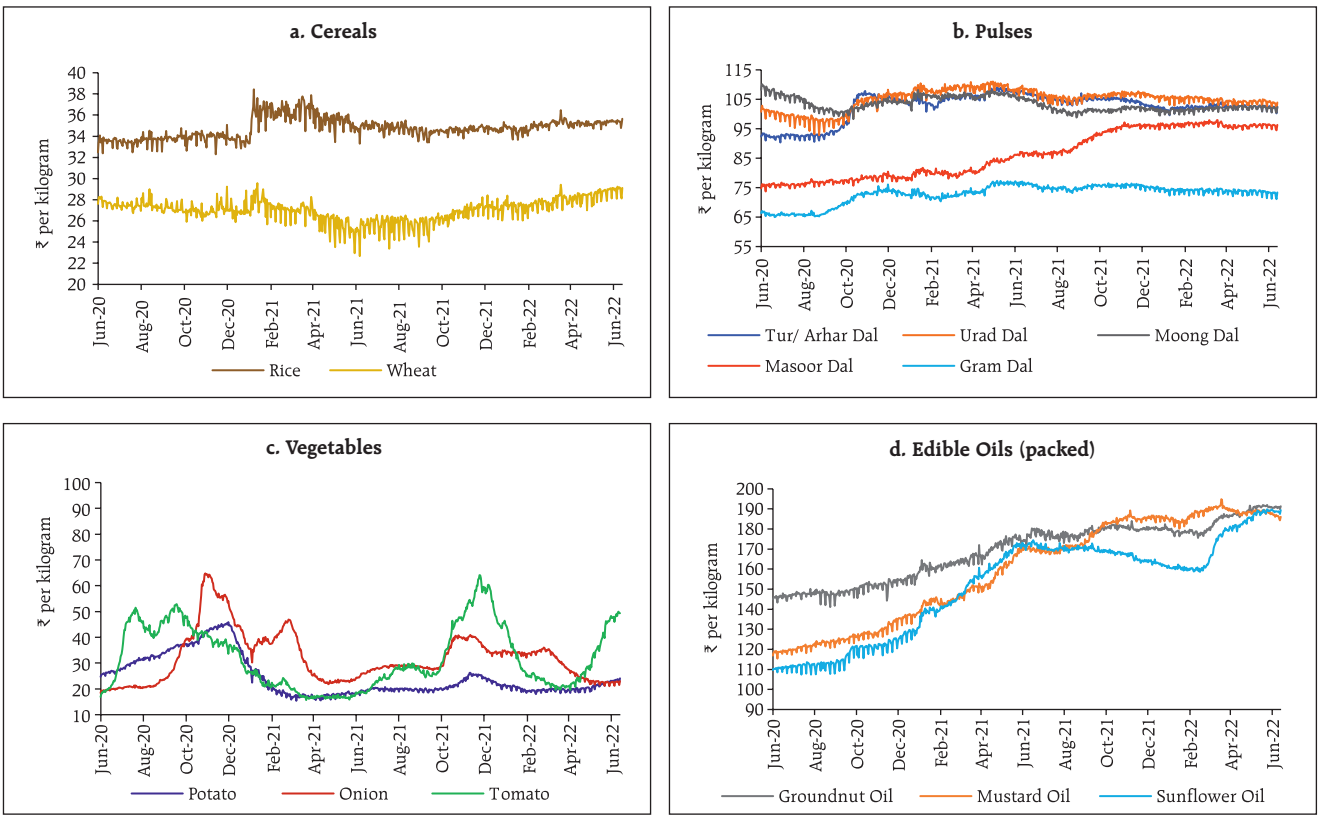
Retail selling prices of petrol and diesel in the four major metros remained steady in June so far (until 13th) though lower *vis-à-vis* last month's levels, reflecting the impact of the cut in excise duties on petrol and diesel by ₹8 per litre and ₹6 per litre, respectively, on May 22, 2022. The decision of Government to provide a subsidy of Rs 200 per 14.2-kg LPG cylinder (upto 12 cylinders) to over 9 crore beneficiaries of Pradhan Mantri Ujjwala Yojana, which will be given through direct benefit transfer, would alleviate pressures on those households budgets though not explicitly

Chart 41: State-wise Monthly Inflation: May 2022



Note: Figures pertaining to Jammu & Kashmir also includes Ladakh. No colour indicates data not available.
Source: Ministry of Statistics and Programme Implementation; and GoI.

Chart 42: DCA Essential Commodity Prices



Sources: Department of Consumer Affairs, GoI; and RBI staff estimates.

reflecting in market prices. Kerosene prices have increased sharply in June so far (Table 3).

Table 3: Petroleum Products Prices

Item	Unit	Domestic Prices			Month-over-month (per cent)	
		June-21	May-22	June-22^	May-22	June-22
Petrol	₹/litre	98.35	110.14	104.18	-2.2	-5.4
Diesel	₹/litre	91.00	98.27	93.48	-1.9	-4.9
Kerosene (subsidised)	₹/litre	32.13	58.81	61.99	3.2	5.4
LPG (non-subsidised)	₹/cylinder	819.63	1001.76	1013.25	4.3	1.1

^ : For the period June 1-13, 2022.

Note: Other than kerosene, prices represent the average Indian Oil Corporation Limited (IOCL) prices in four major metros (Delhi, Kolkata, Mumbai and Chennai). For kerosene, prices denote the average of the subsidised prices in Kolkata, Mumbai and Chennai.

Sources: IOCL; Petroleum Planning and Analysis Cell (PPAC); and RBI staff estimates.

Input cost pressures increased in May 2022 across manufacturing and services as reflected in the PMIs. The input cost component in the PMI for services rose at a record high rate. Selling prices also edged up across manufacturing and services with manufacturing products reaching their highest level in the last nine years.

IV. Financial Conditions

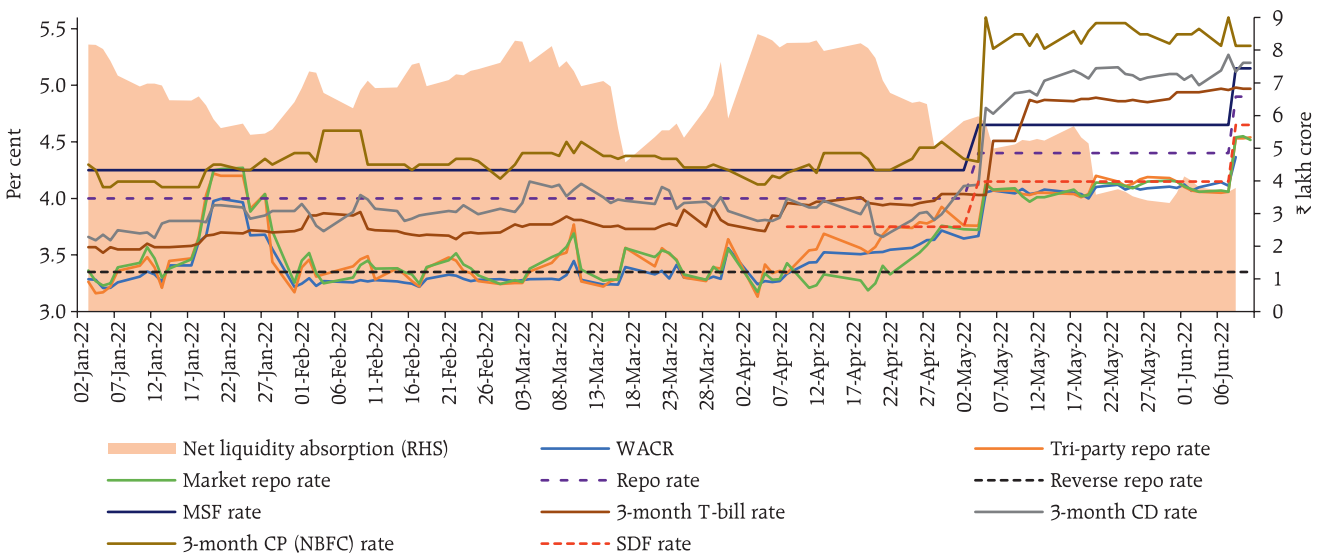
Following the increase in the policy repo rate by 50 bps in the June 2022 meeting of the monetary policy committee (MPC) and its earlier hike of 40 bps in an off-cycle meeting, liquidity conditions have evolved in line with the stated stance, focussing on withdrawal of accommodation. Accordingly, daily liquidity absorption under the liquidity adjustment facility (LAF) averaged ₹4.9 lakh crore in the second

half of May to June 8, moderating from ₹6.7 lakh crore during the second fortnight of April through mid-May 2022. The increase in cash reserve ratio (CRR) requirements effective from the beginning of the reserve maintenance cycle of May 21, coupled with moderation in government spending, drained liquidity from the banking system in the second half of May through June 8, 2022. Of the total absorption, average daily absorption under the standing deposit facility (SDF) was ₹2.2 lakh crore while the bulk of surplus liquidity was mopped up through variable rate reverse repo (VRRR) auctions (both main and fine-tuning) of various tenors.

Overnight money market rates firmed up, with their spreads from the SDF rate narrowing considerably (Chart 43). On an average, the weighted average call rate (WACR), tri-party repo rate and market repo rate traded 7 bps, 5 bps and 6 bps, respectively, below the SDF rate during the second half of May 2022 to June 8 as compared with 15 bps, 7 bps and 22 bps lower, respectively, during mid-April to the first fortnight of May. In the outer term money market segment, yields on 3-month certificates of deposit (CDs) and 3-month commercial paper (CP) stayed elevated, trading above the ceiling of the LAF corridor in the second half of May 2022 through June 8, 2022.

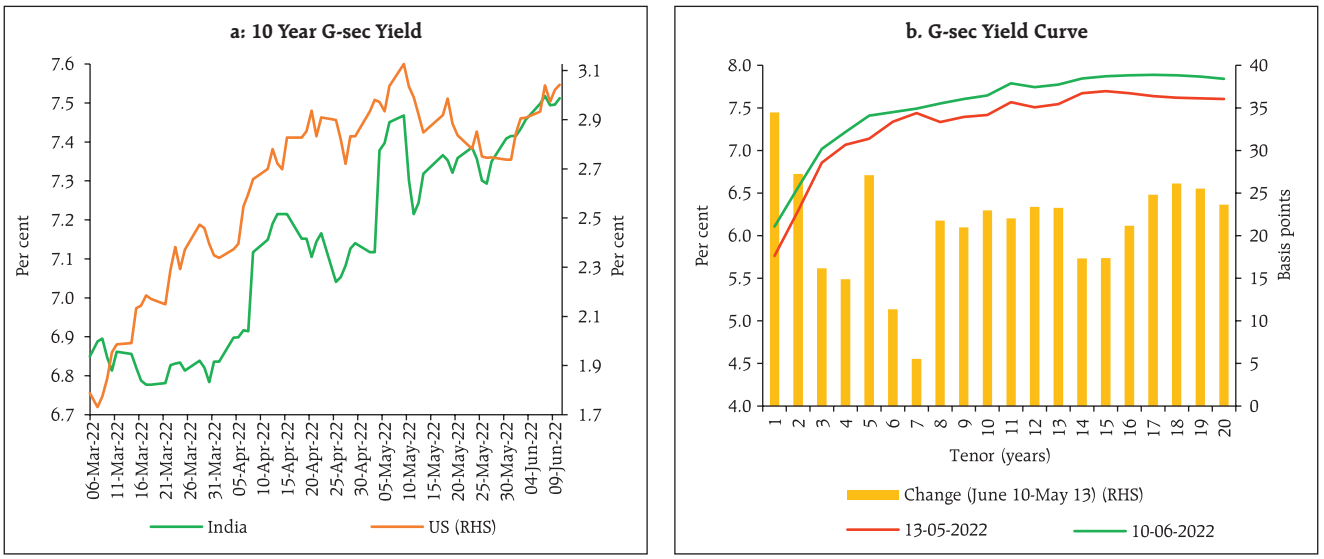
In the fixed income market, bond yields hardened further during the second half of May 2022 to June 8. The rise in crude oil prices, policy rate tightening by systemically important central banks and a pledged ban on Russian energy imports by the European Union (EU) unnerved market sentiment. Domestic inflation pressures, concerns over additional market borrowing following the government's announcement of a reduction in excise duty on petrol and diesel kept bond markets on edge. The rise in the US treasury yields during June also imparted upward pressure domestically. The Reserve Bank's policy action of June 2022 was largely anticipated by the market; consequently, the reaction of the bond market was muted, with the yield on 10 year security easing by 3 bps to close at 7.49 per cent on June 8 (Chart 44a). The yield curve flattened as the short end of the curve increased further in response to moderation in surplus liquidity (Chart 44b). Pressure on the short end was also discernible in the primary market, with 55 per cent of the notified amount (₹4,000 crore) for 4.56 per cent GS 2023 devolving on primary dealers in the

Chart 43: Money Market Rates and Liquidity Conditions



Sources: RBI; and Bloomberg.

Chart 44: Developments in G-sec Market



Source: Bloomberg.

auction conducted on May 27, 2022. The subsequent auction conducted on June 3 sailed through, with the government completing 36 per cent of the scheduled borrowing for H1:2022-23.

Corporate bond yields reflected a hardening bias in June 2022 (up to June 8) –across tenors and rating spectrum – in tandem with the rise in G-sec yields (Table 4). The credit risk premium as reflected in spread of corporate bond yields over risk-free G-sec yields of equivalent maturities also rose during the same period.

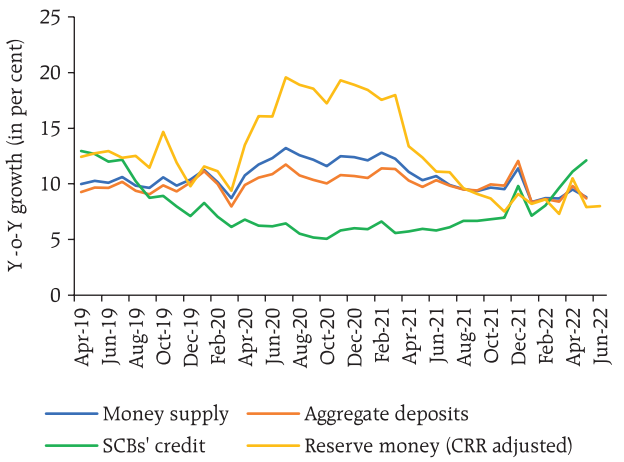
Table 4: Financial Markets - Rates and Spread

Instrument	Interest Rates (per cent)			Spread (bps) (over corresponding risk-free rate)		
	May-22	June 2022 (Up to June 8)	Variation (in bps)	May-22	June 2022 (Up to June 8)	Variation (in bps)
1	2	3	(4 = 3-2)	5	6	(7 = 6-5)
Corporate Bonds						
(i) AAA (1-yr)	6.20	6.84	64	42	51	9
(ii) AAA (3-yr)	7.17	7.67	50	30	57	27
(iii) AAA (5-yr)	7.35	7.59	24	11	18	7
(iv) AA (3-yr)	7.86	8.37	51	99	127	28
(v) BBB-minus (3-yr)	11.57	12.06	53	470	496	26
10-yr G-sec	7.34	7.47	13			

Note: *Yields and spreads are computed as monthly averages*
Source: *FIMMDA and Bloomberg.*

Monetary and credit aggregates moved in tandem with the ongoing recovery in economic activity in May. Reserve money (RM), excluding the first-round impact of the CRR increase by 50 bps to 4.5 per cent effective May 21, 2022, grew by 8.0 per cent on a y-o-y basis as on June 3, 2022 (12.2 per cent a year ago) with currency in circulation (CiC), the largest component of RM, growing at 8.3 per cent (12.8 per cent a year ago). Money supply (M_3) grew at 8.8 per cent as on May 20, 2022 (10.3 per cent a year ago), primarily driven by the growth in aggregate deposits with banks on the components side (having a share of around 85 per cent) at 8.7 per cent (9.7 per cent a year ago). On the sources side, bank credit to the commercial sector – the major constituent – led the expansion in M_3. Scheduled commercial banks' (SCBs') credit growth accelerated to 12.1 per cent y-o-y as on May 20, 2022, more than double that of 6.0 per cent recorded a year ago (Chart 45).

Chart 45: Monetary and Credit Aggregates



Notes: 1. Data pertain to last reporting Friday of every month for money supply, aggregate deposits, and SCBs' credit; and last Friday of every month for reserve money.
2. For June, however, reserve money data are as on June 3, 2022.
Source: RBI.

Table 5: Transmission from the Repo Rate to Banks' Deposit and Lending Rates

(Variation in basis points)

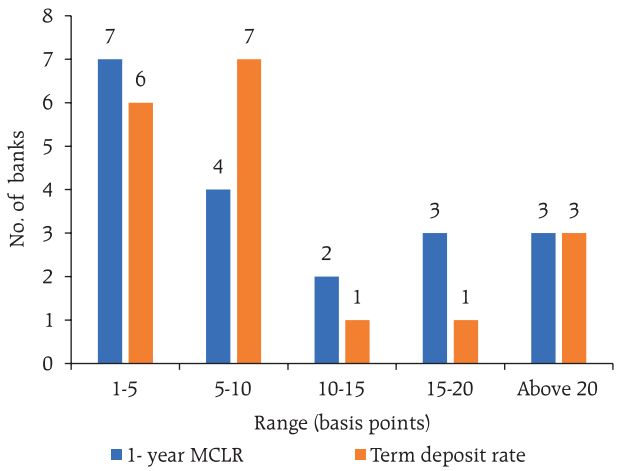
Period	Repo Rate	Term Deposit Rates		Lending Rates		
		Median TDR (Fresh Deposits)	WADTDR (Outstanding Deposits)	1 - Year median MCLR	WALR (Outstanding Rupee Loans)	WALR (Fresh Rupee Loans)
October 2019-March 2022	-140	-180	-180	-128	-150	-189
Apr-22	0	0 (-23 to 18)	0	0 (-40 to 13)	-2	-11
May-22	+40	0 (0 to 60)	-	0 (0 to 31)	-	-

Note: Figures in parentheses indicate range of bank-wise variation for domestic banks.
WALR: Weighted average lending rate; WADTDR: Weighted average domestic term deposit rate; MCLR: Marginal cost of funds-based lending rate; TDR: Term deposit rate.
Source: RBI.

Most banks increased their external benchmark lending rates by 40 bps in May 2022. Amongst domestic banks, seven public sector banks and 12 private banks also increased their 1-year MCLR in a range of 2 to 31 bps (Chart 46).

Banks have also started raising their interest rates on term deposits. Domestic banks have increased term deposit rates (average card rates across all tenors of retail deposits) in the range of 1 to 60 bps during the month of May (Table 5).

Chart 46: Increase in Deposit and Lending Rates in May 2022

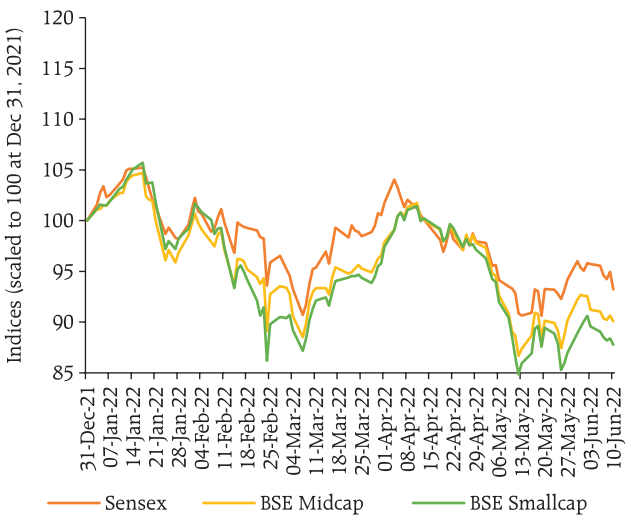


Notes: Term deposit rates are average card rates on retail deposit across all tenors.
Source: RBI.

The weighted average lending rates (WALRs) on outstanding and fresh rupee loans declined by 2 bps and 11 bps, respectively, in April 2022. Considering the decline of 150 bps and 189 bps in WALRs on outstanding and fresh rupee loans during October 2019 to March 2022, the total decline in WALRs amounts to 152 bps and 200 bps, respectively, during the external benchmark period up to April 2022.

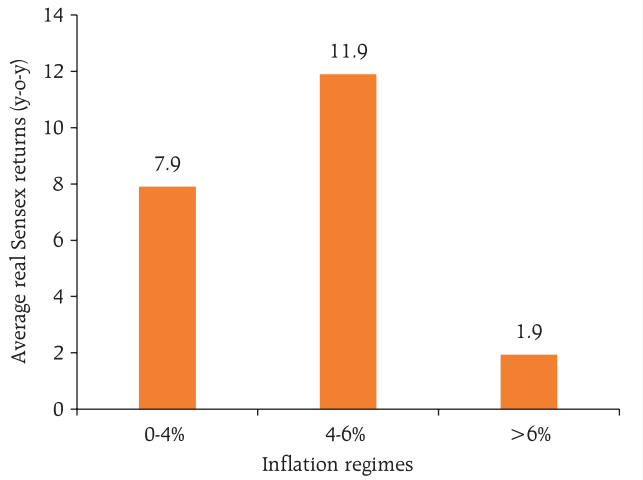
Indian equity markets edged down in the first half of May 2022 reflecting concerns over the tightening of monetary policy by global central banks and risks of an ensuing global economic slowdown. In the second half of May 2022 and early June 2022, markets exhibited an uneven recovery; however, the benchmark Sensex still lost 4.8 per cent since the start of May (till June 10, 2022) to close at 54,303. Inflation, the size and pace of monetary policy tightening in the US and supply chain issues emanating from lagged effects of stringent pandemic-induced lockdowns remain headwinds to equity markets globally. In

Chart 47: Equity Market Performance by Size in 2022



Source: Bloomberg.

Chart 48: Inflation adjusted Equity Returns *vis-à-vis* Different Levels of Inflation (Jan 2011-May 2022)



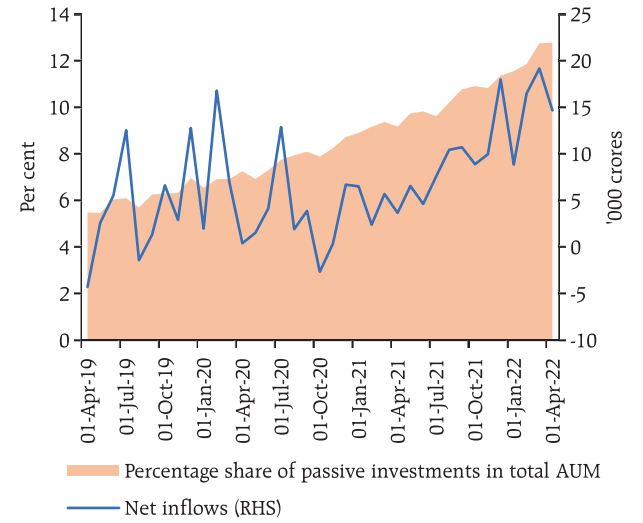
Sources: CEIC; and RBI staff calculations.

alignment with global markets' correction since the beginning of the calendar year 2022, the Sensex has lost 6.8 per cent. The movement of equity markets has been highly volatile during this period with sudden declines and short rallies. The downswing in the BSE midcap and the smallcap indices has been much more pronounced than the BSE Sensex as they lost 9.9 per cent and 12.2 per cent, respectively (Chart 47).

An analysis of data since January 2011 shows that the Sensex provided an average year-on-year nominal return of 13.1 per cent as against an average CPI inflation rate of 5.9 per cent. Significant variation, however, was found across inflation thresholds with low inflation periods on an average being associated with higher real returns for equities (Chart 48).

In recent times, passive strategies, *viz.*, index funds and exchange traded funds (ETFs) have emerged as low-cost alternatives to their active counterparts for investment. Since April 2019, combined assets under management (AUM) of index mutual funds and ETFs (excluding gold ETFs) have more than tripled from ₹1.36 lakh crore (5.5 per cent of total AUM of mutual funds) to ₹4.86 lakh crore (12.80 per cent of total AUM) at end-April 2022 (Chart 49). Considering the growth of passive investing in India and its advantages like transparency, cost-effectiveness and diversification, the Securities and Exchange Board of India (SEBI) recently undertook several measures to aid development of passive investment vehicles in India, such as the introduction of passive equity

Chart 49: Growth of Passive Investments since April 2019



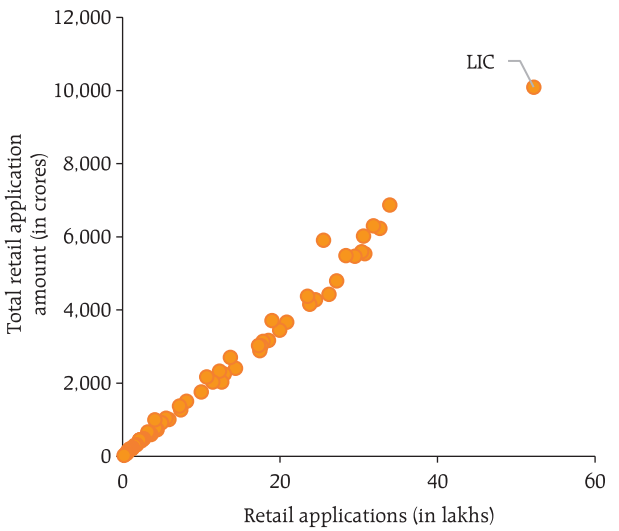
Source: SEBI.

linked saving schemes (ELSS) funds, strengthening of disclosure norms and stipulating threshold tracking error for passive funds among others.[8]

India's largest ever initial public offering (IPO) of the Life Insurance Corporation (LIC) listed in May with an issue size of ₹20,557 crore. It received an active response from retail investors and policyholders, with an overall subscription rate of 2.95 times the issue size. In terms of number of applications received from retail investors, the LIC IPO ranked the first in all mainboard IPOs listed since April 2021 (Chart 50).

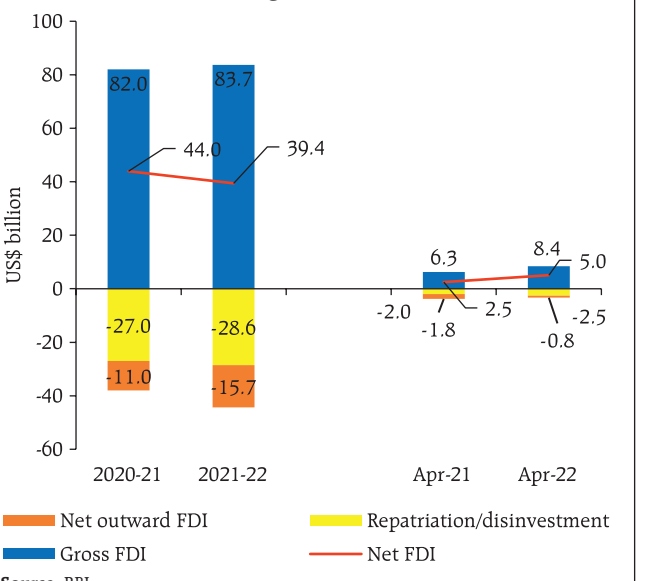
Gross foreign direct investment (FDI) inflows at US$ 8.4 billion in April 2022 were higher than their level of US$ 6.3 billion recorded a year ago (Chart 51). Similarly, net FDI increased to US$ 5.0 billion in April 2022 from US$ 2.5 billion a year ago. Services and manufacturing sectors accounted for a major share in FDI equity inflows in April 2022. According to the UNCTAD's[9] World Investment Report (June 2022), India was the 7th largest recipient of FDI in 2021.

Chart 50: Retail and Policyholders Participation in LIC IPO



Source: Prime Database.

Chart 51: Foreign Direct Investment



Source: RBI.

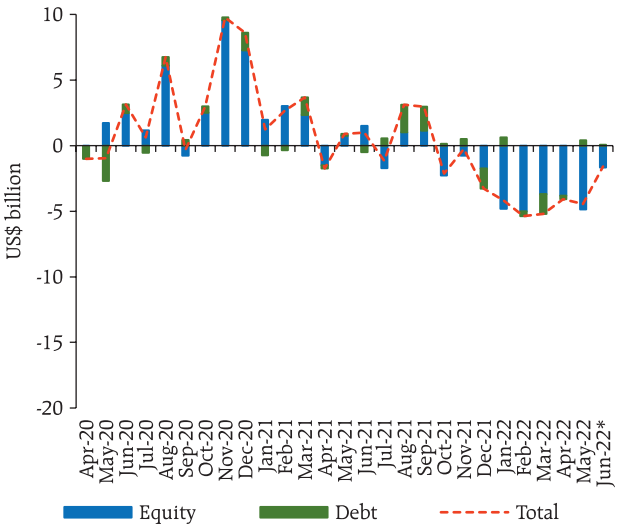
In May 2022, foreign portfolio investors (FPIs) remained net sellers in the Indian equity market amidst inflationary pressures, rising global interest rates, firming US dollar and crude price surges. Equity markets in major emerging market economies (EMEs) such as Brazil, Indonesia, Philippines, South Africa, and Turkey exhibited net outflows as well. FPIs, however, turned net purchasers in the domestic debt market, after being net sellers in the preceding three months. Net equity sell-off led to a total outflow of US$ 4.5 billion from the Indian capital market in the month of May (Chart 52). The information technology sector recorded the highest sell-offs by FPIs, followed by financial services, oil, gas and consumable fuels, and power sectors.

Gross disbursements of external commercial borrowings (ECBs) to India were marginally lower at US$ 1.4 billion in April 2022 from their level of US$ 1.7 billion a year ago. ECBs, excluding inter-company borrowings, recorded net repayments of US$ 0.5 billion in April 2022 as against net disbursements of US$ 0.1 billion a year ago. A considerable part of ECBs has been raised for the purpose of working capital,

8 SEBI's circular on Development of Passive Funds dated May 23, 2022.

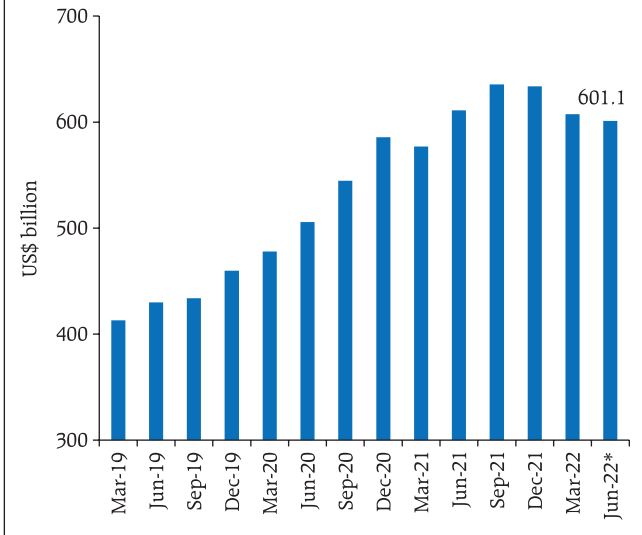
9 UNCTAD: United Nations Conference on Trade and Development.

Chart 52: Net Foreign Portfolio Investment



*: Up to June 9, 2022.
Source: National Securities Depositories Limited (NSDL).

Chart 53: Foreign Exchange Reserves



*: As on June 3, 2022.
Source: RBI.

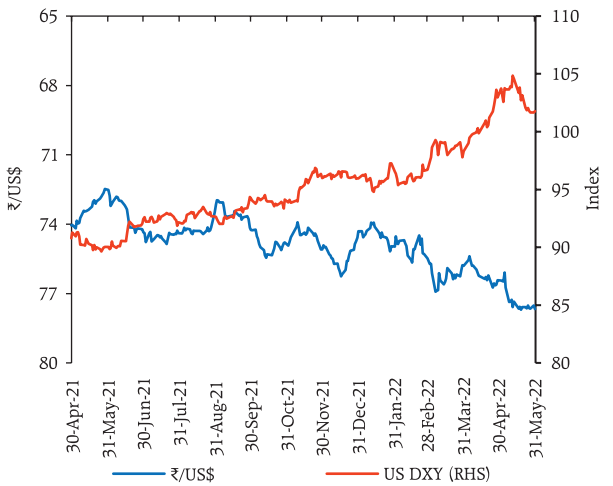
import of capital goods and overseas investment in wholly owned subsidiaries.

The foreign exchange reserves at US$ 601.1 billion as on June 3, 2022 were equivalent to about 10 months of imports projected for 2022-23 (Chart 53).

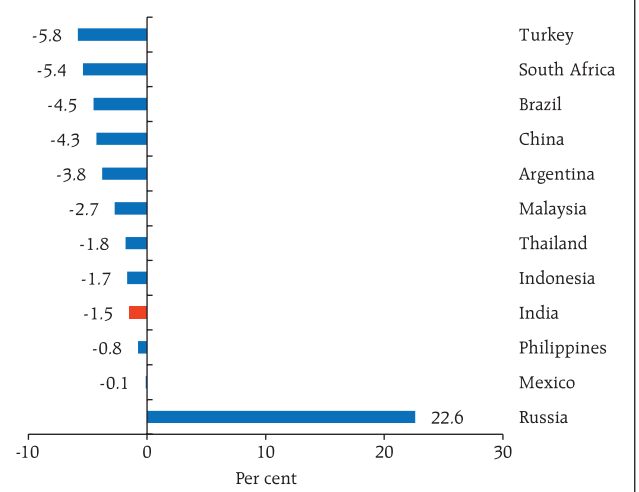
In the foreign exchange market, the Indian rupee (INR) depreciated by 1.5 per cent *vis-à-vis* the US dollar (m-o-m) in May 2022 on the back of FPI equity outflows and strong US dollar (Chart 54a). Nevertheless, the depreciation of the INR was modest relative to major EME currencies (Chart 54b).

Chart 54: Movements of the Indian Rupee and EME Currencies against the US Dollar

a: Indian Rupee and US Dollar Index

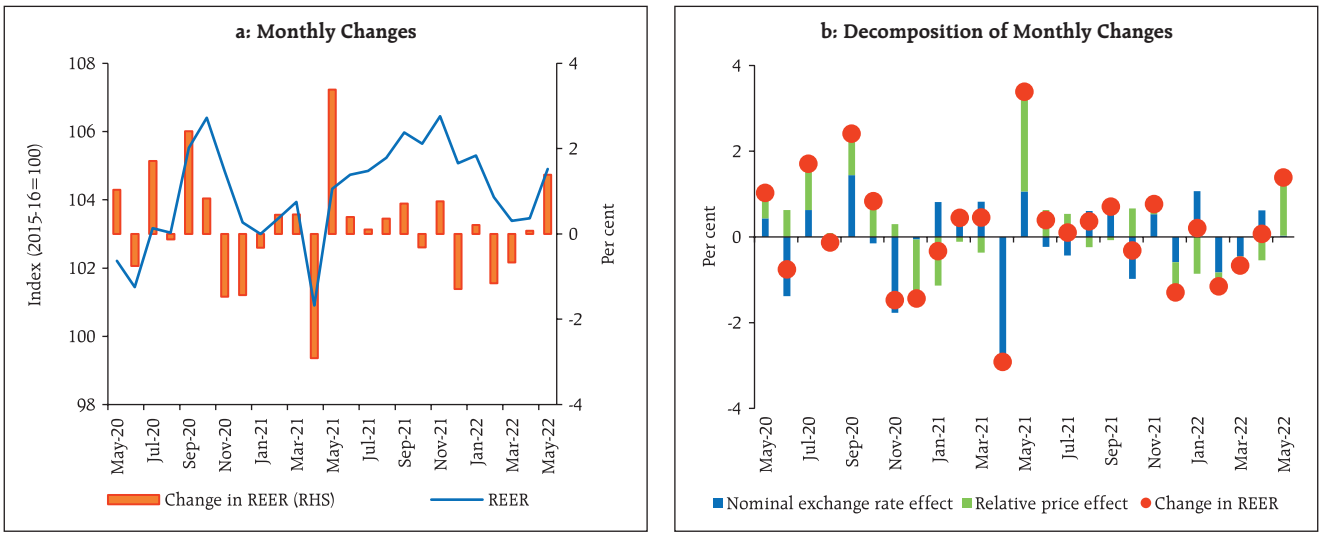


b. Major EME Currencies (May 2022, m-o-m)



Source: FBIL; Thomson Reuters; IMF; and RBI staff calculations.

Chart 55: Monthly Movements in 40-Currency Real Effective Exchange Rate



Note: Figures for May 2022 are provisional.
Source: RBI.

The INR, despite depreciating against the US dollar, appreciated in terms of the 40-currency real effective exchange rate (REER) in the month of May due to higher depreciation of currencies of India's major trading partners against the US dollar and relative price effect (Chart 55).

Payment Systems

Digital payments continued their upward trajectory, with wholesale and retail segments exhibiting strong growth (y-o-y) in May and June 2022 (upto June 10). Large-value credit transfers through Real Time Gross Settlement (RTGS) gained further traction in tandem with economic activity. Retail digital payments exhibited a rise, primarily on the back of Unified Payments Interface (UPI), which hit a new high of 595 crore transactions while breaching the ₹10 lakh crore mark in value. Payment channels like the National Electronic Funds Transfer (NEFT) and Immediate Payment Service (IMPS) posted acceleration in both volume and value terms (Table 6). The turnover in National Automated Clearing House (NACH) also rose owing to the latest disbursal of the *Pradhan Mantri Kisan Samman Nidhi* (PM-KISAN) instalment. Transactions through the National Electronic Toll Collection (NETC)

Table 6: Growth Rates in Select Payment Systems

Payment System	Transaction Volume Growth (Y-o-Y, per cent)				Transaction Value Growth (Y-o-Y, per cent)			
	Apr-2021	Apr-2022	May-2021	May-2022	Apr-2021	Apr-2022	May-2021	May-2022
RTGS	178.8	28.9	37.0	58.7	36.6	26.1	18.8	33.7
NEFT	62.7	30.6	33.0	48.6	56.6	22.1	22.8	40.0
UPI	164.2	111.4	104.9	135.1	226.6	99.2	124.0	112.7
IMPS	163.7	46.0	67.9	73.2	147.3	48.4	57.2	69.9
NACH	-43.0	19.0	45.8	24.9	24.0	14.3	1.8	14.9
NETC	1500.8	61.5	111.1	145.0	1021.6	51.9	86.0	105.6
BBPS	175.2	110.9	137.1	109.3	279.4	117.7	187.8	120.5

Source: RBI.

mode revealed a sharp uptick, given the ongoing normalisation in mobility, the rise in the number of tags issued,[10] and the upward revision in toll rates (with effect from April 1, 2022).[11] Buoyed by the measures aimed at streamlining biller onboarding and a wide range of biller categories, the Bharat Bill Payment System (BBPS) sustained its triple-digit growth run in May. Card transactions displayed resilience in April 2022, with average credit card spending at e-commerce platforms surpassing the value of average debit card payments by three times. Despite the overall low penetration of credit cards relative to debit cards, this points towards the proliferation of deferred payment services in the online space, which assumes significance in view of the growing popularity of the buy-now-pay-later (BNPL) segment.[12]

On the policy front, the Reserve Bank has allowed the provision of interoperable card-less cash withdrawal facility across all banks and ATM networks. Under this, customer authorisation and transaction settlement would be done through the UPI and the National Financial Switch/ATM networks, respectively.[13] Since this will eliminate the need to carry cards, it will enhance customer convenience and help curb card-related fraudulent activities. To align the eligibility criteria for system participants in the BBPS framework, the Reserve Bank has reduced the minimum net worth criterion for non-bank entities seeking to operate as Bharat Bill Payment Operating Units (BBPOUs) from ₹100 crore to ₹25 crore.[14] This is likely to deepen bill payments through the mode, promote competition and widen the BBPS network. Furthermore, the test phase will commence in June for the eight entities selected under the third cohort of the Regulatory Sandbox Scheme on 'MSME Lending'. The Bank has also announced opening of the fourth cohort with 'Prevention and Mitigation of Financial Frauds' as the theme. Recognising that the awareness of digital payment products matters for acceptance, the National Payments Corporation of India (NPCI) took the initiative of making *DigiSaathi* available on social media platforms like WhatsApp.[15] This will help plug information gaps and bolster trust in the adoption of digital payment services.[16]

In the latest Statement on Developmental and Regulatory Policies[17], it has been decided that the Bank will enhance the limit for e-mandate based recurring payments from ₹5,000 to ₹15,000 per transaction to facilitate larger-value payments. To further deepen the reach and usage of UPI, it has also been decided to allow linking of *Rupay* credit cards to UPI. On the digital financial inclusion front, the Bank has proposed to modify the Payments Infrastructure Development Fund (PIDF)[18] Scheme by *inter-alia* enhancing the subsidy amount and simplifying the subsidy claim process. This is expected to further augment the deployment of payment acceptance infrastructure in the targeted geographies.

Giving credence to the digital revolution underway, it was recently reported that India recorded the highest number of real-time transactions[19] in 2021, comprising 40 per cent of global transactions (48.6 billion), which is nearly three times that of China (18.5 billion). This is resulting in efficiency gains and

[10] Tag issuance stood at 5.28 crore in May 2022, up 58 per cent over May 2021.

[11] The Economic Times, May 4, 2022

[12] Financial Express, May 23, 2022

[13] RBI, May 19, 2022

[14] RBI, May 26, 2022

[15] NPCI Press Release, May 10, 2022

[16] *DigiSaathi* will assist the users with all their queries on digital payments *via* the chatbot facility on WhatsApp by simply messaging on +91 892 891 3333.

[17] Statement on Developmental and Regulatory Policies, June 8, 2022

[18] The PIDF Scheme was operationalised by the Reserve Bank in January 2021 to incentivise the deployment of payment acceptance infrastructure in Tier-3 to 6 centres and North Eastern States.

[19] These include transactions through the UPI and the IMPS.

release of additional economic output. Going ahead, digital payments are expected to contribute 1.12 per cent of the country's GDP by 2026.[20]

V. Conclusion

Global economic conditions continued to deteriorate as ratcheting up of commodity prices and financial market volatility have led to heightened uncertainty. Forecasts of global growth and inflation by various agencies paint a grim picture and it is increasingly becoming clear that in advanced economies, the war against inflation would entail significant monetary tightening, complicating the growth-inflation outlook. Emerging market economies grapple with the global trade slowdown, capital outflows and imported inflation. Some abatement of supply chain pressures and relaxation in lockdown measures by key industrial hubs have emerged as silver linings amidst the dark clouds looming over the global economy.

In the midst of this increasingly hostile external environment, India is better placed than many other countries in terms of avoiding the risks of a potential stagflation. With most constituents of GDP surpassing pre-pandemic levels, domestic economic activity is gaining strength. The inflation print for May has brought some relief as it recorded a decline after seven months of continuous rise.

The recovery remained broadly on track. This demonstrates the resilience of the economy in the face of multiple shocks and the innate strength of macro fundamentals as India strives to regain a sustainable high growth trajectory. The recent actions by the Reserve Bank which demonstrated its commitment to price stability while supporting growth augurs well in this milieu.

[20] https://www.aciworldwide.com/wp-content/uploads/2022/04/Prime-Time-for-Real-Time-Report-2022.pdf

*What is the Yield Curve Telling Us About the Economy?**

The government securities yield curve is widely regarded as a valuable predictor of future macroeconomic developments. Following the dynamic latent factor approach suitably modified to fit Indian conditions, this article uses a state space yield-macro model to show that in contrast to advanced economies, it is the level and curvature of the yield curve rather than its slope that contain useful information on market expectations about economic prospects and inflation expectations.

Introduction

Through 2021 and right up to the first half of 2022, government bond markets worldwide have experienced bouts of high turbulence. As elevated inflation pressures became persistent and broadened, monetary policy normalisation intentions were overtaken by front-loaded actions. As fear gained ground that inflation would remain stubborn due to supply disruptions exacerbated by the war in Europe, yields spreads – especially the difference between 10 year and 2 year yields or the 'long-term spread' – fell into negative territory in the US several times as if confirming that a recession was imminent. An animated debate has ensued, with detractors pointing to other yield gaps and 'near-term forward spreads' conveying no such early warning of an impending downturn in economic activity (Engstrom and Sharpe, 2022).

Market participants and the financial press have for long regarded the slope of the yield curve or the spread between long- and short-term yields as a valuable predictor of future macroeconomic developments. Economists have joined them since at least the early 1990s to show that it even outclasses indices of leading indicators and surveys of professional forecasters in its ability to scent future expansions and contractions (Mishkin,1990a; 1990b;1991; Estrella and Mishkin, 1996). Recent empirical evidence has been turned in to show that the predictive power of term spreads remains undiminished, and this statistical strength in predicting historical inflations and recessions over the year ahead is robust to the inclusion of additional predictors (Diebold and Li, 2006; Rudebusch and Wu, 2008). A contrarian view is that the presence of other factors such as liquidity and risk premiums make it tough to separate out *ex ante* real rates and expected inflation that are supposed to be embedded in the nominal interest rate (Patra *et al.*, 2021a).

To the best of our knowledge, extracting the information content in the yield curve on macroeconomic prospects, which is essentially an empirical exercise, has not found much appeal in the Indian context. Hence, this article, which attempts to do so, needs to be regarded as exploratory. It uses a state space model which allows dynamic interaction between the yield curve, *i.e.*, it's level, slope and curvature, and relevant macroeconomic variables using a yield-macro model (as in Patra *et al.*, 2021a) that follows the dynamic latent factor approach (Diebold *et al.*, 2006) suitably modified to fit Indian conditions. The latent factor model considers two-way causality – components of the yield curve to macroeconomic variables and *vice versa* – so that potential bi-directional feedback from the yield curve to the economy and back are nested in the model (Diebold *et al.*, 2006).

We find that in the Indian context, it is the level and curvature of the yield curve rather than

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its slope that contain useful information on market expectations about economic prospects and inflation expectations. The level of the yield curve has increased since 2021 after a steep decline during the pandemic. Furthermore, the yield curve is concave compared to 2019 levels, indicative of strengthening prospects for the recovery, higher inflation expectations and hence market expectations of front-loaded monetary policy normalisation.

The rest of the article is divided into three sections. Empirical evidence on the temporal movements in the yield and it's latent factors are discussed in Section II. The estimation of the yield curve and its interlinkages with the macroeconomic variables of interest is set out in Section III. Section IV concludes with some forward-looking perspectives.

II. The Empirical Evidence

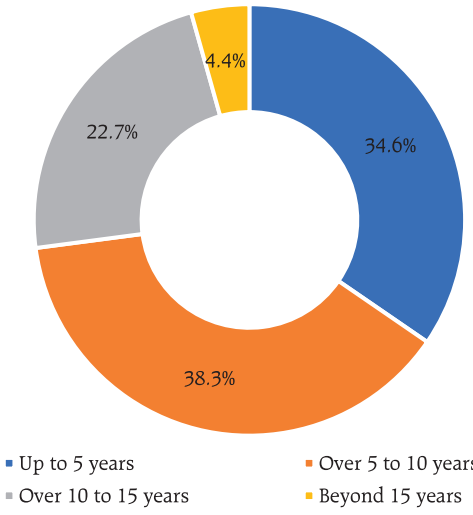
The yield curve depicts the interest rate path for different maturities of similar quality bonds. The long-term yield is a combination of the short-term interest rate set by the central bank, the expected future short-term interest rate embodied in the monetary policy stance, and the term premium – the difference between long-term and short-term yields.

Early explanations of the term premium were based on the expectations hypothesis under which the long-term interest rate is deemed to be the average of expected short-term rates over the maturity period of the bond (Fisher, 1896; Froot, 1989). Although simple, intuitive and elegant, empirical support for the expectations hypothesis is weak (Gürkaynak and Wright, 2012). In terms of the market segmentation hypothesis, on the other hand, long and short-term interest rates are not related to each other and should be viewed separately like items in different markets (Campbell, 1980). Investors have strong maturity preferences and they typically invest in their preferred maturity segment. Yields are determined by supply and demand forces within each market segment based on specific investor preferences in terms of durations, bond characteristics, and investment habits (Ang and Piazzesi, 2003). The criticism has been that this hypothesis can at best be used to explain any particular shape of the yield curve, but not the whole yield curve (Taylor and Masson, 1991; Gürkaynak and Wright, 2012). The preferred habitat theory – which is an extension of the expectations theory – postulates that investors generally prefer short-term bonds *vis-a-vis* long-term bonds, but they care about both expected returns and maturity. Since investors have different investment horizons based on their own preferences, they can only be incentivised to hold bonds other than their preferred maturity if adequately compensated for the additional risk through a premium *i.e.*, higher interest rates. The liquidity premium theory is an offshoot of the expectations theory, but it places more weight on the risk appetite of market participants. Risk aversion causes forward rates to be higher than expected spot rates, usually increasing with maturity. Put differently, longer-term interest rates include a premium for holding longer maturities, which is the compensation demanded by the investor for the risk of illiquidity – tying up money for a longer period as well as price variability and relatively low marketability of longer-term securities.

Based on daily data for 2021-22 on trading volume in the government securities (g-sec) market in India, it is observed that 95.6 per cent of the total trading volume is in the residual maturity segment of up to 15 years (Chart 1).

For the period from March 2020 to May 2022 *i.e.*, the pandemic period, the effective yield curve *i.e.*, up to 15 years maturity, is segmented into various maturity buckets. Events which have a significant bearing on the shape of the yield curve are categorised as policy events and macroeconomic events. Specifically, monetary policy decisions and budget announcements constitute the policy events

Chart 1: Maturity profile of G-Sec trading



Note: 1. Based on residual maturity on trading date.
2. It excludes T-bills, STRIPS, and trading in When Issued market.
Source: Clearing Corporation of India Limited (CCIL).

Table 1: Yield Spread across Maturity Segments before and after Policy Announcements

	3-months and 2-years (2y-3m)			2-years and 10-years (10y-2y)		
	Average t-3	t	Average t+3	Average t-3	t	Average t+3
Monetary policy announcements						
27-03-2020	74	82	80	107	142	152
22-05-2020	100	115	107	192	194	198
08-01-2021	87	75	86	225	226	214
07-04-2021	121	122	129	222	218	215
04-06-2021	119	113	106	213	214	217
06-08-2021	118	116	126	229	232	231
08-10-2021	112	114	115	219	224	229
08-04-2022	112	119	137	225	224	219
04-05-2022	175	182	191	184	187	146
Fiscal policy announcements (Union budget)						
01-02-2021	92	94	99	202	206	207
01-02-2022	115	92	98	229	239	242

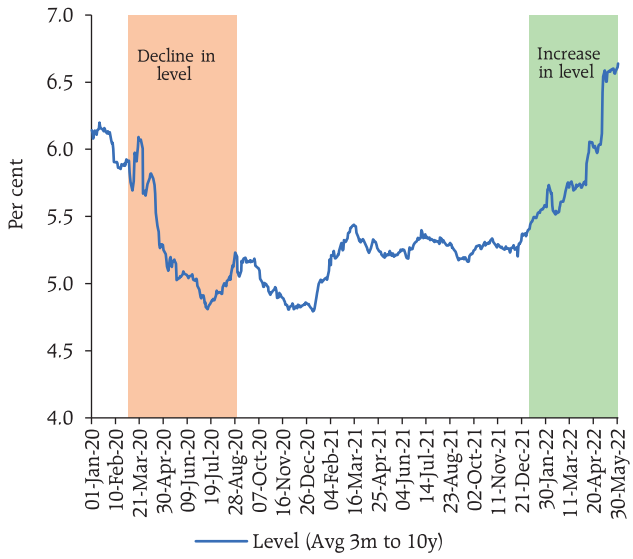
Note: 1. Based on zero coupon yield curve.
2. 't' is the day of the event; 't-3' is three working days prior to the event and 't+3' is three working days after the event.
Source: CCIL and Authors' calculations.

while GDP and inflation data releases are considered as macroeconomic events. The impact of each event is analysed through a 3-working day window prior to and post the event, which translates into a 7-day operating window. Spreads are considered for the following maturity segments: (i) 3 months and 2 years; and (ii) 2 years and 10 years, as they are the most liquid segments of the G-sec market (Table 1).

The measures announced on March 27, 2020 to counter the pandemic had a pronounced impact on the 2 years to 10 years maturity segment. Pandemic related measures significantly lowered the level of the yield curve (Chart 2). Short term rates plummeted, resulting in a steepening of the yield curve across various maturity segments (Chart 3).

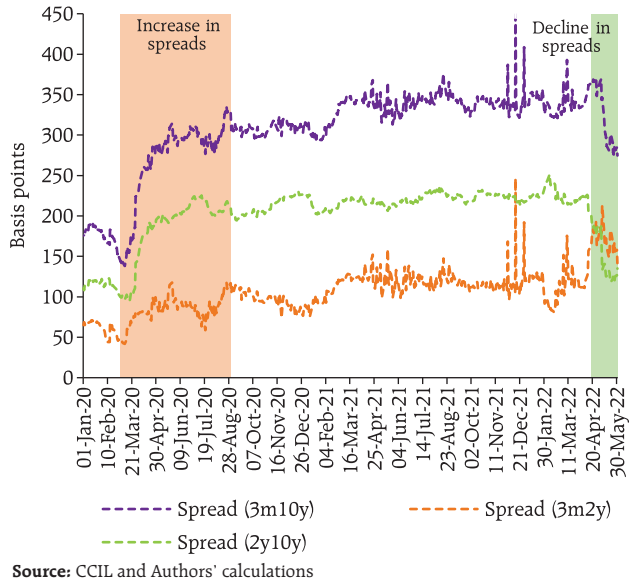
The spread in the 3 months to 2 years segment increased by 8 bps on the policy day from the average of the previous three working days. The cumulative increase in the spread in the 2 years to 10 years segment was 35 bps (Table 1). Beyond 10 years maturity, however, the spread became flat, reflecting illiquidity. The surprise element in advancing the scheduled policy announcement from April to March 2020 amidst the nation-wide lockdown and an unprecedented rate cut of 75 bps accompanied by liquidity injections through targeted long term repo

Chart 2: Level of the Yield Curve



Note: Level is defined as the average yield of 3 months to 10 years maturity.
Source: CCIL, and Authors' calculations

Chart 3: Yield Curve Spreads



Source: CCIL and Authors' calculations

Table 2: Yield Spread across Maturity Segments before and after Inflation Data Release (select dates)

	3-months and 2-years (2y-3m)			2-years and 10-years (10y-2y)		
	Average t-3	t	Average t+3	Average t-3	t	Average t+3
13-04-2020	83	80	80	176	178	184
14-07-2020	75	64	75	223	225	219
14-12-2020	88	87	81	224	225	227
12-01-2021	80	86	91	223	213	210
12-05-2021	107	128	130	214	209	208
14-06-2021	108	137	122	218	217	218
12-08-2021	126	112	131	231	232	231
12-10-2021	115	118	111	223	230	231
12-11-2021	108	115	116	226	226	226
14-03-2022	151	122	126	215	215	215
12-05-2022	172	172	155	138	125	129

Note: 1. Based on zero coupon yield curve.
2. 't' is the day of the event; 't-3' is three working days prior to the event and 't+3' is three working days after the event.

Source: CCIL and Authors' calculations.

operations (TLTROs) and reduction in cash reserve ratio (CRR) undertaken by the RBI unsettled the market. The impact on spreads in the subsequent policy of May 22, 2020 when the policy repo rate was reduced by a further 40 bps was muted in comparison.

On January 8, 2021 when the RBI announced the reintroduction of the 14-day variable rate reverse repo (VRRR) auctions for rebalancing liquidity conditions, the market misinterpreted it as a precursor to policy tightening. Consequently, the spread in the 3 months to 2 years maturity segment steepened by 11 bps after the announcement (t+3) although the spread in the 2 years to 10 years segment moderated by 12 bps.

The announcement of the Union Budget on February 1, 2021 had a marginal impact on various segments – the spread in the 2 years to 10 years segment increased by 4 bps despite the announcement of a large market borrowing programme. Subsequently, the announcement of a secondary market G-sec acquisition programme (G-SAP) for Q1:2021-22 on April 7, 2021 assuaged market concerns and the yield curve flattened by 4 bps in the 2 years to 10 years maturity segment. The termination of the G-SAP programme on October 8, 2021 raised long term rates relative to those in the short term segment, thereby increasing the spread in the 2 years to 10 years segment. The announcement of the Union Budget for 2022-23 increased the spread of the 2 years to 10 years segment by 10 bps reflecting the unanticipatedly large borrowing programme of the government and India's non-inclusion in the global bond indices, which resulted in a sharp spike in longer term rates.

With the announcement of the standing deposit facility (SDF) in April 2022 which came as a surprise to the market, the spread increased by 7 bps in the 3 months to 2 years segment, despite the floor of the liquidity adjustment facility (LAF) corridor (overnight SDF rate) being raised by 40 bps to 3.75 per cent. Similarly, the unexpected increase in the policy repo rate by 40 bps and the hike in CRR by 50 bps on May 4 increased the spread in the 3 months to 2 years segment by 7 bps; however, the impact on the 2 years to 10 years segment was moderate at 3 bps.

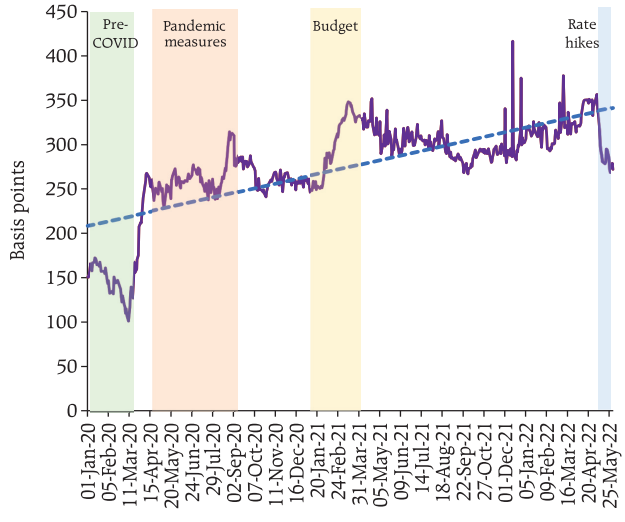
Turning to macroeconomic data releases, the monthly CPI inflation print is usually released on the 12th day of every month (unless it is a holiday). Prior to the release, professional forecasters' median projections are characterised as a consensus forecast. Any noticeable positive divergence (actual more than consensus forecast) creates market unease, which generally gets reflected in the hardening of long term rates and steepening of the yield curve. In the Indian context, however, such surprises tend to have a mixed impact because of the interplay of such releases with monetary policy operations. For example, during the first COVID-19 wave (up to December 2020), inflation surprises increased the spread in the 2 years to 10 years segment (Table 2). Subsequently, however, such surprises resulted in an increase in the spread in the 3 months to 2 years segment as the RBI embarked on liquidity rebalancing, which was interpreted by the market as a reversal of the policy stance. Post October 2021, however, markets started factoring in higher inflation risks. The upward shift in the floor of the LAF corridor through introduction of the SDF in April 2022 increased the spread perceptibly at the short end.

This unequal increase in the spread in various segments has an impact on curvature – increasing the mid-segment of the curve more than the end-points and resulting in the hump shape of the curve getting more pronounced.

The latent yield curve factors provide vital information about future macroeconomic outcomes. To illustrate, Q1:2020-21 GDP growth, which provided the earliest official estimate of the impact of the pandemic, was released on August 31, 2020. Yield curve factors provided an early view of the imminent contraction even before the data release – a sharp decline in the level of the yield curve; little increase in the spread in the 3 months to 2 years segment, but a sharp increase in the 2 years to 10 years spreads, indicating that markets were expecting a recovery thereafter with expectations of continued monetary policy accommodation (Chart 3). During 2022 so far, increasing levels have co-existed with declining spreads, especially in the 2 years to 10 years segment. The spread between 3 months and 2 years yields increased, resulting in an increase in curvature (concavity) of the yield curve, indicative of an upbeat economic outlook amidst rising inflation expectations. The long term spread (between 3 months and 10 years yields) also declined sharply indicating expectations of monetary policy tightening, going forward.

In this background, curvature movements are illustrative of the evolving state of the economy and emerging developments. For example, the curvature underwent a significant decline as market liquidity and economic activity dried up with the onset of the pandemic (Chart 4). With the introduction of the COVID related measures, however, it reversed its trend and increased sharply during March to May 2020. The curvature again increased during the run up and announcement of the Union budget 2021-22, which unveiled a large market borrowing programme. This phase continued till the announcement of G-SAP in April 2021 which mollified market sentiments

Chart 4: Yield curve - Curvature

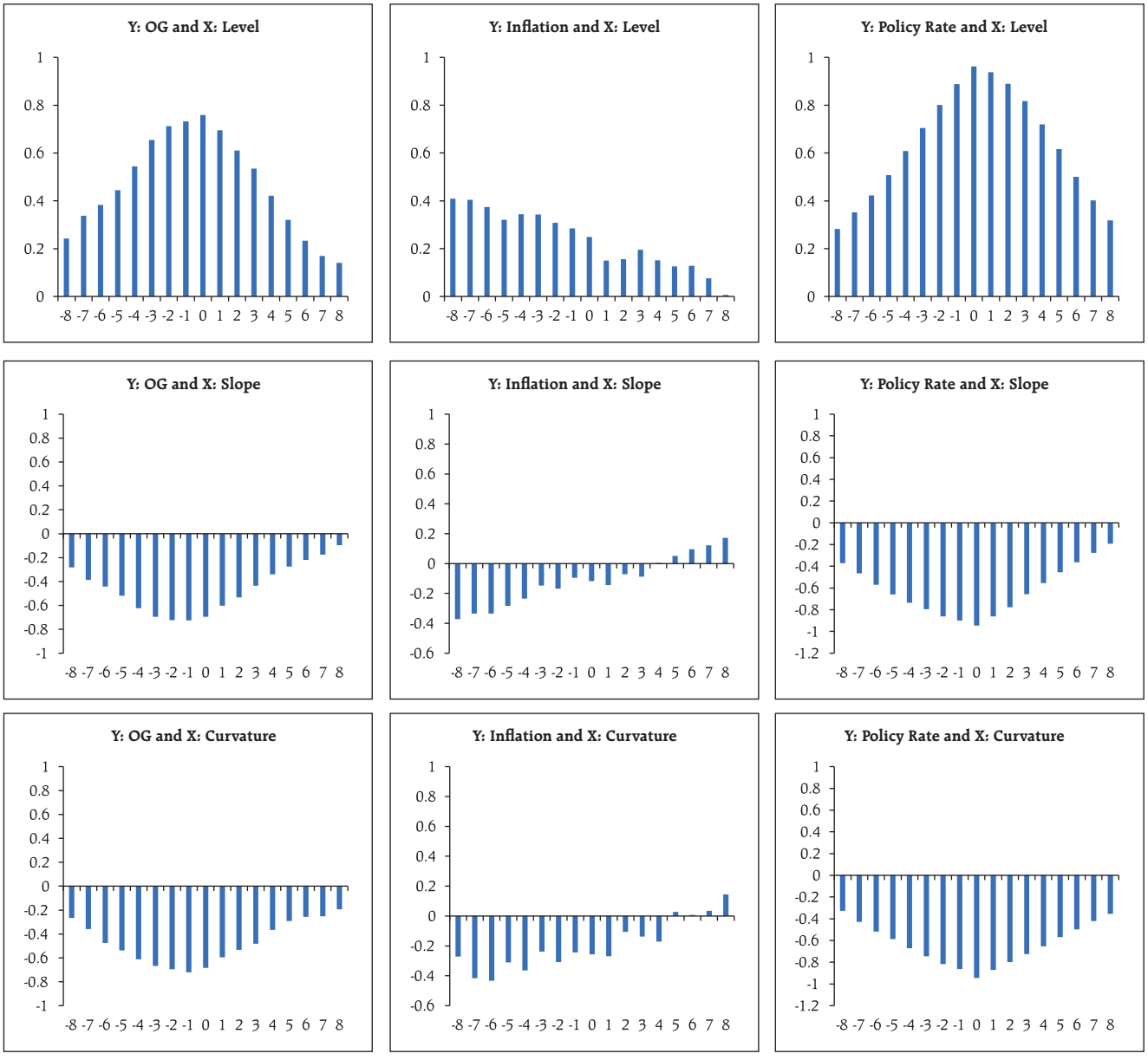


Note: Curvature is defined as 2*10 year yield - (3 months yield + 30 years yield).
Source: Authors' estimates.

thereafter. This, along with the rapid surge of the second wave of COVID-19 infections, reduced the curvature significantly. Thereafter, the curvature continued with its uptrend till the announcement of policy rate hikes in May 2022 which raised short term rates much more in proportion to the medium term.

The empirically estimated yield curve factors[1] are dynamically cross-correlated with macroeconomic variables to identify lead-lag relationships (Chart 5). The results indicate that increase in economic activity measured by the output gaps and higher inflation are associated with an increase in the

Chart 5: Lead-Lag Correlations



Note: Correlation in y-axis; negative values in the x-axes indicate lags and positive values indicate leads. Y represents the dependent variables and X represents the independent variables while calculating the cross-correlations. OG is the output gap. Inflation is CPI-C headline inflation and policy rate is policy repo rate.
Source: Authors' estimates

[1] Level is equal to the average yield on all maturities; Slope is the difference between 30 years and 3 months yield; Curvature is 2 times 10 years yield *minus* the sum of 30 years and 3 months yields.

level of the yield curve and a reduction in the slope and curvature.

On the other hand, correlations of slope and curvature and macro-outcomes (economic activity, inflation) and the policy rate do not produce the expected results. This could be due to the fact that simple correlations ignore the complex underlying interlinkages. This deficiency can be overcome by using a yield-macro model adapted to India specific characteristics of the debt market to which we now turn.

III. Methodology and Results

In order to extract the macroeconomic signals contained in the yield curve, we use a state space model which allows dynamic interaction between the yield curve factors – level[2], slope[3], and curvature[4] – and the macroeconomic variables (Patra *et al.*, 2021a)[5]. The estimation framework follows the tradition of the dynamic latent factor approach (Diebold *et al.*, 2006), which augments the yield-only model with macroeconomic variables representing real activity, inflation, the monetary policy stance, global factors, liquidity conditions and the government market borrowing programme (Diebold and Li, 2006). For this purpose, g-sec yields with maturities of 3 months to 30 years for the period Q1:2011 to Q1:2022 are considered.

The zero-coupon yield[6] at any maturity (τ) is decomposed as follows:

$$y_t(\tau) = L_t + S_t\left(\frac{1-e^{-\lambda_t\tau}}{e^{-\lambda_t\tau}}\right) + C_t\left(\frac{1-e^{-\lambda_t\tau}}{e^{-\lambda_t\tau}} - e^{-\lambda_t\tau}\right) \quad ...(1)$$

where Lt, St and Ct are the level, slope and curvature, respectively, which are unobserved and time-varying. The parameter λ_t, the exponential decay rate[7], is also time-varying.

The model comprises the following set of measurement and transition equations.

$$(f_t - \mu) = A(f_{t-1} - \mu) + \eta_t \quad ...(2)$$

Where $f_t = [L_t, S_t, C_t, OG_t, WACR_t, INF_t, GU_t, LIQ_t, GMB_t]$[8]

$$y_t = \Lambda f_t + \varepsilon_t \quad ...(3)$$

Where Λ is guided by equation (1)

The model is estimated by using Bayesian methods with relatively weak priors (*i.e.*, assuming the parameters to vary over a wide range rather than confined to a tight range as we are less confident of the value of the parameters a *priori*). Impulse responses are generated by using the identification followed in Diebold *et al.*, (2006). The steady states are solved by applying a Newton-type algorithm. The unobservables (latent variables) are filtered out by using a smoothed Kalman filter.

2 Level is the average yield across maturity and usually co-move with equilibrium long rate.

3 Slope is defined as long-term rates minus short-term rates. Thus, an increase in slope means steepening of the yield curve. This notion is used throughout the article.

4 Curvature of the yield curve describes the relationship between yields at short, medium and longer maturities. Higher curvature means higher concavity of the curve *i.e.* the yield curve is steep in the short to medium tenure compared to medium to long-end yields and therefore shows a hump in the yield curve. This notion is used throughout the article.

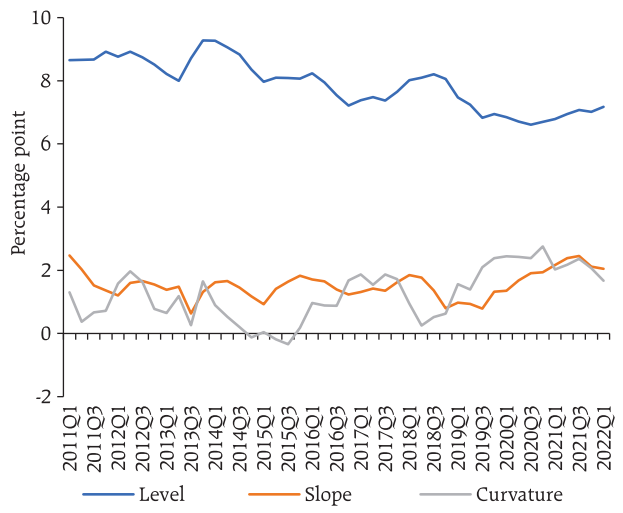
5 The details of the model structure, estimation methodology and goodness of fit can be found in Patra *et al.* (2021a).

6 Source: Bloomberg.

7 Exponential decay describes the process of reducing an amount by a consistent percentage rate over a period of time.

8 Real activity is represented by the output gap (OG) (as estimated in Patra *et al.* 2021b), inflation (INF) by seasonally adjusted quarter on quarter changes in the CPI and monetary policy is proxied by the weighted average call money rate, the operating target of monetary policy. Liquidity conditions are captured by the outstanding absorption/injection under the Reserve Bank's liquidity adjustment facility as a proportion to banks' net demand and time liabilities or LIQU, government market borrowing is proxied by the market borrowing to market turnover ratio (GMB) and global uncertainty is represented by the Global Economic Policy Uncertainty index. The global factors are represented using the GEPU Index which is a GDP-weighted average of national EPU indices for 21 countries, each reflecting the relative frequency of own-country newspaper articles that contain a trio of terms pertaining to the economy (E), policy (P) and uncertainty (U). The data are available at https://www.policyuncertainty.com/global_monthly.html

Chart 6: Estimates of Level, Slope and Curvature based on Yield-Macro Model



Source: Authors' estimates

The estimated Lt, St and Ct from the model point to a steady softening of the level of yields from Q4 of 2018 till 2020, which indicates that the yield curve shifted downwards. Subsequently, the level has shown as upward movement. The slope of the yield curve was found to be increasing till mid-2021 and it remained at that level thereafter. The curvature too had shown an increasing concavity till 2020, but remained relatively stable subsequently. In Q1:2022, both slope and curvature were much above where they were during Q1:2019 (Chart 6).

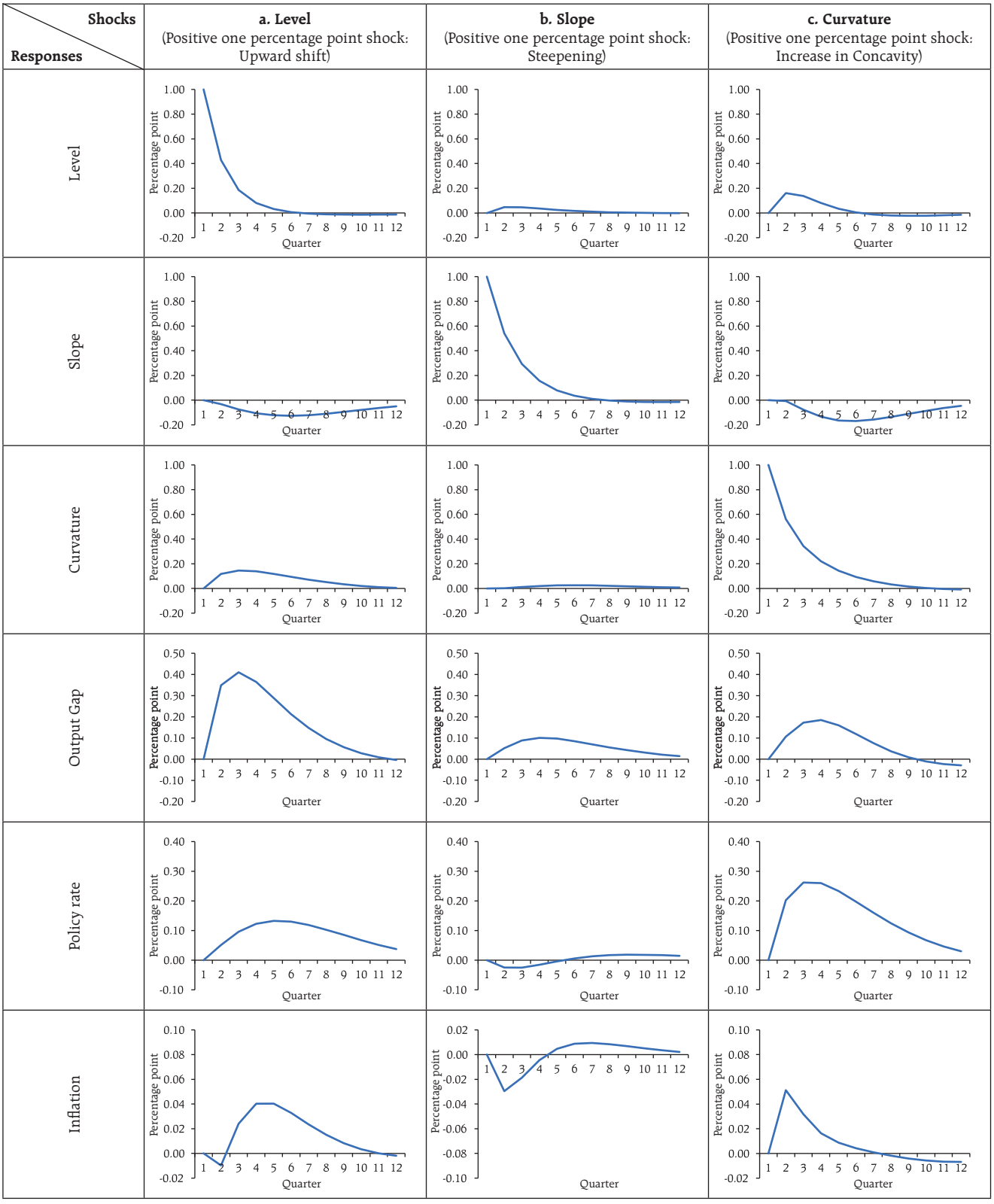
Temporal changes in yield curve factors and the information in them regarding future macroeconomic developments can be explored by using impulse response functions (IRFs) from the yield-macro model (Chart 7). A positive surprise change in the level of the yield curve is followed by hump-shaped responses in slope and curvature. This implies that while initially yields of all maturities move up in lockstep, short- and medium-term maturities' yields increase more than longer maturities in the subsequent quarters. An increase in the level factor points to rising economic activity, the policy rate and inflation. An increase in the level factor is equivalent to an increase in future expected inflation, which lowers the *ex ante* real interest rate. This boosts economic activity.[9] The nominal policy rate rises in response to the level shock, which dampens the inflationary impact (Chart 7a).

An increase in the slope (30 years over 3 months) steepens the yield curve and is expected to be pointing to output gains. Contrary to the majoritarian view (Diebold, Rudebusch and Aruoba, 2006; Estrella and Mishkin, 1996), however, we could find only negligible responses of macro variables to shocks in the slope factor (Chart 7b). This suggests that, controlling for the level and curvature, changes in the slope are not very informative about future economic growth in India.

On the other hand, curvature provides interesting insights into future macroeconomic developments, in contrast to mainstream literature, which assigns an insignificant role to it (Diebold *et al.*, 2006). The larger role of curvature *vis-a-vis* the slope in providing more information on future macroeconomic developments in an emerging market economy like India is attributed to the fragmentation of demand across maturity segments. For instance, the demand for long-term maturity bonds comes mostly from 'buy and hold' investors such as insurance companies and provident funds as the revenue streams from long-term g-secs are broadly aligned with their liability pattern. This leads to infrequent trading, resulting in low turnover in the medium to long segment compared to that of short to medium-term maturities. The higher demand for short to medium-term securities, particularly up to 10 years is reflective of active trading in managing portfolios, rendering them more responsive to evolving developments and expectations about macroeconomic outcomes. Thus,

[9] An *ex-post* real interest rate does not appear to produce an equivalent response, as a positive shock to inflation does not boost economic activity (Diebold, Rudebusch and Aruoba, 2006).

Chart 7: Impulse Response of Yield Curve Factor Shocks on Macro Variables



Source: Authors' estimates.

one would expect the mid-segment of the yield curve to be more sensitive to evolving developments, which would characterise the curvature as being more representative of market sentiments and expected outcomes than other latent factors.

A curvature surprise suggests a boost to economic activity for about 4 quarters and then a slow reversion sets in (Chart 7c). With the curvature shock, expected inflation rises in the medium term, triggering an increase in the policy rate which suppresses the actual inflation outcomes.

IV. Conclusion

The yield curve contains important clues on the likely behaviour of the economy, but a discerning assessment of the underlying latent factors is warranted, tempered by country-specific conditions and a methodological framework that allows for the dynamic interaction between the latent factors and key macroeconomic variables.

The empirical investigation we conduct here is focussed on India's pandemic experience and interesting insights emerge. First, the slope of the yield curve steepened with the onset of pandemic-related policy easing. This trend has reversed in the recent policy tightening phase. Second, the declining level of the yield curve pointed to a contraction even before the data release in 2020-21. Third the curvature increased sharply during the pandemic-related easing and after the announcement of a large market borrowing programme for 2021-22 till the announcement of G-SAP in April 2021.

The results from a yield-macro model indicate that the level and curvature of the yield curve have more information content on future macroeconomic outcomes than the slope. This finding contrasts with the received wisdom and the experience of other countries. In sum, the yield curve is indicating an improvement in long-term growth prospects and an upshift in *ex ante* inflation expectations. At the same time, the fact that the yield curve has become steeper and concave reconfirms expectations of tighter monetary policy in the period ahead.

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*Capital Flows at Risk: India's Experience**

With the spate of emerging market crises since the 1990s and the experience with the global financial crisis and its aftermath, attention has turned from the benefits associated with capital flows to their consequences such as accentuating financial vulnerabilities, aggravating macroeconomic instability and spreading contagion. For India, portfolio flows are the most sensitive to shifts in risk sentiment globally and spillovers. Applying a capital flows at risk approach, it is observed that in an adverse scenario, potential portfolio outflows can average up to 3.2 per cent of GDP. In a black swan event comprising a combination of shocks, potential portfolio outflows can rise to 7.7 per cent of GDP, highlighting the need for maintaining liquid reserves to quell such potential bouts of instability.

Since the 1980s when emerging and developing economies opened their borders either as *suo moto* efforts to integrate into the global economy or as integral elements of structural adjustment programs of the Bretton Woods institutions, the various benefits associated with capital flows for host economies have been documented[1]. With the spate of emerging market crises since the 1990s, and the experience with the global financial crisis (GFC) and its aftermath, however, the narrative has shifted on the back of surges of capital flows, sudden stops and reversals. Attention has turned to their macroeconomic consequences such as amplifying economic cycles, accentuating financial system vulnerabilities, aggravating overall macroeconomic instability and spreading contagion (Forbes and Warnock, 2012). Within this now proliferating literature, the focus is on gross capital flows which have undergone dramatic changes in size and volatility; analyses based on net flows can miss these features as also the sources of volatility, *i.e.*, whether driven by push (foreign) or pull (domestic) factors and interactions, drawing on seminal work on the subject (Calvo *et al.*, 1993; Fernandez-Arias, 1996).

The broad consensus emerging from these analyses is that waves of capital flows are primarily associated with global factors – global risk; economic uncertainty; global growth; interest rates; trade and financial linkages. More recently, oil prices appear to be playing a larger role, especially with tighter macro-prudential regulations, a reduced share of bank flows in total capital flows and slower growth in advanced economies (Forbes and Warnock, 2012). Push factors are found to matter most for portfolio debt and equity flows. Global risk aversion and interest rates in advanced economies have a strong adverse effect on banking flows (Koepke, 2019).

Global risk aversion came into play again with the onset of the COVID-19 pandemic, causing a reallocation of investment portfolios away from emerging market economies (EMEs) and a financial shock to these countries. The negative response of debt flows, in particular, is found to be large and statistically significant while idiosyncratic factors play a relatively less important role (Alba *et al.*, 2021). In contrast, domestic factors – which dominate the theoretical literature - are generally not found to be as prominent, although domestic growth, country vulnerability and domestic asset returns do matter (Bruno and Shin, 2015).

This suggests that financial openness can be a double-edged sword – a fifth of all surges in capital flows to EMEs have ended in financial crises, and EMEs are at least three times more likely to experience

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[1] Capital inflows bring many benefits to countries because they supplement domestic investment, enhance efficiency of production, promote financial sector competitiveness, and facilitate consumption smoothing (Gelos *et al.*, 2021). Capital inflows should support growth through greater allocative efficiency, better risk sharing and increased technological transfers (Carney, 2019).

a financial crisis after these cascades than in normal times (Carney, 2019). With this evidence of capital surges and retrenchments being driven by global factors over which they have no control, policy authorities in host countries have sought to strengthen their ability to withstand capital flow volatility rather than reduce it. This has motivated EMEs to accumulate reserves and/or limit the access to their financial accounts, including by resorting to capital controls which have left their external balance sheets only a third the size of those of advanced economies, despite much faster growth in trade (Carney, 2019).

This paper draws on recent developments in the 'capital flows at risk' framework. It estimates the entire distribution of capital flows conditional upon various pull and push factors. By doing so, it takes into account volatility and higher moments of the distribution so as to assess the effect of a range of risk factors across different parts of the distributions at different horizons[2] (Eguren Martin *et al.*, 2021; Gelos *et al.*, 2021). The objective is to understand the following issues: what drives capital flow volatility in the Indian context so that appropriate policy responses can be fashioned? Can we quantify the tail risks to these capital flows and hence fashion appropriate measures to shield the economy from such shocks?

Our findings suggest that growth differentials and domestic term premia are the predominant pull factors attracting capital flows to India while global risk aversion is the main push factor driving capital outflows. Portfolio flows are most sensitive to shifts in risk sentiment globally and consequent spillovers – there is a 5 per cent chance of portfolio investments amounting to 3.2 per cent of GDP flowing out from India in response to a historical shock to any individual determinant. When shocks to all determinants are combined to simulate an extreme risk scenario, the size of portfolio outflows rises to 7.7 per cent of GDP.

The rest of the paper is organised into four sections. The next section presents stylised facts on gross capital flows to EMEs and India, their composition and key drivers. Section III sets out the methodological framework for evaluating capital flows at risk. Section IV presents the main results and Section V concludes the paper with some perspectives on the policy questions we pose here.

II. Profiling Capital Flows

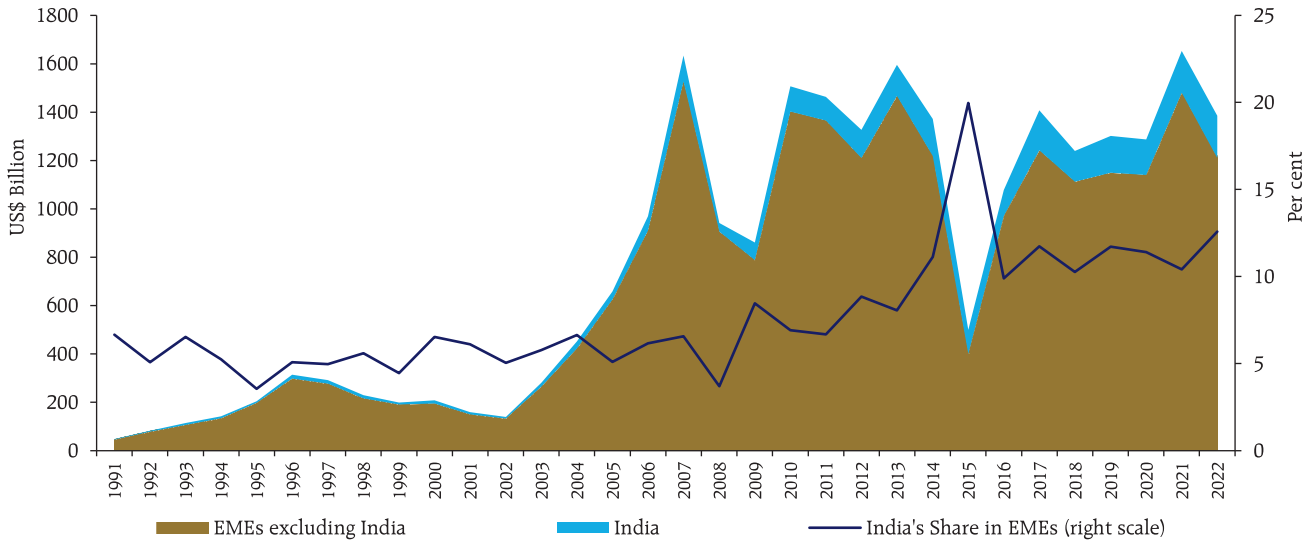
In this section, the strategy is to present the historical profile of capital flows to EMEs and then turn to the Indian experience. The objective is to provide analytical foundations to the view that is broadly endorsed in this part of the world, capital flows can have a destabilising influence on macroeconomic and financial fundamentals in the short run although they may deliver the benefits that have been associated with them in the literature over the medium-term.

Capital flows to EMEs experienced a remarkable upshift after 2002 to reach a peak of 11 per cent of GDP in 2007, driven by improvements in their macroeconomic fundamentals and institutional frameworks, deepening and growing sophistication of host financial markets and the rising tide of integration into the global economy to harness new engines of growth (Chart 1).

The GFC imposed a sharp retrenchment but in its aftermath, surges of capital flows to EMEs resumed in a broad-based rebound with a peak in 2009, rekindling the debate about the boom-bust nature of these flows and associated macroeconomic challenges and financial stability concerns (Ghosh *et al.*, 2012). By the second half of 2011, amidst a worsening global economic outlook and following the U.S. sovereign debt rating downgrade in early August 2011, capital flows receded rapidly, eliminating much of the cumulated currency gains of the pre-GFC period and

[2] This follows the methodology adopted to characterize the distribution of forecast GDP growth in order to evaluate the effects of financial condition (Adrian *et al.*, 2019).

Chart 1: Capital Flows to EMEs



Source: Institute of International Finance.

leaving EMEs grappling with sharply depreciating currencies. Although they resumed and peaked again in 2012, inflows to EMEs were the most affected by the "taper tantrum" of May 2013, with a marked slowdown in gross inflows and an increase in gross outflows until 2015.

Since early 2016, capital flows returned to EMEs and rose to another peak in 2016 - *albeit* modest in comparison with 2007 and 2009 – followed by some moderation during 2017-19. This period coincided with a slowdown in major EMEs, a steep fall in oil and other commodity prices and a strong appreciation of the US dollar that impacted dollar-denominated debt in several EMEs. Commodity exporters, in particular, experienced strong capital outflows and currency depreciations. Capital flows in these years were characterised by lower portfolio investment and a reduction in other investments – mainly bank loans - while foreign direct investment (FDI) was relatively unaffected.

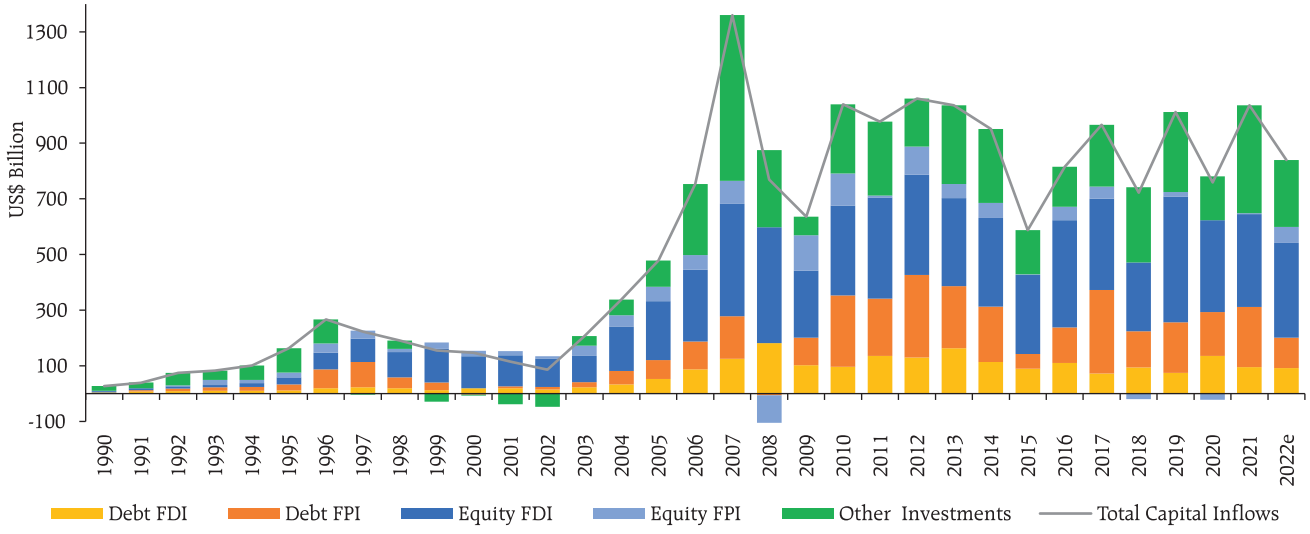
The outbreak of the Covid-19 pandemic triggered a sharp reversal of capital flows to EMEs and some advanced economies (AEs) in March 2020. Yet, inflows to EMEs recovered starting from April 2020, boosted by monetary policy easing in major AEs. The initial rebound in portfolio flows was heterogeneous along several dimensions. First, investors were more selective, differentiating on the basis of economic vulnerabilities, policy frameworks and the extent to which the pandemic had been brought under control. Second, the pace of recovery in debt inflows was initially faster than in equity inflows. Third, flows into local currency bond funds were initially subdued, owing to concerns about weak EME currencies, availability of future fiscal space and central banks' policy stance (Arslanalp *et al.*, 2020). Heterogeneity decreased in late 2020, when flows into equities and local currency funds picked up substantially across many EMEs. In 2021, a rise in US long-term yields preceded capital outflows from many EMEs in March of that year, although shifts were more moderate than during the "taper tantrum". This was followed by a recovery from April until the war in Ukraine forced a disruption, followed by continuing outflows, currency depreciations and reserve drains.

Turning to the composition of capital flows to EMEs, FDI has made up about half, while the other half is roughly evenly split between portfolio inflows and other investments (Chart 2). Portfolio inflows have increased in the post-GFC period when compared with the period before the GFC, led by investments in EME bond markets. In the years following the taper tantrum, portfolio equity flows ebbed to levels much lower than in the years preceding it. This is true in relation to debt portfolio flows as well. The decrease in gross inflows in 2015-19 was also mainly driven by lower portfolio investment.

Other investment is the volatile component across all past major downturns. One of the most salient changes during the post-GFC period has been a retrenchment of cross-border bank lending, driven in large part by the deleveraging of AE banks, particularly those headquartered in the euro area. Nevertheless, banks remain the dominant source of funding. Cross-border bank loans declined as a share of external debt between 2008 and 2012 and have fluctuated around 45 per cent since then (López and Stracca, 2021). Notably, even while reducing their cross-border lending, banks continue to invest in portfolio debt, but they are being replaced as intermediaries by market-based flows driven by asset managers, investment funds and other non-bank financial intermediaries (Lane and Milesi-Ferretti, 2017; López and Stracca, 2021). Since the GFC, public sector borrowers have accounted for a growing share of total debt securities issuance in many EMEs and at the global level (Lane and Milesi-Ferretti, 2017). On average, over the 2009-19 period, 38 per cent of total capital inflows to EMEs and more than half of portfolio inflows could be attributed to the public sector (López and Stracca, 2021).

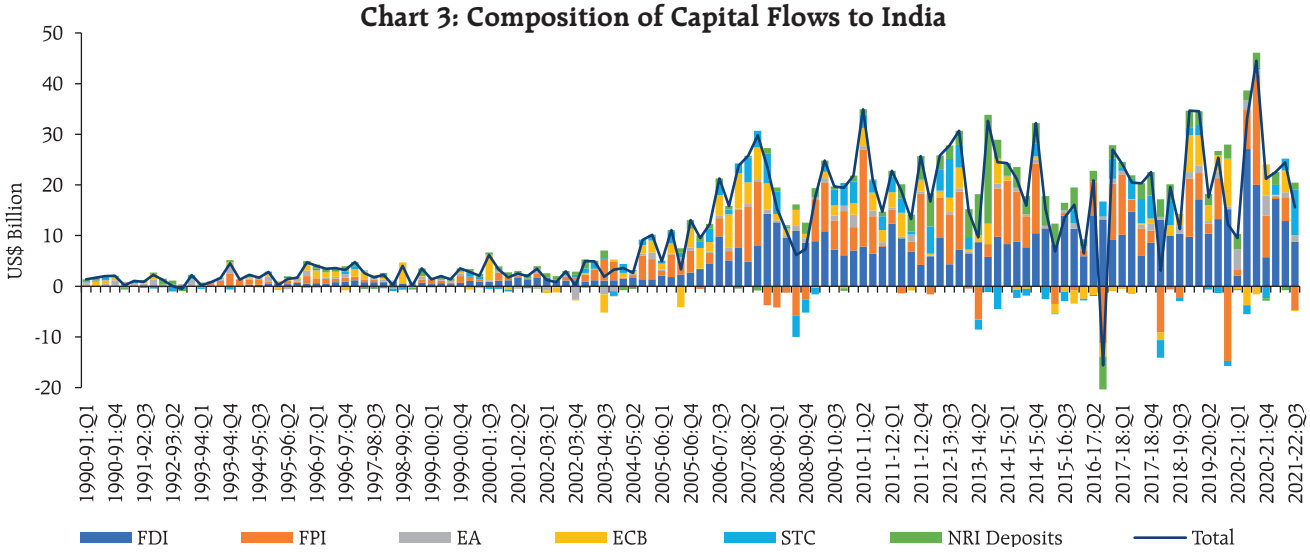
Capital flows to India have behaved in ways similar to the rest of EMEs (Chart 3). The first surges, however, predated the 2002 EME watershed and can be traced back to the early 1990s when trade and financial liberalization was undertaken as an integral element of macroeconomic adjustment and structural reforms. Also similar to the EME experience, India has undergone five major episodes of sudden stops and reversals – the GFC; the taper tantrum; 2018; the onset of the pandemic; and the current phase that prevails in the train of the war in Ukraine.

Chart 2: Capital Flows to EMEs excluding China



Source: Institute of International Finance and authors' estimates.

Chart 3: Composition of Capital Flows to India



Note: In the chart, FDI: Foreign Direct Investment; FPI: Foreign Portfolio Investment; EA: External Assistance; ECB: External Commercial Borrowings; STC: Short-term Trade Credit; NRI Deposits: Non Resident Indian Deposits.
Source: Reserve Bank of India.

Tracking the performance of other EMEs, capital flows began to rise from the first quarter of 2003 as the Indian economy emerged from a slowdown. With accommodative monetary policies in advanced economies operating as a push factor, an acceleration started building up from the third quarter of 2004, taking capital flows to India to a peak in the last quarter of 2007 before being overwhelmed by the GFC.

In the post-GFC period, capital flows resumed, analogous to the broader EME experience. The turnaround in capital flows can be dated to the second quarter of 2009. An acceleration similar to the pre-GFC phenomenon was experienced, but this surge was short-lived and it crested in the third quarter of 2010 as monetary policy was tightened to counter elevated inflation pressures, and the ongoing debt crisis in Europe triggered a flight to safety. As real GDP growth started decelerating during 2011-2012, capital flows turned volatile and a generalised risk aversion set in amidst the US downgrade and slowing global growth. Ahead of the taper tantrum in the second quarter of 2013, India faced a large external financing requirement brought on by a burgeoning current account deficit and deteriorating macro-fundamentals. Consequently, when risk-off sentiments became pervasive with taper talk, capital flows receded swiftly from India and plunged it into the infamous group of the fragile five. In response to monetary policy and liquidity tightening, restrictions on gold imports and raising of exceptional financing from abroad, capital flows returned cautiously to India by the second half of 2013 but remained subdued and volatile up to the first quarter of 2018, with intermittent outflows.

Real GDP growth in India slid down to a five-year low in 2018-19. Investment slowed as did sales growth among non-financial corporations, with private consumption also losing pace. Export growth decelerated and non-oil and non-gold imports went into contraction. Global spillovers and the tightening of financial conditions herded investors to safe havens, shunning EMEs as an asset class, with India experiencing portfolio outflows.

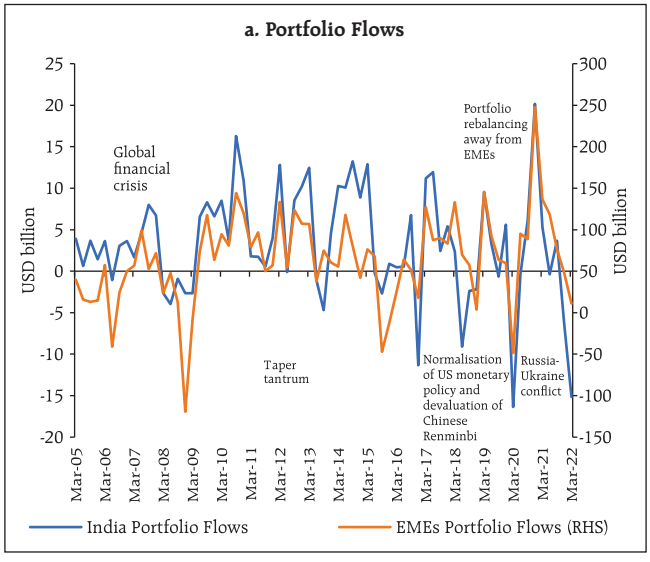
Global risks ebbed in the first quarter of 2019 and improved market sentiment rejuvenated the appetite for risk, bringing back portfolio flows to India. Capital

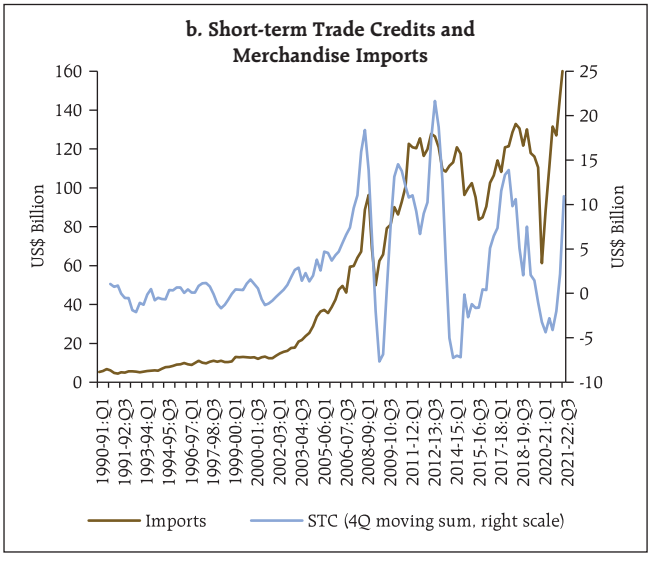
flows remained strong through the rest of 2019. Even after the onset of the pandemic in early 2020 when EMEs generally faced outflows, India remained a host for capital inflows, including portfolio investment, throughout the year and into the next. Since the start of 2022, however, the combination of synchronised monetary policy tightening and the war in Ukraine has caused outflows and even FDI has ebbed.

The pattern and composition of capital inflows to India have remained broadly stable. FDI accounted for more than half, followed by portfolio flows with a share of 30 per cent in which equity and debt account for 60 per cent and 40 per cent, respectively. Portfolio flows have turned out to be the most volatile component, moving in tandem with portfolio flows to the EMEs, ranging from surges that took their share in total flows to a high of 55 per cent to outflows of US $ 14.7 billion or 2 per cent of GDP during capital flow reversals (Chart 4). Equity flows have tended to be more volatile than debt flows and associated with large outflows during the GFC, the taper tantrum, the US presidential election of 2016 and COVID-19. Debt flows turned negative with the onset of the pandemic. The tapering announcement by the US Fed in May 2013 led to heavy outflows by foreign portfolio investors from both equity and debt markets, and especially from the debt segment. Similarly, global risk aversion driven by the outcome of the US presidential elections and expectations of an increase in the Federal funds rate culminated in intense selling pressure in equity and debt segments from November 2016 through January 2017.

While inflows under non-resident Indian (NRI) deposits provide a cushion by offsetting the impact of large outflows in other accounts, a lumpy redemption of FCNR (B) deposits raised by banks under the Reserve Bank's special swap window from September to November 2013 imparted some volatility. Loans under external commercial borrowing (ECB) account for another source of capital inflows into India. These flows have remained broadly stable as approvals are regulated under an overall ceiling and individual loans are subject to end-use and all-in-cost stipulations. Like portfolio flows, short-term trade credit is another volatile component in capital inflows into India and co-moves with India's imports.

Chart 4: Volatile Capital Flows





Source: Institute of International Finance; Reserve Bank of India.

III. Data and Methodology

As the preceding section showed, EMEs in general and India in our specific case, are vulnerable to both surges of capital inflows and episodes of outflows, with associated policy challenges in terms of managing the macroeconomic and financial consequences. While EMEs have fashioned responses to inflow booms by employing a combination of monetary and fiscal policies, macroprudential tools and capital flow management measures, capital outflows are more daunting to deal with as they can lead to tightening of financial conditions and instability, with contractionary effects on growth. In this context, policy authorities have found it useful to ascertain the magnitude of expected capital outflows at various probabilities in response to specific shocks. This has been termed as the capital flows at risk (CaR) approach (Gelos *et al.*, 2021). Drawing on the financial risk management literature, CaR takes a forward-looking perspective on risks to capital flows by asking what global and domestic conditions today can tell us about the probability and the size of future capital flows. In this framework, first, a link between different quantiles[3] of capital flows and their drivers is established by using a quantile regression[4] to predict capital flows for various quantiles. In the second step, the predicted capital flows are used to obtain the empirical distribution of future capital flows. The risks to capital flows are then quantified by estimating the size of outflows for a given probability (*i.e.*, usually at 5 per cent) from the empirical distribution. Alternatively, one can also compute the probability for the magnitude of capital outflows, based on the empirical distribution.

Formally, quantile regression can be represented as:

$$y_{t+h}^{q} = \beta_q X_t + \varepsilon_t^q \quad \ldots(1)$$

for quantiles $q \in (0,1)$ and horizon h with the error term $\varepsilon_t^q \sim N(0,\sigma)$. Here y_t refers to capital flows as a ratio of GDP and X_t is a set of various determinants of capital flows distinguished as 'push' and 'pull' factors. A skewed-t distribution has been fitted which has four parameters – mean (μ), variance (σ), skewness (α), and kurtosis (ν) – to derive the capital flows distribution (Azzalini and Capitanio, 2003). The distribution is given by:

$$f(x;\mu,\sigma,\alpha,\nu) = \frac{2}{\sigma}\, t\left(\frac{x-\mu}{\sigma};\nu\right) T\left(\frac{\frac{\alpha(x-\mu)}{\sigma}\sqrt{\nu+1}}{\sqrt{\nu+\frac{(x-\mu)}{\sigma}}};\nu+1\right) \quad \ldots(2)$$

Here $t(.)$ and $T(.)$ are probability density and cumulative density functions of the student's-t distribution, respectively.

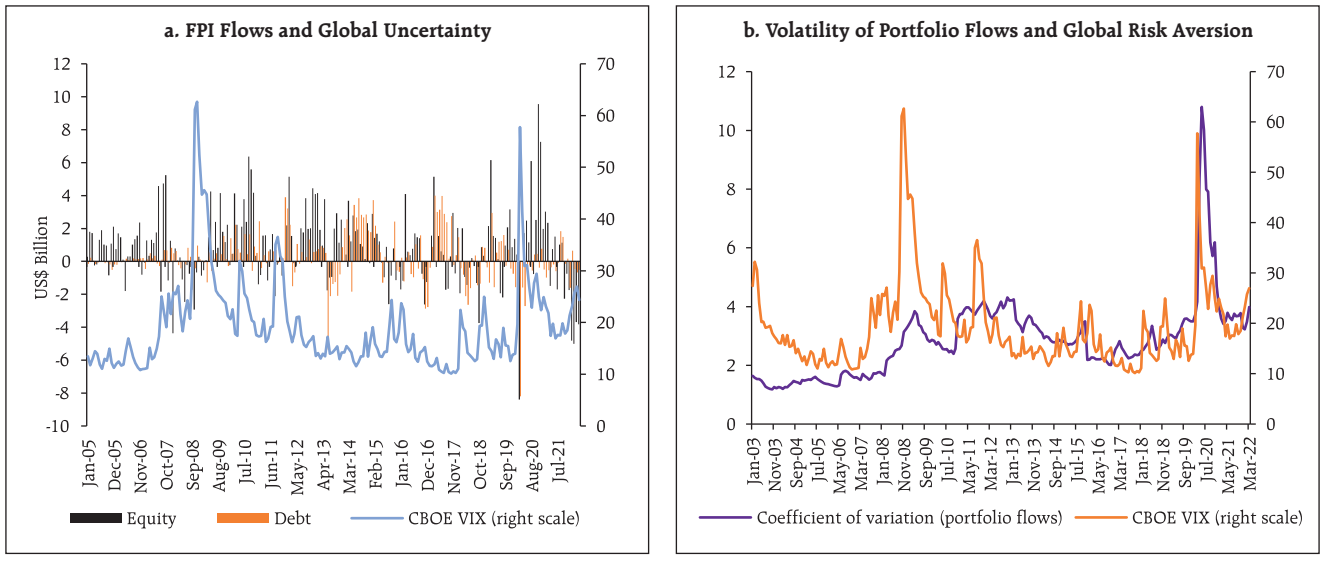
Drawing on the extensive literature on capital flows and "pull" and "push" factors (Koepke, 2019), changes in global uncertainty, as captured in the VIX of the Chicago Board Options Exchange (CBOE), affect the risk appetite of international investors which, in turn, results in sudden movements in capital flows as observed vividly during the GFC, the European debt crisis and COVID-19. Movements in the VIX are closely associated with the volatility of foreign portfolio investment (FPI) flows to and from India (Chart 5). We also observe an inverse association between capital flows and VIX, indicating high risk aversion of international investors during periods of uncertainty.

Other forms of capital inflows like FDI and ECBs are driven mainly by attractive returns in India relative to the rest of the world, which we attempt to capture through India's growth relative to the US (Chart 6). This is a hybrid push-pull variable which economises on degrees of freedom lost that is acute in quantile regressions.

[3] A quantile divides a frequency distribution into equal groups, each containing the same fraction of the total population.

[4] In contrast to ordinary least squares, which provides an estimate of the conditional mean of a variable of interest, given a set of explanatory variables, quantile regression allows modelling the entire conditional distribution of a dependent variable for a given set of covariates. Hence, quantile regression allows the effects of independent variables to differ over quantiles.

Chart 5: FPI Flows and Volatility



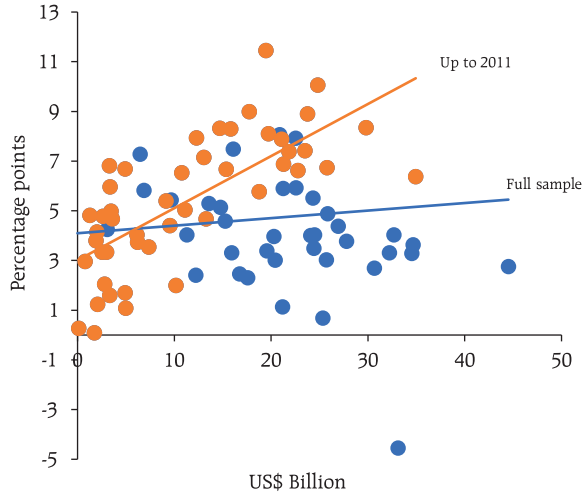
Source: Authors' calculation; FRED St. Louise.

Ultra-accommodative monetary policies and ultra-low interest rates in AEs have been extensively studied in the literature as a powerful push factor driving capital flows to EMEs, especially in the post-GFC years. Again, we employ a hybrid variable – interest rate differential between India and the US – and find a strong positive association with capital flows (Chart 7).

The shifts in macroeconomic risks as reflected in term premia (*i.e.*, the difference between yields on government securities of 10-year and 3-month maturities) are found to be correlated negatively with capital inflows to India (Chart 8).

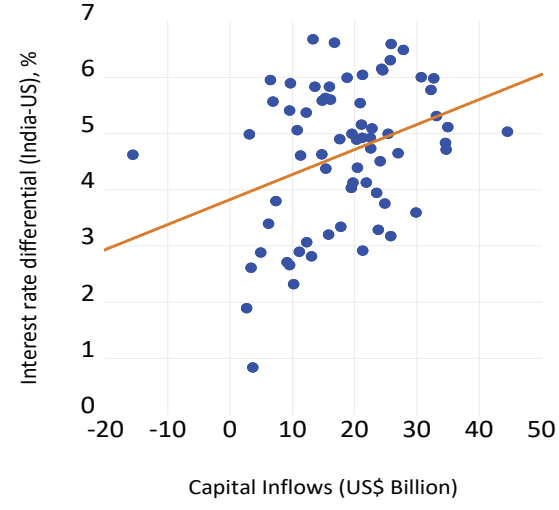
We use quarterly data from 2004:Q2 to 2021:Q1 so as to cover the episodes of capital outflows discussed

Chart 6: Capital Inflows and Growth Differentials



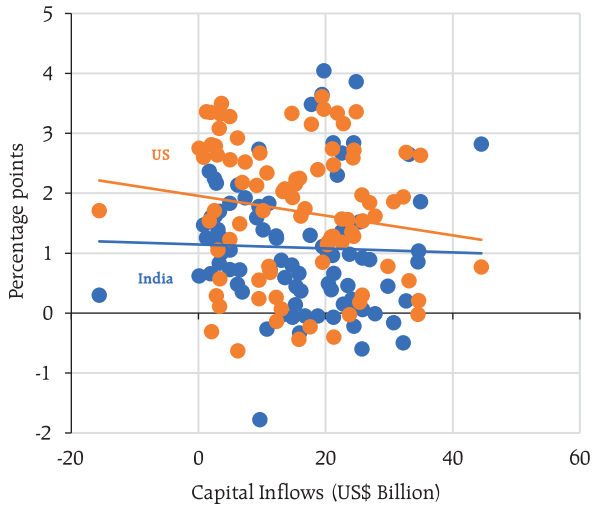
Source: Authors' calculation; Reserve Bank of India.

Chart 7: Capital Inflows and Interest Rate Differentials



Source: Authors' calculation; Reserve Bank of India.

Chart 8: Capital Inflows and Term Premium



Source: Authors' calculation; Reserve Bank of India.

in Section II. Two measures of gross capital inflows (net of redemptions) have been considered - FPI flows to India and gross capital inflows comprising FDI, FPI, external assistance, external commercial borrowings, short-term trade credit, net international liabilities of commercial banks, and other capital flows to India. Like FPI flows, short-term trade credit to India is also found to be volatile and therefore, we have also estimated a CaR exclusively focused on the latter.

IV. Empirical Analysis

The unconditional distribution of capital inflows to India is positively skewed, reflecting that in the net there are more frequent episodes of inflows rather than outflows, with left tail risks[5] associated with FPI being greater relative to overall capital inflows (Table 1).

The results of the quantile regression at (1) in Section 3 are statistically satisfactory. Growth differentials and the term premium in India turn out to be the most influential variables in determining capital flows to India, indicating the predominance of pull factors (Chart 9). The coefficients on these variables are lower in size or statistically insignificant for the left quantiles, indicating a weakening of pull factors in attracting capital inflows in the face of uncertainty. These results hold across aggregate flows and portfolio investment. Interest rate differentials are found to be statistically insignificant, although a rise in US yields by itself is generally associated with portfolio outflows. The US term spread is statistically insignificant, but the sensitivity towards the left tail is high, implying that a rise in macro risks in the US pushes capital flows to India. VIX is found to be negative and statistically significant only in the case of portfolio flows, reinforcing the role of risk aversion. Overall, the quantile regression results suggest that the responsiveness of capital flows in the tails is high relative to the centre of distribution, making a case for estimating the size of expected capital outflows in the case of an adverse event.[6]

The predicted capital flows of lower and higher quantiles show the dynamics of CaR over time

Table 1: Distribution of Capital Flows to India

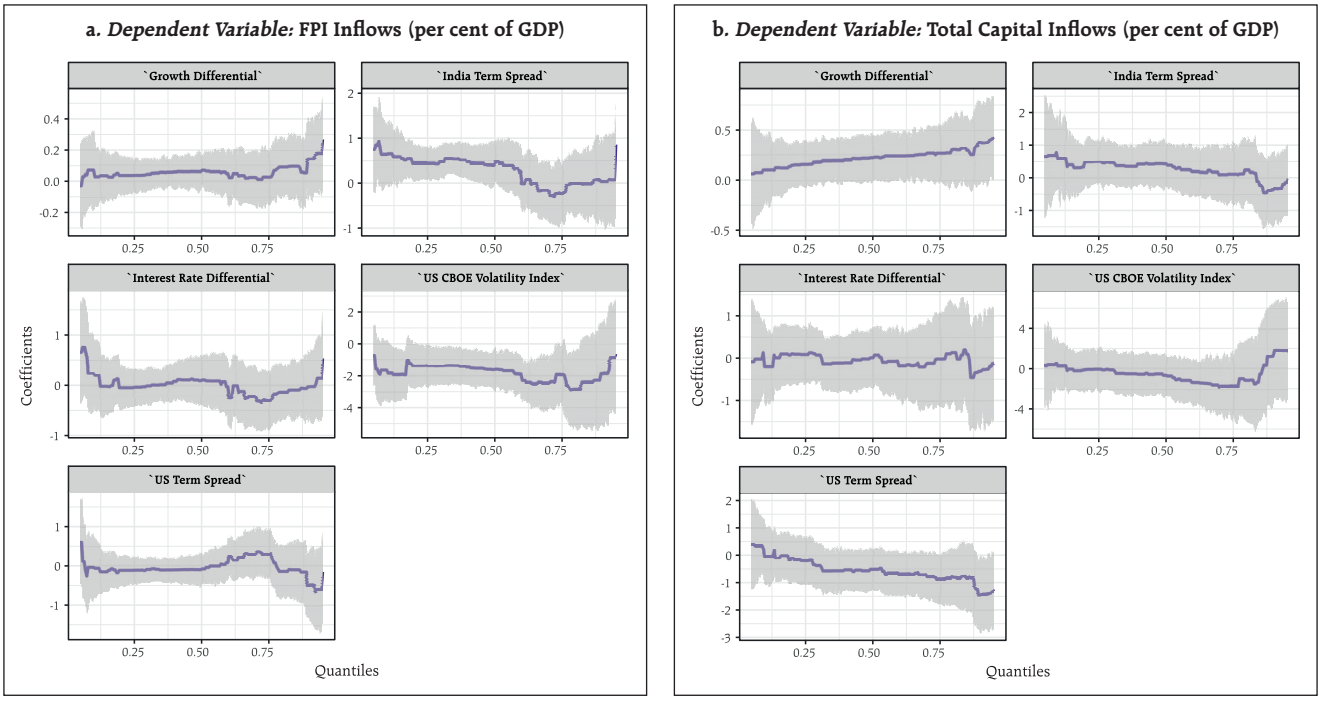
	Minimum	1st Quantile	5th Quantile	Median	95th Quantile	99th Quantile	Maximum
FPI Inflows to India (per cent of GDP)	-2.04	-2.03	-1.46	0.91	3.12	4.34	5.14
Total Capital Inflows (per cent of GDP)	-1.76	-0.36	-0.88	3.96	8.66	10.95	11.55

Source: Authors' estimates; Reserve Bank of India.

[5] Risks of capital outflows (reversals of inflows/ capital flight) are generally indicated through left tails while the risks of capital inflows (surges) are captured in right tails.

[6] The robustness of the results is examined separately using financial conditions of India and the US, which is presented in the Annex. The results are found to be qualitatively similar.

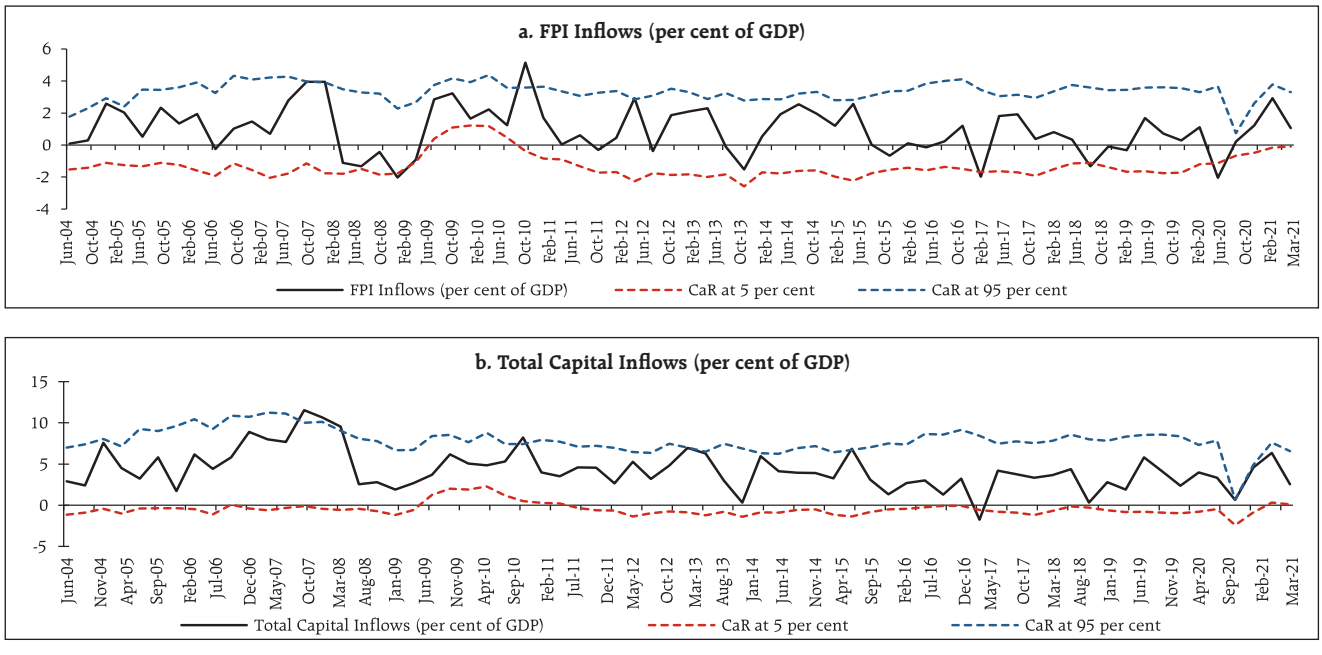
Chart 9: Quantile Regression Results



Source: Authors' estimates.

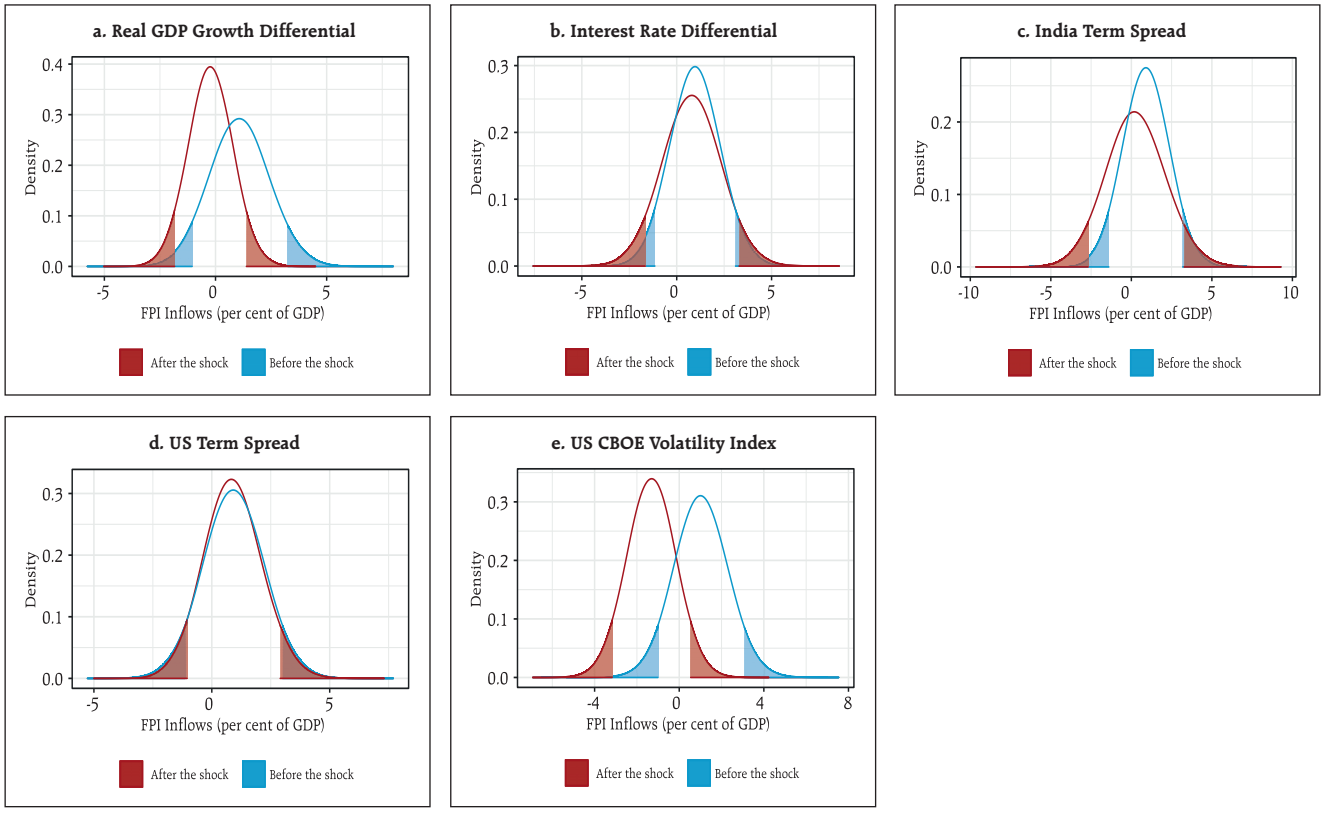
(Chart 10). The estimated tail risks (CaR at 5 per cent) to capital flows are found to be high and they match with the actual capital outflows during the GFC and the taper tantrum. On the other hand, the 5th quantile

Chart 10: Capital Flow at Risk (CaR)



Source: Authors' estimates.

Chart 11: FPI Inflows



Note: "Before the shock" is the baseline scenario in which all explanatory variables are considered at their respective historical average values. "After the shock" is the scenario of adverse shock (historically observed) to the respective explanatory variable.
Source: Authors' estimates.

estimate fails to capture the pandemic experience in respect of portfolio flows but the CaR for the 95th quantile drops to 0.7 per cent of GDP from 3.7 per cent, indicating a lower probability of getting capital inflows during the pandemic. The CaR of overall capital flows drops from -0.5 per cent of GDP to -2.4 per cent of GDP during the Covid-19 phase, a historically high value. In fact, the data point to a fall in the otherwise stable FDI during this period.

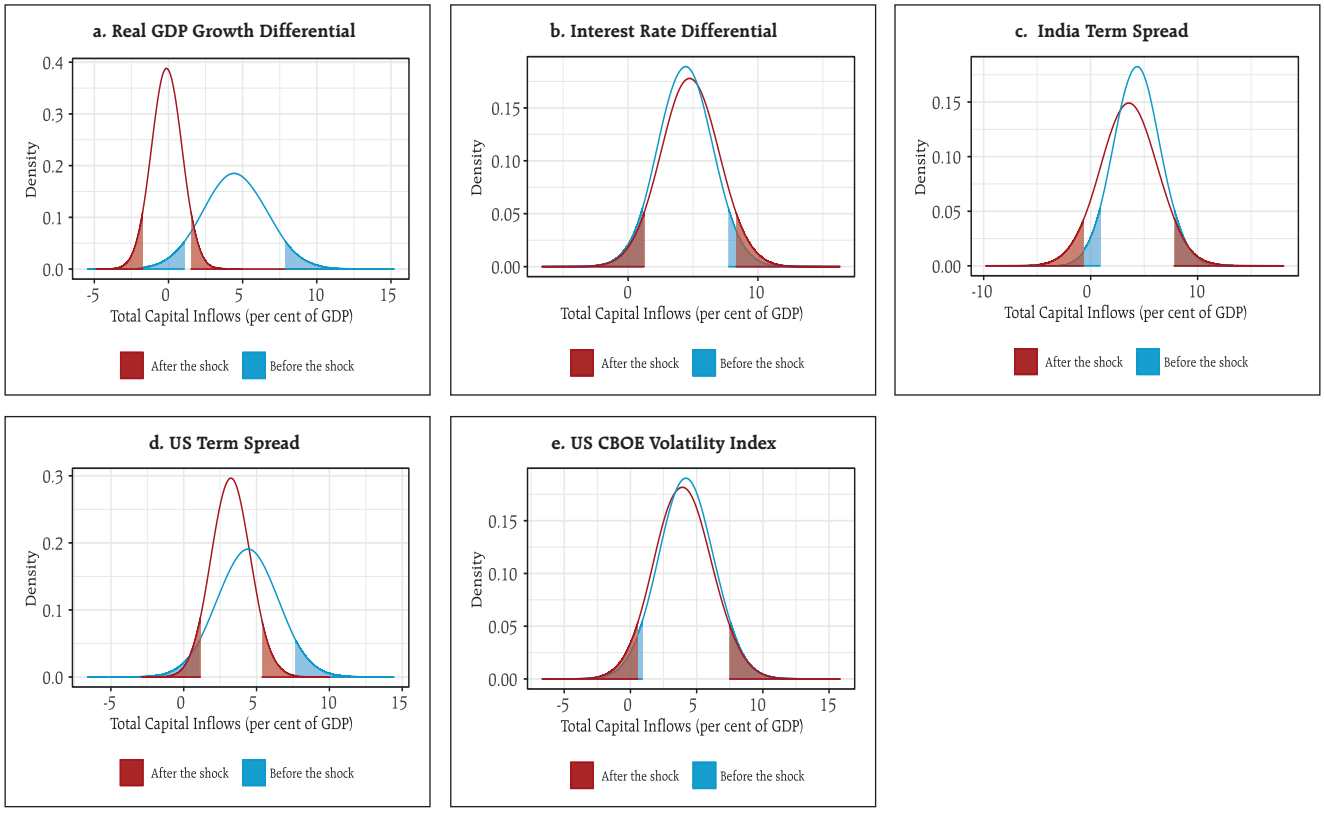
A comparison of the distributions of predicted capital flows (baseline or before shock) and predicted capital flows with shocks (equivalent to extreme historical values) to the push and pull factors - one at a time - reveals that VIX is the primary factor for tail risks to FPI flows while growth differentials and the US's term spread are major upside risks to overall capital inflows (Charts 11 and 12). A higher positive growth differential increases the likelihood of capital flows to India, while an inverted yield curve as observed during the taper tantrum period could enhance the risk of extreme capital outflows, particularly in the case of portfolio flows, which have a greater sensitivity to volatility represented by the VIX than other flows.

With these inputs, it is possible to estimate the expected value of capital outflows below the 5th quantile in the face of black swan events[7]. This estimate becomes relevant from a policy perspective in order to plan buffers and countervailing actions. The expected capital outflows are estimated as:

$$CF_{0.05} = E(y|y < CaR_{0.05}) \quad \ldots(3)$$

[7] The estimation of expected capital outflows at 5 per cent probability is similar to the expected loss measure, *i.e.*, conditional value at risk (CVaR).

Chart 12: Total Capital Inflows



Note: "Before the shock" is the baseline scenario in which all explanatory variables are considered at their respective historical average values. "After the shock" is the scenario of adverse shock (historically observed) to the respective explanatory variable.
Source: Authors' estimates.

In response to shocks to each of the determinants of a size that is at least equal to what has been observed in the historical experience, potential portfolio outflows can be in the range of 2.6 to 3.6 per cent of GDP, averaging to 3.2 per cent of GDP (or US$ 100.6 billion in a year) (Table 2).

Table 2: Expected Capital Outflows during Extreme Adverse Shocks (per cent of GDP)

$CF_{0.05}$	The scenario of historically extreme adverse shocks				
	Lowest GDP growth differential	Lowest Interest rate differential	Lowest India term spread	Highest United States term spread	Highest US CBOE Volatility Index
FPI Inflows (per cent of GDP)	-3.18	-3.10	-3.63	-2.62	-3.32
Total Capital Inflows (per cent of GDP)	-2.63	-0.01	-2.42	-0.84	-0.08

Source: Authors' estimates.

A black swan event could be characterised by a combination of all adverse shocks experienced in Indian history coming together, leading to a perfect storm. Expected portfolio outflows at 5 per cent probability could be of the order of 7.7 per cent of GDP and expected outflows under short-term trade credits could amount 3.9 per cent of GDP (Table 3).

Table 3: Extreme Adverse Shocks Scenarios

	Expected Capital Flows at Risk in Extreme Adverse Shocks to All Factors		
	At 5 per cent probability	At 1 per cent probability	At 0.1 per cent probability
FPI Flows (per cent of GDP)	-7.66	-8.89	-10.32
Total Capital Inflows (per cent of GDP)	-5.67	-6.64	-7.81
Short-term Credit to India (per cent of GDP)	-3.87	-4.56	-5.37

Source: Authors' estimates.

Table 4: Probability of Capital Outflow

	Normal / Baseline Scenario	Extreme Adverse Scenario
FPI Flows (per cent of GDP)	0.20	0.96
Total Capital Inflows (per cent of GDP)	0.01	0.89
Short-term Credit to India (per cent of GDP)	0.29	0.89

Source: Authors' estimates.

The magnitude of outflows could be even higher when CaR is measured at 0.1 per cent probability (highly unlikely). These results show that the entire stock of portfolio investments could exit India in this extreme adverse scenario. In the face of an extreme event, other forms of capital flow considered as stable flows may also exit.

As mentioned earlier, another approach for measuring tail risks to capital flows is to calculate the probability of capital flows falling below a certain threshold, say below zero. We have estimated the probability of capital outflows during an extreme event *vis-a-vis* the baseline scenario. The probability of outflows is found to be high during extreme adverse events (Table 4).

V. Conclusion

Even as EMEs have opened up their borders to international capital movements to exploit the well-documented benefits associated with these flows, they have become vulnerable to large swings, with attendant volatility, shocks and crises. With no multilateral safety net in place, EMEs are literally on their own in defending their economies from these vicissitudes. In this context, the estimates from a capital flows at risk (CaR) approach applied to Indian conditions provide proximate answers to the questions we posed to ourselves in the introductory section.

Our findings suggest the predominant role of pull factors in attracting capital flows to India, key among them being growth differentials and domestic term premia. On the other hand, it is global risk aversion, reflected in the VIX, that drives capital outflows. Portfolio flows are the most sensitive to shifts in global risk sentiment. The country experience, including India's, does not offer any quantifiable guideposts for the pace and extent of liberalisation of the financial account of the balance of payments. It is largely a function of crossing the river by feeling the pebbles. Even so, the observed volatility of international capital flows can be overwhelming for individual EMEs, especially with the growing importance of passive flows driven by funds, asset managers and index pursuit.

This brings us to the challenge that EMEs – the so-called bystanders that stand alone – face in mitigating the instability that globally mobile capital flows bring. Clearly, Bretton Woods type prescriptions such as tightening of monetary and fiscal policies, exchange rate adjustments and structural reforms in some kind of pecking order as a hierarchy will not work. All instruments, including prudential and other capital flow measures, are an integral part of the playbook, and often the measures of the first resort. In the ultimate analysis, spillovers can be global but the responsibility for macroeconomic and financial stability is national. This focuses attention on the role of international reserve accumulation as the only reliable safety net. Obviously, adequacy becomes the key consideration and this is an empirical, country-specific issue.

Our results indicate that there is a 5 per cent chance of portfolio outflows from India of the order of 3.2 per cent of GDP or US $ 100.6 billion in a year in response to (i) a COVID-type contraction in real GDP growth, or (ii) a GFC type decline in interest rate differentials *vis-à-vis* the US, or (iii) a GFC type surge in the VIX. In an extreme risk scenario or a black swan event in which there is a combination of all these shocks, there is a 5 per cent chance of outflows under portfolio investments of 7.7 per cent of GDP and short-

term trade credit retrenchment of 3.9 per cent of GDP. These estimates assume significance when assessed against the total stock of portfolio investment in India of US$ 288 billion and short-term trade credit of US$ 110.5 billion at the end of December 2021. This is indicative of the level of liquid reserves that need to be maintained at all times – in addition to standard metrics of import and debt servicing cover – to quell bouts of instability that volatile capital flows can impose in a dynamic and highly uncertain global setting in which pandemics, supply chain disruptions, and elevated commodity prices and geopolitical tensions keep interacting and intertwining.

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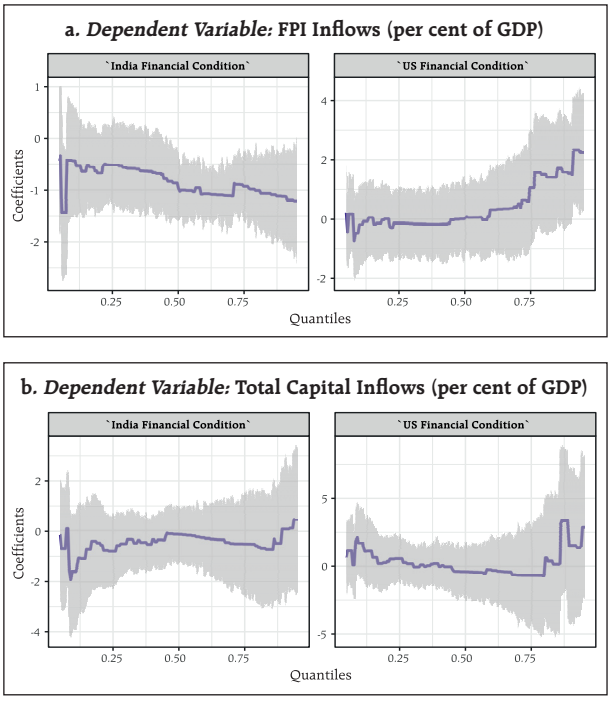
Annex: Capital Flow at Risk using Financial Conditions

An empirical exercise has been put through here using the financial conditions of India and the US as determinants of capital flows to India to assure the robustness of our results. Since capital flows are driven by the risk-adjusted returns, pull and push factors can be proxied by the information content in asset prices. Accordingly, pull factors are proxied by a domestic financial condition index constructed by Citibank while push factors are proxied by a financial condition index for the US.

A higher value of FCI indicates a tighter financial condition and *vice-versa*. Results indicate a tighter financial condition in India could lead to higher capital outflows while a tighter FCI in the US leads to higher capital inflows (Chart A1).

Next, we perform a scenario analysis for the extreme adverse shocks of both the FCIs which were more often observed during the Global Financial Crisis (2007-09). Results show that during extreme domestic

Chart A1: Quantile Regression Results: Financial Conditions



Source: Authors' estimates.

Chart A2: FPI Inflows (per cent of GDP)

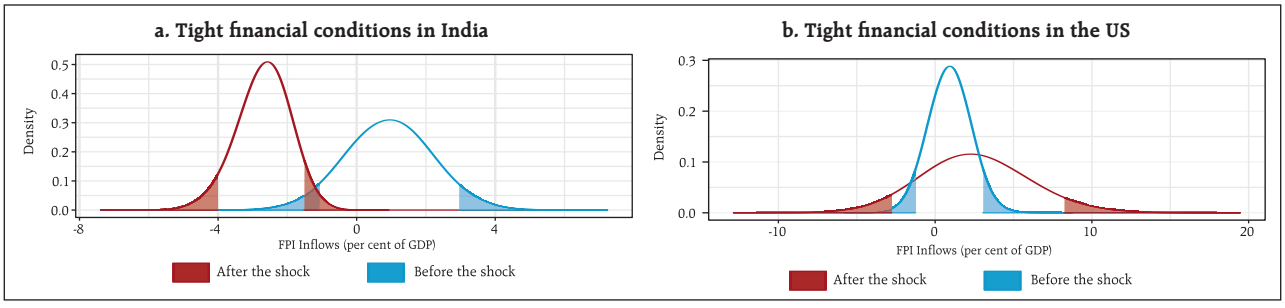
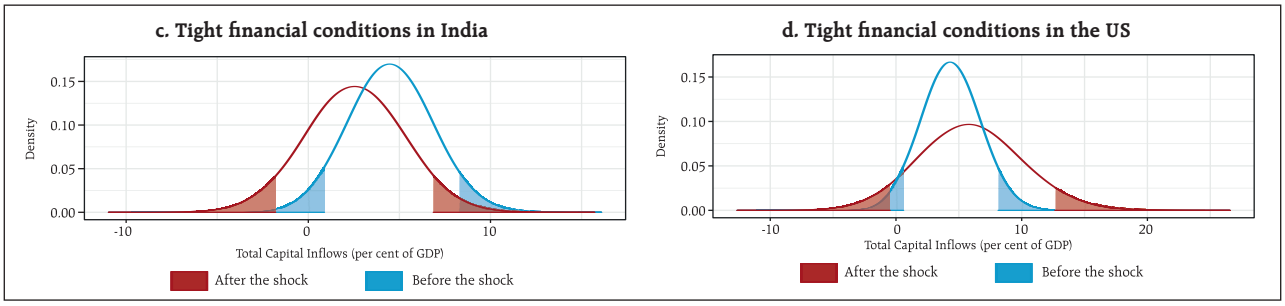


Chart A3: Total Capital Inflows (per cent of GDP)



Note: "Before the shock" is the baseline scenario in which all explanatory variables are considered at their respective historical average values. "After the shock" is the scenario of adverse shock (historically observed) to the respective explanatory variable.
Source: Authors' estimates.

(Contd.)

tight financial conditions there is a higher likelihood of FPI outflows of around 4.9 per cent of GDP. For a similar scenario of the tight financial conditions in the US, it could go to the extent up to 4.2 per cent of the GDP. In the case of overall capital flows to India, a tighter domestic and global financial conditions led to a capital outflow of 3.4 per cent and 1.6 per cent of GDP, respectively (Chart A2). Considering an extreme tight financial conditions both domestically and globally, the expected portfolio outflows could rise up to 6.0 per cent of GDP (Table A1).

Table A1: Extreme Adverse Tight Financial Conditions

	Expected capital outflows with probability		
	At 5 per cent	**At 1 per cent**	**At 0.1 per cent**
FPI inflows (per cent of GDP)	-5.97	-7.41	-9.36
Total capital inflows (per cent of GDP)	-2.18	-3.74	-5.69
Short-term trade credits inflows (per cent of GDP)	-2.68	-3.34	-3.91

Source: Authors' estimates

*Revisiting India's Natural Rate of Interest**

Revisiting the natural rate of interest in India with updated data, we obtain estimates in a range between 0.8 per cent and 1 per cent for Q3 of 2021-22, as against the range of 1.6–1.8 per cent estimated earlier for Q4:2014-15. Pandemic-induced factors have likely altered natural rate of interest which is sensitive to the choice of methodology and variables used, warranting careful interpretation within the assessment of the monetary policy stance.

Introduction

Since the 1990s, the natural rate of interest has transcended its Wicksellian origins and moved into centre-stage in the monetary policy apparatus of modern central banks that employ interest rates as their major policy instrument. The natural rate has emerged as a benchmark for assessing the policy stance. If the policy interest rate adjusted for inflation is higher than the natural interest rate, monetary policy is judged to be as anti-inflationary or contractionary. Analogously, if the real policy rate is lower than the natural rate, monetary policy is regarded as expansionary or accommodative. When the real policy rate is at or close to the natural rate, monetary policy is neutral, *i.e.*, neither expansionary nor contractionary. This situation is expected to prevail when inflation is aligned to the target and output is at or close to its potential level.

The natural rate of interest is, however, unobserved in real life and has to be inferred from the data on its proximate determinants. It is determined by the efficiency of production, available amount of fixed and liquid capital, supply of labour and land (Wicksell, 1898); potential growth (Mendes, 2014; Garrison, 2006); demographics (Ikeda and Saito, 2014); fiscal policy and associated crowding-out effects (Engen and Hubbard, 2004); size of sovereign debt and default risk premium (Manasse *et al.*, 2003); monetary policy shocks (Hanson and Stein 2015); financial cycles (Borio *et al.*, 2019); globalisation and co-movement of real interest rates (Rogoff, 2006); and a host of heterogenous factors like fertility rate and life expectancy, inequality, relative price of capital goods, investment sentiment, capital flows and risk premium (Borio *et al.*, 2017; IMF, 2022)[1]. Consequently, the natural rate of interest, or r-star as it has come to be referred to in central banking parlance, becomes an empirical question (Wieland, 2018). Accordingly, accurate and statistically robust estimation of r-star and regular update of these estimates is a valid operational pursuit in the context of the conduct of monetary policy.

Estimates of the natural rate are notoriously imprecise, which weakens their utility as a reference guidepost for monetary policy. First, empirical estimation is inevitably model-driven and extremely methodology sensitive, with confidence intervals of imprecision. Model-specific differences and statistical uncertainties of estimates pose formidable obstacles to passing a judgement on the level of the natural rate of interest in real time (Brand *et al.*, 2018). Second, these estimates also tend to be sensitive to the choice of time horizon – short-term, medium-term or long-term – and hence to the nature of shocks (*i.e.*, whether they are temporary or structural and long-lived); the measure of inflation; and, the choice of underlying determinants. Third, it is important to be reminded by prescient voices in the literature that incorrect estimation of the natural rate could lead to significant welfare cost (Orphanides and Williams, 2002). Consequently, a central bank may generally talk about the level of interest rates that would broadly be

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[1] Please see Behera *et al.*(2015) for a comprehensive review of literature on the range of possible determinants of the natural interest rate.

neutral, instead of conveying any precise number (Chetwin and Wood, 2013).

In the post-pandemic world, identification of the level of this neutral interest rate has become even more challenging because several determinants of the natural rate have exhibited distinct shifts, with persisting uncertainty about whether and over what time frame they may normalise. The trajectory of potential growth, a key determinant of the natural rate, may rise due to large increase in public spending on infrastructure, digitisation, push to innovation from start-ups and new business opportunities, but it may also decline due to the scarring effects of the pandemic on education, labour market, globalisation, growing state influence in the economy and market concentration, and hence on productivity (Gromling, 2021; Tanaka *et al.*, 2021). Pandemics typically depress investment demand, because of the overwhelming preference of households to save more/rebuild depleted wealth rather than consume, and as a result, the natural interest rate post-pandemic may decline by nearly 1.5 percentage points, reaching its lowest point after about 20 years, and then taking equal number of years to return to the pre-pandemic level (Jorda *et al.*, 2020). While higher public spending and government debt could raise the r-star, a drop in desire to invest by the private sector and an increase in desire to save by the households may lower it, with the net impact likely to remain uncertain (Adolfsen *et al.*, 2021). Two opposing forces – high public debt and expenditure on the one hand and the unusual swell in savings on the other – could influence the evolution of the natural rate post-COVID (Goy and End, 2020; Bismut and Ramajo, 2021). Extra caution, however, would be advisable while estimating the natural rate because the impact of the ongoing structural transformations ranging from climate change to the rise of shadow banking and fintech may be hard to approximate (IMF, 2022). Thus, for monetary policy assessment, what one can get is a broad range rather than a bright line drawn on the road: "It's not something we can identify with any precision. So we estimate it within broad bands of uncertainty" (Powel, 2022)[2].

In India, net household financial savings surged to about 16 per cent of GDP in Q1:2020-21 during the first wave of the pandemic, from 8.0 pr cent of GDP during the financial year 2019-20, before moderating in the subsequent three quarters. During the second wave of the pandemic, it surged again to 14.8 per cent of GDP in Q1:2021-22 (RBI, 2022). On the other hand, general government debt increased to 89.4 per cent in 2020-21 (from 75.7 per cent in 2019-20) and is likely to remain sticky at around 84 per cent of GDP over the next five years (RBI, 2022). The potential growth of India is also assessed to have declined to marginally below 6 per cent post-COVID (RBI, 2022; Patra *et al.*, 2021), though the steady state growth path is likely to normalise/rise to a range of 6.5 - 8.5 per cent in the medium-term as the beneficial impact of reforms in the pipeline as well as new reforms gain traction[3]. In the labour market, the labour force participation rate plummeted after the pandemic struck, which is yet to normalise (RBI, 2022). According to the recent National Family Health Survey (NFHA), India's fertility rate has consistently declined over the last three decades to marginally below the replacement rate. Sharp changes in these underlying drivers of the natural rate call for a revisit of the estimates. This assumes relevance in the context of the

[2] As stated in the transcript of Chair Powell's Press Conference of May 4, 2022 in response to a question on what constitutes a neutral policy setting in terms of the fed funds rate.

[3] Post-pandemic, several sectors in the economy have exhibited remarkable resilience – agriculture, exports, start-ups, renewables and balance sheets of the organised corporate sector and the financial sector. After the impact of record high commodity prices and global supply chain disruptions on growth dissipates, the economy is likely to recover to a steady state of 6.5 – 8.5 per cent (RBI, 2022). Accordingly, while the estimated time varying natural rate may moderate/hover within a wider range for the immediate post-COVID period, it may converge to a range consistent with the assessed medium-term steady state path, whose lower range is similar to the average GDP growth of 6.6 per cent recorded pre-COVID (CAGR for 2012-13 to 2019-20).

recent observation that "It is time now (for the RBI) to withdraw crisis time accommodation in terms of moving towards the equilibrium or neutral real rates consistent with non-inflationary growth" (Goyal, 2022)[4].

Set against this background, the main motivation of this article is to update estimates of r-star for India provided in Behera *et al.* (2015), while also exploring new estimates that incorporate the effects of financial cycles. Section II presents the theoretical framework used for estimation of the natural rate. Empirical results are set out in Section III. Concluding observations are given in Section IV.

2. Theoretical Framework for Estimation

The methodology used in this article follows the seminal work of Laubach and Williams (2003) (LW, henceforth) and its extended version (Juselius *et al.*, 2016)[5]. In essence, the LW framework combines robust theoretical relationships embodied in Ramsey's growth model and the standard New Keynesian or neo-Wicksellian policy dynamics with the Kalman filter estimation technique, in order to model unobservable/ unknown macro-dynamics. In the New Keynesian framework, the natural rate of interest is time-varying and could be influenced by shocks impacting both aggregate supply and aggregate demand.

Ramsey's growth model endogenises saving (consumption) behaviour in response to changes in the interest rate (r) relative to the household's time preference (ρ), and inter-temporal elasticity of substitution ($\sigma = \frac{1}{c}$), where c is the risk aversion parameter. In a simple representation of this relationship, output growth depends on the saving rate which, in turn, is a function of r, ρ and σ.

$$g = \frac{1}{c}(r - \rho) \quad \ldots (1)$$

If the time preference to consume today relative to tomorrow is high, r must exceed ρ to encourage saving today. The extent by which saving may increase will depend on the intertemporal elasticity of substitution. By rearranging (1):

$$r = \rho + cg \quad \ldots(2)$$

The more general reformulation, as considered by LW, is presented below:

$$r_t^* = cg_t + z_t \quad \ldots(3)$$

This suggests that the natural rate (r_t^*) moves up and down along with the potential (or trend) growth (g_t), while z_t captures all other determinants of r_t^*, including ρ.

A modified version of equation (3), which considers a slow adjustment process in the movement of the natural rate, can be written as:

$$r_t^* = \beta_1 r_{t-1}^* + (1 - \beta_1)(\frac{1}{\sigma} g_t + z_t) \quad \ldots(4)$$

The laws of motion driving unobservable potential output and its growth rate (g_t) are specified as:

$$y_t^* = y_{t-1}^* + g_{t-1} + \varepsilon_t^{y*} \quad \ldots(5)$$

$$g_t = g_{t-1} + \varepsilon_t^g \quad \ldots(6)$$

where ε_t^{y*} and ε_t^g are serially uncorrelated errors. Drawing on the literature, potential output is assumed to follow a random walk with a drift, and trend growth is assumed to follow a random walk process.

It is assumed that z_t follows a random walk process (following the LW), *i.e.*,

$$z_t = z_{t-1} + \varepsilon_t^z \quad \ldots(7)$$

where ε_t^z is a white noise process.

We model aggregate demand (IS curve) and expectations augmented Phillips curve as follows:

$$\tilde{y}_t = (y_t - y_t^*) = \phi_1 \tilde{y}_{t-1} - \phi_2 \tilde{y}_{t-2} - \gamma(r_{t-1} - r_{t-1}^*) + \varepsilon_t^{\tilde{y}} \quad \ldots(8)$$

[4] Minutes of the Monetary Policy Committee Meeting, RBI, April 6 to 8, 2022 released on April 22, 2022.

[5] According to Juselius *et al.* (2016), a real interest cannot be considered an equilibrium interest rate if it generates costly boom-bust cycles and therefore, any natural rate estimate that ignores the state of the financial cycle may have limitations in guiding monetary policy.

$$(\pi_t - \pi_t^*) = b_1\tilde{y}_{t-1} + b_2\tilde{y}_{t-2} + \varepsilon_t^{\pi} \quad ...(9)$$

with inflation expectations as: $\pi_t^* = \pi_{t-1}^* + \varepsilon_t^{\pi^*}$ ...(9')

where $\tilde{y}_t$ is the output gap, r_t is the real interest rate, π_t^* is the inflation expectations derived from its underlying trend which follows a random walk process and r_t^* is the natural or equilibrium real interest rate. Aggregate demand (output gap) responds to changes in the real interest rate (engineered through changes in the nominal interest rate in the short-run) which, in turn, influences q-o-q annualised inflation (π_t). It follows a feedback rule, based on time-varying (π_t^*) and ($y_t - y_t^*$), for given r_t^*.

An important channel through which monetary policy could alter the trend real interest rate is the financial cycles (Borio *et al.* 2019). Incorporating financial cycles into a modified LW framework ensures that the equilibrium real interest rate is consistent not only with the requirement of actual output at close to potential and actual inflation close to its long-term trend but also with a state of financial equilibrium. Financial booms and busts can have permanent effects on output, and therefore, a measure of the natural rate that can also help limit financial disequilibrium in the system could also effectively help reduce output effects of financial booms and busts. The LW framework is augmented by incorporating the leverage gap as a proxy for the financial cycle, *i.e.*, a measure of the leverage gap is introduced in the IS curve as a determinant of the output gap and a separate equation is added for the leverage gap (Juselius *et al.* 2016 and Borio *et al.* 2019).

Modified IS curve:

$$\tilde{y}_t = \phi_1\tilde{y}_{t-1} - \phi_2\tilde{y}_{t-2} - \gamma_1(r_{t-1} - r_{t-1}^*) - \phi_3 levg_{t-1} + \varepsilon_t^{\tilde{y}} \quad ...(10)$$

Evolution of the leverage gap:

$$levg_t = \beta_2 levg_{t-1} + \gamma_2(r_{t-1} - r_{t-1}^*) + \varepsilon_t^{lev} \quad ...(11)$$

The leverage gap is estimated by first establishing a cointegrating relationship between credit to GDP ratio (*cred*) and real asset prices (*rap*), and then taking deviations from its steady state equilibrium relationship:

$$levg_t = cred_t - rap_t - \overline{lev} \quad ...(12)$$

When the leverage gap is negative, that would indicate that asset prices are bullish, and through positive collateral valuation effects, the credit to GDP ratio could increase, leading to higher output. This inverse relationship between the leverage gap and the output gap in the modified IS curve is presented in eq. (10). The real interest rate gap (*i.e.*, actual real interest rate *minus* the natural rate) matters for the leverage gap, as presented in eq. (11). If the actual real rate is above the natural rate, asset prices should decline to increase the leverage gap.[6] The real interest rate is the difference between nominal policy rate (i_t) and inflation expectations (π_t^*), where i_t is based on a Taylor-type rule: $i_t = \beta_9 i_{t-1} + (1-\beta_9)\left(r_t^* + \pi_t^* + \beta_{10}(\pi_t^{yoy} - \pi_t^*) + \beta_{11}\tilde{y}_t\right) + \varepsilon_t^i$ ...(13)

Here, π_t^{yoy} refers to y-o-y inflation.

Quarterly data for various macroeconomic variables for the period 1999:Q4 to 2021:Q4 are used. GDP data are obtained from the website of the National Statistical Office with appropriate splicing (Bhoi and Behera, 2017). GDP data are adjusted for COVID-19 shocks (Patra *et al.*, 2021). Data on consumer prices (CPI-combined), short-term nominal interest rates (91-day Treasury bill yields), bank credit and BSE Sensex (as a proxy for India's equity prices) are taken from the Database on Indian Economy (https://dbie.rbi.org.in). The underlying real interest rate (r) used in the model is worked out by taking the difference between 3-month Treasury bill

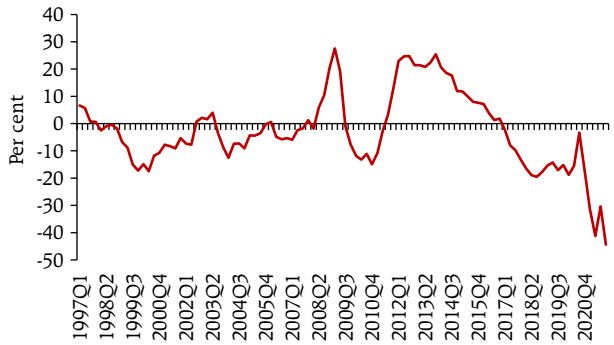
[6] Since we did not find two cointegrating vectors between credit-GDP ratio, real asset prices and weighted average lending rate as found by Juselius and Drehmann (2015), we use only the first two variables to estimate the leverage gap, and accordingly estimate the model without a debt service gap as specified in eq. (10). By imposing two cointegrating vectors among the variables as in Juselius and Drehmann (2015), we did not find the path of the leverage gap altering much from what is used in our model.

yields[7] and the underlying trend inflation. The trend inflation, estimated endogenously within the model, is used as a proxy for inflation expectations. Real GDP, CPI, bank credit and equity prices are adjusted for seasonality using US Census X-13 ARIMA-SEATS[8]. The real equity price (*rap*) series is constructed by deflating seasonally adjusted equity prices with seasonally adjusted CPI inflation. The credit to GDP ratio variable is generated by dividing bank credit with nominal GDP.

In order to estimate the model with latent factors, the standard practice is to use maximum likelihood estimation (MLE) methods (Laubach and Williams 2003; Clark and Kozicki 2005; Behera *et al.* 2017; Holston *et al.* 2017). Here, the main challenge is fixing relevant priors on parameters, giving rise to the 'pile-up problem'[9], as the contributions from variations in some of the variables used in estimation to overall variability in the data are relatively small (Me´sonnier and Renne 2007; Laubach and Williams 2003; Stock and Watson 1998; Stock 1994). Consequently, maximum likelihood estimates tend to be biased, which can be mitigated by using the median unbiased estimator procedure, but it is based on a very precise implicit prior belief about the volatilities of latent factors and, therefore, highly restrictive (Lewis and Vazquez-Grande, 2018). To overcome these problems, we have used Bayesian methods with relatively loose priors on different parameters[10]. This not only provides a solution to the pile-up problem, but it also generates estimates which are more reliable (Primiceri 2005; Lewis and Vazquez-Grande 2018; Kim and Kim 2018).

Johansen maximum likelihood estimation results suggest the evidence of one cointegrating relationship,

Chart 1: Leverage Gap



Note: When the leverage gap is negative, real asset price growth is stronger than the corresponding value of the credit to GDP ratio. A pick-up in credit/GDP ratio induced by the positive collateral value of financial assets could close the gap over time. In turn, when the leverage gap is positive, decline in real asset prices may drive the credit to GDP ratio to moderate responding to lower value of collaterals, which in turn could close the gap over time. The overriding assumption here is that loans are collateralised and there is a trend relationship between real asset prices and credit/GDP ratio, but the actual behaviour of the two variables may deviate from their steady state relationship at any point in time.
Source: Authors' estimates.

as the null hypothesis of 'no cointegration' is rejected at 5 per cent level of significance. The estimated leverage gap for India seems to capture credit booms and episodes of asset price bubbles and busts reasonably well (Chart 1). For the more recent period *i.e.*, 2018-21, the leverage gap would suggest that asset (equity) prices are relatively bullish compared with the credit-GDP ratio in the economy, resulting in a negative leverage gap. If a "lean against the wind" policy is pursued, then asset prices could get better aligned with the credit to GDP ratio[11].

Employing a Bayesian approach as stated earlier, we have estimated the baseline LW version (eqs. 4 to 9') and the modified LW version adjusted for financial cycle (replacing equation 8 with eq. 10 and adding eqs. 11 and 13). Given that the parameter set is large, we avoid specifying priors that are fully non-informative and consider a beta distribution for prior parameters

[7] A short-term risk-free money market rate like the 3-month Treasury Bill rate is commonly used to estimate the natural rate as it is market determined, and hence can capture the time varying impact of key determinants of an equilibrium interest rate.

[8] Please see https://www.census.gov/srd/www/x13as/

[9] The pile-up problem is said to occur when the maximum likelihood estimate of the variance of a state equation error is zero, even though its true value is small but not zero. This makes statistical inference more difficult as the usual asymptotic properties of the estimator do not hold.

[10] Pescatori and Turunen (2016) have also shown that a Bayesian approach generates more plausible results than MLE for the unobserved variables in the LW model.

[11] For India, the specific reasons as to why monetary policy should not pursue a "lean against the wind" approach was highlighted in Singh and Pattanaik (2012).

for the coefficient value of all variables and a gamma distribution for shock variances. The assumptions on specifying the means and standard deviations of the priors are mostly motivated by existing estimates for India in the literature as well as estimates from HP filtered series of different variables wherever parameter estimates are not available in the literature. We calibrate the rate of time preferences (ρ) with a value equal to 0.99 in line with the literature. As we have estimated the model with non-stationary variables, we use diffuse Kalman filter along with Metropolis-Hastings algorithm to estimate the model. Each set of results is based on 180,000 posterior draws while considering an initial 50 per cent draws as burn-in. For computing each marginal likelihood value, we use 90,000 important sampling draws.

3. Empirical Results

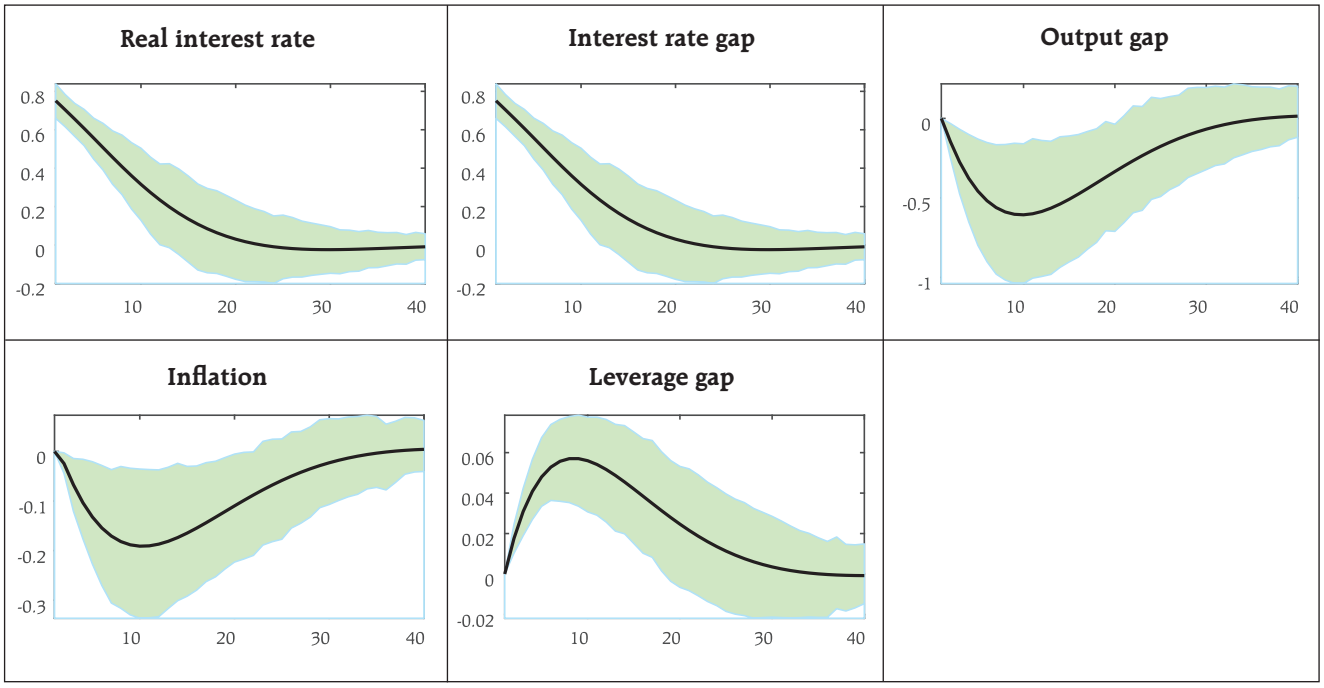
The posterior estimates of the parameters in the model are found to be different from the priors, making them suitable for use to estimate the natural rate (Table 2). The posterior estimates indicate that the output gap is significantly influenced by the leverage gap (*a la* Rath *et al.*, 2017 and Juselius *et al.*, 2016). Some caveats, however, need to be recognised. First, the inclusion of the leverage gap in the IS curve equation increases persistence of the output gap, implying a weaker influence of monetary policy (or real interest rate gap) on demand conditions (or output gap). Second, the leverage gap also exhibits a high degree of persistence, indicative of long-run effects on the output gap. Third, we did not find a major role of monetary policy in influencing financial cycles in India as the coefficient of the real interest rate gap (γ_2) in the leverage gap equation is small.

Impulse responses from the estimated model suggest that a positive shock to the interest rate leads to an equivalent increase in the real interest rate gap, which lowers the output gap and inflation and also narrows the leverage gap. The magnitude of the impact on the leverage gap is relatively small though, and it also involves greater lags (Chart 2). This suggests that the use of macro-prudential measures instead of monetary policy may be the preferred policy option to stabilise the leverage gap.

Table 2: Parameter Estimates with and without Leverage Gap

Equation	Parameter	Variables	Without Leverage Gap				With Leverage Gap			
			Prior mean	Prior s.d.	Posterior mean	Posterior s.d.	Prior mean	Prior s.d.	Posterior mean	Posterior s.d.
IS Curve	ϕ_1	$(y_{t-1} - y^*_{t-1})$	0.60	0.15	0.816	0.079	0.60	0.15	0.911	0.049
	ϕ_2	$(y_{t-2} - y^*_{t-2})$	0.30	0.15	0.094	0.053	0.30	0.15	0.049	0.031
	γ_1	$(r_{t-1} - r^*_{t-1})$	0.30	0.15	0.175	0.084	0.30	0.15	0.190	0.087
	ϕ_3	$levg_{t-1}$					0.20	0.07	0.200	0.071
Phillips Curve	b_1	$(y_t - y^*_t)$	0.13	0.05	0.130	0.049	0.13	0.05	0.169	0.057
	b_2	$(y_{t-1} - y^*_{t-1})$	0.11	0.05	0.096	0.043	0.11	0.05	0.150	0.059
Taylor Rule	β_9	i_{t-1}	0.80	0.19	0.933	0.019	0.80	0.10	0.940	0.019
	β_{10}	$(\pi^{yoy}_t - \pi^*_t)$	1.50	0.10	1.487	00.099	1.50	0.10	1.467	0.100
	β_{11}	$\tilde{y}_t$	0.30	0.07	0.316	0.072	0.30	0.07	0.310	0.070
Natural Rate	β_1	r^*_{t-1}	0.95	0.025	0.946	0.027	0.95	0.025	0.935	0.024
Leverage Gap	β_2	$levg_{t-1}$					0.50	0.20	0.833	0.054
	γ_2	$(r_t - r^*_t)$					0.30	0.20	0.023	0.006

Chart 2: Impulse Responses to Monetary Policy Rate Shock

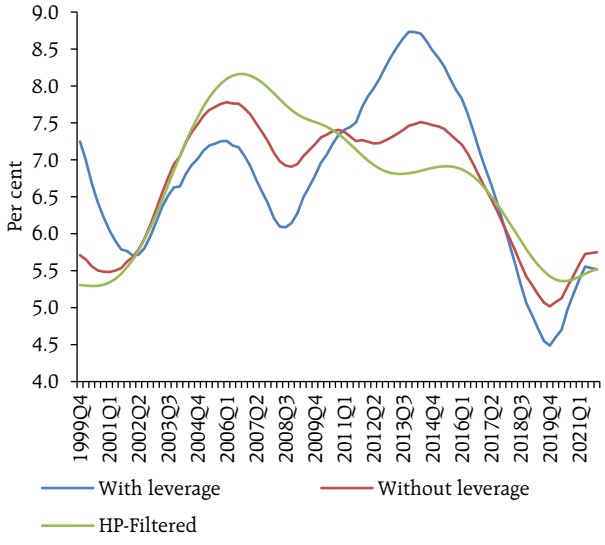


Source: Authors' estimates.

The results indicate that since 2014, growth in potential output has decelerated, and the output gap measures[12] show the presence of slack in the economy, which is in line with the findings of Patra *et al.* (2021) (Chart 3). Correspondingly, the natural rate is estimated to have declined to 1 per cent, with a higher confidence band (lower band at 0.15 per cent and the upper band at 1.9 per cent) to reflect the impact of post-COVID volatility in key determinants of the natural rate (Chart 4).

While LW based estimates using different measures of inflation (*i.e.*, headline and core CPI) produce more or less similar time varying behaviour of the natural rate of interest, the estimates incorporating leverage dynamics produce different set of estimates (Chart 5). For Q3:2021-22, LW estimates are in the range of 0.8 per cent (when core CPI inflation is used as the deflator)

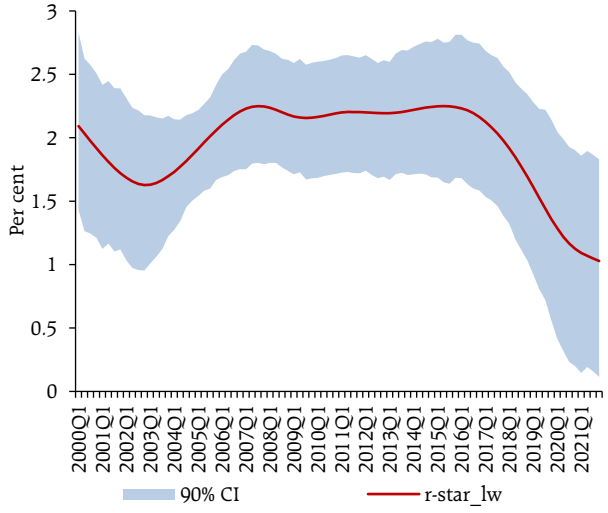
Chart 3: Potential Output (Growth in per cent)



Source: Authors' estimates.

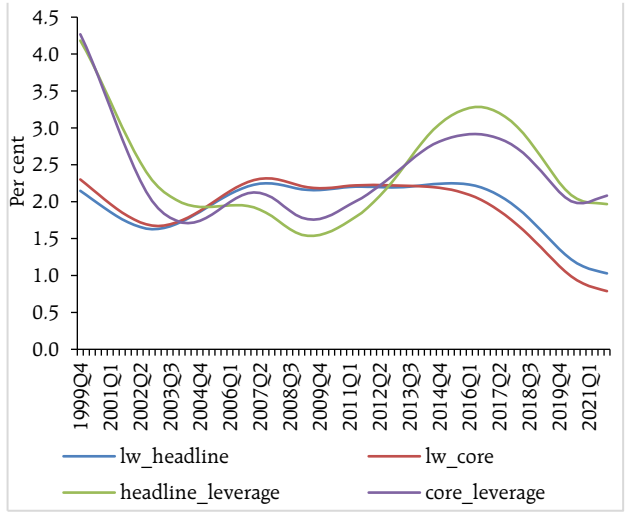
[12] It is important to note here that standalone estimates of potential output and output gap using any standard time series technique (such as a Hodrick-Prescott Filter) could yield very different results compared with LW model consistent measures, and therefore, it is not advisable to use natural rate estimated from a LW framework in a Taylor type rule that otherwise uses independently estimated measures of output gap.

Chart 4: India's Natural Rate of Interest (with 90 per cent CI)



Source: Authors' estimates.

Chart 5: Estimates of Natural Interest Rates - Different Measures



Source: Authors' estimates.

to 1.0 per cent (when headline CPI inflation is used as the deflator), with a wide confidence band of around +/- 90 bps. Corresponding modified LW estimates are in the range of 2.0 per cent to 2.1 per cent with a confidence band of around +/- 60 bps.

Available estimates of the natural rate of interest for India in the literature during the last decade offer useful insights. The trend level of the real policy rate in India derived from application of statistical filters declined by more than 200 basis points after the global financial crisis (Perrelli and Roache, 2014). Large downward shifts in estimated natural rates after the global financial crisis have been reported in the literature for both advanced and emerging economies. Natural rates in the Asian economies also declined after the global crisis, reflecting lower trend GDP growth at home and a lower global neutral rate. Three different methodologies – theoretical calibration; semi-structural modelling; and extended Taylor rule – suggested a decline in India's natural rate after the global crisis to 2.6 per cent, 4.2 per cent and 1.1 per cent, respectively (IMF, 2015). Another study for the BRICS countries highlighted that in India the real interest rate has been systemically kept below the equilibrium value and must be raised (Klose 2018). A counter view is evident from the findings of Goyal *et al.*, (2016), which highlighted that periods when the policy interest rate in India exceeded the natural rate were far more frequent, and as a result, monetary policy was largely contractionary. Thus, in the pre-pandemic period, different estimates were used to draw divergent inferences on the stance of monetary policy. Post-COVID, notwithstanding the higher uncertainty band around the estimated natural rate of India, it may be appropriate to infer that the natural rate might have moderated somewhat, as suggested by the decline in comparable estimates from a range of 1.6 -1.8 per cent[13] in Q4:2014-15 to 0.8 -1.0 per cent in Q3:2021-22.

5. Conclusions

This article highlights why point estimates of the natural rate of interest may vary significantly over time, and more importantly, why the estimated values of the natural rate of interest may lie within a wide range at

[13] The revised estimate for Q4:2014-15 as per the updated model works out to 2.2 per cent.

any point in time, depending upon the choice of methodology, model assumptions and the nature of the data. For India, our estimates of the natural rate for the post-pandemic period suggest a range of 0.8 per cent to 1.0 per cent for Q3 of 2021-22, which is lower by about 80 basis points than the earlier comparable estimate of 1.6 -1.8 per cent for Q4:2014-15. This decline is consistent with the assessed moderation in growth of potential output during the corresponding period. Reflecting greater uncertainty surrounding the estimation of the natural rate post-Pandemic arising from more volatile paths of some of the key underlying drivers of the natural rate, the confidence band around the estimates has increased to +/- 90 basis points, as against +/- 50 bps for 2014-15.

An alternative model that takes into account both financial cycles and business cycles to generate the equilibrium real interest rate recognises the dynamic interactions between them, in the context of the debate on whether monetary policy must "lean against the wind" to avoid asset price bubbles. The alternative estimates of natural rate as per this approach turn out to be higher in the range of 2.0 -2.1 per cent for Q3:2021-22, reflecting the post-pandemic negative leverage gap, *i.e.*, the real asset prices being more bullish than prevailing credit market conditions, that may require higher interest rates than warranted to effectively lean against the wind to restore equilibrium. Impulse response analysis, however, shows that the magnitude of the impact of higher real interest rates on the leverage gap is relatively small and it also works with greater lags. Thus, even as financial cycles tend to influence the output gap, the sensitivity of leverage gap to changes in real interest rate is estimated to be modest, which could be interpreted as a case against using monetary policy to "lean against the wind".

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*Central Bank Balance Sheet Size and Inflation: Unravelling the Fuzzy Dynamics**

The global surge in inflation since the second half of 2021 has reignited interest in assessing the role of post-pandemic balance sheet policies of central banks in fuelling inflation, against the backdrop of the missing inflation puzzle that was encountered after the global financial crisis (GFC). This article explains the link between RBI's balance sheet size, growth in monetary aggregates and inflation, and explores conditions under which excess money growth may not be inflationary. It finds that in the post-COVID period, the decline in income velocity of money and persistent negative output-gap warranted a larger than usual growth in monetary aggregates, without endangering the inflation outlook.

The intellectual pivot for monetary policy that "inflation is always and everywhere a monetary phenomenon"[1] views money supply as an exogenous process, solely determined by the monetary authority. Excess money creation, or unrestrained expansion in the balance sheet size of a central bank, accordingly, has been vaunted as the prime driver of inflation. The practice of central banking since the 1990s, however, has progressively de-emphasized this wisdom, with interest rate emerging as the key instrument of monetary policy, thereby discrediting any meaningful role for exogenously determined money supply. In fact, most models for contemporary macroeconomic policy analysis either exclude money, or at best treat money as endogenous or demand determined, precluding any causal role for money (Carpenter *et al*, 2010). In the monetary policy strategy review undertaken by the European Central Bank (ECB) in 2021, it also highlighted "a weakening of the empirical link between monetary aggregates and inflation".

The prime driving force behind this overwhelming shift in monetary consensus has been the growing realisation that money supply is not exogenously determined by a central bank. In practice, it is determined endogenously by the private sector (and government) demand which the central bank must accommodate to keep the interest rates in the economy aligned to its policy interest rate. If a central bank injects excess primary money into circulation than what the private sector desires to hold or can absorb, it must come back to the central bank as unabsorbed excess liquidity in the system. Unless fully absorbed by the central bank, money market rates can crash to levels below the policy interest rate. A corridor system for implementing monetary policy may provide a floor to money market rates, but even then, excess liquidity could still remain largely non-inflationary in the absence of adequate demand to absorb the surplus liquidity.

Since the global financial crisis (GFC) of 2008, however, the exogenous money view has resurfaced, with the central banks of advanced economies (AEs) resorting to large scale asset purchase programmes, or unconventional balance sheet policies, highlighting new channels for transmission of such unconventional policies to support recovery in growth[2]. The missing inflation puzzle post-GFC for more than a decade emboldened them to persevere with oversized balance sheets, till they faced the upsurge in inflation

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1 (Friedman, 1970).

2 Balance sheet policies, that arise from a central bank's unique position to create reserves at will to be able to buy stressed assets and lend to stressed borrowers, directly or indirectly, have emerged as effective crisis management tools since the GFC. Conventionally, however, such policies have been used even before the GFC, taking the form of either money financing (MF) of fiscal deficit or Quantitate Easing (QE) in a situation of liquidity trap, as practiced in Japan in the 1990s. Between MF and QE, the former may be perceived by markets as more permanent, while the initial monetary expansion in the case of QE is more likely to be state and context specific (Agur *et al*, 2022).

in 2021 and 2022 (so far) prompting them to end QE/ start quantitative tightening (QT). This has reignited research interest in examining the relevance of the monetarist view to the contemporary world. Large scale expansion in the balance sheet size of the Federal Reserve post-GFC was not inflationary because money supply growth remained subdued relative to growth in base money (implying a collapse in the money multiplier) and also nominal GDP or demand in the economy was not very sensitive to expansion in base money (reflected in a collapse in the income velocity of base money), together explaining a profound breakdown of the relationship between base money and inflation/economic activity (Williams, 2012). The relationship, however, was expected to re-emerge with recovery in economic activity as banks were more likely to use excess reserves for new lending in such a situation rather than park them with the central bank. This eventual risk materialised in the US with the robust post-COVID recovery in economic activity led by fiscal and monetary stimulus that was evident from record high growth in money supply in 2021 and 2022 (so far). Recent research on the importance of reference value of monetary aggregates to assess risks to inflation under different economic conditions suggests that when inflation is stable and close to the target, the relationship from money to inflation may not be relevant. In unsettled monetary and inflationary conditions (*i.e.,* periods of high variability in both), however, monetary aggregates tend to provide useful lead information about inflation (Cadamuro and Papadia, 2021). Others nevertheless reiterate the view that there is no causal relationship between base money and inflation (Stella, *et al.,* 2021). The post-GFC missing inflation conundrum and the recent (post-COVID) surge in inflation in some of the major advanced economies, given that both outcomes coincided with bloated balance sheets of their respective central banks, inspire curiosity to revisit the relevance of the conventional monetarist view to current Indian conditions.

In India, the post-COVID unconventional monetary measures - that ranged from provision of term liquidity up to three years at overnight repo rate on the one hand to the use of G-sec Acquisition Programmes (G-SAPs) to facilitate a non-disruptive completion of record high borrowings of the government on the other, involving an injection of cumulative potential liquidity equivalent to 8.7 per cent of GDP - and the associated expansion in Reserve Bank of India (RBI)'s balance sheet size has also been viewed as a risk to inflation (Rangarajan, 2022; Ranade, 2022). The endogenous money view, given the persisting and large negative output-gap[3], however, would generally suggest no risks to inflation as the demand for money continues to be weak. Only a robust pick-up in demand that can absorb the surplus liquidity in the system could be inflationary. Empirical findings for India suggest that excess liquidity that does not lead to higher broad money growth is not inflationary (RBI, 2017).

An informed assessment of the significance of endogenous *versus* exogenous monetary channels in the current Indian context requires a revisit of several lessons from past experience. First, in a crisis time, income velocity of money could crash and as a result the information content of money growth may become ambiguous (Pattanaik and Shankaran, 2011). Higher money growth may counterbalance the contractionary impact of the velocity shock rather than pose risks to inflation. Second, the stability of conventional money demand function, which is the bedrock of monetarism, is increasingly less likely to hold in the age of financial innovations, rising digital non-cash modes of payments for transactions and also in view of the emergence of FinTech for financial intermediation. In India, non-banks (*i.e.*, non-banking financial entities and markets) meet about 50 per cent of the annual financial resource

[3] Patra *et al.* (2021) estimated a large and negative output gap of about 4-6 per cent per quarter during Q2:2020 through Q1:2021. The output gap continues to be negative until Q3:2021-22 when the same model is estimated with updated data.

requirement of the commercial sector, and this share also changes from year-to-year. Monetary aggregates, accordingly, provide less consistent lead information about transaction demand in the economy. Third, transitory supply shocks to inflation may at times be accommodated by the central bank, which could invariably reverse the direction of causation (from inflation to money supply, rather than the opposite as propounded by the exogenous money view). Fourth, the experiment with the efficacy of an exogenous monetary expansion in AEs post-GFC could be sustained in a low inflation environment. The scope for such an experimentation in a high inflation regime may be limited, given the risks of unhinging inflation expectations and also likely policy ineffectiveness resulting from economic agents adjusting fully to the money financed stimulus by anticipating its consequences for inflation and the associated erosion of financial wealth/savings. The emergence of private markets for funding – reflected in the private equity (PE) boom providing "one-stop-capital" to firms as an alternative to funding from banks and public markets (through bonds and shares) – can also add further haze to the relationship between any conventional measure of money and inflation (The Economist, 2022a and 2022b).

Against this backdrop, this article examines the relationship between RBI's balance sheet size and CPI inflation, with a focus on identifying the leading information properties of reserve money. Section II compares RBI's balance sheet size with other major central banks that have adopted aggressive quantitative easing (or balance sheet) policies in response to both GFC and COVID-19. The difference between balance sheet size and reserve money (or high-powered money created by the RBI) is presented in Section III, with an assessment of the causal relationship between reserve money (M_0)[4], broad money (M_3), balance sheet size on the one hand and CPI inflation on the other, with a view to check the empirical significance of the endogenous money view. Recognising the role of time-varying nature of money multiplier and income velocity of money in disturbing the signals embodied in monetary aggregates, their patterns are also studied in this section for normal and stress periods. In view of the expected role of the state of business cycle in altering the degree of sensitivity of inflation to changes in monetary aggregates, the impact assessment is undertaken in Section IV, enabling assessment of risks to inflation from money growth when monetary stimulus in a period of economic slack aims at achieving non-inflationary recovery in growth. Concluding observations are presented in Section V.

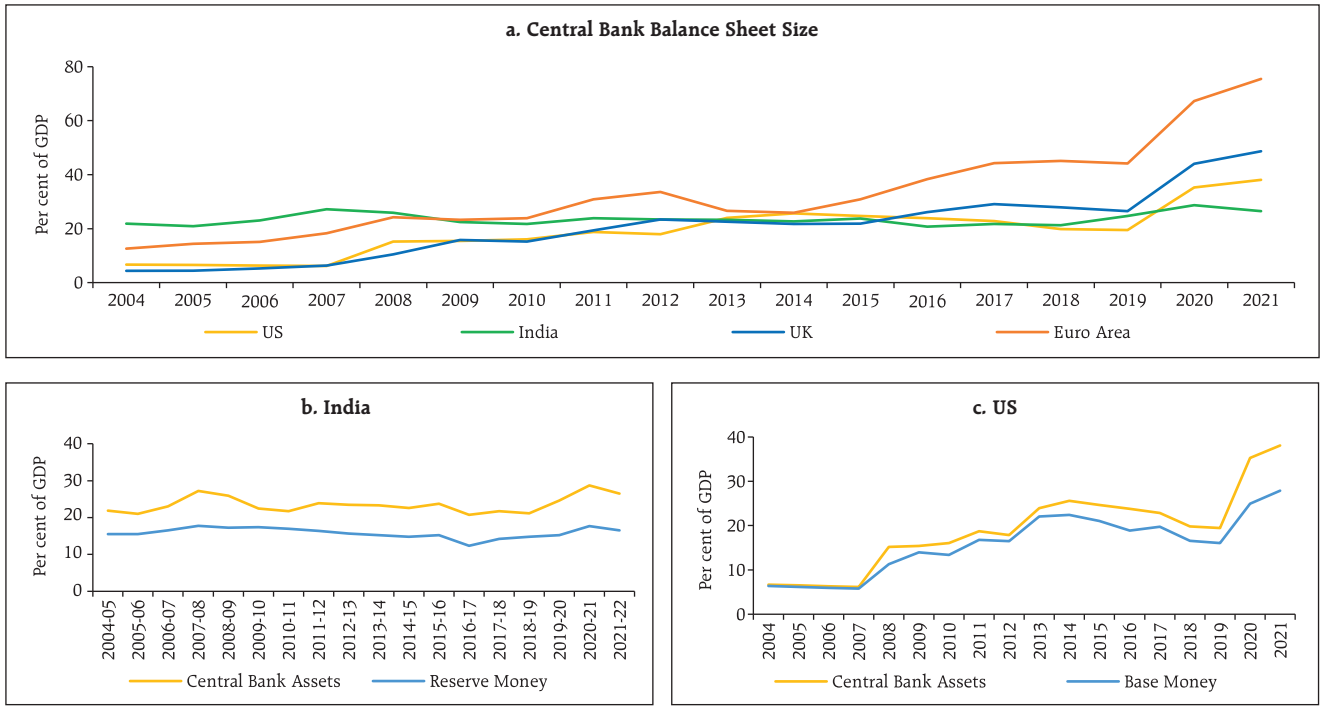
II. Balance Sheet Expansion in Response to COVID-19

Like many AEs, India also resorted to unconventional monetary policies to ease COVID-19 related stress in the financial markets/specific segments of the economy and ensure flow of credit to the productive sectors of the economy (for details, refer to Patra, 2022). As a result, RBI's balance sheet size as a per cent of GDP expanded to 28.7 per cent in 2020-21, before moderating to 26.5 per cent in 2021-22 (Chart 1a). The post-COVID expansion in the RBI's balance sheet was, however, relatively subdued compared to the scale of expansions recorded in the AEs such as the US, UK and Euro area. Moreover, the order of expansion in the stock of reserve money as a percentage of GDP was particularly restrained in India[5]. In fact, the evolution of reserve money in relation to nominal GDP in India has been along

[4] Reserve money, base money, high-powered money and M_0 are used inter-changeably in this article.

[5] Monetary aggregates need to be assessed in relation to nominal GDP growth, as the latter drives the demand for money. In absolute term, while RBI's balance sheet size expanded by 26.5 per cent (between March 2020 and March 2022), base money and broad money expanded by 28.2 per cent and 22.0 per cent, respectively. Nominal GDP increased by 17.9 per cent during the period 2019-20 and 2021-22. This was a period, however, when income velocity of money and money multiplier changed significantly, that altered the normal time relationships between the variables, as explained later in this article.

Chart 1: Central Bank Balance Sheet Size and Base Money



Note: 1. Data for India and UK are on financial year basis and for others on calendar year basis.
2. Reserve money and balance sheet data for India pertain to last Friday of the financial year.
Source: Reserve Bank of India, FREDS St. Louise, World Economic Outlook Database (IMF, April 2022) and Refinitiv.

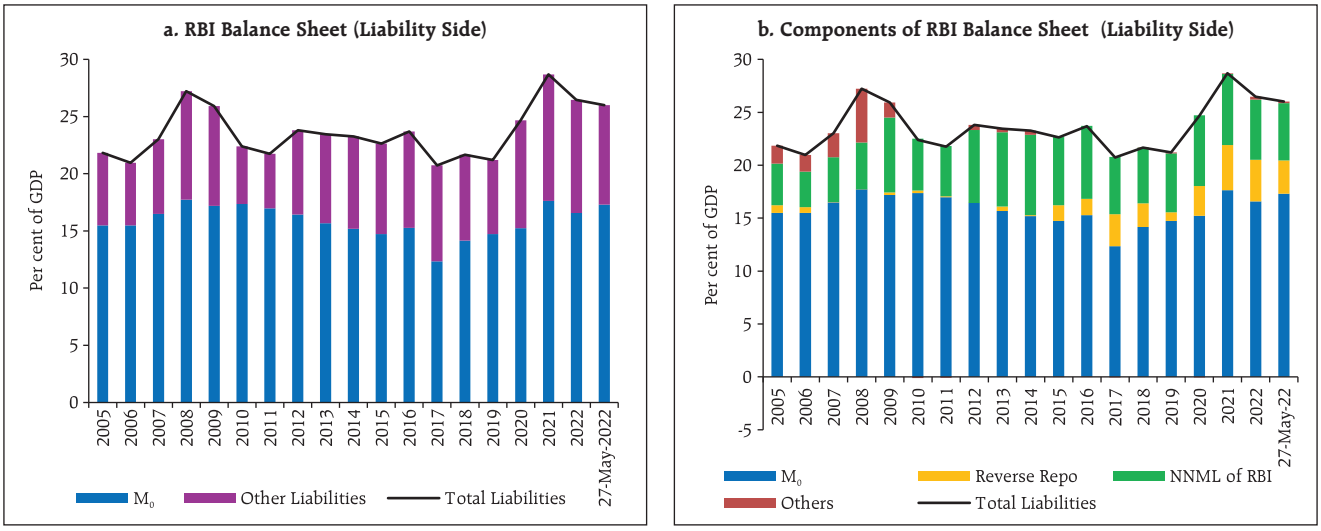
a stable trajectory all through and occasional crisis time deviations have normalised quickly.[6] These distinctions are often not kept in perspective in India while highlighting concerns based on central bank balance sheet patterns observed in AEs.

III. Balance Sheet Size *versus* Monetary Aggregates

A decomposition of RBI's balance sheet as a per cent of GDP from the liability side shows that its headline expansion in 2020-21 was driven by increases in both reserve money (monetary liabilities) and other liabilities together with a contraction in nominal GDP, while the subsequent moderation is largely because of reduction in other liabilities (Chart 2a). At a further disaggregated level, other liabilities mainly comprise net non-monetary liabilities (NNML) of RBI reflecting movements in currency and gold revaluation account (CGRA) - on account of revaluation of foreign currency assets and gold due to exchange rate and gold price changes - as well as reverse repo/standing deposit facility (SDF) outstanding amounts, representing absorption of excess liquidity (Chart 2b). In fact, a large part of the moderation of the balance sheet size as a per cent of GDP in 2021-22 reflects the gradual unwinding of unconventional liquidity injections given their embedded sunset dates and a pick up in nominal GDP.

[6] Such large gaps between the balance sheet size and reserve money (as percent of GDP) in India could be explained by specific liabilities that are either non-monetary in nature (such as risk buffers including revaluation accounts) or an outcome of liquidity operations to absorb surplus liquidity that do not form part of reserve money/base money (such as reverse repo operations or surpluses parked under the standing deposit facility (SDF)). For example, at the end of March 2022 (*i.e.*, as on March 25, 2022), while the RBI's balance sheet size was about Rs. 62.6 trillion, the corresponding stock of reserve money was much lower at Rs. 39.2 trillion, with the difference between the two accounted for mainly by net non-monetary liabilities (NNML) of Rs. 13.5 trillion and reverse repos of Rs. 9.3 trillion.

Chart 2: RBI Balance Sheet Size and Its Composition

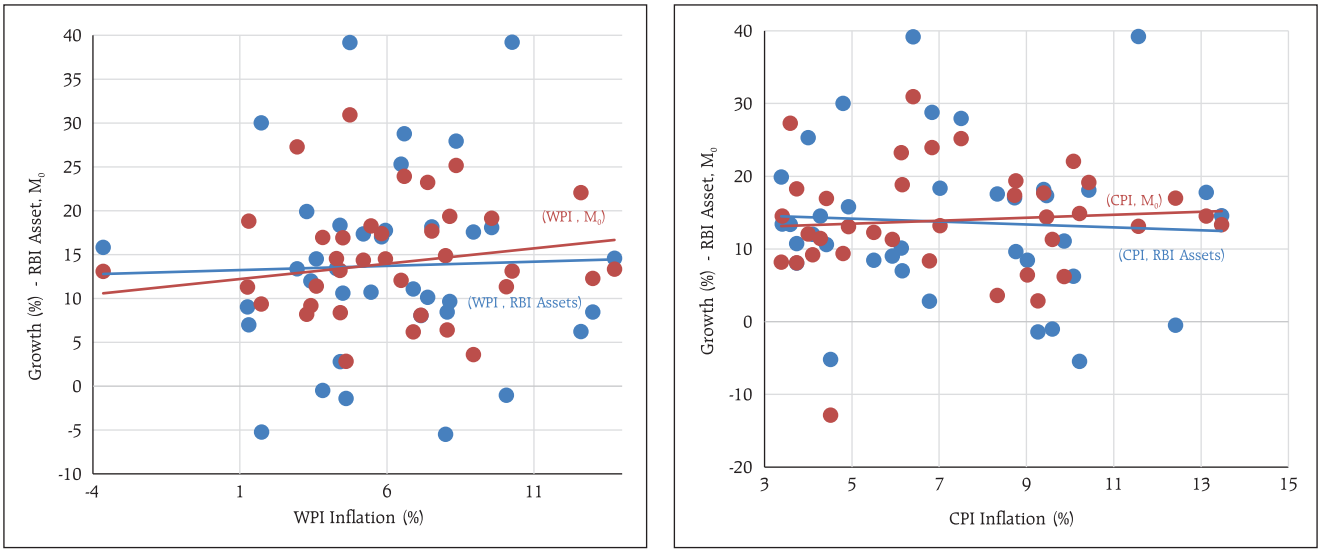


Note: Nominal GDP of 2021-22 has been used to calculate the ratios for May 27, 2022.
Source: RBI.

In view of the large difference between balance sheet size and base money, it may be pertinent to examine their relationship with inflation separately. The relationship between growth in balance sheet size and inflation is observed to be flatter than that between growth in reserve money and inflation (measured by both CPI and WPI) (Chart 3).

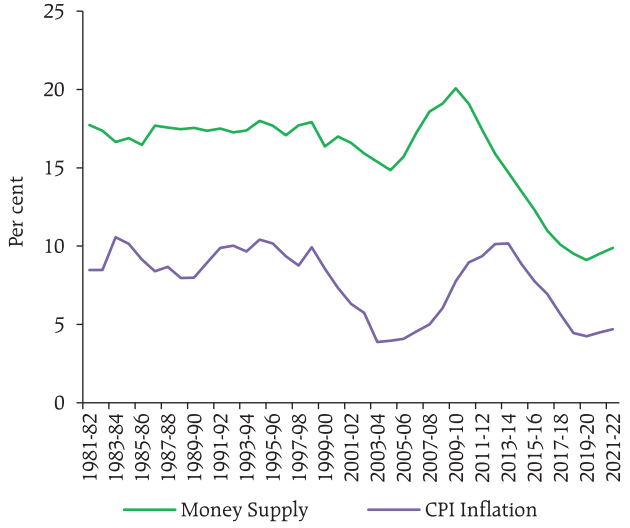
As explained above, while balance sheet size has received greater attention in the post-COVID period, it is the base money and other monetary aggregates that matter to any analysis of monetary sources of inflation. Accordingly, we focus on reserve money and its relationship with broad money and GDP to analyse the dynamic relationship between money and inflation.

Chart 3: RBI Balance Sheet, Reserve Money and Inflation (1985-86 to 2021-22)



Source: Authors' Calculations; RBI.

Chart 4: Money (M_3) Growth and Inflation (5-year Moving Average)

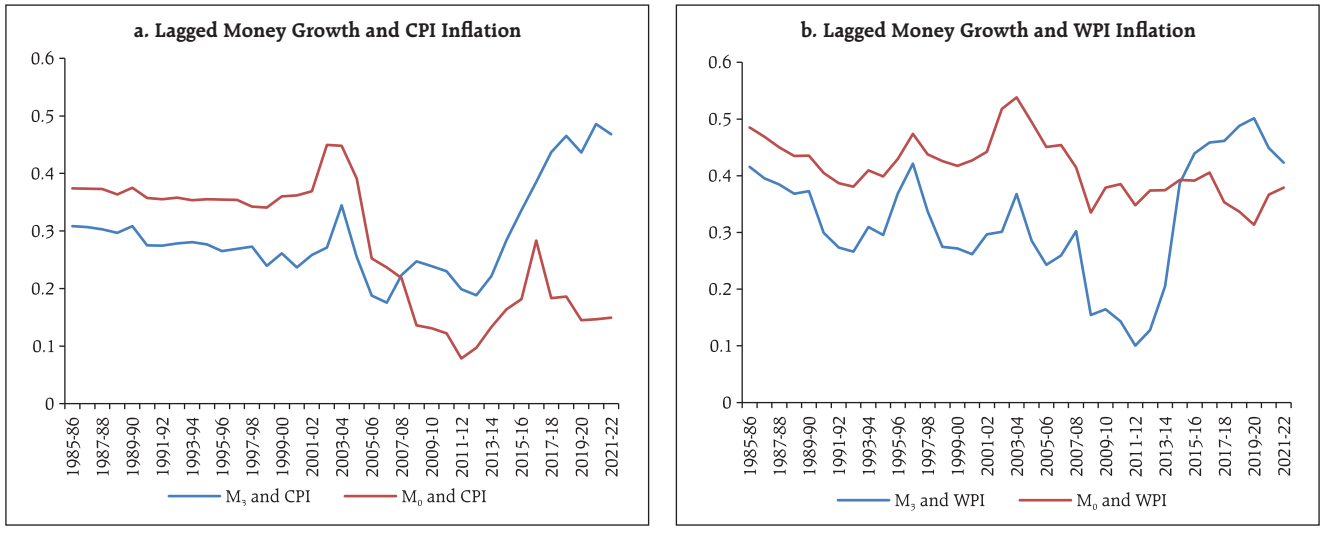


Source: Authors' Calculations; RBI.

As one would expect, money and inflation being two nominal variables, there is a high degree of co-movement between growth in money supply and inflation in India (Chart 4).

Moreover, the strength of the relationship (as measured by correlation coefficient) has also increased over time (though remain statistically insignificant between CPI inflation and M_0), suggesting money's role as a valuable source of information for inflation analysis, notwithstanding their cause-and-effect dynamics. In fact, the correlation of (one year) lagged money growth with inflation (that accounts for the monetary transmission lag), which had weakened with the progressive de-emphasis on money (and increasing emphasis on interest rate) as the policy instrument since the adoption of multiple indicator approach in 1998-99, has increased post-GFC, especially during the flexible inflation targeting (FIT) period (Chart 5a). A similar trend is observed in case of correlation of lagged money growth with wholesale price index (WPI) inflation (Chart 5b)[7]. In an endogenous money supply process, normal accommodation of inflation up to a limit (threshold or target) could yield a positive relationship. In an exogenous money supply process under a monetary targeting regime, however, targeted money growth *ex ante* may accommodate tolerable inflation, but in the event of inflation overshooting the tolerable level

Chart 5: Rolling Correlation between Money Growth and Inflation



Note: CPI data from 2011-12 relates to CPI combined series and prior to that relates to CPI-IW. Rolling correlation is calculated by using a window size of 30 years.
Source: Authors' Calculations; RBI.

[7] Even before the Agreement on Monetary Policy Framework of February 20, 2015, CPI-Combined was used as the metric for measuring inflation for the conduct of monetary policy starting with the monetary policy statement of April 1, 2014 following the recommendations of the Expert Committee. In the policy statement of October 29, 2013, projections for both WPI and CPI inflation were presented.

policy induced monetary contraction could yield a negative relationship *ex post*[8].

A formal test of the direction of causality between reserve money and inflation supports unidirectional Granger causality[9], *i.e.*, reserve money growth Granger causing inflation in India during the sample period 1971-72 to 2021-22[10]. But in the case of broad money growth, causality turns bi-directional, *i.e.*, broad money growth not only Granger causes inflation but is also caused by inflation (Table 1). On the other hand, RBI balance sheet growth and inflation do not exhibit any statistically significant causal relationship, corroborating the need for focusing on monetary aggregates instead of balance sheet size for inflation analysis in India.

Given the above empirical evidence on money (both reserve money and broad money) Granger causing inflation, it is important to understand the relationship between the two during periods of exogenous shocks and different states of the business cycle, so as to assess whether every increase in money supply is inflationary. Insights on whether the relationship of money with inflation is symmetric or asymmetric over the business cycle could be of critical significance to monetary policy, even when policy is conducted by changing the interest rate, as that can influence the speed and timing of rate actions, which, in turn, could influence money demand and restore price stability.

It is evident from experience that during periods of extreme exogenous shocks such as the COVID pandemic or the GFC, the relationship between reserve money and broad money breaks down due to risk averse behaviour of economic agents (reflected in higher precautionary household savings in the form of currency, which raises the currency to deposit ratio and in turn lowers the money multiplier)[11]. Due to liquidity hoarding and the fear of restrained access to liquidity, income velocity of money may fall, at times by a large magnitude. In order to restore monetary (M_3) balance in the economy and to ensure that risk averse behaviour due to uncertainty does not freeze financial markets, central banks commit to and provide ample liquidity to the system, *i.e.*, they compensate for the fall in velocity of money by increasing the reserve (base) money. All of the liquidity injected, however, does not get absorbed in the system, as a result of which a part of it flows back to the central bank and remains as idle balances in the balance sheet of the central bank (such as outstanding reverse repo/SDF balances in India). Thus, a part of the liquidity injected by the central bank supports higher money creation to compensate for the drop in velocity while another part remains merely as unutilised liability of the central bank until the economy recovers from the shock. The pace at which the economy may recover after a shock is an important indicator to early warn the ominous

Table 1: Granger Causality Test Results (Sample: 1971-72 to 2021-22)

Hypothesis	Lag	F-Stat	P-value
M_0 Growth Doesn't Cause CPI Inflation	3	4.15**	0.01
CPI Inflation Doesn't Cause M_0 Growth	3	0.97	0.42
M_3 Growth Doesn't Cause CPI Inflation	2	3.37**	0.04
CPI Inflation Doesn't Cause M_3 Growth	2	4.45**	0.02
Balance Sheet Growth Causes CPI Inflation	1	0.99	0.32
CPI Inflation Causes Balance Sheet Growth	1	1.72	0.20

The lag length selected to perform the Granger causality test is based on 'Likelihood Ratio (LR) test'.
**: Null hypothesis of no causality is rejected at less than 5 per cent level of significance.

[8] Findings for some countries support the possibility of no correlation between money growth and inflation; in fact, the relationship may be negative in a crisis time when monetary stimulus invariably aims at reviving the economy facing deflationary risks (Heinz and Kohling, 2021).

[9] Granger causality test is a statistical hypothesis test to know whether one variable has any effect on another variable.

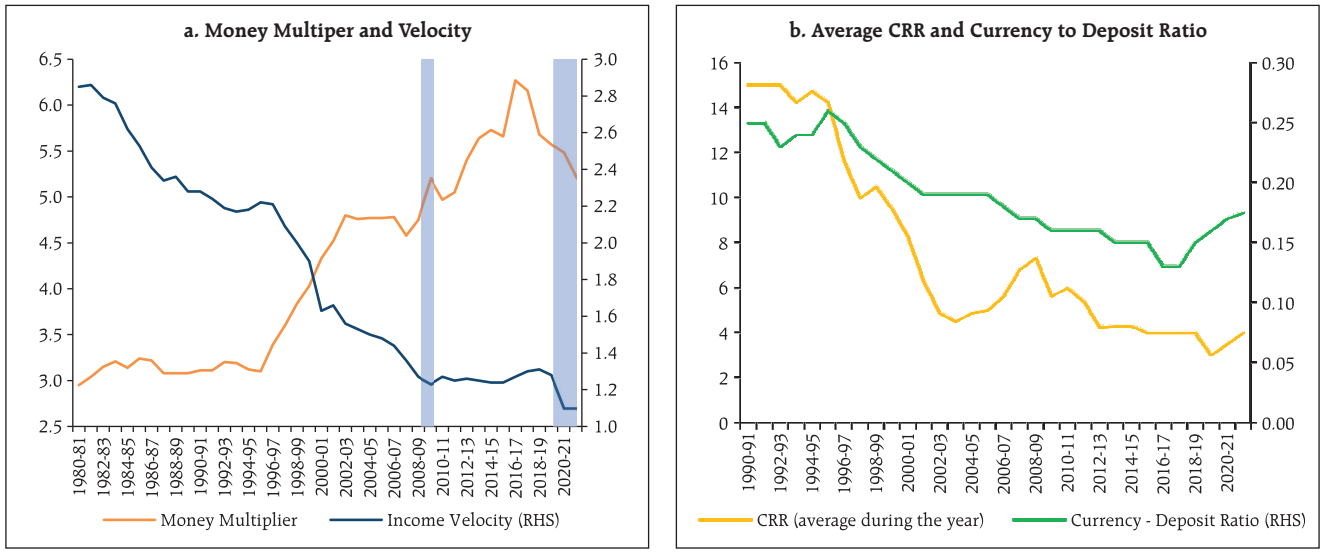
[10] Similar results are found in the case of most AEs.

[11] The relationship can also change if the cash reserve ratio (CRR) is used to mitigate the impact of the shock. Lower CRR could increase the money multiplier, as a result of which the decline in money multiplier expected due to increase in currency to deposit ratio may not materialise. In such instances, the concept of adjusted reserve money (that adjusts for the first-round impact of changes in CRR) becomes more useful.

risks to inflation. Thus, while money growth in the event of an exogenous adverse shock may have to be higher than any non-inflationary norm for normal times, as the shock dissipates money growth must normalise to ward off risks to inflation.

In India, reflecting the preference of economic agents to hoard liquidity in a crisis and also limited opportunities to spend after the pandemic, the transaction velocity of money (*i.e.*, nominal GDP divided by M_3 money stock) declined sharply after COVID from 1.3 in 2019-20 to 1.1 in 2020-21 and 2021-22 (Chart 6a). The money multiplier (*i.e.*, M_3 divided by base money) also declined from 5.57 in 2019-20 to 5.48 in 2020-21 and further to 5.20 in 2021-22[12], as the currency to deposit ratio rose from 0.16 to 0.17 and further to 0.18 during the corresponding period (which is equivalent to about 200 bps increase in CRR in terms of impact on money multiplier) (Chart 6b)[13]. Higher growth in reserve money (18.8 per cent in 2020-21) and money supply (12.2 per cent) during this period needs to be assessed keeping in view the changes in velocity and money multiplier. A similar pattern was also observed in the aftermath of the GFC when velocity fell. Thus, in crisis situations money growth may have to be somewhat higher to compensate for the decline in velocity, and to meet the requirement of money demand associated with the same level of nominal GDP in the economy. Only when money growth is not contained even after velocity returns to normal levels after a crisis that excess money injection can be inflationary. Moreover, when velocity normalises (*i.e.*, rises after a fall), a lower order of M_3 growth may coexist with higher growth in nominal GDP, unlike the perceived proportional relationship between M_3 growth and growth in nominal GDP, which holds only in normal times when velocity may exhibit reasonable stability.

Chart 6: Money Supply and Velocity of Money



[12] Money multiplier $=(1+c)/(c+r)$, and hence it is inversely related to both currency to deposit ratio (c) and reserves to deposit ratio (r), which include cash reserve ratio or required reserves plus excess reserves.

[13] The money multiplier in the US fell from around 12 to below 10 during the GFC; during COVID it fell again from 6 to below 4. The velocity of broad money declined from 1.5 in 2000 to 1.0 before COVID and further to about 0.8 post-COVID. Precautionary savings, private sector deleveraging, and a generalised decline in inflation globally pre-pandemic are some of the factors that may explain these shifts (Heinz and Kohling, 2021).

Section IV: Exploring the Fuzzy Dynamics

Recent empirical research covering the impact of balance sheet policies on inflation highlights that: (a) the association between money growth and inflation is modest, unless initial conditions – high level of inflation, large fiscal deficit and weak central bank independence – are adverse, causing a disproportionate increase in inflation with expansion in money supply, and (b) announcements of unconventional monetary policies (UMPs) that cause monetary expansion may not always increase inflation expectations, particularly when such policies are used in response to an exceptional shock like the COVID pandemic (Agur *et al.*, 2022).

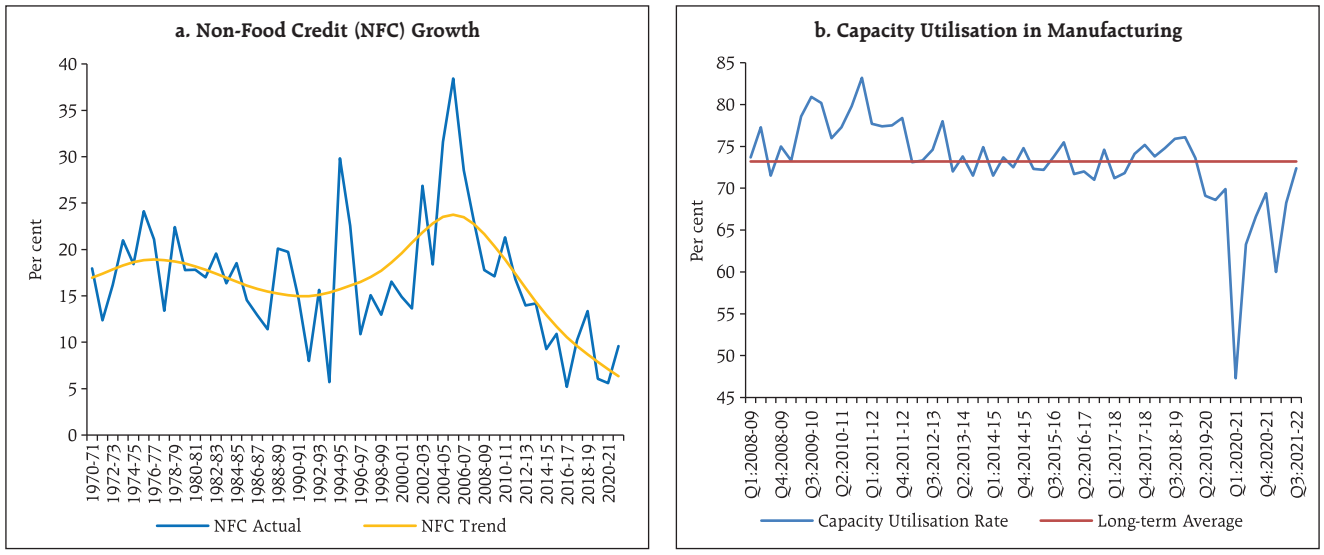
For an assessment of excess primary money as a cause of inflation, it is important to recognise that both exogenous and endogenous views may be at work at the same time. When adverse food and fuel shocks raise inflation temporarily, monetary policy may accommodate such inflation, particularly the first-round impact, making the causality run from inflation to money supply[14]. On the other hand, when a central bank increases surplus liquidity in the system in sync with an accommodative monetary policy stance, the causality is reversed and expected to run from exogenous money to economic growth (or growth in nominal GDP, which would comprise the impact of policy stimulus on both real GDP and inflation). Different channels of monetary policy – lower term premium, depreciated exchange rate, higher asset prices – may still allow the exogenous money channel to work. Thus, when both exogenous and endogenous dynamics are at play, the impact of excess money supply on inflation could be largely viewed as an empirical country-specific and context-specific issue.

In view of the complex interactions between central bank liquidity measures, money creation process and inflation dynamics during periods of exogenous shocks, it is important to examine the nature of the relationship from an empirical perspective. Anecdotal evidence suggests that the inflationary impact of crisis-time liquidity/money may be contingent on the nature of credit growth in the economy (which is the main medium for absorption of surplus liquidity in the system), *i.e.*, whether it is weak due to prevailing slack in the economy or grows at above-trend pace to stimulate recovery and thereby close the output-gap. In India, in the post-COVID period, actual credit growth has been around its declining long-term trend (Chart 7a) and capacity utilisation rate has also hovered below its long-term average (Chart 7b) suggesting the continuing presence of slack in the economy. Against this backdrop, the possible presence of asymmetric impact of money growth on inflation is examined below.

We examine the causal impact of money supply on CPI inflation using a standard vector autoregression (VAR) model with a vector of three endogenous variables $Y_t = [\pi_t, \Delta y_t, \Delta \mathrm{m}_t\,]'$ covering data for the period 1996:Q2 to 2022:Q1. Here, π_t represents CPI inflation (year-on-year), Δy_t refers to real GDP growth (year-on-year) and $\Delta \mathrm{m}_t$ is money supply growth (year-on-year). The VAR is estimated with an interactive dummy which takes the value of one for positive output gap (expansion) and zero for others (contraction/no change), and by interacting the dummy variable with money supply growth. The parameters of VAR models are estimated by using Bayesian methods with Jeffrey's

[14] Surplus liquidity in excess of 1.52 per cent of net demand and time liabilities (NDTL) is estimated to be inflationary in India (RBI, 2022). This empirical support for exogenous money view essentially reflects the consequence of accommodation of supply shock induced inflation, and the corresponding automatic increase in demand for money. Excess liquidity can also stimulate aggregate demand by lowering interest rate, but in the presence of economic slack it may not stoke inflation. The state of the business cycle, thus, is critical to assess the risks from exogenous excess money to inflation. In conditions when slack in the real economy coexists with high inflation caused by supply shocks, as has been the case post-COVID, however, both exogenous and endogenous channels may influence inflation dynamics, with the former suggesting higher inflation through monetary accommodation of supply shocks and the latter suggesting little risks to inflation due to economic slack that should keep the money growth (or money demand) contained.

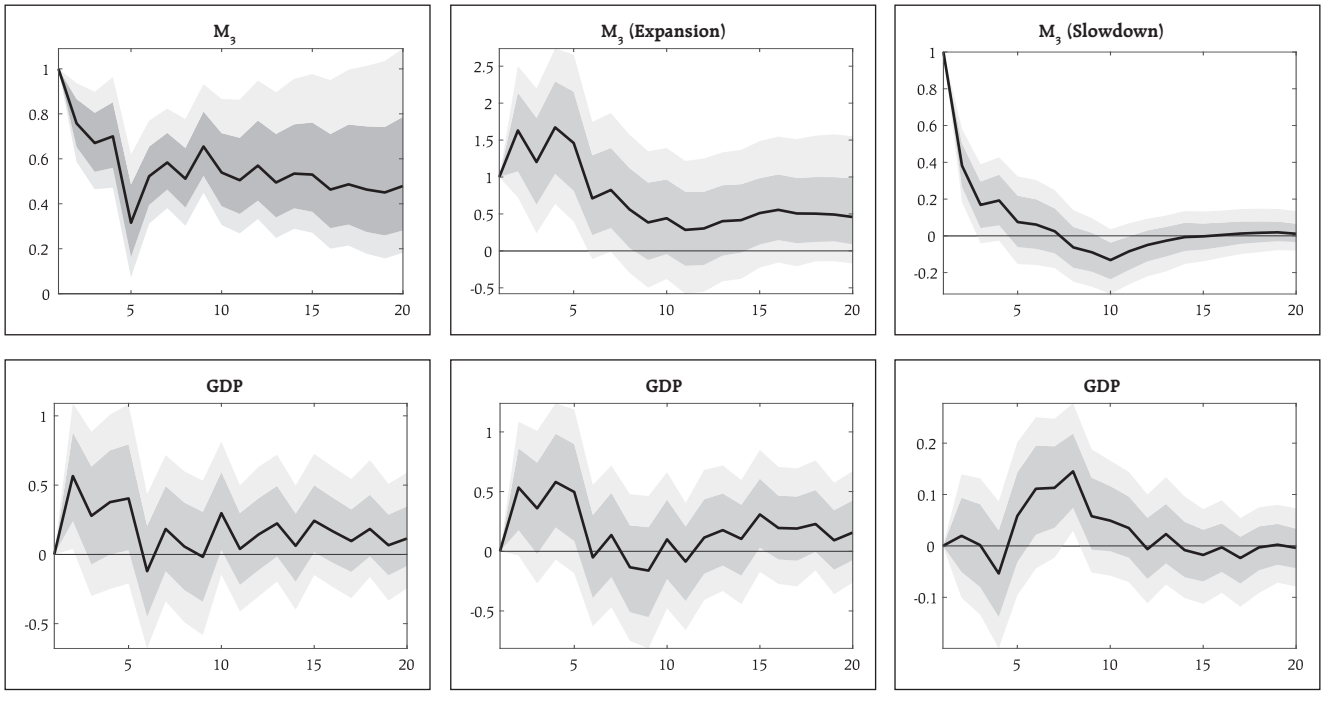
Chart 7: Credit Growth and Capacity Utilisation in India

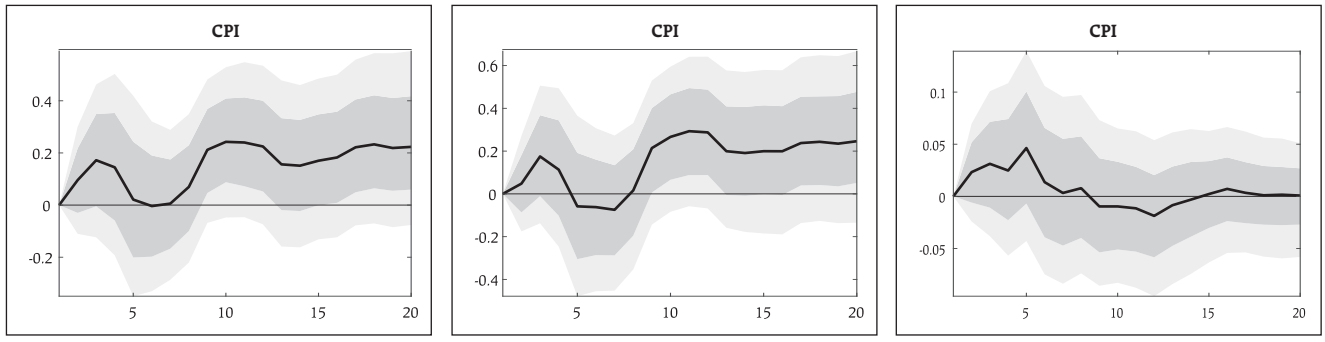


Source: RBI.

(uninformative) priors. The posterior distributions of the parameters are obtained through a Gibbs sampler algorithm. The responses to money supply shock are identified through a recursive identification scheme based on 50000 draws. The impulse responses from Bayesian VAR models (the median values) suggest that both GDP growth and inflation rise in response to higher money supply, measured in terms of either M_3 or M_0, when full sample data are used but without the interactive dummy (Charts 8 and 9; first column).

Chart 8: Asymmetric Response of Inflation and Real GDP Growth to M_3 Growth

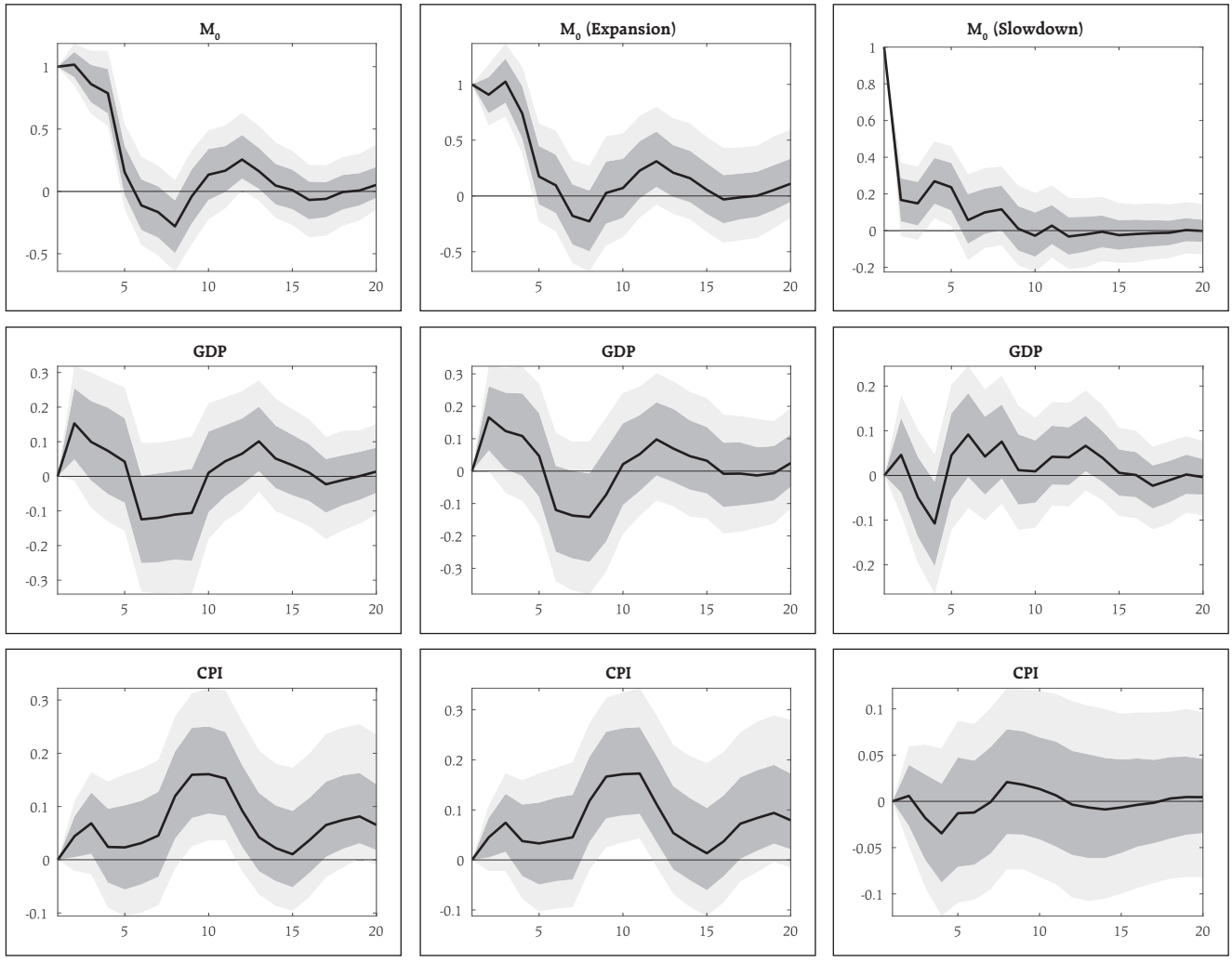




Note: The black line represents the median impulse responses of the variables to a one percentage point rise in M_3 growth. Dark gray area represents 90 per cent credible band.
Source: Authors' estimation.

When the state of the business cycle is incorporated through the interactive dummy, it is found that the impact of an increase in money supply on inflation is positive and statistically significant during periods of

Chart 9: Asymmetric Response of Inflation and Real GDP Growth to M_0 Growth



Note: The black line represents the median impulse responses of the variables to a one percentage point rise in M_0 growth. Dark gray area represents 90 per cent credible band.
Source: Authors' estimation.

economic expansion while the impact is statistically weak during periods of economic slowdown or when the output-gap is negative. Additionally, the impact of money supply on inflation is persistently higher and positive for a long period when there is no slack in the economy. These results suggest that money supply expansion during periods of economic slack may not be inflationary, but once the economy recovers to the steady state position, curbing excess growth in money may be necessary to secure price stability.

V. Conclusion

In India, the size of the RBI's balance sheet does not exhibit any statistically significant causal relationship with CPI inflation. The reserve money or primary money created by the RBI constitutes only a part of the balance sheet size, which multiplies through the banking system to determine the stock of broad money (or M_3) in the system at any point in time. Empirically it is found that both reserve money and broad money exhibit statistically significant causal influence on inflation, highlighting their continuing utility as reference indicators to early warn risks to the inflation outlook in India, notwithstanding the progressive de-emphasis of monetary aggregates in the conduct of monetary policy across the world in view of the established edge of interest rate as the more effective policy instrument. While the endogenous money view – *i.e.*, it is the demand for money that decides the supply of money in a monetary policy regime where policy is conducted by changing the interest rate – holds sway, the exogenous money view may be still relevant, particularly when excess exogenous money created by a central bank allows accommodation of supply shock induced inflation and/or a stimulus-led revival in demand. It is important therefore to assess money growth: (a) by taking into account occasional large exogenous shocks that could significantly alter the values of velocity of money and money multiplier; and (b) by recognising the asymmetric impact of money growth on inflation during periods of economic slowdown and periods of expansion. In India, notable declines in income velocity of money and the money multiplier in the post-COVID period warranted higher growth in both reserve money and broad money to meet the transaction financing needs of the economy, which need not be construed as inflationary, unless empirically established. Empirical results suggest that money growth does not pose risks to inflation in the presence of economic slack. When the economy is in an expansionary phase, however, an increase in money supply can cause higher inflation. These findings indicate that money growth during the COVID period was not a primary source of inflation, but as the economy recovers to its trend level and velocity of money normalises, curbing excess money growth timely can help secure the goal of price stability.

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*State Finances: A Risk Analysis**

Against the backdrop of the Sri Lankan crisis, this article attempts to put the spotlight on fiscal risks confronting state governments in India, with emphasis on the heavily indebted states. The slowdown in own tax revenue, a high share of committed expenditure and rising subsidy burdens have stretched state government finances already exacerbated by COVID-19. New sources of risks have emerged in the form of rising expenditure on non-merit freebies, expanding contingent liabilities, and the ballooning overdue of DISCOMs.

Introduction

The prolonged COVID crisis has worsened fiscal positions of governments around the world as reflected in mounting debt levels. The sustainability of public debt at national and sub-national levels has again assumed centre-stage as the dominant fiscal risk. In particular, the pandemic has taken a heavy toll on finances of states in India, warranting a mid-term course correction at least among the more direly affected ones. Given this parlous situation, the tendency towards handing out cash subsidies, in normal times, provision of free utility services, revival of the old pension scheme by some states and extension of implicit and explicit guarantees by various state governments in India act like swords of Damocles.

This article attempts to put the spotlight on the fiscal risks confronting state governments in India, with emphasis on the heavily indebted states. The rest of the article is structured into four parts. Section II assesses the financial health of Indian states in terms of various vulnerability indicators. Section III evaluates debt sustainability of the states by testing econometrically whether they meet the solvency condition. Drawing therefrom in terms of risk identification, Section IV undertakes a detailed risk assessment of the fiscally vulnerable states through risk quantification and stress testing. Conclusions and policy perspectives are discussed in Section V.

II. Fiscal Vulnerability of Indian States

A major motivation for undertaking this analysis is the unfolding of the crisis in Sri Lanka, which has culminated in its first ever debt default on May 19, 2022. The Sri Lankan economy was battered by the pandemic, as travel restrictions hit tourism; exports of textiles, garments and tea suffered a setback due to pandemic-driven slump in global trade; and remittances were impacted by the global growth slowdown. Apart from the pandemic, public policies also contributed towards the crisis – a sharp cut in direct and indirect taxes just before the pandemic; shift to organic farming by imposing total ban on the use of chemical fertilizer and pesticides to save on fertilizer subsidy, but with severe effect on rice output and productivity of the plantation sector that resulted in a spike in food inflation and shortages of essentials; and ambitious infrastructure projects funded by costly Chinese debt.

Against this backdrop, the fiscal health of Indian states warrants a careful assessment. Up to the onset of the pandemic, the average GFD-GDP[1] ratio of the states remained modest at 2.5 per cent during 2011-12 to 2019-20, lower than the Fiscal Responsibility Legislation (FRL) ceiling of 3 per cent. There were, however, substantial inter-state variations - while Andhra Pradesh, Kerala, Punjab and Rajasthan incurred average GFD of above 3.5 per cent of GSDP, Assam, Gujarat, Maharashtra, Odisha and Delhi ran ratios less than 2 per cent.[2] States' fiscal positions

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1 GFD-GDP ratio refers to gross fiscal deficit to nominal GDP ratio.

2 Since the erstwhile State of Jammu and Kashmir was divided into two UTs in 2019-20, we have not included it here even though its average GFD-GSDP ratio was 5.3 per cent.

deteriorated sharply in 2020 with a sharp decline in revenue, increase in spending and a sharp rise in debt to GSDP ratios.

In the first stage of the analysis, a panel of indicators is employed to identify fiscal vulnerability.[3] Based on the debt-GSDP ratio in 2020-21,[4] Punjab, Rajasthan, Kerala, West Bengal, Bihar, Andhra Pradesh, Jharkhand, Madhya Pradesh, Uttar Pradesh and Haryana turn out to be the states with the highest debt burden. These 10 states account for around half of the total expenditure by all state governments in India (Table 1). Other vulnerability indicators also capture these 10 states in their cross hairs. Their GFD-GSDP ratios were equal to or more than 3 per cent in 2021-22, besides deficits in their revenue accounts (except Uttar Pradesh and Jharkhand). Moreover, the interest payment to revenue receipts (IP-RR) ratio, a measure of debt servicing burden on states' revenues, in 8 of these states was more than 10 per cent.[5]

Taking into account the warning signs flashing from all the indicators, we can identify a core subset of highly stressed states from among the 10 states identified by the necessary condition *i.e.*, the debt/GSDP ratio. The highly stressed states are Bihar, Kerala, Punjab, Rajasthan, and West Bengal.

Among the ten states, Andhra Pradesh, Bihar, Rajasthan and Punjab exceeded both debt and fiscal

Table 1: Key Fiscal Indicators of States

(Per cent of GSDP)

State	2020-21	2021-22 RE	2022-23 BE	Relative Size of States (in per cent)	2021-22 RE			
	Debt				Interest Payment to Revenue Receipts (Per cent)	Gross Fiscal Deficit	Revenue Deficit	Primary Deficit
Andhra Pradesh	35.5	32.5	32.8		14.3	3.2	1.6	1.4
Bihar	36.7	38.6	38.7		8.6	11.3	5.5	9.2
Chhattisgarh	26.3	26.2			8.0	3.8	0.3	2.1
Gujarat	21.0	19.0			14.2	1.5	0.0	0.2
Haryana	28.0	29.4			20.9	3.0	1.4	0.8
Jharkhand	34.4	33.0	27.0		8.4	3.0	-0.1	1.3
Karnataka	22.4	26.6	27.5		14.3	2.8	0.4	1.3
Kerala	37.1	37.0	37.2		18.8	4.2	2.6	1.7
Madhya Pradesh	31.0	31.3	33.3		11.7	4.2	0.6	2.2
Maharashtra	19.6	17.9	18.1		11.4	2.8	1.0	1.5
Odisha	20.0	18.8	18.6		4.3	3.5	-3.3	-0.6
Punjab	49.1	53.3			21.3	4.6	1.6	0.7
Rajasthan	40.5	39.5	39.8		14.9	5.2	3.0	3.3
Tamil Nadu	26.9	27.4	27.7		21.0	3.8	2.5	1.9
Telangana	25.2	24.7	25.3		11.3	3.9	-0.4	2.4
Uttar Pradesh	29.1	34.9	32.5		11.2	4.3	-1.3	1.8
West Bengal	37.1	34.4	34.2		20.8	3.5	2.2	1.1

← Higher Lower →

Note: 1. Data for Punjab is based on the Report titled 'State Finances: A Study of Budgets 2021-22' as its budget for 2022-23 has not been presented yet. Though, Odisha's budget for 2022-23 is Vote-on-Account, it has released its FRBM documents for 2022-23. As indicated by the state government, debt stock of 16.98 per cent of GSDP may increase by 3 per cent of GSDP if public account liabilities are incorporated..

2. For other states, data for debt, GFD, RD and PD are reported by the respective state governments in their budget documents and may not match with data to be compiled by the Reserve Bank as the methodology for compilation of these indicators differ.

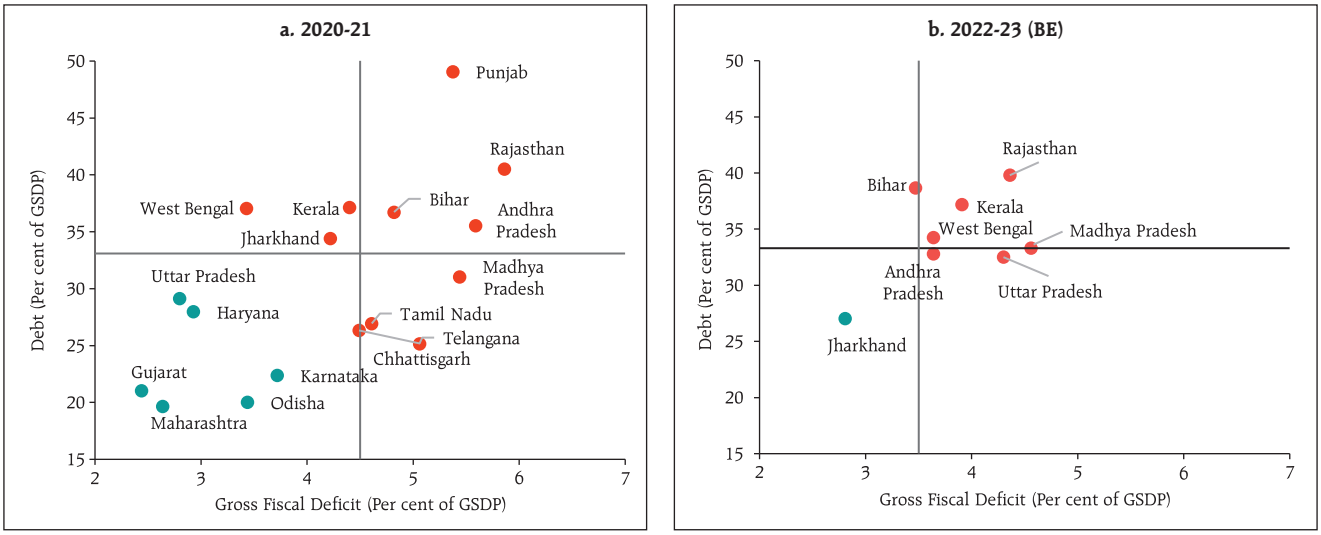
Sources: Budget documents of state governments; Reserve Bank of India; and PRS Legislative Research.

[3] Fiscal vulnerability describes a situation where a government is exposed to the possibility of failure to meet its aggregate fiscal policy objectives and longer-term fiscal sustainability (IMF, 2000).

[4] The data for 2020-21 are based on accounts data, except for Punjab. North-eastern and hilly areas as well as union territories (UTs) are excluded from the analysis in view of their special characteristics. Goa is also excluded due to its low share in total expenditure.

[5] The IP-RR ratio of Bihar and Jharkhand is less than 10 per cent.

Chart 1: States' Key Indicator *vis-à-vis* 15th Finance Commission's Indicative Target



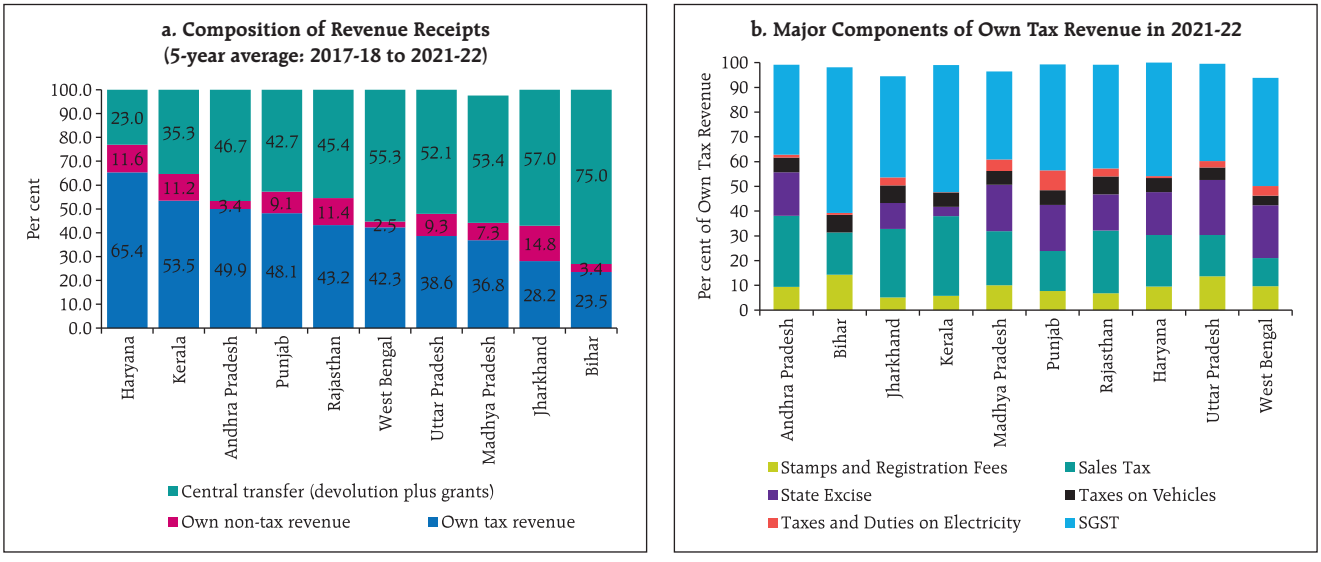
Note: Horizontal and vertical lines inside the graph are the 15th FC's indicative targets for debt and GFD, respectively.
Source: Budget documents of state governments.

deficit targets for 2020-21 set by the 15th Finance Commission (FC-XV) (Chart 1a). Kerala, Jharkhand and West Bengal exceeded the debt target, while Madhya Pradesh overshot the fiscal deficit target. Haryana and Uttar Pradesh were exceptions as they met both criteria. Rajasthan, Kerala and West Bengal are projected to surpass the FC-XV targets for debt and fiscal deficit in 2022-23 (BE) (Chart 1b).

Government Revenue

The ten selected states account for around half of the total revenue collected by all states and UTs. Their total revenue comprises tax revenue, non-tax revenue and central transfers, *i.e.*, share in central taxes and grants (Chart 2a). Own tax revenue of Haryana, Kerala and Andhra Pradesh constitutes about half of their

Chart 2: Composition of States' Tax



Source: Budget documents of state governments.

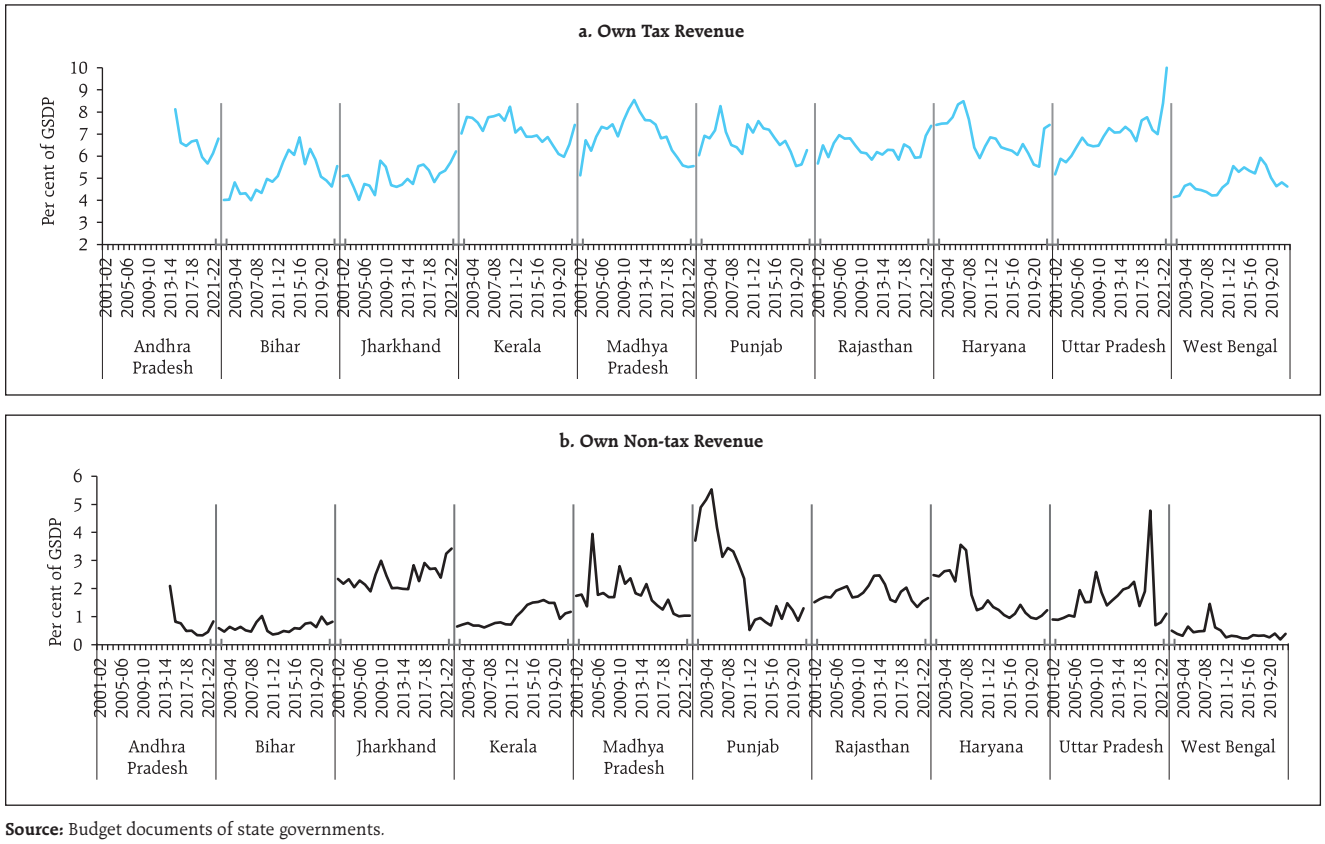
total revenue collections. The major source of revenue of other states is central transfers. Within own tax revenue, states' goods and services tax (SGST), states' excise duties and sales tax are the major sources of revenue (Chart 2b).

The own tax revenue of some of these 10 states, *viz.*, Madhya Pradesh, Punjab and Kerala, has been declining over time, making them fiscally more vulnerable (Chart 3a). For most of these states, non-tax revenue has remained volatile, dropping significantly in recent years (Chart 3b). The decline in non-tax revenue is under general services, interest receipts and economic services. The declining own tax revenue and non-tax revenue affect the states' expenditure planning and increase their dependence on market borrowing.

Expenditure Quality

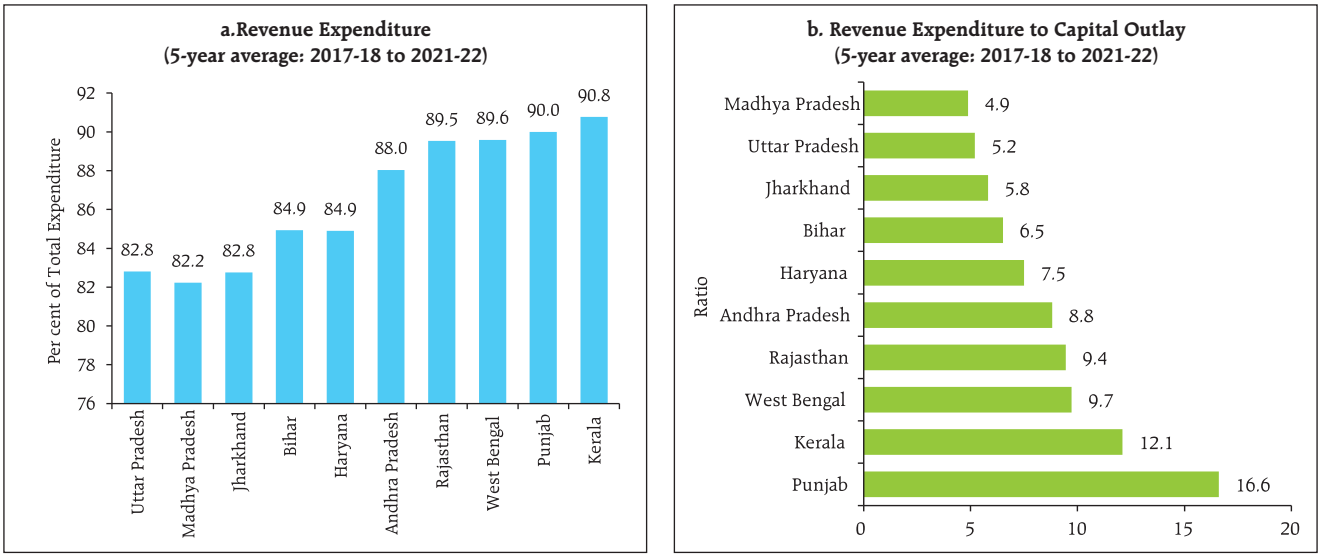
The 10 states identified by the vulnerability indicators account for around half of the total expenditure by all states and UTs. The share of revenue expenditure in total expenditure of these states varies in the range of 80-90 per cent. Some states like Rajasthan, West Bengal, Punjab and Kerala spend around 90 per cent in revenue accounts (Chart 4a). This results in poor expenditure quality, as reflected in their high revenue spending to capital outlay ratios (Chart 4b). Although welfare-enhancing, the impact of revenue spending on economic activity lasts for just about a year. In contrast, the impact of capital outlay is stronger and lasts longer, with the peak effect materialising after two-three years. In the medium to long term, states with high revenue spending and low

Chart 3: States' Own Tax and Non-tax Revenue



Source: Budget documents of state governments.

Chart 4: Revenue Spending and Quality of Expenditure

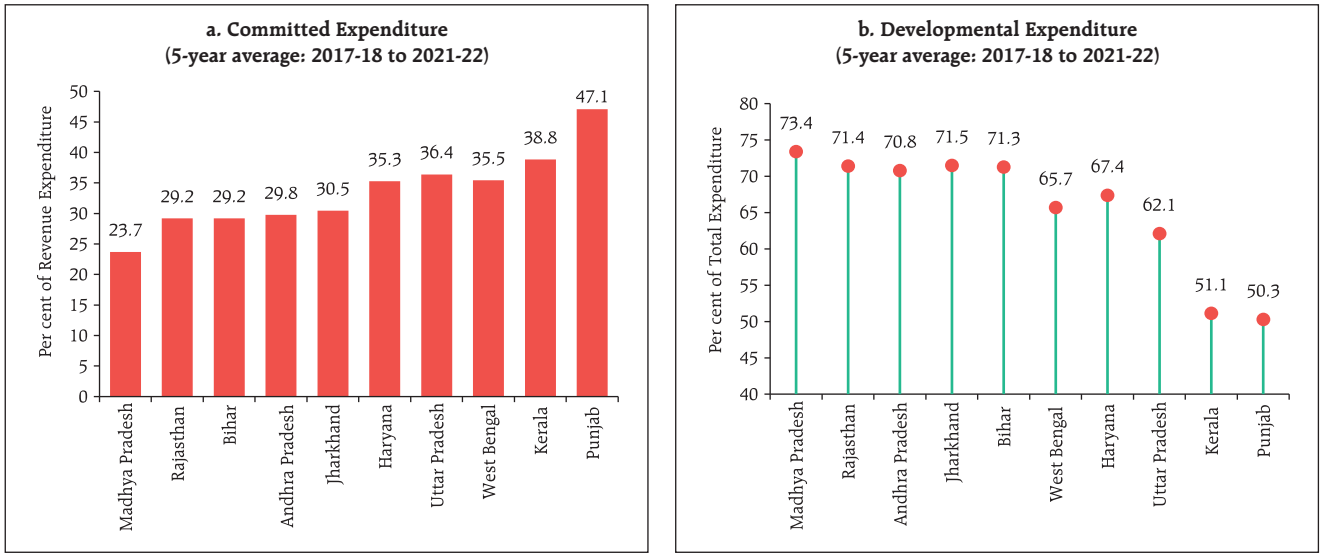


Source: Budget documents of state governments.

capital investment may experience slower revenue growth and higher interest outgo.

Committed expenditure, which *inter alia* includes interest payments, pensions and administrative expenses, accounts for a significant portion (over 35 per cent) of the total revenue expenditure in states like Haryana, Uttar Pradesh, West Bengal, Kerala and Punjab, leaving limited fiscal space for undertaking developmental expenditure (Chart 5a). Consequently, the share of developmental expenditure in these states is considerably lower than the other states (Chart 5b).

Chart 5: Indicators relating to States' Spending



Source: Budget documents of state governments.

Table 2: State-wise 10-Year SDL Yield

(Per cent)

State	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Andhra Pradesh	7.6	7.6	8.3	7.2	6.5	
Bihar	7.4	8.0	8.3	7.1		7.2
Chhattisgarh	7.7	7.9		7.3		
Gujarat	7.6	7.7	8.3	7.3	6.7	7.0
Haryana	7.4	7.8	8.5	7.2	7.4	7.0
Jharkhand	7.4	7.3	8.4	7.0	6.8	6.9
Karnataka	7.3	7.7	8.2	7.1	6.6	7.0
Kerala	7.6	7.8	8.3	7.4	7.2	7.1
Madhya Pradesh	7.4	7.6	8.3	7.2	6.9	6.9
Maharashtra	7.5	7.4	8.3	7.3	7.0	6.8
Odisha	7.4	7.7	8.2	7.1		
Punjab	7.8	7.7	8.3	7.3	6.8	7.0
Rajasthan	7.5	7.8	8.4	7.4	6.7	7.0
Tamil Nadu	7.5	7.7	8.3	7.4	6.7	7.0
Telangana	7.7			7.7	7.0	
Uttar Pradesh	7.5	7.7	8.4	7.2	6.9	7.0
West Bengal	7.5	7.8	8.3	7.2	6.7	7.1

← Higher Lower →

Source: RBI.

SDL Yield

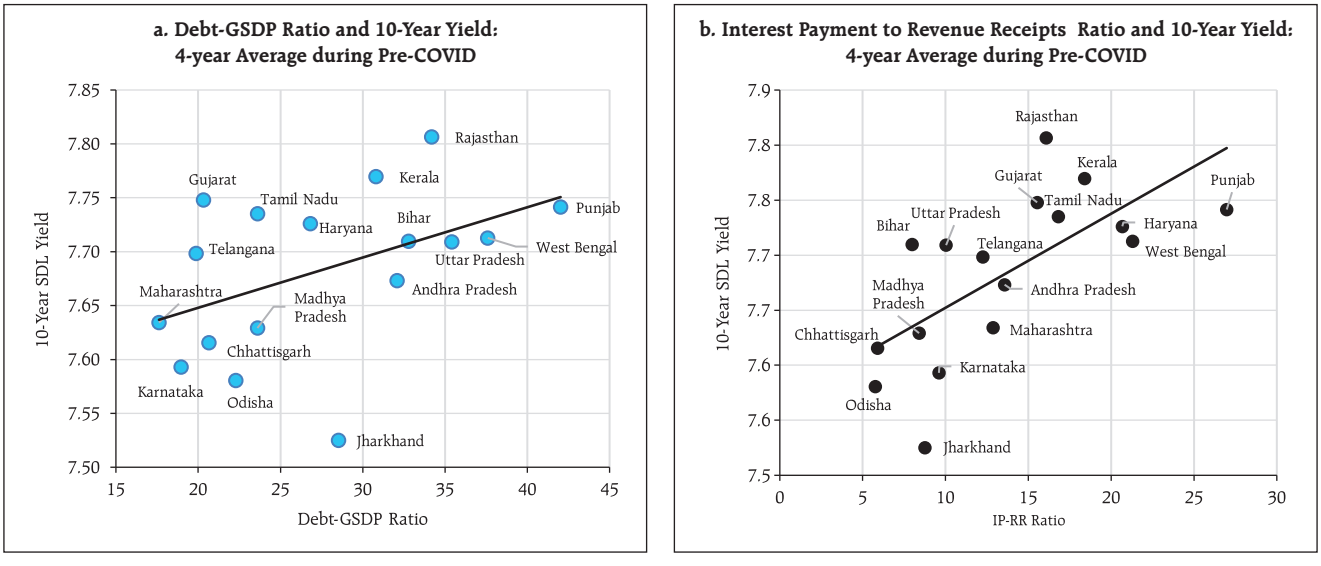
Despite modest interstate spreads, there is an inverse relationship between fiscal performance of states and the SDL yields (Table 2). For instance, fiscally weak states with higher debt-GSDP ratios and higher IP-RR ratios tend to have higher SDL yields (Chart 6). In the absence of SDL ratings, these fiscal conditions seem to be playing the role of a differentiating filter in the determination of SDL yields.

Hence, it is critical for the states to consolidate their fiscal position in order to lower their cost of borrowing.

III. Debt Sustainability of Vulnerable States

The IMF's fiscal risk analysis and management framework[6] provides a fiscal reaction function (FRF) to help assess debt sustainability and fiscal stress. The FRF assesses solvency by linking the primary balance to debt, while accounting for current economic conditions to reflect the impact of business cycle fluctuations (IMF, 2016; Bohn, 1998; Adams, *et al.*, 2010; Tiwari, 2012; Kaur, *et al.*, 2018). When the primary balance (relative to GDP) moves in the same direction as public debt (relative to GDP), it implies that rising debt ratios lead to higher primary surpluses

Chart 6: Key Fiscal Indicators and 10-Year SDL Yield



Source: Reserve Bank of India.

6 IMF (2016). Analyzing and Managing Fiscal Risks – Best Practices.

which can be used for repayment and servicing of debt implying debt sustainability. Using this approach, the following equation is estimated in a panel data framework with annual data from 2001-02 to 2021-22:

$$S_{i,t} = \alpha_0 + \beta D_{i,t-1} + \alpha_1 GSDPGAP_{i,t} + \alpha_2 EXPGAP_{i,t} + \varepsilon_{i,t} \quad \ldots.(1)$$

where GSDP is the gross state domestic product; *S* is the primary balance to GSDP ratio; *D* is debt to GSDP ratio, which also includes contingent liabilities in the form of explicit guarantees; *GSDPGAP* is the deviation of actual output from its trend; *EXPGAP* is the deviation of actual primary expenditure from its trend; and ε is the error term. 'β' is the coefficient of interest as it measures the response of primary balance to debt. A coefficient value between zero and one implies that a rise in Debt-GSDP ratio in the current period leads to a rise in primary balance in the subsequent period which is consistent with a sustainable fiscal policy adjustment to debt. On the other hand, a negative coefficient indicates that the response could be destabilising as rise in debt ratios in the current year leads to a fall in primary surplus next year, making debt servicing difficult.

Equation 1 is estimated for (i) all states[7]; (ii) 10 most indebted states; and (iii) 5 most indebted states.[8] The performance of states is based on debt-GSDP ratio in 2020-21 (Table 1 in Section 2 and Table 3[9]).

The results indicate that for all states and for the 10 most indebted states, the coefficients of the explanatory variables are all statistically significant and have the correct signs as per the *a priori* expectations. The positive coefficient of D_{t-1} obtained for all states, except the 5 most indebted ones, suggests that the primary balance of the state governments generally increases in response to rising debt ratios, indicative of debt sustainability.

Table 3: Estimation Results

Explanatory Variables	Estimated Coefficients		
	All States/UTs	10 most indebted States	5 most indebted States
1	2	3	4
Constant	-3.65*** (0.00)	-2.87*** (0.00)	1.54 (0.59)
D_{t-1}	0.07*** (0.00)	0.04*** (0.00)	-0.09 (0.24)
$GSDPGAP_t$	3.53*** (0.00)	3.22* (0.08)	5.79 (0.26)
$EXPGAP_t$	-9.63*** (0.00)	-7.92*** (0.00)	-13.14*** (0.00)
AR (1)	0.46*** (0.00)	0.44*** (0.00)	0.38** (0.02)
Adjusted R^2	0.50	0.40	0.62
DW	1.99	2.02	1.68

Notes: 1) Figures in the parentheses represent respective P values.
2) ***, ** and * denote significance at 1 per cent, 5 per cent and 10 per cent levels, respectively.

The coefficient of D_{t-1} turns out to be negative for the 5 most indebted states, though lacks statistical significance, implying that rising debt ratios have no significant impact on the primary balance ratios of these states. Thus, it can be concluded from the analysis that while the aggregate state government debt in India is still sustainable, the public debt of the 5 most indebted states does not satisfy the sustainability condition.

An analysis of various indicators of debt sustainability of these 5 states reveals that the Domar stability condition (the real rate of interest on debt[10] should be lower than the real GDP growth rate: r-g <0) was fulfilled in these states during the last five years except in 2020-21 (Table 4). On the other hand, the rate of growth of public debt turns out to be higher than GSDP growth most of the time in the last five

[7] Except the North-Eastern Hill states and Telangana, for which data are available only from 2014-15.

[8] Based on data for the year 2020-21, the top 5 most indebted states in India are: Punjab, Rajasthan, Bihar, Kerala and West Bengal. Apart from these states, the top 10 most indebted states include: Uttar Pradesh, Jharkhand, Andhra Pradesh, Madya Pradesh and Haryana.

[9] Hausman Test results indicated that Fixed Effect model is the most suitable for the dataset.

[10] Effective interest rate adjusted for inflation.

Table 4: Debt Sustainability Indicators

States	2018-19	2019-20	2020-21	2021-22	2022-23
1	2	3	4	5	6
r-g (Percentage point)					
Bihar	-6.2	-6.0	2.3	-3.4	-3.5
Kerala	-4.6	3.3	10.8	-5.4	-3.0
Punjab	-0.5	2.9	7.9	-2.4	
Rajasthan	-1.8	-2.0	5.7	-11.2	-5.5
West Bengal	-5.3	-1.8	-0.1	-10.5	-4.1
Difference in nominal GSDP and debt growth (Percentage point)					
Bihar	5.0	-2.0	-11.4	-5.5	-0.3
Kerala	-0.2	-5.2	-17.1	0.5	-0.6
Punjab	0.2	-2.9	-12.9	1.4	
Rajasthan	-1.2	-3.7	-14.2	2.9	-0.7
West Bengal	4.0	-0.6	-4.9	8.4	0.6

Source: RBI Staff Estimates.

years, which has resulted in mounting debt-GSDP ratio in these states.

IV. Fiscal Risk Analysis of States

In a robust fiscal risk analysis framework, it is important to identify the potential sources and nature of fiscal risks, achieve quantification of fiscal risk and recommend suitable risk management practices for adoption[11].

IV.1 Risk Identification

Fiscal risks can arise from macroeconomic shocks and the realisation of contingent liabilities. Contingent liabilities can be either 'explicit', *viz.,* government loan guarantees, or 'implicit', wherein even without any specific guarantee, there is widespread public expectation that the government will rescue or bailout the troubled entities. Globally, the most common sources of contingent liabilities are troubled financial institutions, state-owned enterprises, subnational governments, private non-financial companies, and public-private partnerships, as the government has to rescue or bailout these entities in case of a default even without any direct stake or ownership in the defaulting entity (IMF, 2016). Besides, natural disasters often amplify fiscal risks, depending on the magnitude and nature of fiscal responses deployed to mitigate their impact on the economy. Legal cases, though infrequent, can pose significant fiscal risks at times.

The major macroeconomic risks facing the state governments in India currently arise from uncertainties surrounding the evolving COVID situation, spillovers from the Russia-Ukraine war operating through high global food and commodity prices, and the synchronized monetary tightening by central banks across the world. Apart from these macroeconomic shocks, the other potential sources of fiscal risk for the Indian states stem from declining own tax revenue, increase in expenditure following growing preference for distribution of "freebies", relaunch of the old pension scheme, increased frequency of natural disasters, realisation of government guarantees extended to state-owned enterprises and rising overdues of loss-making power distribution companies (DISCOMs).

Pension Expenditure

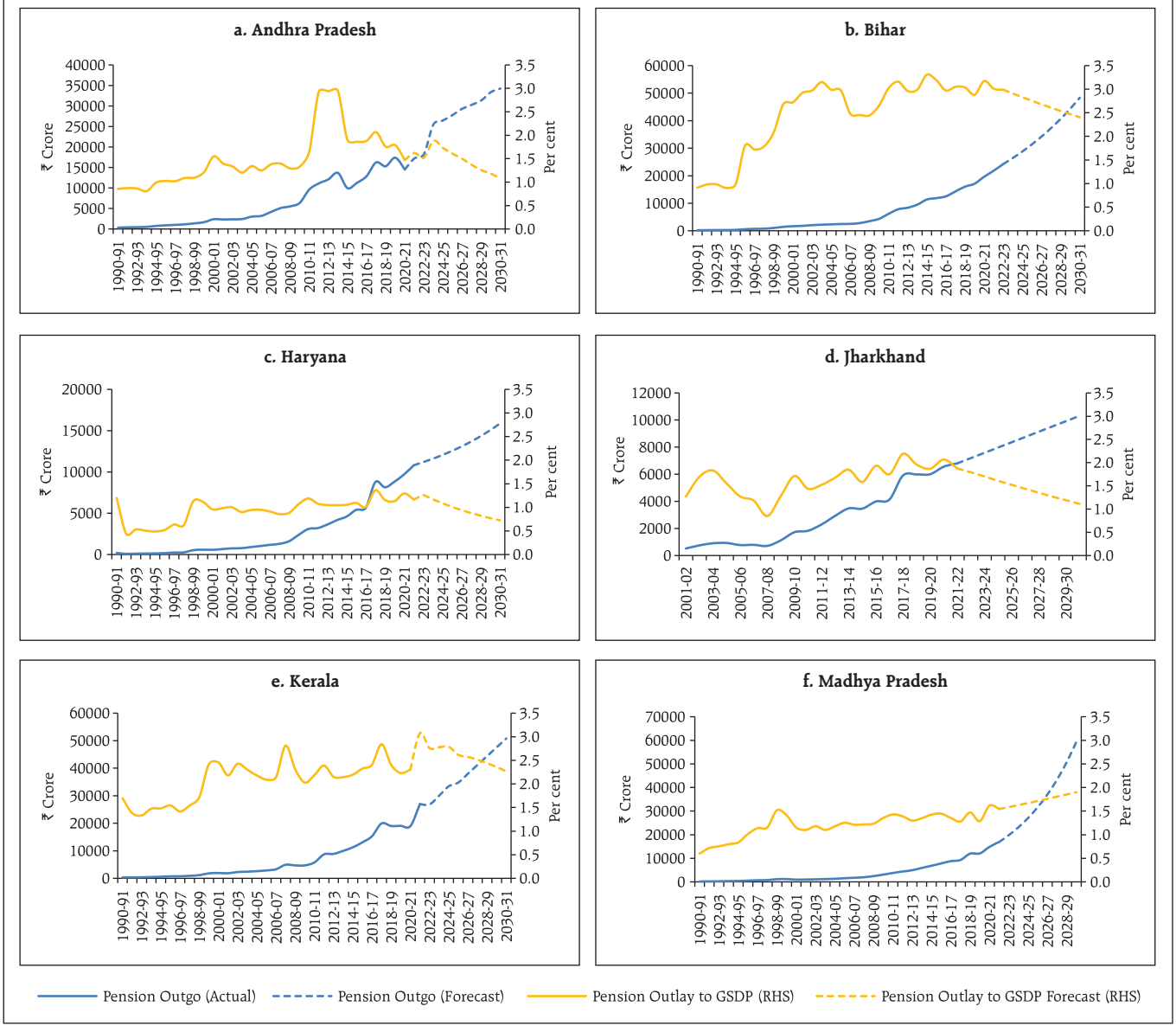
The old pension system (defined benefits) – primarily a pay-as-you-go system and hence, unfunded – had numerous drawbacks, particularly in terms of medium-term fiscal sustainability and the tax burden on future generations. Many states (excluding West Bengal) had switched to the New Pension Scheme (NPS) after realising that the old system was unsustainable in the long run.[12] The recent reversal of positions on the old pension scheme by Rajasthan and Chhattisgarh, however, has reignited the debate about the *pros and cons* of the old pension scheme *versus* the NPS, with a few more states reportedly contemplating taking similar steps.

[11] IMF (2016). "Analyzing and Managing Fiscal Risks – Best Practices". IMF Policy Paper.

[12] Kerala adopted NPS in 2013 and West Bengal has not adopted NPS.

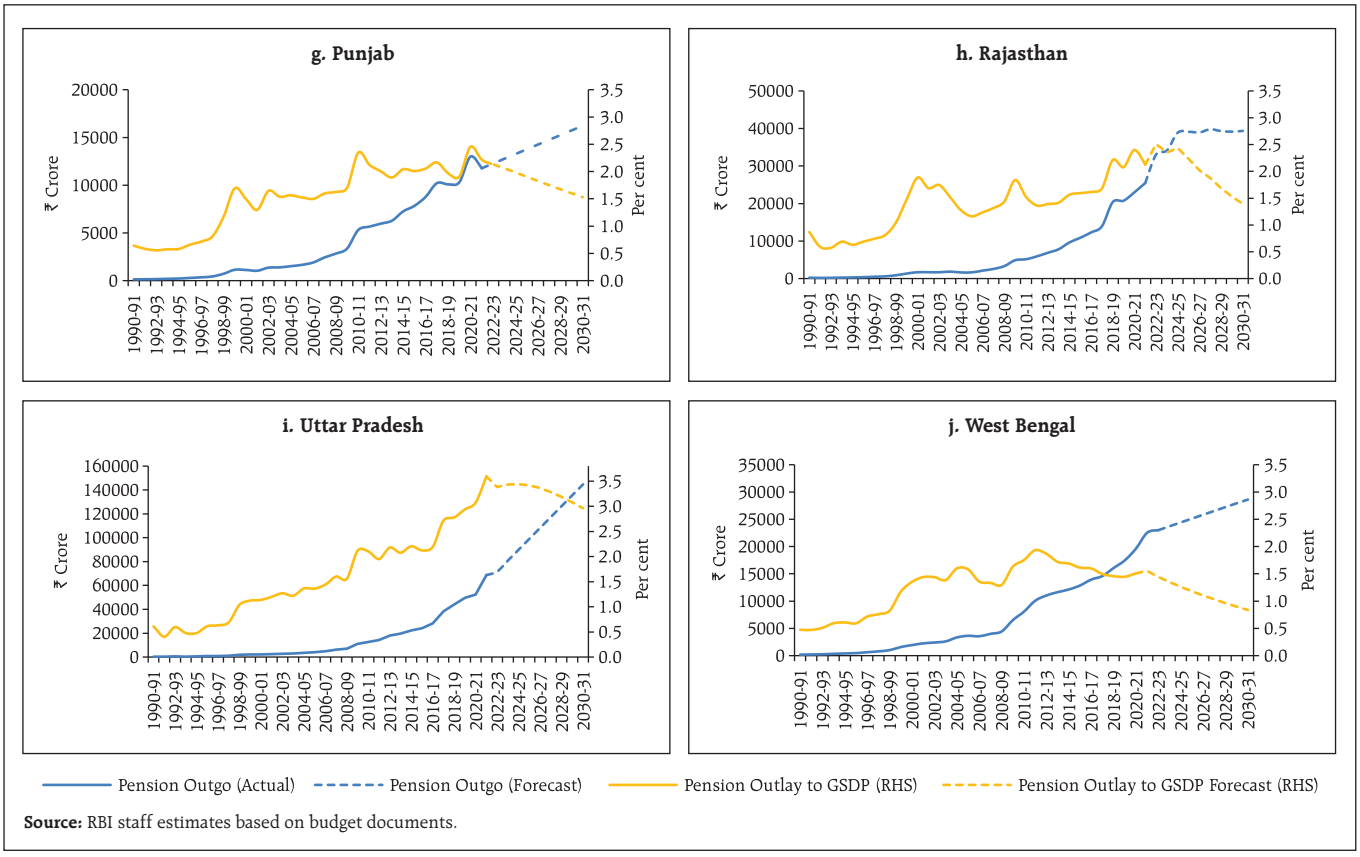
Pension expenditure alone accounts for 12.4 per cent (average of 2017-18 to 2021-22) of total revenue expenditure of the 10 most indebted states. It is estimated that the pension outgo will continue to be in the range of 0.7-3.0 per cent of GSDP in the ten most indebted states until 2030-31 (Chart 7). As the current state government retirees are primarily the beneficiaries of the old pension scheme, the immediate financial strain will not be felt if the states choose to revert to the old pension scheme.

Chart 7: Projected Pension Outgo of States[13]



(Contd...)

[13] GSDP of the states are projected from 2021-22 to 2029-30 using the average growth rate of the last five years preceding 2020-21. The pension outgo projection for Andhra Pradesh, Bihar, Haryana, Madhya Pradesh and Rajasthan from 2021-22 to 2029-30 is taken from the medium-term fiscal policy statements (MTFPS) of these states. For West Bengal, the pension outgo projection till 2023-24 is taken from MTFPS (for West Bengal, MTFPS provides the pension outgo projections till 2023-24). Pension outgo of Jharkhand, Kerala, Punjab, Uttar Pradesh and West Bengal (from 2024-25 to 2029-30) are estimated from 2021-22 to 2029-30 using an exponential smoothing algorithm on the historical data from 1990-91.



Source: RBI staff estimates based on budget documents.

However, when state government employees who joined after 2004-05 under the NPS begin to retire from 2034 onwards, the cost of such a move will become apparent. In other words, the adoption of the old pension scheme is likely to benefit the current generation at the expense of future generations.

State Subsidies and Freebies

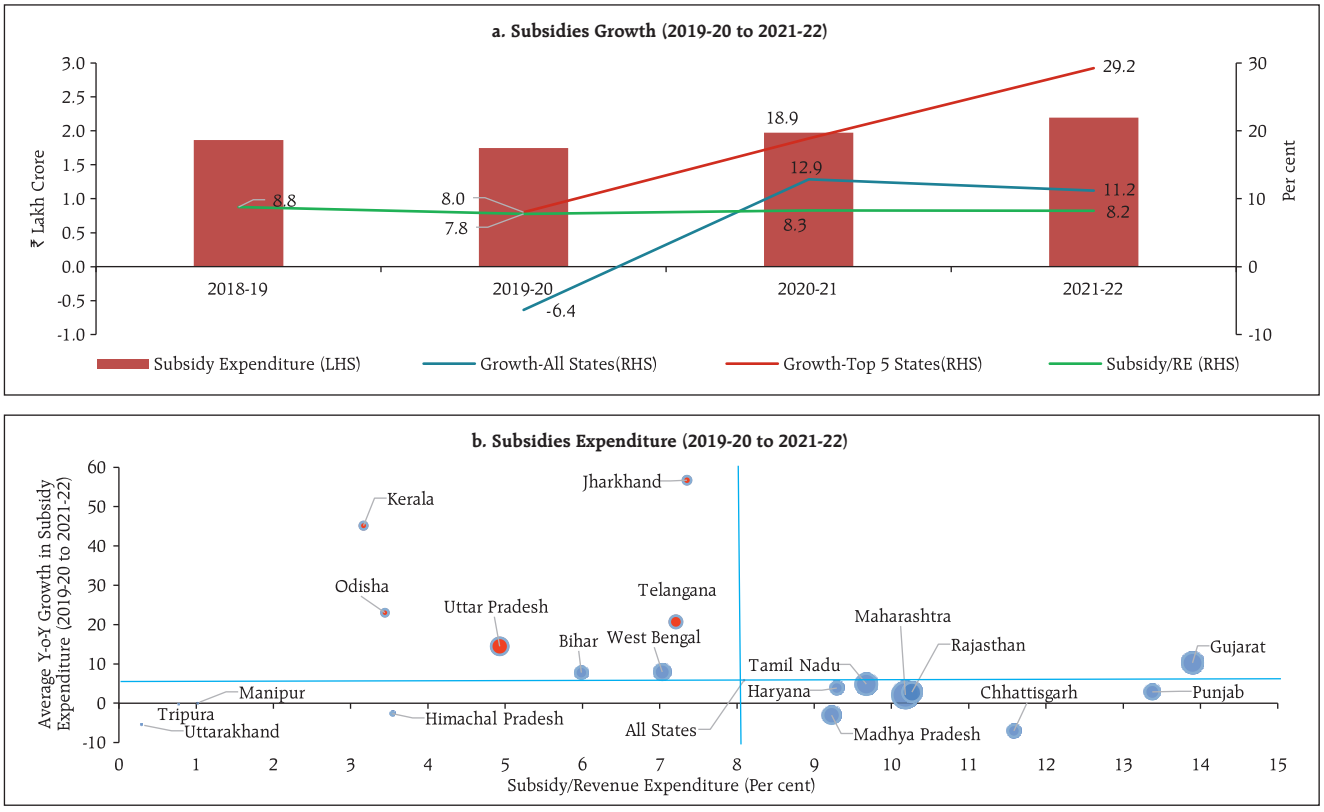
As per the latest available data from the Comptroller and Auditor General of India (CAG), the state governments' expenditure on subsidies has grown at 12.9 per cent and 11.2 per cent during 2020-21 and 2021-22, respectively, after contracting in 2019-20 (Chart 8a).[14] Commensurately, the share of subsidies in total revenue expenditure by states has also risen from 7.8 per cent in 2019-20 to 8.2 per cent in 2021-22. At a disaggregated level, there are stark variations among states. For instance, Jharkhand, Kerala, Odisha, Telangana and Uttar Pradesh are the top five states with the largest rise in subsidies over the last three years. States like Gujarat, Punjab and Chhattisgarh spend more than 10 per cent of their revenue expenditure on subsidies (Chart 8b). Subsidies, however, are known to crowd out resources from other useful purposes (Gopalan, 2013).

In the recent period, state governments have started delivering a portion of their subsidies in the form of freebies.[15] While there is no precise definition of freebies, it is necessary to distinguish them from public/merit goods, expenditure on which brings economic benefits, such as the public distribution system, employment guarantee schemes, states' support for education and health (Singh, 2022). On the other hand, provision of free electricity, free water, free public transportation, waiver of pending utility bills

[14] In respect of 19 states.

[15] A public welfare measure that is provided free of charge.

Chart 8: States' Subsidies Expenditure



Note: Data pertains to 19 states for which monthly subsidies expenditure data is available till March 2022. Bubble size corresponds to the total subsidy outgo during 2019-20 to 2021-22.
Source: Comptroller and Auditor General of India (CAG).

and farm loan waivers are often regarded as freebies, which potentially undermine credit culture, distort prices through cross-subsidisation eroding incentives for private investment, and disincentivise work at the current wage rate leading to a drop in labour force participation. Some freebies may benefit the poor if properly targeted with minimal leakages, but their advantages must be evaluated against the large fiscal costs and inefficiencies they cause by distorting prices and misallocating resources. Additionally, the provisions of free electricity and water are known to accelerate environmental degradation and depletion of water tables.

To derive an estimate of freebies, we have collated data on major financial assistance/ cash transfers, utility subsidies, loan or fee waivers and interest free loans announced by the states in their latest budget speeches (*i.e.*, for 2022-23). As per these estimates, expenditure on freebies range from 0.1 - 2.7 per cent of GSDP for different states (Table 5). The freebies

Table 5: Freebies Announced by the States in 2022-23

	(As a per cent of GSDP)	(As a per cent of Revenue Receipts)	(As a per cent of Own Tax Revenue)
1	2	3	4
Andhra Pradesh	2.1	14.1	30.3
Bihar	0.1	0.6	2.7
Haryana	0.1	0.6	0.9
Jharkhand	1.7	8.0	26.7
Kerala	0	0	0.1
Madhya Pradesh	1.6	10.8	28.8
Punjab*	2.7	17.8	45.4
Rajasthan	0.6	3.9	8.6
West Bengal	1.1	9.5	23.8

*: Dhasmana, I. (2022). "Not all states are so financially weak that they can't announce freebies". Business Standard. April 2022.
Source: Budget documents of the state government.

have exceeded 2 per cent of GSDP for some of the highly indebted states such as Andhra Pradesh and Punjab (Annex 1).

The Centre's GST compensation payout will come to an end in June 2022, further reducing the headroom available for social sector expenditure. In such a situation, a multitude of social welfare schemes in the form of freebies will not only put a heavy burden on the exchequer but will also exert upward pressures on yields if they are financed through market borrowing. It will be important, therefore, for the state governments to reprioritise their expenditure to achieve optimum long-term welfare advantages by ensuring that the beneficiaries get empowered permanently and forego such benefits. Also, states should ensure that there is a sunset clause for each social sector scheme. Reducing the quantum of subsidies by ensuring that only the deserving receive them will free up resources to invest in health, education, agriculture, R&D and rural infrastructure, which will help create more jobs and reduce poverty on a sustainable basis (Gulati 2022).

Contingent Liabilities

Contingent liabilities are the contractual obligations of the government to pay in the event of a default by the borrower, either on the principal amount borrowed or interest payments on such amount or both. The contingent liabilities of states have been rising in recent years. As per the latest available information, the off-budget borrowings by states - loans raised by state-owned entities and guaranteed by the state governments - have reached around 4.5 per cent of GDP in 2022 (CRISIL, 2022). While the power sector accounts for almost 40 per cent of these guarantees, other beneficiaries include sectors like irrigation, infrastructure development, food and water supply. Contingent liabilities have surpassed 5 per cent of GSDP in states like Punjab, Rajasthan, Uttar Pradesh and Andhra Pradesh (Table 6).

DISCOMs Bailouts

The power sector accounts for much of the financial burden of state governments in India, both in terms of subsidies and contingent liabilities. Illustratively, many state governments provide subsidies, artificially depressing the cost of electricity for the farm sector and a section of the household sector. State governments also infuse capital into power distribution companies (DISCOMs) through equity and debt to enable them to undertake productive investments. Additionally, periodic bailouts (3 bailouts of DISCOMs in the last 20 years[16]) wherein states take over either the losses or the debt burden of the DISCOMs have substantial repercussion for state finances.

Table 6: Guarantees issued by State Governments (Per cent of GSDP)

	Bihar	Kerala	Punjab	Rajasthan	West Bengal	Andhra Pradesh	Uttar Pradesh	Haryana
2017-18	1.1	2.5	4.5	7.5	0.9	4.6	6.3	2.2
2018-19	1.0	3.4	0.9	7.6	0.6	6.2	6.9	2.6
2019-20	0.9	3.2	4.1	8.1	0.5	8.1	6.7	2.7
2020-21 (RE)	3.4	3.9	5.3	8.6	0.6	9.0	8.0	NA

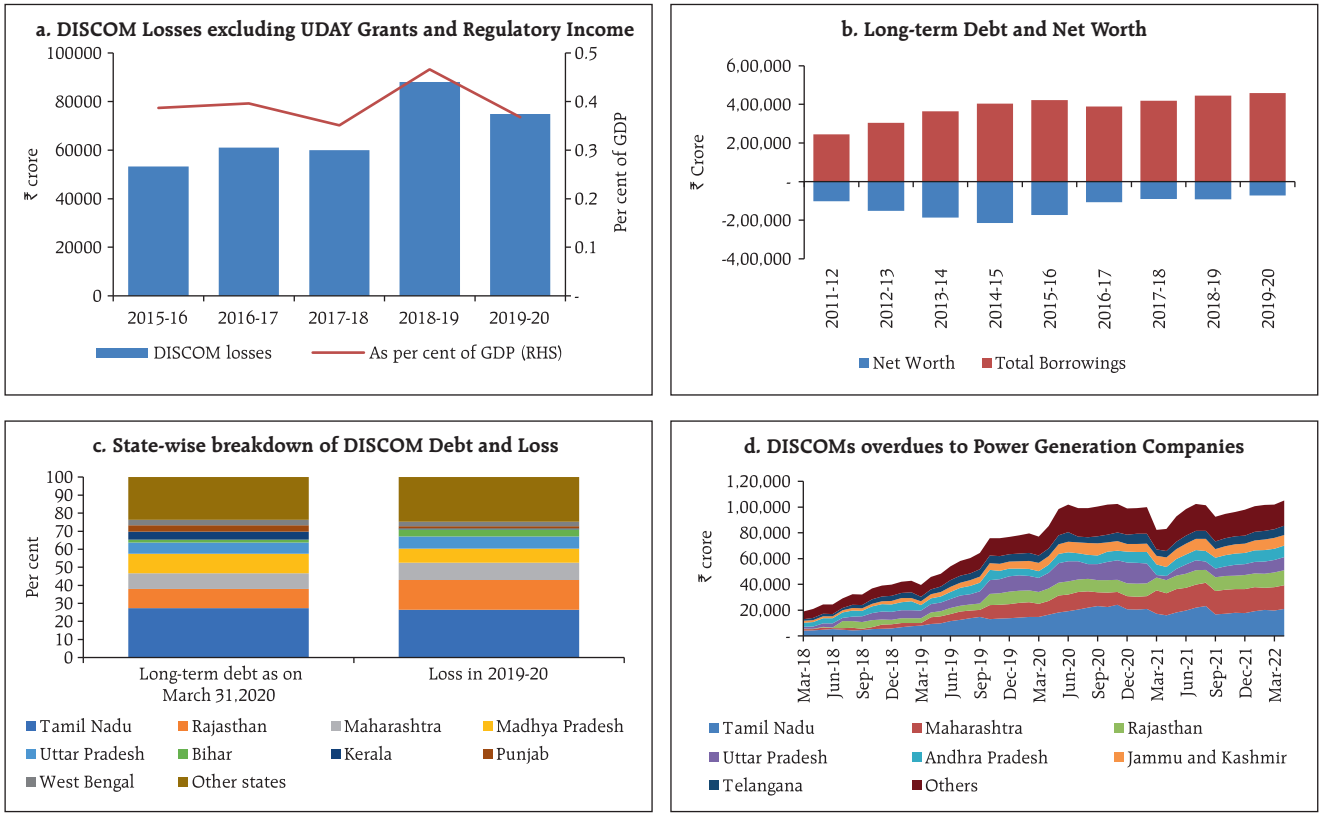
NA: Not Available

Sources: Budget documents of state government; state governments; and PRS Legislative Research (PRS).

[16] One Time Settlement in 2003, Financial Restructuring Plan in 2012 and Ujjwal DISCOM Assurance Yojana (UDAY) in 2015.

Despite various financial restructuring measures[17], the performance of the DISCOMs has remained weak, with their losses surpassing the pre-UDAY level of 0.4 per cent of GDP in 2018-19 (Chart 9a). In addition, their long-term debt started increasing since 2017-18, surpassing the pre-UDAY level by 2018-19 and rising further in 2019-20 (Chart 9b). The combined losses of DISCOMs in the five most indebted states, *viz.*, Bihar, Kerala, Punjab, Rajasthan and West Bengal, constituted 24.7 per cent of the total DISCOMs losses in 2019-20, while their combined long-term debt was 22.9 per cent of the total DISCOM debt in 2019-20 (Chart 9c). Furthermore, overdues of DISCOMs to power generating companies (GENCOs) have increased since March 2018 (with some moderation during November 2020 to April 2021 due to the additional liquidity provided to DISCOMs under the *Atma Nirbhar Bharat Abhiyan*)[18] which may require fresh liquidity injections to ensure uninterrupted power supply (Chart 9d).

Chart 9: Finances of DISCOMs



Sources: Power Finance Corporation report on performance of state power utilities (various issues) and Praapti portal.

[17] The first bailout episode took place in 2003, when the state governments cleared the outstanding dues of State Electricity Boards to Central Power Sector Undertakings through issuance of Power Bonds. In the second instance, the state governments had to undertake a Financial Restructuring Plan in 2012 to enable DISCOMS to meet their short-term debt obligations. The third and most ambitious of the three bailouts was the Ujjwal DISCOM Assurance Yojana in 2015, under which the state governments took over 75 per cent of outstanding liabilities of DISCOMS.

[18] Under the scheme, Power Finance Corporation and Rural Electrification Corporation sanctioned ₹1.35 lakh crore of long-term transition loans (up to 10 years) to DISCOMs for liquidating outstanding dues out of which ₹1.03 lakh crore had been disbursed by December 31, 2021. With DISCOM dues rising again, a second initiative was announced by the Central Government in May 2022, which entails a relaxation on late payment surcharge towards dues to generating companies, provided DISCOMs pay off their dues in 48 instalments.

A rescue package for the DISCOMs may involve substantial financial burden for the states. For instance, if: (i) 75 per cent of the long-term debt of the DISCOMs (as at end-March 2020) is taken over by the state governments (similar to UDAY); and (ii) the states infuse liquidity (in the form of equity) into the DISCOMs to the tune of overdue outstanding to the GENCOs as of April 2022, the burden on the exchequer will be significant. For the 18 major states, the cost of the bailout will be 2.3 per cent of their combined GSDP, though there are significant differences amongst states. Tamil Nadu, Madhya Pradesh, Rajasthan and Punjab are most vulnerable to a possible bailout while Gujarat, Assam, Haryana and Odisha are relatively insulated from this risk (Table 7). For avoiding such bailouts, going forward, the DISCOMs need to undertake appropriate tariff revisions that reflect the underlying cost of power supply, keeping in view the rising cost of imported coal.

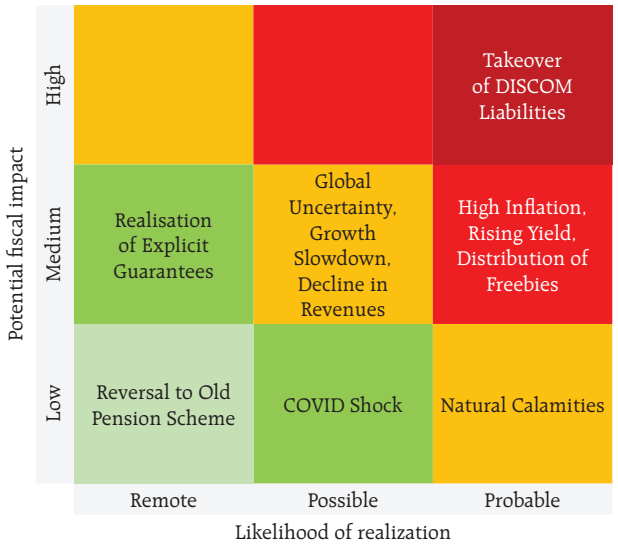
The overall risk rating of state governments, based on the sources, nature, and quantum of risks are summarised (Chart 10).

Table 7: Impact of Potential Bailout of DISCOMs in Major States

State	Pre-bailout		Size of the bailout		Post-bailout		Total bailout size	
	Long-term debt	Equity	Assumption of 75% of long-term debt	Liquidity infusion for power purchase overdues	Long-term debt	Equity		
	₹ Crore	₹ Crore	₹ Crore	₹ Crore	₹ Crore	₹ Crore	₹ Crore	Per cent of 2020-21 GSDP
Punjab	16,258	22,417	12,194	1,404	4,065	36,015	13,598	2.5
Rajasthan	48,934	-46,282	36,701	11,543	12,234	1,962	48,244	3.7
West Bengal	14,222	16,430	10,667	677	3,556	27,774	11,344	0.9
Kerala	20,310	-5,581	15,233	493	5,078	10,145	15,726	1.8
Bihar	6,726	21,603	5,045	755	1,682	27,403	5,800	0.8
Andhra Pradesh	26,810	-19,810	20,108	8,914	6,703	9,212	29,022	2.1
Uttar Pradesh	28,782	8,368	21,587	10,195	7,196	40,150	31,782	1.3
Jharkhand	10,530	2,889	7,898	3,643	2,633	14,430	11,541	2.5
Haryana	6,864	1,347	5,148	919	1,716	7,414	6,067	0.7
Tamil Nadu	1,24,413	-72,411	93,310	21,038	31,103	41,937	1,14,348	5.2
Odisha	4,599	-5,948	3,449	321	1,150	-2,178	3,770	0.6
Chattisgarh	4,102	-2,896	3,077	191	1,026	372	3,268	0.9
Telangana	21,948	-23,363	16,461	7,201	5,487	299	23,662	1.7
Madhya Pradesh	49,112	-31,090	36,834	5,240	12,278	10,984	42,074	3.9
Assam	2,429	8,457	1,822	45	607	10,324	1,867	0.5
Karnataka	22,767	3,232	17,075	4,304	5,692	24,611	21,379	1.0
Gujarat	563	16,607	422	715	141	17,744	1,137	0.0
Maharashtra	39,086	29,135	29,315	18,392	9,772	76,842	47,707	1.0
Total for above states	**4,48,455**	**-76,896**	**3,36,341**	**95,990**	**1,12,114**	**3,55,435**	**4,32,331**	**2.3**

Sources: Power Finance Corporation report on performance of state power utilities (various issues), Praapti portal and RBI staff estimates.

Chart 10: Risk Rating for Indian States



Note: Probable- likely to materialize in the near term; Possible- likely to materialize at some point but unlikely in the near term; Remote-difficult to predict over a given timeframe.
Sources: RBI Staff Estimates using IMF Toolkit.

IV.2 Debt Forecasts and Stress Testing

In the base case scenario, for all the states taken together, the debt-GSDP ratio is projected to moderate between 2021-22 and 2026-27 (underlying assumptions are set out in Annex 2). The moderation in the ratio is primarily attributable to the stellar fiscal performance of a few states, namely, Gujarat, Maharashtra, Delhi, Karnataka and Odisha. Most of the other states are likely to exceed the debt-GSDP ratio of 30 per cent in 2026-27. Punjab is expected to remain in the worst position as its debt-GSDP ratio is projected to exceed 45 per cent in 2026-27, with further deterioration in its fiscal position. Rajasthan, Kerala and West Bengal are projected to exceed the debt-GSDP ratio of 35 per cent by 2026-27. These states will need to undertake significant corrective steps to stabilise their debt levels (Table 8).

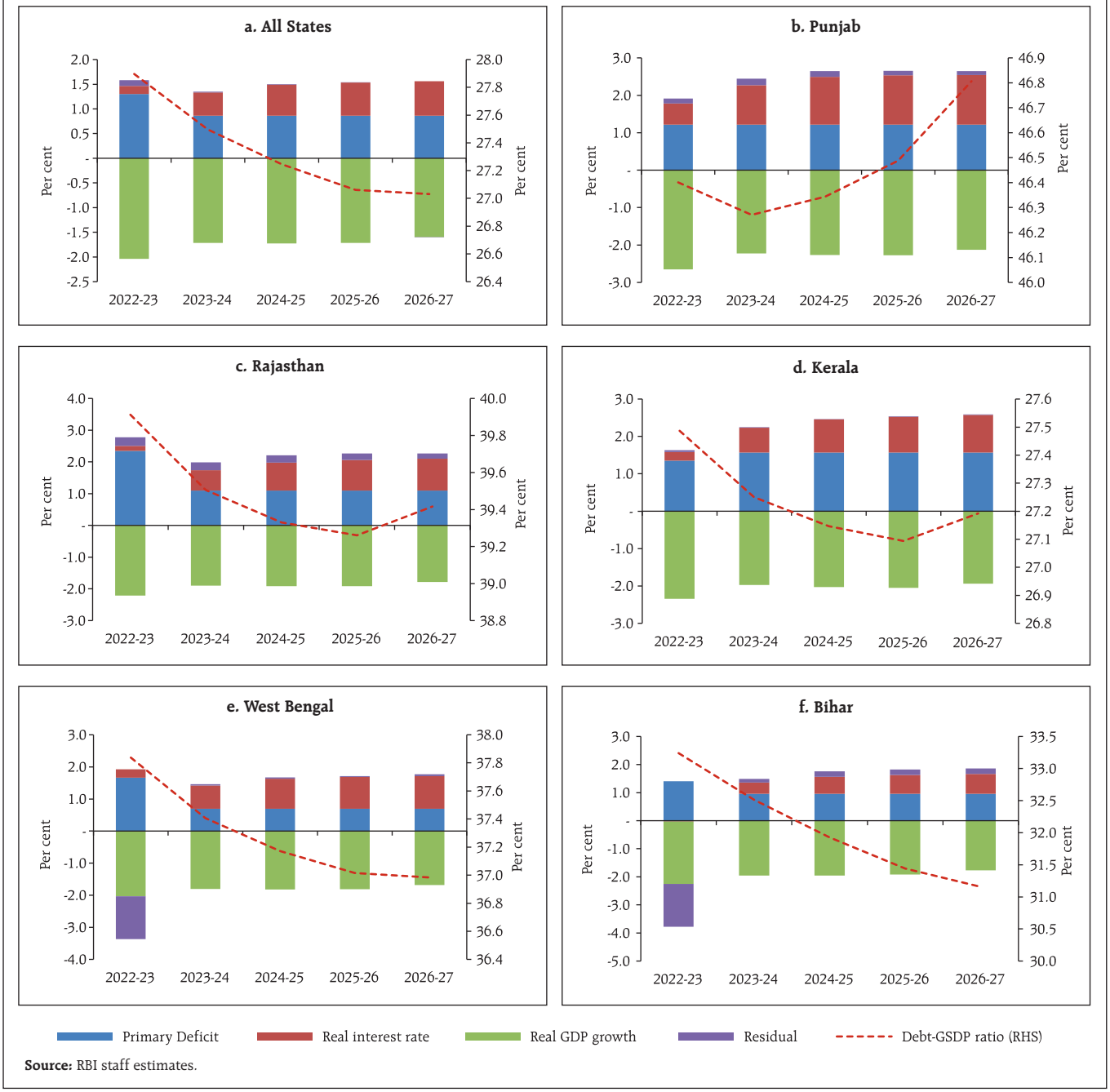
Table 8: Key Indicators for Major States

State	Average for the forecast period (per cent of GSDP)		Debt GDP ratio		Change in debt GSDP ratio	Terminal year (2026-27) outlook	
	Primary deficit	Gross borrowing requirement	2019-20	2026-27		Primary Deficit	Debt stabilising primary deficit
Andhra Pradesh	2.2	6.1	31.7	33.9	2.2	2.3	1.6
Assam	1.1	3.5	21.9	23.8	1.9	0.7	1.0
Bihar	1.0	3.8	32.6	31.2	-1.4	1.0	1.2
Chhattisgarh	1.1	3.6	24.9	29.7	4.7	0.9	0.6
Gujarat	0.6	2.1	20.2	16.6	-3.6	0.6	1.0
Haryana	1.6	5.3	28.1	31.1	3.0	1.7	1.3
Jharkhand	1.1	3.9	29.4	30.2	0.8	1.1	1.1
Karnataka	1.3	3.2	20.8	22.6	1.8	1.3	1.0
Kerala	1.5	5.1	31.3	38.2	6.9	1.6	0.9
Madhya Pradesh	1.4	3.9	22.6	27.2	4.6	1.1	1.0
Maharashtra	0.4	2.2	17.1	18.6	1.5	0.2	0.4
NCT Delhi	0.1	0.5	4.1	3.9	-0.2	-0.0	0.1
Odisha	0.3	2.2	26.2	19.7	-6.5	0.3	1.2
Punjab	1.2	9.6	42.5	46.8	4.3	1.2	0.9
Rajasthan	1.3	4.7	35.4	39.4	4.1	1.1	0.9
Tamil Nadu	1.5	4.1	25.7	31.0	5.3	1.4	1.0
Telangana	2.3	6.3	23.5	29.8	6.2	2.3	1.4
Uttar Pradesh	-0.2	2.7	32.6	27.3	-5.2	-0.2	0.7
Uttarakhand	1.0	5.3	26.6	32.2	5.5	1.0	0.8
West Bengal	0.9	6.0	36.9	37.0	0.1	0.7	0.7
All States*	0.9	3.9	26.0	27.0	1.1	0.9	0.9

*: All states also includes other states and UTs not shown in the table.
Source: RBI staff estimates.

For all states taken together, the decline in the debt-GSDP ratio is driven by favorable interest rate - growth differential (the difference between the impact of real interest rate and real GDP growth) that offsets the accruals to debt from primary deficits (Chart 11). The decline is more pronounced in the initial years of the forecast due to high inflation.[19] This pattern is broadly shared by the five

Chart 11: Contribution to changes in debt-GSDP ratio – all states and 5 most indebted states



Source: RBI staff estimates.

[19] Real interest rate impact = {[Nominal interest rate – inflation rate * (1 + GSDP growth)] * Debt - GSDP ratio in the previous year} / {1 + GSDP growth + inflation rate + GSDP growth * inflation rate}.

Real GSDP growth impact = {(-) GSDP growth rate * Debt - GSDP ratio in the previous year} / {1 + GSDP growth + inflation rate + GSDP growth * inflation rate}.

most indebted states, except in the case of Punjab and Rajasthan where debt begins to rise after declining in the initial years.

Stress Testing

State finances are vulnerable to a variety of unexpected shocks that might alter their fiscal outcomes, causing slippages relative to their budgets and expectations. For some states, shocks may increase their debt by a significant amount, posing fiscal sustainability challenges. Some hypothetical scenarios are created based on past events and the risk ratings for the states. Among the 5 most indebted states, Punjab and Rajasthan appear to be most vulnerable to fiscal shocks arising out of realisation of contingent liabilities (Table 9). Financial restructuring or bailout of ailing DISCOMs will also have most severe impact on the debt-GSDP ratio of these two states. The financial risks from freebies seem to be moderate in case of these states, except Punjab which spends a large amount on provision of free utilities.

Table 9: Impact on Debt to GSDP under different Scenarios

States	Scenario 1 (Contingent Liabilities fully invoked)	Scenario 2 (UDAY-like bailout of DISCOMs)	Scenario 3 (Own Tax Revenue Growth Shock)	Scenario 4 (Subsidies/ Freebies Financed through Borrowings)
Bihar	3.4	0.8	0.9	0.1
Kerala	3.9	1.8	0.7	0.0
Punjab	5.3	2.5	1	2.7
Rajasthan	8.6	3.7	0.4	0.6
West Bengal	0.9	0.9	0.7	1.1

Note: Scenario 1: If the contingent liabilities (as a per cent of GSDP) is invoked, the debt to GSDP ratio of Rajasthan and Punjab could increase substantially (by 5.3 and 8.6 percentage points, respectively). **Scenario 2:** In the case of a UDAY-like bailout, if the states takeover 75 per cent of the DISCOMs debt as at end-March 2020, the debt burden of Punjab, Bihar and Rajasthan may increase by 2.5, 1.8 and 3.7 percentage points, respectively. **Scenario 3**: Own tax revenue shock is taken as the minimum of all the negative deviations from the mean of own tax revenue to GSDP ratios of the states in the last ten years (from 2012-13 to 2021-22). The impact of own tax revenue shocks will be relatively modest at less than 1 per cent of GSDP. **Scenario 4:** Financing of freebies entirely through market borrowings will have a mild to moderate impact on the finances of the most indebted states.

Sources: Budget documents of states; Power Finance Corporation Reports; and information collected from state governments.

V. Conclusions

The recent economic crisis in neighbouring Sri Lanka is a reminder of the critical importance of public debt sustainability. The fiscal conditions among states in India are showing warning signs of building stress. The slowdown in own tax revenue, a high share of committed expenditure and rising subsidy burden have stretched state government finances exacerbated by COVID-19. For the five most indebted states, the debt stock is no longer sustainable, as the debt growth has outpaced their GSDP growth in the last five years. New sources of risks have emerged – relaunch of the old pension scheme by some states; rising expenditure on non-merit freebies; expanding contingent liabilities; and the ballooning overdue of DISCOMs - warranting strategic corrective measures. Stress tests show that the fiscal conditions of the most indebted state governments are expected to deteriorate further, with their debt-GSDP ratio likely to remain above 35 per cent in 2026-27.

As a corrective measure, the state governments must restrict their revenue expenses by cutting down expenditure on non-merit goods in the near term. In the medium term, these states need to put efforts towards stabilising debt levels. Further, large scale reforms in power distribution sector would enable the DISCOMs to reduce losses and make them financially sustainable and operationally efficient. In the long term, increasing the share of capital outlays in the total expenditure will help create long-term assets, generate revenue and boost operational efficiency. Alongside, state governments need to conduct fiscal risk analyses and stress test their debt profiles regularly to be able to put in place provisioning and other specific risk mitigation strategies to manage fiscal risks efficiently.

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Annex 1: List of some recent Schemes of Financial Assistance/ Subsidies announced by the States

S. No.	Scheme	Description	Allocation for 2022-23 (BE) (in ₹ Crore)	As per cent of GSDP	As per Cent of Revenue Receipts	As per cent of Own Tax Revenue
		ANDHRA PRADESH				
1.	*Jagananna Ammavodi*	Financial assistance of ₹15000 to the students' mother to encourage parents to send children to school	6,500	0.5	3.4	7.1
2.	YSR *Aasra*	Reimbursement of the outstanding bank loans of SHGs as on 11.04.2019	6,400	0.5	3.3	7.0
3.	Electricity Subsidy	Free power supply/ concessional power supply/ cash transfer for electricity for agriculture/ to horticulture farmers/aqua culture farmers.	5000	0.4	2.6	5.5
4.	YSR *Cheyutha*	Financial assistance of ₹75,000 to women in the age group of 45-60 years belonging to SC, ST, BC, and minorities to improve their livelihood.	4,236	0.3	2.2	4.7
5.	*YSR Rythu Bharosa*	Financial assistance of ₹7500 per farmer family including tenants and ₹13,500 to landless cultivators belonging to SC, ST, BC, Minorities.	3,900	0.3	2.0	4.3
6.	YSR *Sunna Vaddi Panta Runalu*	Subsidy on interest for crop loans up to ₹1,00,000 to the farmers.	500	0.0	0.3	0.5
7.	Dr. YSR *Aarogya Aasara*	Financial assistance of ₹225 per day as post-operative sustenance allowance to patients for the post-operation recovery period	300	0.0	0.2	0.3
8.	YSR *Vahana Mitra*	Financial assistance of ₹10,000 per annum to self-owned auto/ taxi drivers for meeting expenses on insurance, fitness certificate, repairs, and other requirements.	260	0.0	0.1	0.3
9.	Financial support to religious persons	Salary and remuneration fund to Archakas and other employees	120	0.0	0.1	0.1
		Incentives to Imams and Mouzans	126	0.0	0.1	0.1

(Contd...)

S. No.	Scheme	Description	Allocation for 2022-23 (BE) (in ₹ Crore)	As per cent of GSDP	As per Cent of Revenue Receipts	As per cent of Own Tax Revenue
10.	YSR *Nethanna Nestham*	Financial assistance of ₹24,000/- per annum to every handloom owning weaver family to modernize equipment.	199	0.0	0.1	0.2
		Total	27,541	2.1	14.4	30.3
		BIHAR				
1.	*Sashakt mahila , Saksham mahila*	Cash incentives to female students for completing senior secondary and graduation	900	0.1	0.5	2.2
2.	*Mukhya Mantri Balika* Cycle *Yojana*	Financial assistance of ₹3000 per female student	200	0.0	0.1	0.5
		Total	**1,100**	0.1	0.6	2.7
		JHARKHAND				
1.	Electricity subsidy	Free electricity up to 100 units to farmers and poor	4,855	1.2	5.8	19.5
		Tariff subsidy to the consumers	1,800	0.4	2.2	7.2
2.	*Guruji* Credit Card Scheme	Soft loan up to loan up to ₹10 lakhs at a low interest rate without mortgage to student for pursuing higher education.	-			
		Total	**6,655**	1.7	8.0	26.7
		KERALA				
1.	Interest subsidy	On prompt repayment of agricultural loans taken from co-operative institutions	**50**	0.0	0.0	0.1
		Total	**50**	0.0	0.0	0.1
		MADHYA PRADESH				
1.	Electricity subsidy	To farmers and domestic users	21,000	1.6	10.8	28.8
		Total	**21,000**	1.6	10.8	28.8
		PUNJAB[20]				
1.	Electricity Subsidy	Free electricity up to 300 units to every household	5,000	0.8	5.2	13.4
2.	Waiver	Waive off pending electricity bills.	-			

(Contd...)

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S. No.	Scheme	Description	Allocation for 2022-23 (BE) (in ₹ Crore)	As per cent of GSDP	As per Cent of Revenue Receipts	As per cent of Own Tax Revenue
3.	Financial Assistance to Women	Financial assistance of ₹1000 to every adult woman for female empowerment	12,000	1.9	12.6	32.1
		Total	**17,000**	**2.7**	**17.8**	**45.4**
		RAJASTHAN				
1.	Electricity subsidy	Free electricity up to 50 units for those consuming less than 100 units and concessional rates for higher consumption slab	4500	0.3	2.1	4.6
2.	*Mukhya Mantri* Digital Seva Yojana	Provision of free smart phones to the lady heads of the Chiranjeevi families for 3 years	2500	0.2	1.2	2.5
3.	Waivers	Farm loan waivers	1,000	0.1	0.5	1.0
4.	*Indira Gandhi Matritave Poshan Yojana*	Financial assistance of ₹6000 on birth of second child to pregnant women	210	0.0	0.1	0.2
5.	*Mukhya Mantri Divyang Scooty Yojana Scheme, Kali Bal Bheel* and *Devnarayan Yojana*	Provision of free scooties to students	170	0.0	0.1	0.2
6.	*Rajasthan Krishi Shramik Sambal* Mission	Financial assistance of ₹5000 to landless farmers to purchase agricultural equipment	100	0.0	0.0	0.1
7.	Byaj Maafi Yojana	Waiver of mandi charges				
		Total	**8,480**	0.6	3.9	8.6
		WEST BENGAL				
1.	*Lakshmi Bhandar*	Financial assistance of ₹1000 to every SC/ST woman and ₹500 to every other woman for their financial empowerment	10,767	0.6	5.4	13.6
2.	*Krishak Bondhu*	One Time Grant to the Family of Deceased Farmer under Krishak Bondhu	500	0.0	0.3	0.6
		Financial assistance of ₹10,000 to all farmers for agricultural purposes	4,994	0.3	2.5	6.3

(Contd...)

S. No.	Scheme	Description	Allocation for 2022-23 (BE) (in ₹ Crore)	As per cent of GSDP	As per Cent of Revenue Receipts	As per cent of Own Tax Revenue
3.	*Kanyashree Prakalpa*	Annual incentive of ₹75 and one-time grant of ₹25,000 to ensure that girls stay in school and delay their marriage until after 18 years of age.	1866.2	0.1	0.9	2.4
4.	*Rupashree Prakalpa*	Financial assistance of ₹25000 per indigent women for the purpose of marriage	750	0.0	0.4	0.9
		Total	**18,877**	**1.1**	**9.5**	**23.8**
		HARYANA				
1.	Monthly stipend to SC/ BPL/BC students	monetary incentive to improve the educational avenues of the students and enhance their admission and retention.	242	0.0	0.2	0.3
3.	*Mukhjya Manti Vivha Shagun Yojana*	Financial assistance to poor families, widows, destitute women, sportspersons for the marriage of their daughters.	180	0.0	0.2	0.2
4.	*Aapki Beti, Humari Beti (Ladli)* Scheme	Financial assistance of ₹21,000 on birth of first and second girl child to SC and BPL families.	160	0.0	0.2	0.2
5.	Stipend to college students	Stipends of ₹1000 per month to all SC students in government college in the State for their upliftment and welfare.	45	0.0	0.0	0.1
6.	Free Bicycles	Provision of free bicycles to SC students in classes IX to XII.	6	0.0	0.0	0.0
7.	Scheme for Welfare of Scheduled Castes Families Fisheries Sector	Financial assistance will be provided to the fish farmers, fishermen and fish contractors of notified waters in the State.	5.6	0.0	0.0	0.0
		Total	**638.6**	**0.1**	**0.6**	**0.9**

Note: Data for Punjab pertains to 2021-22 while for the other states it pertains to 2022-23 (BE).
Source: Budget documents of the States.

Annex 2: Assumptions for the State-Level Debt Sustainability Model

Variable	Assumptions
Gross State Domestic Product (GSDP) at constant prices	• For FY 2021-22, data for 18 states is directly obtained from MOSPI. The all states average GSDP is assumed to be the same as the weighted average of these 18 states. • For FY2022-23 to FY 2026-27, the consolidated GSDP of all states is assumed to grow based on IMF projections. • Inter-state differences in growth rates are accounted for by assuming the relative growth performance of the state in the projection period will follow the 5-year average of period of 2014-15 to 2018-19.
Inflation based on GDP deflator	• For FY2021-22, data for 18 states is directly obtained from MOSPI. For the remaining states, average inflation of these 18 states is assumed. • For FY2022-23 to FY 2026-27, inflation is based on IMF projections. All states are assumed to have the same inflation.
Primary deficit	• For FY2022-23, data for 23 states is directly obtained from budgets. For the remaining states, state's primary deficit as a per cent to GSDP is assumed to be the historical average of the 10-year period from 2009-10 to 2018-19. • For FY2022-23 to FY2026-27, state's primary deficit (after netting out the one time impact of DISCOM bailouts under UDAY) as a per cent of state's GSDP is assumed to be the historical average of the 10-year period from 2009-10 to 2018-19. • For Andhra Pradesh, 2014-15 is excluded from the average considering the year of bifurcation of the state. For Telangana, average of 2015-16 to 2018-19 is considered in making assumptions for the forecast period.
Interest rate	• Yield on fresh borrowings assumed to be 7.3 per cent in 2022-23 based on the price discovered in auctions in April and May 2022. • Yield assumed to decline gradually to 6.9 per cent by 2026-27 with softening inflationary conditions.

*Freight Costs of India's Trade**

Global container shipping industry, a significant part of global supply chain logistics, came under severe pressure as world trade recovered from the collapse triggered by initial wave of the COVID-19 pandemic. Mirroring the global surge, freight charges in India have also been trending up and contributing to the rising value of India's exports and imports in the recent quarters. The freight shocks emanating from container shortages and increased market frictions are found to have an impact on domestic retail prices, through import quantum and wholesale price channels under a structural vector autoregression (SVAR) framework. Higher freight also appear to exacerbate the passthrough of import cost shock to retail inflation.

Introduction

The world-wide restrictions triggered by coronavirus shock in 2020 led to significant collapse of international movements in goods and labour. The pandemic struck when global trade was already facing heightened uncertainties in the wake of Brexit and US-China trade tensions, which had rendered freight capacity relatively stagnant and supply chains disrupted (Patra *et. al.*, 2022). Also, no significant new capacities could have been added during the early waves of the pandemic. The container shipping industry that caters to transport of the traded goods and forms a significant part of global supply chain logistics, came under severe pressure when the world trade recovered swiftly, particularly from sharp acceleration in exports from East Asia, Pacific and China, which reflected in the surge in freight cost across all transoceanic trade routes.

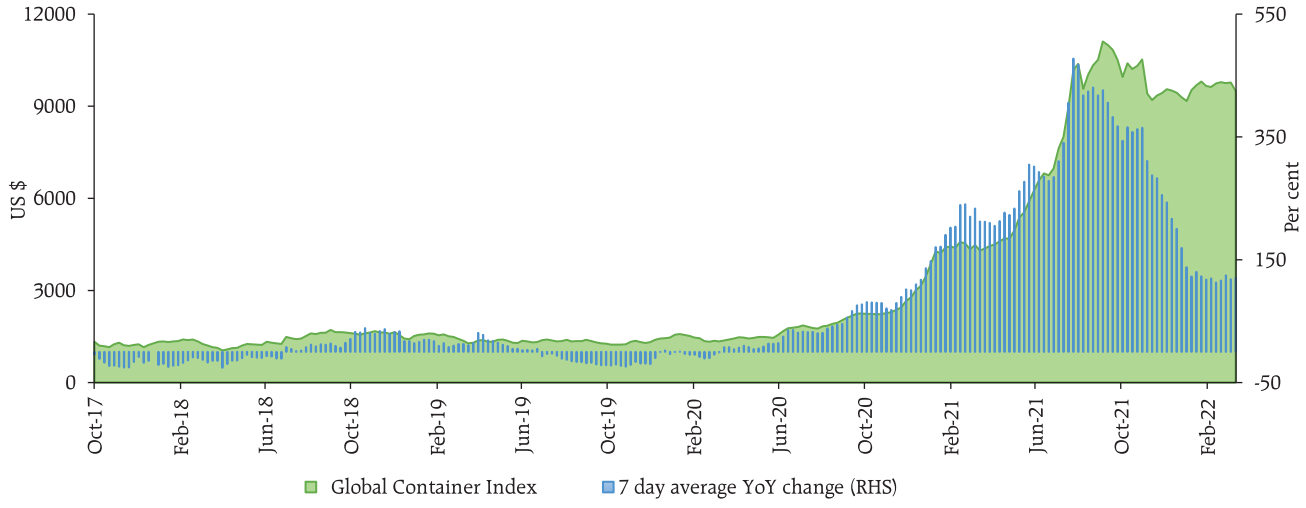
In this context, this study looks at international trade in India that rebounded from the initial impact of the pandemic and has now surpassed the pre-COVID-19 average levels and analyses the contribution of freight in imports and exports values, using unit value and quantum indices as well as by constructing quarterly price indices for India, separately for freight and import cost based on the freight to trade ratios as derived components from its balance of payments (BOP) statistics. In view of the greater role of freight price[1] in import and export prices in the recent period, it also examines the role of freight in inflation dynamics in India.

The interconnected nature of global trade passed through the terrains of both risk and resilience during the pandemic which reflected in its contraction and rebound, aided by initial hindrances and later supply responses. Interruptions to international trade including lower activity or suspension of services on some routes in view of sinking demand and heavy restrictions, led to the congestions at ports, as shipping containers that usually move back and forth, got concentrated at few ports (UNCTAD, 2020). The constrained capacity management by carriers amid swiftly dropping container inventory caused market frictions (*viz.*, long delays at ports, backlog of product waiting to be delivered/cleared/loaded adding to the congestion and leading further to container unavailability). These market frictions were further aggravated by other underlying causes, including pandemic related labour shortages and changing trade patterns - surge in e-commerce, consumer spending shift from contact-intensive services to lockdown-initiated consumer durables and health related supplies, that added more pressure to the shipping costs (Kamali, 2022). The low recycling of empty containers on longer trade routes amid restrictions contributed to their global shortages, which in turn

* This article has been prepared by Dipankar Biswas, Savita Pareek and Seema Saggar in the Balance of Payment Statistics Division of the Department of Statistics and Information Management. The views expressed in the article are those of the authors and are not necessarily shared by the Reserve Bank of India.

[1] Freight price is the freight/cost/charge/rate of transporting goods from one place to another.

Chart 1: Freightos Baltic Global Container Index (FBX)
(US $, per cent change of 7 day average YoY)



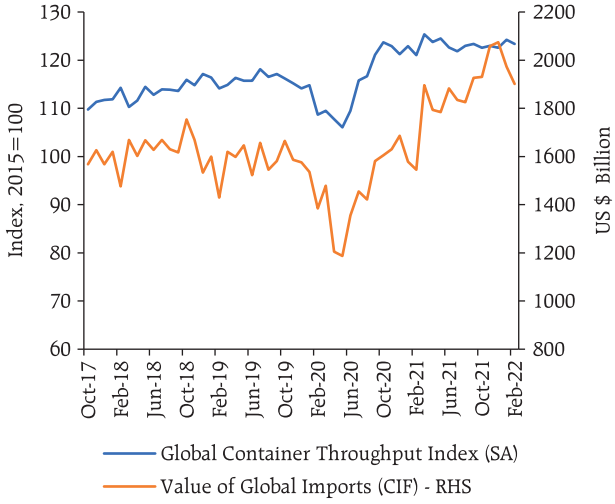
Source: Bloomberg.

contributed to higher premiums/leasing rates on new containers (UNICEF, 2021).

Such increased market frictions led to manifold increase in the global container freight costs at the time when shipping industry was already struggling to meet the surging demand, more notably from China, which recovered sooner from the pandemic *vis-à-vis* other regions and contributed substantially to the rebound in trade, given its strong position in global trade and its being a dominant container manufacturer (Attinasi *et. al.*, 2021). The market driven shipping costs, as reflected in Freightos Baltic Global Container Index (FBX)[2], has been recording over 100 per cent annual growth consistently since late 2020, indicating sustained high pressure (Chart 1). The spikes reflect the strong demand and faster than expected recovery in global trade (Chart 2). Prices of shipping containers and container freight rates across all trade links spiralled up according to the Drewry world container index, which has remained at elevated levels after touching record peak during Sept-Oct 2021 (Chart 3).

Reflecting the surge in global commodity prices and transport costs, inflation and inflation expectations in the Euro area and the US have risen substantially in the recent period (Charts 4a, 4b). In order to gauge the inflationary impact of the higher costs, OECD quantifies the pass-through of 50 per cent rise in shipping cost to consumer price inflation

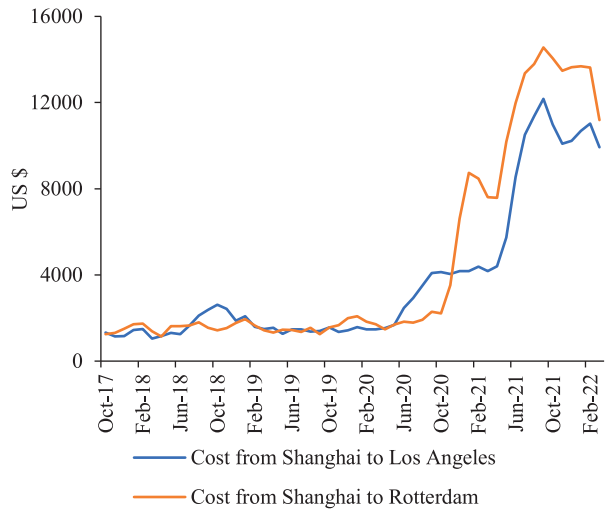
Chart 2: Global Container Throughput Index (SA)
and Value of Global Imports (CIF)



Notes: SA- Seasonally Adjusted.
Source: CEIC.

[2] It is a leading international freight rate index, created in cooperation with the Baltic Exchange and provides market rates for shipping 40 ft container.

Chart 3: Drewry World Container Index (in US $ to ship a 40 ft container)



Source: Bloomberg.

(*via* merchandise import price inflation) to around 0.2 percentage point after four quarters, given the relatively small portion of transport costs in the total goods value (Nefussi and Rusticelli, 2021). Another study looks at the impact of shipping cost on US inflation and estimates that 15 percent increase in shipping costs leads to 0.10 percentage point increase in core inflation after one year (Herriford *et. al.*, 2016). Based on a sample of 46 countries from February 1992 to December 2021, shipping cost is found to be closely affecting the inflation (Swallow *et. al.*, 2022). The study concludes that a one standard deviation increase in global shipping costs typically increases domestic headline inflation by 0.15 percentage point over 12 months. Even as adverse impact of the pandemic waves is still lingering on the macro-economic conditions in different parts of the globe, the Russian invasion of Ukraine has come as another severe economic shock to the international trade, growth and the prices (OECD, 2022).

The rest of the study is organised in five sections. Section II presents some emerging stylised facts in international merchandise trade and freight *vis-à-vis* India, including trends in their unit value and quantum indices. Section III elucidates construction of unit price indices separately for freight and estimates the contribution of freight in overall increase in import values in context of global surge in freight rates. Section IV examines the impact of freight price shocks on domestic retail inflation and describes structural vector autoregression (SVAR) framework. Section V concludes.

Chart 4a: CPI Inflation (in per cent)

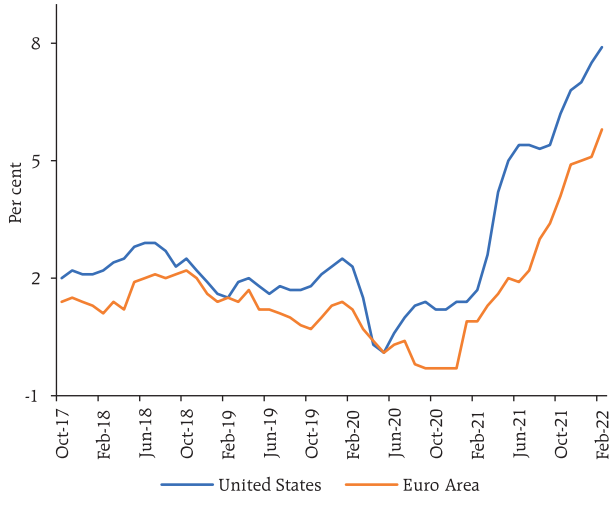
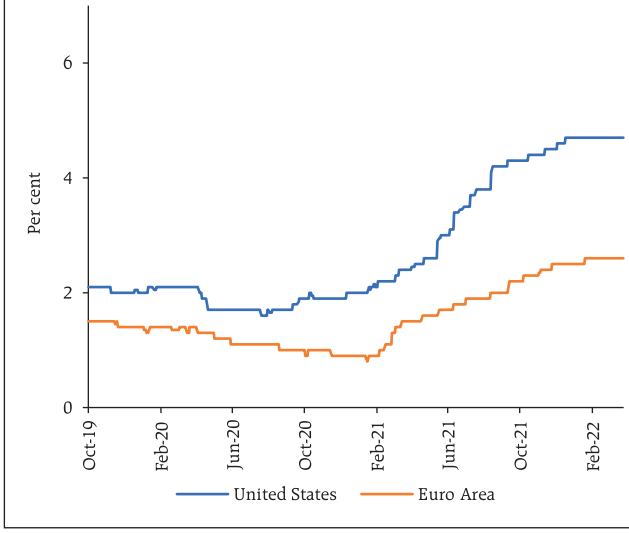


Chart 4b: Inflation Expectations (in per cent)



Source: Bloomberg.

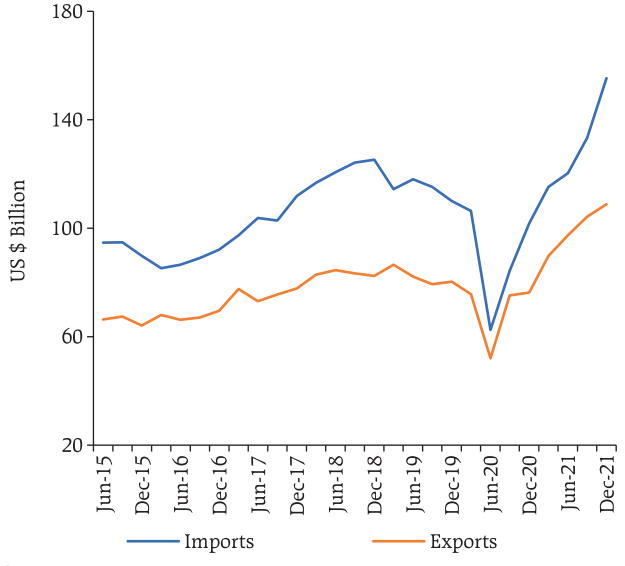
II. India's Commodity Trade and the Freight Costs - Stylised Facts

(a) **The widespread global trade downturn followed by the V-shape recovery**[3]: With the collapse in international commodity prices, particularly of crude oil in conjunction with weak global demand, international trade that had recovered in 2016-17, deteriorated again from the second half of 2018-19 and further in 2019-20, also led by trade tensions between the US and China, fears of disorderly Brexit in Europe and a subdued global output outlook (UNCTAD, 2021). The widespread trade downturn was also reflected in India's trade movements (Chart 5) and their growth rates. With the advent of COVID-19 pandemic that followed up with the sharp compression in consumption and investment, and the collapse in international commodity prices during first half of 2020-21, India's merchandise exports and imports contracted by 7.3 per cent and 18.0 per cent, respectively in 2020-21.

Policy support and rolling out of stimulus packages in response to the stress conditions, and gradual easing-up of lockdown measures with increasing vaccination coverage resulted in fast recovery in domestic demand and improvements in the supply chains in 2021. Also the commodity prices, particularly the oil price dynamics gradually changed during the year with supply restraints more strictly observed by OPEC plus, well supported by additional voluntary production cuts by the OPEC's largest producers, driving fuel costs further, which in turn, added to higher trade values. The steady rebound was also reflected in India trade movements and their growth rates.

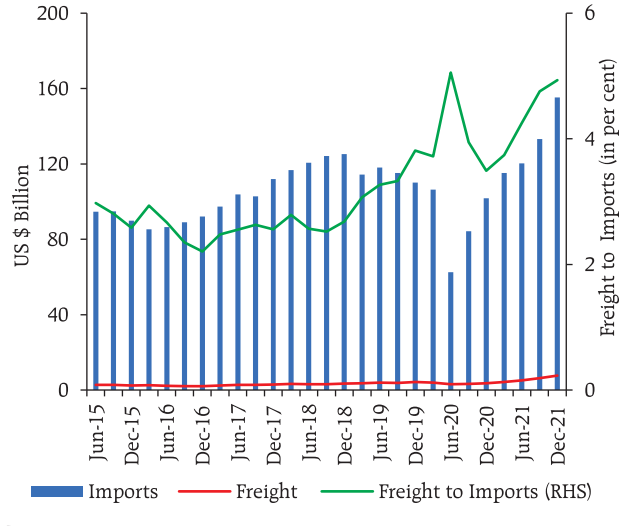
(b) **Increased freight and shipping costs**[4]**:** Global spurt in freight costs is reflected in India's trade as well. In line with rebound in trade and escalating freight, the ratio of freight to

Chart 5: Imports and Exports of Goods - Value



Source: RBI.

Chart 6: Imports - Value and Freight to Import ratio

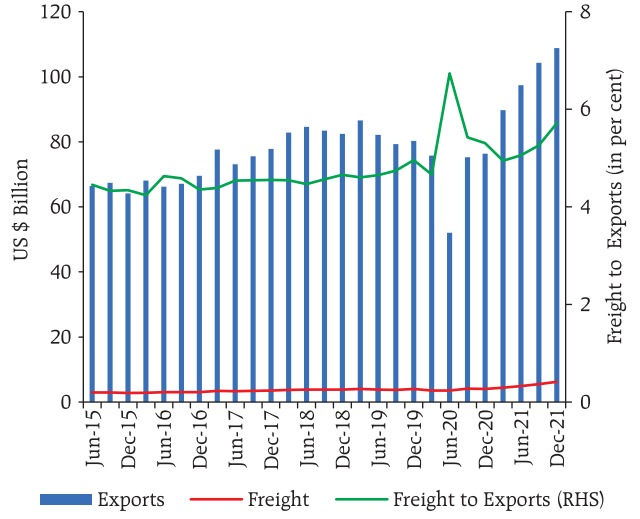


Source: RBI.

[3] Global trade rebound beats expectations but marked by regional divergences, PRESS/889 WTO (https://www.wto.org/english/news_e/pres21_e/pr889_e.htm).

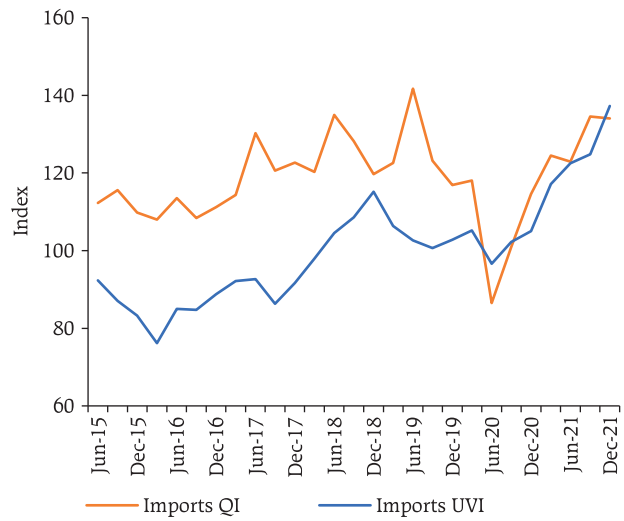
[4] https://unctad.org/news/shipping-during-covid-19-why-container-freight-rates-have-surged.

Chart 7: Exports - Value and Freight to Export ratio



Source: RBI.

Chart 8: Unit Value Index (UVI) and Quantum Index (QI) for Imports



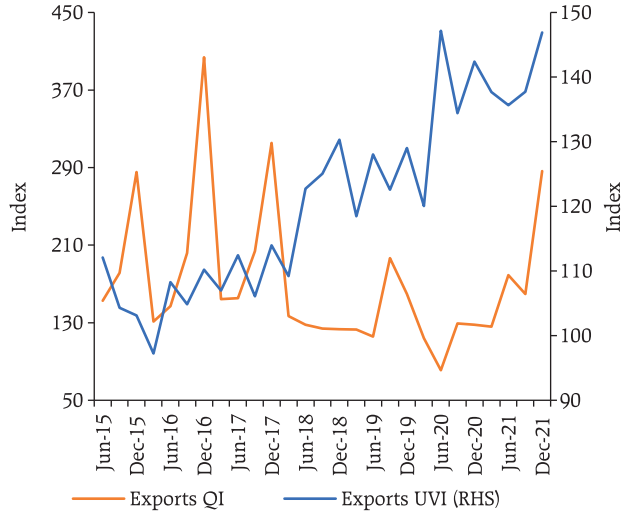
Source: DGCI&S.

India's exports and imports have also surged in the recent period (Charts 6 and 7).

Though the trade fell substantially in Q1:2020-21 in response to COVID-19 demand disruptions, the ratio of freight to total exports and imports stayed elevated as freight charges held up and remained sticky. Foreign trade picked up gradually with easing of the lockdown restrictions and consequent rebound in the economic activity since Q2:2021-22. Acceleration in trade demand drove the freight charges to import ratio that had generally remained steady around 3.5 per cent, upwards to 4.9 per cent by Q3:2021-22. Similarly, the freight to exports ratio climbed to 5.7 per cent in Q3:2021-22 from below 5 per cent during the pre-pandemic period.

(c) **Soaring unit values[5]:** Unit value (including freight) and quantum indices for imports have risen after the first wave of COVID-19. As the import quantum index caught up with pre-pandemic level, the unit value index continued its sharp upward movement, implying the increasing role of prices (cost plus freight) in driving up imports. On the other hand, both quantity and value contributed in the surge of merchandise exports between Q1:2020-21 and Q3:2021-22 (Charts 8 and 9)[6].

Chart 9 : Unit Value Index (UVI) and Quantum Index (QI) for Exports



Source: DGCI&S.

[5] High freight rates cast a shadow over economic recovery, UNCTAD/PRESS/PR/2021/040 (https://unctad.org/press-material/high-freight-rates-cast-shadow-over-economic-recovery).

[6] While the import indices did not show any seasonality, the seasonality was observed in unit value and quantum indices of exports.

III. Construction of Price Indices and Recent Trends

Three broad variables, namely, value (V), price (P) and quantum (Q) are considered for construction of the freight price indices for merchandise exports and imports. Given the very low share of insurance in total imports measured on 'cost, insurance and freight' (CIF) basis, it is included under cost. In other words, the total import price is broken down into two broad groups, *viz*, cost (C) and freight (F).

Since exports are compiled on free on board (FOB) basis, the total export price is equivalent to the cost and accordingly, the freight price needs to be determined separately. Let the variables $V^{j}_{i,t}, P^{j}_{i,t}, Q^{j}_{i,t}$ be the value, price, and quantum of group *'i'* for trade *'j'* at time *'t'*, where, i = F, C; and j = M, X; M and X imply imports and exports, respectively. Based on the relations,

$$V^{M}_{t} = V^{M}_{F,t} + V^{M}_{C,t}\ ; \quad \text{...(1)}$$

$$V^{M}_{F,t} = P^{M}_{F,t} Q^{M}_{F,t}\ ; \quad \text{...(2)}$$

$$V^{M}_{C,t} = P^{M}_{C,t} Q^{M}_{C,t}\ ; \quad \text{...(3)}$$

and $$Q^{M}_{F,t} = Q^{M}_{C,t} = Q^{M}_{t} \quad \text{...(4)}$$

the prices of freight (F) and cost (C) for imports are computed. It may be noted that equation (1) represents the sum of total freight value and the import cost, which are separately determined as the product of price and quantum indices by the equations (2) and (3), respectively. In equation (2), $V^{M}_{F,t}$ is the value index of freight constructed, based on the quarterly value of freight available in the BOP statistics. The equation (2) represents the freight value index as the product of freight price index and the freight quantum index. Further, as represented by equation (4), the quantum corresponding to the freight and the import cost are assumed to be same as the import quantum index. Accordingly, the freight price index is constructed by dividing the freight value index by the import quantum index. The weight contributions of cost and freight to the changes in import prices are computed by taking the shares of their values as weights, which in turn can be expressed as the function of prices, under the assumption of equivalent quantum for both cost and freight. The weights for cost and freight in imports at time *'t'* are

$$w^{M}_{F,t} = \frac{P^{M}_{F,t}}{(P^{M}_{F,t} + P^{M}_{C,t})}; \quad \text{...(5)}$$

and $w^{M}_{C,t} = 1 - w^{M}_{F,t}$, respectively. ...(6)

In case of exports, as the freight price needs to be determined separately, the relations that are used to compute the freight prices are

$$V^{X}_{F,t} = R^{X}_{F,t} V^{X}_{t}; \quad \text{...(7)}$$

and $$R^{X}_{F,t} = \frac{T^{X}_{F,t}}{T^{X}_{t}}, \quad \text{...(8)}$$

where $T^{X}_{F,t}$ and T^{X}_{t} are the inflows received on account of export freight and total exports of goods, respectively. The equation (8) is derived from (7), as the values of exports and inflows received are same. For the construction of export freight price index, the export freight value series is converted into index $V^{X}_{F\,t}$, and adjusted with the export quantum index.

Following the above approach and using the quarterly data on unit value index (UVI), quantum index (QI) and freight on imports/exports (in value terms) for the period Q1:2013-14 to Q3:2021-22 and the lockdown dummy, the freight prices are estimated. Seasonally adjusted quarter-over-quarter (Q-o-Q) growth rates, using X-13 ARIMA-SEATS method, are used to quantify the impact of freight prices on trade.

The export quantum index (QI) is found to observe the seasonal peak in Q3 until 2019-20. However, with successive waves of the pandemic subsequently, the pattern appears to have broken down. Accordingly, while adjusting seasonality for this series, the effective period has been taken as Q1:2013-14 to Q4:2019-20.

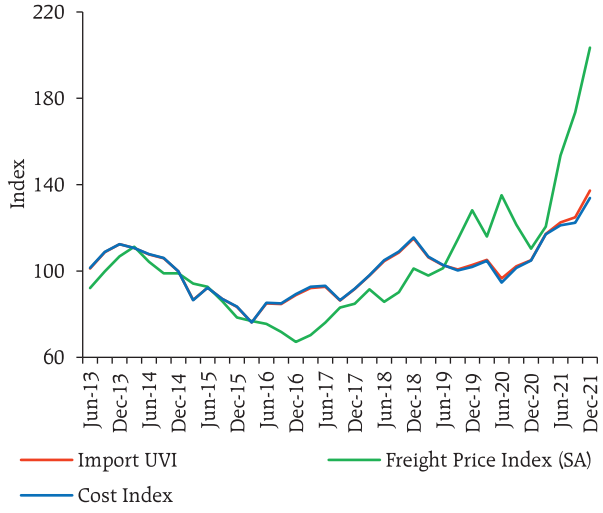
Due to collapse in trade on account of nation-wide lockdowns, year-on-year (YoY) growth rates for export freight price index recorded strong base effects during the first half of 2021-22, though the influence of base effects on import freight price index was much lower (Charts A1, A2 and Table A1 in the Annex). As year-on-year growth rate is susceptible to the base effect, the quarter-over-quarter (Q-o-Q) growth momentum is used in the rest of the study. Moreover, with a view that the seasonal factors may mask the inherent short-run behaviour, the series are tested and seasonally adjusted while using Q-o-Q growth rates.

The implications for the import cost and freight price shocks on domestic inflation have been analysed through SVAR methodology (Sims 1987; Sims and Zha 1998) and is described in Section IV. In this context, it may be mentioned that, in case of the US economy, Attinasi *et. al.* (2021) analysed and quantified the impact of increased transportation cost through SVAR method, following Herriford *et. al.* (2016). Also, Kose and Ünal (2021) analysed oil price and its volatility impact on Turkey's inflation, based on SVAR model.

Imports: To explore whether the freight charges in India have taken the greater role in the rising trade values in the context of up-trending global shipping costs, the unit price indices for freight and cost for imports are separately constructed (Chart 10) for the reference period Q1:2013-14 to Q3:2021-22 based on the quarterly UVI and QI using freight to import ratios as weights. It is observed that freight price index has surged sharply since Q3:2020-21, while cost index has slowly and gradually moved up since Q1:2020-21. Additionally, the freight price index is found to display seasonal upticks, mainly during Jan-March of every year (Table A2 in Annex).

An analysis of the contribution of the freight price and cost in the quarterly variation of the import price index indicates that freight price has contributed substantially to the rise in import price (and

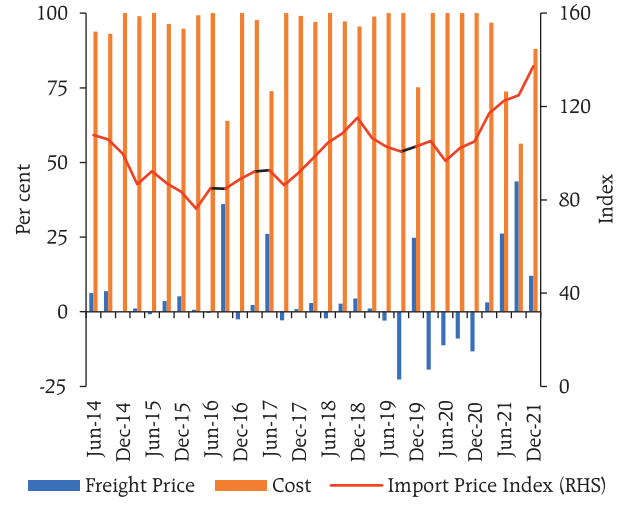
Chart 10: Import UVI, Freight Price (SA) and Cost Indices



Source: DGCI&S and authors' calculations.

therefore in the value) during Q1 and Q2 of 2021-22 (Chart 11). The movement in share of freight price index in overall unit price index, however, was also influenced by some episodes of muted sequential growth of import price index (e.g., Q2:2016-17, Q1:2017-18 and Q3:2019-20) (shaded in black). The positive contribution of freight price during the first

Chart 11: Contribution of Freight Price and Cost in QoQ growth of Import Price Index



Source: Authors' calculations.

Chart 12a: Proportionate contribution of Freight Price and Cost in QoQ growth of Import Price Index

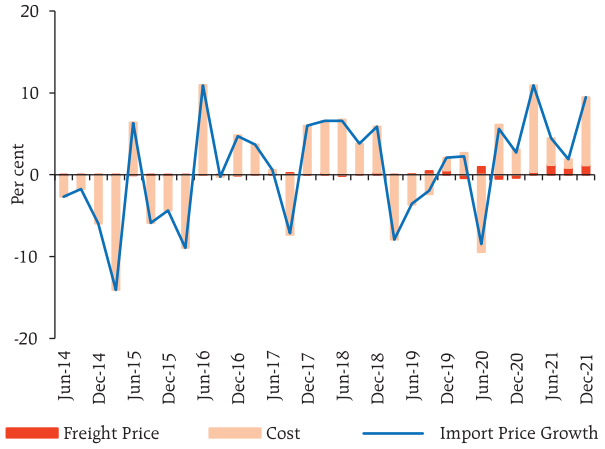
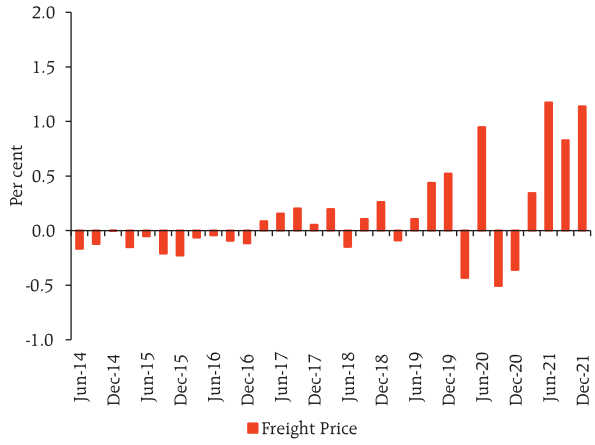


Chart 12b: Contribution of Freight Price in QoQ growth of Import Price Index



Source: Authors' calculations.

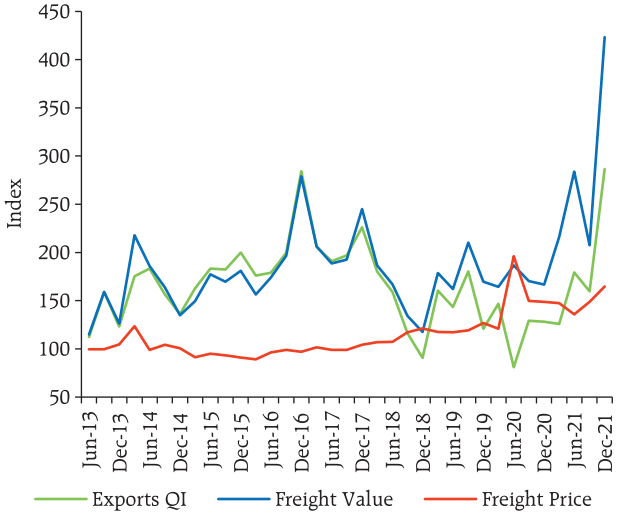
half of 2021-22, was visibly substantial in rising import price index. The contribution, however, shrank in the subsequent periods as the cost component gained more dominance.

The contributions of freight and cost in total import prices (UVI) were also seen by distributing the Q-o-Q growth rates of total import prices proportionately between the freight price and cost (Chart 12a). It is observed that the changes in total import prices, influenced by the changes in freight prices were substantial in the recent period (Chart 12b).

The high freight prices during Q1:2020-21 despite large drop in import prices when global trade collapsed significantly, reflects stickiness in freight prices in a period of restricted movements of some vessels/ routes. However, as mentioned earlier, the latest three quarters of the reference period experienced a visible rise in freight prices, which also contributed to increase in imports prices.

Exports: In Q1:2020-21 during the first wave of COVID-19, although exports had fallen drastically in value as well as in volume terms, freight receipts did not moderate, reflecting firmness in the transport service prices. The lower capacity utilisation in carriers during the pandemic could also have prevented fall in freight charges. With the borders opening-up, a clear upward shift in freight prices was observed, which remained strong even as export quantum surged in Q3:2021-22 (Chart 13).

Chart 13 : Seasonally Adjusted Indices of Exports Freight Price, Quantum, and Value



Source: Authors' calculations.

IV. Implications of Rise in Freight Prices for Retail Inflation

The implication of rise in global freight prices to the domestic inflation through trade channel is empirically established based on SVAR model with five variables, *viz.*, import cost index ($P_{C,t}^{M}$), freight price index ($P_{F,t}^{M}$), import quantum index (Q_t^{M}), domestic wholesale price index (P_t^{WPI}) and domestic consumer price index (P_t^{CPI}) for the reference period Q1:2013-14 to Q3:2021-22. The quarter-over-quarter (QoQ) seasonally adjusted growth rates of these variables are considered in the SVAR system with the following structure:

$[\pi_{C,t}^{M}, \pi_{F,t}^{M}, q_t^{M}, \pi_t^{WPI}, \pi_t^{CPI}]'$

where, 'π' implies the QoQ inflation, and 'q' is the QoQ growth rate of the quantum of imports. It may be mentioned that, although in the recent period, the surge of world commodity prices has been identified as a major driver for rising inflation and inflation expectations, the world commodity prices are not considered in the SVAR system with a view that it may vitiate the empirical results due to its influence on the import cost.

Among the price indices selected for the SVAR system, the domestic price indices are found to be highly correlated. While WPI being commodity price index has higher correlation with import cost, CPI which also includes price of services, has weaker co-movement with import cost. In terms of QoQ growth rates of indices, while the import cost and freight price are found to co-move with WPI, their correlations with CPI are relatively low (Table 1 and Chart 14), which could be due to different basket structures.

The structural specification, among the structural shocks (ε) and residuals/errors (u) for determining short-run contemporaneous relationships, is as under:

Table 1: Correlations between Price Indices and their Growth Rates

	Import Cost	WPI	CPI
Freight Price	0.78 (0.13)	0.86 (0.28)	0.62 (0.07)
Import Cost		0.79 (0.71)	0.38 (0.06)
WPI			0.83 (0.25)

Note: Figures in brackets imply correlations between growth rates.

$$u_{\pi,C}^{M} = \alpha_1 \varepsilon_{\pi,C}^{M}$$

$$u_{\pi,F}^{M} = C_1 u_{\pi,C}^{M} + \alpha_2 \varepsilon_{\pi,F}^{M}$$

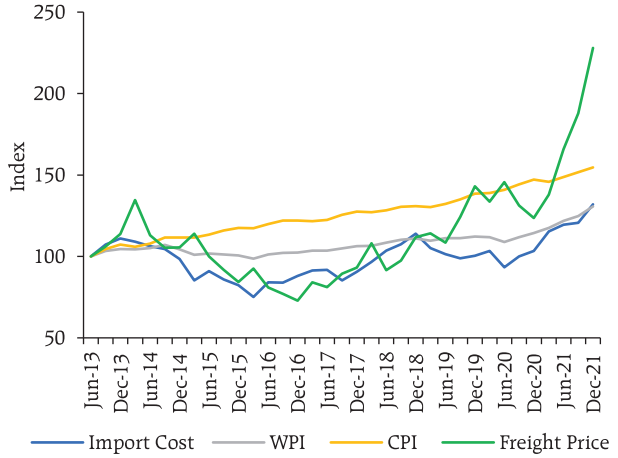
$$u_{q}^{M} = C_2 u_{\pi,C}^{M} + C_4 u_{\pi,F}^{M} + \alpha_3 \varepsilon_{q}^{M}$$

$$u_{\pi}^{WPI} = C_3 u_{\pi,C}^{M} + C_5 u_{\pi,F}^{M} + C_7 u_{q}^{M} + \alpha_4 \varepsilon_{\pi}^{WPI}$$

$$u_{\pi}^{CPI} = \alpha_5 u_{\pi,C}^{M} + C_6 u_{\pi,F}^{M} + C_8 u_{q}^{M} + C_9 u_{\pi}^{WPI} + \alpha_6 \varepsilon_{\pi}^{CPI}$$

In this specification, apart from the usual restrictions for exactly identified system, the additional restriction $\alpha_5 = 0$ is imposed while estimating the model with the view that imports cost would usually be impacting CPI based inflation *via* its impact on WPI, and not directly[7].

Chart 14: Indices - India's Import Cost, Freight Price, WPI and CPI



Sources: Ministry of Statistics and Programme Implementation (MoSPI); Ministry of Commerce and Industry, and authors' calculations.

[7] This additional restriction leads to an over-identified SVAR system, which however has not been found to impact the overall results. The estimated coefficients appeared in the contemporaneous structure between the shocks and residuals, for exactly identified system are provided in Table A3 in Annex.

In addition, a dummy is introduced since the second quarter of 2020 for factoring COVID-19 impact on import cost, freight charges and import quantum[8] (Charts A3, A4, A5 in Annex), when the country-wide lockdown severely affected the whole economy including international trade. The lockdown was, thereafter, gradually lifted within the next two quarters. The dummy variables, however, are found to be insignificant for the third and fourth quarters of 2020 and are dropped for the empirical analysis.

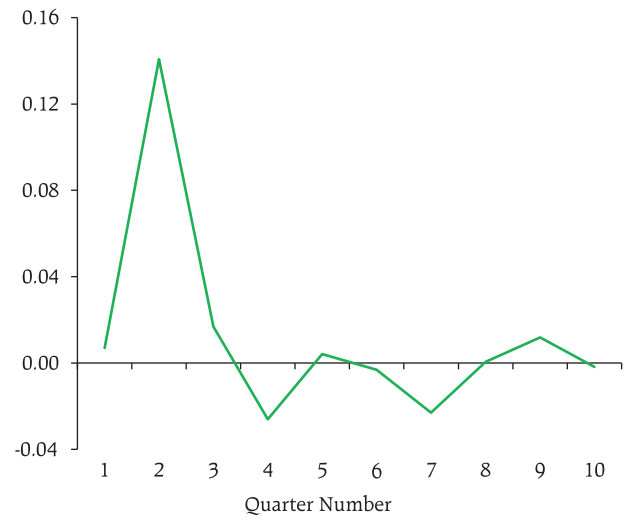
Table 2 provides the estimated values of coefficients appeared in the contemporaneous structure between the shocks and residuals, along with their levels of significance. The freight shock, which is at the central point of discussion worldwide since Q2:2021-22, is observed to have contemporaneous pass-through to the domestic CPI inflation through the multiple channels. Specifically, the freight shock (for instance, from the shortage of containers or due to increase in market frictions) is observed to be significant and positive for WPI and then impacts retail CPI. Second, although a positive freight price inflation shock is found negatively impacting import quantum to be transported significantly, the impact from import quantum to domestic WPI inflation is observed insignificant. Also, the model does not find the direct contemporary impact of freight shock to CPI.

Table 2: Results of Structural VAR Model

Dependent \ Shock	Import Cost	Freight Price	Import Quantum	WPI
Freight Price	0.44 *[1.89*] C1*			
Import Quantum	0.15 *[0.86] C2*	-0.36 *[-2.91***] C4*		
WPI	0.14 *[4.13***] C3*	0.09 *[3.32***] C5*	-0.001 *[-0.02] C7*	
CPI		-0.01 *[-1.00] C6*	-0.001 *[-0.10] C8*	0.15 *[2.50**] C9*

Note: The symbols *,**,*** imply 10 per cent, 5 per cent and 1 per cent levels of significance, respectively.

Chart 15: Response of CPI Inflation (QoQ SA) to Freight Price Shock



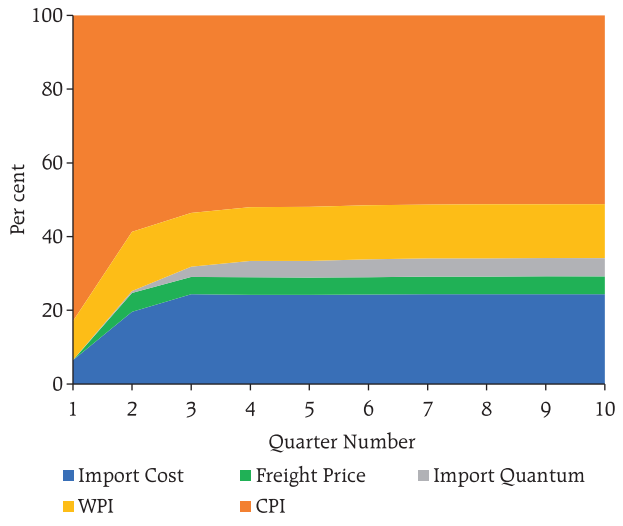
Sources: Authors' calculations.

Based on the impulse response function (IRF), it is observed that the impact of freight shock on CPI inflation (QoQ SA) is maximum in the second successive quarter before dying down (Chart 15). Also from the forecast error variance decomposition, the evidence of more than 5 per cent contribution of freight shock to the total forecast error variance of CPI inflation in the second quarter, supports its impact on CPI inflation (Chart 16). In case of import quantum, the contribution of its shock to the total forecast error variance of CPI inflation becomes significant in the third quarter *vis-à-vis* the second quarter, and thus, underscoring its lag impact on domestic CPI inflation.

In order to quantify the impact of exogenous shocks (import cost/freight price) on the domestic retail inflation (YoY), the SVAR system is estimated at first without any shock and the baseline forecasts for CPI and their corresponding inflation numbers are

[8] Dummies for WPI and CPI are not introduced. For WPI, while adjusting for seasonality, the quarter Q1:2020-21 is detected as automatically identified outlier causing temporary changes, whereas for CPI, no outlier is automatically detected.

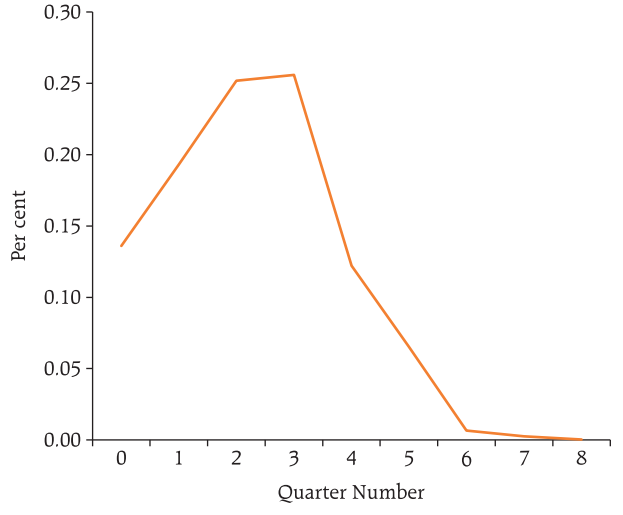
Chart 16: Forecast Error Variance Decomposition for CPI Inflation (QoQ)



Sources: Authors' calculations.

generated. In the second step, the similar procedure is applied with shock and the corresponding forecasts for inflation are obtained. The difference between the inflation forecasts with shock and the baseline forecasts is quantified as the impact of exogenous shock to YoY inflation.

Chart 17: Response of CPI Inflation to Freight Price Inflation



Sources: Authors' calculations.

Based on the impulse response function, it is found that 10 per cent rise in import freight cost is expected to raise the year-on-year CPI inflation by 0.89 percentage point over the next six quarters before dying down (Chart 17). In particular, 10 per cent rise in import freight price leads to a rise in annual consumer price inflation by 0.21 percentage point (Table A4 in Annex). Also, the passthrough of import cost to retail inflation, which is predominantly influenced *via* WPI channel, is also exacerbated by the higher freight prices.

V. Conclusions

The COVID-19 pandemic-induced supply side disruptions increased transaction costs in many sectors, especially the contact intensive ones. The associated disruptions had adverse impact on many activities, exposing weak links. Global transport of goods was one such segment which has taken time to respond as trade started rebounding after initial wave of the pandemic. In line with sharper recovery in global trade in 2021-22, particularly the imports, that recovered and exceeded the pre-COVID-19 levels faster than the exports, the freight costs surged and have remained elevated since Q3:2020-21 reflecting the increasing supply-demand imbalances, market frictions and constrained shipping capacities. These developments impacted logistic charges worldwide, including in India as reflected in the ratio of freight charges to India's exports and imports.

The study looks at India's international trade movements and analyses the contribution of freight charges in imports and exports values, using unit value and quantum indices as well as by constructing its quarterly price indices. In view of the greater role of freight charges in import and export prices in the recent period, the study also examines the role of freight costs in exacerbating inflation dynamics in India.

The study finds the impact of freight price shocks such as container shortages and the pandemic related market frictions, on the retail prices through import quantum and wholesale price channels. Based on the impulse response function, the study estimates that 10 per cent rise in import freight cost is expected to raise the year-on-year CPI inflation by 0.89 percentage point over the next six quarters before dying down. In particular, 10 per cent rise in import freight price leads to a rise in annual consumer price inflation by 0.21 percentage point.

This study precedes the recent Russia-Ukraine war and hence do not quantify the impact on the freight costs from further disruptions caused to supply chains. The softening seen since September 2021 in the transport costs with new capacities coming onstream and economies normalising, has already started getting constrained by the renewed pressure from the war effects. The stretched shipping costs could, therefore, be a new normal for a longer period, contingent largely on easing of geopolitical pressures and appearance of no further pandemic waves.

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Annex

Table A1: Base Effects of Freight Price Index for India's Exports and Imports

Quarters	Freight Price Index for Exports			Freight Price Index for Imports		
	Base Effect	Q-o-Q Growth	Difference in Y-o-Y Growth	Base Effect	Q-o-Q Growth	Difference in Y-o-Y Growth
2019-20:Q1	-9.9	8.7	-1.2	16.5	-5.2	11.4
2019-20:Q2	-4.0	-2.4	-6.4	-6.2	13.6	7.3
2019-20:Q3	-6.1	9.7	3.6	-13.8	14.1	0.3
2019-20:Q4	10.6	-13.3	-2.8	-2.0	-6.8	-8.8
2020-21:Q1	-8.7	57.1	48.4	5.2	8.6	13.8
2020-21:Q2	2.4	-30.7	-28.3	-13.6	-10.3	-23.9
2020-21:Q3	-9.7	3.5	-6.2	-14.1	-6.0	-20.1
2020-21:Q4	**13.3**	-10.4	3.0	6.8	11.0	17.8
2021-22:Q1	**-57.1**	0.8	-56.3	-8.6	18.4	9.8
2021-22:Q2	**30.7**	5.5	36.2	10.3	12.5	22.8
2021-22:Q3	-3.5	14.7	11.2	6.0	19.4	25.4

Table A2: Average Seasonal Factors (Period: 2013-14 to 2020-21)

Variable	Q1	Q2	Q3	Q4
Imports Cost	101.0	99.0	100.5	99.8
Freight Price	97.2	97.1	98.6	106.9
Imports Quantum	106.0	100.0	97.7	96.3
WPI	100.1	100.5	100.3	99.2
CPI	99.5	100.6	100.6	99.2

Table A3: Estimated Coefficients – SVAR Exactly Identified System

Dependent \ Shock	Import Cost	Freight Price	Import Quantum	WPI
Freight Price	0.44 *[1.89*] C1*			
Import Quantum	0.15 *[0.86] C2*	-0.36 *[-2.91***] C4*		
WPI	0.14 *[4.13***] C3*	0.09 *[3.32***] C5*	-0.001 *[-0.02] C7*	
CPI	-0.02 *[-1.20]* α_5	-0.01 *[-1.09] C6*	0.001 *[0.04] C8*	0.20 *[2.77***] C9*

Note: The symbols *,**,*** imply 10%, 5% and 1% levels of significance, respectively.

Table A4: Response of Domestic Retail Inflation *via* Freight Price changes under SVAR Framework

10% shock to	Average Response of CPI Inflation (Y-o-Y) over next one year (in bps)
A. Freight Price	21
Channel 1: *via* Import Quantum and WPI	10
Channel 2: *via* WPI	25
B. Import Cost	36
B1. Import Cost *via* Freight Price	22
Channel 1: *via* Freight Price, WPI	24
Channel 2: *via* Freight Price, Import Quantum and WPI	17
B2. Import Cost *via* WPI	30
All variables simultaneously	58

Chart A1: India's Export Freight Price Index - YoY Growth, Base Effect and Momentum

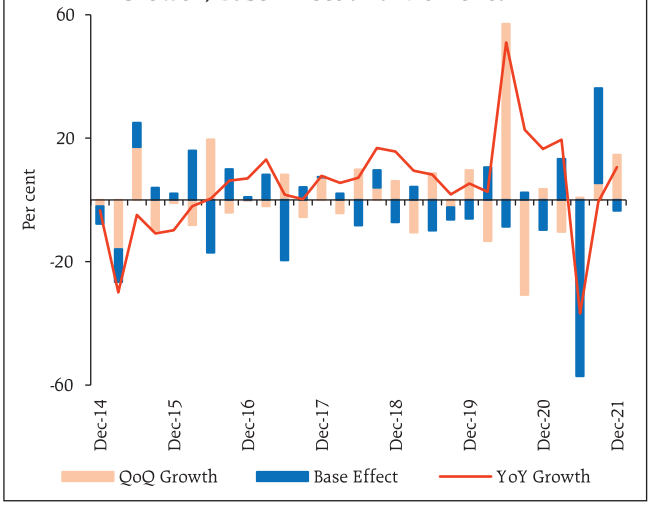
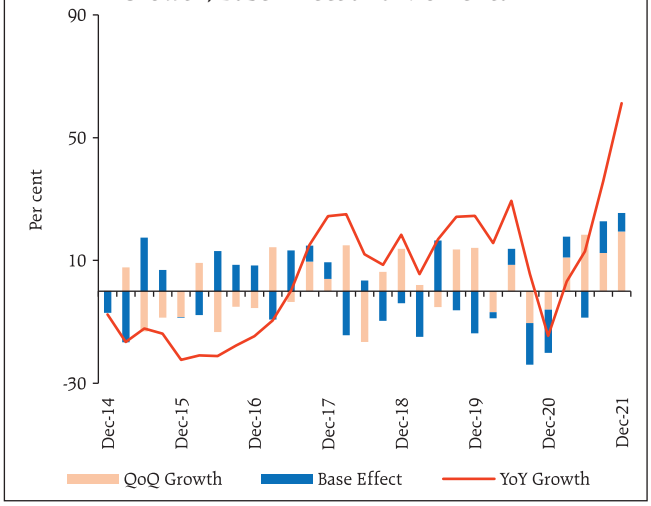


Chart A2: India's Import Freight Price Index - YoY Growth, Base Effect and Momentum



Source: Authors' calculations.

Chart A3: Import Cost - Actual and Dummy Adjusted

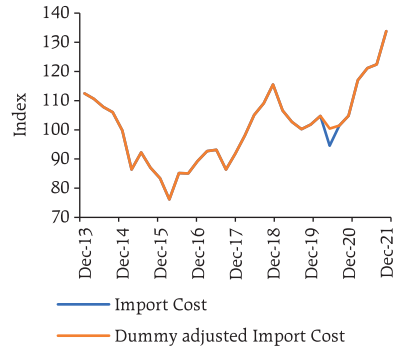


Chart A4: Freight Price - Actual and Dummy Adjusted

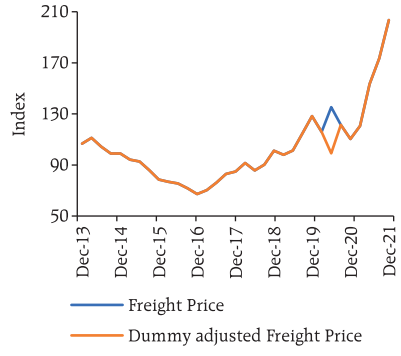
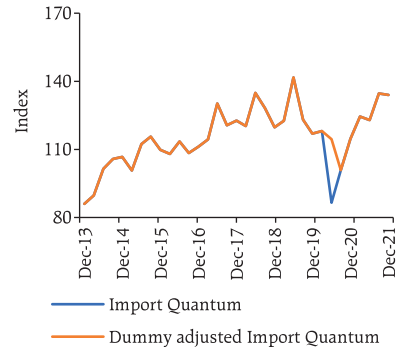


Chart A5: Import Quantum - Actual and Dummy Adjusted



Source: Authors' calculations.

*Industrial Revolution 4.0: Will it be different this time for India?**

The study explores the likely impact of the fourth industrial revolution (IR-4) on India's manufacturing sector. Industry 4.0 is integrating new technologies – like Internet of Things (IoT), cloud computing and analytics, artificial intelligence and machine learning - into manufacturing production processes and operations, ushering in a new era of 'smart manufacturing'. India's lead in information technology (IT) exports and presence of experienced IT professionals provides an advantage. However, when it comes to the quality of human capital in general and physical infrastructure required to make the great leap forward, India lags behind its competitors.

Introduction

Technological changes in the last decade have revolutionised the organisation of industrial production influencing supply chains and production processes. Industry 4.0 (IR-4 hereafter) has integrated new technologies – like Internet of Things (IoT), cloud computing and analytics, and artificial intelligence and machine learning into manufacturing production processes and operations, ushering in a new era of 'smart manufacturing'. The digital technologies used in the manufacturing processes promotes automation and self-optimisation leading to operational efficiency across the value chain.

Since the publication of the book "The Fourth Industrial Revolution", by Klaus Schwab, World Economic Forum Founder and Executive Chairman, it has generated considerable global attention. IR-4 amalgamates the use of digital technologies from the third industrial revolution with the latest biological and physical innovations which has a potential to transform institutions, industries, and individuals (Schwab, 2016).

This article explores the likely impact of IR-4 on India's manufacturing sector. Section 2 presents in brief the unique characteristic features of various Industrial Revolutions with a focus on IR-4. Section 3 analyses the current profile of India's manufacturing by exploring its share in global value chains and technology intensity of the sector. Section 4 offers an assessment of the potential for India to benefit from IR-4 and corresponding pre-requisites. Section 5 concludes the paper.

II. Industrial Revolution

The term Industrial Revolution, first coined in 1837 by Louis-Auguste Blanqui, a French economist, referred to economic and social changes driving the transition from industrial activity carried at homes with simple instruments to those undertaken in factories with the help of power-driven machinery[1]. Phases of major industrial revolutions have been differentiated into periods based on the access to and use of new technology – steam engine and railways (late 18th century); electrification enabling division of labour and mass production (late 19th century); electronics, IT, and automation (late 20th century) (Schwab, 2015) (Table 1). The world is currently going through a fourth industrial revolution, as production becomes increasingly automated and new networks of exchange of information between human and machine are formed (Popkova *et al.*, 2019).

IR-4 brings in major changes in industrial organisation and potential localisation of activities, altering the market dynamics through which value-added is generated and appropriated (Primi and Toselli, 2020). From the output side, products and services are expected to be highly interconnected making many of

* This article is prepared by V. Dhanya, Rigzen Yangdol, Satyarth Singh of Department of Economic and Policy Research, and Mamta Dhanda (Research Intern), Reserve Bank of India. The views expressed in this article are those of the authors and do not represent the views of Reserve Bank of India.

[1] The Oxford Companion to British History, 2ed., 2015.

Table 1: Different phases of Industrial Revolution

Period	Transition Period	Energy Resource	Main Technical Achievement	Means of Transport
1760-1900	1860-1900	Coal	Steam Engine	Train
1870-1940	1940-1960	Oil, Electricity	Internal Combustion Engine	Train, Car
1930-2000	1980-2000	Nuclear Energy, Natural Gas	Computers, Robots	Car, Plane
2000 and beyond	2000-2010	Green Energies	Internet, 3D printer, Genetic Engineering	Electric and driverless cars, Ultra-Fast Train, Drones, Air Taxis

Source: Schwab, 2015

the existing industry boundaries obsolete (Table 2). Data science, biotechnology and artificial intelligence will be used intensively as inputs, necessitating upskilling of the labour force.

The fourth industrial revolution is fuelled by four major components: widespread internet penetration; hyper-efficient processing technology (chips); artificial intelligence; and machine learning. While the earlier waves of automation due to past industrial revolutions popularised mass-homogeneous production systems, IR-4 brings to the fore more customised industrial production. With IR-4, new production models will emerge, where automated systems, data exchanges, 3-D printers and robots are used effectively in an environment of smart factories, which will make the production processes lean and flexible enabling optimum utilisation of resources. Lean manufacturing helps identification and steady elimination of all kinds of waste in a manufacturing system and flexible manufacturing enables computer-controlled production with customised volume, process and types (Lu, Morris, & Frechette, 2016).

The IR-4 technologies have found initial adoption in the manufacturing sector, where sizeable gains in productivity and efficiency can be unlocked in areas such as supply chain management, inventory management, shipping, construction and consumer analytics. The services sector could also face a radical change with services delivery becoming more targeted using digital platforms. Almost all sectors in the economy would be exposed to opportunities and challenges from technologies. For example, construction processes are changing, with off-site planning and assembling of building happening in a location other than the building site which have a dramatic impact on productivity and efficiency in delivery. In the health sector, wearable devices can not only track health vitals but also use information to predict possible risk factors using artificial intelligence. With the use of Internet-of-Things, care givers can track location and health and administer medicines remotely and more intelligently. The transportation sector is expected to face a major transformation with clean energy fuelled cars and driver-less vehicles ushering increased road safety and reduced pollution.

This changing nature of manufacturing process calls for a re-look at developing countries' export-led policies. The factors - like cheap labour and favourable FDI policies - that helped low-income economies to increase their productivity and income earlier, may not be the determining factor in this new era (Lee et al., 2020). Instead, technologically advanced economies with sophisticated labour force capable of spearheading the digital wave will have an edge over others. This may change the global value chains, with production process re-shoring to countries with higher

Table 2: Changing Dynamics of Production

	Yesterday		Tomorrow
Output	Product and Services	→	Data and Experiences
Core Value	Design and R&D	→	Integrated Systems & Platforms
Value Chain Organisation	Cost Optimisation Driven	→	Image and Reputation Driven

Source: Primi and Toselli, 2020

technological capabilities. At present, with much of the technological advances concentrated in the developed economies which are labour scarce, the benefits emerging from these changes could be asymmetrical and skewed against labour rich developing economies and restrict the scope of low-income countries to benefit out of international trade, unless they adapt and enrich themselves to meet the challenges brought about by the technological developments.

Traditionally, manufacturing-led growth has yielded high economic growth, through productivity gains and job creation for the unskilled labour force (Hallward-Driemeier & Nayyar, 2018). Export-led manufacturing growth helped the East Asian economies to move up the ladder in the 1970s. More recently, China emerged as a global leader in manufacturing, largely benefitting from the third industrial revolution. The third industrial revolution led automation of routine tasks may however, stifle low income countries' economic catch-up, leaving them with stagnant productivity and per capita income growth (UNCTAD, 2017).

The new technological developments have brought to the forefront the Schumpeterian idea of Creative Destruction. While new technologies can create new jobs, it can also result in job displacements in certain sectors. Hence, it is crucial for labour rich developing countries to frame strategies for adapting to the changing scenario. The success of a country in harnessing the technological developments depends on the current state of industrial technology, the speed and extent of the acquisition of new technology and the demographic profile with focus on quality rather than quantity (WTO, 2020). Accordingly, we assess the current state of industrial development and human capital of India, next.

III. Status of India's Manufacturing Sector

The benefits from first and second industrial revolution largely escaped colonial India. The technological developments in the West resulted in de-industrialisation in India, limiting it to a raw material exporter for the factories in England. Accordingly, India's share went down from one fourth of world income in 1700 to 3.0 per cent in 1950 (Maddison, 2007). The Third Industrial Revolution, which began in the 1980s, coincided with the era of economic reforms in India. Economic liberalisation aided technical collaboration with foreign firms, and also relaxed norms governing technology induction in the Indian manufacturing sector (Bhat, 2020). Cross border production supported by advances in information and communication technology, among others, led to multi-country production networks with value generated across the globe (Seric & Tong, 2019). However, the benefits of third industrial revolution based on information technology was lopsided in India, with services sector taking off through IT and IT-enabled services (ITeS), e-commerce and e-governance while manufacturing sector was unable to benefit as much due to presence of inefficiency and backwardness in the organisation of industrial production (Singh N., 2016).

Over the years, India has moved up in terms of its share in world manufacturing GVA. As per UNIDO Competitive Index, India's rank in terms of World Manufacturing Value Added Index improved from 14 in 2000 to 5 in 2019. However, in terms of Competitive Industrial Performance Index, India ranked low at 38 in 2019 mainly due to low share of manufacturing sector in GDP. In 2019-20, the sector contributed to 17.1 per cent of GVA and 11.2 per cent of total employment. The manufacturing sector in India is capital intensive, with the organised sector contributing to nearly three fourths of manufacturing sector Gross Value Added (GVA). Textiles and leather products and food and beverages had the highest shares in employment as well as a high share in manufacturing GVA. Both these sectors have relatively higher unorganised sector contributions, with households contributing to 33.6

Chart 1: Structure of Indian Manufacturing in 2018-19

Note: Size of bubble indicates Total Factor productivity. And the colour shows contribution of household to sectoral GVA. Red colour indicates household contribution>25 per cent; Orange-medium share of household sector (5%-25%) and Green-low share of household sector (<5%).
Source: Authors' calculations based on NSO and KLEMS data.

and 14.7 per cent of their respective GVA. On the other hand, transport equipment, chemicals and machinery have high share in manufacturing GVA with lower employment elasticity. Productivity of these sectors are also high compared to labour intensive sectors (Chart 1).

Growth in manufacturing sector has moved in sync with export growth, making global demand an important determinant of manufacturing output growth. Exports accounted for 20.7 per cent of total manufacturing output in 2019-20. Hence, the impact of IR-4 on India's manufacturing sector could depend a lot on how it can improve its global competitiveness.

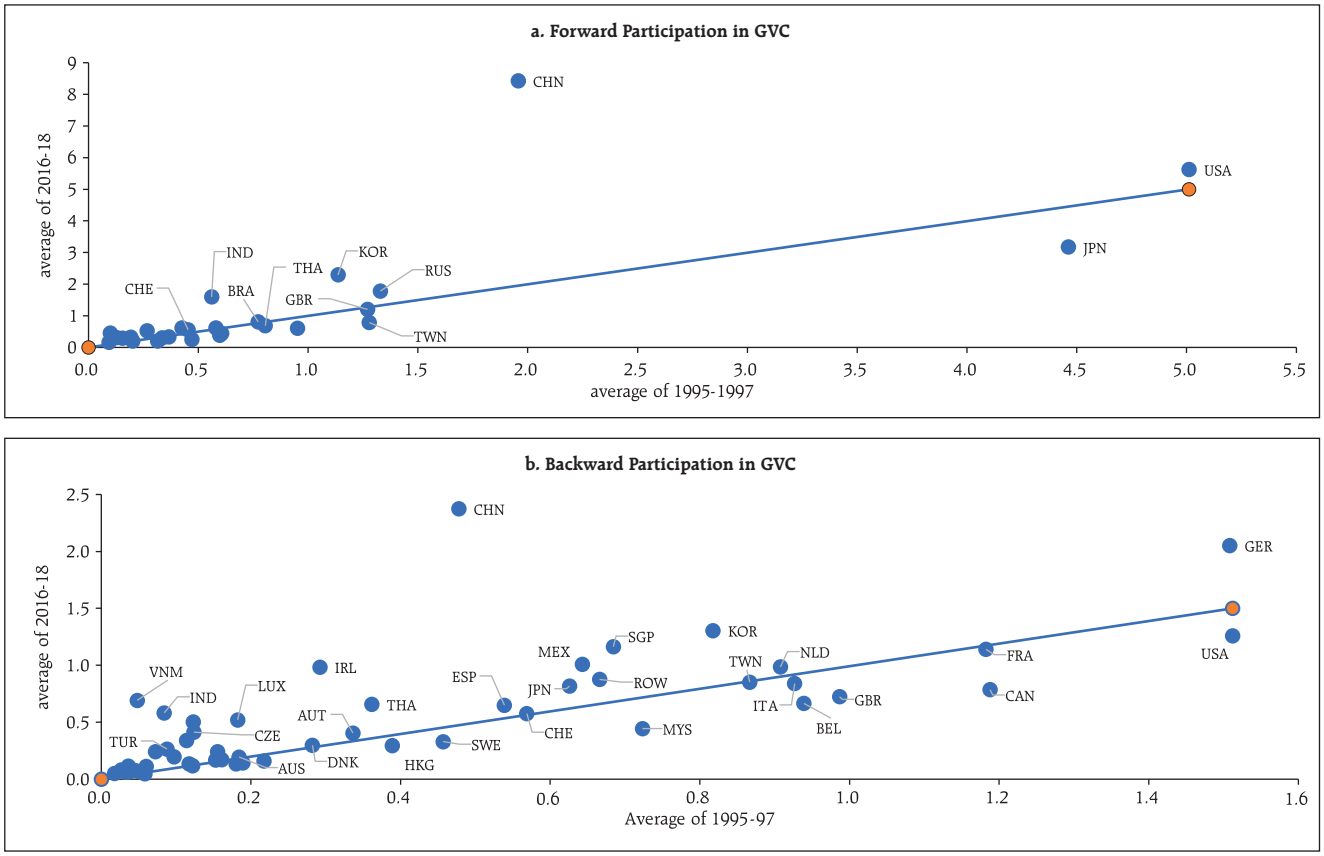
III.2 Participation in Global Value Chain

Industrial production since the 1970's has been organised in complex multi-country networks with suppliers and consumers spreading across various nodes of the supply chain. While India has made sustained strides in global markets, its share has remained limited in world trade and participation in the global value chain.

In line with the global value chain literature, we use two indicators[2] to arrive at India's participation in global value chain. 'Climbing up the ladder', where a more than proportional increase of domestic value-added content of foreign exports, measures forward participation in value chain; and 'Deepening in assembly', where a more than proportional increase in foreign value-added content in domestic exports, measures backward participation in value chain (Primi & Toselli, 2020). Following Banga (2013), each indicator is then divided by "Global Value Added of Exports", which is arrived at by summing up the domestic value-added in exports of all countries. Global Value Added of Exports differs from Global Gross Exports as the former nets out double counting in global trade, which is caused by export and re-export of intermediate products in the trade network. Accordingly, countries that specialise in assembling with little value addition end up having a low share

[2] Analysis is carried out using OECD Trade in Value Added (TiVA) database. The data is available for the period 1995- 2018.

Chart 2: Participation in Global Value Chain (GVC)

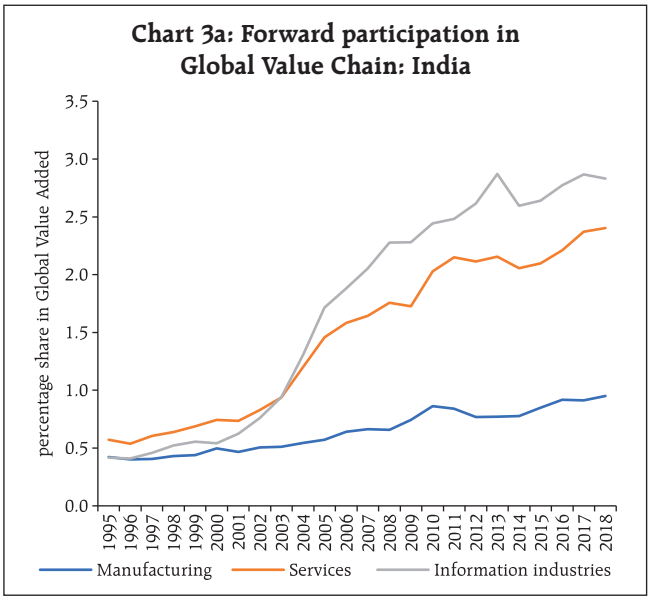


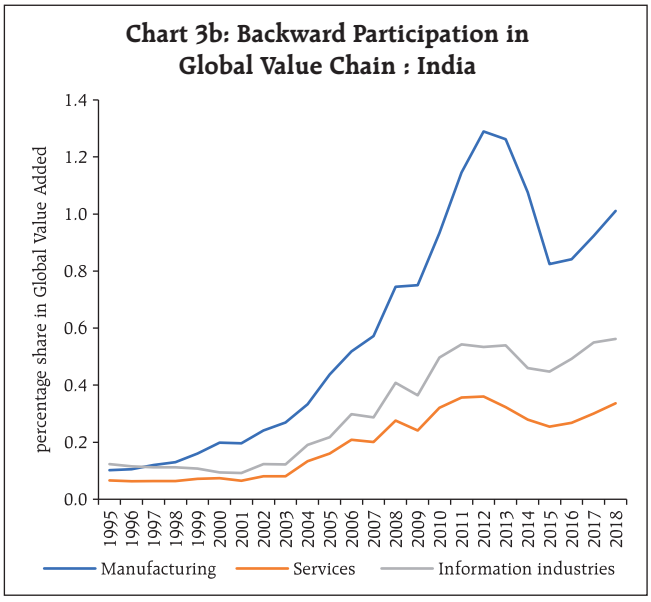
Source: OECD Trade in Value Added (TiVA) database, 1995-2018.

in global value added of exports. The value arrived at gives the relative contribution of a country in Global Value Added of Exports (Chart 2a and 2b).

Since the data is available for the period 1995-2018, the analysis is carried out by taking an average of 1995-97 as the base. While both backward and forward participation of India has improved over period 1995-97, India' shares in gross exports of other countries have increased at a higher rate than other countries share in India's gross exports[3]. Between 1995-97 to 2016-18, India's forward participation in Global Value Added increased from 0.6 per cent to 1.6 per cent respectively, while backward participation increased by a meagre 0.5 percentage points from 0.1 per cent to 0.6 per cent. China's forward participation increased from 2.0 per cent to 8.4 per cent between the two-time periods. Backward participation was more spread out with most countries facing an increase in foreign share in their gross exports. Sector wise, compared to manufacturing, India's participation in services value chain and in particular trade in information industries is higher. Forward participation in information technology increased from 0.4 per cent in 1995 to 2.8 per cent in 2018 (Chart 3a and 3b). India's advantage in information technology service sector is expected to benefit adoption of IR-4 technologies in India. However, transforming the advantage that India has, in IT as a service to the manufacturing space will depend on technology intensity of India's manufacturing sector.

[3] Full country names against the codes are given in Annex 1



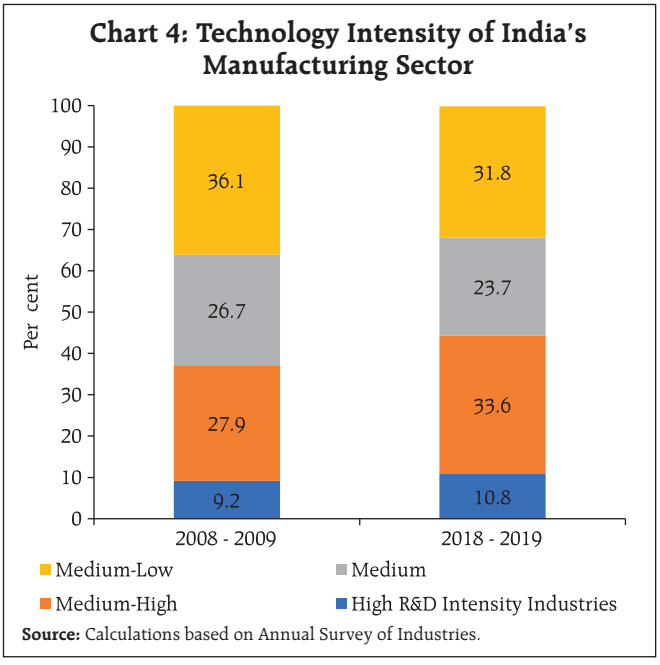


Source: OECD Trade in Value Added (TiVA) database, 1995-2018.

III.3 Technology Intensity of India's Manufacturing sector

Based on OECD classification of economic activities on Research and Development (R&D) intensity[4], India's manufacturing sector is divided into four categories: High R&D Intensive; Medium-High R&D Intensive; Medium R&D intensive; and Medium-low R&D Intensive. As of 2018-19[5], India's manufacturing sector is dominated by low-medium R&D industries, though its share has come down over the years. High and Medium R&D intensive industries are increasingly playing an important role in Indian manufacturing sector reflecting India's scope for benefitting from IR-4 (Chart 4).

Despite increasing importance of R&D intensive sectors in India's manufacturing sector, India's R&D intensity, measured as expenditure on R&D as a percentage of GDP, remains low. As per the latest available data for 2018, India's R&D intensity is about 0.7 percent in contrast to advanced nations' at about 3 per cent (Chart 5). Share of business in R&D expenses is low in India compared to other countries as, in 2018, 63.2 per cent of R&D came from the Government sector (Chart 6). India also has one of the lowest R&D personnel per thousand labour force (Chart 7).

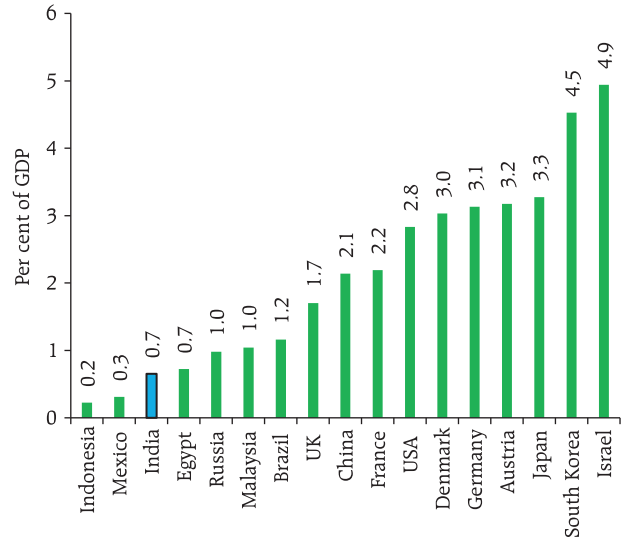


Source: Calculations based on Annual Survey of Industries.

[4] Detailed OECD (2016) classification given in Annex 2

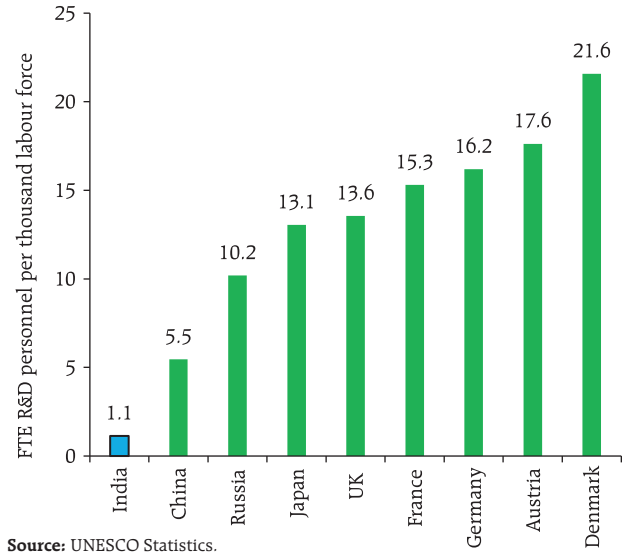
[5] Classification based on Annual Survey of Industries data, latest data available is 2018-19.

Chart 5: R&D as per cent of GDP: 2018



Source: UNESCO Statistics.

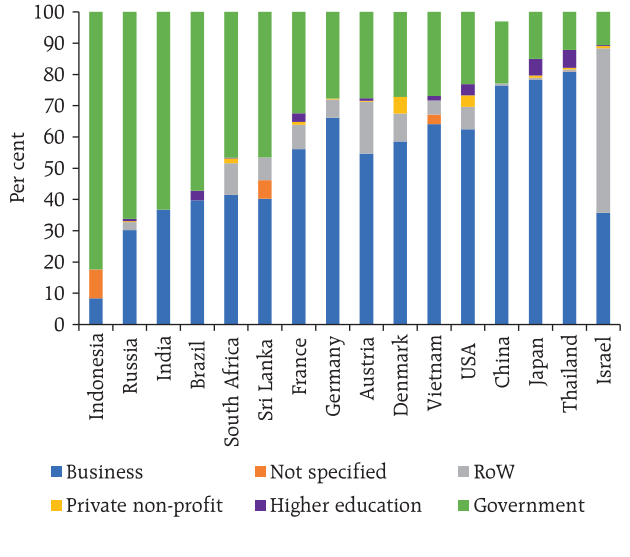
Chart 7: R&D Personnel per thousand Labour Force-2018[6]



Source: UNESCO Statistics.

To harness opportunities in IR-4, concerted actions are required to channelize India's strength in digital technologies to develop smart manufacturing. A pre-requisite for this transition is investment in R&D and strengthening the knowledge base of human capital. To understand the determinants of R&D expenditure in India's manufacturing sector, a panel data analysis using CMIE Prowess database, is carried out on 1,438 manufacturing enterprises covering 26 manufacturing sub-sectors, for the period 2014-15 to 2018-19 (*i.e.*, pre-COVID period). The explanatory variables used are firm age- based on incorporation year, firm size- based on total assets, growth in net sales, profitability- based on net profits before tax and extraordinary items; debt-equity ratio; and tech to asset ratio. Robust standard errors are used to control heteroscedasticity and serial correlation, whereas two-stage least square (2SLS) is used to control endogeneity by using lags of tech to asset ratio as instrumental variable. Endogeneity exists in a model when the residual of the regression model correlate with the explanatory variables (Gujarati *et al.*, 2012) and instrumental variables are used to control it. Tech to asset ratio is taken as the instrumental variable here as it was the

Chart 6: Source wise R&D Expenditure-2018



Source: UNESCO Statistics.

[6] The Full-time equivalent (FTE) of R&D personnel is defined as the ratio of working hours actually spent on R&D during a specific reference period (usually a calendar year) divided by the total number of hours conventionally worked in the same period by an individual or by a group.

only variable found to be significantly correlated with the residual term. Lag of Tech to Asset is considered as the instrument as lag values prove to be the best instruments to check endogeneity (Mohmed *et al.*, 2020). Given the linear regression,

$$Log\ R\&D = \beta_1 + \beta_2 Log\ Age + \beta_3 Firm\ Size + \beta_4 Sales\ Growth + \beta_5 Profitability + \beta_6\ Debt\ to\ equity\ ratio + \beta_7 Tech\ to\ Asset\ Ratio + \varepsilon$$

Where,

Log R&D: Log research and developments expenses

Log Age: Log (1+age)

Firm Size: Log total assets

Sales Growth: Percentage change in Net Sales
i.e., (Net Sales$_t$ - Net Sales$_{t-1}$/ Net Sales$_t$) X 100

Profitability: Percentage change in net profits before tax and extraordinary items
i.e., (Net profits$_t$ - Net profits$_{t-1}$/ Net profits$_t$) X 100

Debt to Equity Ratio: Debt/Total equity- directly from prowess

Tech to Asset Ratio: presents gross technical know-how including product designs/formulae etc. as a ratio of total assets. Technical know-how means the knowledge and technical/ practical skill, use of specific technology or way of doing something more efficiently and effectively. As for the world of businesses, technical know-how often takes shape of computer software, technology development and related knowledge. However, the meaning is not exhaustive may include product designs, formulae, databases etc.

The results show that maturity, size, profitability and technical know-how determine R&D expenditure in India's manufacturing sector. Older companies, large sized firms, firms with high profitability and technical know-how have higher level of R&D expenses (Table 3). The results suggest that mature companies invest considerably in innovative activities, as they are more experienced and have stability in the market. Since large companies have greater amount of funds available with them and need to develop themselves continuously in order to thrive in the market, the positive coefficient value in the regression depicts a direct influence of firm size on research and development expenses. Profitability and tech to asset ratio have a small yet significant influence on research and development expenses of an organization. Companies earning higher profits and having exposure to technology incur higher research and development expenses. Further, the positive coefficient value of tech to asset ratio depicts that companies with better knowledge regarding the use of specific technology or way of doing something more efficiently and effectively, have higher investment in research and development. As companies with technical know-how are already equipped with basic pre-requisites for research, they may prefer to induce it. The findings are in line with existing literature (Lee, K., 2019).

Table 3: Regression results

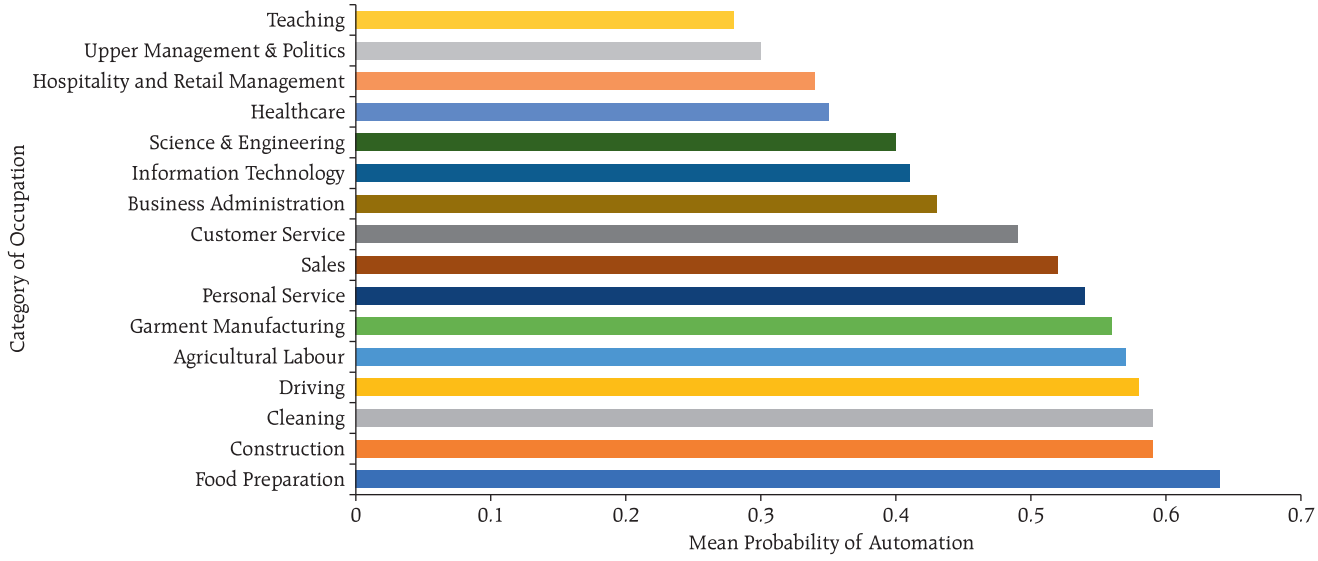
Log R&D	Coefficient	p-value
Log age	1.334568***	0.000
F. Size	0.1228386*	0.060
Sales Growth	0.00000583	0.700
Profitability	0.00000172*	0.090
Debt to equity	0.0002413	0.100
Tech to asset	0.00000448**	0.010
Constant	-0.065827426	
N (Observations)	1860	
N (Companies)	639	
Wald Chi^2	1.36	
p-values	0	
R-square	0.1712	

Notes: ***, **, * presents level of significance at 1%, 5% and 10 % respectively.

IV. IR-4 and Human Capital

Like past Industrial Revolutions, IR-4 is also expected to bring about far-reaching changes in the labour market with technology shaping the type and nature of work. According to Frey and Osborne (2013),

Chart 8: Susceptibility to Automation Across Jobs

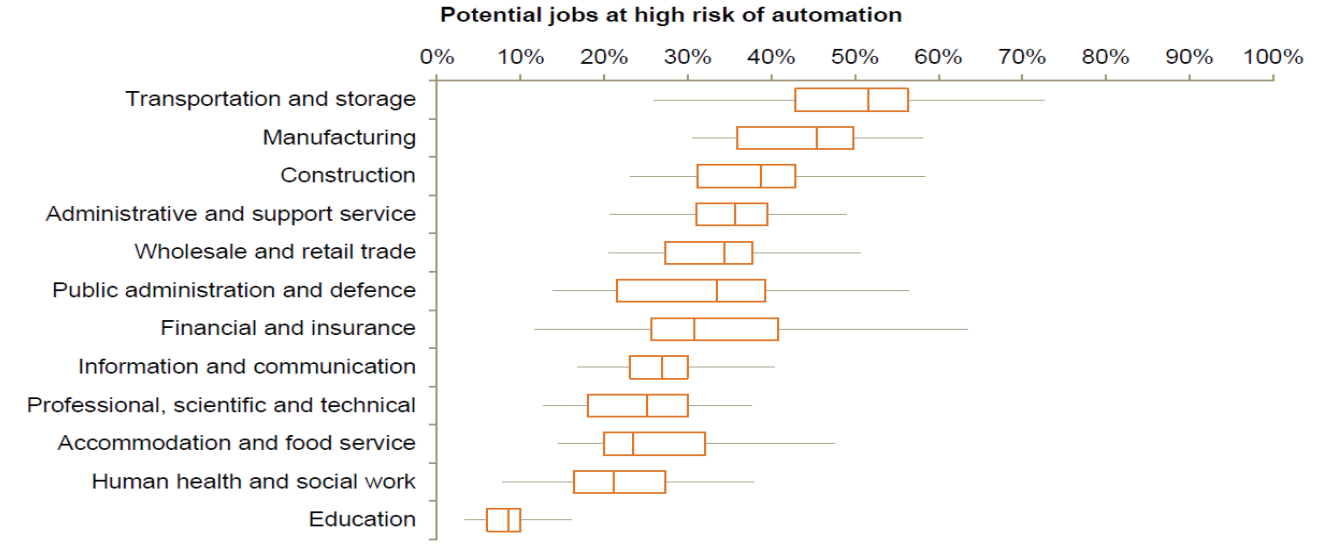


Source: Nedelkoska, L., & Quintini, G. (2018).

47 per cent of jobs in the United States are at a high risk of being automated. Similarly, in a cross-country study of 32 countries, close to one in two jobs are likely to be significantly affected by automation, based on the tasks they involve (Nedelkoska, L., & Quintini, G. 2018). About 14 per cent of jobs in OECD countries are highly automatable (*i.e.*, probability of automation of over 70 per cent); another 32 per cent of jobs have a risk of automation between 50 per cent and 70 per cent, pointing to the possibility of significant change in the way these jobs are carried out (Chart 8).

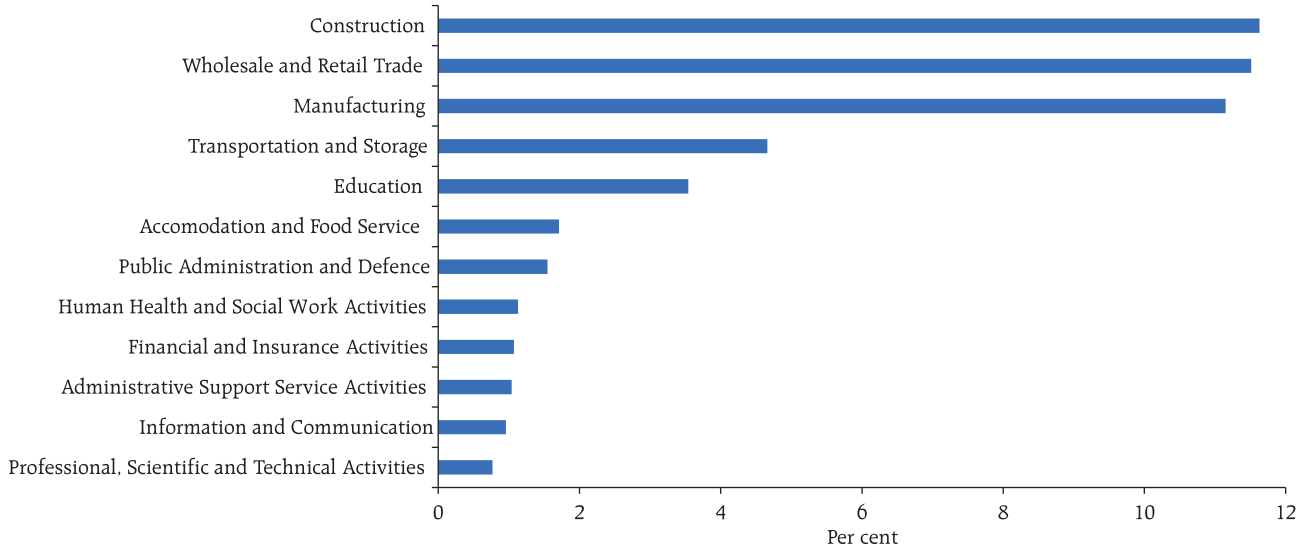
Sectors with higher possibility of increased automation and displacement of significant labour force include transportation, storage, manufacturing and construction (Chart 9). A comparison with India's

Chart 9: Share of Jobs with Potentially High Automation Rates by Industry



Source: PricewaterhouseCoopers, 2018.

Chart 10: Percentage Distribution of Workers by Industry - India

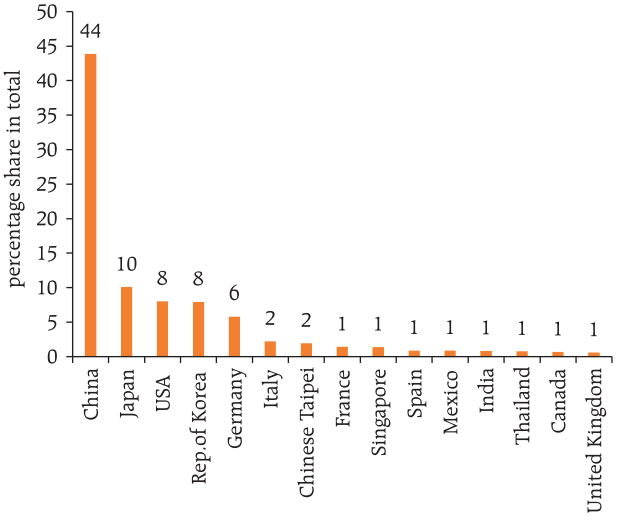


Source: Periodic Labour Force Survey, 2019-20.

employment structure reveals that more than three fourths of India's workforce outside agriculture is employed in these sectors (Chart 10). Thus, India has a high share of workers employed in sectors with high risk of automation. Manufacturing sector, which is already capital intensive in India may be impacted further by automation as many of the assembly lines can be run by machines and production and distribution processes can be streamlined using advanced technologies, making it even more capital intensive. Further, many of the services that are used in the manufacturing processes would also be impacted by automation, limiting employment potential in manufacturing going ahead.

Use of industrial robots in manufacturing is progressing gradually with five major markets accounting for 76 per cent of industrial robots' installations (Chart 11). India, with a share of 0.8 per cent, is a small player in this segment. In 2020, the world average robot density in the manufacturing sector was 126 robots per 10,000 employees, with Asia having an average robot density of 134 units per 10,000 employees. As per the International Federation of Robotics, World Robotics, 2021, robots' installation has increased by 0.5 per cent in the pandemic year 2020, making it the third most successful year in robotics industry after 2017 and 2018. The main growth driver was the electronics industry (29 per cent of installations) which surpassed the automotive industry (21 per cent of installations) as the largest customer of industrial robots followed by metals and machinery (11 per

Chart 11: Industry Robot Installations 2020: Country-wise



Source: International Federation of Robotics.

cent), plastics and chemical products (5 per cent) and food and beverages (3 per cent).

Those jobs which are repetitive, routine cognitive, and manual have high chances of automation (Autor, Levy and Murnane, 2003). While it is highly plausible that occupations involving routine tasks, cognitive or otherwise, are at a higher risk of getting replaced, the tasks having more social requirements are well-placed to survive and thrive. The premium is placed on occupations that deal with managing and improving these technologies and the ones that require human understanding. Therefore, it is important to look at the evolution in skill demand due to these frontier technologies.

Like every new technology in the past, IR-4 also brings with it hope of generating new occupations and tasks. Technology has brought higher labour productivity to many sectors by reducing the demand for workers in routine tasks. It also creates proximity to distant markets, facilitating creation of new and more efficient value chains (World Bank, 2019).

As the risk of automation is inversely proportional to the skill levels of the workers, the level of human capital development is an important marker of the risks to automation across various countries. Accordingly, the level of educational attainment of the workforce becomes an important variable for deciding the automation potential of the occupations employing the workforce (Ilavarasan, 2017) (Table 4).

IV.2 India's Prospects

Successful adaptation to IR-4 require development of skill sets among the working population. While India has made rapid strides in education, three-fourths of the population has educational qualification of only up to secondary level, which are categorised as unskilled to low skilled with high probability of facing the rile of automation. Only 11.8 per cent of the workforce has educational qualifications of graduate and above. India's tertiary[7] enrolment ratio in 2019 was lower than both low-middle income countries and the world average (Chart 12).

Further, notwithstanding the fact that employability is high for technically trained personnel, only 3.2 per cent of the workforce have formal vocational/technical training in India (PLFS 2019-20). Many of the task-specific/occupation-specific skills were traditionally transferred either within a family from one generation to another *via* a family vocation or by learning on the job from veteran skilled workers.

Table 4: Skill levels, education, occupations and automation

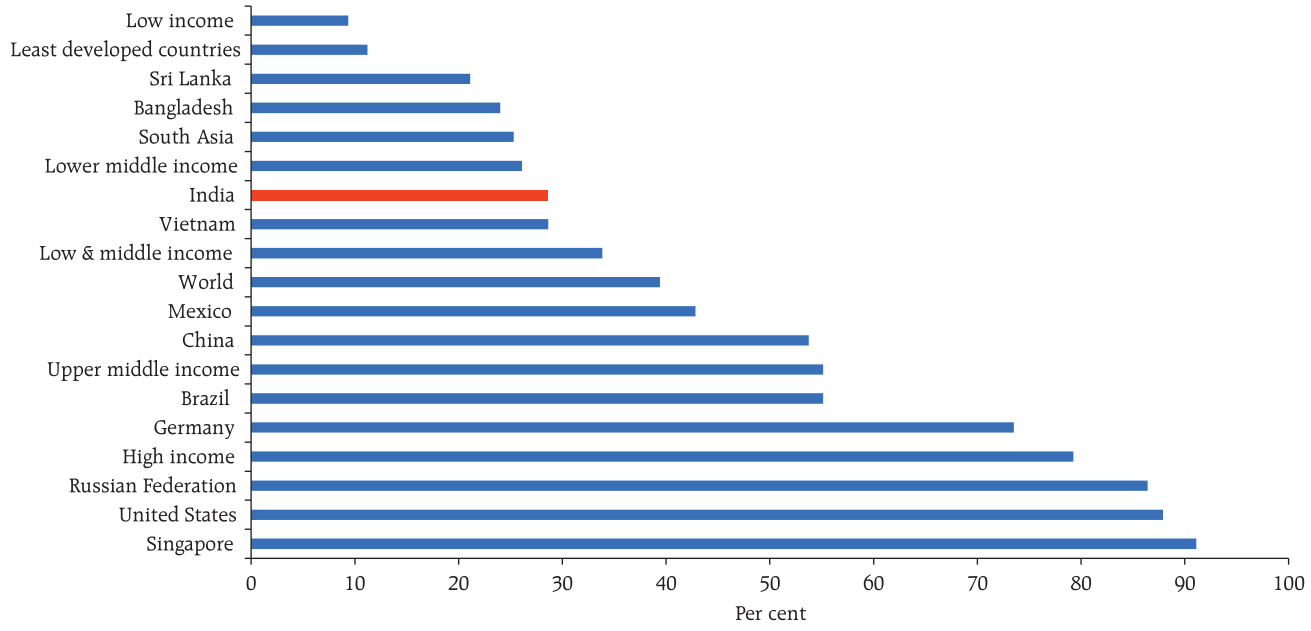
Skill Levels, Education, Occupations and Automation

Skill Level	Skill Definition	Education	Occupation - Divisions	Automation Possibilty
I (unskilled)	Routine physical and/or manual tasks	Primary (upto 10 years of formal/informal skills)	Elementary occupations; Armed Forces Occupations	Very high
II (low skilled)	Operating machinery, electrical equipment, driving vehicles, repairing, storage info	Secondary (11-13 years)	Clerical Support Workers; Services and Sales Workers; Skilled Agri, Forestry & Fishery Workers; Crafts & Related Trades Workers; and Plant and Machine Operators & Assemblers, Armed Forces Occupations	Very high
III (skilled)	Complex technical and practical tasks which need knowledge in specialized fields	First Univ. (14-15 years)	Technicians and Associate Professionals; Managers	High & Moderate
IV (high skilled)	Tasks require complex skills, knowledge in a specialised field	Post Graduate (More than 15 years)	Professionals; Managers; Armed Forces Occupations	Low

Source: Ilavarasan, V. (2017).

[7] Education at the post-secondary level.

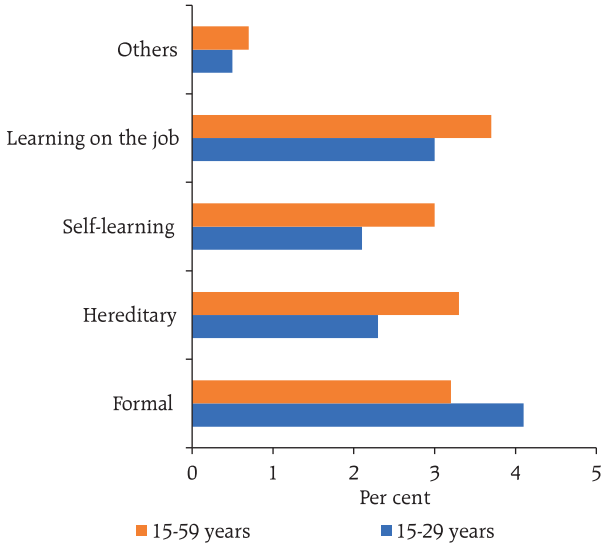
Chart 12: Teritiary School Enrollement



Source: World Bank, World Development Indicators.

In recent years, more institutionalised mechanisms of imparting skills are spreading across India. PLFS (2019-20) reveals that the younger workers (15-29 years) are increasingly getting vocationally/technically trained from formal institutions as compared to the workers in the 15-59 years age cohort (Chart 13).

Chart 13: Vocational/Technical Training Received

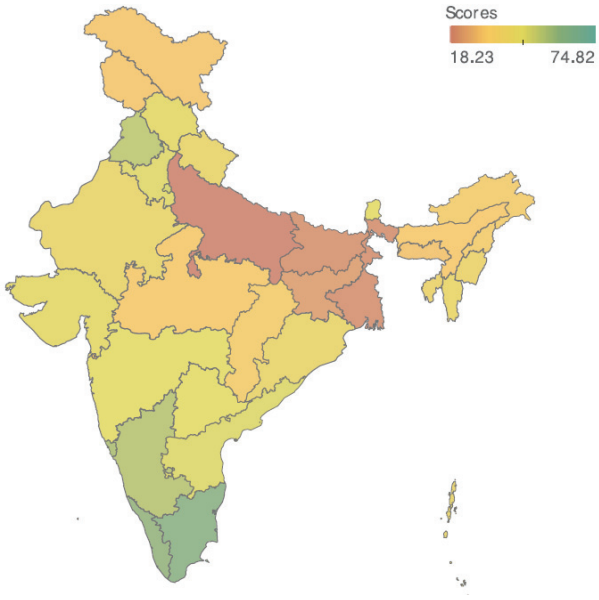


Source: Periodic Labour Force Survey (2019-20).

IR-4 technologies demand digital and analytical skills, which make it imperative to expand the spread and scope of technical courses. All-India Survey of Higher Education (AISHE) 2019-20 paints a hopeful picture as enrolment in engineering and technology courses at undergraduate level is the third highest in the country. Similarly, the number of post-graduate and higher degree courses in the engineering and technology domain remains high. However, wide divergence across states in human capital also needs to be addressed. States like Tamil Nadu, Kerala, Karnataka and Punjab have a relatively higher level of human capital development as compared to northern and eastern states of Uttar Pradesh, Bihar, West Bengal and Jharkhand *etc.* (Chart 14).

New technologies would place higher demands on the IT infrastructure – the availability and reliability of ICT services, the data ecosystem, skills, and intellectual property rights become important in this context. India's density of cellular subscriptions has reached 84 per cent, but it lags major comparable economies on access to digital

Chart 14: Regional mapping of human capital scores



Source: India Innovation Index Report, 2020 (NITI Aayog).

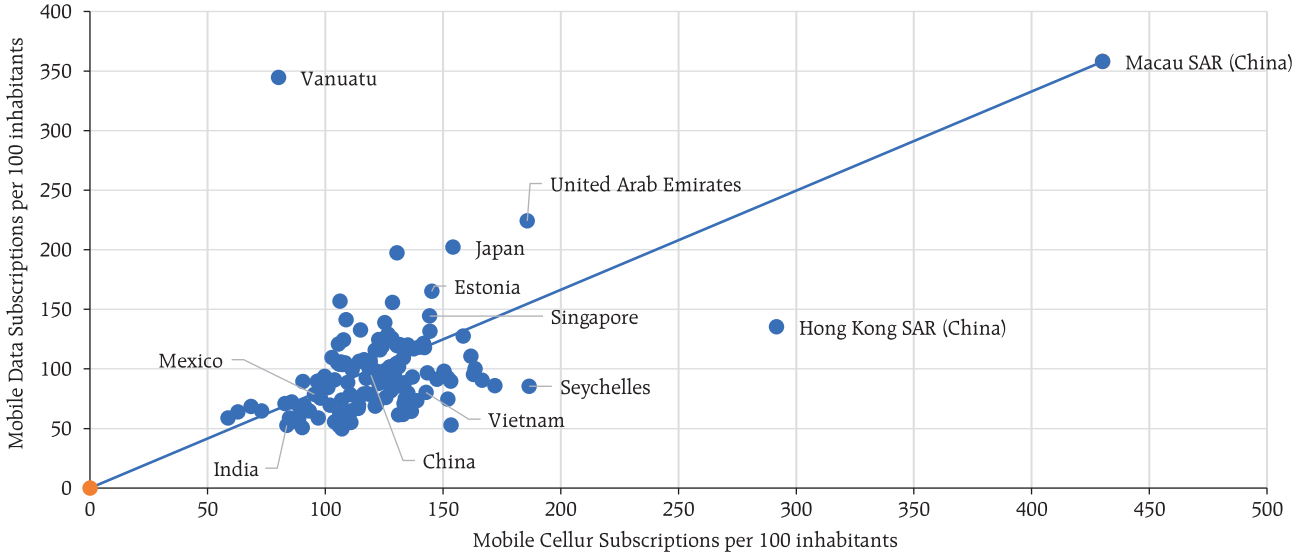
technology (Chart 15). Similarly, in terms of usage of internet, 41.0 per cent of individuals used internet, lower than the global average of 56.7 per cent [World Development Indicators (World Bank, 2019)].

V. Summary and Conclusion

The new age technologies are expected to bring about far-reaching changes in production processes in India's manufacturing sector. In terms of its participation in global value chain and technology intensity, the sector is assessed to be in a relatively better position to reap the benefits of emerging tech revolution. India's advantage in technology exports and presence of experienced professionals also provide an added advantage. However, when it comes to the quality of human capital and physical infrastructure required to make the great leap forward, India lags its competitors. Unless the vast labour force is upskilled, the benefits from IR-4 will be more than offset by large scale labour displacement.

India has made giant strides in digital space implementing unique, large-scale projects powered by public digital infrastructure, particularly in the payment infrastructure. Efforts are being made in harnessing digital technologies for providing large scale public solutions through the Unified Payments

Chart 15:Access to Digital Technology



Source: International Telecommunication Union.

Interface, Aadhar, Cowin, Jan-Dhan Yojna, E-shram portal, eNational Agricultural Market (eNAM), and Direct Benefit Transfer. These open digital platforms being affordable and interoperable are catalysts for innovation and adoption, aiding India's entrepreneurs to build technologies and provide solutions at scale. India's start-up landscape has grown exponentially in recent years driven by the underlying infrastructure of increased internet usage and accessibility, providing digital based solutions across sectors. Indian services sector has gained renewed vigour, but large-scale adoption of IR-4 in the manufacturing sector is yet to happen.

The importance of adopting new technologies is not lost to the Government. Some initiatives undertaken include, setting up of the Centre for the Fourth Industrial Revolution in India in 2018, for elaborating new policy frameworks for emerging technologies. Samarth Udyog Bharat 4.0 (Smart Advanced Manufacturing and Rapid Transformation Hubs) under the Department of Heavy Industries (Ministry of Heavy Industries & Public Enterprises) is another initiative to push for Industry 4.0 implementation with an aim to propagate technological solutions to Indian manufacturing units by 2025 through steps like awareness programme, training, demo centres etc. The new technologies also got a push under the Performance Linked Incentive Scheme (PLI).

As new business models challenge incumbents in novel ways and rapidly render skills obsolete, proactive measures are required for faster adaptation of work-force to the new world. This calls for broad and flexible government policies that stay ahead of the curve facilitating smooth transition focusing on developing skill set to the large section of population. While government policies to support digitalisation and improve governance have benefitted the economy, large scale adoption of technology will require extensive knowledge diffusion, higher industry -research collaborations, robust industry infrastructure and inclusive policies for MSMEs. Further, manual, low skill labour displacement will have to be countered by up-skilling labour to reap the advantage of new skilled jobs created. Simultaneously, new avenues of products, services and solutions necessitates prerequisites of local capability and capacity for providing cyber security solutions to protect IR 4.0 applications. Increased funding and incentives to support innovation in manufacturing remain fundamental policy imperatives.

An underlying requirement for successful adaptation of fourth IR is an accomplished third IR. Unless the shift to automation and digitization is adequate, the benefits may be partial. While new fields of telemedicine, tele lawyering and edu-tech can ease access to services and create jobs, the job content will become more skill-intensive. These new sectors will not only need resources to develop but also global standard data protection frameworks to thrive. At the state level, innovation hubs need to be developed that are interactive and integrated at the national level. Education system needs to be revamped, to not only include digital education but also improve on the existing quality of education. Future of manufacturing and future of economy depends a lot on how quickly India can improve its human capital and work towards developing a skilled workforce.

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Annex 1: Country Codes and Names

Country Code	Country Name	Country Code	Country Name
CHN	China (People's Republic of)	HUN	Hungary
GER	Germany	SWE	Sweden
KOR	Korea	DNK	Denmark
USA	United States	HKG	Hong Kong, China
SGP	Singapore	TUR	Turkey
FRA	France	RUS	Russian Federation
MEX	Mexico	SVK	Slovak Republic
NLD	Netherlands	BRA	Brazil
IRL	Ireland	AUS	Australia
ROW	Rest of the World	IDN	Indonesia
TWN	Chinese Taipei	PRT	Portugal
ITA	Italy	FIN	Finland
JPN	Japan	NOR	Norway
CAN	Canada	ZAF	South Africa
GBR	United Kingdom	PHL	Philippines
VNM	Viet Nam	ISR	Israel
BEL	Belgium	ROU	Romania
THA	Thailand	GRC	Greece
ESP	Spain	BGR	Bulgaria
IND	India	MAR	Morocco
CHE	Switzerland	SVN	Slovenia
LUX	Luxembourg	CHL	Chile
POL	Poland	SAU	Saudi Arabia
MYS	Malaysia	MLT	Malta
CZE	Czech Republic	LTU	Lithuania
AUT	Austria	NZL	New Zealand

Source: OECD TiVA database.

Annex 2: Classification of Manufacturing Activity based on R&D Intensity

	NIC 2008	Manufacturing
High R&D intensity industries	303	Air and spacecraft and related machinery
	21	Pharmaceuticals
	26	Computer, electronic and optical products
Medium-high R&D intensity industries	252	Weapons and ammunition
	29	Motor vehicles, trailers and semi-trailers
	325	Medical and dental instruments
	28	Machinery and equipment n.e.c.
	20	Chemicals and chemical products
	27	Electrical equipment
	30	Railroad, military vehicles and transport n.e.c. (NIC 302, 304 and 309)
Medium R&D intensity industries	22	Rubber and plastic products
	301	Building of ships and boats
	32	Other manufacturing except medical and dental instruments (ISIC 32 less 325)
	23	Other non-metallic mineral products
	24	Basic metals
	33	Repair and installation of machinery and equipment
Medium-low R&D Intensity Industries	13	Textiles
	15	Leather and related products
	17	Paper and paper products
	10-12	Food products, beverages and tobacco
	14	Wearing apparel
	25	Fabricated metal products except weapons and ammunition (ISIC 25 less 252)
	19	Coke and refined petroleum products
	31	Furniture
	16	Wood and products of wood and cork
	18	Printing and reproduction of recorded media

Source: OECD 2016, "Taxonomy of Economic Activities Based on R&D Intensity.

*Nowcasting Global Growth**

Incoming data suggests that global growth is losing steam in the first and second quarter of 2022. Estimates and forecasts of global GDP growth are on an annual basis. This article attempts to bridge the gap between the availability of and the arrival of global GDP estimates and higher frequency indicators of global economic activity.

Introduction

The year 2022-23 has begun on a sombre note. The global economy was on the cusp of recovery when it was hit by a mammoth geopolitical shock. The escalation of geopolitical tensions has also led to a broad-based increase in global commodity prices with the potential of keeping elevated inflation persistent and undermining global trade and growth.

Available high frequency indicators suggest that global growth is losing steam in the first and second quarters of 2022. It is in this backdrop that this study attempts to gauge global growth outcomes on an ongoing basis based on incoming data. These findings can be considered as indicative and would get firmed up as more experience is gained with these nowcasts that are based on actual releases of official data. They are intended to fill the gaps in the availability of estimates and forecasts of global GDP growth which are currently on an annual basis.

The rest of the study is organised into four sections. Section II deals with some stylised facts. Section III discusses the analytical framework of the study and data construction while section IV presents the main findings. Section V concludes the study.

II. Stylized Facts

The global economy grew by 6.1 per cent in 2021 – the highest in six decades but is now projected to decelerate to 3.6 per cent in 2022 and 2023 (WEO, April 2022), and 2.9 per cent in 2022 and 3.0 per cent in 2023 (GEP, June 2022).[1] This has prompted some to expect the current decade to be "crawling 2020s" (Chart 1).

After the double shock of Covid-19 and the Russia-Ukraine war, inflation rates have exceeded expectations, surging to their highest levels in decades in many countries, while economic growth forecasts are rapidly deteriorating.

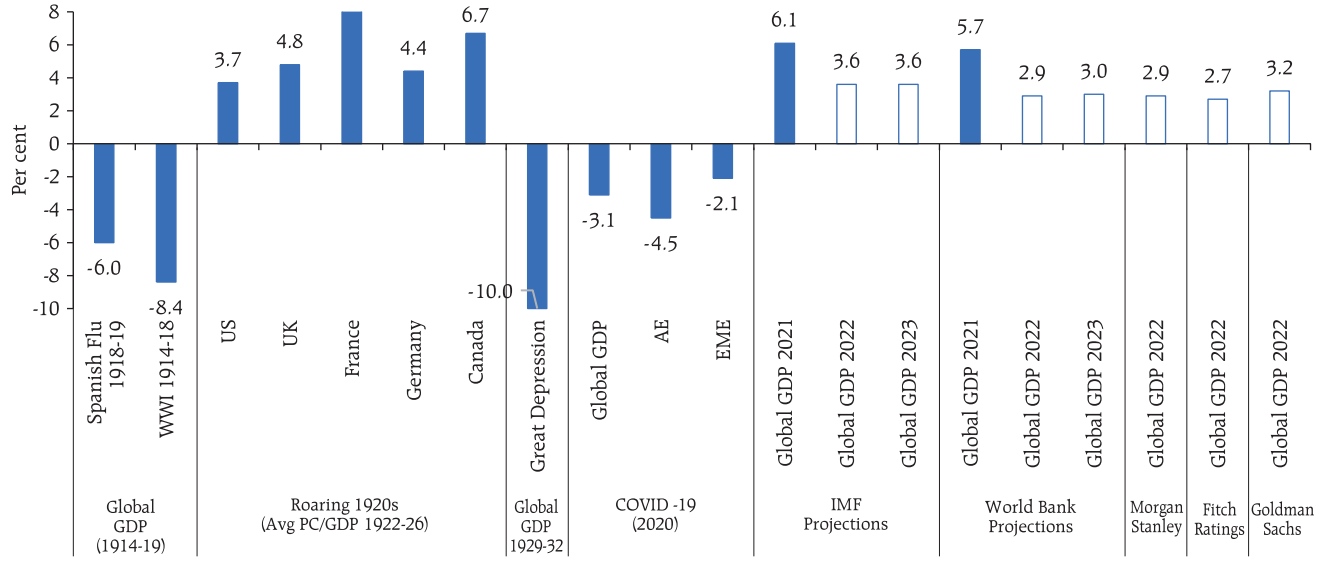
Early high frequency data provides a mixed picture: as per available data, global IIP and trade volume slowed-down in March 2022; composite global PMI index accelerated marginally in May 2022 after two consecutive months of deceleration during March-April, driven mainly by expansion in new orders – both manufacturing and services (Chart 2). GDP data released so far for Q1:2022 point to contraction and deceleration.

Global food and energy prices have skyrocketed resulting in higher and more broad-based inflation than in several decades. Brent crude oil hit an average of US $120.7 per barrel in June 2022 so far – the highest since the June-August 2008 average of US$ 129.9 per barrel. The current oil price shock has been described to be one of the biggest in decades (Chart 3). There have since been revisions and

* This article has been prepared by Ramesh Kumar Gupta, Bhanu Pratap, Jessica Maria Anthony and Thangzason Sonna of the Department of Economic and Policy Research. The team is grateful to Dr. Michael Debabrata Patra, Deputy Governor, for conceiving this analytical exercise and encouraging us in writing this study. The views expressed in the article are those of the authors and do not represent the views of the Reserve Bank of India.

[1] Independent estimates/forecasts place global GDP growth for 2022 in a range of 2.7-3.3 per cent. According to Morgan Stanley, global GDP growth for 2022 could be down to 2.9 per cent (May 11, 2022), and 2.7 per cent, according to Fitch Ratings (March 21, 2022), and 3.2 per cent as per Goldman Sachs (January 31, 2022). The consensus global economic growth is only 3.3 per cent, down from 4.1 that was expected in January (Financial Times, May 02, 2022).

Chart 1: Roaring 1920s and Crawling 2020s?

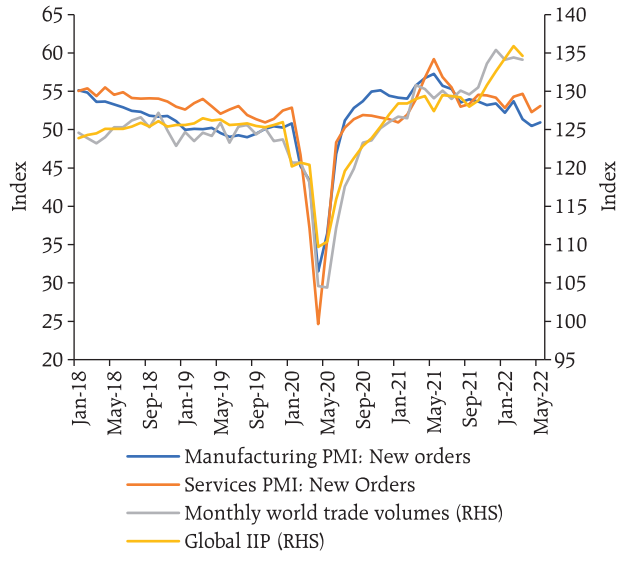


Source: IMF, WB, Maddison Historical Data, Morgan Stanley, Fitch Ratings and Goldman Sachs.

projections of oil prices - Environmental Investigation Agency (EIA): US $105.22 per barrel for 2022; Goldman Sachs: US $135 per barrel for 2022; Morgan Stanley: US $115 per barrel in Q2 and US $150 per barrel for the rest of 2022.

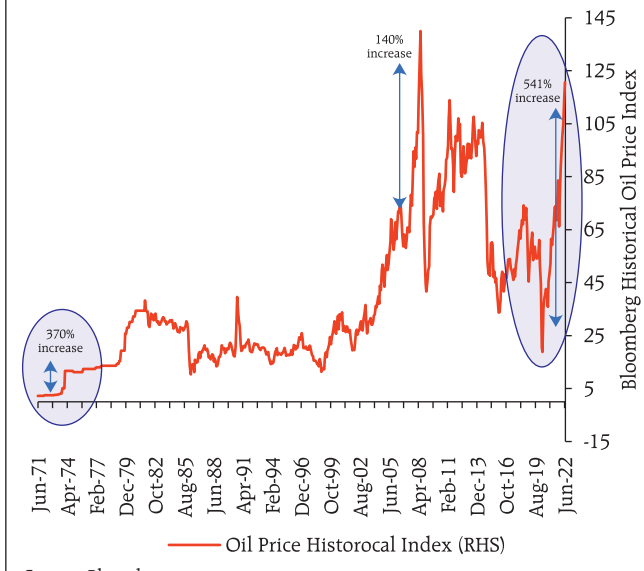
Meanwhile, global food prices – measured by both the Food and Agriculture Organisation (FAO) and the International Monetary Fund (IMF) were at an all-time high in April 2022 and expected to remain elevated due to supply disruptions (Chart 4: a-b).

Chart 2: Global Economic Indicators



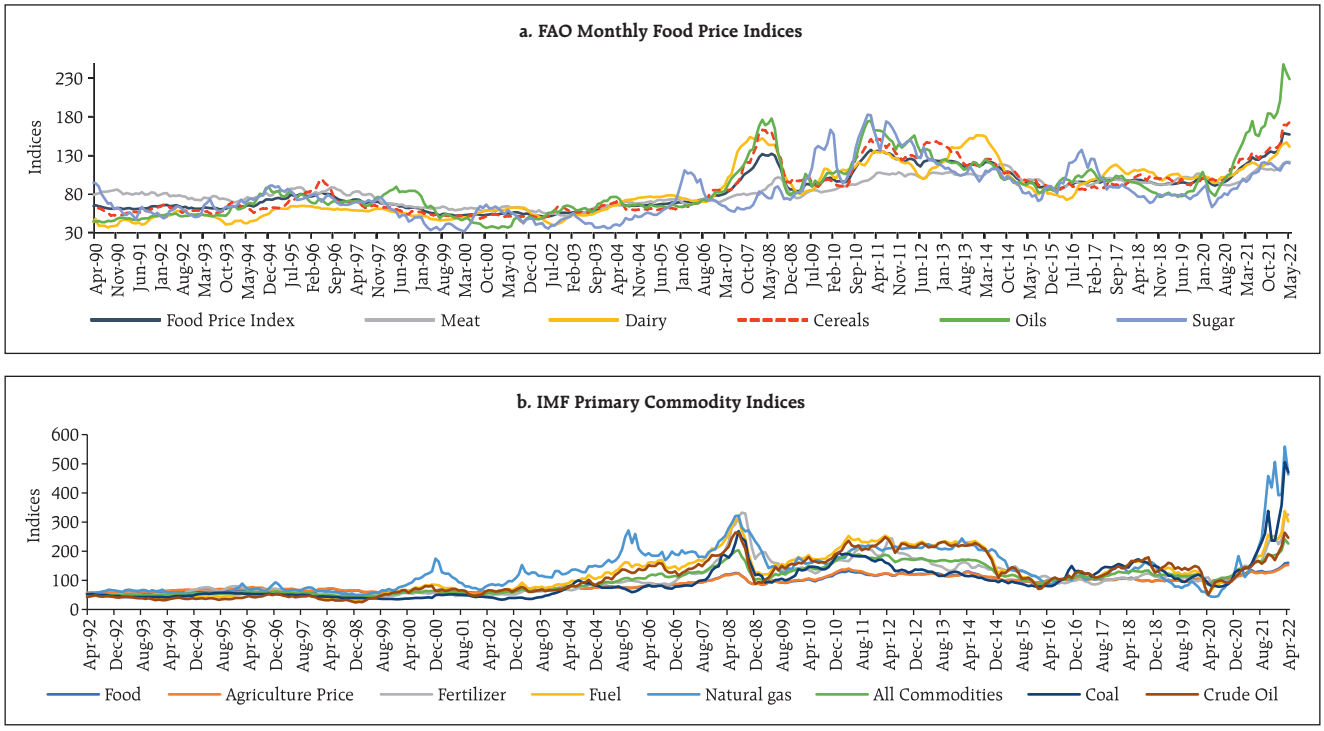
Source: Bloomberg, IHS Markit.

Chart 3: Oil Shocks Since 1970s



Source: Bloomberg.

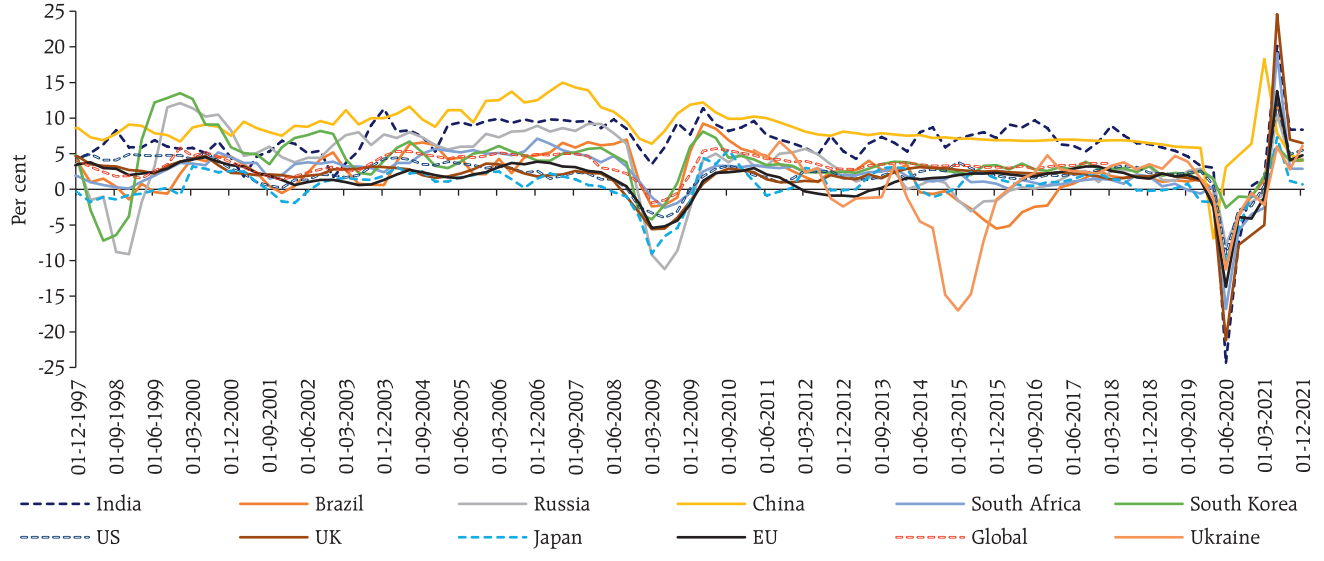
Chart 4: Food Price at All Time High



Source: FAO and IMF.

In this uncertain environment, high correlation between India's GDP growth and those of major economies suggests that business cycles across countries have become highly synchronised (Chart 5; Annex Table 1).

Chart 5: Quarterly GDP Growth: Global and Select Countries



Source: OECD Database.

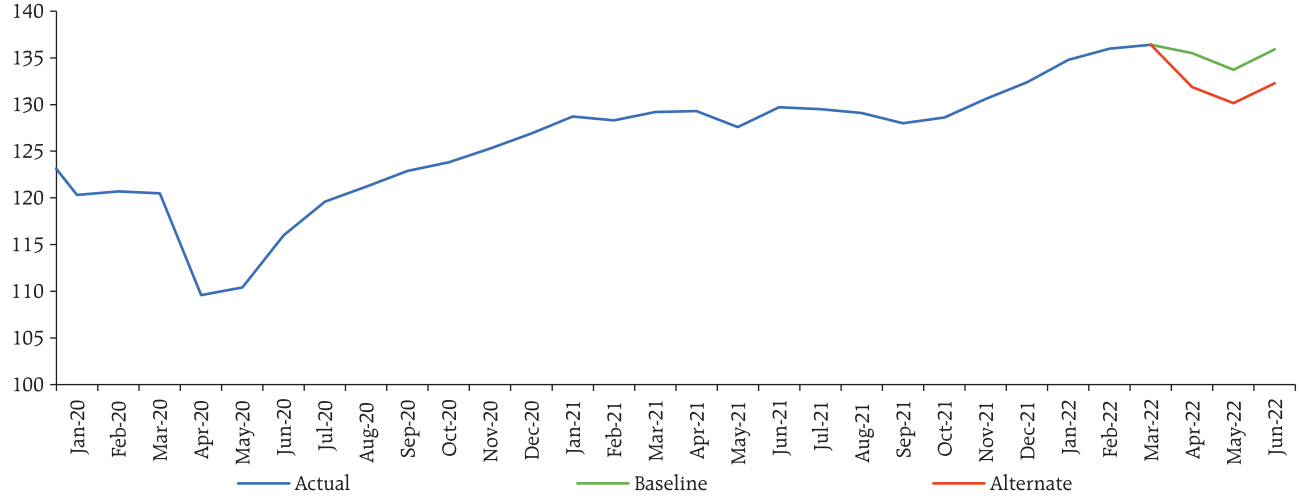
III. Analytical Framework

As stated earlier, this study aims to nowcast global GDP growth for Q1:2022 and Q2:2022 to test the waters for the possibility of generating these nowcasts on a regular basis. Two approaches have been adopted in the exercise. In the first, the dataset on global GDP, compiled by the Organization for Economic Co-operation and Development (OECD), covering 48 countries (both OECD and non-OECD members) comprising more than 80 per cent of the global GDP in purchasing power parity terms (PPP) at 2015 prices is used. The latest update covers data till Q4:2021. So far, GDP data for Q1:2022 have been released by 35 countries accounting for 61 per cent of global GDP. For the purpose of these nowcasts, 35 countries are considered as representative of global GDP.

In the second exercise (Annex Box 1), several candidate indicators such as global index of industrial production (IIP), trade volume and purchasing managers index (PMI) that are known to be highly correlated with global GDP are tested for their ability to predict global GDP growth. In an autoregressive integrated moving average (ARIMA) framework with exogeneous regressors, global IIP emerges as the strongest predictor of global GDP growth. The data on global GDP from Q1:2012 to Q4:2021 is computed by aggregating real GDP for 69 countries currently available in the CEIC database. The data for global IIP is available till March 2022.

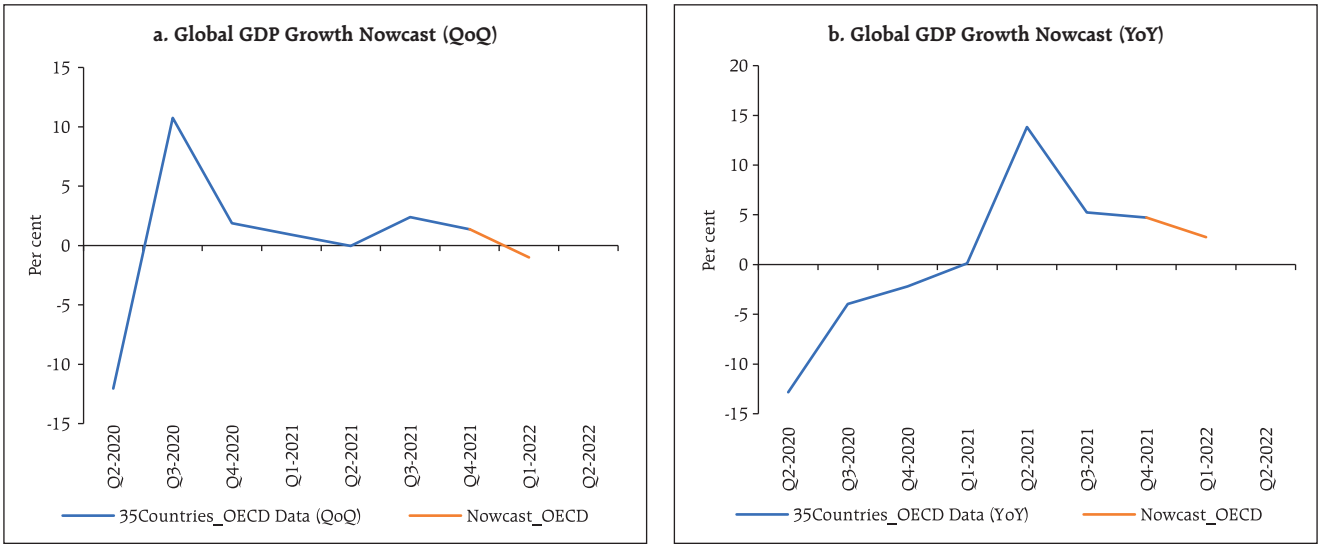
Two alternate scenarios are considered for the forecasting exercise. Under the baseline scenario, global IIP during April-June 2022 is assumed to grow at the same year-on-year rate as during the previous six months. The alternative scenario assumes a much slower growth rate of 2.0 per cent for April-June 2022 to capture risks to the global economy (Chart 6).

Chart 6: Forecast Scenarios: Global IIP



Note: *Baseline* - Year-on-year growth observed over last six months, *i.e.*, 4.8 per cent in case of global IIP, to continue over April-June 2022.
Alternative - Year-on-year growth of 2 per cent in global IIP to prevail over April-June 2022.
Source: Authors' Estimate.

Chart 7: Global GDP Nowcast: OECD 35 Countries



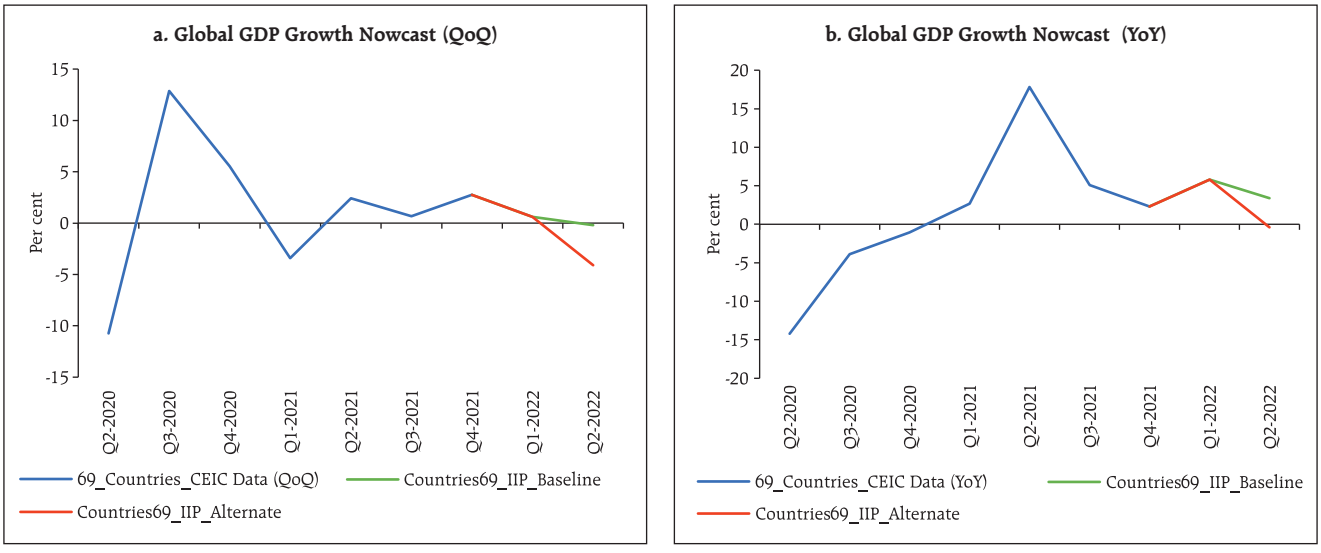
Source: OECD Database. Authors' Estimates.

IV. Empirical Results

As it emerges, extension of OECD database to Q1:2022 using Q1:2022 GDP growth rates for 35 countries indicates that the momentum of global GDP growth during Q1:2022 has lost steam sequentially and annually, possibly entering contractionary zone (Chart 7: a-b).

As regards the model-based forecasts of global GDP for Q1:2022 and Q2:2022, global GDP growth momentum seems to have decelerated in Q1:2022 and is likely to contract in Q2: 2022. The decline is expected to be much sharper under the alternative scenario (Chart 8: a-b; Annex Box 1).

Chart 8: Model-based Global GDP Forecasts



Source: CEIC Database. Authors' Estimates.

V. Conclusions

Global growth has lost momentum over the first half of 2022 as evident from incoming data. The outlook is fluid and uncertain. In this highly uncertain environment, our endeavour will be to track global GDP and subsequently inflation on as contemporaneous basis as possible so as to keep all stakeholders forewarned and forearmed.

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Annexure

Annex Table 1: Global Business Cycle Synchronised

Correlation t-Statistic Probability	Brazil	China	EU	France	Germany	India	Japan	Russia	South Africa	South Korea	UK	US
Brazil	1.000000											

China	0.497090	1.000000										
	5.613086	-----										
	0.0000	-----										
EU	0.544231	0.249360	1.000000									
	6.356102	2.522920	-----									
	0.0000	0.0133	-----									
France	0.584671	0.299770	0.947656	1.000000								
	7.061255	3.078720	29.08027	-----								
	0.0000	0.0027	0.0000	-----								
Germany	0.553643	0.216334	0.892030	0.796970	1.000000							
	6.514017	2.171043	19.33747	12.92789	-----							
	0.0000	0.0324	0.0000	0.0000	-----							
India	0.518318	0.362708	0.708751	0.736044	0.640190	1.000000						
	5.938407	3.813487	9.843697	10.65351	8.165082	-----						
	0.0000	0.0002	0.0000	0.0000	0.0000	-----						
Japan	0.579368	0.274057	0.747261	0.682808	0.767948	0.586956	1.000000					
	6.964616	2.792097	11.01776	9.157064	11.74736	7.103305	-----					
	0.0000	0.0063	0.0000	0.0000	0.0000	0.0000	-----					
Russia	0.627636	0.356325	0.570734	0.488322	0.551026	0.360806	0.621377	1.000000				
	7.899164	3.736519	6.810127	5.482703	6.469759	3.790481	7.770437	-----				
	0.0000	0.0003	0.0000	0.0000	0.0000	0.0003	0.0000	-----				
South Africa	0.739933	0.378438	0.814346	0.831452	0.714570	0.781106	0.709375	0.686589	1.000000			
	10.77753	4.005851	13.74779	14.66270	10.00812	12.25697	9.861128	9.252746	-----			
	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-----			
South Korea	0.425728	0.275254	0.433585	0.369448	0.423474	0.254370	0.490276	0.705305	0.465000	1.000000		
	4.609888	2.805290	4.714446	3.895437	4.580131	2.577074	5.511572	9.748209	5.146276	-----		
	0.0000	0.0061	0.0000	0.0002	0.0000	0.0115	0.0000	0.0000	0.0000	-----		
UK	0.520931	0.148332	0.919973	0.928858	0.792646	0.755726	0.726769	0.487598	0.849164	0.387007	1.000000	
	5.979460	1.469613	22.99564	24.56806	12.73831	11.30663	10.36691	5.472048	15.75385	4.112330	-----	
	0.0000	0.1449	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	-----	
US	0.481672	0.147455	0.885833	0.877897	0.751477	0.626659	0.719967	0.494236	0.733476	0.409412	0.900533	1.000000
	5.385283	1.460722	18.70537	17.96302	11.16004	7.878904	10.16444	5.570405	10.57292	4.396777	20.29359	-----
	0.0000	0.1474	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-----

Annexure Box 1: Model-based Global GDP Forecasts

In order to forecast global GDP growth, several candidate indicators, such as global index of industrial production (IIP), trade volume and purchasing managers index (PMI), that are known to be highly correlated with global GDP, are analysed for their predictive ability. The data on global GDP was computed by aggregating real GDP (in constant US dollar terms) for 69 countries obtained from the CEIC database. Data on other indicators were obtained from CPB Netherlands, Bloomberg and IHS Markit. Table B1 shows the contemporaneous correlation between global GDP and such indicators. Global GDP was found to be highly correlated with global IIP and global trade volume.

Next, these indicators are subjected to the *Granger Causality test* in order to assess their ability to forecast global GDP growth. Results are shown below in Table B2. Global IIP and PMI indicators *Granger cause* global GDP indicating useful forward-looking information contained within these variables.

Taking cognizance of the above results and the slow-moving nature of GDP, the forecasting problem is approached using an autoregressive integrated moving average (ARIMA) framework with exogeneous regressors. In the first step, a baseline model is estimated to forecast global GDP. Since the GDP data was found to be stationary in both QoQ and YoY terms, the model identification was restricted to finding the appropriate AR and MA lag length. Allowing for additional seasonal AR and MA lags in the model, a grid-search method and Akaike information criterion (AIC) was used to identify the appropriate lag length in line with standard practices. The model was estimated over a training sample from 2012Q1:2019Q4.

Table B1: Correlation Between Global GDP and Global Indicators

S. No.	Indicators	Global GDP QoQ (%)	Global GDP YoY (%)
1.	Global IIP@	0.635***	0.740***
2.	Global Trade Volume@	0.536***	0.771***
3.	Global PMI – Inputs	0.268*	0.690***
4.	Global PMI – New Orders	0.414***	0.589***
5.	Global PMI – Headline	0.423***	0.571***

Note: Based on quarterly data sample from 2012Q1 to 2021Q4.
***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively.
@ Taken in QoQ (%) or YoY(%) terms depending on target GDP indicator.

Table B2: Granger Causality Test

S. No.	Hypothesis	Global GDP QoQ (%)	Global GDP YoY (%)
1.	Global IIP@	4.817***	3.160**
2.	Global Trade Volume@	1.270	1.504
3.	Global PMI – Inputs	1.262	1.078
4.	Global PMI – New Orders	2.798**	4.102**
5.	Global PMI – Headline	2.761**	3.877**

Note: The above table shows the F-statistic against the hypothesis that "Variable X does not granger cause Global GDP". The granger causality test was conducted considering upto 4 lags and 5 per cent level of significance. Based on quarterly data sample from 2012Q1 to 2021Q4.
***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively.
@ Taken in QoQ (per cent) or YoY (per cent) terms depending on target GDP indicator.

In the second step, several candidate models were estimated by augmenting the univariate model selected in the first step with global trade, IIP and PMI indicators. Splitting the data into a train and test sample, each such model is estimated over the training sample from 2012Q1:2019Q4 and assessed over the testing sample *i.e.*, from 2020Q1:2021Q4. The forecast accuracy over the test sample is measured using the root mean squared error (RMSE) metric. Based on adjusted R-squared, model AIC criterion and out-of-sample RMSE over a rolling sample, model augmented with global IIP is selected as the final model to forecast global GDP.

Finally, a simple scenario-based forecasting analysis is considered to incorporate the headwinds facing the global economy, *viz.*, ongoing Ukraine-Russia war, a slowdown in China and surging commodity prices, for which, two alternate scenarios were incorporated in the forecasting exercise. Under the baseline scenario, global IIP is assumed to grow at the same rate in the April-June 2022 period as observed over the last six months in year-on-year (YoY) terms. In contrast, the alternative scenario assumes a slower 2 per cent YoY growth rate for April-June 2022 period encompassing the risks to the global economy. Respective growth paths thus obtained for

(Contd.)

global IIP are used to forecast global GDP under the two alternative scenarios.

The model-based forecasts of global GDP for Q1:2022 and Q2:2022 are provided below in Table B3. Under the baseline scenario, global GDP growth momentum seems to have decelerated in Q1:2022 and is likely to contract in Q2: 2022, *albeit* by only 0.2 per cent. The decline is expected to be much sharper under the alternative scenario. This translates into a sequential slowdown as seen in the forecasts of global GDP growth. Note that global industrial production grew at an average of 4.8 per cent over the last six months, thus, providing an impetus to global GDP. Overall, however, Global GDP growth is expected to slow down under both the scenarios.

Table B3: Model-based Global GDP Forecasts

		GDP QoQ (per cent)		GDP YoY (per cent)	
		Baseline	**Alternative**	**Baseline**	**Alternative**
1.	Q1:2022	0.6 [-5.7, 7.0]	0.6 [-5.7, 7.0]	5.8 [1.2, 10.4]	5.8 [1.2, 10.4]
2.	Q2:2022	- 0.2 [-6.5, 6.2]	- 4.1 [-10.5, 2.4]	3.4 [-3.4, 10.1]	- 0.4 [-6.8, 6.0]

Note: The above table shows the point forecasts for global GDP growth. 95 per cent prediction intervals are provided in the parentheses. Source: Authors' estimates.

CURRENT STATISTICS

Select Economic Indicators

Reserve Bank of India

Money and Banking

Prices and Production

Government Accounts and Treasury Bills

Financial Markets

External Sector

Payment and Settlement Systems

Occasional Series

Contents

Notes: .. = Not available.
– = Nil/Negligible.
P = Preliminary/Provisional. PR = Partially Revised.

No. 1: Select Economic Indicators

Item	2021-22	2020-21		2021-22	
		Q3	Q4	Q3	Q4
	1	2	3	4	5
1 Real Sector (% Change)					
1.1 GVA at Basic Prices	8.1	2.1	5.7	4.7	3.9
1.1.1 Agriculture	3.0	4.1	2.8	2.5	4.1
1.1.2 Industry	9.8	6.2	11.6	1.5	1.0
1.1.3 Services	8.8	0.04	4.3	6.6	5.0
1.1a Final Consumption Expenditure	7.0	0.4	9.6	6.8	2.3
1.1b Gross Fixed Capital Formation	15.8	-0.6	10.1	2.1	5.1
	2021-22	**2021**		**2022**	
		Mar.	**Apr.**	**Mar.**	**Apr.**
	1	2	3	4	5
1.2 Index of Industrial Production	11.3	24.2	- -	1.9	-
2 Money and Banking (% Change)					
2.1 Scheduled Commercial Banks					
2.1.1 Deposits	8.9	11.4	11.2	8.9	10.0
2.1.2 Credit #	9.6	5.6	6.2	9.6	11.0
2.1.2.1 Non-food Credit #	9.7	5.5	6.0	9.7	11.4
2.1.3 Investment in Govt. Securities	6.0	19.3	14.1	6.0	6.9
2.2 Money Stock Measures					
2.2.1 Reserve Money (M0)	13.0	18.8	18.7	13.0	13.2
2.2.2 Broad Money (M3)	8.7	12.2	11.1	8.7	9.5
3 Ratios (%)					
3.1 Cash Reserve Ratio	4.00	3.50	3.50	4.00	4.00
3.2 Statutory Liquidity Ratio	18.00	18.00	18.00	18.00	18.00
3.3 Cash-Deposit Ratio	4.7	4.2	4.4	4.7	5.0
3.4 Credit-Deposit Ratio	72.2	72.4	71.5	72.2	71.5
3.5 Incremental Credit-Deposit Ratio #	77.2	37.4	-24.4	77.2	35.6
3.6 Investment-Deposit Ratio	28.7	29.5	29.7	28.7	28.8
3.7 Incremental Investment-Deposit Ratio	19.7	46.8	44.6	19.7	35.4
4 Interest Rates (%)					
4.1 Policy Repo Rate	4.00	4.00	4.00	4.00	4.00
4.2 Fixed Reverse Repo Rate	3.35	3.35	3.35	3.35	3.35
4.3 Standing Deposit Facility (SDF) Rate *	-	-	-	-	3.75
4.4 Marginal Standing Facility (MSF) Rate	4.25	4.25	4.25	4.25	4.25
4.5 Bank Rate	4.25	4.25	4.25	4.25	4.25
4.6 Base Rate	7.25/8.80	7.40/8.80	7.40/8.80	7.25/8.80	7.25/8.80
4.7 MCLR (Overnight)	6.45/7.00	6.55/7.05	6.55/7.05	6.45/7.00	6.50/7.00
4.8 Term Deposit Rate >1 Year	5.00/5.60	4.90/5.50	4.90/5.50	5.00/5.60	5.00/5.60
4.9 Savings Deposit Rate	2.70/3.00	2.70/3.00	2.70/3.00	2.70/3.00	2.70/3.00
4.10 Call Money Rate (Weighted Average)	3.34	3.25	3.21	3.34	3.63
4.11 91-Day Treasury Bill (Primary) Yield	3.84	3.32	3.32	3.84	3.98
4.12 182-Day Treasury Bill (Primary) Yield	4.27	3.47	3.45	4.27	4.40
4.13 364-Day Treasury Bill (Primary) Yield	4.58	3.83	3.72	4.58	4.81
4.14 10-Year G-Sec Par Yield (FBIL)	6.86	6.34	6.26	6.86	7.15
5 Reference Rate and Forward Premia					
5.1 INR-US$ Spot Rate (Rs. Per Foreign Currency)	76.18	72.40	74.02	76.18	76.42
5.2 INR-Euro Spot Rate (Rs. Per Foreign Currency)	84.01	85.31	89.69	84.01	80.58
5.3 Forward Premia of US$ 1-month (%)	5.67	6.80	6.00	5.67	4.08
3-month (%)	4.46	5.64	5.38	4.46	3.77
6-month (%)	4.10	5.47	5.17	4.10	3.69
6 Inflation (%)					
6.1 All India Consumer Price Index	5.51	5.5	4.2	7.0	7.8
6.2 Consumer Price Index for Industrial Workers	5.13	5.7	5.1	5.4	6.3
6.3 Wholesale Price Index	12.96	7.9	10.7	14.5	15.1
6.3.1 Primary Articles	10.21	7.3	9.9	15.5	15.4
6.3.2 Fuel and Power	32.73	9.7	21.3	34.5	38.7
6.3.3 Manufactured Products	11.05	7.8	9.4	10.7	10.9
7 Foreign Trade (% Change)					
7.1 Imports	55.16	55.4	169.5	28.4	31.0
7.2 Exports	44.56	64.1	202.6	26.1	30.7

Note : Financial Benchmark India Pvt. Ltd. (FBIL) has commenced publication of the G-Sec benchmarks with effect from March 31, 2018 as per RBI circular FMRD.DIRD.7/14.03.025/2017-18 dated March 31, 2018. FBIL has started dissemination of reference rates w.e.f. July 10, 2018.

*: As per Press Release No. 2022-2023/41 dated April 08, 2022

#: Bank credit growth and related ratios for all fortnights since December 3, 2021 are adjusted for past reporting errors by select scheduled commercial banks (SCBs).

- -: The index for month of April 2021 is not strictly comparable with April 2020.

Reserve Bank of India

No. 2: RBI - Liabilities and Assets *

(₹ Crore)

Item	As on the Last Friday/ Friday						
	2021-22	2021	2022				
		May	Apr. 29	May 6	May 13	May 20	May 27
	1	2	3	4	5	6	7
1 Issue Department							
1.1 Liabilities							
1.1.1 Notes in Circulation	3107637	2936065	3182321	3204195	3214955	3197840	3191136
1.1.2 Notes held in Banking Department	15	15	13	12	9	12	14
1.1/1.2 Total Liabilities (Total Notes Issued) or Assets	**3107652**	**2936080**	**3182334**	**3204207**	**3214965**	**3197852**	**3191150**
1.2 Assets							
1.2.1 Gold	128208	115898	123547	124548	121829	122524	122749
1.2.2 Foreign Securities	2978927	2819499	3058380	3079277	3092784	3074999	3068097
1.2.3 Rupee Coin	518	683	407	382	351	329	304
1.2.4 Government of India Rupee Securities	–	–	–	–	–	–	–
2 Banking Department							
2.1 Liabilities							
2.1.1 Deposits	1794574	1618155	1654833	1655530	1641229	1678847	1681711
2.1.1.1 Central Government	101	101	100	100	101	101	100
2.1.1.2 Market Stabilisation Scheme							
2.1.1.3 State Governments	42	42	42	42	42	42	42
2.1.1.4 Scheduled Commercial Banks	683437	645726	740234	706380	704063	810295	761736
2.1.1.5 Scheduled State Co-operative Banks	7123	7191	7650	7696	7488	8551	8095
2.1.1.6 Non-Scheduled State Co-operative Banks	4121	3717	4156	4143	4350	4470	4559
2.1.1.7 Other Banks	37589	36088	38403	38352	39577	40184	42927
2.1.1.8 Others	988819	924064	804385	834281	823535	756616	808897
2.1.1.9 Financial Institutions Outside India	73343	1225	59862	64536	62072	58588	55353
2.1.2 Other Liabilities	1359254	1300816	1237355	1221936	1246750	1254243	1282215
2.1/2.2 Total Liabilities or Assets	**3153828**	**2918971**	**2892188**	**2877466**	**2887979**	**2933090**	**2963926**
2.2 Assets							
2.2.1 Notes and Coins	15	15	13	12	9	12	14
2.2.2 Balances held Abroad	1243853	1218300	1040173	1029074	1036549	1091989	1125024
2.2.3 Loans and Advances							
2.2.3.1 Central Government	–	–	–	–	–	–	–
2.2.3.2 State Governments	670	6473	4380	20746	13873	8504	10723
2.2.3.3 Scheduled Commercial Banks	94299	90093	94306	94332	94515	95276	94368
2.2.3.4 Scheduled State Co-op.Banks	–	–	–	–	–	–	–
2.2.3.5 Industrial Dev. Bank of India	–	–	–	–	–	–	–
2.2.3.6 NABARD	24927	1679	23010	23084	23084	23084	23084
2.2.3.7 EXIM Bank	–	–	–	–	–	–	–
2.2.3.8 Others	8077	–	6498	5711	13211	13211	13211
2.2.3.9 Financial Institutions Outside India	72741	1225	59307	63848	61868	58383	55138
2.2.4 Bills Purchased and Discounted							
2.2.4.1 Internal	–	–	–	–	–	–	–
2.2.4.2 Government Treasury Bills	–	–	–	–	–	–	–
2.2.5 Investments	1491042	1438893	1464756	1439007	1446757	1442522	1441442
2.2.6 Other Assets	218203	162293	199745	201653	198113	200110	200923
2.2.6.1 Gold	201354	160164	194425	196392	192489	194361	194717

* Data are provisional

No. 3: Liquidity Operations by RBI

(₹ Crore)

Date	Liquidity Adjustment Facility						Standing Liquidity Facilities	OMO (Outright)		Net Injection (+)/ Absorption (-) (1+3+5+7+9-2-4-6-8)
	Repo	Reverse Repo	Variable Rate Repo	Variable Rate Reverse Repo	MSF	SDF		Sale	Purchase	
	1	2	3	4	5	6	7	8	9	10
Apr. 1, 2022	-	81513	-	-	568	-	–	-	-	-80945
Apr. 2, 2022	-	107527	-	-	1258	-	–	-	-	-106269
Apr. 3, 2022	-	5388	-	-	111	-	–	-	-	-5277
Apr. 4, 2022	-	657311	-	-	7	-	–	-	-	-657304
Apr. 5, 2022	-	149133	-	499580	1	-	–	-	-	-648712
Apr. 6, 2022	-	138548	-	-	52	-	–	-	-	-138496
Apr. 7, 2022	-	119389	-	-	2748	-	–	-	-	-116641
Apr. 8, 2022	-	0	-	539647	33	234996	-2800	-	-	-777410
Apr. 9, 2022	-	0	-	-	542	10967	–	-	-	-10425
Apr. 10, 2022	-	0	-	-	80	8041	–	-	-	-7961
Apr. 11, 2022	-	0	-	-	292	235650	–	-	-	-235358
Apr. 12, 2022	-	0	-	-	70	243159	–	-	-	-243089
Apr. 13, 2022	-	0	-	-	113	210299	–	-	-	-210186
Apr. 14, 2022	-	0	-	-	1445	12790	–	-	-	-11345
Apr. 15, 2022	-	0	-	-	2832	5660	–	-	-	-2828
Apr. 16, 2022	-	0	-	-	706	37909	–	-	-	-37203
Apr. 17, 2022	-	0	-	-	2	6253	–	-	-	-6251
Apr. 18, 2022	-	0	-	-	284	234424	–	-	-	-234140
Apr. 19, 2022	-	0	-	50010	177	216659	-3000	-	-	-269492
Apr. 20, 2022	-	0	-	-	735	186363	–	-	-	-185628
Apr. 21, 2022	-	0	-	-	152	118136	–	-	-	-117984
Apr. 22, 2022	-	0	-	451901	140	166762	–	-	-	-618523
Apr. 23, 2022	-	0	-	-	38	16556	–	-	-	-16518
Apr. 24, 2022	-	0	-	-	28	3907	–	-	-	-3879
Apr. 25, 2022	-	0	-	-	155	136450	–	-	-	-136295
Apr. 26, 2022	-	0	-	-	248	141119	–	-	-	-140871
Apr. 27, 2022	-	0	-	-	4	133241	–	415	-	-133652
Apr. 28, 2022	-	0	-	-	22	91837	–	130	-	-91945
Apr. 29, 2022	-	0	-	-	58	110806	-2200	325	-	-113273
Apr. 30, 2022	-	0	-	-	1643	42694	–	-	-	-41051

SDF: Standing Deposit Facility; MSF: Marginal Standing Facility.

No. 4: Sale/ Purchase of U.S. Dollar by the RBI

i) Operations in onshore / offshore OTC segment

Item	2021-22	2021	2022	
		Apr.	Mar.	Apr.
	1	2	3	4
1 Net Purchase/ Sale of Foreign Currency (US $ Million) (1.1–1.2)	17312	4212	-20101	1965
1.1 Purchase (+)	113991	8182	4315	11965
1.2 Sale (–)	96679	3970	24416	10000
2 ₹ equivalent at contract rate (₹ Crores)	134629	31779	-153010	14061
3 Cumulative (over end-March) (US $ Million)	17312	4212	17312	1965
(₹ Crores)	134629	31779	134629	14061
4 Outstanding Net Forward Sales (–)/ Purchase (+) at the end of month (US $ Million)	65791	64944	65791	63826

ii) Operations in currency futures segment

Item	2021-22	2021	2022	
		Apr.	Mar.	Apr.
	1	2	3	4
1 Net Purchase/ Sale of Foreign Currency (US $ Million) (1.1–1.2)	0	0	0	0
1.1 Purchase (+)	2370	690	570	0
1.2 Sale (–)	2370	690	570	0
2 Outstanding Net Currency Futures Sales (–)/ Purchase (+) at the end of month (US $ Million)	0	0	0	0

No. 4 A : Maturity Breakdown (by Residual Maturity) of Outstanding Forwards of RBI (US $ Million)

Item	As on April 30, 2022		
	Long (+)	Short (-)	Net (1-2)
	1	2	3
1. Upto 1 month	7010	0	7010
2. More than 1 month and upto 3 months	12931	0	12931
3. More than 3 months and upto 1 year	33750	0	33750
4. More than 1 year	10135	0	10135
Total (1+2+3+4)	**63826**	**0**	**63826**

No. 5: RBI's Standing Facilities

(₹ Crore)

Item	As on the Last Reporting Friday							
	2021-22	2021		2022				
		May 21	Dec. 31	Jan. 28	Feb. 25	Mar. 25	Apr. 22	May 20
	1	2	3	4	5	6	7	8
1 MSF	11	494	8176	38	1858	11	140	1009
3.1 Limit	4900	4900	4900	4900	4900	4900	4900	4900
3.2 Outstanding	–	0	0	734	0	0	0	0
4.1 Limit	76000	60000	76000	76000	76000	76000	76000	76000
4.2 Outstanding	32401	1662	24401	24401	24401	32401	31021	35521
5 Total Outstanding (1+2.2+3.2+4.2)	32412	2156	32577	25173	26259	32412	31161	36530

Note :1.Special refinance facility to Others, i.e. to the EXIM Bank, is reopened since May 22, 2020
2.Refinance facility to Others, i.e. to the NABARD/SIDBI/NHB U/S 17(4H) of RBI ACT,1934, since, April 17, 2020.

Money and Banking

No. 6: Money Stock Measures

(₹ Crore)

Item	Outstanding as on March 25/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		Apr. 23	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
1 Currency with the Public (1.1 + 1.2 + 1.3 – 1.4)	3037622	2802804	3037622	2967201	3093159
1.1 Notes in Circulation	3107637	2880247	3107637	3148104	3181381
1.2 Circulation of Rupee Coin	27270	26170	27270	27270	27270
1.3 Circulation of Small Coins	743	743	743	743	743
1.4 Cash on Hand with Banks	98028	104355	98028	208916	116235
2 Deposit Money of the Public	2265371	1908059	2265371	2226398	2193024
2.1 Demand Deposits with Banks	2212992	1862550	2212992	2168599	2135456
2.2 'Other' Deposits with Reserve Bank	52379	45509	52379	57800	57568
3 M_1 (1 + 2)	**5302993**	**4710863**	**5302993**	**5193600**	**5286184**
4 Post Office Saving Bank Deposits	170853	170853	170853	170853	170853
5 M_2 (3 + 4)	**5473846**	**4881716**	**5473846**	**5364453**	**5457037**
6 Time Deposits with Banks	15186605	14208174	15186605	15512626	15425879
7 M_3 (3 + 6)	**20489597**	**18919037**	**20489597**	**20706225**	**20712063**
8 Total Post Office Deposits	510435	510435	510435	510435	510435
9 M_4 (7 + 8)	**21000032**	**19429472**	**21000032**	**21216660**	**21222498**

No. 7: Sources of Money Stock (M_3)

(₹ Crore)

Sources	Outstanding as on March 25/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		Apr. 23	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
1 Net Bank Credit to Government	**6204211**	**5911684**	**6204211**	**6515591**	**6411599**
1.1 RBI's net credit to Government (1.1.1–1.1.2)	1177178	1144052	1177178	1461763	1343761
1.1.1 Claims on Government	1490166	1381547	1490166	1474544	1466235
1.1.1.1 Central Government	1489496	1379184	1489496	1470360	1463536
1.1.1.2 State Governments	670	2363	670	4184	2698
1.1.2 Government deposits with RBI	312988	237496	312988	12781	122473
1.1.2.1 Central Government	312946	237453	312946	12738	122431
1.1.2.2 State Governments	42	42	42	42	43
1.2 Other Banks' Credit to Government	5027033	4767633	5027033	5053828	5067838
2 Bank Credit to Commercial Sector	**12610042**	**11582039**	**12610042**	**12697114**	**12683203**
2.1 RBI's credit to commercial sector	10092	8672	10092	13766	10881
2.2 Other banks' credit to commercial sector	12599950	11573368	12599950	12683348	12672322
2.2.1 Bank credit by commercial banks	11891314	10860485	11891314	11965873	11956344
2.2.2 Bank credit by co-operative banks	690201	695336	690201	700034	698969
2.2.3 Investments by commercial and co-operative banks in other securities	18435	17547	18435	17441	17009
3 Net Foreign Exchange Assets of Banking Sector (3.1 + 3.2)	**4850355**	**4740835**	**4850355**	**4727535**	**4735562**
3.1 RBI's net foreign exchange assets (3.1.1–3.1.2)	4551499	4361389	4551499	4428679	4436706
3.1.1 Gross foreign assets	4551740	4361626	4551740	4428920	4436947
3.1.2 Foreign liabilities	241	237	241	241	241
3.2 Other banks' net foreign exchange assets	298856	379446	298856	298856	298856
4 Government's Currency Liabilities to the Public	**28013**	**26913**	**28013**	**28013**	**28013**
5 Banking Sector's Net Non-monetary Liabilities	**3203024**	**3342435**	**3203024**	**3262027**	**3146314**
5.1 Net non-monetary liabilities of RBI	1346960	1514082	1346960	1268960	1265658
5.2 Net non-monetary liabilities of other banks (residual)	1856064	1828352	1856064	1993067	1880656
M_3 (1+2+3+4–5)	**20489597**	**18919037**	**20489597**	**20706225**	**20712063**

No. 8: Monetary Survey

(₹ Crore)

Item	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		Apr. 23	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
Monetary Aggregates					
NM_1 (1.1 + 1.2.1+1.3)	5307127	4710863	5302993	5193600	5286184
NM_2 (NM_1 + 1.2.2.1)	12081052	11035286	12076918	12113593	12168200
NM_3 (NM_2 + 1.2.2.2 + 1.4 = 2.1 + 2.2 + 2.3 – 2.4 – 2.5)	20634888	19001607	20630754	20851066	20859368
1 Components					
1.1 Currency with the Public	3035689	2802804	3037622	2967201	3093159
1.2 Aggregate Deposits of Residents	17266162	15916824	17266159	17546361	17428827
1.2.1 Demand Deposits	2212994	1862550	2212992	2168599	2135456
1.2.2 Time Deposits of Residents	15053167	14054274	15053167	15377763	15293371
1.2.2.1 Short-term Time Deposits	6773925	6324423	6773925	6919993	6882017
1.2.2.1.1 Certificates of Deposit (CDs)	176718	86436	176718	196285	206988
1.2.2.2 Long-term Time Deposits	8279242	7729851	8279242	8457769	8411354
1.3 'Other' Deposits with RBI	58444	45509	52379	57800	57568
1.4 Call/Term Funding from Financial Institutions	274594	236470	274594	279704	279813
2 Sources					
2.1 Domestic Credit	20080613	18481277	19802634	20194284	20093050
2.1.1 Net Bank Credit to the Government	6477629	5911685	6204211	6515591	6411599
2.1.1.1 Net RBI credit to the Government	1450596	1144052	1177178	1461763	1343761
2.1.1.2 Credit to the Government by the Banking System	5027033	4767633	5027033	5053828	5067838
2.1.2 Bank Credit to the Commercial Sector	13602984	12569593	13598423	13678694	13681451
2.1.2.1 RBI Credit to the Commercial Sector	39581	30097	35020	36776	33657
2.1.2.2 Credit to the Commercial Sector by the Banking System	13563403	12539495	13563403	13641918	13647793
2.1.2.2.1 Other Investments (Non-SLR Securities)	952195	956266	952195	947798	959581
2.2 Government's Currency Liabilities to the Public	28013	26913	28013	28013	28013
2.3 Net Foreign Exchange Assets of the Banking Sector	4705192	4690547	4814212	4777246	4748952
2.3.1 Net Foreign Exchange Assets of the RBI	4442479	4361389	4551499	4428679	4436706
2.3.2 Net Foreign Currency Assets of the Banking System	262713	329158	262713	348567	312246
2.4 Capital Account	3111575	2937753	3111573	3005628	3069509
2.5 Other items (net)	1067355	1259377	902533	1142850	941138

No. 9: Liquidity Aggregates

(₹ Crore)

Aggregates	2021-22	2021	2022		
		Apr.	Feb.	Mar.	Apr.
	1	2	3	4	5
1 NM_3	**20630754**	**19001607**	**20326078**	**20630754**	**20859368**
2 Postal Deposits	509544	510435	509544	509544	509544
3 L_1 (1 + 2)	**21140298**	**19512042**	**20835622**	**21140298**	**21368912**
4 Liabilities of Financial Institutions	49578	28937	44627	49578	41050
4.1 Term Money Borrowings	1824	3563	2082	1824	1758
4.2 Certificates of Deposit	39170	20275	34185	39170	39170
4.3 Term Deposits	8584	5099	8360	8584	122
5 L_2 (3 + 4)	**21189876**	**19540979**	**20880249**	**21189876**	**21409961**
6 Public Deposits with Non-Banking Financial Companies	31905	..	..	31905	..
7 L_3 (5 + 6)	**21221781**	..	..	**21221781**	..

Note : 1. Figures in the columns might not add up to the total due to rounding off of numbers.

No. 10: Reserve Bank of India Survey

(₹ Crore)

Item	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		Apr. 23	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
1 Components					
1.1 Currency in Circulation	3133716	2907160	3135649	3176117	3209394
1.2 Bankers' Deposits with the RBI	876726	595372	732270	724802	735349
1.2.1 Scheduled Commercial Banks	823632	552893	683437	673528	684949
1.3 'Other' Deposits with the RBI	58444	45509	52379	57800	57568
Reserve Money (1.1 + 1.2 + 1.3 = 2.1 + 2.2 + 2.3 – 2.4 – 2.5)	4068887	3548040	3920298	3958719	4002311
2 Sources					
2.1 RBI's Domestic Credit	906895	673821	687746	770987	803251
2.1.1 Net RBI credit to the Government	1450596	1144052	1177178	1461763	1343761
2.1.1.1 Net RBI credit to the Central Government (2.1.1.1.1 + 2.1.1.1.2 + 2.1.1.1.3 + 2.1.1.1.4 – 2.1.1.1.5)	1448972	1141731	1176550	1457622	1341106
2.1.1.1.1 Loans and Advances to the Central Government	–	–	–	–	–
2.1.1.1.2 Investments in Treasury Bills	–	–	–	–	–
2.1.1.1.3 Investments in dated Government Securities	1488816	1378479	1488978	1469881	1463104
2.1.1.1.3.1 Central Government Securities	1488816	1378479	1488978	1469881	1463104
2.1.1.1.4 Rupee Coins	508	705	518	479	432
2.1.1.1.5 Deposits of the Central Government	40352	237453	312946	12738	122431
2.1.1.2 Net RBI credit to State Governments	1624	2321	628	4141	2656
2.1.2 RBI's Claims on Banks	-583282	-500328	-524452	-727552	-574168
2.1.2.1 Loans and Advances to Scheduled Commercial Banks	-560272	-478902	-499524	-704542	-551158
2.1.3 RBI's Credit to Commercial Sector	39581	30097	35020	36776	33657
2.1.3.1 Loans and Advances to Primary Dealers	–	–	–	–	–
2.1.3.2 Loans and Advances to NABARD	23010	21426	24927	23010	23010
2.2 Government's Currency Liabilities to the Public	28013	26913	28013	28013	28013
2.3 Net Foreign Exchange Assets of the RBI	4442479	4361389	4551499	4428679	4436706
2.3.1 Gold	322213	269822	329562	322692	327120
2.3.2 Foreign Currency Assets	4120283	4091584	4221955	4106005	4109603
2.4 Capital Account	1344371	1307634	1344369	1226131	1244927
2.5 Other Items (net)	-35870	206448	2592	42830	20731

No. 11: Reserve Money - Components and Sources

(₹ Crore)

Item	2021-22	Outstanding as on March 31/ last Fridays of the month/ Fridays					
		2021	2022				
		Apr. 30	Apr. 1	Apr. 8	Apr. 15	Apr. 22	Apr. 29
	1	2	3	4	5	6	7
Reserve Money (1.1 + 1.2 + 1.3 = 2.1 + 2.2 + 2.3 + 2.4 + 2.5 – 2.6)	4068887	3585500	3997142	3958719	4016766	4002311	4059241
1 Components							
1.1 Currency in Circulation	3133716	2914857	3133716	3176117	3200828	3209394	3210481
1.2 Bankers' Deposits with RBI	876726	621624	802720	724802	756737	735349	790444
1.3 'Other' Deposits with RBI	58444	49019	60706	57800	59201	57568	58316
2 Sources							
2.1 Net Reserve Bank Credit to Government	1450596	1187599	1459699	1461763	1499598	1343761	1338817
2.2 Reserve Bank Credit to Banks	-560272	-512012	-641217	-704542	-693938	-551158	-495401
2.3 Reserve Bank Credit to Commercial Sector	16571	8686	16571	13766	13766	10647	8562
2.4 Net Foreign Exchange Assets of RBI	4442479	4335869	4436307	4428679	4443024	4436706	4415731
2.5 Government's Currency Liabilities to the Public	28013	26973	28013	28013	28013	28013	28160
2.6 Net Non- Monetary Liabilities of RBI	1308500	1461615	1302230	1268960	1273698	1265658	1236627

No. 12: Commercial Bank Survey

(₹ Crore)

Item	Outstanding as on last reporting Fridays of the month/ reporting Fridays of the month				
	2021-22	2021	2022		
		Apr. 23	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
1 Components					
1.1 Aggregate Deposits of Residents	16331876	14980407	16331876	16606412	16490982
1.1.1 Demand Deposits	2072747	1727332	2072747	2027259	1994770
1.1.2 Time Deposits of Residents	14259129	13253075	14259129	14579153	14496212
1.1.2.1 Short-term Time Deposits	6416608	5963884	6416608	6560619	6523296
1.1.2.1.1 Certificates of Deposits (CDs)	176718	86436	176718	196285	206988
1.1.2.2 Long-term Time Deposits	7842521	7289191	7842521	8018534	7972917
1.2 Call/Term Funding from Financial Institutions	274594	236470	274594	279704	279813
2 Sources					
2.1 Domestic Credit	17575016	16296726	17575016	17672370	17694881
2.1.1 Credit to the Government	4728179	4477633	4728179	4755788	4770863
2.1.2 Credit to the Commercial Sector	12846837	11819094	12846837	12916582	12924018
2.1.2.1 Bank Credit	11891314	10860485	11891314	11965873	11956344
2.1.2.1.1 Non-food Credit	11836304	10802150	11836304	11926038	11913792
2.1.2.2 Net Credit to Primary Dealers	11522	10125	11522	11035	16153
2.1.2.3 Investments in Other Approved Securities	769	1180	769	838	902
2.1.2.4 Other Investments (in non-SLR Securities)	943233	947304	943233	938836	950619
2.2 Net Foreign Currency Assets of Commercial Banks (2.2.1–2.2.2–2.2.3)	262713	329158	262713	348567	312246
2.2.1 Foreign Currency Assets	465464	534987	465464	555789	518674
2.2.2 Non-resident Foreign Currency Repatriable Fixed Deposits	133437	153900	133437	134863	132509
2.2.3 Overseas Foreign Currency Borrowings	69314	51930	69314	72359	73919
2.3 Net Bank Reserves (2.3.1+2.3.2–2.3.3)	1268887	1124923	1268887	1574659	1339631
2.3.1 Balances with the RBI	683437	552893	683437	673528	684949
2.3.2 Cash in Hand	85926	93128	85926	196589	103524
2.3.3 Loans and Advances from the RBI	-499524	-478902	-499524	-704542	-551158
2.4 Capital Account	1743033	1605948	1743033	1755327	1800411
2.5 Other items (net) (2.1+2.2+2.3–2.4–1.1–1.2)	757113	927982	757113	954154	775552
2.5.1 Other Demand and Time Liabilities (net of 2.2.3)	571534	505285	571534	547409	536209
2.5.2 Net Inter-Bank Liabilities (other than to PDs)	26533	64614	26533	25689	33786

No. 13: Scheduled Commercial Banks' Investments

(₹ Crore)

Item	As on March 25, 2022	2021	2022		
		Apr. 23	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
1 SLR Securities	4728948	4478813	4728948	4756627	4771765
2 Commercial Paper	55315	78327	55315	53797	52448
3 Shares issued by					
3.1 PSUs	7642	9753	7642	7948	8061
3.2 Private Corporate Sector	73814	65026	73814	74100	73651
3.3 Others	5152	5145	5152	5113	5074
4 Bonds/Debentures issued by					
4.1 PSUs	117860	121112	117860	116214	116594
4.2 Private Corporate Sector	326188	313812	326188	323990	322078
4.3 Others	148753	155531	148753	144054	145829
5 Instruments issued by					
5.1 Mutual funds	34404	33633	34404	40497	53485
5.2 Financial institutions	174090	165317	174090	173123	173399

Note: Data against column Nos. (1), (2) & (3) are Final and for column Nos. (4) & (5) data are Provisional.

No. 14: Business in India - All Scheduled Banks and All Scheduled Commercial Banks

(₹ Crore)

Item	As on the Last Reporting Friday (in case of March)/ Last Friday							
	All Scheduled Banks				All Scheduled Commercial Banks			
	2021-22	2021	2022		2021-22	2021	2022	
		Apr.	Mar.	Apr.		Apr.	Mar.	Apr.
	1	2	3	4	5	6	7	8
Number of Reporting Banks	212	209	212	212	136	133	136	136
1 Liabilities to the Banking System	**262674**	**267690**	**262674**	**286523**	**258649**	**262752**	**258649**	**282404**
1.1 Demand and Time Deposits from Banks	194143	186221	194143	209838	190570	181561	190570	206168
1.2 Borrowings from Banks	38369	61927	38369	43696	38317	61920	38317	43687
1.3 Other Demand and Time Liabilities	30162	19541	30162	32988	29762	19270	29762	32549
2 Liabilities to Others	**17832517**	**16521821**	**17832517**	**18175461**	**17380755**	**16076926**	**17380755**	**17722219**
2.1 Aggregate Deposits	16899634	15687888	16899634	17217122	16465313	15260104	16465313	16781822
2.1.1 Demand	2117513	1797670	2117513	2159439	2072747	1758653	2072747	2114456
2.1.2 Time	14782121	13890219	14782121	15057683	14392567	13501450	14392567	14667366
2.2 Borrowings	278985	243047	278985	291194	274594	238212	274594	286127
2.3 Other Demand and Time Liabilities	653898	590886	653898	667146	640848	578611	640848	654271
3 Borrowings from Reserve Bank	**94299**	**89934**	**94299**	**94306**	**94299**	**89934**	**94299**	**94306**
3.1 Against Usance Bills /Promissory Notes	–	–	–	–	–	–	–	–
3.2 Others	94299	89934	94299	94306	94299	89934	94299	94306
4 Cash in Hand and Balances with Reserve Bank	788725	690109	788725	858781	769363	672600	769363	838556
4.1 Cash in Hand	88732	95303	88732	100931	85926	93256	85926	98322
4.2 Balances with Reserve Bank	699993	594806	699993	757851	683437	579344	683437	740234
5 Assets with the Banking System	**315282**	**273253**	**315282**	**342661**	**243637**	**211287**	**243637**	**276977**
5.1 Balances with Other Banks	199434	198638	199434	220581	164240	163203	164240	186407
5.1.1 In Current Account	19733	38440	19733	21301	16691	36075	16691	18727
5.1.2 In Other Accounts	179701	160198	179701	199280	147549	127128	147549	167680
5.2 Money at Call and Short Notice	36905	29323	36905	41052	6982	8100	6982	15308
5.3 Advances to Banks	39340	17378	39340	35697	35802	14912	35802	33241
5.4 Other Assets	39603	27914	39603	45332	36613	25072	36613	42021
6 Investment	**4874070**	**4664020**	**4874070**	**4983763**	**4728948**	**4528292**	**4728948**	**4841099**
6.1 Government Securities	4867102	4656702	4867102	4977408	4728179	4527038	4728179	4840121
6.2 Other Approved Securities	6968	7317	6968	6356	769	1253	769	979
7 Bank Credit	**12259048**	**11261321**	**12259048**	**12376048**	**11891314**	**10913725**	**11891314**	**12004113**
7a Food Credit	90827	115320	90827	98423	55011	79502	55011	52702
7.1 Loans, Cash-credits and Overdrafts	12016486	11053058	12016486	12134896	11651337	10707739	11651337	11765504
7.2 Inland Bills-Purchased	36070	29877	36070	34771	36055	29860	36055	34756
7.3 Inland Bills-Discounted	155796	125919	155796	154044	154212	124517	154212	152374
7.4 Foreign Bills-Purchased	19537	19416	19537	21013	19157	19133	19157	20718
7.5 Foreign Bills-Discounted	31160	33051	31160	31324	30554	32476	30554	30761

Note: Data in column Nos. (4) & (8) are Provisional.

No. 15: Deployment of Gross Bank Credit by Major Sectors

(₹ Crore)

Sector	Outstanding as on				Growth (%)	
	Mar.25, 2022	2021	2022		Financial year so far	Y-o-Y
		Apr.23	Mar.25	Apr.22	2022-23	2022
	1	2	3	4	%	%
I. Gross Bank Credit (II+III)	**11890638**	**10756517**	**11890638**	**11954640**	**0.5**	**11.1**
II. Food Credit	**55011**	**58335**	**55011**	**42552**	**-22.6**	**-27.1**
III. Non-food Credit	**11835628**	**10698182**	**11835628**	**11912088**	**0.6**	**11.3**
1. Agriculture & Allied Activities	**1461350**	**1336773**	**1461350**	**1478559**	**1.2**	**10.6**
2. Industry (Micro and Small, Medium and Large)	**3152449**	**2917372**	**3152449**	**3152414**	**0.0**	**8.1**
2.1 Micro and Small [1]	532081	422612	532081	545070	2.4	29.0
2.2 Medium	213996	142134	213996	218112	1.9	53.5
2.3 Large	2406372	2352625	2406372	2389232	-0.7	1.6
3. Services	**3017116**	**2717808**	**3017116**	**3018767**	**0.1**	**11.1**
3.1 Transport Operators	155353	144026	155353	152498	-1.8	5.9
3.2 Computer Software	20899	20158	20899	20249	-3.1	0.4
3.3 Tourism, Hotels & Restaurants	64369	59878	64369	64941	0.9	8.5
3.4 Shipping	8437	5795	8437	7917	-6.2	36.6
3.5 Aviation	23979	28251	23979	23067	-3.8	-18.3
3.6 Professional Services	116743	109270	116743	117355	0.5	7.4
3.7 Trade	696349	623756	696349	707317	1.6	13.4
3.7.1 Wholesale Trade	351228	324485	351228	374605	6.7	15.4
3.7.2 Retail Trade	345121	299271	345121	332712	-3.6	11.2
3.8 Commercial Real Estate	291168	291713	291168	296145	1.7	1.5
3.9 Non-Banking Financial Companies (NBFCs)[2] *of which,*	1078447	929877	1078447	1091216	1.2	17.4
3.9.1 Housing Finance Companies (HFCs)	278979	273161	278979	288085	3.3	5.5
3.9.2 Public Financial Institutions (PFIs)	144121	80322	144121	142802	-0.9	77.8
3.10 Other Services [3]	561373	505083	561373	538062	-4.2	6.5
4. Personal Loans	**3385827**	**3002385**	**3385827**	**3442993**	**1.7**	**14.7**
4.1 Consumer Durables	27613	17521	27613	28896	4.6	64.9
4.2 Housing	1684424	1500094	1684424	1706286	1.3	13.7
4.3 Advances against Fixed Deposits	78734	71234	78734	79768	1.3	12.0
4.4 Advances to Individuals against share & bonds	6261	5335	6261	6112	-2.4	14.6
4.5 Credit Card Outstanding	147782	128052	147782	153681	4.0	20.0
4.6 Education	82723	77783	82723	82600	-0.1	6.2
4.7 Vehicle Loans	402667	371006	402667	413536	2.7	11.5
4.8 Loan against gold jewellery	75311	76536	75311	74281	-1.4	-2.9
4.9 Other Personal Loans	880314	754825	880314	897834	2.0	18.9
5. Priority Sector *(Memo)*						
5.1 Agriculture & Allied Activities [4]	1485438	1332875	1485438	1529136	2.9	14.7
5.2 Micro & Small Enterprises [5]	1377138	1177524	1377138	1408936	2.3	19.7
5.3 Medium Enterprises [6]	351900	215045	351900	354749	0.8	65.0
5.4 Housing	614487	583421	614487	610187	-0.7	4.6
5.5 Education Loans	58118	58593	58118	57760	-0.6	-1.4
5.6 Renewable Energy	3842	1853	3842	3552	-7.5	91.7
5.7 Social Infrastructure	2483	2937	2483	2513	1.2	-14.4
5.8 Export Credit	23385	25051	23385	21144	-9.6	-15.6
5.9 Others	37159	16268	37159	43698	17.6	168.6
5.10 Weaker Sections including net PSLC- SF/MF	1180928	1003564	1180928	1212594	2.7	20.8

Note 1: Data are provisional. Gross bank credit and non-food credit data are based on Section-42 return, which covers all scheduled commercial banks (SCBs), while sectoral non-food credit data are based on sector-wise and industry-wise bank credit (SIBC) return, which covers select banks accounting for about 93 per cent of total non-food credit extended by all SCBs.
Note 2: With effect from January 2021, sectoral credit data are based on revised format due to which values and growth rates of some of the existing components published earlier have undergone some changes.
Note 3: Bank credit growth are adjusted for past reporting errors by select SCBs.

1 Micro & Small includes credit to micro & small industries in the manufacturing sector.

2 NBFCs include HFCs, PFIs, Microfinance Institutions (MFIs), NBFCs engaged in gold loan and others.

3 Other Services include Mutual Fund (MFs), Banking and Finance other than NBFCs and MFs and other services which are not indicated elsewhere under services.

4 Agriculture and Allied Activities also include priority sector lending certificates (PSLCs).

5 Micro and Small Enterprises include credit to micro and small enterprises in manufacturing and services sector and also include PSLCs.

6 Medium Enterprises include credit to medium enterprises in the manufacturing and services sector.

No. 16: Industry-wise Deployment of Gross Bank Credit

(₹ Crore)

Industry	Outstanding as on				Growth (%)	
	Mar. 25, 2022	2021	2022		Financial year so far	Y-o-Y
		Apr. 23	Mar.25	Apr. 22	2022-23	2022
	1	2	3	4	%	%
2 Industries (2.1 to 2.19)	3152449	2917372	3152449	3152414	–0.0	8.1
2.1 Mining & Quarrying (incl. Coal)	49038	42906	49038	47466	–3.2	10.6
2.2 Food Processing	173243	157909	173243	175433	1.3	11.1
2.2.1 Sugar	26307	26000	26307	26528	0.8	2.0
2.2.2 Edible Oils & Vanaspati	18246	17622	18246	17463	–4.3	–0.9
2.2.3 Tea	5728	5117	5728	5948	3.8	16.2
2.2.4 Others	122962	109170	122962	125494	2.1	15.0
2.3 Beverage & Tobacco	18176	17340	18176	18020	–0.9	3.9
2.4 Textiles	223508	207906	223508	222928	–0.3	7.2
2.4.1 Cotton Textiles	90189	85220	90189	89202	–1.1	4.7
2.4.2 Jute Textiles	3509	2678	3509	3526	0.5	31.6
2.4.3 Man-Made Textiles	38354	35182	38354	38290	–0.2	8.8
2.4.4 Other Textiles	91456	84825	91456	91910	0.5	8.4
2.5 Leather & Leather Products	11481	10684	11481	11323	–1.4	6.0
2.6 Wood & Wood Products	16248	15165	16248	16293	0.3	7.4
2.7 Paper & Paper Products	40073	37265	40073	40221	0.4	7.9
2.8 Petroleum, Coal Products & Nuclear Fuels	107242	82765	107242	103596	–3.4	25.2
2.9 Chemicals & Chemical Products	196179	185340	196179	204316	4.1	10.2
2.9.1 Fertiliser	33160	33618	33160	34562	4.2	2.8
2.9.2 Drugs & Pharmaceuticals	61093	54878	61093	63353	3.7	15.4
2.9.3 Petro Chemicals	19622	26342	19622	21215	8.1	–19.5
2.9.4 Others	82303	70502	82303	85185	3.5	20.8
2.10 Rubber, Plastic & their Products	71915	56866	71915	71616	–0.4	25.9
2.11 Glass & Glassware	5948	6037	5948	5813	–2.3	–3.7
2.12 Cement & Cement Products	47912	53509	47912	46781	–2.4	–12.6
2.13 Basic Metal & Metal Product	288395	300872	288395	287221	–0.4	–4.5
2.13.1 Iron & Steel	187443	207827	187443	184990	–1.3	–11.0
2.13.2 Other Metal & Metal Product	100952	93045	100952	102231	1.3	9.9
2.14 All Engineering	167680	152272	167680	166455	–0.7	9.3
2.14.1 Electronics	38180	34626	38180	38771	1.6	12.0
2.14.2 Others	129500	117646	129500	127683	–1.4	8.5
2.15 Vehicles, Vehicle Parts & Transport Equipment	89688	84540	89688	90076	0.4	6.5
2.16 Gems & Jewellery	80411	69611	80411	77804	–3.2	11.8
2.17 Construction	117625	120544	117625	112462	–4.4	–6.7
2.18 Infrastructure	1193965	1091902	1193965	1202839	0.7	10.2
2.18.1 Power	610815	568302	610815	612805	0.3	7.8
2.18.2 Telecommunications	130349	114367	130349	130730	0.3	14.3
2.18.3 Roads	269896	231253	269896	273756	1.4	18.4
2.18.4 Airports	6646	9887	6646	8493	27.8	–14.1
2.18.5 Ports	8886	10271	8886	9112	2.5	–11.3
2.18.6 Railways	10512	12536	10512	11483	9.2	–8.4
2.18.7 Other Infrastructure	156861	145286	156861	156461	–0.3	7.7
2.19 Other Industries	253724	223939	253724	251752	–0.8	12.4

Note : With effect from January 2021, sectoral credit data are based on revised format due to which values and growth rates of some of the existing components published earlier have undergone some changes.

No. 17: State Co-operative Banks Maintaining Accounts with the Reserve Bank of India

(₹ Crore)

Item	Last Reporting Friday (in case of March)/Last Friday/ Reporting Friday								
	2020-21	2021		2022					
		Mar, 26	Dec, 31	Jan, 14	Jan, 28	Feb, 11	Feb, 25	Mar, 11	Mar, 25
	1	2	3	4	5	6	7	8	9
Number of Reporting Banks	32	32	33	33	33	33	33	33	33
1 Aggregate Deposits (2.1.1.2+2.2.1.2)	**125859.6**	**125859.6**	**125717.1**	**127755.5**	**127431.3**	**126324.0**	**126531.5**	**126249.0**	**128858.8**
2 Demand and Time Liabilities									
2.1 Demand Liabilities	**23736.9**	**23736.9**	**25194.1**	**24360.8**	**24041.4**	**26573.3**	**24733.8**	**24009.6**	**25679.4**
2.1.1 Deposits									
2.1.1.1 Inter-Bank	4896.9	4896.9	4992.8	5599.7	5534.4	5468.9	5237.4	5305.3	5902.5
2.1.1.2 Others	13,899.4	13899.4	13529.3	13388.7	13490.3	13829.4	13918.4	13572.3	14022.3
2.1.2 Borrowings from Banks	0.0	0.0	30.0	0.0	0.0	294.9	499.9	0.0	0.0
2.1.3 Other Demand Liabilities	4940.6	4940.6	6642.1	5372.5	5016.7	6980.0	5078.1	5132.1	5754.5
2.2 Time Liabilities	**179957.5**	**179957.5**	**175645.6**	**177700.6**	**178141.3**	**176359.3**	**177613.0**	**178862.0**	**189169.3**
2.2.1 Deposits									
2.2.1.1 Inter-Bank	65333.7	65333.7	60369.4	60244.0	61099.8	60724.4	61880.2	63021.6	71236.3
2.2.1.2 Others	111960.2	111960.2	112187.8	114366.9	113941.1	112494.5	112613.1	112676.7	114836.5
2.2.2 Borrowings from Banks	630.0	630.0	879.7	877.6	876.9	876.8	859.4	874.8	853.7
2.2.3 Other Time Liabilities	2033.7	2033.7	2208.6	2212.1	2223.6	2263.6	2260.3	2288.9	2242.7
3 Borrowing from Reserve Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Borrowings from a notified bank / Government	63559.8	63559.8	65323.6	64801.9	64328.2	65375.2	64466.5	64019.3	66978.0
4.1 Demand	15691.8	15691.8	12617.5	12576.2	12684.0	13311.1	12992.3	13989.3	15765.8
4.2 Time	47868.0	47868.0	52706.1	52225.7	51644.2	52064.0	51474.2	50030.0	51212.3
5 Cash in Hand and Balances with Reserve Bank	**8151.1**	**8151.1**	**9710.1**	**9513.9**	**9868.9**	**9040.8**	**9228.6**	**8995.9**	**9725.6**
5.1 Cash in Hand	570.3	570.3	706.3	681.3	705.8	691.6	743.8	812.4	1014.8
5.2 Balance with Reserve Bank	7580.8	7580.8	9003.8	8832.7	9163.0	8349.1	8484.8	8183.4	8710.8
6 Balances with Other Banks in Current Account	**1148.1**	**1148.1**	**1419.1**	**1186.3**	**1275.4**	**1284.4**	**1310.3**	**1359.6**	**1604.9**
7 Investments in Government Securities	**64455.2**	**64455.2**	**71870.3**	**72279.7**	**71991.8**	**71964.6**	**71262.5**	**71736.8**	**75927.5**
8 Money at Call and Short Notice	**28835.7**	**28835.7**	**24601.8**	**24189.3**	**25584.6**	**24200.2**	**24875.8**	**25326.5**	**32918.8**
9 Bank Credit (10.1+11)	**114631.6**	**114631.6**	**109318.7**	**110344.5**	**110029.1**	**112313.6**	**111718.8**	**111685.2**	**111549.1**
10 Advances									
10.1 Loans, Cash-Credits and Overdrafts	**114612.1**	**114612.1**	**109298.1**	**110323.9**	**110008.5**	**112293.0**	**111698.2**	**111659.5**	**111529.1**
10.2 Due from Banks	89429.1	89429.1	103321.6	102808.2	103697.0	104523.9	106973.7	108134.5	112645.5
11 Bills Purchased and Discounted	19.5	19.5	20.6	20.6	20.6	20.6	20.6	25.7	20.0

Prices and Production

No. 18: Consumer Price Index (Base: 2012=100)

Group/Sub group	2021-22			Rural			Urban			Combined		
	Rural	Urban	Combined	Apr. 21	Mar. 22	Apr 22(P)	Apr. 21	Mar. 22	Apr 22(P)	Apr. 21	Mar. 22	Apr 22(P)
	1	2	3	4	5	6	7	8	9	10	11	12
1 Food and beverages	**162.8**	**168.7**	**165.0**	**155.6**	**166.6**	**168.6**	**162.0**	**171.5**	**174.5**	**158.0**	**168.4**	**170.8**
1.1 Cereals and products	146.4	150.4	147.6	142.7	150.2	151.8	147.6	153.7	155.4	144.3	151.3	152.9
1.2 Meat and fish	200.4	206.5	202.6	195.5	208.0	209.7	202.5	215.8	215.8	198.0	210.7	211.8
1.3 Egg	173.3	176.0	174.4	163.4	167.9	164.5	166.4	167.7	164.7	164.6	167.8	164.6
1.4 Milk and products	158.3	159.0	158.6	155.0	162.0	163.8	156.0	162.6	164.2	155.4	162.2	163.9
1.5 Oils and fats	192.2	172.4	184.9	175.2	203.1	207.4	161.4	180.0	185.9	170.1	194.6	199.5
1.6 Fruits	155.3	163.5	159.2	160.6	155.9	169.7	168.8	159.6	175.9	164.4	157.6	172.6
1.7 Vegetables	156.1	192.8	168.5	135.1	155.8	153.6	161.6	188.4	190.9	144.1	166.9	166.3
1.8 Pulses and products	164.1	164.4	164.2	161.1	164.2	165.1	162.8	163.4	164.0	161.7	163.9	164.7
1.9 Sugar and confectionery	117.4	119.1	118.0	112.2	118.1	118.2	114.8	120.3	120.5	113.1	118.8	119.0
1.10 Spices	171.2	167.5	170.0	164.4	178.7	182.8	162.8	174.7	177.9	163.9	177.4	181.2
1.11 Non-alcoholic beverages	167.8	154.7	162.3	161.9	171.2	172.4	151.5	157.1	157.5	157.6	165.3	166.2
1.12 Prepared meals, snacks, sweets	173.0	175.8	174.3	166.8	177.4	178.9	171.4	181.5	183.2	168.9	179.3	180.9
2 Pan, tobacco and intoxicants	**190.3**	**196.5**	**191.9**	**186.8**	**192.3**	**192.8**	**194.4**	**197.5**	**197.1**	**188.8**	**193.7**	**193.9**
3 Clothing and footwear	**168.2**	**158.4**	**164.3**	**159.9**	**175.1**	**177.1**	**153.4**	**164.9**	**166.2**	**157.3**	**171.1**	**172.8**
3.1 Clothing	168.8	160.9	165.7	160.7	175.4	177.5	155.9	167.1	168.3	158.8	172.1	173.9
3.2 Footwear	164.5	144.7	156.3	155.1	173.2	175.1	139.3	152.6	154.5	148.5	164.6	166.5
4 Housing	**--**	**163.0**	**163.0**	**--**	**--**	**--**	**161.4**	**165.3**	**167.0**	**161.4**	**165.3**	**167.0**
5 Fuel and light	**164.0**	**159.8**	**162.4**	**156.0**	**168.9**	**173.2**	**154.9**	**164.5**	**171.0**	**155.6**	**167.2**	**172.4**
6 Miscellaneous	**164.1**	**156.1**	**160.2**	**158.0**	**168.3**	**170.2**	**150.5**	**160.6**	**163.1**	**154.4**	**164.6**	**166.8**
6.1 Household goods and services	161.8	153.5	157.9	155.5	166.5	167.6	147.6	158.6	159.8	151.8	162.8	163.9
6.2 Health	172.0	163.3	168.6	165.3	176.0	177.0	157.5	168.2	169.0	162.3	173.0	174.0
6.3 Transport and communication	157.9	150.0	153.7	151.7	162.0	166.2	142.1	154.2	159.3	146.6	157.9	162.6
6.4 Recreation and amusement	162.7	154.8	158.2	158.6	166.6	167.2	149.1	160.8	162.2	153.2	163.3	164.4
6.5 Education	168.4	160.1	163.5	164.1	170.6	170.9	157.6	162.7	164.0	160.3	166.0	166.9
6.6 Personal care and effects	161.3	160.8	161.1	154.6	167.4	169.0	156.6	166.8	168.4	155.4	167.2	168.8
General Index (All Groups)	**164.5**	**163.1**	**163.8**	**157.6**	**168.7**	**170.8**	**158.0**	**166.5**	**169.2**	**157.8**	**167.7**	**170.1**

Source: National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India.
P: Provisional.

No. 19: Other Consumer Price Indices

Item	Base Year	Linking Factor	2021-22	2021	2022	
				Apr.	Mar.	Apr.
	1	2	3	4	5	6
1 Consumer Price Index for Industrial Workers	2016	2.88	-	120.1	126	127.7
2 Consumer Price Index for Agricultural Labourers	1986-87	5.89	1075	1041	1098	1108
3 Consumer Price Index for Rural Labourers	1986-87	–	1084	1049	1109	1119

Source: Labour Bureau, Ministry of Labour and Employment, Government of India.

No. 20: Monthly Average Price of Gold and Silver in Mumbai

Item	2021-22	2021	2022	
		Apr.	Mar.	Apr.
	1	2	3	4
1 Standard Gold (₹ per 10 grams)	47999	46517	51750	52023
2 Silver (₹ per kilogram)	65426	67528	68286	66922

Source: India Bullion & Jewellers Association Ltd., Mumbai for Gold and Silver prices in Mumbai.

No. 21: Wholesale Price Index

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			Apr	Feb.	Mar. (P)	Apr. (P)
	1	2	3	4	5	6
1 ALL COMMODITIES	**100.000**	**139.4**	**132.0**	**145.3**	**148.8**	**151.9**
1.1 PRIMARY ARTICLES	**22.618**	**160.6**	**151.5**	**167.5**	**170.3**	**174.9**
1.1.1 FOOD ARTICLES	**15.256**	**167.3**	**161.6**	**170.4**	**169.0**	**175.1**
1.1.1.1 Food Grains (Cereals+Pulses)	3.462	163.5	161.0	165.9	169.1	170.8
1.1.1.2 Fruits & Vegetables	3.475	187.5	170.1	192.1	178.5	198.8
1.1.1.3 Milk	4.440	156.7	154.7	157.8	159.7	162.6
1.1.1.4 Eggs,Meat & Fish	2.402	164.0	162.1	167.3	169.6	169.4
1.1.1.5 Condiments & Spices	0.529	159.8	151.6	170.3	172.9	173.8
1.1.1.6 Other Food Articles	0.948	168.3	169.7	173.8	173.0	177.3
1.1.2 NON-FOOD ARTICLES	**4.119**	**158.1**	**143.2**	**170.2**	**175.2**	**177.3**
1.1.2.1 Fibres	0.839	158.5	133.1	190.4	201.1	214.8
1.1.2.2 Oil Seeds	1.115	214.4	195.7	215.4	226.6	227.2
1.1.2.3 Other non-food Articles	1.960	119.9	115.5	123.3	126.7	127.3
1.1.2.4 Floriculture	0.204	217.0	163.0	290.2	253.9	230.8
1.1.3 MINERALS	**0.833**	**196.9**	**185.9**	**225.0**	**224.7**	**225.0**
1.1.3.1 Metallic Minerals	0.648	193.0	182.9	226.9	226.6	226.9
1.1.3.2 Other Minerals	0.185	210.4	196.5	218.6	218.3	218.4
1.1.4 CRUDE PETROLEUM & NATURAL GAS	**2.410**	**110.3**	**90.2**	**125.1**	**151.6**	**152.5**
1.2 FUEL & POWER	**13.152**	**124.8**	**108.9**	**138.3**	**146.9**	**151.0**
1.2.1 COAL	**2.138**	**129.0**	**127.3**	**130.9**	**130.9**	**130.9**
1.2.1.1 Coking Coal	0.647	143.0	141.9	143.4	143.4	143.4
1.2.1.2 Non-Coking Coal	1.401	119.8	119.8	119.8	119.8	119.8
1.2.1.3 Lignite	0.090	170.5	138.1	212.6	212.6	212.6
1.2.2 MINERAL OILS	**7.950**	**126.2**	**103.1**	**142.9**	**155.7**	**167.5**
1.2.3 ELECTRICITY	**3.064**	**118.5**	**111.1**	**131.8**	**135.3**	**122.2**
1.3 MANUFACTURED PRODUCTS	**64.231**	**134.9**	**129.9**	**138.9**	**141.6**	**144.0**
1.3.1 MANUFACTURE OF FOOD PRODUCTS	**9.122**	**157.9**	**154.2**	**160.5**	**164.6**	**169.1**
1.3.1.1 Processing and Preserving of meat	0.134	142.7	143.4	141.0	142.1	143.6
1.3.1.2 Processing and Preserving of fish, Crustaceans, Molluscs and products thereof	0.204	144.1	143.2	147.3	142.8	144.8
1.3.1.3 Processing and Preserving of fruit and Vegetables	0.138	122.3	121.5	122.5	122.1	123.4
1.3.1.4 Vegetable and Animal oils and Fats	2.643	187.0	182.7	190.1	200.2	210.2
1.3.1.5 Dairy products	1.165	149.3	148.9	151.9	155.0	158.4
1.3.1.6 Grain mill products	2.010	145.6	142.7	147.6	149.9	150.9
1.3.1.7 Starches and Starch products	0.110	133.3	121.5	146.7	151.0	154.2
1.3.1.8 Bakery products	0.215	146.2	140.9	150.8	152.5	154.8
1.3.1.9 Sugar, Molasses & honey	1.163	122.9	118.4	124.8	124.6	125.2
1.3.1.10 Cocoa, Chocolate and Sugar confectionery	0.175	130.4	128.2	133.8	133.6	134.6
1.3.1.11 Macaroni, Noodles, Couscous and Similar farinaceous products	0.026	135.9	131.5	144.3	142.8	160.6
1.3.1.12 Tea & Coffee products	0.371	170.9	171.4	165.8	166.6	171.3
1.3.1.13 Processed condiments & salt	0.163	157.4	152.8	163.7	165.0	169.1
1.3.1.14 Processed ready to eat food	0.024	137.0	137.9	138.6	138.7	141.0
1.3.1.15 Health supplements	0.225	153.3	142.4	164.2	165.2	172.4
1.3.1.16 Prepared animal feeds	0.356	200.9	187.9	204.1	210.1	213.9
1.3.2 MANUFACTURE OF BEVERAGES	**0.909**	**126.8**	**125.7**	**127.6**	**127.6**	**127.6**
1.3.2.1 Wines & spirits	0.408	123.6	121.7	124.9	125.4	126.8
1.3.2.2 Malt liquors and Malt	0.225	130.4	128.4	132.7	132.6	134.3
1.3.2.3 Soft drinks; Production of mineral waters and Other bottled waters	0.275	128.8	129.5	127.3	126.9	123.3
1.3.3 MANUFACTURE OF TOBACCO PRODUCTS	**0.514**	**160.2**	**160.3**	**159.8**	**161.3**	**163.3**
1.3.3.1 Tobacco products	0.514	160.2	160.3	159.8	161.3	163.3

No. 21: Wholesale Price Index (Contd.)

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			Apr	Feb.	Mar. (P)	Apr. (P)
1.3.4 MANUFACTURE OF TEXTILES	**4.881**	**135.2**	**128.7**	**142.4**	**143.5**	**145.4**
1.3.4.1 Preparation and Spinning of textile fibres	2.582	128.1	121.0	137.9	138.3	140.1
1.3.4.2 Weaving & Finishing of textiles	1.509	146.8	140.1	151.8	154.1	155.6
1.3.4.3 Knitted and Crocheted fabrics	0.193	125.5	121.9	130.0	127.7	131.9
1.3.4.4 Made-up textile articles, Except apparel	0.299	138.6	134.6	142.3	146.6	148.5
1.3.4.5 Cordage, Rope, Twine and Netting	0.098	168.5	170.6	165.7	162.9	166.2
1.3.4.6 Other textiles	0.201	126.2	119.5	130.9	132.3	133.9
1.3.5 MANUFACTURE OF WEARING APPAREL	**0.814**	**143.1**	**140.3**	**144.7**	**145.2**	**145.9**
1.3.5.1 Manufacture of Wearing Apparel (woven), Except fur Apparel	0.593	142.0	139.2	143.5	143.7	144.3
1.3.5.2 Knitted and Crocheted apparel	0.221	145.8	143.5	147.8	149.0	150.1
1.3.6 MANUFACTURE OF LEATHER AND RELATED PRODUCTS	**0.535**	**119.3**	**118.2**	**121.3**	**121.7**	**120.9**
1.3.6.1 Tanning and Dressing of leather; Dressing and Dyeing of fur	0.142	103.6	97.7	107.2	108.2	106.4
1.3.6.2 Luggage, HandbAgs, Saddlery and Harness	0.075	141.5	139.8	144.4	144.5	144.7
1.3.6.3 Footwear	0.318	121.0	122.2	122.1	122.3	121.8
1.3.7 MANUFACTURE OF WOOD AND PRODUCTS OF WOOD AND CORK	**0.772**	**141.0**	**138.4**	**142.9**	**144.1**	**145.0**
1.3.7.1 Saw milling and Planing of wood	0.124	129.0	124.2	132.6	135.5	133.8
1.3.7.2 Veneer sheets; Manufacture of plywood, Laminboard, Particle board and Other panels and Boards	0.493	141.9	140.6	143.5	144.5	145.7
1.3.7.3 Builder's carpentry and Joinery	0.036	193.9	191.3	195.2	195.2	201.5
1.3.7.4 Wooden containers	0.119	134.0	127.9	135.9	136.1	137.1
1.3.8 MANUFACTURE OF PAPER AND PAPER PRODUCTS	**1.113**	**137.4**	**132.8**	**143.3**	**146.7**	**151.9**
1.3.8.1 Pulp, Paper and Paperboard	0.493	141.2	138.5	146.2	149.6	155.2
1.3.8.2 Corrugated paper and Paperboard and Containers of paper and Paperboard	0.314	137.7	130.9	142.5	144.9	146.9
1.3.8.3 Other articles of paper and Paperboard	0.306	131.0	125.7	139.3	144.0	151.9
1.3.9 PRINTING AND REPRODUCTION OF RECORDED MEDIA	**0.676**	**157.9**	**153.8**	**160.5**	**163.1**	**163.5**
1.3.9.1 Printing	0.676	157.9	153.8	160.5	163.1	163.5
1.3.10 MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS	**6.465**	**133.4**	**128.0**	**139.2**	**141.5**	**143.9**
1.3.10.1 Basic chemicals	1.433	143.8	133.5	153.2	156.4	159.9
1.3.10.2 Fertilizers and Nitrogen compounds	1.485	129.5	126.5	133.8	134.4	136.5
1.3.10.3 Plastic and Synthetic rubber in primary form	1.001	140.2	140.2	143.9	149.6	151.6
1.3.10.4 Pesticides and Other agrochemical products	0.454	132.0	126.7	139.7	141.0	141.1
1.3.10.5 Paints, Varnishes and Similar coatings, Printing ink and Mastics	0.491	130.4	121.4	137.3	138.6	141.2
1.3.10.6 Soap and Detergents, Cleaning and Polishing preparations, Perfumes and Toilet preparations	0.612	127.7	123.4	128.0	129.6	132.0
1.3.10.7 Other chemical products	0.692	130.2	122.9	137.6	139.7	141.7
1.3.10.8 Man-made fibres	0.296	106.5	102.4	111.1	112.9	115.6
1.3.11 MANUFACTURE OF PHARMACEUTICALS, MEDICINAL CHEMICAL AND BOTANICAL PRODUCTS	**1.993**	**135.8**	**134.7**	**137.9**	**136.3**	**137.6**
1.3.11.1 Pharmaceuticals, Medicinal chemical and Botanical products	1.993	135.8	134.7	137.9	136.3	137.6
1.3.12 MANUFACTURE OF RUBBER AND PLASTICS PRODUCTS	**2.299**	**124.8**	**122.2**	**127.3**	**129.8**	**131.8**
1.3.12.1 Rubber Tyres and Tubes; Retreading and Rebuilding of Rubber Tyres	0.609	104.4	102.3	106.4	106.1	107.2
1.3.12.2 Other Rubber Products	0.272	101.9	98.1	105.1	106.4	106.6
1.3.12.3 Plastics products	1.418	138.0	135.3	140.6	144.4	147.2
1.3.13 MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS	**3.202**	**123.7**	**121.2**	**126.7**	**127.3**	**129.4**
1.3.13.1 Glass and Glass products	0.295	139.1	132.5	144.7	145.6	148.2
1.3.13.2 Refractory products	0.223	115.6	111.8	119.9	119.4	118.8
1.3.13.3 Clay Building Materials	0.121	119.4	114.1	133.6	132.7	135.5
1.3.13.4 Other Porcelain and Ceramic Products	0.222	112.9	114.4	116.1	116.6	116.2
1.3.13.5 Cement, Lime and Plaster	1.645	126.4	124.7	128.4	129.0	131.6

No. 21: Wholesale Price Index (Contd.)

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			Apr	Feb.	Mar. (P)	Apr. (P)
1.3.13.6 Articles of Concrete, Cement and Plaster	0.292	129.2	128.2	130.6	131.4	132.8
1.3.13.7 Cutting, Shaping and Finishing of Stone	0.234	122.2	122.9	120.5	120.9	123.7
1.3.13.8 Other Non-Metallic Mineral Products	0.169	90.5	78.9	98.3	100.2	104.9
1.3.14 MANUFACTURE OF BASIC METALS	**9.646**	**140.0**	**128.6**	**147.1**	**156.2**	**160.5**
1.3.14.1 Inputs into steel making	1.411	150.8	133.6	162.4	177.1	181.4
1.3.14.2 Metallic Iron	0.653	147.7	135.5	154.9	172.0	178.4
1.3.14.3 Mild Steel - Semi Finished Steel	1.274	118.8	113.0	122.9	127.9	133.8
1.3.14.4 Mild Steel -Long Products	1.081	137.2	127.6	144.8	153.1	158.6
1.3.14.5 Mild Steel - Flat products	1.144	157.5	142.8	160.3	169.8	178.3
1.3.14.6 Alloy steel other than Stainless Steel- Shapes	0.067	133.6	127.7	143.6	150.2	155.2
1.3.14.7 Stainless Steel - Semi Finished	0.924	141.7	131.0	147.7	169.8	173.0
1.3.14.8 Pipes & tubes	0.205	155.9	140.4	167.1	171.0	172.7
1.3.14.9 Non-ferrous metals incl. precious metals	1.693	139.7	125.9	149.4	154.9	155.2
1.3.14.10 Castings	0.925	118.8	113.3	122.7	122.6	125.6
1.3.14.11 Forgings of steel	0.271	159.0	155.3	165.8	165.0	166.9
1.3.15 MANUFACTURE OF FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	**3.155**	**130.4**	**122.6**	**133.5**	**134.4**	**137.8**
1.3.15.1 Structural Metal Products	1.031	123.9	120.6	125.3	127.5	130.3
1.3.15.2 Tanks, Reservoirs and Containers of Metal	0.660	155.9	139.4	159.8	159.5	166.8
1.3.15.3 Steam generators, Except Central Heating Hot Water Boilers	0.145	96.1	96.8	93.5	96.4	96.4
1.3.15.4 Forging, Pressing, Stamping and Roll-Forming of Metal; Powder Metallurgy	0.383	117.5	100.9	126.2	126.2	127.7
1.3.15.5 Cutlery, Hand Tools and General Hardware	0.208	108.2	106.7	109.4	108.5	111.7
1.3.15.6 Other Fabricated Metal Products	0.728	136.5	131.3	140.1	140.8	143.2
1.3.16 MANUFACTURE OF COMPUTER, ELECTRONIC AND OPTICAL PRODUCTS	**2.009**	**113.7**	**111.6**	**116.4**	**116.5**	**116.3**
1.3.16.1 Electronic Components	0.402	106.0	102.2	111.5	111.5	113.0
1.3.16.2 Computers and Peripheral Equipment	0.336	134.7	134.6	134.7	134.8	134.8
1.3.16.3 Communication Equipment	0.310	121.7	116.3	128.6	128.8	128.2
1.3.16.4 Consumer Electronics	0.641	102.1	101.8	102.3	102.2	101.2
1.3.16.5 Measuring, Testing, Navigating and Control equipment	0.181	108.4	107.0	112.2	112.2	111.2
1.3.16.6 Watches and Clocks	0.076	145.6	142.8	148.4	150.5	150.6
1.3.16.7 Irradiation, Electromedical and Electrotherapeutic equipment	0.055	106.1	103.5	107.4	107.6	107.9
1.3.16.8 Optical instruments and Photographic equipment	0.008	98.3	95.8	99.7	99.7	99.6
1.3.17 MANUFACTURE OF ELECTRICAL EQUIPMENT	**2.930**	**122.3**	**118.6**	**124.8**	**125.2**	**125.9**
1.3.17.1 Electric motors, Generators, Transformers and Electricity distribution and Control apparatus	1.298	119.6	117.6	121.2	121.4	121.6
1.3.17.2 Batteries and Accumulators	0.236	121.7	116.5	125.1	126.2	129.1
1.3.17.3 Fibre optic cables for data transmission or live transmission of images	0.133	102.9	102.2	106.4	107.2	102.7
1.3.17.4 Other electronic and Electric wires and Cables	0.428	140.5	130.4	146.5	148.1	151.5
1.3.17.5 Wiring devices, Electric lighting & display equipment	0.263	114.5	112.4	115.4	115.3	115.8
1.3.17.6 Domestic appliances	0.366	128.4	124.6	131.3	131.3	131.9
1.3.17.7 Other electrical equipment	0.206	113.2	110.2	113.9	113.4	113.1
1.3.18 MANUFACTURE OF MACHINERY AND EQUIPMENT	**4.789**	**120.0**	**116.7**	**122.0**	**122.3**	**123.7**
1.3.18.1 Engines and Turbines, Except aircraft, Vehicle and Two wheeler engines	0.638	119.2	112.7	121.4	122.7	125.5
1.3.18.2 Fluid power equipment	0.162	122.1	120.3	124.9	124.9	125.1
1.3.18.3 Other pumps, Compressors, Taps and Valves	0.552	115.1	114.2	115.2	115.5	116.4
1.3.18.4 Bearings, Gears, Gearing and Driving elements	0.340	118.1	114.4	119.9	119.6	120.3
1.3.18.5 Ovens, Furnaces and Furnace burners	0.008	74.2	72.1	76.9	76.5	77.3
1.3.18.6 Lifting and Handling equipment	0.285	120.0	115.2	124.1	124.0	125.3

No. 21: Wholesale Price Index (Concld.)

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			Apr	Feb.	Mar. (P)	Apr. (P)
1.3.18.7 Office machinery and Equipment	0.006	130.2	130.2	130.2	130.2	130.2
1.3.18.8 Other general-purpose machinery	0.437	133.4	131.1	135.5	134.0	138.9
1.3.18.9 Agricultural and Forestry machinery	0.833	128.4	122.9	132.1	132.8	133.3
1.3.18.10 Metal-forming machinery and Machine tools	0.224	114.1	109.7	116.5	116.5	117.7
1.3.18.11 Machinery for mining, Quarrying and Construction	0.371	78.1	76.8	79.4	79.7	80.5
1.3.18.12 Machinery for food, Beverage and Tobacco processing	0.228	130.1	128.3	131.2	130.5	131.0
1.3.18.13 Machinery for textile, Apparel and Leather production	0.192	125.1	126.0	125.9	126.6	127.9
1.3.18.14 Other special-purpose machinery	0.468	134.8	132.5	136.1	137.4	137.2
1.3.18.15 Renewable electricity generating equipment	0.046	66.6	66.4	67.2	67.3	67.6
1.3.19 MANUFACTURE OF MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS	**4.969**	**122.7**	**119.1**	**125.6**	**126.3**	**126.1**
1.3.19.1 Motor vehicles	2.600	122.7	119.8	125.9	126.4	125.1
1.3.19.2 Parts and Accessories for motor vehicles	2.368	122.7	118.4	125.2	126.1	127.2
1.3.20 MANUFACTURE OF OTHER TRANSPORT EQUIPMENT	**1.648**	**131.7**	**128.8**	**133.7**	**133.8**	**134.3**
1.3.20.1 Building of ships and Floating structures	0.117	158.9	158.8	158.9	159.0	159.1
1.3.20.2 Railway locomotives and Rolling stock	0.110	104.4	104.1	103.7	103.7	103.7
1.3.20.3 Motor cycles	1.302	131.0	127.5	133.6	133.6	134.2
1.3.20.4 Bicycles and Invalid carriages	0.117	137.1	135.2	137.9	138.3	139.2
1.3.20.5 Other transport equipment	0.002	135.9	132.7	139.5	142.0	143.5
1.3.21 MANUFACTURE OF FURNITURE	**0.727**	**150.1**	**145.8**	**154.7**	**157.2**	**158.7**
1.3.21.1 Furniture	0.727	150.1	145.8	154.7	157.2	158.7
1.3.22 OTHER MANUFACTURING	**1.064**	**137.9**	**133.9**	**140.5**	**146.6**	**147.8**
1.3.22.1 Jewellery and Related articles	0.996	136.0	131.9	138.9	145.0	146.4
1.3.22.2 Musical instruments	0.001	192.3	196.9	185.1	180.7	184.4
1.3.22.3 Sports goods	0.012	140.4	135.9	144.3	145.9	146.6
1.3.22.4 Games and Toys	0.005	150.9	146.6	152.4	154.8	158.1
1.3.22.5 Medical and Dental instruments and Supplies	0.049	171.8	169.8	169.6	177.8	176.4
2 FOOD INDEX	**24.378**	**163.7**	**158.8**	**166.7**	**167.3**	**172.9**

Source: Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India.

No. 22: Index of Industrial Production (Base:2011-12=100)

Industry	Weight	2020-21	2021-22	April-March		March	
				2020-21	2021-22	2021	2022
	1	2	3	4	5	6	7
General Index	100.00	118.1	131.5	118.1	131.5	145.6	148.3
1 Sectoral Classification							
1.1 Mining	14.37	101.0	113.3	101.0	113.3	139.0	144.6
1.2 Manufacturing	77.63	117.2	130.9	117.2	130.9	143.3	144.6
1.3 Electricity	7.99	157.6	170.1	157.6	170.1	180.0	191.0
2 Use-Based Classification							
2.1 Primary Goods	34.05	118.1	129.5	118.1	129.5	145.0	153.3
2.2 Capital Goods	8.22	75.9	88.6	75.9	88.6	109.2	110.0
2.3 Intermediate Goods	17.22	124.7	143.5	124.7	143.5	153.9	154.8
2.4 Infrastructure/ Construction Goods	12.34	124.7	148.4	124.7	148.4	158.9	170.5
2.5 Consumer Durables	12.84	101.2	113.9	101.2	113.9	133.0	128.8
2.6 Consumer Non-Durables	15.33	142.1	146.6	142.1	146.6	157.2	149.3

Source : National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India.

Government Accounts and Treasury Bills

No. 23: Union Government Accounts at a Glance

(Amount in ₹ Crore)

Item	2022-23			2021-22		
	Budget Estimates	April 2022		Provisional Accounts	Revised Estimates	Provisional Accounts as per cent to Revised Estimates
		Actuals	Percent to Budget Estimates			
	1	2	3	4	5	6
1 Revenue Receipts	**2204422**	**196495**	**8.9**	**2168426**	**2078936**	**104.3**
1.1 Tax Revenue (Net)	1934771	184557	9.5	1820382	1765145	103.1
1.2 Non-Tax Revenue	269651	11938	4.4	348044	313791	110.9
2 Non Debt Capital Receipts	**79291**	**3488**	**4.4**	**39208**	**99975**	**39.2**
2.1 Recovery of Loans	14291	429	3.0	24570	21975	111.8
2.2 Other Receipts	65000	3059	4.7	14638	78000	18.8
3 Total Receipts (1+2)	**2283713**	**199983**	**8.8**	**2207634**	**2178911**	**101.3**
4 Revenue Expenditure	3194663	195904	6.1	3201373	3167289	101.1
of which :						
4.1 Interest Payments	940651	41288	4.4	805390	813791	99.0
5 Capital Expenditure	750246	78925	10.5	592798	602711	98.4
6 Total Expenditure (4+5)	**3944909**	**274829**	**7.0**	**3794171**	**3770000**	**100.6**
7 Revenue Deficit (4-1)	990241	**-591**	**-0.1**	1032947	1088352	94.9
8 Fiscal Deficit (6-3)	**1661196**	**74846**	**4.5**	**1586537**	**1591089**	**99.7**
9 Gross Primary Deficit (8-4.1)	**720545**	**33558**	**4.7**	**781147**	**777298**	**100.5**

Source: Controller General of Accounts, Ministry of Finance, Government of India.

No. 24: Treasury Bills – Ownership Pattern

(₹ Crore)

Item	2021-22	2021	2022					
		Apr. 30	Mar. 25	Apr. 1	Apr. 8	Apr. 15	Apr. 22	Apr. 29
	1	2	3	4	5	6	7	8
1 91-day								
1.1 Banks	5310	4289	5310	5384	6007	5774	5598	7549
1.2 Primary Dealers	16705	16736	16705	20191	19356	17713	18260	21356
1.3 State Governments	31320	22875	31320	47800	47800	48950	57950	53950
1.4 Others	72109	95761	72109	66123	74321	83644	89027	89280
2 182-day								
2.1 Banks	70130	87003	70130	76931	67768	72475	75966	79249
2.2 Primary Dealers	63669	30415	63669	67992	81644	84164	86252	90726
2.3 State Governments	15763	9843	15763	16763	17263	18668	19311	20311
2.4 Others	69259	67050	69259	72166	76310	79538	83245	83968
3 364-day								
3.1 Banks	112386	121312	112386	107791	102545	105378	104560	101687
3.2 Primary Dealers	160461	159149	160461	172480	178074	156286	160503	164687
3.3 State Governments	22836	18090	22836	22836	26326	25671	26164	26514
3.4 Others	118392	151602	118392	120479	121364	143097	142378	141150
4 14-day Intermediate								
4.1 Banks								
4.2 Primary Dealers								
4.3 State Governments	289362	163969	289362	207675	173532	194119	197634	183862
4.4 Others	659	205	659	194	345	771	1460	899
Total Treasury Bills (Excluding 14 day Intermediate T Bills) #	758339	784125	758339	796938	818779	841359	869214	880427

14D intermediate T-Bills are non-marketable unlike 91D, 182D and 364D T-Bills. These bills are 'intermediate' by nature as these are liquidated to replenish shortfall in the daily minimum cash balances of State Governments

No. 25: Auctions of Treasury Bills

(Amount in ₹ Crore)

Date of Auction	Notified Amount	Bids Received			Bids Accepted			Total Issue (6+7)	Cut-off Price	Implicit Yield at Cut-off Price (per cent)
		Number	Total Face Value		Number	Total Face Value				
			Competitive	Non-Competitive		Competitive	Non-Competitive			
	1	2	3	4	5	6	7	8	9	10
91-day Treasury Bills										
2021-22										
Mar. 30	7000	56	15499	21507	35	6996	21507	28504	99.05	3.8400
2022-23										
Apr. 6	13000	125	48739	1	49	12999	1	13000	99.04	3.8682
Apr. 12	13000	125	53582	2851	41	12999	2851	15850	99.02	3.9795
Apr. 20	13000	126	49279	12204	36	12996	12204	25200	99.02	3.9599
Apr. 27	13000	121	38007	2512	45	12998	2512	15510	99.02	3.9799
182-day Treasury Bills										
2021-22										
Mar. 30	15000	181	49020	1001	47	14999	1001	16000	97.92	4.2669
2022-23										
Apr. 6	13000	209	70028	501	33	12999	501	13500	97.92	4.2651
Apr. 12	13000	189	36808	1500	75	13000	1500	14500	97.84	4.4306
Apr. 20	13000	227	59683	746	49	12899	746	13645	97.85	4.4097
Apr. 27	12000	186	38808	1000	58	12000	1000	13000	97.85	4.3999
364-day Treasury Bills										
2021-22										
Mar. 30	15000	157	49888	1	47	14999	1	15000	95.63	4.5805
2022-23										
Apr. 6	8000	135	33555	3896	17	7999	3896	11895	95.65	4.5600
Apr. 12	8000	136	22707	460	60	8000	460	8460	95.41	4.8240
Apr. 20	8000	190	28385	833	67	7700	833	8533	95.42	4.8130
Apr. 27	8000	160	27141	350	61	8000	350	8350	95.42	4.8102

Financial Markets

No. 26: Daily Call Money Rates

(Per cent per annum)

As on	Range of Rates	Weighted Average Rates
	Borrowings/ Lendings	Borrowings/ Lendings
	1	2
April 4, 2022	2.20-3.40	3.24
April 5, 2022	2.20-3.55	3.26
April 6, 2022	2.20-3.60	3.26
April 7, 2022	2.20-3.55	3.27
April 8, 2022	2.20-3.80	3.33
April 11, 2022	2.20-3.80	3.44
April 12, 2022	2.20-3.80	3.44
April 13, 2022	2.20-3.90	3.52
April 16, 2022	2.90-4.00	3.69
April 18, 2022	2.20-3.90	3.51
April 19, 2022	2.20-3.95	3.51
April 20, 2022	2.20-3.95	3.52
April 21, 2022	2.20-3.90	3.53
April 22, 2022	2.30-3.99	3.54
April 25, 2022	2.30-3.90	3.56
April 26, 2022	2.30-4.00	3.59
April 27, 2022	2.30-4.10	3.64
April 28, 2022	2.30-3.95	3.63
April 29, 2022	2.30-4.20	3.72
April 30, 2022	2.90-4.00	3.19
May 2, 2022	2.30-3.90	3.64
May 4, 2022	2.30-4.40	3.67
May 5, 2022	2.30-4.35	4.05
May 6, 2022	2.30-4.30	4.07
May 7, 2022	3.20-4.50	3.64
May 9, 2022	2.30-4.30	4.04
May 10, 2022	2.30-4.35	4.08
May 11, 2022	2.30-4.35	4.04
May 12, 2022	2.30-4.30	4.05
May 13, 2022	2.00-4.30	4.08

Note: Includes Notice Money.

No. 27: Certificates of Deposit

Item	2021	2022			
	Apr. 23	Mar. 11	Mar. 25	Apr. 8	Apr. 22
	1	2	3	4	5
1 Amount Outstanding (₹ Crore)	85792.41	154363.89	181171.43	202431.31	201427.56
1.1 Issued during the fortnight (₹ Crore)	764.84	33526.78	34878.78	22347.23	5160.29
2 Rate of Interest (per cent)	3.91-4.56	3.77-5.44	3.82-5.49	3.85-5.50	4.38-5.75

No. 28: Commercial Paper

Item	2021	2022			
	Apr. 30	Mar. 15	Mar. 31	Apr. 15	Apr. 30
	1	2	3	4	5
1 Amount Outstanding (₹ Crore)	374846.75	368090.45	352292.55	351642.10	364999.65
1.1 Reported during the fortnight (₹ Crore)	53838.60	44531.60	71015.75	43499.30	64930.35
2 Rate of Interest (per cent)	3.21-13.02	3.84-12.15	3.79-12.17	3.70-12.11	3.77-13.41

No. 29: Average Daily Turnover in Select Financial Markets

(₹ Crore)

Item	2021-22	2021	2022					
		Apr. 30	Mar. 25	Apr. 1	Apr. 8	Apr. 15	Apr. 22	Apr. 29
	1	2	3	4	5	6	7	8
1 Call Money	14515	22573	17736	19325	19871	11622	15449	16222
2 Notice Money	2122	735	1305	632	633	5918	550	4541
3 Term Money	515	506	822	235	553	207	813	286
4 Triparty Repo	618526	610198	611595	703445	729546	752798	652229	721457
5 Market Repo	383844	420038	427776	456559	485655	493370	384865	481888
6 Repo in Corporate Bond	4373	7742	191	57	309	27	312	241
7 Forex (US $ million)	67793	73580	96538	113833	89955	83470	90269	112085
8 Govt. of India Dated Securities	51300	52896	41031	41344	40162	41692	86405	82491
9 State Govt. Securities	5570	7340	5734	8567	7124	19998	18742	7136
10 Treasury Bills								
10.1 91-Day	4690	2484	4558	5923	6934	4415	5249	3490
10.2 182-Day	3440	8363	7723	6494	7820	5638	6972	5341
10.3 364-Day	3530	2653	5035	8515	5493	2988	2675	3538
10.4 Cash Management Bills								
11 Total Govt. Securities (8+9+10)	68530	73736	64080	70844	67533	74730	120044	101995
11.1 RBI	–	3143	907	1300	80	10	66	376

No. 30: New Capital Issues By Non-Government Public Limited Companies

(Amount in ₹ Crore)

Security & Type of Issue	2021-22		2021-22 (Apr.-Apr.)		2022-23 (Apr.-Apr.) *		Apr. 2021		Apr. 2022 *	
	No. of Issues	Amount	No. of Issues	Amount	No. of Issues	Amount	No. of Issues	Amount	No. of Issues	Amount
	1	2	3	4	5	6	7	8	9	10
1 Equity Shares	**164**	**138894**	**10**	**3288**	**15**	**4957**	**10**	**3288**	**15**	**4957**
1A Premium	154	136893	9	3202	14	4865	9	3202	14	4865
1.1 Public	121	112567	7	3009	10	4819	7	3009	10	4819
1.1.1 Premium	119	111314	7	2939	10	4760	7	2939	10	4760
1.2 Rights	43	26327	3	280	5	138	3	280	5	138
1.2.1 Premium	35	25580	2	263	4	105	2	263	4	105
2 Preference Shares	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
2.1 Public	–	–	–	–	–	–	–	–	–	–
2.2 Rights	–	–	–	–	–	–	–	–	–	–
3 Bonds & Debentures	**28**	**11589**	**6**	**3581**	**6**	**1343**	**6**	**3581**	**6**	**1343**
3.1 Convertible	–	–	–	–	–	–	–	–	–	–
3.1.1 Public	–	–	–	–	–	–	–	–	–	–
3.1.2 Rights	–	–	–	–	–	–	–	–	–	–
3.2 Non-Convertible	28	11589	6	3581	6	1343	6	3581	6	1343
3.2.1 Public	28	11589	6	3581	6	1343	6	3581	6	1343
3.2.2 Rights	–	–	–	–	–	–	–	–	–	–
4 Total(1+2+3)	**192**	**150484**	**16**	**6869**	**21**	**6301**	**16**	**6869**	**21**	**6301**
4.1 Public	149	124157	13	6590	16	6163	13	6590	16	6163
4.2 Rights	43	26327	3	280	5	138	3	280	5	138

Note : 1.Since April 2020, monthly data on equity issues is compiled on the basis of their listing date.
2.Figures in the columns might not add up to the total due to rounding of numbers.

Source : Securities and Exchange Board of India.

* : Data is Provisional

External Sector

No. 31: Foreign Trade

Item	Unit	2021-22	2021		2022			
			Apr.	Dec.	Jan.	Feb.	Mar.	Apr.
		1	2	3	4	5	6	7
1 Exports	₹ Crore	3145831	228981	295992	262178	278585	338850	306095
	US $ Million	421848	30747	39271	35219	37143	44443	40187
1.1 Oil	₹ Crore	503531	27001	50912	34090	51733	74455	62880
	US $ Million	67430	3626	6755	4579	6897	9765	8255
1.2 Non-oil	₹ Crore	2642300	201980	245080	228087	226852	264395	243215
	US $ Million	354418	27121	32516	30640	30246	34677	31932
2 Imports	₹ Crore	4564870	342864	454456	388840	417687	478533	459260
	US $ Million	612000	46039	60295	52234	55689	62763	60296
2.1 Oil	₹ Crore	1205952	80168	124324	91971	116341	161199	153768
	US $ Million	161564	10765	16495	12355	15511	21142	20188
2.2 Non-oil	₹ Crore	3358918	262696	330132	296869	301346	317334	305492
	US $ Million	450436	35274	43800	39879	40178	41621	40108
3 Trade Balance	₹ Crore	-1419039	-113884	-158464	-126662	-139102	-139683	-153165
	US $ Million	-190152	-15292	-21024	-17015	-18546	-18320	-20109
3.1 Oil	₹ Crore	-702421	-53167	-73411	-57880	-64608	-86744	-90888
	US $ Million	-94134	-7139	-9740	-7775	-8614	-11377	-11933
3.2 Non-oil	₹ Crore	-716617	-60717	-85052	-68782	-74494	-52939	-62277
	US $ Million	-96018	-8153	-11284	-9240	-9932	-6943	-8176

Source: DGCI&S and Ministry of Commerce & Industry.

No. 32: Foreign Exchange Reserves

Item	Unit	2021	2022					
		May 28	Apr. 22	Apr. 29	May 6	May 13	May 20	May 27
		1	2	3	4	5	6	7
1 Total Reserves	**₹ Crore**	**4333464**	**4592398**	**4568295**	**4582334**	**4596385**	**4638067**	**4665848**
	US $ Million	**598165**	**600423**	**597728**	**595954**	**593279**	**597509**	**601363**
1.1 Foreign Currency Assets	₹ Crore	4010076	4083917	4072243	4081848	4102732	4140278	4166344
	US $ Million	553529	533933	532823	530855	529554	533378	536988
1.2 Gold	₹ Crore	276061	327120	317972	320940	314318	316885	317466
	US $ Million	38106	42768	41604	41739	40570	40823	40917
	Volume (Metric Tonnes)	696.25	760.42	761.35	762.29	763.22	765.09	765.09
1.3 SDRs	SDRs Million	1049	13657	13657	13657	13657	13657	13657
	₹ Crore	10975	142737	139857	141247	141037	142099	143058
	US $ Million	1515	18662	18299	18370	18204	18306	18438
1.4 Reserve Tranche Position in IMF	₹ Crore	36352	38623	38222	38298	38298	38806	38980
	US $ Million	5016	5060	5001	4990	4951	5002	5019

* Difference,if any, is due to rounding off.

No. 33: Non-Resident Deposits

(US$ Million)

Scheme	Outstanding				Flows	
	2021-22	2021	2022		2021-22	2022-23
		Apr.	Mar.	Apr.	Apr.	Apr.
	1	2	3	4	5	6
1 NRI Deposits	**139,022**	**142,081**	**139,022**	**139,154**	**2,822**	**529**
1.1 FCNR(B)	16,918	20,027	16,918	16,135	–446	–783
1.2 NR(E)RA	100,801	103,249	100,801	101,559	2,895	1,086
1.3 NRO	21,303	18,805	21,303	21,460	372	226

No. 34: Foreign Investment Inflows

(US$ Million)

Item	2021-22	2021-22	2022-23	2021	2022	
		Apr.	Apr.	Apr.	Mar.	Apr.
	1	2	3	4	5	6
1.1 Net Foreign Direct Investment (1.1.1–1.1.2)	**39375**	**2484**	**5030**	**2484**	**2736**	**5030**
1.1.1 Direct Investment to India (1.1.1.1–1. 1.1.2)	**55074**	**4331**	**5837**	**4331**	**4307**	**5837**
1.1.1.1 Gross Inflows/Gross Investments	**83676**	**6301**	**8377**	**6301**	**6685**	**8377**
1.1.1.1.1 Equity	59826	4509	6528	4509	4723	6528
1.1.1.1.1.1 Government (SIA/FIPB)	1698	3	63	3	60	63
1.1.1.1.1.2 RBI	42932	4204	5839	4204	4226	5839
1.1.1.1.1.3 Acquisition of shares	14143	233	558	233	307	558
1.1.1.1.1.4 Equity capital of unincorporated bodies	1052	69	69	69	129	69
1.1.1.1.2 Reinvested earnings	18647	1461	1461	1461	1506	1461
1.1.1.1.3 Other capital	5204	332	388	332	456	388
1.1.1.2 Repatriation/Disinvestment	**28602**	**1970**	**2540**	**1970**	**2378**	**2540**
1.1.1.2.1 Equity	27184	1939	2450	1939	2106	2450
1.1.1.2.2 Other capital	1417	31	91	31	272	91
1.1.2 Foreign Direct Investment by India (1.1.2.1+1.1.2.2+1.1.2.3–1.1.2.4)	**15699**	**1847**	**807**	**1847**	**1570**	**807**
1.1.2.1 Equity capital	8804	653	336	653	1006	336
1.1.2.2 Reinvested Earnings	2744	221	221	221	251	221
1.1.2.3 Other Capital	7542	1153	453	1153	1130	453
1.1.2.4 Repatriation/Disinvestment	3391	181	204	181	816	204
1.2 Net Portfolio Investment (1.2.1+1.2.2+1.2.3–1.2.4)	**-17225**	**-1816**	**-4160**	**-1816**	**-5251**	**-4160**
1.2.1 GDRs/ADRs	–	–	–	–	–	–
1.2.2 FIIs	-14541	-1824	-4071	-1824	-5201	-4071
1.2.3 Offshore funds and others	–	–	–	–	–	–
1.2.4 Portfolio investment by India	2683	-8	89	-8	50	89
1 Foreign Investment Inflows	**22151**	**668**	**870**	**668**	**-2515**	**870**

No. 35: Outward Remittances under the Liberalised Remittance Scheme (LRS) for Resident Individuals

(US$ Million)

Item	2021-22	2021	2022		
		Apr.	Feb.	Mar.	Apr.
	1	2	3	4	5
1 Outward Remittances under the LRS	**19610.77**	**1188.18**	**1823.35**	**1968.77**	**2023.70**
1.1 Deposit	830.05	75.78	54.20	182.61	113.90
1.2 Purchase of immovable property	112.90	9.19	8.07	16.35	14.09
1.3 Investment in equity/debt	746.57	51.78	60.39	104.51	76.24
1.4 Gift	2336.29	161.56	201.36	276.19	299.20
1.5 Donations	16.55	0.72	3.28	0.65	0.85
1.6 Travel	6909.04	284.76	980.45	776.64	880.78
1.7 Maintenance of close relatives	3302.37	240.74	282.61	391.02	385.57
1.8 Medical Treatment	37.79	2.16	3.69	4.21	4.51
1.9 Studies Abroad	5165.33	353.49	216.07	202.25	232.95
1.10 Others	153.88	8.00	13.23	14.33	15.59

No. 36: Indices of Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) of the Indian Rupee

Item	2020-21	2021-22	2021	2022	
			May	April	May
	1	2	3	4	5
40-Currency Basket (Base: 2015-16=100)					
1 Trade-weighted					
1.1 NEER	93.92	93.13	93.25	93.32	93.34
1.2 REER	103.46	104.66	104.32	103.46	104.90
2 Export-weighted					
2.1 NEER	93.59	93.55	93.42	94.48	94.46
2.2 REER	102.96	103.48	103.21	102.37	103.64
6-Currency Basket (Trade-weighted)					
1 Base: 2015-16 = 100					
1.1 NEER	88.45	87.03	87.28	87.59	88.04
1.2 REER	101.84	102.27	101.91	103.22	104.49
2 Base: 2020-21 = 100					
2.1 NEER	100.00	98.39	98.67	99.03	99.53
2.2 REER	100.00	100.42	100.07	101.35	102.60

No. 37: External Commercial Borrowings (ECBs) – Registrations

(Amount in US$ Million)

Item	2021-22	2021	2022	
		Apr	Mar	Apr
	1	2	3	4
1 Automatic Route				
1.1 Number	1086	111	115	65
1.2 Amount	28851	2723	3938	362
2 Approval Route				
2.1 Number	18	0	2	0
2.2 Amount	11035	0	1104	0
3 Total (1+2)				
3.1 Number	1104	111	117	65
3.2 Amount	39886	2723	5042	362
4 Weighted Average Maturity (in years)	8.00	6.25	5.90	5.30
5 Interest Rate (per cent)				
5.1 Weighted Average Margin over 6-month LIBOR or reference rate for Floating Rate Loans	1.71	2.10	1.23	1.63
5.2 Interest rate range for Fixed Rate Loans	0.00-10.50	0.00-9.90	0.00-11.50	0.00-11.80
Borrower Category				
I. Corporate Manufacturing	12244	647	680	174
II. Corporate-Infrastructure	17023	2004	2987	56
a.) Transport	1597	34	36	50
b.) Energy	8215	1945	1150	5
c.) Water and Sanitation	10	0	0	0
d.) Communication	1258	0	750	0
e.) Social and Commercial Infrastructure	0	0	0	0
f.) Exploration,Mining and Refinery	4691	0	1051	0
g.) Other Sub-Sectors	1252	24	0	1
III. Corporate Service-Sector	1570	21	53	113
IV. Other Entities	609	0	9	0
a.) units in SEZ	9	0	9	1
b.) SIDBI				
c.) Exim Bank	600	0	0	0
V. Banks	100	0	0	0
VI. Financial Institution (Other than NBFC)	4	0	0	0
VII. NBFCs	7995	27	1216	8
a). NBFC- IFC/AFC	5621	0	1118	0
b). NBFC-MFI	93	27	27	8
c). NBFC-Others	2282	0	71	0
VIII. Non-Government Organization (NGO)	0	0	0	0
IX. Micro Finance Institution (MFI)	0	0	0	0
X. Others	341	25	97	10

No. 38: India's Overall Balance of Payments

(US$ Million)

Item	Oct-Dec 2020			Oct-Dec 2021(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
Overall Balance of Payments(1+2+3)	**328716**	**296233**	**32483**	**427028**	**426562**	**465**
1 CURRENT ACCOUNT (1.1+ 1.2)	**156966**	**159200**	**-2235**	**205430**	**228454**	**-23024**
1.1 MERCHANDISE	**77218**	**111820**	**-34602**	**108970**	**169395**	**-60425**
1.2 INVISIBLES (1.2.1+1.2.2+1.2.3)	**79748**	**47380**	**32367**	**96461**	**59059**	**37402**
1.2.1 Services	53339	30103	23237	67018	39207	27811
1.2.1.1 Travel	2170	2836	-667	2745	4335	-1590
1.2.1.2 Transportation	5602	5147	455	8950	10037	-1088
1.2.1.3 Insurance	575	577	-2	845	644	201
1.2.1.4 G.n.i.e.	179	260	-82	223	264	-41
1.2.1.5 Miscellaneous	44815	21282	23532	54256	23927	30329
1.2.1.5.1 Software Services	25782	2312	23470	31740	3384	28356
1.2.1.5.2 Business Services	12930	12807	123	15312	13722	1590
1.2.1.5.3 Financial Services	1068	1192	-124	1354	1535	-181
1.2.1.5.4 Communication Services	738	381	357	801	276	524
1.2.2 Transfers	20757	1498	19258	23528	2216	21312
1.2.2.1 Official	62	298	-236	132	267	-135
1.2.2.2 Private	20695	1200	19494	23396	1949	21447
1.2.3 Income	5652	15779	-10128	5914	17636	-11721
1.2.3.1 Investment Income	4118	15063	-10945	4267	16841	-12574
1.2.3.2 Compensation of Employees	1534	717	818	1647	794	853
2 CAPITAL ACCOUNT (2.1+2.2+2.3+2.4+2.5)	**171174**	**137033**	**34141**	**221313**	**198108**	**23205**
2.1 Foreign Investment (2.1.1+2.1.2)	**120012**	**81415**	**38597**	**147673**	**148394**	**-721**
2.1.1 Foreign Direct Investment	28407	11027	17380	19591	14471	5120
2.1.1.1 In India	26926	6932	19994	19015	10192	8823
2.1.1.1.1 Equity	21843	6919	14924	12259	9936	2324
2.1.1.1.2 Reinvested Earnings	4392		4392	5073		5073
2.1.1.1.3 Other Capital	691	13	678	1683	257	1426
2.1.1.2 Abroad	1480	4094	-2614	576	4278	-3702
2.1.1.2.1 Equity	1480	1949	-469	576	2215	-1639
2.1.1.2.2 Reinvested Earnings	0	753	-753	0	663	-663
2.1.1.2.3 Other Capital	0	1392	-1392	0	1400	-1400
2.1.2 Portfolio Investment	91605	70388	21217	128082	133924	-5842
2.1.2.1 In India	91216	69514	21703	127509	132213	-4704
2.1.2.1.1 FIIs	91216	69514	21703	127509	132213	-4704
2.1.2.1.1.1 Equity	80566	60741	19825	115423	119516	-4093
2.1.2.1.1.2 Debt	10650	8772	1877	12086	12697	-611
2.1.2.1.2 ADR/GDRs	0	0	0	0	0	0
2.1.2.2 Abroad	389	875	-485	573	1711	-1138
2.2 Loans (2.2.1+2.2.2+2.2.3)	**19712**	**19393**	**319**	**29363**	**19137**	**10226**
2.2.1 External Assistance	2567	1383	1184	2692	1399	1293
2.2.1.1 By India	10	21	-11	13	16	-3
2.2.1.2 To India	2557	1362	1195	2680	1383	1297
2.2.2 Commercial Borrowings	6692	7786	-1094	6041	6092	-51
2.2.2.1 By India	970	484	486	352	241	111
2.2.2.2 To India	5722	7302	-1580	5689	5851	-162
2.2.3 Short Term to India	10453	10224	229	20629	11645	8984
2.2.3.1 Buyers' credit & Suppliers' Credit >180 days	9538	10224	-686	12003	11645	357
2.2.3.2 Suppliers' Credit up to 180 days	915	0	915	8626	0	8626
2.3 Banking Capital (2.3.1+2.3.2)	**21093**	**28707**	**-7614**	**25913**	**17707**	**8206**
2.3.1 Commercial Banks	20700	28707	-8007	25913	17501	8412
2.3.1.1 Assets	5384	15872	-10489	11213	6154	5058
2.3.1.2 Liabilities	15316	12834	2481	14700	11346	3353
2.3.1.2.1 Non-Resident Deposits	14151	11183	2969	12141	10809	1332
2.3.2 Others	393	0	393	0	206	-206
2.4 Rupee Debt Service		0	0	0	0	0
2.5 Other Capital	10358	7519	2839	18365	12871	5494
3 Errors & Omissions	**576**		**576**	**284**		**284**
4 Monetary Movements (4.1+ 4.2)	0	**32483**	**-32483**	0	**465**	**-465**
4.1 I.M.F.	0	0	0	0	0	0
4.2 Foreign Exchange Reserves (Increase - / Decrease +)		32483	-32483	0	465	-465

Note : P : Preliminary

No. 39: India's Overall Balance of Payments

(₹ Crore)

Item	Oct-Dec 2020			Oct-Dec 2021(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
Overall Balance of Payments(1+2+3)	**2424516**	**2184933**	**239583**	**3199638**	**3196151**	**3487**
1 CURRENT ACCOUNT (1.1+ 1.2)	**1157735**	**1174217**	**-16482**	**1539250**	**1711763**	**-172513**
1.1 MERCHANDISE	**569540**	**824754**	**-255214**	**816489**	**1269245**	**-452756**
1.2 INVISIBLES (1.2.1+1.2.2+1.2.3)	**588196**	**349463**	**238733**	**722761**	**442518**	**280243**
1.2.1 Services	393415	222028	171388	502154	293770	208384
1.2.1.1 Travel	16002	20921	-4919	20568	32478	-11910
1.2.1.2 Transportation	41319	37963	3355	67059	75208	-8149
1.2.1.3 Insurance	4238	4254	-17	6329	4826	1503
1.2.1.4 G.n.i.e.	1317	1918	-601	1668	1976	-309
1.2.1.5 Miscellaneous	330540	156971	173569	406530	179282	227248
1.2.1.5.1 Software Services	190159	17051	173108	237819	25352	212467
1.2.1.5.2 Business Services	95368	94463	905	114730	102817	11913
1.2.1.5.3 Financial Services	7879	8793	-914	10149	11503	-1354
1.2.1.5.4 Communication Services	5440	2809	2632	6000	2071	3929
1.2.2 Transfers	153095	11051	142044	176292	16607	159685
1.2.2.1 Official	457	2199	-1742	991	2002	-1011
1.2.2.2 Private	152638	8852	143786	175301	14605	160696
1.2.3 Income	41685	116384	-74699	44315	132141	-87826
1.2.3.1 Investment Income	30370	111099	-80729	31975	126190	-94216
1.2.3.2 Compensation of Employees	11315	5285	6030	12340	5951	6389
2 CAPITAL ACCOUNT (2.1+2.2+2.3+2.4+2.5)	**1262531**	**1010716**	**251816**	**1658258**	**1484387**	**173871**
2.1 Foreign Investment (2.1.1+2.1.2)	**885174**	**600491**	**284682**	**1106486**	**1111889**	**-5404**
2.1.1 Foreign Direct Investment	209519	81329	128190	146792	108426	38366
2.1.1.1 In India	198601	51132	147469	142477	76370	66107
2.1.1.1.1 Equity	161110	51035	110074	91857	74446	17411
2.1.1.1.2 Reinvested Earnings	32393	0	32393	38013	0	38013
2.1.1.1.3 Other Capital	5098	96	5002	12608	1925	10683
2.1.1.2 Abroad	10918	30197	-19279	4315	32056	-27741
2.1.1.2.1 Equity	10918	14377	-3459	4315	16597	-12282
2.1.1.2.2 Reinvested Earnings	0	5556	-5556	0	4971	-4971
2.1.1.2.3 Other Capital	0	10264	-10264	0	10487	-10487
2.1.2 Portfolio Investment	675655	519162	156492	959694	1003463	-43770
2.1.2.1 In India	672784	512712	160072	955401	990645	-35244
2.1.2.1.1 FIIs	672784	512712	160072	955401	990645	-35244
2.1.2.1.1.1 Equity	594234	448009	146225	864845	895510	-30665
2.1.2.1.1.2 Debt	78550	64703	13847	90555	95135	-4580
2.1.2.1.2 ADR/GDRs	0	0	0	0	0	0
2.1.2.2 Abroad	2871	6450	-3580	4293	12818	-8525
2.2 Loans (2.2.1+2.2.2+2.2.3)	**145387**	**143035**	**2352**	**220011**	**143386**	**76625**
2.2.1 External Assistance	18933	10202	8731	20174	10483	9690
2.2.1.1 By India	71	153	-82	95	120	-26
2.2.1.2 To India	18862	10049	8813	20079	10363	9716
2.2.2 Commercial Borrowings	49355	57424	-8070	45268	45646	-378
2.2.2.1 By India	7153	3567	3586	2638	1806	833
2.2.2.2 To India	42202	53857	-11655	42629	43840	-1211
2.2.3 Short Term to India	77100	75409	1690	154570	87257	67313
2.2.3.1 Buyers' credit & Suppliers' Credit >180 days	70350	75409	-5059	89934	87257	2677
2.2.3.2 Suppliers' Credit up to 180 days	6749	0	6749	64636	0	64636
2.3 Banking Capital (2.3.1+2.3.2)	**155574**	**211734**	**-56160**	**194158**	**132675**	**61483**
2.3.1 Commercial Banks	152674	211734	-59060	194158	131130	63028
2.3.1.1 Assets	39708	117071	-77362	84016	46113	37902
2.3.1.2 Liabilities	112966	94663	18303	110142	85016	25126
2.3.1.2.1 Non-Resident Deposits	104375	82480	21896	90969	80991	9978
2.3.2 Others	2900	0	2900	0	1546	-1546
2.4 Rupee Debt Service	0	0	0	0	0	0
2.5 Other Capital	76397	55456	20941	137603	96436	41167
3 Errors & Omissions	**4249**	0	**4249**	**2129**	0	**2129**
4 Monetary Movements (4.1+ 4.2)	0	**239583**	**-239583**	0	**3487**	**-3487**
4.1 I.M.F.	0	0	0	0	0	0
4.2 Foreign Exchange Reserves (Increase - / Decrease +)	0	239583	-239583	0	3487	-3487

Note : P: Preliminary

No. 40: Standard Presentation of BoP in India as per BPM6

(US$ Million)

Item	Oct-Dec 2020			Oct-Dec 2021(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
1 Current Account (1.A+1.B+1.C)	**156961**	**159174**	**-2212**	**205419**	**228432**	**-23013**
1.A Goods and Services (1.A.a+1.A.b)	**130557**	**141923**	**-11365**	**175988**	**208602**	**-32614**
1.A.a Goods (1.A.a.1 to 1.A.a.3)	**77218**	**111820**	**-34602**	**108970**	**169395**	**-60425**
1.A.a.1 General merchandise on a BOP basis	76304	101812	-25508	108854	155340	-46486
1.A.a.2 Net exports of goods under merchanting	914	0	914	116	0	116
1.A.a.3 Nonmonetary gold		10008	-10008		14055	-14055
1.A.b Services (1.A.b.1 to 1.A.b.13)	**53339**	**30103**	**23237**	**67018**	**39207**	**27811**
1.A.b.1 Manufacturing services on physical inputs owned by others	49	5	45	129	17	112
1.A.b.2 Maintenance and repair services n.i.e.	38	291	-253	68	394	-326
1.A.b.3 Transport	5602	5147	455	8950	10037	-1088
1.A.b.4 Travel	2170	2836	-667	2745	4335	-1590
1.A.b.5 Construction	619	705	-86	750	592	158
1.A.b.6 Insurance and pension services	575	577	-2	845	644	201
1.A.b.7 Financial services	1068	1192	-124	1354	1535	-181
1.A.b.8 Charges for the use of intellectual property n.i.e.	359	2297	-1937	238	2363	-2125
1.A.b.9 Telecommunications, computer, and information services	26593	2810	23783	32638	3813	28825
1.A.b.10 Other business services	12930	12807	123	15312	13722	1590
1.A.b.11 Personal, cultural, and recreational services	579	768	-190	834	1205	-371
1.A.b.12 Government goods and services n.i.e.	179	260	-82	223	264	-41
1.A.b.13 Others n.i.e.	2579	408	2171	2933	286	2647
1.B Primary Income (1.B.1 to 1.B.3)	**5652**	**15779**	**-10128**	**5914**	**17636**	**-11721**
1.B.1 Compensation of employees	1534	717	818	1647	794	853
1.B.2 Investment income	3126	14713	-11587	2886	16554	-13668
1.B.2.1 Direct investment	1631	9693	-8062	1568	11635	-10067
1.B.2.2 Portfolio investment	67	1974	-1906	88	1941	-1853
1.B.2.3 Other investment	130	3045	-2916	82	2976	-2893
1.B.2.4 Reserve assets	1298	1	1297	1147	2	1144
1.B.3 Other primary income	992	349	642	1382	287	1094
1.C Secondary Income (1.C.1+1.C.2)	**20752**	**1472**	**19281**	**23516**	**2194**	**21322**
1.C.1 Financial corporations, nonfinancial corporations, households, and NPISHs	20695	1200	19494	23396	1949	21447
1.C.1.1 Personal transfers (Current transfers between resident and/ non-resident households)	19969	847	19122	22443	1359	21084
1.C.1.2 Other current transfers	725	353	373	953	590	363
1.C.2 General government	58	272	-214	121	245	-125
2 Capital Account (2.1+2.2)	**98**	**265**	**-167**	**227**	**430**	**-202**
2.1 Gross acquisitions (DR.)/disposals (CR.) of non-produced nonfinancial assets	4	109	-105	94	166	-71
2.2 Capital transfers	94	156	-62	133	264	-131
3 Financial Account (3.1 to 3.5)	**171080**	**169277**	**1803**	**221098**	**198166**	**22932**
3.1 Direct Investment (3.1A+3.1B)	**28407**	**11027**	**17380**	**19591**	**14471**	**5120**
3.1.A Direct Investment in India	26926	6932	19994	19015	10192	8823
3.1.A.1 Equity and investment fund shares	26235	6919	19316	17333	9936	7397
3.1.A.1.1 Equity other than reinvestment of earnings	21843	6919	14924	12259	9936	2324
3.1.A.1.2 Reinvestment of earnings	4392		4392	5073		5073
3.1.A.2 Debt instruments	691	13	678	1683	257	1426
3.1.A.2.1 Direct investor in direct investment enterprises	691	13	678	1683	257	1426
3.1.B Direct Investment by India	1480	4094	-2614	576	4278	-3702
3.1.B.1 Equity and investment fund shares	1480	2702	-1222	576	2879	-2303
3.1.B.1.1 Equity other than reinvestment of earnings	1480	1949	-469	576	2215	-1639
3.1.B.1.2 Reinvestment of earnings		753	-753		663	-663
3.1.B.2 Debt instruments	0	1392	-1392	0	1400	-1400
3.1.B.2.1 Direct investor in direct investment enterprises		1392	-1392		1400	-1400
3.2 Portfolio Investment	**91605**	**70388**	**21217**	**128082**	**133924**	**-5842**
3.2.A Portfolio Investment in India	91216	69514	21703	127509	132213	-4704
3.2.1 Equity and investment fund shares	80566	60741	19825	115423	119516	-4093
3.2.2 Debt securities	10650	8772	1877	12086	12697	-611
3.2.B Portfolio Investment by India	389	875	-485	573	1711	-1138
3.3 Financial derivatives (other than reserves) and employee stock options	**2748**	**3818**	**-1071**	**4851**	**6752**	**-1902**
3.4 Other investment	**48321**	**51562**	**-3241**	**68574**	**42554**	**26020**
3.4.1 Other equity (ADRs/GDRs)	0	0	0	0	0	0
3.4.2 Currency and deposits	14544	11183	3362	12141	11015	1125
3.4.2.1 Central bank (Rupee Debt Movements; NRG)	393	0	393	0	206	-206
3.4.2.2 Deposit-taking corporations, except the central bank (NRI Deposits)	14151	11183	2969	12141	10809	1332
3.4.2.3 General government			0			0
3.4.2.4 Other sectors			0			0
3.4.3 Loans (External Assistance, ECBs and Banking Capital)	15807	26693	-10886	22506	14183	8323
3.4.3.A Loans to India	14827	26189	-11361	22141	13926	8215
3.4.3.B Loans by India	979	504	475	365	257	108
3.4.4 Insurance, pension, and standardized guarantee schemes	55	44	11	70	89	-19
3.4.5 Trade credit and advances	10453	10224	229	20629	11645	8984
3.4.6 Other accounts receivable/payable - other	7462	3418	4044	13229	5621	7607
3.4.7 Special drawing rights			0			
3.5 Reserve assets	0	**32483**	**-32483**	0	**465**	**-465**
3.5.1 Monetary gold			0			0
3.5.2 Special drawing rights n.a.			0			0
3.5.3 Reserve position in the IMF n.a.			0			0
3.5.4 Other reserve assets (Foreign Currency Assets)	0	32483	-32483	0	465	-465
4 Total assets/liabilities	**171080**	**169277**	**1803**	**221098**	**198166**	**22932**
4.1 Equity and investment fund shares	111473	75100	36373	138825	140882	-2057
4.2 Debt instruments	52145	58277	-6131	69044	51197	17847
4.3 Other financial assets and liabilities	7462	35901	-28439	13229	6087	7142
5 Net errors and omissions	**576**		**576**	**284**		**284**

No. 41: Standard Presentation of BoP in India as per BPM6

(₹ Crore)

Item	Oct-Dec 2020			Oct-Dec 2021(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
1 Current Account (1.A+1.B+1.C)	**1157704**	**1174021**	**-16317**	**1539162**	**1711598**	**-172436**
1.A Goods and Services (1.A.a+1.A.b)	**962955**	**1046782**	**-83827**	**1318643**	**1563015**	**-244372**
1.A.a Goods (1.A.a.1 to 1.A.a.3)	**569540**	**824754**	**-255214**	**816489**	**1269245**	**-452756**
1.A.a.1 General merchandise on a BOP basis	562796	750936	-188140	815620	1163930	-348311
1.A.a.2 Net exports of goods under merchanting	6744	0	6744	869	0	869
1.A.a.3 Nonmonetary gold		73819	-73819	0	105315	-105315
1.A.b Services (1.A.b.1 to 1.A.b.13)	**393415**	**222028**	**171388**	**502154**	**293770**	**208384**
1.A.b.1 Manufacturing services on physical inputs owned by others	364	34	330	967	127	839
1.A.b.2 Maintenance and repair services n.i.e.	281	2143	-1863	506	2950	-2444
1.A.b.3 Transport	41319	37963	3355	67059	75208	-8149
1.A.b.4 Travel	16002	20921	-4919	20568	32478	-11910
1.A.b.5 Construction	4565	5197	-633	5621	4437	1183
1.A.b.6 Insurance and pension services	4238	4254	-17	6329	4826	1503
1.A.b.7 Financial services	7879	8793	-914	10149	11503	-1354
1.A.b.8 Charges for the use of intellectual property n.i.e.	2651	16941	-14290	1784	17709	-15926
1.A.b.9 Telecommunications, computer, and information services	196143	20727	175416	244549	28566	215983
1.A.b.10 Other business services	95368	94463	905	114730	102817	11913
1.A.b.11 Personal, cultural, and recreational services	4269	5668	-1398	6250	9030	-2780
1.A.b.12 Government goods and services n.i.e.	1317	1918	-601	1668	1976	-309
1.A.b.13 Others n.i.e.	19020	3006	16015	21975	2142	19833
1.B Primary Income (1.B.1 to 1.B.3)	**41685**	**116384**	**-74699**	**44315**	**132141**	**-87826**
1.B.1 Compensation of employees	11315	5285	6030	12340	5951	6389
1.B.2 Investment income	23057	108522	-85465	21622	124037	-102415
1.B.2.1 Direct investment	12030	71495	-59464	11752	87181	-75429
1.B.2.2 Portfolio investment	497	14556	-14059	661	14541	-13881
1.B.2.3 Other investment	957	22462	-21506	617	22297	-21679
1.B.2.4 Reserve assets	9573	9	9564	8592	18	8574
1.B.3 Other primary income	7313	2577	4736	10353	2153	8199
1.C Secondary Income (1.C.1+1.C.2)	**153064**	**10855**	**142209**	**176205**	**16442**	**159763**
1.C.1 Financial corporations, nonfinancial corporations, households, and NPISHs	152638	8852	143786	175301	14605	160696
1.C.1.1 Personal transfers (Current transfers between resident and/ non-resident households)	147287	6249	141038	168163	10186	157977
1.C.1.2 Other current transfers	5351	2603	2748	7138	4419	2719
1.C.2 General government	426	2003	-1577	903	1837	-933
2 Capital Account (2.1+2.2)	**724**	**1955**	**-1232**	**1704**	**3220**	**-1516**
2.1 Gross acquisitions (DR.)/disposals (CR.) of non-produced nonfinancial assets	32	803	-772	707	1241	-535
2.2 Capital transfers	692	1152	-460	998	1979	-981
3 Financial Account (3.1 to 3.5)	**1261839**	**1248540**	**13299**	**1656642**	**1484820**	**171822**
3.1 Direct Investment (3.1A+3.1B)	**209519**	**81329**	**128190**	**146792**	**108426**	**38366**
3.1.A Direct Investment in India	198601	51132	147469	142477	76370	66107
3.1.A.1 Equity and investment fund shares	193502	51035	142467	129870	74446	55424
3.1.A.1.1 Equity other than reinvestment of earnings	161110	51035	110074	91857	74446	17411
3.1.A.1.2 Reinvestment of earnings	32393	0	32393	38013	0	38013
3.1.A.2 Debt instruments	5098	96	5002	12608	1925	10683
3.1.A.2.1 Direct investor in direct investment enterprises	5098	96	5002	12608	1925	10683
3.1.B Direct Investment by India	10918	30197	-19279	4315	32056	-27741
3.1.B.1 Equity and investment fund shares	10918	19933	-9015	4315	21568	-17253
3.1.B.1.1 Equity other than reinvestment of earnings	10918	14377	-3459	4315	16597	-12282
3.1.B.1.2 Reinvestment of earnings	0	5556	-5556	0	4971	-4971
3.1.B.2 Debt instruments	0	10264	-10264	0	10487	-10487
3.1.B.2.1 Direct investor in direct investment enterprises	0	10264	-10264	0	10487	-10487
3.2 Portfolio Investment	**675655**	**519162**	**156492**	**959694**	**1003463**	**-43770**
3.2.A Portfolio Investment in India	672784	512712	160072	955401	990645	-35244
3.2.1 Equity and investment fund shares	594234	448009	146225	864845	895510	-30665
3.2.2 Debt securities	78550	64703	13847	90555	95135	-4580
3.2.B Portfolio Investment by India	2871	6450	-3580	4293	12818	-8525
3.3 Financial derivatives (other than reserves) and employee stock options	**20265**	**28161**	**-7896**	**36345**	**50593**	**-14248**
3.4 Other investment	**356400**	**380304**	**-23904**	**513811**	**318850**	**194961**
3.4.1 Other equity (ADRs/GDRs)	0	0	0	0	0	0
3.4.2 Currency and deposits	107275	82480	24796	90969	82537	8432
3.4.2.1 Central bank (Rupee Debt Movements; NRG)	2900	0	2900	0	1546	-1546
3.4.2.2 Deposit-taking corporations, except the central bank (NRI Deposits)	104375	82480	21896	90969	80991	9978
3.4.2.3 General government			0			
3.4.2.4 Other sectors			0			
3.4.3 Loans (External Assistance, ECBs and Banking Capital)	116586	196880	-80294	168631	106268	62362
3.4.3.A Loans to India	109363	193160	-83798	165898	104342	61555
3.4.3.B Loans by India	7224	3720	3504	2733	1926	807
3.4.4 Insurance, pension, and standardized guarantee schemes	404	326	78	522	668	-146
3.4.5 Trade credit and advances	77100	75409	1690	154570	87257	67313
3.4.6 Other accounts receivable/payable - other	55035	25209	29825	99120	42120	56999
3.4.7 Special drawing rights	0	0	0	0	0	0
3.5 Reserve assets	**0**	**239583**	**-239583**	**0**	**3487**	**-3487**
3.5.1 Monetary gold			0	0	0	0
3.5.2 Special drawing rights n.a.			0	0	0	0
3.5.3 Reserve position in the IMF n.a.			0	0	0	0
3.5.4 Other reserve assets (Foreign Currency Assets)	0	239583	-239583	0	3487	-3487
4 Total assets/liabilities	**1261839**	**1248540**	**13299**	**1656642**	**1484820**	**171822**
4.1 Equity and investment fund shares	822194	553914	268280	1040190	1055603	-15414
4.2 Debt instruments	384610	429833	-45223	517332	383609	133724
4.3 Other financial assets and liabilities	55035	264793	-209758	99120	45607	53512
5 Net errors and omissions	**4249**		**4249**	**2129**	**0**	**2129**

Note : P: Preliminary

No. 42: International Investment Position

(US$ Million)

Item	As on Financial Year /Quarter End							
	2020-21		2020		2021			
			Dec.		Sep.		Dec.	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
	1	2	3	4	5	6	7	8
1. Direct investment Abroad/in India	193929	482234	190857	480255	202675	506835	206378	514292
1.1 Equity Capital*	122726	456947	122489	454603	126945	480753	129248	487905
1.2 Other Capital	71203	25286	68368	25651	75730	26082	77130	26386
2. Portfolio investment	7936	278524	6277	270276	8578	282598	9716	277231
2.1 Equity	2340	177278	2482	170630	4590	177034	6444	172794
2.2 Debt	5596	101245	3795	99647	3988	105564	3272	104437
3. Other investment	80606	453950	69382	446978	84517	478419	76504	492569
3.1 Trade credit	5644	100343	3196	102598	11819	104450	12891	113463
3.2 Loan	13335	197464	10610	192181	10831	201073	8871	203970
3.3 Currency and Deposits	42436	143760	37343	142491	42302	142904	34796	143502
3.4 Other Assets/Liabilities	19191	12384	18234	9708	19565	29991	19946	31633
4. Reserves	576984		585771		635363		633614	
5. Total Assets / Liabilities	859454	1214707	852286	1197509	931134	1267851	926212	1284091
6. Net IIP (Assets - Liabilities)		**–355253**		**–345223**		**–336718**		**–357880**

Note: * Equity capital includes share of investment funds and reinvested earnings.

Payment and Settlement Systems

No.43: Payment System Indicators

PART I - Payment System Indicators - Payment & Settlement System Statistics

System	Volume (Lakh)				Value (₹ Crore)			
	FY 2020-21	2021	2022		FY 2020-21	2021	2022	
		Apr.	Mar.	Apr.		Apr.	Mar.	Apr.
	1	2	3	4	5	6	7	8
A. Settlement Systems								
Financial Market Infrastructures (FMIs)								
1 CCIL Operated Systems (1.1 to 1.3)	33.01	2.36	3.25	3.06	206873112	15138384	20588727	18651860
1.1 Govt. Securities Clearing (1.1.1 to 1.1.3)	12.22	0.83	1.04	1.08	142072939	9963717	13682354	11915370
1.1.1 Outright	6.21	0.41	0.46	0.59	8793301	739674	660443	870328
1.1.2 Repo	3.09	0.21	0.30	0.25	51015712	3829853	5341282	4315711
1.1.3 Tri-party Repo	2.92	0.20	0.27	0.23	82263926	5394189	7680629	6729332
1.2 Forex Clearing	19.90	1.49	2.11	1.87	59775826	4913256	6232193	6124936
1.3 Rupee Derivatives @	0.88	0.05	0.11	0.11	5024347	261411	674180	611554
B. Payment Systems								
I Financial Market Infrastructures (FMIs)	–	–	–	–	–	–	–	–
1 Credit Transfers - RTGS (1.1 to 1.2)	2078.39	151.52	230.04	195.32	128657516	8802868	14458955	11097594
1.1 Customer Transactions	2063.73	150.19	228.68	194.11	113319292	7555042	13069669	9780600
1.2 Interbank Transactions	14.66	1.33	1.36	1.21	15338225	1247825	1389286	1316994
II Retail								
2 Credit Transfers - Retail (2.1 to 2.6)	577631.89	34506.22	66272.08	66747.57	42722828	2946342	5062364	4050335
2.1 AePS (Fund Transfers) @	9.76	0.94	0.56	0.55	575	61	35	33
2.2 APBS $	12298.50	972.73	1154.92	1119.53	133052	5383	15462	11118
2.3 IMPS	46625.25	3229.68	4920.01	4716.26	4171037	299542	462279	444670
2.4 NACH Cr $	18729.79	1029.55	1825.88	1329.76	1276801	101457	131428	112354
2.5 NEFT	40407.29	2862.71	4314.20	3737.59	28725463	2046235	3492578	2498587
2.6 UPI @	459561.30	26410.61	54056.51	55843.88	8415900	493664	960582	983573
2.6.1 of which USSD @	11.99	0.96	0.91	0.86	177	15	12	12
3 Debit Transfers and Direct Debits (3.1 to 3.3)	12222.27	961.29	1136.67	1121.68	1038334	79291	98645	93616
3.1 BHIM Aadhaar Pay @	227.73	13.88	19.47	16.76	6114	377	640	580
3.2 NACH Dr $	10787.53	854.05	979.27	996.72	1030532	78776	97801	92902
3.3 NETC (linked to bank account) @	1207.01	93.36	137.93	108.20	1690	139	204	135
4 Card Payments (4.1 to 4.2)	61782.94	4788.55	5512.70	5541.17	1701851	115232	171159	170521
4.1 Credit Cards (4.1.1 to 4.1.2)	22398.83	1575.32	2237.51	2229.30	971638	59049	107107	105459
4.1.1 PoS based $	11124.59	782.31	1134.33	1152.87	380643	26314	38777	39807
4.1.2 Others $	11274.23	793.00	1103.18	1076.43	590994	32735	68330	65652
4.2 Debit Cards (4.2.1 to 4.2.1)	39384.11	3213.23	3275.19	3311.87	730213	56183	64052	65062
4.2.1 PoS based $	22967.10	1794.37	2078.45	2131.77	451550	35621	40770	43530
4.2.2 Others $	16417.00	1418.86	1196.73	1180.10	278663	20562	23282	21532
5 Prepaid Payment Instruments (5.1 to 5.2)	65812.39	4800.66	6567.09	6551.30	293658	22148	27865	27664
5.1 Wallets	52683.01	3963.08	5016.86	5036.15	226645	14421	20054	19360
5.2 Cards (5.2.1 to 5.2.2)	13129.38	837.58	1550.23	1515.15	67014	7727	7811	8305
5.2.1 PoS based $	1066.47	50.39	164.77	169.34	18123	1517	2860	3183
5.2.2 Others $	12062.91	787.19	1385.46	1345.81	48891	6209	4951	5121
6 Paper-based Instruments (6.1 to 6.2)	6999.12	557.79	702.93	624.01	6650332	553322	694335	670259
6.1 CTS (NPCI Managed)	6999.12	557.79	702.93	624.01	6650332	553322	694335	670259
6.2 Others	0.00	–	–	–	–	–	–	–
Total - Retail Payments (2+3+4+5+6)	724448.61	45614.50	80191.47	80585.73	52407004	3716336	6054368	5012396
Total Payments (1+2+3+4+5+6)	726527.00	45766.02	80421.51	80781.06	181064521	12519204	20513323	16109991
Total Digital Payments (1+2+3+4+5)	719527.88	45208.23	79718.58	80157.05	174414188	11965881	19818988	15439731

PART II - Payment Modes and Channels

System	Volume (Lakh)				Value (₹ Crore)			
	FY 2020-21	2021	2022		FY 2020-21	2021	2022	
		Apr.	Mar.	Apr.		Apr.	Mar.	Apr.
	1	2	3	4	5	6	7	8
A. Other Payment Channels								
1 Mobile Payments (mobile app based) (1.1 to 1.2)	507531.40	32494.77	57378.44	59767.47	14973395	1006256	1652795	1683493
1.1 Intra-bank $	40805.67	2563.99	4218.03	4515.92	2726360	191178	298556	312756
1.2 Inter-bank $	466725.74	29930.78	53160.40	55251.55	12247035	815078	1354239	1370737
2 Internet Payments (Netbanking / Internet Browser Based) @ (2.1 to 2.2)	36127.50	2682.48	3915.10	3639.09	50121370	3180133	8831268	7155362
2.1 Intra-bank @	7375.30	567.04	995.71	964.04	23505766	1352169	5347683	4288061
2.2 Inter-bank @	28752.20	2115.44	2919.39	2675.04	26615604	1827964	3483584	2867301
B. ATMs								
3 Cash Withdrawal at ATMs $ (3.1 to 3.3)	65287.28	5256.36	5971.07	5834.29	3111927	255527	287374	286411
3.1 Using Credit Cards $	62.38	5.09	6.80	6.12	3130	258	344	303
3.2 Using Debit Cards $	64898.81	5226.23	5932.11	5796.88	3097741	254397	285893	285011
3.3 Using Pre-paid Cards $	326.11	25.03	32.16	31.28	11056	871	1138	1097
4 Cash Withdrawal at PoS $ (4.1 to 4.2)	92.26	22.06	2.79	2.74	805	133	57	54
4.1 Using Debit Cards $	79.42	18.85	2.21	2.24	557	111	21	22
4.2 Using Pre-paid Cards $	12.84	3.20	0.57	0.50	248	22	36	32
5 Cash Withrawal at Micro ATMs @	11126.04	725.35	1032.68	984.19	299776	21701	28479	27824
5.1 AePS @	11126.04	725.35	1032.68	984.19	299776	21701	28479	27824

PART III - Payment Infrastructures (Lakh)

System	As on March 2021	2021	2022	
		Apr.	Mar.	Apr.
	1	2	3	4
Payment System Infrastructures				
1 Number of Cards (1.1 to 1.2)	9912.93	9630.55	9912.93	9956.84
1.1 Credit Cards	736.27	622.60	736.27	751.66
1.2 Debit Cards	9176.66	9007.95	9176.66	9205.18
2 Number of PPIs @ (2.1 to 2.2)	27403.54	22216.97	27403.54	27405.90
2.1 Wallets @	24645.39	20249.78	24645.39	24748.38
2.2 Cards @	2758.15	1967.19	2758.15	2657.52
3 Number of ATMs (3.1 to 3.2)	2.48	2.40	2.48	2.49
3.1 Bank owned ATMs $	2.17	2.14	2.17	2.17
3.2 White Label ATMs $	0.32	0.25	0.32	0.32
4 Number of Micro ATMs @	7.81	4.14	7.81	8.16
5 Number of PoS Terminals	60.70	45.25	60.70	61.26
6 Bharat QR @	49.72	40.28	49.72	40.90
7 UPI QR *	1727.34	978.19	1727.34	1807.21

@: New inclusion w.e.f. November 2019
#: Data reported by Co-operative Banks, LABs and RRBs included with effect from December 2021.
$: Inclusion separately initiated from November 2019 - would have been part of other items hitherto.
*: New inclusion w.e.f. September 2020; Includes only static UPI QR Code

Note : 1. Data is provisional.
2. ECS (Debit and Credit) has been merged with NACH with effect from January 31, 2020.
3. The data from November 2019 onwards for card payments (Debit/Credit cards) and Prepaid Payment Instruments (PPIs) may not be comparable with earlier months/ periods, as more granular data is being published along with revision in data definitions.
4. Only domestic financial transactions are considered. The new format captures e-commerce transactions; transactions using FASTags, digital bill payments and card-to-card transfer through ATMs, etc.. Also, failed transactions, chargebacks, reversals, expired cards/ wallets, are excluded.

Occasional Series

No. 44: Small Savings

(₹ Crore)

Scheme		2020-21	2020	2021		
			Jun.	Apr.	May	Jun.
		1	2	3	4	5
1 Small Savings	**Receipts**	**181237**	**16063**	**10447**	**10536**	**18523**
	Outstanding	**1259585**	**1113107**	**1270014**	**1280538**	**1299066**
1.1 Total Deposits	**Receipts**	**132687**	**12968**	**7687**	**7975**	**13852**
	Outstanding	**867494**	**763577**	**875182**	**883158**	**897008**
1.1.1 Post Office Saving Bank Deposits	Receipts	39748	3933	1100	1246	3308
	Outstanding	205888	177232	206988	208234	211542
1.1.2 MGNREG	Receipts					
	Outstanding					
1.1.3 National Saving Scheme, 1987	Receipts	276	-13	-19	-11	-29
	Outstanding	3419	3122	3400	3389	3360
1.1.4 National Saving Scheme, 1992	Receipts	166	1	-3	-2	-4
	Outstanding	175	8	172	171	167
1.1.5 Monthly Income Scheme	Receipts	12211	1096	905	742	1389
	Outstanding	221379	210984	222284	223026	224414
1.1.6 Senior Citizen Scheme 2004	Receipts	21009	2024	1540	1118	2298
	Outstanding	97051	79523	98591	99710	102008
1.1.7 Post Office Time Deposits	Receipts	41470	3836	2973	2314	4546
	Outstanding	207557	172804	210531	212844	217390
1.1.7.1 1 year Time Deposits	Outstanding	108205	95703	109070	109647	110643
1.1.7.2 2 year Time Deposits	Outstanding	7473	7121	7515	7541	7616
1.1.7.3 3 year Time Deposits	Outstanding	7227	7506	7202	7183	7164
1.1.7.4 5 year Time Deposits	Outstanding	84652	62474	86744	88473	91967
1.1.8 Post Office Recurring Deposits	Receipts	17807	2091	1191	2568	2344
	Outstanding	132029	119908	133220	135788	138131
1.1.9 Post Office Cumulative Time Deposits	Receipts	0	0	0	0	0
	Outstanding	-25	-25	-25	-25	-25
1.1.10 Other Deposits	Receipts	0	0	0	0	0
	Outstanding	21	21	21	21	21
1.2 Saving Certificates	**Receipts**	**34860**	**2739**	**2625**	**2236**	**4408**
	Outstanding	**286863**	**257316**	**289469**	**291692**	**296108**
1.2.1 National Savings Certificate VIII issue	Receipts	17361	1325	1199	1105	2057
	Outstanding	135348	120403	136547	137652	139709
1.2.2 Indira Vikas Patras	Receipts	-3	0	0	0	0
	Outstanding	159	162	159	159	159
1.2.3 Kisan Vikas Patras	Receipts	-7911	-691	-209	-120	-208
	Outstanding	-6776	357	-6985	-7105	-7314
1.2.4 Kisan Vikas Patras - 2014	Receipts	25340	2105	1635	1251	2559
	Outstanding	147942	126197	149577	150828	153387
1.2.5 National Saving Certificate VI issue	Receipts	41	0	0	0	0
	Outstanding	-114	-155	-114	-114	-114
1.2.6 National Saving Certificate VII issue	Receipts	32	0	0	0	0
	Outstanding	-74	-106	-74	-74	-74
1.2.7 Other Certificates	Outstanding	10378	10458	10359	10346	10355
1.3 Public Provident Fund	**Receipts**	**13690**	**356**	**135**	**325**	**263**
	Outstanding	**105228**	**92214**	**105363**	**105688**	**105950**

Note : Data on receipts from April 2017 are net receipts, i.e., gross receipt minus gross payment.

Source: Accountant General, Post and Telegraphs.

No. 45 : Ownership Pattern of Central and State Governments Securities

(Per cent)

Central Government Dated Securities					
Category	2021				2022
	Mar.	Jun.	Sep.	Dec.	Mar.
	1	2	3	4	5
(A) Total (in ₹. Crore)	**7635902**	**7882533**	**8235318**	**8439811**	**8529036**
1 Commercial Banks	37.77	35.99	37.82	35.40	37.75
2 Non-Bank PDs	0.27	0.34	0.35	0.27	0.29
3 Insurance Companies	25.30	25.83	24.18	25.74	25.89
4 Mutual Funds	2.94	2.82	2.91	3.08	2.91
5 Co-operative Banks	1.82	1.82	1.50	1.82	1.81
6 Financial Institutions	1.00	1.43	1.17	1.69	0.94
7 Corporates	1.06	1.39	0.72	1.37	1.47
8 Foreign Portfolio Investors	1.87	1.79	1.81	1.66	1.56
9 Provident Funds	4.44	4.04	3.77	4.33	4.60
10 RBI	16.20	17.11	16.98	16.92	16.62
11. Others	7.33	7.43	8.79	7.73	6.15
11.1 State Governments	1.69	1.67	1.67	1.69	1.82

State Governments Securities					
Category	2021				2022
	Mar.	Jun.	Sep.	Dec.	Mar.
	1	2	3	4	5
(B) Total (in ₹. Crore)	**3879982**	**4028849**	**4153508**	**4257578**	**4410250**
1 Commercial Banks	33.69	33.75	35.94	34.41	34.39
2 Non-Bank PDs	0.48	0.39	0.44	0.40	0.38
3 Insurance Companies	30.04	29.67	27.50	28.85	28.42
4 Mutual Funds	1.82	1.74	1.97	1.91	1.82
5 Co-operative Banks	4.05	4.12	3.60	4.07	4.04
6 Financial Institutions	1.86	1.79	1.72	1.73	1.72
7 Corporates	0.49	1.45	1.32	1.70	1.82
8 Foreign Portfolio Investors	0.02	0.02	0.03	0.02	0.02
9 Provident Funds	22.00	21.09	18.27	20.66	20.79
10 RBI	0.77	0.88	0.85	0.83	0.80
11. Others	4.77	5.10	8.38	5.40	5.81
11.1 State Governments	0.18	0.18	0.18	0.19	0.20

Treasury Bills					
Category	2021				2022
	Mar.	Jun.	Sep.	Dec.	Mar.
	1	2	3	4	5
(C) Total (in ₹. Crore)	**690646**	**901327**	**763582**	**692869**	**757198**
1 Commercial Banks	55.54	52.25	50.22	47.01	51.14
2 Non-Bank PDs	2.82	1.82	1.33	1.53	4.20
3 Insurance Companies	5.61	4.75	4.12	6.29	6.58
4 Mutual Funds	17.80	19.93	17.72	13.72	14.01
5 Co-operative Banks	2.43	1.60	1.32	1.49	1.79
6 Financial Institutions	1.24	2.56	2.12	2.36	3.53
7 Corporates	3.16	3.00	2.40	3.13	3.47
8 Foreign Portfolio Investors	0.00	0.00	0.15	0.72	0.49
9 Provident Funds	0.22	0.10	0.37	0.85	0.21
10 RBI	0.49	2.58	2.63	0.00	0.00
11. Others	10.70	11.42	17.62	22.89	14.59
11.1 State Governments	5.98	7.97	12.64	18.92	11.54

No. 46: Combined Receipts and Disbursements of the Central and State Governments

(₹ Crore)

Item	2016-17	2017-18	2018-19	2019-20	2020-21 RE	2021-22 BE
	1	2	3	4	5	6
1 Total Disbursements	**4265969**	**4515946**	**5040747**	**5410887**	**6523916**	**7160694**
1.1 Developmental	2537905	2635110	2882758	3074492	3906147	4254004
1.1.1 Revenue	1878417	2029044	2224367	2446605	3259401	3242247
1.1.2 Capital	501213	519356	596774	588233	636062	922982
1.1.3 Loans	158275	86710	61617	39654	10684	88775
1.2 Non-Developmental	1672646	1812455	2078276	2253027	2526514	2810847
1.2.1 Revenue	1555239	1741432	1965907	2109629	2334608	2602289
1.2.1.1 Interest Payments	724448	814757	894520	955801	1082302	1244457
1.2.2 Capital	115775	69370	111029	141457	189487	177328
1.2.3 Loans	1632	1654	1340	1941	2419	31230
1.3 Others	55417	68381	79713	83368	91255	95843
2 Total Receipts	**4288432**	**4528422**	**5023352**	**5734166**	**6489736**	**7039032**
2.1 Revenue Receipts	3132201	3376416	3797731	3851563	3834126	4682025
2.1.1 Tax Receipts	2622145	2978134	3278947	3231582	3175594	3829889
2.1.1.1 Taxes on commodities and services	1652377	1853859	2030050	2012578	2100982	2514708
2.1.1.2 Taxes on Income and Property	965622	1121189	1246083	1216203	1071552	1311449
2.1.1.3 Taxes of Union Territories (Without Legislature)	4146	3086	2814	2800	3060	3732
2.1.2 Non-Tax Receipts	510056	398282	518783	619981	658532	852135
2.1.2.1 Interest Receipts	33220	34224	36273	31137	39830	33198
2.2 Non-debt Capital Receipts	69063	142433	140287	110094	54861	201138
2.2.1 Recovery of Loans & Advances	20942	42213	44667	59515	21151	19581
2.2.2 Disinvestment proceeds	48122	100219	95621	50578	33710	181557
3 Gross Fiscal Deficit [1 - (2.1 + 2.2)]	**1064704**	**997097**	**1102729**	**1449230**	**2634928**	**2277532**
3A Sources of Financing: Institution-wise						
3A.1 Domestic Financing	1046708	989167	1097210	1440548	2580406	2276017
3A.1.1 Net Bank Credit to Government	617123	144792	387091	571872	890012	-----
3A.1.1.1 Net RBI Credit to Government	195816	-144847	325987	190241	107494	-----
3A.1.2 Non-Bank Credit to Government	429585	844375	710119	868676	1690394	-----
3A.2 External Financing	17997	7931	5519	8682	54522	1514
3B Sources of Financing: Instrument-wise						
3B.1 Domestic Financing	1046708	989167	1097210	1440548	2580406	2276017
3B.1.1 Market Borrowings (net)	689821	794856	795845	971378	1778062	1620936
3B.1.2 Small Savings (net)	35038	71222	88961	209232	455724	367863
3B.1.3 State Provident Funds (net)	45688	42351	51004	38280	47300	45504
3B.1.4 Reserve Funds	-6436	18423	-18298	10411	-3450	5051
3B.1.5 Deposits and Advances	17792	25138	66289	-14227	29050	28868
3B.1.6 Cash Balances	-22463	-12476	17395	-323279	34179	121663
3B.1.7 Others	287268	49653	96014	548753	239540	86132
3B.2 External Financing	17997	7931	5519	8682	54522	1514
4 Total Disbursements as per cent of GDP	*27.7*	*26.4*	*26.7*	*26.6*	*33.0*	*32.1*
5 Total Receipts as per cent of GDP	*27.9*	*26.5*	*26.6*	*28.2*	*32.9*	*31.6*
6 Revenue Receipts as per cent of GDP	*20.3*	*19.8*	*20.1*	*18.9*	*19.4*	*21.0*
7 Tax Receipts as per cent of GDP	*17.0*	*17.4*	*17.4*	*15.9*	*16.1*	*17.2*
8 Gross Fiscal Deficit as per cent of GDP	*6.9*	*5.8*	*5.8*	*7.1*	*13.3*	*10.2*

…: Not available. RE: Revised Estimates; BE: Budget Estimates

Source : Budget Documents of Central and State Governments.

No. 47: Financial Accommodation Availed by State Governments under various Facilities

(₹ Crore)

Sr. No	State/Union Territory	During April-2022					
		Special Drawing Facility (SDF)		Ways and Means Advances (WMA)		Overdraft (OD)	
		Average amount availed	Number of days availed	Average amount availed	Number of days availed	Average amount availed	Number of days availed
	1	2	3	4	5	6	7
1	Andhra Pradesh	641	25	838	21	-	-
2	Arunachal Pradesh	-	-	-	-	-	-
3	Assam	-	-	-	-	-	-
4	Bihar	-	-	-	-	-	-
5	Chhattisgarh	-	-	-	-	-	-
6	Goa	-	-	-	-	-	-
7	Gujarat	-	-	-	-	-	-
8	Haryana	-	-	-	-	-	-
9	Himachal Pradesh	-	-	-	-	-	-
10	Jammu & Kashmir UT	-	-	874	21	198	11
11	Jharkhand	-	-	-	-	-	-
12	Karnataka	-	-	-	-	-	-
13	Kerala	-	-	-	-	-	-
14	Madhya Pradesh	-	-	-	-	-	-
15	Maharashtra	-	-	-	-	-	-
16	Manipur	18	30	195	30	127	15
17	Meghalaya	-	-	-	-	-	-
18	Mizoram	-	-	-	-	-	-
19	Nagaland	102	2	-	-	-	-
20	Odisha	-	-	-	-	-	-
21	Puducherry	-	-	-	-	-	-
22	Punjab	-	-	-	-	-	-
23	Rajasthan	901	9	-	-	-	-
24	Tamil Nadu	-	-	-	-	-	-
25	Telangana	615	30	1274	23	438	11
26	Tripura	-	-	-	-	-	-
27	Uttar Pradesh	-	-	-	-	-	-
28	Uttarakhand	-	-	-	-	-	-
29	West Bengal	-	-	-	-	-	-

Source: Reserve Bank of India.

No. 48: Investments by State Governments

(₹ Crore)

Sr. No	State/Union Territory	As on end of April 2022			
		Consolidated Sinking Fund (CSF)	Guarantee Redemption Fund (GRF)	Government Securities	Auction Treasury Bills (ATBs)
	1	2	3	4	5
1	Andhra Pradesh	9363	923	--	-
2	Arunachal Pradesh	2030	3	--	-
3	Assam	2890	71	--	-
4	Bihar	6301	--	--	8000
5	Chhattisgarh	5581	--	1	4508
6	Goa	712	350	--	-
7	Gujarat	7033	540	--	-
8	Haryana	1364	1365	--	-
9	Himachal Pradesh	--	--	--	-
10	Jammu & Kashmir UT	--	--	--	-
11	Jharkhand	977	--	--	-
12	Karnataka	10394	--	--	20000
13	Kerala	2425	--	--	-
14	Madhya Pradesh	--	1036	--	-
15	Maharashtra	52625	932	--	9000
16	Manipur	174	113	--	-
17	Meghalaya	883	62	9	-
18	Mizoram	441	53	--	-
19	Nagaland	1863	38	--	-
20	Odisha	14684	1647	95	35728
21	Puducherry	381	--	--	873
22	Punjab	3034	--	8	-
23	Rajasthan	--	--	129	8600
24	Tamil Nadu	7494	--	40	12166
25	Telangana	6391	1398	--	-
26	Tripura	685	15	--	1900
27	Uttar Pradesh	3021	--	180	-
28	Uttarakhand	3889	154	--	-
29	West Bengal	10147	708	214	-
	Total	**154783**	**9406**	**675**	**100775**

No. 49: Market Borrowings of State Governments

(₹ Crore)

Sr. No.	State	2020-21		2021-22		2021-22				2022-23		Total amount raised, so far in 2022-23	
						February		March		April			
		Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross	Net
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Andhra Pradesh	50896	41915	46443	36692	4000	3420	3943	3363	4000	2695	4000	2695
2	Arunachal Pradesh	767	767	563	530	-	-	-	-33	-	-	-	-
3	Assam	15030	14230	12753	10753	2200	2200	600	600	-	-	-	-
4	Bihar	27285	24685	28489	24334	2000	2000	1489	334	-	-	-	-
5	Chhattisgarh	13000	10500	4000	913	-	-	-	-1587	-	-	-	-
6	Goa	3354	3054	2000	1450	-	-	200	150	-	-	-	-
7	Gujarat	44780	33280	31054	13554	4000	2500	5000	500	-	-	-	-
8	Haryana	30000	25550	30500	20683	2500	2055	10000	5678	-	-650	-	-650
9	Himachal Pradesh	6000	3755	4000	1875	-	-660	-	-710	-	-	-	-
10	Jammu & Kashmir UT	9328	6020	8562	5373	600	600	1562	-52	-	-	-	-
11	Jharkhand	9400	8900	5000	3191	-	-	3500	2691	-	-	-	-
12	Karnataka	69000	61900	59000	49000	17000	15000	-	-1500	-	-	-	-
13	Kerala	28566	23066	27000	18120	-	-1400	7000	5900	-	-1000	-	-1000
14	Madhya Pradesh	45573	38773	22000	13900	-	-	4000	1400	-	-	-	-
15	Maharashtra	69000	50022	68750	40790	4500	-2960	4000	1500	4000	4000	4000	4000
16	Manipur	1302	1044	1476	1326	60	60	180	180	-	-75	-	-75
17	Meghalaya	1777	1587	1608	1298	-	-	80	80	-	-	-	-
18	Mizoram	944	677	747	447	73	73	90	40	-	-65	-	-65
19	Nagaland	1721	1366	1727	1222	-	-	440	185	-	-	-	-
20	Odisha	3000	500	0	-6473	-	-1000	-	-1500	-	-1500	-	-1500
21	Puducherry	1390	790	1374	841	185	-215	300	167	-	-	-	-
22	Punjab	32995	23467	25814	12428	1000	317	6500	4497	1500	400	1500	400
23	Rajasthan	57359	44273	51149	38243	3500	3326	7380	2730	-	-	-	-
24	Sikkim	1292	1292	1511	1471	-	-	382	382	-	-	-	-
25	Tamil Nadu	87977	76796	87000	72500	7500	4500	24600	23300	-	-	-	-
26	Telangana	43784	37365	45716	38667	3000	2580	3029	2609	-	-945	-	-945
27	Tripura	1916	1631	300	0	-	-	-	-100	-	-	-	-
28	Uttar Pradesh	75500	59185	62500	42355	-	-1000	5000	2142	-	-	-	-
29	Uttarakhand	6200	5208	3200	1800	-	-	1000	700	-	-	-	-
30	West Bengal	59680	50180	67390	45199	-	-1000	13390	12722	-	-2500	-	-2500
	Grand Total	798816	651777	701626	492483	52118	30396	103665	66368	9500	360	9500	360

- : Nil.

Note: The State of J&K has ceased to exist constitutionally from October 31, 2019 and the liabilities of the State continue to remain as liabilities of the new UT of Jammu and Kashmir.

Source: Reserve Bank of India.

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise

(Amount in ₹ Crore)

Item	2019-20				
	Q1	Q2	Q3	Q4	Annual
Net Financial Assets (I-II)	**252658.0**	**513118.4**	**400437.3**	**446254.3**	**1612468.0**
Per cent of GDP	*5.1*	*10.6*	*7.8*	*8.7*	*8.0*
I. Financial Assets	**413192.2**	**604322.7**	**538186.1**	**843385.9**	**2399086.9**
Per cent of GDP	*8.4*	*12.4*	*10.5*	*16.4*	*12.0*
of which:					
1.Total Deposits (a+b)	13020.4	299089.8	138131.8	473183.4	923425.5
(a) Bank Deposits	-9769.4	280588.7	130328.0	465529.7	866677.0
i. Commercial Banks	-13293.8	269475.4	66666.7	446006.7	768855.0
ii. Co-operative Banks	3524.4	11113.2	63661.3	19523.0	97822.0
(b) Non-Bank Deposits	22789.9	18501.2	7803.7	7653.7	56748.5
2. Life Insurance Funds	117394.9	107731.0	109895.6	37236.1	372257.5
3. Provident and Pension Funds (including PPF)	110601.0	113593.0	113676.0	117235.0	455104.9
4. Currency	61244.1	-26104.8	86832.6	160690.2	282662.1
5. Investments	43936.8	43018.8	22655.1	-11953.8	97656.9
of which:					
(a) Mutual Funds	23303.5	38382.2	19191.1	-19191.1	61685.7
(b) Equity	18648.2	2172.4	936.2	4981.0	26737.8
6. Small Savings (excluding PPF)	65930.8	65930.8	65930.8	65930.8	263723.4
II. Financial Liabilities	**160534.2**	**91204.3**	**137748.8**	**397131.6**	**786618.9**
Per cent of GDP	*3.2*	*1.9*	*2.7*	*7.7*	*3.9*
Loans (Borrowings) from					
1. Financial Corporations (a+b)	160500.7	91170.8	137715.2	397098.1	786484.7
(a) Banking Sector	141332.5	58250.2	121754.0	200413.2	521749.9
of which:					
Commercial Banks	135754.1	57135.0	87377.4	202214.2	482480.6
(b) Other Financial Institutions	19168.2	32920.5	15961.2	196684.8	264734.8
i. Non-Banking Financial Companies	-519.7	22976.7	29930.7	198264.3	250652.0
ii. Housing Finance Companies	17033.0	8093.1	-15710.4	-3093.1	6322.6
iii. Insurance Companies	2655.0	1850.8	1740.9	1513.6	7760.2
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8	33.8	33.8	135.1
3. General Government	-0.3	-0.3	-0.3	-0.3	-1.0

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise (Contd.)

(Amount in ₹ Crore)

Item	2020-21				
	Q1	Q2	Q3	Q4	Annual
Net Financial Assets (I-II)	**623053.8**	**592327.3**	**506558.3**	**581769.1**	**2303708.6**
Per cent of GDP	*16.1*	*12.5*	*9.3*	*10.1*	*11.6*
I. Financial Assets	**828447.4**	**630907.1**	**676131.6**	**973510.9**	**3108997.0**
Per cent of GDP	*21.4*	*13.4*	*12.4*	*16.9*	*15.7*
of which:					
1.Total Deposits (a+b)	297376.2	278589.7	158113.5	533651.5	1267730.9
(a) Bank Deposits	281155.1	264523.3	147037.2	535157.5	1227873.0
i. Commercial Banks	279010.5	262033.7	143558.6	471730.9	1156333.7
ii. Co-operative Banks	2144.6	2489.6	3478.6	63426.6	71539.3
(b) Non-Bank Deposits	16221.1	14066.4	11076.3	-1506.0	39857.9
2. Life Insurance Funds	122369.1	141443.4	155516.3	100812.3	520141.0
3. Provident and Pension Funds (including PPF)	121582.5	124106.5	124949.5	130185.5	500824.0
4. Currency	202432.7	21286.9	91456.0	66800.5	381976.1
5. Investments	6249.8	-12956.4	67659.3	63624.0	124576.7
of which:					
(a) Mutual Funds	-16021.0	-28837.7	57675.4	51267.0	64083.8
(b) Equity	18599.4	8291.5	5307.1	6333.3	38531.2
6. Small Savings (excluding PPF)	77381.6	77381.6	77381.6	77381.6	309526.3
II. Financial Liabilities	**205393.5**	**38579.8**	**169573.3**	**391741.8**	**805288.5**
Per cent of GDP	*5.3*	*0.8*	*3.1*	*6.8*	*4.1*
Loans (Borrowings) from					
1. Financial Corporations (a+b)	205436.7	38623.0	169616.5	391785.8	805462.1
(a) Banking Sector	211005.3	13211.7	139387.5	304100.8	667705.3
of which:					
Commercial Banks	211259.3	13213.8	140514.3	242476.0	607463.5
(b) Other Financial Institutions	-5568.6	25411.3	30229.0	87685.1	137756.8
i. Non-Banking Financial Companies	-15450.4	21627.1	15921.2	61326.1	83424.0
ii. Housing Finance Companies	10516.6	2875.1	13048.5	25336.1	51776.2
iii. Insurance Companies	-634.8	909.2	1259.3	1022.9	2556.6
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8	33.8	33.0	134.4
3. General Government	-77.0	-77.0	-77.0	-77.0	-308.0

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise (Concld.)

(Amount in ₹ Crore)

Item	2021-22	
	Q1	Q2
Net Financial Assets (I-II)	**760273.0**	**388307.9**
Per cent of GDP	*14.8*	*6.9*
I. Financial Assets	**631184.5**	**567403.7**
Per cent of GDP	*12.3*	*10.1*
of which:		
1.Total Deposits (a+b)	146933.8	207184.4
(a) Bank Deposits	124803.6	201833.5
i. Commercial Banks	123282.3	200159.7
ii. Co-operative Banks	1521.3	1673.8
(b) Non-Bank Deposits	22130.2	5350.9
2. Life Insurance Funds	114617.8	127356.0
3. Provident and Pension Funds (including PPF)	129821.9	132967.9
4. Currency	128660.2	-68631.2
5. Investments	24929.6	82305.4
of which:		
(a) Mutual Funds	14573.0	63151.3
(b) Equity	4502.5	13218.5
6. Small Savings (excluding PPF)	85163.8	85163.8
II. Financial Liabilities	**-129088.5**	**179095.8**
Per cent of GDP	*-2.5*	*3.2*
Loans (Borrowings) from		
1. Financial Corporations (a+b)	-129109.8	179074.5
(a) Banking Sector	-105750.5	124240.8
of which:		
Commercial Banks	-98583.4	126251.1
(b) Other Financial Institutions	-23359.3	54833.7
i. Non-Banking Financial Companies	-31118.4	28880.1
ii. Housing Finance Companies	7132.0	24403.8
iii. Insurance Companies	627.1	1549.8
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8
3. General Government	-12.5	-12.5

Notes: 1. Net Financial Savings of households refer to the flow of net financial assets, which represents change in financial assets held by households minus change in their financial liabilities.
2. Data as ratios to GDP have been calculated based on the Second Advance Estimates of National Income 2021-22 released on February 28, 2022.
3. Figures in the columns may not add up to the total due to rounding off.

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators

(Amount in ₹ Crore)

Item	Jun-2019	Sep-2019	Dec-2019	Mar-2020
Financial Assets (a+b+c+d)	**16130869.8**	**16439609.3**	**16829228.1**	**17002698.8**
Per cent of GDP	*83.7*	*84.4*	*85.3*	*84.7*
(a) Bank Deposits (i+ii)	8831785.7	9111489.5	9239027.3	9688573.4
i. Commercial Banks	8131543.2	8401018.6	8467685.3	8913692.0
ii. Co-operative Banks	700242.5	710470.8	771341.9	774881.4
(b) Life Insurance Funds	3883609.7	3930727.6	4049902.5	3884771.5
(c) Currency	2010842.9	1984738.1	2071570.7	2232261.0
(d) Mutual funds	1404631.5	1412654.1	1468727.6	1197092.9
Financial Liabilities (a+b)	**6490282.2**	**6581453.0**	**6719168.2**	**7116266.3**
Per cent of GDP	*33.7*	*33.8*	*34.0*	*35.4*
Loans (Borrowings) from				
(a) Banking Sector	5268304.7	5326554.9	5448308.9	5648722.1
of which:				
i. Commercial Banks	4668496.4	4725631.3	4813008.7	5015222.9
ii. Co-operative Banks	513013.7	513764.2	542994.4	529720.6
(b) Other Financial Institutions	1221977.5	1254898.1	1270859.3	1467544.1
of which:				
i. Non-Banking Financial Companies	451922.3	474899.0	504829.7	703094.0
ii. Housing Finance Companies	673312.1	681405.2	665694.8	662601.7

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators (Contd.)

(Amount in ₹ Crore)

Item	Jun-2020	Sep-2020	Dec-2020	Mar-2021
Financial Assets (a+b+c+d)	**17850174.9**	**18408441.6**	**19129606.6**	**19979862.7**
Per cent of GDP	*93.9*	*97.6*	*99.7*	*100.9*
(a) Bank Deposits (i+ii)	9969728.5	10234251.8	10381289.0	10916446.4
i. Commercial Banks	9192702.5	9454736.2	9598294.8	10070025.7
ii. Co-operative Banks	777026.0	779515.6	782994.2	846420.7
(b) Life Insurance Funds	4102000.7	4274424.9	4551882.0	4718718.2
(c) Currency	2434693.7	2455980.6	2547436.6	2614237.0
(d) Mutual funds	1343752.0	1443784.4	1648999.0	1730461.0
Financial Liabilities (a+b)	**7321703.0**	**7360326.0**	**7529942.6**	**7921728.4**
Per cent of GDP	*38.5*	*39.0*	*39.3*	*40.0*
Loans (Borrowings) from				
(a) Banking Sector	5859727.5	5872939.2	6012326.7	6316427.4
of which:				
i. Commercial Banks	5226482.2	5239696.0	5380210.4	5622686.4
ii. Co-operative Banks	558551.1	558545.6	557545.8	608703.4
(b) Other Financial Institutions	1461975.5	1487386.9	1517615.9	1605301.0
of which:				
i. Non-Banking Financial Companies	687643.6	709270.7	725191.9	786518.0
ii. Housing Finance Companies	673118.3	675993.4	689041.8	714377.9

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators (Concld.)

(Amount in ₹ Crore)

Item	Jun-2021	Sep-2021
Financial Assets (a+b+c+d)	**20533386.0**	**21086975.2**
Per cent of GDP	*97.4*	*98.1*
(a) Bank Deposits (i+ii)	11041250.0	11243083.5
i. Commercial Banks	10193308.0	10393467.7
ii. Co-operative Banks	847942.1	849615.9
(b) Life Insurance Funds	4894238.5	5105262.1
(c) Currency	2742897.3	2674266.1
(d) Mutual funds	1855000.1	2064363.5
Financial Liabilities (a+b)	**7793017.9**	**7972092.4**
Per cent of GDP	*37.0*	*37.1*
Loans (Borrowings) from		
(a) Banking Sector	6210676.9	6334917.7
of which:		
i. Commercial Banks	5524103.0	5650354.1
ii. Co-operative Banks	596687.9	603180.5
(b) Other Financial Institutions	1582341.0	1637174.6
of which:		
i. Non-Banking Financial Companies	755399.6	784279.7
ii. Housing Finance Companies	721510.0	745913.7

Notes: 1. Data have been compiled for select financial instruments only (loans from Banking Sector, NBFCs and HFCs) for which data are available.

2. Data as ratios to GDP have been calculated based on the Second Advance Estimates of National Income 2021-22 released on February 28, 2022.

3. Figures in the columns may not add up to the total due to rounding off.

Explanatory Notes to the Current Statistics

Table No. 1

1.2& 6: Annual data are average of months.
3.5 & 3.7: Relate to ratios of increments over financial year so far.
4.1 to 4.4, 4.8,4.9 &5: Relate to the last friday of the month/financial year.
4.5, 4.6 & 4.7: Relate to five major banks on the last Friday of the month/financial year.
4.10 to 4.12: Relate to the last auction day of the month/financial year.
4.13: Relate to last day of the month/ financial year
7.1&7.2: Relate to Foreign trade in US Dollar.

Table No. 2

2.1.2: Include paid-up capital, reserve fund and Long-Term Operations Funds.
2.2.2: Include cash, fixed deposits and short-term securities/bonds, e.g., issued by IIFC (UK).

Table No. 4

Maturity-wise position of outstanding forward contracts is available at http://nsdp.rbi.org.in under ''Reserves Template''.

Table No. 5

Special refinance facility to Others, i.e. to the EXIM Bank, is closed since March 31, 2013.

Table No. 6

For scheduled banks, March-end data pertain to the last reporting Friday.
2.2: Exclude balances held in IMF Account No.1, RBI employees' provident fund, pension fund, gratuity and superannuation fund.

Table Nos. 7 & 11

3.1 in Table 7 and 2.4 in Table 11: Include foreign currency denominated bonds issued by IIFC (UK).

Table No. 8

NM_2 and NM_3 do not include FCNR (B) deposits.
2.4: Consist of paid-up capital and reserves.
2.5: includes other demand and time liabilities of the banking system.

Table No. 9

Financial institutions comprise EXIM Bank, SIDBI, NABARD and NHB.
L_1 and L_2 are compiled monthly and L_3 quarterly.
Wherever data are not available, the last available data have been repeated.

Table No. 13

Data against column Nos. (1), (2) & (3) are Final and for column Nos. (4) & (5) data are Provisional.

Table No. 14

Data in column Nos. (4) & (8) are Provisional.

Table No. 17

2.1.1: Exclude reserve fund maintained by co-operative societies with State Co-operative Banks

2.1.2: Exclude borrowings from RBI, SBI, IDBI, NABARD, notified banks and State Governments.

4: Include borrowings from IDBI and NABARD.

Table No. 24

Primary Dealers (PDs) include banks undertaking PD business.

Table No. 30

Exclude private placement and offer for sale.

1: Exclude bonus shares.

2: Include cumulative convertible preference shares and equi-preference shares.

Table No. 32

Exclude investment in foreign currency denominated bonds issued by IIFC (UK), SDRs transferred by Government of India to RBI and foreign currency received under SAARC SWAP arrangement. Foreign currency assets in US dollar take into account appreciation/depreciation of non-US currencies (such as Euro, Sterling, Yen and Australian Dollar) held in reserves. Foreign exchange holdings are converted into rupees at rupee-US dollar RBI holding rates.

Table No. 34

1.1.1.1.2 & 1.1.1.1.1.4: Estimates.

1.1.1.2: Estimates for latest months.

'Other capital' pertains to debt transactions between parent and subsidiaries/branches of FDI enterprises.

Data may not tally with the BoP data due to lag in reporting.

Table No. 35

1.10: Include items such as subscription to journals, maintenance of investment abroad, student loan repayments and credit card payments.

Table No. 36

Increase in indices indicates appreciation of rupee and vice versa. For 6-Currency index, base year 2020-21 is a moving one, which gets updated every year. REER figures are based on Consumer Price Index (combined). The details on methodology used for compilation of NEER/REER indices are available in December 2005, April 2014 and January 2021 issues of the RBI Bulletin.

Table No. 37

Based on applications for ECB/Foreign Currency Convertible Bonds (FCCBs) which have been allotted loan registration number during the period.

Table Nos. 38, 39, 40 & 41

Explanatory notes on these tables are available in December issue of RBI Bulletin, 2012.

Table No. 43

Part I-A. Settlement systems

1.1.3: Tri- party Repo under the securities segment has been operationalised from November 05, 2018.

Part I-B. Payments systems

4.1.2: 'Others' includes e-commerce transactions and digital bill payments through ATMs, etc.

4.2.2: 'Others' includes e-commerce transactions, card to card transfers and digital bill payments through ATMs, etc.

5: Available from December 2010.

5.1: includes purchase of goods and services and fund transfer through wallets.

5.2.2: includes usage of PPI Cards for online transactions and other transactions.

6.1: Pertain to three grids – Mumbai, New Delhi and Chennai.

6.2: 'Others' comprises of Non-MICR transactions which pertains to clearing houses managed by 21 banks.

Part II-A. Other payment channels

1: Mobile Payments –
- Include transactions done through mobile apps of banks and UPI apps.
- The data from July 2017 includes only individual payments and corporate payments initiated, processed, and authorised using mobile device. Other corporate payments which are not initiated, processed, and authorised using mobile device are excluded.

2: Internet Payments – includes only e-commerce transactions through 'netbanking' and any financial transaction using internet banking website of the bank.

Part II-B. ATMs

3.3 and 4.2: only relates to transactions using bank issued PPIs.

Part III. Payment systems infrastructure

3: Includes ATMs deployed by Scheduled Commercial Banks (SCBs) and White Label ATM Operators (WLAOs). WLAs are included from April 2014 onwards.

Table No. 45

(-): represents nil or negligible

The revised table format since June 2016, incorporates the ownership pattern of State Governments Securities and Treasury Bills along with the Central Government Securities.

State Government Securities include special bonds issued under Ujwal DISCOM Assurance Yojana (UDAY) scheme.

Bank PDs are clubbed under Commercial Banks. However, they form very small fraction of total outstanding securities.

The category 'Others' comprises State Governments, Pension Funds, PSUs, Trusts, HUF/Individuals *etc.*

Table No. 46

GDP data is based on 2011-12 base. GDP data from 2019-20 pertains to the Provisional Estimates of National Income released by National Statistics Office on 29th May 2020. GDP for 2020-21 is from Union Budget 2020-21.
Data pertains to all States and Union Territories.
Total receipts and total expenditure exclude National Calamity Contingency Fund expenditure.
1 & 2: Data are net of repayments of the Central Government (including repayments to the NSSF) and State Governments.
1.3: Represents compensation and assignments by States to local bodies and Panchayati Raj institutions.
2: Data are net of variation in cash balances of the Central and State Governments and includes borrowing receipts of the Central and State Governments.
3A.1.1: Data as per RBI records.
3B.1.1: Borrowings through dated securities.
3B.1.2: Represent net investment in Central and State Governments' special securities by the National Small Savings Fund (NSSF).
This data may vary from previous publications due to adjustments across components with availability of new data.
3B.1.6: Include Ways and Means Advances by the Centre to the State Governments.
3B.1.7: Include Treasury Bills, loans from financial institutions, insurance and pension funds, remittances, cash balance investment account.

Table No. 47

SDF is availed by State Governments against the collateral of Consolidated Sinking Fund (CSF), Guarantee Redemption Fund (GRF) & Auction Treasury Bills (ATBs) balances and other investments in government securities.
WMA is advance by Reserve Bank of India to State Governments for meeting temporary cash mismatches.
OD is advanced to State Governments beyond their WMA limits.
Average amount Availed is the total accommodation (SDF/WMA/OD) availed divided by number of days for which accommodation was extended during the month.
- : Nil.

Table No. 48

CSF and GRF are reserve funds maintained by some State Governments with the Reserve Bank of India.
ATBs include Treasury bills of 91 days, 182 days and 364 days invested by State Governments in the primary market.
--: Not Applicable (not a member of the scheme).

The concepts and methodologies for Current Statistics are available in Comprehensive Guide for Current Statistics of the RBI Monthly Bulletin **(https://rbi.org.in/Scripts/PublicationsView.aspx?id=17618)**

Time series data of 'Current Statistics' is available at https://dbie.rbi.org.in.
Detailed explanatory notes are available in the relevant press releases issued by RBI and other publications/releases of the Bank such as **Handbook of Statistics on the Indian Economy**.

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12. Perspectives on Central Banking Governors Speak (1935-2010) Platinum Jubilee	₹1400 per copy (over the counter)	US$ 50 per copy (inclusive of air mail courier charges)

Notes

1. Many of the above publications are available at the RBI website (www.rbi.org.in).
2. Time Series data are available at the Database on Indian Economy (http://dbie.rbi.org.in).
3. The Reserve Bank of India History 1935-1997 (4 Volumes), Challenges to Central Banking in the Context of Financial Crisis and the Regional Economy of India: Growth and Finance are available at leading book stores in India.

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