

RESERVE BANK OF INDIA
BULLETIN



APRIL 2022

VOLUME LXXVI NUMBER 4

Chair

Michael Debabrata Patra

Editorial Committee

Ajit R. Joshi

Deba Prasad Rath

Rajiv Ranjan

Sitikantha Pattanaik

Pallavi Chavan

Snehal Herwadkar

Tushar Baran Das

Pulastya Bandyopadhyay

Editor

Shashidhar M. Lokare

The Reserve Bank of India Bulletin is issued monthly by the Department of Economic and Policy Research, Reserve Bank of India, under the direction of the Editorial Committee.

The Central Board of the Bank is not responsible for interpretation and opinions expressed. In the case of signed articles, the responsibility is that of the author.

© Reserve Bank of India 2022

All rights reserved.

Reproduction is permitted provided an acknowledgment of the source is made.

For subscription to Bulletin, please refer to Section 'Recent Publications'

The Reserve Bank of India Bulletin can be accessed at <https://bulletin.rbi.org.in>

CONTENTS

Governor's Statement

Governor's Statement	1
----------------------	---

Monetary Policy Statement for 2022-23

Monetary Policy Statement, 2022-23 Resolution of the Monetary Policy Committee (MPC) April 6-8 2022	7
---	---

Statement on Developmental and Regulatory Policies

Statement on Developmental and Regulatory Policies	11
--	----

Monetary Policy Report

Monetary Policy Report - April 2022	15
-------------------------------------	----

Speeches

Taper 2022: Touchdown in Turbulence – Michael Debabrata Patra	119
--	-----

Importance of Governance and Assurance Functions in Financial Institutions Shri M. K. Jain	127
--	-----

Articles

State of the Economy	133
----------------------	-----

Measuring Supply Chain Pressures on India	169
---	-----

Monetary Transmission to Banks' Interest Rates: Implications of External Benchmark Regime	185
--	-----

What Drives the Forward Premia – An Analytical Perspective	205
---	-----

Foreign Exchange Reserves Buffer in Emerging Market Economies: Drivers, Motives and Implications	223
---	-----

Digitisation in Urban Cooperative Banks: Depth and Differentiation	239
---	-----

Current Statistics	249
---------------------------	------------

Recent Publications	302
----------------------------	------------

GOVERNOR'S STATEMENT

Governor's Statement

*Governor's Statement**

Shaktikanta Das

Two years ago in March 2020, we began a journey to fight the onslaught of COVID-19 on our economy with courage and determination. During the period thereafter, the Reserve Bank has successfully navigated its course through turbulent waters. While the pandemic has scarred our psyche and tested our resilience, we have responded with bold, unconventional and resolute measures to stabilise the economy through three waves of the pandemic. As the situation normalised, we have taken measures towards rebalancing liquidity conditions while ensuring that our actions are nimble and proactive but well-timed.

Now two years later, as we were emerging out of the pandemic situation, the global economy has seen tectonic shifts beginning 24th February, with the commencement of the war in Europe, followed by sanctions and escalating geopolitical tensions. We are confronted with new but humungous challenges – shortages in key commodities; fractures in the international financial architecture; and fears of deglobalisation. Extreme volatility characterises commodity and financial markets. While the pandemic quickly morphed from a health crisis to one of life and livelihood, the conflict in Europe has the potential to derail the global economy. Caught in the cross-current of multiple headwinds, our approach needs to be cautious but proactive in mitigating the adverse impact on India's growth, inflation and financial conditions. We are, however, reassured by the strong buffers that we have built over the past few years, including large foreign exchange reserves, significant improvement in external sector indicators and substantial strengthening of the financial sector, all of which would help us to weather this storm. Once

again, we in the RBI stand resolute and in readiness to defend the economy and navigate out of the current storm.

Decisions and Deliberations of the Monetary Policy Committee

Against this backdrop, the Monetary Policy Committee (MPC) met on 6th, 7th and 8th April 2022 and, based on an assessment of the macroeconomic situation and the outlook, voted unanimously to keep the policy repo rate unchanged at 4 per cent. The MPC also decided unanimously to remain accommodative while focussing on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth. The marginal standing facility (MSF) rate and the Bank rate remain unchanged at 4.25 per cent. Further, it has been decided by the Reserve Bank to restore the width of the Liquidity Adjustment Facility (LAF) corridor to 50 basis points, the position that prevailed before the pandemic. The floor of the corridor will now be provided by the newly instituted standing deposit facility (SDF), which will be placed 25 basis points below the repo rate, i.e., at 3.75 per cent. I shall explain the details in this regard later in my statement.

Let me first dwell upon the MPC's rationale for its decision on the policy rate and the stance. Since the MPC's last meeting in early February 2022, the expected positive benefits from the ebbing Omicron wave have been offset by the sharp escalation in geopolitical tensions. This has significantly changed the external and domestic landscape. Concerns over protracted supply disruptions have rattled global commodity and financial markets, given the significant share of the two economies engaged in war in global production and exports of key commodities like oil and natural gas; wheat and corn; palladium, aluminium and nickel; edible oils; and fertilisers. Global crude oil prices briefly crossed US\$ 130 per barrel, touching their highest level since 2008 and remain volatile at elevated levels, despite some correction. Global food prices along with

* Governor's Statement - April 8, 2022.

metal and other commodity prices have also hardened significantly. Risk aversion towards assets of emerging market economies (EMEs) has increased, leading to large capital outflows and a depreciating bias in their currencies. These developments have, first, ratcheted up the projections of global inflation, which was already running well above targets in major countries; and second, will produce sizeable adverse impact on output across geographies.

The geopolitical tensions have exacerbated at a time when the global economy was grappling with a sharp rise in inflation and consequent monetary policy normalisation in major advanced economies. Global supply chain disruptions and input cost pressures are now expected to linger even longer. The resurgence of COVID-19 infections in some major economies in March and the associated lockdowns run the risk of further aggravating the global supply bottlenecks and input cost pressures. World trade and output and hence external demand are likely to be weaker than envisaged two months ago. Overall, the external developments during the past two months have led to the materialisation of downside risks to the domestic growth outlook and upside risks to inflation projections presented in the February MPC resolution. Inflation is now projected to be higher and growth lower than the assessment in February. Economic activity, although recovering, is barely above its pre-pandemic level. Against this backdrop, the MPC decided to retain the repo rate at 4 per cent. It also decided to remain accommodative while focusing on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

Assessment of Growth and Inflation

Growth

According to the second advance estimates released by the National Statistical Office (NSO) on February 28, 2022, real GDP rose by 8.9 per cent in 2021-22. Private consumption and fixed investment –

key drivers of domestic demand – however, remain subdued, with these two components being only 1.2 per cent and 2.6 per cent respectively, above their pre-pandemic levels. On the supply side, contact-intensive services still trail the 2019-20 level. Nevertheless, the Indian economy is steadily reviving from its pandemic induced contraction.

During 2021-22, weakness in economic activity resurfaced in Q3 and got exacerbated by the emergence of the Omicron variant in January 2022. A gradual turnaround has been noticed during February, although in March 2022 a mixed picture was seen. Some contact-intensive activities have regained traction amidst declining infections and removal of restrictions. Several high frequency indicators – railway freight; GST collections; toll collections; electricity demand; fuel consumption; and imports of capital goods posted robust year-on-year expansion during February-March. With the easing of restrictions, domestic air passenger traffic rebounded in March. According to our surveys, consumer confidence is improving and households' optimism in outlook for the year ahead has strengthened with an uptick in sentiments. Business confidence is in optimistic territory and supportive of revival in economic activity. On the other hand, passenger vehicle sales and registrations continue to contract, though at a moderating pace. Both manufacturing and services PMIs remain in the zone of expansion; while manufacturing PMI moderated slightly in March, services and composite showed improvement.

Going forward, robust Rabi output should support recovery in rural demand, while a pick-up in contact-intensive services should help in further strengthening urban demand. Investment activity may gain traction with improving business confidence, pick up in bank credit, continuing support from government capex and congenial financial conditions. Capacity utilisation (CU) in the manufacturing sector recovered further to 72.4 per cent in Q3:2021-22 from

68.3 per cent in the previous quarter, surpassing the pre-pandemic level of 69.9 per cent in Q4:2019-20.

As the horizon was brightening up, escalating geopolitical tensions have cast a shadow on our economic outlook. Although India's direct trade exposure to countries at the epicentre of the conflict is limited, the war could potentially impede the economic recovery through elevated commodity prices and global spillover channels. Further, financial market volatility induced by monetary policy normalisation in advanced economies, renewed COVID-19 infections in some major countries with augmented supply-side disruptions and protracted shortages of critical inputs, such as semi-conductors and chips, pose downside risks to the outlook. Taking all these factors into consideration, real GDP growth for 2022-23 is now projected at 7.2 per cent with Q1:2022-23 at 16.2 per cent; Q2 at 6.2 per cent; Q3 at 4.1 per cent; and Q4 at 4.0 per cent, assuming crude oil (Indian basket) at US\$ 100 per barrel during 2022-23.

Inflation

The February 2022 meeting of the MPC had projected a moderating path for inflation during 2022-23. Heightened geopolitical tensions since end-February have, however, upended the earlier narrative and considerably clouded the inflation outlook for the year. On the food price front, a likely record Rabi harvest would help to keep domestic prices of cereals and pulses in check. Global factors such as the loss of wheat supply from the Black Sea region and the unprecedented high international prices of wheat could, however, put a floor under domestic wheat prices. Edible oil price pressures are likely to remain elevated in the near-term due to export restrictions by key producers as well as loss of supply from the Black Sea region. Feed cost pressures could continue due to global supply shortages, which could also have a spillover impact on poultry, milk and dairy product prices.

Coming to non-food items, the spike in international crude oil prices since end-February poses substantial upside risk to inflation through both direct and indirect effects. Sharp increase in domestic pump prices could trigger broad-based second round price pressures. A combination of high international commodity prices and elevated logistic disruptions could aggravate input costs across agriculture, manufacturing and services sectors. Their pass-through to retail prices, therefore, warrants continuous monitoring and pro-active supply management. Financial markets are likely to remain volatile on rising risk premia, dislocations in trade and capital flows and divergent monetary policy responses across central banks. Taking into account these factors and on the assumption of a normal monsoon in 2022 and average crude oil price (Indian basket) of US \$ 100 per barrel, inflation is now projected at 5.7 per cent in 2022-23, with Q1 at 6.3 per cent; Q2 at 5.8 per cent; Q3 at 5.4 per cent; and Q4 at 5.1 per cent.

It may, however, be noted that given the excessive volatility in global crude oil prices since late February and the extreme uncertainty over the evolving geopolitical tensions, any projection of growth and inflation is fraught with risk, and is largely contingent upon future oil and commodity price developments.

In this context, continuation and deepening of supply side measures may alleviate food price pressures and also mitigate cost-push pressures across manufacturing and services. On our part, let me assure all stakeholders that as in the past, the Reserve Bank will use all its policy levers to preserve macroeconomic stability and enhance the resilience of our economy. The situation is dynamic and fast changing and our actions have to be tailored accordingly.

Liquidity and Financial Market Conditions

As stated earlier, the macroeconomic outlook is undergoing tectonic shifts and our policy response has to be pre-emptive and re-calibrated dynamically to the evolving outlook. The Reserve Bank will

continue to adopt a nuanced and nimble footed approach to liquidity management while maintaining adequate liquidity in the system. At present, liquidity management is characterised by two-way operations: through variable rate reverse repo (VRRR) auctions of varying maturities to absorb liquidity; and variable rate repo (VRR) auctions to meet transient liquidity shortages and offset mismatches. This approach will be continued.

It may be noted that the interest rate for around 80 per cent of the total liquidity absorbed under the LAF during Q4:2021-22 has firmed up close to the policy repo rate due to the rebalancing of liquidity through VRRR auctions. Accordingly, financial market participants have been prepared for the eventual normalisation of the LAF corridor.

Further, it has now been decided to fully restore the liquidity management framework instituted in February 2020, albeit with some refinements to enhance its effectiveness. Accordingly, the following measures are being instituted:

- i. The amendment to Section 17 of the RBI Act in 2018 empowered the Reserve Bank to introduce the Standing Deposit Facility (SDF). By removing the binding collateral constraint on the central bank, the SDF strengthens the operating framework of monetary policy. Accordingly, it has now been decided to introduce the SDF as the floor of the LAF corridor. This would provide symmetry to the operating framework of monetary policy by introducing a standing absorption facility at the bottom of the LAF corridor, similar to the standing injection tool at the upper end of the corridor, namely the marginal standing facility (MSF). Thus, at both ends of the LAF corridor, there will be standing facilities – one to absorb and the other to inject liquidity. Accordingly, access to SDF and MSF will be at the discretion of banks, unlike repo/reverse

repo, OMO and CRR which are available at the discretion of the Reserve Bank. Notably, the SDF is also a financial stability tool in addition to its role in liquidity management.

- ii. The SDF rate will be 25 bps below the policy rate, and it will be applicable to overnight deposits at this stage. It would, however, retain the flexibility to absorb liquidity of longer tenors as and when the need arises, with appropriate pricing. The MSF rate will continue to be 25 bps above the policy repo rate. Thus, the width of the LAF corridor is restored to the pre-pandemic configuration of 50 bps, symmetrically around the policy repo rate, which will be at the centre of the corridor.
- iii. The fixed rate reverse repo (FRRR) rate is retained at 3.35 per cent. It will remain as part of RBI's toolkit and its operation will be at the discretion of the RBI for purposes specified from time to time. The FRRR along with the SDF will impart flexibility to the RBI's liquidity management framework.
- iv. Both MSF and SDF will be available on all days of the week, throughout the year.
- v. It has also been decided to restore the opening time for financial markets regulated by the RBI to the pre-pandemic timing of 9:00 am with effect from April 18, 2022, without any change in their closing time prevailing at present.

During the pandemic, the RBI offered liquidity facilities of the order ₹17.2 lakh crore of which ₹11.9 lakh crore was utilised. So far ₹5.0 lakh crore has been returned or withdrawn on the lapse of various facilities on their due dates. The extraordinary liquidity measures undertaken in the wake of the pandemic, combined with the liquidity injected through various other operations of the RBI have

left a liquidity overhang of the order of ₹8.5 lakh crore in the system. The RBI will engage in a gradual and calibrated withdrawal of this liquidity over a multi-year time frame in a non-disruptive manner beginning this year. The objective is to restore the size of the liquidity surplus in the system to a level consistent with the prevailing stance of monetary policy. While doing so, I would like to reiterate our commitment to ensure the availability of adequate liquidity to meet the productive requirements of the economy. We also remain focussed on completion of the borrowing programme of the Government and towards this end the RBI will deploy various instruments as warranted.

External Sector

Despite the worsening global supply shocks slowing the recovery in the world economy, India's merchandise exports grew robustly in 2021-22, overshooting the target of US\$ 400 billion. A sharp escalation in international commodity prices in conjunction with domestic demand recovery has also led to a strong rebound in imports and a widening of trade and current account deficits. The sustained and robust growth in services exports and in-bound remittances continue to keep our invisible account balance in large surplus, which helps to offset partly the merchandise trade deficit. Despite the sharp jump in crude oil and other commodity prices, we expect the current account deficit to remain at sustainable levels which can be financed with normal capital flows.

Overall, our external sector indicators remain healthy and have improved significantly in recent years. Our foreign exchange reserves stand at US\$ 606.5 billion as on April 1, 2022 which are further bolstered by the net forward assets of the RBI. The Reserve Bank remains committed to maintain orderly conditions in the domestic financial markets and will take appropriate steps, as needed, on an ongoing basis to contain the adverse spillovers from the global

developments.

Additional Measures

I now propose to 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. These measures are as follows:

Individual Housing Loans – Rationalisation of Risk Weights

The risk weights for individual housing loans were rationalised in October 2020 by linking them only with loan to value (LTV) ratios for all new housing loans sanctioned up to March 31, 2022. Recognising the importance of the housing sector and its multiplier effects, it has been decided to extend the applicability of these guidelines till March 31, 2023. This will facilitate higher credit flow for individual housing loans.

SLR holdings in HTM category

With a view to enable banks to better manage their investment portfolio during 2022-23, it has been decided to enhance the present limit under Held to Maturity (HTM) category from 22 percent to 23 per cent of NDTL till March 31, 2023. It has also been decided to allow banks to include eligible SLR securities acquired between April 1, 2022 and March 31, 2023 under this enhanced limit. The HTM limits would be restored from 23 per cent to 19.5 per cent in a phased manner starting from the quarter ending June 30, 2023.

Discussion Paper on Climate Risk and Sustainable Finance

Climate change poses certain risks that could have implications for the safety and soundness of financial institutions and as well as financial stability. To facilitate better understanding and assessment of the potential impact of climate-related financial risks by Regulated Entities, a Discussion Paper on Climate

Risk and Sustainable Finance will be published shortly for feedback.

Committee for review of Customer Service Standards in RBI Regulated Entities

The Reserve Bank has over the years taken a number of measures to enhance consumer protection. These measures include laying down regulatory frameworks on customer service, internal grievance redress and the Ombudsman mechanisms. In view of the transformation underway in the financial landscape due to innovations in products and services, deepening of digital penetration and emergence of various service providers, it is proposed to set up a committee to examine and review the current state of customer service in the RBI Regulated Entities, adequacy of customer service regulations and suggest measure to improve the same.

Interoperable Card-less Cash Withdrawal at ATMs

At present, the facility of card-less cash withdrawal through ATMs is limited only to a few banks. It is now proposed to make card-less cash withdrawal facility available across all banks and ATM networks using the UPI. In addition to enhancing ease of transactions, the absence of the need for physical card for such transactions would help prevent frauds such as card skimming, card cloning, etc.

Bharat Bill Payment System – Rationalisation of Net-worth Requirement for Operating Units

Bharat Bill Payment System (BBPS), an interoperable platform for bill payments, has seen an increase in the volume of bill payments and billers over the years. To further facilitate greater penetration of bill payments through the BBPS and to encourage participation of a greater number of non-bank Bharat Bill Payment Operating Units in the BBPS, it is proposed to reduce the net worth requirement of such entities from ₹100 crore to ₹25 crore.

Cyber Resilience and Payment Security Controls of Payment System Operators (PSOs)

Payment systems play a catalytic role in facilitating financial inclusion and promoting financial stability. To ensure that our payment systems remain resilient to conventional and emerging risks, specifically those relating to cyber security, it is proposed to issue guidelines on Cyber Resilience and Payment Security Controls for Payment System Operators.

Concluding Remarks

The last two years have seen turbulence and uncertainty of epic proportions. At the Reserve Bank, we have worked unrelentingly to mitigate their impact on our economy. When I look back, I see that we have traversed an arduous path with candour, courage and the conviction that a brighter future lies ahead.

The conflict in Europe now poses a new and overwhelming challenge, complicating an already uncertain global outlook. As the daunting headwinds of the geopolitical situation challenge us, the RBI is braced up and prepared to defend the Indian economy with all instruments at its command. As we have demonstrated over the last two years, we are not hostage to any rulebook and no action is off the table when the need of the hour is to safeguard the economy. Our goals of price stability, sustained growth and financial stability are mutually reinforcing and we continue to be guided by this approach.

The sky today may be overcast with clouds, but we will use all our energies, resolve and resources to let the sunlight illuminate India's future. Let me end by recalling what the Father of our nation, Mahatma Gandhi said long ago: "It is faith that steers us through stormy seas, faith that moves mountains and faith that jumps across the ocean."¹

Thank you. Stay safe. Stay well. Namaskar.

¹ Young India, 24-9-1925, p. 331

MONETARY POLICY STATEMENT FOR 2022~23

Resolution of the Monetary Policy Committee (MPC)
April 6-8, 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 (April 8, 2022) decided to:

- keep the policy repo rate under the liquidity adjustment facility (LAF) unchanged at 4.0 per cent.

The marginal standing facility (MSF) rate and the Bank Rate remain unchanged at 4.25 per cent. The standing deposit facility (SDF) rate, which will now be the floor of the LAF corridor, will be at 3.75 per cent.

- The MPC also decided to remain accommodative while focusing 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 February 2022, the global economic and financial environment has worsened with the escalation of geopolitical conflict and accompanying sanctions. Commodity

prices have shot up substantially across the board amidst heightened volatility, with adverse fallouts on net commodity importers. Financial markets have exhibited increased volatility. Crude oil prices jumped to 14-year high in early March; despite some correction, they remain volatile at elevated levels. Supply chain pressures, which were set to ease, are rising again. The broad-based jump in global commodity prices has exacerbated inflationary pressures across advanced economies (AEs) and emerging market economies (EMEs) alike causing a sharp revision in their inflation projections. The global composite purchasing managers' index (PMI) eased to 52.7 in March from 53.5 in February with output growth slowing in both manufacturing and services sectors. World merchandise trade momentum has weakened.

3. Several central banks, especially systemic ones, continue to be on the path of normalisation and tightening of monetary policy stances. Resultantly, sovereign bond yields in major AEs have been hardening. Bullion prices had buoyed to near 2020 highs on safe haven flows, with some recent correction as bond yields rose. Global equity markets fell, although more recently they have recovered some ground. In recent weeks, strong capital outflows from the EMEs have moderated thus curbing the downward pressures on their currencies, even as the US dollar has strengthened. Overall, the global economy faces major headwinds from several fronts, including continuing uncertainty about the pandemic's trajectory.

Domestic Economy

4. The second advance estimates (SAE) for 2021-22 released by the National Statistical Office (NSO) on February 28, 2022 placed India's real gross domestic product (GDP) growth at 8.9 per cent, 1.8 per cent above the pre-pandemic (2019-20) level. On the supply side, real gross value added (GVA) rose by 8.3 per cent in 2021-22, with its major components, including services, exceeding pre-pandemic levels. GDP growth

* Released on April 8, 2022.

in Q3:2021-22 decelerated to 5.4 per cent.

5. In Q4:2021-22, available high frequency indicators exhibit signs of recovery with the fast ebbing of the third wave but the picture is mixed. Urban demand reflected in domestic air traffic rebounded in March and the pace of contraction in passenger vehicle sales moderated in February. On the other hand, rural demand mirrored in two-wheeler and tractor sales contracted in February. Import of capital goods increased robustly in February, although domestic production continued to contract. Merchandise exports remained buoyant and clocked double-digit growth for the thirteenth successive month in March 2022 and reached US\$ 417.8 billion in 2021-22 surpassing the target of US\$ 400 billion. All categories of imports, however, have risen even faster, leading to merchandise trade deficit at a record annual level of US \$ 192 billion in 2021-22 or 6.1 per cent of GDP.

6. On the supply side, foodgrains production touched a new record in 2021-22, with both kharif and rabi output crossing the final estimates for 2020-21 as well as the targets set for 2021-22. The manufacturing PMI remained in expansion zone in March, although it moderated somewhat to 54.0 from 54.9 in February. Services sector indicators – railway freight; e-way bills; GST collections; toll collections; fuel consumption; and electricity demand – were in expansion in February-March. The services PMI continued in expansion mode, inching up to 53.6 in March from 51.8 in the preceding month.

7. Headline CPI inflation edged up to 6.0 per cent in January 2022 and 6.1 per cent in February, breaching the upper tolerance threshold. Pick-up in food inflation contributed the most in headline inflation, with inflation of cereals, vegetables, spices and protein-based food items like eggs, meat and fish being the key drivers. Fuel inflation moderated on continuing deflation in electricity and steady LPG prices. Core inflation, i.e., CPI inflation excluding food

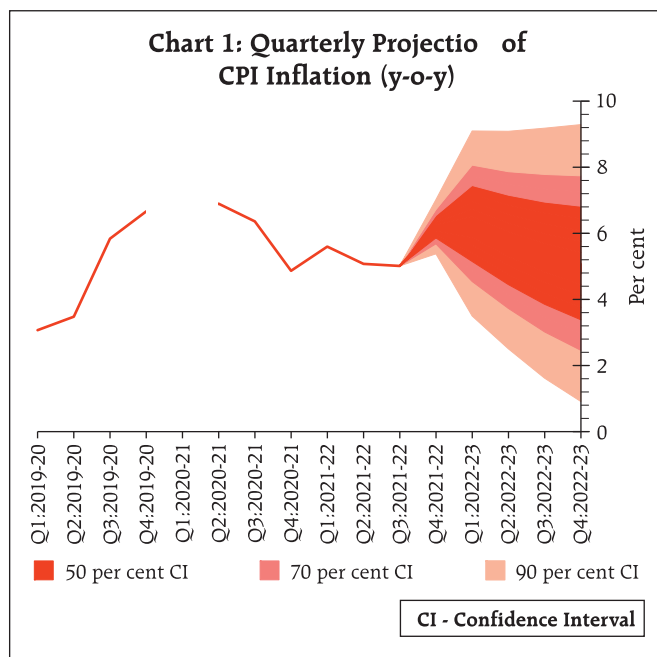
and fuel remained elevated, though there was some moderation from 6.0 per cent in January to 5.8 per cent in February primarily due to the easing of inflation in transport and communication; pan, tobacco and intoxicants; recreation and amusement; and health.

8. Overall system liquidity remained in large surplus, with average daily absorption (through both the fixed and variable rate reverse repos) under the LAF at ₹7.5 lakh crore in March, marginally lower than ₹7.8 lakh crore in January-February 2022. Reserve money (adjusted for the first-round impact of the change in the cash reserve ratio) expanded by 10.9 per cent (y-o-y) on April 1, 2022. Money supply (M3) and bank credit by commercial banks rose (y-o-y) by 8.7 per cent and 9.6 per cent, respectively, as on March 25, 2022. India's foreign exchange reserves increased by US\$ 30.3 billion to US\$ 607.3 billion in 2021-22.

Outlook

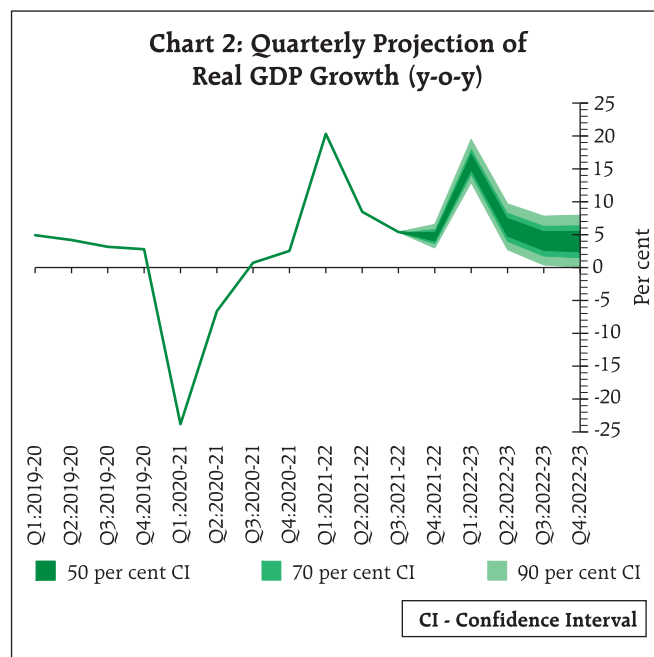
9. Looking ahead, the inflation trajectory will depend critically upon the evolving geopolitical situation and its impact on global commodity prices and logistics. On food prices, domestic prices of cereals have registered increases in sympathy with international prices, though record foodgrains production and buffer stock levels should prevent a major flare up in domestic prices. Elevated global price pressures in key food items such as edible oils, and in animal and poultry feed due to global supply shortages impart high uncertainty to the food price outlook, warranting continuous monitoring.

10. In this scenario, pro-active supply management is critical to contain inflation. International crude oil prices remain volatile and elevated, with considerable uncertainties surrounding global supplies. With the broad-based surge in prices of key industrial inputs and global supply chain disruptions, input cost push pressures appear likely to persist for longer than expected earlier. Their pass-through to retail prices, though limited till now given the continuing slack



in the economy, needs to be monitored carefully. Manufacturing sector firms polled in the Reserve Bank's industrial outlook survey expect higher 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\$ 100 per barrel, inflation is now projected at 5.7 per cent in 2022-23, with Q1 at 6.3 per cent; Q2 at 5.8 per cent; Q3 at 5.4 per cent; and Q4 at 5.1 per cent (Chart 1).

11. Going forward, good prospects of rabi output augur well for rural demand. With the ebbing of the third wave and expanding vaccination coverage, the pick-up in contact-intensive services and urban demand is expected to be sustained. The government's thrust on capital expenditure coupled with initiatives such as the production linked incentive (PLI) scheme should bolster private investment activity, amidst improving capacity utilisation, deleveraged corporate balance sheets, higher offtake of bank credit and congenial financial conditions. At the same time, the escalation of the geopolitical situation and the accompanying surge in international crude oil and other commodity prices, tightening of global financial



conditions, persistence of supply-side disruptions and significantly weaker external demand pose downside risks to the outlook. The future course of the pandemic and the uncertainties about the pace of monetary policy normalisation in major advanced economies also weigh on the outlook. Taking all these factors into consideration, the real GDP growth for 2022-23 is now projected 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).

12. The MPC is of the view that since the February meeting, the ratcheting up of geopolitical tensions, generalised hardening of global commodity prices, the likelihood of prolonged supply chain disruptions, dislocations in trade and capital flows, divergent monetary policy responses and volatility in global financial markets are imparting sizeable upside risks to the inflation trajectory and downside risks to domestic growth.

13. Given the evolving risks and uncertainties, the MPC has decided to keep the policy repo rate unchanged at 4 per cent. The MPC also decided to remain accommodative while focusing on withdrawal

of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

14. All members of the MPC – Dr. Shashanka Bhide, Dr. Ashima Goyal, Prof. Jayanth R. Varma, Dr. Mridul K. Sagar, Dr. Michael Debabrata Patra and Shri Shaktikanta Das – unanimously voted to keep the policy repo rate at 4.0 per cent.

15. All members, namely, Dr. Shashanka Bhide, Dr. Ashima Goyal, Prof. Jayanth R. Varma, Dr. Mridul

K. Sagar, Dr. Michael Debabrata Patra and Shri Shaktikanta Das unanimously voted to remain accommodative while focusing on withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.

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

17. The next meeting of the MPC is scheduled during June 6-8, 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) liquidity measures; (ii) regulation and supervision; and (iii) payment and settlement systems.

I. Liquidity Measures

1. Introduction of the Standing Deposit Facility

In 2018, the amended Section 17 of the RBI Act empowered the Reserve Bank to introduce the Standing Deposit Facility (SDF) – an additional tool for absorbing liquidity without any collateral. By removing the binding collateral constraint on the RBI, the SDF strengthens the operating framework of monetary policy. The SDF is also a financial stability tool in addition to its role in liquidity management.

Accordingly, it has been decided to institute the SDF with an interest rate of 3.75 per cent with immediate effect. The SDF will replace the fixed rate reverse repo (FRRR) as the floor of the LAF corridor. Both the standing facilities viz., the MSF and the SDF will be available on all days of the week, throughout the year.

The fixed rate reverse repo (FRRR) rate is retained at 3.35 per cent. It will remain as part of the RBI's toolkit and its operation will be at the discretion of the RBI for purposes specified from time to time. The FRRR along with the SDF will impart flexibility to the RBI's liquidity management framework.

2. Restoration of the Symmetric LAF Corridor

In 2020 during the pandemic, the width of the LAF corridor was widened to 90 basis points (bps) by asymmetric adjustments in the reverse repo rate vis-à-vis the policy repo rate. With a view to fully restore the pre-pandemic liquidity management framework of February 2020 and in view of the gradual return to normalcy in financial markets, it has now been

decided to restore the width of the LAF corridor to its pre-pandemic level. With the introduction of the SDF at 3.75 per cent, the policy repo rate being at 4.00 per cent and the MSF rate at 4.25 per cent, the width of the LAF corridor is restored to its pre-pandemic configuration of 50 bps. Thus, the LAF corridor will be symmetric around the policy repo rate with the MSF rate as the ceiling and the SDF rate as the floor with immediate effect.

II. Regulation and Supervision

3. Individual Housing Loans – Rationalisation of Risk Weights

The Reserve Bank vide circular dated October 12, 2020 had rationalised the risk weights for individual housing loans by linking them only with loan to value (LTV) ratios for all new housing loans sanctioned up to March 31, 2022. Recognising the importance of the housing sector, its multiplier effects and its role in supporting the overall credit growth, it has been decided that the risk weights as prescribed in the circular ibid shall continue for all new housing loans sanctioned up to March 31, 2023.

4. SLR Holdings in HTM category

The Reserve Bank had increased the limits under Held to Maturity (HTM) category from 19.5 per cent to 22 per cent of net demand and time liabilities (NDTL) in respect of statutory liquidity ratio (SLR) eligible securities acquired on or after September 1, 2020, up to March 31, 2022. This dispensation of enhancement in HTM limit was made available up to March 31, 2023. With a view to enable banks to better manage their investment portfolio in FY 2022-23, it has now been decided to enhance the limit for inclusion of SLR eligible securities in the HTM category to 23 per cent of NDTL and allow the banks to include securities acquired between April 1, 2022 and March 31, 2023 under the enhanced limit of 23 per cent. The HTM limits would be restored from 23 per cent to 19.5 per cent in a phased manner starting from the quarter ending June 30, 2023.

5. Discussion Paper on Climate Risk and Sustainable Finance

Climate change may result in physical and transition risks that could have implications for the safety and soundness of individual Regulated Entities (REs) as well as financial stability. Thus, there is a need for REs to develop and implement a sound process for understanding and assessing the potential impact of climate-related financial risks in their business strategy and operations. This would require, among other things, an appropriate governance structure and a strategic framework to effectively manage and address these risks. Further, some regulatory initiatives in the area of climate risk and sustainable finance would also help the REs to better handle climate risk and guide them in the transition period. A Discussion Paper on Climate Risk and Sustainable Finance covering the above aspects will be placed shortly on the RBI's website for comments of stakeholders.

6. Committee for Review of Customer Service Standards in RBI Regulated Entities

RBI has progressively taken a number of measures, including laying down an elaborate regulatory framework on customer service and internal grievance redress at regulated entities (REs) as also putting in place the Ombudsman framework as far back as 1995, to ensure overarching protection for the customers of its REs. Regulatory instructions are issued to REs based on the conditions prevailing in the financial system, findings of conduct supervision, analysis of complaints received, and recommendations received from various Committees set up for this purpose. The important committees set up by RBI on customer service over the years include (i) Talwar Committee on Customer Service (1975), (ii) Goiporia Committee (1990), (iii) Tarapore Committee on Procedures and Performance Audit on Public Services (CPPAPS, 2004) and (iv) Damodaran Committee on Customer Service (2010).

The financial landscape is undergoing a revolutionary transformation consequent to the rising

customer base of the banks, advent of digital products, technology platforms and service providers as also the rising volumes of digital transactions emerging from innovations in payment systems. Accordingly, it is proposed to set up a committee to examine and review the state of customer service in the REs and adequacy of customer service regulations and suggest measure to improve the same.

III. Payment and Settlement Systems

7. Interoperable Card-less Cash Withdrawal (ICCW) at ATMs

Card-less cash withdrawal through ATMs is a permitted mode of transaction offered by a few banks in the country on an on-us basis (for their customers at their own ATMs). The absence of need for a card to initiate cash withdrawal transactions would help in containing frauds like skimming, card cloning, device tampering, etc. To encourage card-less cash withdrawal facility across all banks and all ATM networks / operators, it is proposed to enable customer authorisation through the use of Unified Payments Interface (UPI) while settlement of such transactions would happen through the ATM networks. Separate instructions would be issued to NPCI, ATM networks and banks shortly.

8. Bharat Bill Payment System – Rationalisation of Net-worth Requirement for Operating Units

Bharat Bill Payment System (BBPS) is an interoperable platform for bill payments and the scope and coverage of BBPS extends to all categories of billers who raise recurring bills. Users of BBPS enjoy benefits like standardised bill payment experience, centralised customer grievance redressal mechanism, prescribed customer convenience fee, etc. BBPS has seen an increase in the volume of transactions as well as number of onboarded billers.

It is observed that there has not been a corresponding growth in the number of non-bank Bharat Bill Payment Operating Units (BBPOUs). The

current requirement of net worth for a non-bank BBPOU to obtain authorisation is ₹100 crore and it is viewed as a constraint to greater participation. It is, therefore, proposed to align the net worth requirement of non-bank BBPOUs with that of other non-bank participants who handle customer funds (like Payment Aggregators) and have a similar risk profile. Accordingly, the net worth requirement for non-bank BBPOUs is being reduced to ₹25 crore. The necessary amendment to regulations will be carried out shortly.

9. Cyber Resilience and Payment Security Controls of Payment System Operators (PSOs)

Payment systems play a catalytic role in promoting financial stability and facilitating financial inclusion. Maintaining the safety and

security of these systems is a key objective of RBI. With greater adoption of digital payment modes, it is important to ensure that payment system infrastructures are not only efficient and effective but also resilient to conventional and emerging risks, specifically those relating to cyber security. RBI has prescribed the necessary security controls for digital payment products and services offered by banks and credit card issuing NBFCs. It is proposed to issue similar directions for Payment System Operators (PSOs), covering robust governance mechanism for identification, assessment, monitoring and management of cybersecurity risks including information security risks and vulnerabilities, and specify baseline security measures for ensuring safe and secure digital payment transactions. The directions will be issued shortly.

MONETARY POLICY REPORT FOR 2022~23

Monetary Policy Report - April 2022

I. Macroeconomic Outlook

The global economic environment has drastically altered, with the escalating geopolitical situation clouding the outlook for both growth and inflation in India and across the world warranting a revision in forecasts. Lingered war and sanctions, elevated oil and commodity prices, prolonged supply chain disruptions, accentuated global financial market volatility emanating from monetary policy shifts in major economies, and renewed waves of COVID-19 across countries pose downside risks to the growth and upside risks to the inflation outlook.

I.1 Key Developments since the October 2021 MPR

Since the release of the October 2021 Monetary Policy Report (MPR), the global economic environment has drastically altered, with the escalating geopolitical situation clouding the outlook for both growth and inflation in India and across the world warranting a revision in forecasts. Amidst persisting global supply chain disruptions, elevated energy and input prices and tighter labour markets, apprehensions of heightened global financial and commodity market volatility come together in a perfect storm.

Brent crude prices crossed US\$ 130 per barrel on March 8, 2022 and have hovered in the US\$ 100-120 range since mid-March, posing the biggest risk to India's economic prospects and putting the global recovery at heightened risk. The Bloomberg commodity index spiked by around 10 per cent since the war erupted on February 24 and 52 per cent on a year-on-year basis (as on April 5, 2022) as supply concerns exacerbated across commodities. Gold prices crossed US\$ 2,000 per ounce on safe haven demand before some correction. Global food prices were at an all-time high in February 2022 and are expected to harden further in view of potential supply disruptions.

With inflation turning out to be persistent and broad-based and well above targets, major advanced economies (AEs) quickened the pace of unwinding of their ultra-accommodative monetary policies. A number of emerging market economies (EMEs) have been in a tightening mode since 2021, and more are expected to follow. Sovereign bond yields in major AEs had hardened substantially in anticipation of a faster and steeper tightening of policy rates, but geopolitical risks have imparted high volatility as risk sentiment experiences sudden and sizeable shifts by every passing day. Equity markets have seen sharp corrections since the start of the calendar year with the market volatility index rising to a one-year high amidst geopolitical tensions. Currency markets have turned highly volatile in response to these developments, with the US dollar index reaching its highest since June 2020 due to flight to safety.

Turning to the domestic economy, real gross domestic product (GDP) rose by 8.9 per cent in 2021-22, above its pre-pandemic (2019-20) level by just 1.8 per cent. Economic activity, which gained strength in Q2:2021-22 (July-September) with the ebbing of the second wave, has lost pace since Q3:2021-22 (October-December), exacerbated by the spread of the Omicron variant in Q4 (January-March). The beneficial effects of the rapid ebb of infections have, however, been overwhelmed by the geopolitical conflagration since February 2022. Consumer price index (CPI) inflation edged above the upper tolerance band in February 2022 as unfavourable base effects combine with the onset of supply shocks as conflict escalates. While India's direct trade and financial exposures are modest, indirect spillovers from the slowing global economy, the sharp jump in commodity prices across the board and elevated risk aversion and uncertainty owing to geopolitical developments weigh heavily on the outlook.

Monetary Policy Committee: October 2021-March 2022

During October 2021-March 2022, the Monetary Policy Committee (MPC) met thrice. When the MPC met for its October 2021 meeting, CPI inflation had returned within the tolerance band after breaching the upper threshold in May-June 2021. The outlook for aggregate demand was progressively improving but output was still below the pre-COVID level and the recovery was uneven. The external environment had turned uncertain and challenging, with headwinds from slowing growth in major economies, a steep jump in natural gas prices and concerns emanating from normalisation of monetary policy in major advanced economies. Against this backdrop, the MPC noted that the domestic recovery needed to be nurtured assiduously through all policy channels and decided unanimously to keep the policy repo rate unchanged at 4 per cent and by a majority of 5 to 1 to continue with an accommodative stance as long as necessary to revive and sustain growth on a durable basis and continue to mitigate the impact of COVID-19 on the economy, while ensuring that inflation remains within the target going forward.

In its December 2021 meeting, the MPC noted that continuing the normalisation of excise duties and value added taxes (VATs) on petroleum products alongside measures to address other input cost pressures assumed critical importance for a sustained lowering of core inflation. The domestic recovery was gaining traction but was just about catching up with pre-pandemic levels and downside risks remained significant, rendering the outlook highly uncertain, especially on account of global spillovers, the potential resurgence in COVID-19 infections with new mutations, persisting shortages and bottlenecks and the widening divergences in policy actions and stances across the world. Against this backdrop, the MPC judged that the ongoing domestic recovery needed sustained policy support to make it more

broad-based and decided unanimously to maintain *status quo* on the policy repo rate and with a majority of 5 to 1 to continue with the accommodative stance set out in the October resolution.

At the time of MPC's February 2022 meeting, CPI inflation had edged even higher, driven up by unfavourable base effects while demand-pull pressures remained muted. The MPC noted that inflation was likely to moderate in H1:2022-23 and move closer to the target thereafter, providing room to remain accommodative. The potential pick up of input costs was seen as a contingent risk, especially if international crude oil prices remained elevated. On economic activity, the MPC observed that COVID-19 continued to impart some uncertainty to the future outlook while the global macroeconomic environment was characterised by deceleration in global demand, with increasing headwinds from financial market volatility induced by monetary policy normalisation. Judging that the domestic recovery was still incomplete and needed continued policy support, the MPC decided unanimously to keep the policy repo rate unchanged and on a 5 to 1 majority to continue with the accommodative stance.

The MPC's voting pattern reflects the diversity in individual members' assessments, expectations and policy preferences, a characteristic also reflected in voting patterns of other central banks (Table I.1).

Macroeconomic Outlook

Chapters II and III analyse macroeconomic developments related to inflation and economic activity during H2:2021-22 (October-March). For the updated projections set out in this Chapter, the evolution of key macroeconomic and financial variables over the past six months warrants revisions in the baseline assumptions (Table I.2).

First, international crude oil prices have surged over the past six months. Crude oil prices initially declined in late November 2021 in the wake of the

Table I.1 Monetary Policy Committees and Policy Rate Voting Patterns

Country	Policy Meetings: October 2021-March 2022			
	Total meetings	Meetings with full consensus	Meetings without full consensus	Variation in policy rate (basis points)
Brazil	4	4	0	550
Chile	4	4	0	550
Colombia	4	0	4	300
Czech Republic	4	0	4	350
Hungary	6	6	0	275
India	3	3	0	0
Israel	4	3	1	0
Japan	4	0	4	0
South Africa	3	0	3	75
Sweden	2	2	0	0
Thailand	4	4	0	0
UK	4	0	4	65
US	4	3	1	25

Sources: Central bank websites.

Omicron wave and the expected reduction in demand; since then, global crude oil prices have been on the rise as demand increased with the ebbing of Omicron infections while supply remained sluggish due to the chronic under-performance *versus* targets by the Organization of the Petroleum Exporting Countries (OPEC) *plus*, a subdued shale response, multi-year low oil inventories, dwindling spare capacity and Russia-Ukraine developments (Chart I.1). The outlook has become highly uncertain due to escalating geopolitical tensions and sanctions, even as the US has decided to release about 180 million barrels of oil from its stockpile in a bid to cool crude prices. Taking into account these developments, crude prices (Indian basket) are assumed at US\$ 100 per barrel in the baseline, 33 per cent above the October MPR baseline.

Second, the nominal exchange rate (the Indian rupee or INR *vis-à-vis* the US dollar) has exhibited two-way movements in a range of INR 74-77 per US dollar since October 2021. The INR exhibited a depreciating bias till the middle of December 2021 over concerns

Table I.2: Baseline Assumptions for Projections

Indicator	MPR October 2021	MPR April 2022
Crude Oil (Indian basket)	US\$ 75 per barrel during H2:2021-22	US\$ 100 per barrel during 2022-23
Exchange rate	₹ 74.3/US\$ during H2:2021-22	₹ 76/US\$ during 2022-23
Monsoon	1 per cent below long-period average	Normal for 2022-23
Global growth	6.0 per cent in 2021 4.9 per cent in 2022	3.5 per cent in 2022 3.5 per cent in 2023
Fiscal deficit (per cent of GDP)	To remain within BE 2021-22 Centre: 6.8 Combined: 10.2	To remain within BE 2022-23 Centre: 6.4 Combined: 9.0
Domestic macroeconomic/structural policies during the forecast period	No major change	No major change

Notes: 1. The Indian basket of crude oil represents a derived numeraire comprising sour grade (Oman and Dubai average) and sweet grade (Brent) crude oil.

2. The exchange rate path assumed here is for the purpose of generating the baseline projections and does not indicate any 'view' on the level of the exchange rate. The Reserve Bank is guided by the objective of containing excess volatility in the foreign exchange market and not by any specific level of and/or band around the exchange rate.

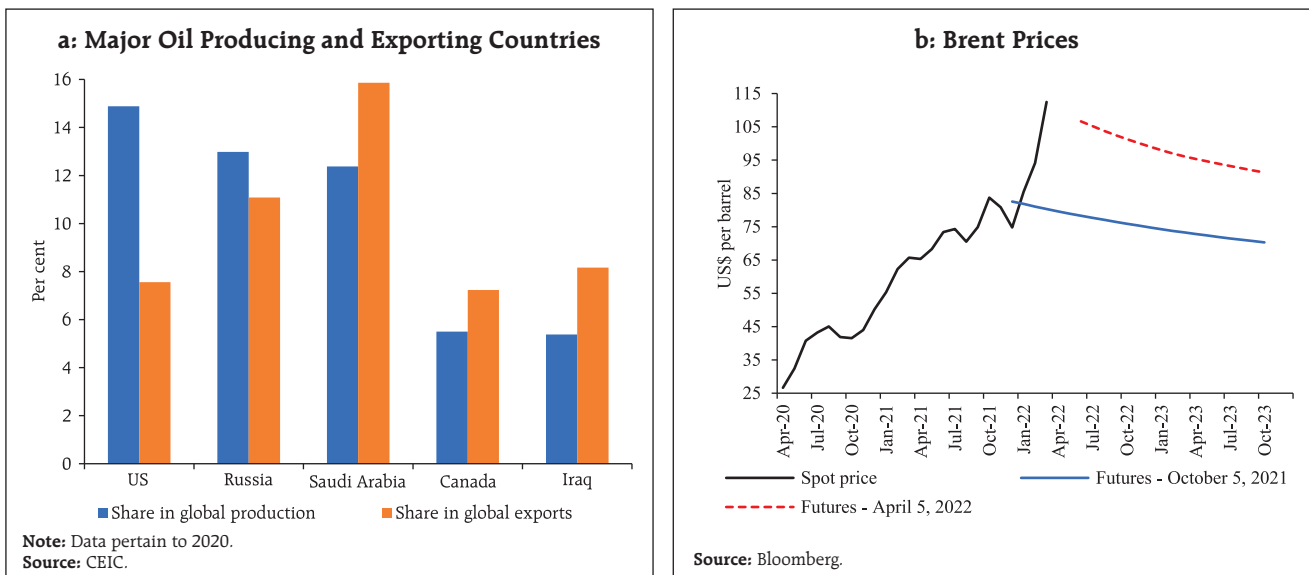
3. BE: Budget estimates.

4. Combined fiscal deficit refers to that of the Centre and States taken together.

Sources: RBI staff estimates; Budget documents; and IMF.

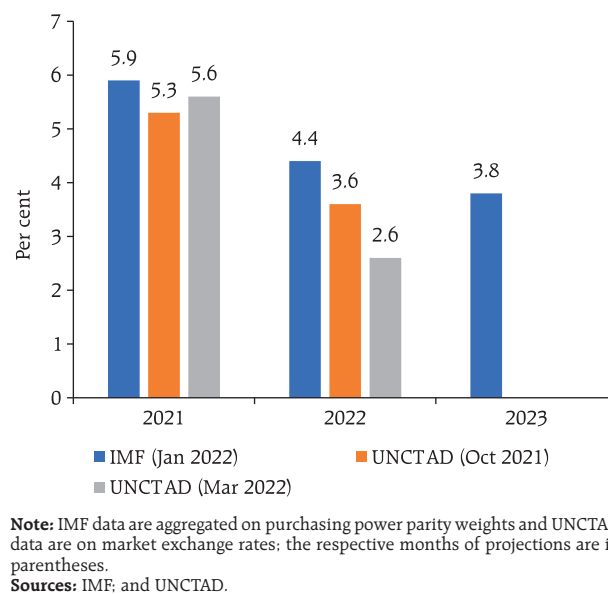
about the economic fallout from the Omicron wave, elevated crude oil prices, and expectations of faster rate hikes by the US Fed. Subsequently, as the Omicron caseloads declined sharply, the INR showed signs of appreciation. The INR came under pressure from late February due to geopolitical tensions and the surge in crude oil prices. Taking these developments into consideration, the exchange rate is assumed at INR 76 per US dollar in the baseline as against INR 74.3 in the October 2021 MPR.

Third, the global economic prospects have weakened significantly since the October MPR, with a sequence of headwinds from the Omicron wave, prolonged global supply chain disruptions, persistent

Chart I.1: Crude Oil – Production and Prices

container shortages, multi-decadal inflation highs in major advanced economies forcing their central banks to quicken the pace of monetary policy normalisation and more recently by the escalating geopolitical tensions (Chart I.2). According to the Organisation for Economic Co-operation and Development (OECD), the rise in commodity prices and financial market volatility since the ratcheting up of the geopolitical tensions in February, if sustained, could reduce global GDP growth by over one percentage point in the first year and push up global consumer price inflation by around 2.5 percentage points; the output losses could be higher in case of further sanctions, consumer and business boycotts, disruptions to shipping and air traffic, the unavailability of key products from Russia, trade restrictions such as export bans on food commodities, and undermined consumer confidence.¹ In March, the United Nations Conference on Trade and Development (UNCTAD) projected global growth

for 2022 to be 100 bps below its October 2021 assessment.²

Chart I.2: Global GDP Growth Outlook

¹ OECD (2022), "Economic and Social Impacts and Policy Implications of the War in Ukraine", *Economic Outlook, Interim Report*, March.

² UNCTAD (2022), "Tapering in a Time of Conflict", *Trade and Development Report Update*, March.

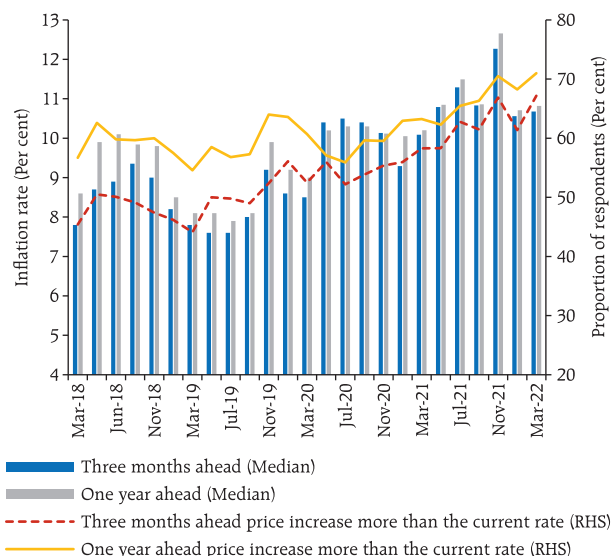
I.2 The Outlook for Inflation

After easing to 4.3 per cent in September 2021, CPI inflation rose in the following months to reach 6.1 per cent in February 2022, driven by the increase in food inflation.

Looking ahead, the three months and one year ahead median inflation expectations of urban households increased marginally by 10 bps each in the March 2022 round of the Reserve Bank's survey.³ The proportion of respondents expecting the general price level to increase by more than the current rate also increased for both the three months and one year ahead horizons *vis-à-vis* the previous round (Chart I.3).

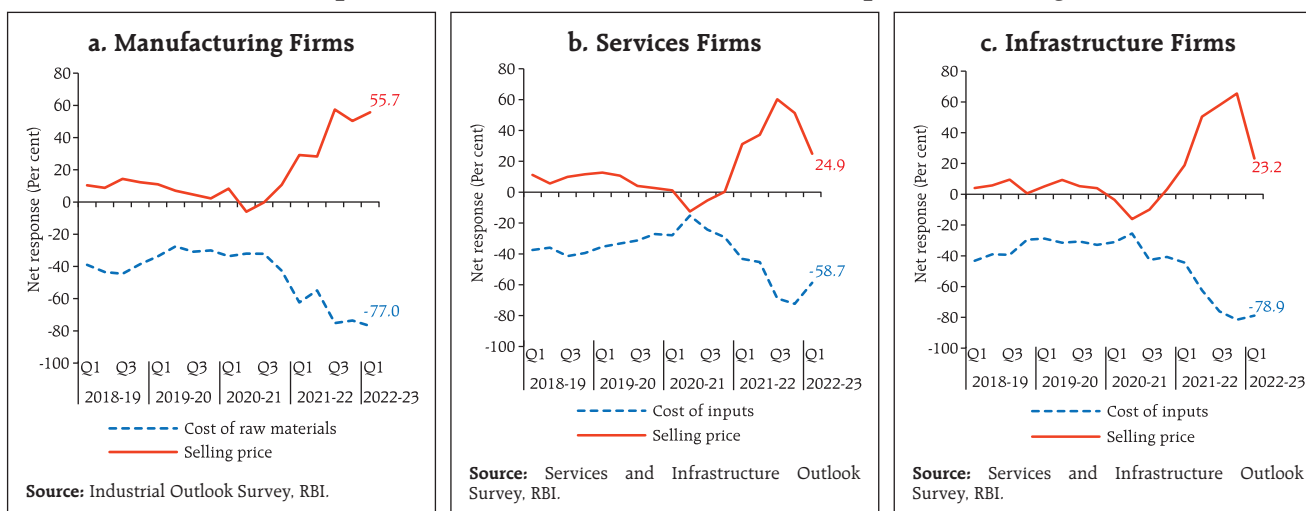
Manufacturing firms polled in the January-March 2022 round of the Reserve Bank's industrial outlook survey expected increase in their input costs and selling prices in Q1:2022-23 (Chart I.4a).⁴ Service and infrastructure sector companies expected moderation

Chart I.3: Inflation Expectations of Households



in the pace of increase in input costs and selling prices in Q1:2022-23 (Charts I.4b and I.4c).⁵ The respondents

Chart I.4: Expectations about Cost of Raw Materials/Inputs and Selling Prices

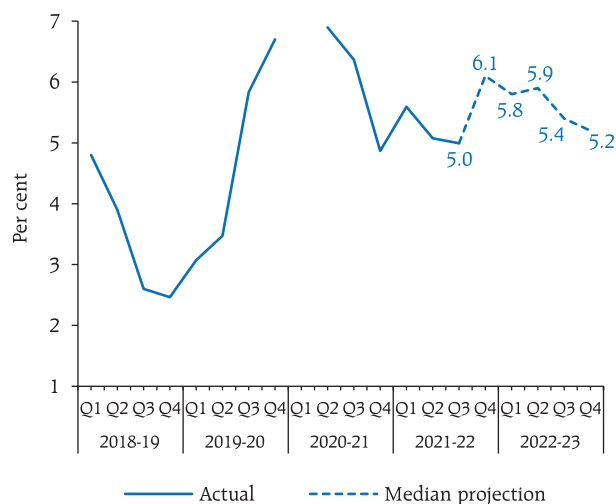


Note: Net response is the difference between the share of respondents reporting optimism and those reporting pessimism. The range is -100 to 100. A positive/ negative value of net response is considered as optimistic/pessimistic from the view point of respondent firms. Therefore, higher positive values of selling prices indicate increase in output prices while lower values for the cost of raw materials/cost of inputs indicate higher input price pressures and vice versa.

³ The Reserve Bank's inflation expectations survey of households is being conducted in 19 cities since March 2021 (18 cities in previous rounds) and the results of the March 2022 round are based on responses from 6,033 households.

⁴ The results of the January-March 2022 round of the industrial outlook survey are based on responses from 1,283 companies.

⁵ Based on 574 companies polled in the January-March 2022 round of the services and infrastructure outlook survey.

Chart I.5: Professional Forecasters' Projection of CPI Inflation

Sources: Survey of Professional Forecasters; RBI; and National Statistical Office.

in manufacturing and services PMI reported continued input and output price pressures in March 2022.

Professional forecasters surveyed by the Reserve Bank in March 2022 expected CPI inflation to move from 6.1 per cent in Q4:2021-22 to 5.8 per cent in Q1:2022-23, 5.9 per cent in Q2, 5.4 per cent in Q3 and 5.2 per cent in Q4 (Chart I.5 and Table I.3).⁶ One-year ahead inflation expectations of professional forecasters are anchored around the inflation target,

Table I.3: Projections - Reserve Bank and Professional Forecasters

(Per cent)

	2021-22	2022-23	2023-24
Reserve Bank's Baseline Projections			
Inflation, Q4 (y-o-y)	6.2	5.1	5.5
Real GDP growth	8.9 [@]	7.2	6.3
Median Projections of Professional Forecasters			
Inflation, Q4 (y-o-y)	6.1	5.2	
Real GDP growth	8.8	7.5	
Gross domestic saving (per cent of GNDI)	29.0	28.7	
Gross capital formation (per cent of GDP)	30.1	30.6	
Credit growth of scheduled commercial banks	8.0	9.4	
Combined gross fiscal deficit (per cent of GDP)	10.4	9.7	
Central government gross fiscal deficit (per cent of GDP)	6.9	6.4	
Repo rate (end-period)	4.0	4.5	
Yield on 91-days treasury bills (end-period)	3.9	4.5	
Yield on 10-year central government securities (end-period)	6.8	7.1	
Overall balance of payments (US\$ billion)	42.5	-18.1	
Merchandise exports growth	39.0	8.9	
Merchandise imports growth	53.0	12.9	
Current account balance (per cent of GDP)	-1.7	-2.6	

[@]: Second advance estimates, National Statistical Office.

Note: GNDI: Gross National Disposable Income.

Sources: RBI staff estimates; and Survey of Professional Forecasters (March 2022).

while those of households seem to be sensitive to volatility in food prices (Box I.1).

Box I.1: Inflation Expectations Anchoring

Inflation expectations of firms and households are a key determinant of actual inflation dynamics. Two facets of the degree of anchoring of inflation expectations can be empirically examined – shock and level anchoring (Ball and Mazumder, 2011; Chen, 2019). Shock anchoring would imply that transitory supply-side shocks and inflation surprises (difference between the realised inflation and prior inflation expectations) do not affect inflation expectations of economic agents (equations 1 and 2 below). Level anchoring – a stronger form of

the hypothesis – assesses directly whether inflation expectations are anchored at the inflation target (equation 3 below). Drawing upon this conceptual framework, an empirical analysis is undertaken for 4-quarter ahead inflation expectations of professional forecasters (SPF) and households (IESH) in the Indian context for the period October 2016 to February 2022. The analysis is also conducted for the pre-pandemic period for robustness, given the persistent supply-side shocks in the period since March 2020.

(Contd.)

⁶ 33 panellists participated in the March 2022 round of the Reserve Bank's survey of professional forecasters.

Table I.1.1: Shock Anchoring

	SPF				IESH			
	FIT period		FIT period excluding pandemic		FIT period		FIT period excluding pandemic	
Core inflation	0.244**	0.240*	0.233**	0.214**	0.687***	0.596**	0.657***	0.743***
Food and fuel inflation	-0.013	-	-0.024	-	0.156**	-	0.399***	-
Food inflation	-	-0.012	-	-0.020	-	0.130**	-	0.288***
Fuel inflation	-	0.013	-	0.015	-	0.079	-	0.025
Constant	3.242***	3.183***	3.397***	3.418***	5.411***	5.602***	4.628***	4.545***
Observations	33	33	21	21	33	33	21	21
Adjusted R ²	0.47	0.46	0.74	0.73	0.51	0.48	0.57	0.51
DW Statistic	1.56	1.59	1.47	1.49	1.86	1.82	2.00	1.92

Note: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively. Regression estimates are corrected for first-order serially correlated residuals by using the Prais–Winsten transformation. FIT refers to Flexible Inflation Targeting.

Source: RBI staff estimates.

$$E_t \pi_{t+4} = \beta_0 + \beta_1 \pi_{t-j}^{core} + \beta_2 \pi_{t-j}^{food_fuel} + u_t \quad \dots (1)$$

$$\Delta E_t \pi_{t+4} = \beta_0 + \beta_1 (\pi_{t-j} - E_{t-1} \pi_{t-j}) + u_t \quad \dots (2)$$

$$E_t \pi_{t+4} = \beta_1 \pi^* + \beta_2 \pi_{t-j} + u_t \quad \dots (3)$$

where $E_t \pi_{t+4}$ is 4-quarter ahead inflation expectations formed in period t ; π_{t-j}^{core} and $\pi_{t-j}^{food_fuel}$ are core, and food and fuel inflation (y-o-y), respectively, available at the time of the survey; and π^* is the inflation target/anchor (4 per cent). Core inflation is CPI headline inflation excluding food and fuel.⁷ *A priori*, β_2 (the degree of sensitivity to transient supply shocks) in equation 1 and β_1 (the degree of sensitivity to inflation surprises) in equation 2 are expected to be statistically insignificant for shock-anchored expectations. In equation 3, β_1 (the degree of alignment with the target) is expected to be positive and statistically significant for level-anchored expectations, with closeness to unity indicative of the degree of anchoring. The results indicate that expectations of professional forecasters are shock-anchored (full sample as well as pre-pandemic period), *i.e.*, they are not influenced by food and fuel price shocks (Tables I.1.1 and I.1.2).

One-year ahead expectations of professional forecasters are also level-anchored (*i.e.*, they remain in close proximity to the inflation target); the null hypothesis of a unit coefficient on the inflation target and a zero coefficient on the actual realisation of inflation is not rejected (Table I.1.3 and Chart I.1.1a). Such anchoring of medium- and long-term inflation expectations can

Table I.1.2: Shock Anchoring

	SPF		IESH	
	FIT period	FIT period excluding pandemic	FIT period	FIT period excluding pandemic
News shock	0.082	0.030	0.219**	0.442**
Constant	-0.014	-0.052	0.969**	1.896**
Observations	33	21	33	21
Adjusted R ²	0.03	-0.04	0.08	0.15
DW Statistic	1.61	1.52	2.27	2.26

Note: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively.

Source: RBI staff estimates.

impart stability to bond yields and improve monetary transmission. Inflation expectations of households,

Table I.1.3: Level Anchoring

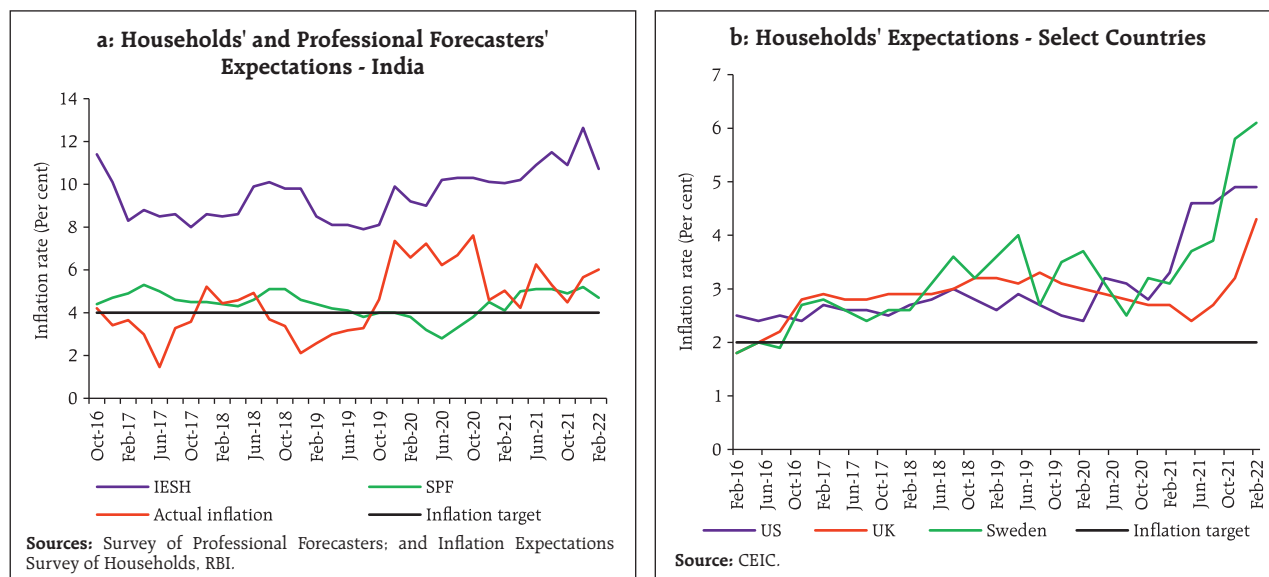
	SPF		IESH	
	FIT period	FIT period excluding pandemic	FIT period	FIT period excluding pandemic
Target	1.082***	1.118***	2.228***	1.574***
Inflation	0.027	-0.017	0.169	0.711***
Observations	33	21	33	21
Adjusted R ²	0.87	0.96	0.96	1.00
DW Statistic	1.54	1.18	1.96	1.84
Wald Test for $\beta_1 = 1$ & $\beta_2 = 0$ (p-value)	0.27	0.14	0.00	0.00

Note: ***, **, * denote the level of significance at 1%, 5% and 10%, respectively. Regression estimates are corrected for first-order serially correlated residuals by using the Prais–Winsten transformation.

Source: RBI staff estimates.

(Contd.)

⁷ For robustness, the empirical analysis also considered the core measure of inflation excluding food, fuel, petrol and diesel, but the results remained similar.

Chart I.1.1: One-year Ahead Inflation Expectations

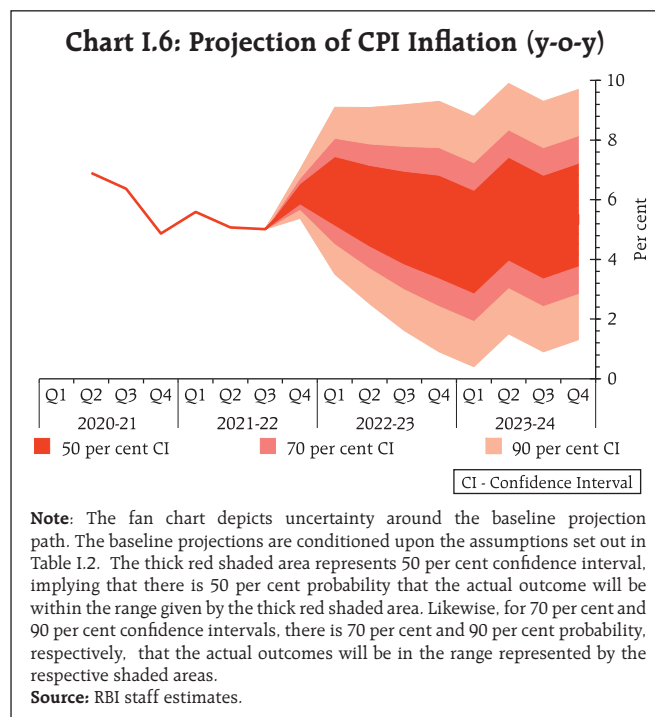
on the other hand, seem to be adaptive and backward-looking, driven by changes in food prices (food items have a weight of 46 per cent in the CPI in India) as well as the relatively more volatile nature of food prices (Singh *et al.*, 2022). A comparison of the regressions of households for the full period and the pre-pandemic period (Tables I.1.1 and I.1.2) indicates a reduction in the coefficients on food and fuel inflation as well as on inflation surprises in the extended sample, suggesting reduced sensitivity of their expectations to shocks. An upward bias in households' inflation expectations is observed in other countries as well (Chart I.1.1.b). The co-movement of households' inflation expectations with actual inflation appears to be in consonance with the cross-country experience with expectations responding more to an increase in prices than to an equivalent fall in prices (Baqaee, 2020).

References:

- Ball, Laurence, and S. Mazumder (2011), "Inflation Dynamics and the Great Recession", *Brookings Papers on Economic Activity* 42 (Spring), pp. 337–405.
- Baqaee, David Rezza (2020), "Asymmetric Inflation Expectations, Downward Rigidity of Wages, and Asymmetric Business Cycles", *Journal of Monetary Economics*, 114, pp. 174-193.
- Chen, Yiqun Gloria (2019), "Inflation, Inflation Expectations, and the Phillips Curve", Congressional Budget Office Working paper, 2019-07.
- Singh, D. P., Mishra, A., and Shaw, P. (2022), "Taking Cognisance of Households' Inflation Expectations in India", RBI Working Paper Series, 02/2022.

Looking ahead, the record foodgrains production in 2021-22, ample foodgrains buffer stocks and the government's supply side interventions augur well for food inflation in 2022-23 on the assumption of a normal monsoon. Taking into account the initial conditions, signals from forward-looking surveys,

estimates from structural and other time-series models, and crude oil (Indian basket) at US\$ 100 per barrel in 2022-23, CPI inflation is projected to average 5.7 per cent in 2022-23 – 6.3 per cent in Q1, 5.8 per cent in Q2, 5.4 per cent in Q3, and 5.1 per cent in Q4 (Chart I.6). The 50 per cent and the 70 per

Chart I.6: Projection of CPI Inflation (y-o-y)

cent confidence intervals for headline inflation in Q4:2022-23 are 3.4-6.8 per cent and 2.5-7.7 per cent, respectively. For 2023-24, assuming a progressive normalisation of supply chains, a normal monsoon and no further exogenous or policy shocks, structural model estimates indicate that inflation will move in a range of 4.6-5.7 per cent. The 50 per cent and the 70 per cent confidence intervals for Q4:2023-24 are 3.8-7.2 per cent and 2.9-8.1 per cent, respectively.

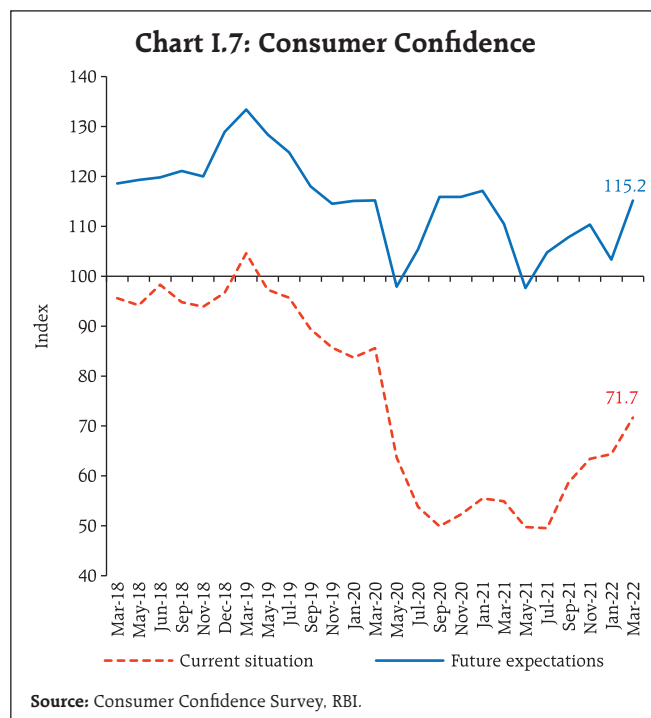
There are a number of upside and downside risks to the baseline inflation forecasts. The upside risks emanate from a further hardening of global crude and other commodity prices due to geopolitical tensions, longer-than-expected supply chain disruptions, a larger pass-through of input cost pressures to output prices in the event of stronger demand conditions and global financial market volatility from a quicker-than-expected normalisation of monetary policy by the advanced economies. The downside risks arise from an early mending of supply chain disruptions, a muted pass-through to output prices and a correction in global commodity prices due to global demand

weakening more than expected and an easing of geopolitical tensions.

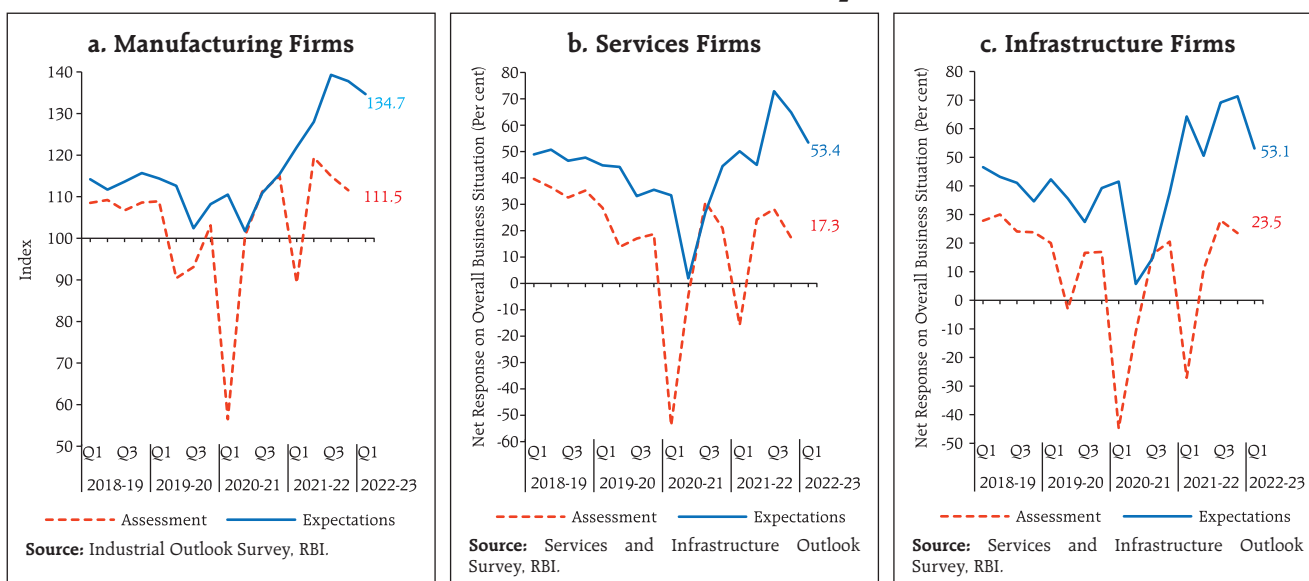
1.3 The Outlook for Growth

Economic activity which was recovering with the ebbing of the third wave, rapid stride towards universal vaccination, and supportive fiscal and monetary policies now faces significant headwinds from the exacerbating geopolitical developments and the accompanying sharp rise in global commodity prices and weakening global growth outlook.

Turning to the key messages from forward-looking surveys, the consumer confidence (the current situation index) rose in the March 2022 survey round, although it remained in the pessimistic zone. For the year ahead, consumers' optimism strengthened further on the back of improved sentiments on the general economic situation, employment and household income (Chart I.7).⁸



⁸ The Reserve Bank's consumer confidence survey is being conducted in 19 cities since March 2021 (13 cities in the previous rounds) and the results of the March 2022 round are based on responses from 5,984 respondents.

Chart I.8: Business Assessment and Expectations

Optimism in the manufacturing sector for the quarter ahead moderated marginally in the January-March 2022 round of the Reserve Bank's industrial outlook survey due to an ebb in sentiments on inventory of raw materials and finished goods (Chart I.8a). Services and infrastructure sectors also reported lower optimism on the overall business situation in Q1:2022-23 (Charts I.8b and I.8c).

Recent surveys by other agencies indicate a sequential moderation in business expectations (Table I.4). According to the PMI surveys, one year ahead business expectations of firms in the manufacturing sector moderated while those of firms in the services sector remained steady in March 2022.

Professional forecasters polled in the March 2022 round of the Reserve Bank's survey expected real GDP growth at 3.9 per cent in Q4:2021-22, 14.0 per cent in Q1:2022-23 (due to favourable base effects), 6.4 per

cent in Q2, 5.1 per cent in Q3, and 4.9 per cent in Q4 (Chart I.9).

Table I.4: Business Expectations Surveys

Item	NCAER Business Confidence Index (December 2021)	FICCI Overall Business Confidence Index (January 2022)	Dun and Bradstreet Composite Business Optimism Index (Feb- ruary 2022)	CII Business Confidence Index (March 2022)
Current level of the index	124.4	63.9	89.9	65.0
Index as per previous survey	117.4	75.7	94.6	66.8
% change (q-o-q) sequential	6.0	-15.6	-5.0	-2.7
% change (y-o-y)	46.6	-13.9	12.5	-5.4

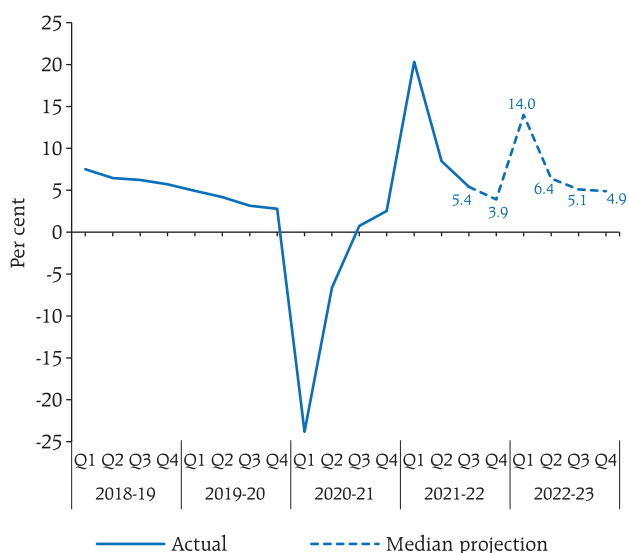
Notes:

1. NCAER: National Council of Applied Economic Research.

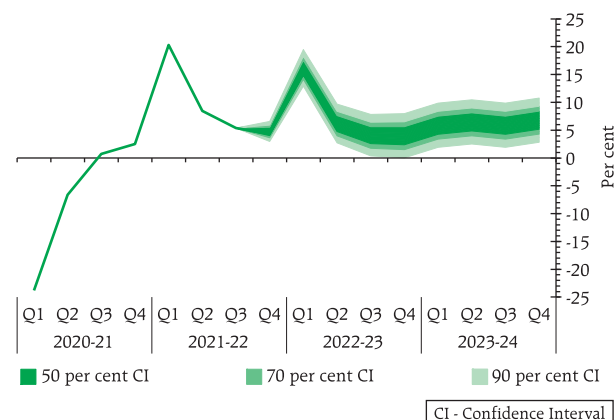
2. FICCI: Federation of Indian Chambers of Commerce & Industry.

3. CII: Confederation of Indian Industry.

Sources: NCAER; FICCI; CII; and Dun & Bradstreet Information Services India Pvt. Ltd.

Chart I.9: Professional Forecasters' Projection of Real GDP Growth

Sources: Survey of Professional Forecasters; RBI; and National Statistical Office.

Chart I.10: Projection of Growth in Real GDP (y-o-y)

Note: The fan chart depicts uncertainty around the baseline projection path. The baseline projections are conditioned upon the assumptions set out in Table I.2. The thick green shaded area represents 50 per cent confidence interval, implying that there is 50 per cent probability that the actual outcome will be within the range given by the thick green shaded area. Likewise, for 70 per cent and 90 per cent confidence intervals, there is 70 per cent and 90 per cent probability, respectively, that the actual outcomes will be in the range represented by the respective shaded areas.

Source: RBI staff estimates.

Taking into account the baseline assumptions, including crude oil (Indian basket) at US\$ 100 per barrel, the survey indicators, and model forecasts, real GDP growth is expected at 7.2 per cent in 2022-23 - Q1:2022-23 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 evenly balanced around this baseline path (Chart I.10 and Table I.3). For 2023-24, assuming a normal monsoon, and no major exogenous or policy shocks, the structural model estimates indicate real GDP growth at 6.3 per cent, with quarterly growth rates in the range of 5.9-6.8 per cent.

There are upside and downside risks to the baseline growth path. Upside risks to the baseline trajectory could emanate from stronger and sustained expansion in domestic demand, including for contact-intensive services, a boost to private investment activity from the confluence of government's thrust on capital expenditure, and healthier corporate balance sheets (Chapter III). On the contrary, the

heightened geopolitical tensions – resulting in the significant hardening of international crude oil and other commodity prices to multi-year highs, the upsurge in global financial market turmoil and the loss of momentum in global trade and demand – pose sizeable downside risks to the baseline growth path. Additional downside risks emanate from renewed COVID-19 infections, new and more contagious variants of the virus, pandemic-related global supply bottlenecks stretching longer than expected, and AE monetary policy normalisation-induced global financial market volatility.

I.4 Balance of Risks

The baseline projections of inflation and growth presented in the previous sections are conditional on the assumptions of key domestic and international macroeconomic variables set out in Table I.2. This section explores plausible alternative scenarios to assess the balance of risks to the baseline projections.

(i) Geopolitical Risks

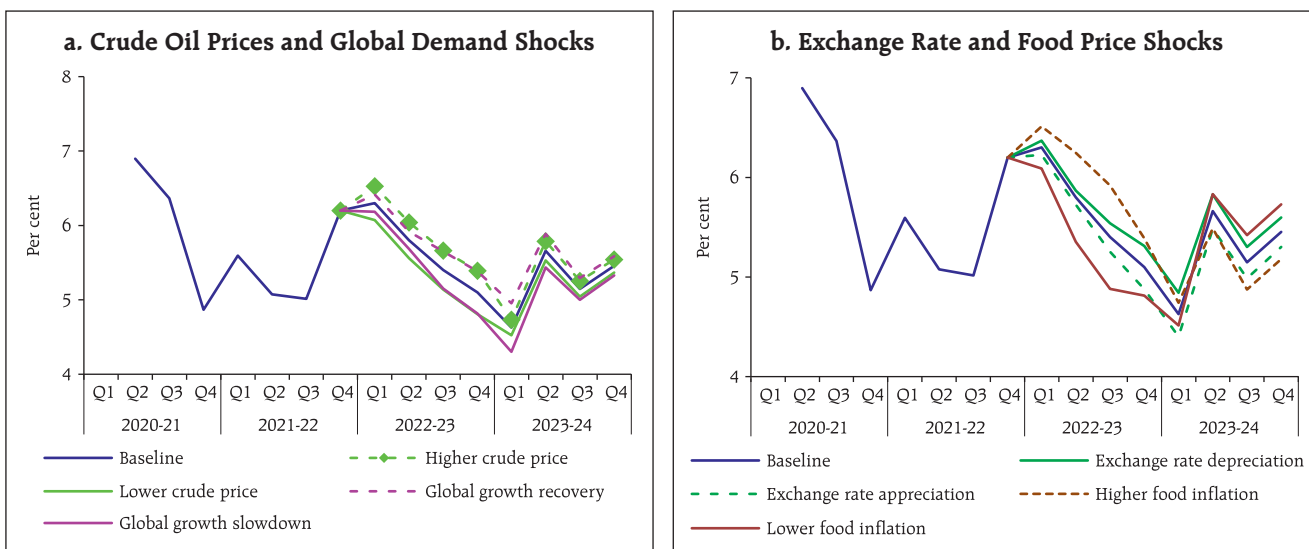
The global recovery from the COVID-19 pandemic is turning out to be muted relative to earlier expectations. Downside risks to even this subdued recovery have jumped significantly from the escalation of geopolitical tensions, which have led to a broad-based increase in global commodity prices and are expected to have a large negative impact on global trade and growth. Even as the share of Russia and Ukraine in global economy is modest, they are among the major global suppliers of key commodities such as crude oil, natural gas, fertilisers, wheat, corn, and metals. A more protracted conflict, extended sanctions, sustained further hardening of global commodity prices and prolonged supply bottlenecks could push global growth well below the baseline. Recurrent waves of COVID-19 infections amidst new mutants of the virus, uneven vaccination progress across countries, and a sharper and deeper tightening of monetary policy by major AE central banks to anchor inflation expectations impose further downside risks to the global outlook. In such a scenario, if global growth is 100 bps lower than the

baseline, domestic growth and inflation could be around 40 bps and 20 bps, respectively, below the baseline trajectories; however, the jump in crude oil prices due to geopolitical tensions, as discussed later, would harden domestic inflation. Conversely, an early easing of geopolitical tensions, growing vaccination coverage across countries, a more even distribution of vaccines towards low-income countries, a faster easing of supply chain disruptions and a more gradual withdrawal of monetary accommodation by the major AEs could provide a boost to economic activity. In this scenario, assuming that global growth surprises by 100 bps on the upside, domestic growth and inflation could edge higher by around 40 bps and 20 bps, respectively, over the baseline (Charts I.11a and I.12a).

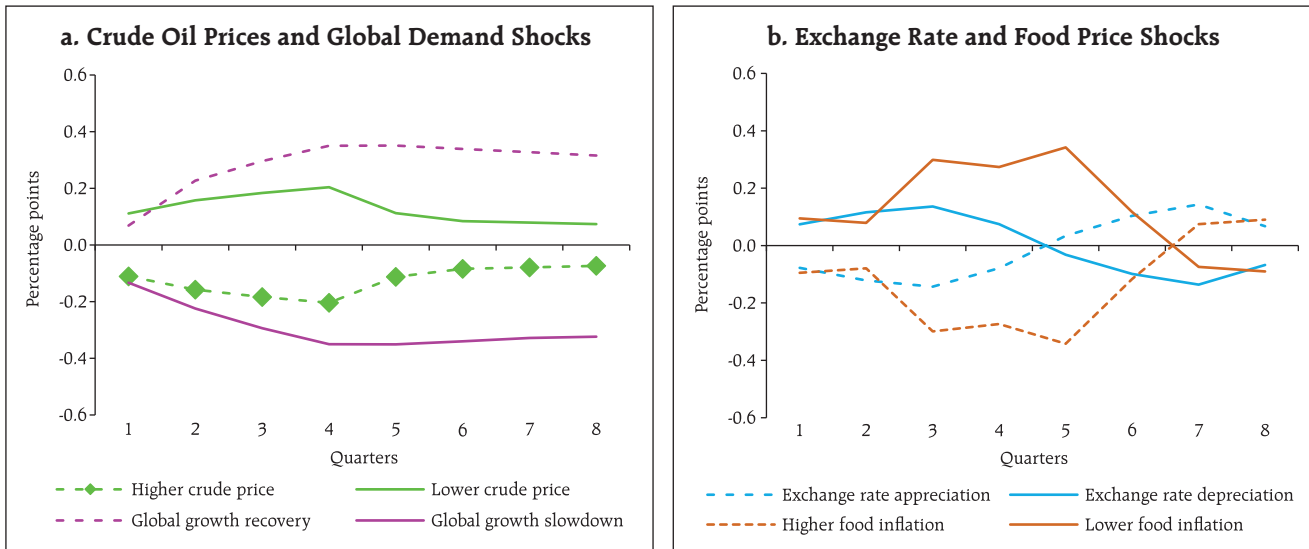
(ii) International Crude Oil Prices

International crude oil prices have risen sharply, driven by sudden and overwhelming disruptions caused by war, strong demand and a less than proportionate expansion in output by the OPEC *plus*. While future prices and the medium-term outlook for supplies suggest a correction in crude oil prices in the

Chart I.11: Impact of Risk Scenarios on the Baseline Inflation Path



Source: RBI staff estimates.

Chart I.12: Impact of Risk Scenarios on the Baseline Growth Path

Source: RBI staff estimates.

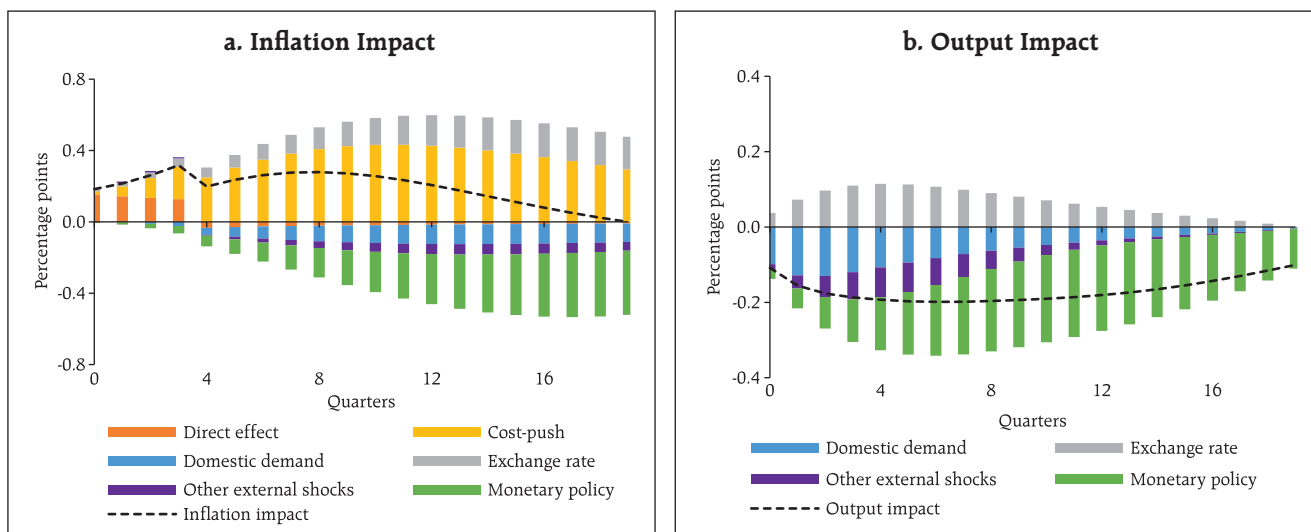
months ahead, this could easily be overwhelmed by the fallout of the conflict. The outlook poses sizeable risks on either side for a net energy importer like India. An escalation of geopolitical tensions and further drawdown of global inventories amidst OPEC *plus* production continuing to lag demand could harden international crude oil prices even further and US\$ 150 per barrel could easily be tested.

Assuming crude oil price to be 10 per cent above the baseline of US\$ 100 per barrel, domestic inflation and growth could be higher by around 30 bps and weaker by around 20 bps, respectively, over the baseline. Conversely, crude oil prices could soften below the baseline due to a faster resolution of geopolitical tensions, release of emergency stockpiles, a stronger shale production response, and global demand becoming subdued owing to renewed waves of the virus. As a result, if the Indian basket of crude prices falls by 10 per cent relative to the baseline, inflation could ease by around 30 bps with a boost of 20 bps to growth (Charts I.11a and I.12a).

Crude oil prices impact growth and inflation through multiple channels. First, international

crude prices have a direct impact on inflation, given the weights of petrol and diesel in the CPI basket, which wear off in a year. Second, indirect effects through cost push and higher inflation expectations could push up headline inflation in the medium run. Third, higher trade and current account deficits in the balance of payments can exert downward impact on the INR exchange rate, adding to inflationary pressures. On the output side, higher petroleum prices act as a negative terms of trade shock to the economy, reduce the consumption of non-oil items of households and lower profit margins of firms, cash flows and investment. The consequent moderation in aggregate demand helps to offset some of the inflationary pressures. On net, inflation increases and might attract a monetary policy response (Chart I.13).

The impact of crude oil prices on domestic inflation and output is also conditional on the initial level of crude oil prices in view of the retail petroleum product prices containing specific (*non-ad valorem*) elements such as excise duty and refining costs which do not co-move with crude oil prices. Therefore, the higher the initial level of crude oil prices, the higher

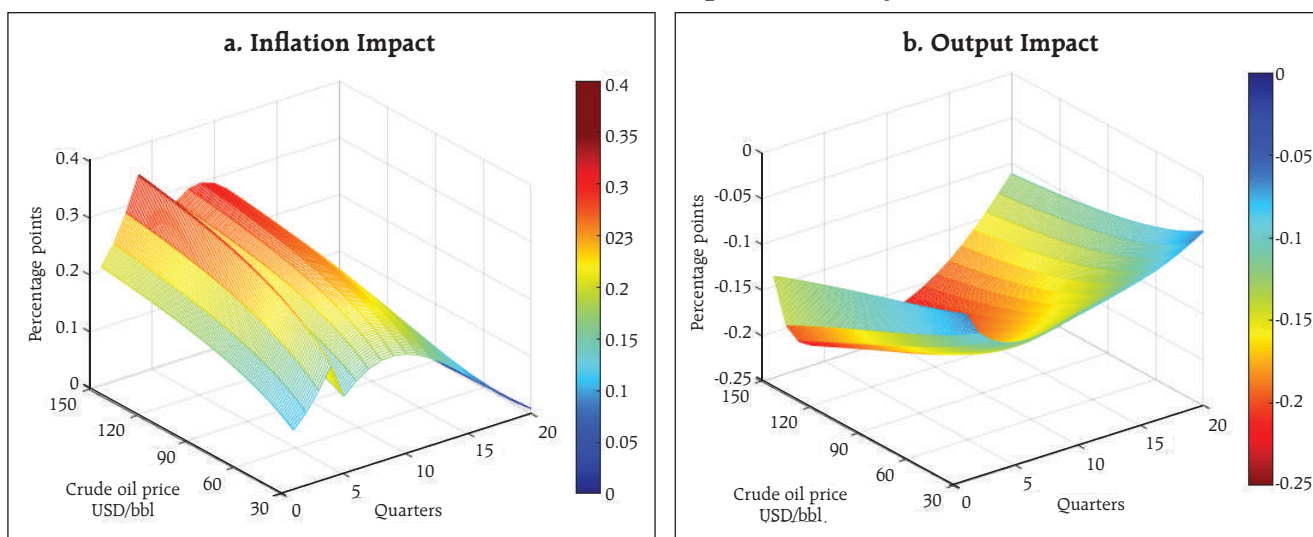
Chart I.13: Crude Oil Shock, Inflation and Output: Decomposition of Channels

Note: Charts show the impact of 10 per cent increase in crude oil prices (at US\$ 100/bbl).
Source: RBI staff estimates.

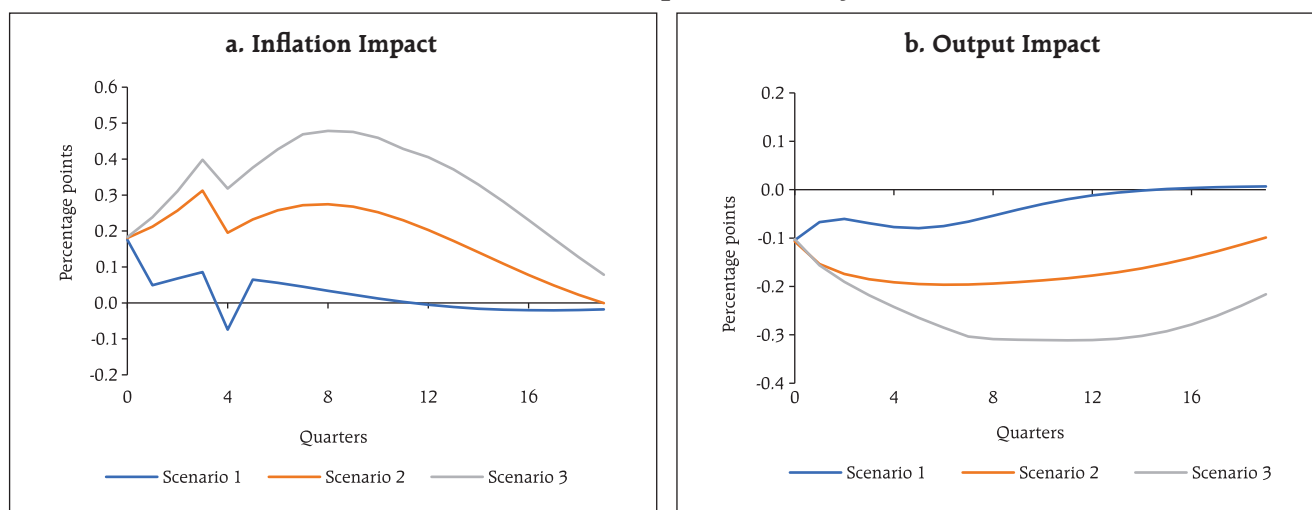
is the impact of a given shock on domestic headline inflation, imparting non-linearity and time variations (Chart I.14).

Finally, the impact of crude oil prices on the domestic economy would also be dependent on the persistence of the oil shock. A transitory shock

to crude oil prices (Scenario 1) has only a negligible and temporary impact on inflation and output, while the adverse impact can be substantially higher and more protracted in case crude oil prices remain at elevated levels for longer (Scenarios 2 and 3) (Chart I.15).

Chart I.14: Crude Oil Shock, Inflation and Output: Sensitivity to Level of Crude Prices

Note: Charts show the impact of 10 per cent increase in crude oil prices at various levels of crude oil price.
Source: RBI staff estimates.

Chart I.15: Crude Oil Shock, Inflation and Output: Sensitivity to the Persistence of the Shock

Note: Crude oil price increases from US\$ 100 per barrel to US\$ 110 and (a) returns to US\$ 100 in one quarter (Scenario 1), (b) returns gradually to US\$ 100 over 5 years (Scenario 2), and (c) remains at US\$ 110 for 2 years before gradually declining to US\$ 100 over another 5 years.

Source: RBI staff estimates.

(iii) Exchange Rate

The INR has exhibited two-way movements over the past six months, reflecting both global and domestic factors. Looking ahead, the protracted geopolitical tensions, the heightened volatility in global financial markets, elevated global sovereign bond yields on the back of more than currently anticipated monetary policy tightening in major AEs, and new COVID-19 mutations could lead to a broader risk aversion towards EME assets and net capital outflows. Such developments can put downward pressure on the INR. Should the INR depreciate by 5 per cent from the baseline, inflation could edge up by around 20 bps while GDP growth could be higher by around 15 bps through increased net exports; the exchange rate pass-through to inflation can, however, be non-linear and time-varying in an environment of high volatility in financial and commodity markets (Patra *et al*, 2018).⁹ On the other hand, given that India is among the fastest growing large economies with relatively better

growth outlook, strong capital flows led by foreign direct investment could continue. In this scenario, if the INR appreciates by 5 per cent relative to the baseline, inflation and GDP growth could moderate by around 20 bps and 15 bps, respectively (Charts I.11b and I.12b).

(iv) Food Inflation

Food inflation has risen in recent months, largely due to adverse base effects. The expected seasonal correction seems to be getting backloaded. Going forward, however, robust *rabi* prospects, ample buffer stocks of cereals, easing of supply chain bottlenecks and effective supply management measures could soften food inflation more than anticipated, and push headline inflation 50 bps below the baseline. Conversely, hardening global food prices due to geopolitical tensions and domestic demand-supply gaps in key food items like pulses and edible oils could lead to upward pressures on food prices and raise headline inflation by around 50 bps. The baseline assumes a normal south-west monsoon in 2022 and any deviations in the actual outturn on either side as well as unseasonal rains would be a critical factor

⁹ Patra, Michael Debabrata, Jeevan Kumar Khundrakpam and Joice John (2018), "Non-Linear, Asymmetric and Time-Varying Exchange Rate Pass-Through: Recent Evidence from India", Working Paper 02/2018, Reserve Bank of India.

for the food as well as headline inflation trajectory (Charts I.11b and I.12b).

I.5 Conclusion

Economic activity was recovering from the ebbing of the Omicron wave when the fallout of the Ukraine-Russia conflict has overcast the near-term outlook with heightened uncertainties. Growth and inflation outcomes are at high risk across the world as well as in India. In the face of this extraordinary risk, the positive effects expected from the release of pent-up demand, especially for contact-intensive services, the government's thrust on infrastructure and capital expenditure, congenial financial conditions and improving capacity utilisation appear ephemeral. Updated forecasts indicate that headline inflation,

which was expected to ease from current elevated levels as food inflation gets contained on the back of record production and abundant stocks, is now subject to a large geopolitical shock. The escalation of war, continued supply chain disruptions, global financial market volatility emanating from monetary policy normalisation in major advanced economies and the evolving COVID-19 trajectory pose downside risks to growth and upside risks to the inflation outlook and could get exacerbated significantly by the intensification of geopolitical tensions. The concomitant surge in global oil and commodity prices to multi-year highs has increased risk aversion as reflected in jumps in financial market volatility and these developments could increasingly shape the economic prospects globally and for India.

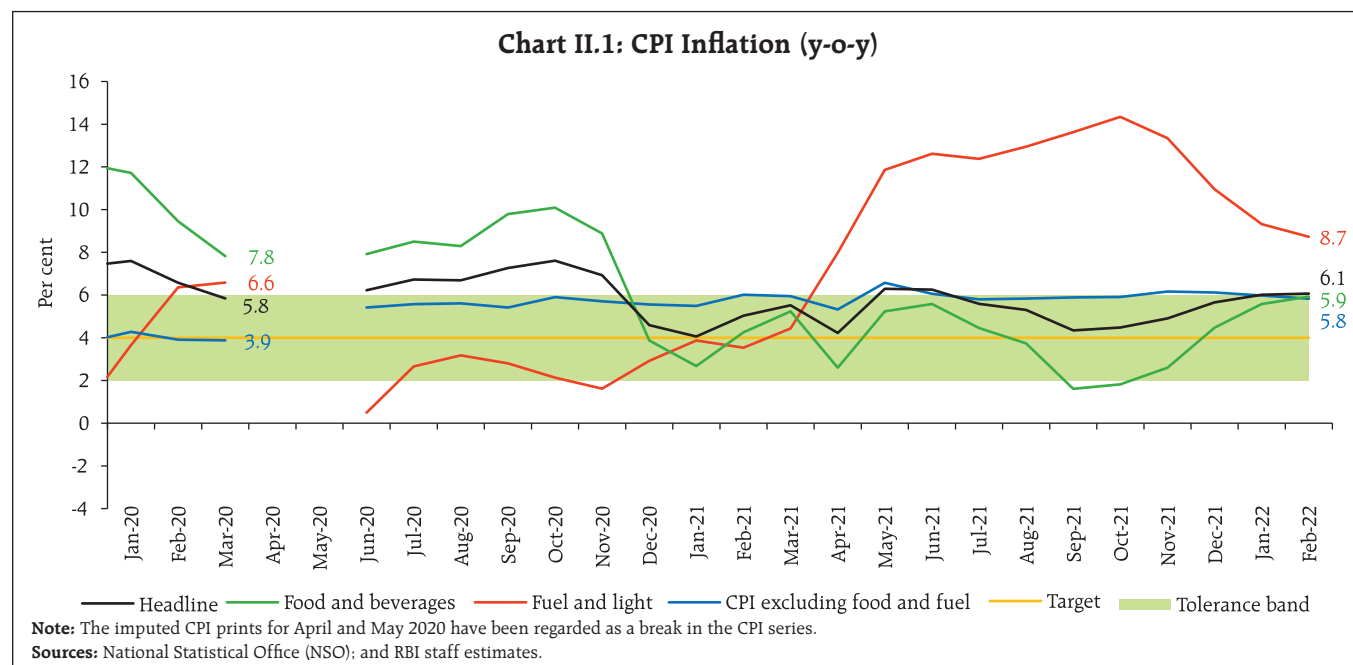
II. Prices and Costs

Consumer price index (CPI) inflation remained volatile during September 2021 to February 2022. After moderating close to the target rate in September, headline CPI inflation rose sequentially to the upper tolerance threshold during January-February 2022 mirroring the movements in food inflation, even as fuel inflation remained elevated and core inflation sticky. Costs of farm and non-farm inputs remained elevated. Growth in nominal rural wages for both agricultural and non-agricultural labourers as well as staff costs in the organised sector remained contained.

Since the publication of the October 2021 MPR, headline inflation¹ has registered two-way movements – first, it moderated close to the target at 4.3 per cent in September 2021; thereafter, it moved up sequentially to the upper tolerance threshold of 6 per cent in January 2022, breaching it at 6.1

per cent in February. The movements in headline inflation mirrored the sharp movements in food inflation, which oscillated between a low of 1.6 per cent in September 2021 and a peak of 5.9 per cent in February 2022. A combination of transitory supply dislocation shocks, elevated import price pressures and unfavourable base effects drove the surge in food inflation. With international petroleum product prices on an unrelenting upward trajectory, fuel group inflation remained in double digits during September to December, moderating a little to 9.3 per cent in January 2022 and further to 8.7 per cent in February. Core inflation² has remained elevated, sticking close to the upper tolerance threshold of 6.0 per cent as cost-push pressures impacted both manufactures and services (Chart II.1).

The Reserve Bank of India (RBI) Act enjoins the RBI to set out deviations of actual inflation outcomes from projections, if any, and explain the underlying reasons thereof. The October 2021



¹ Headline inflation is measured by year-on-year changes in the all-India consumer price index (CPI) produced by the National Statistical Office (NSO).

² Core CPI, i.e., CPI excluding food and fuel is worked out by eliminating the groups 'food and beverages' and 'fuel and light' from the headline CPI.

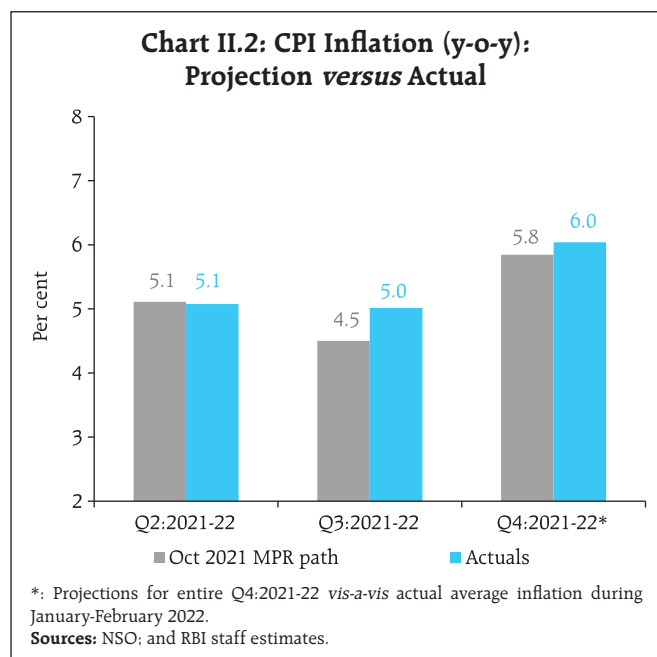
MPR projected inflation to moderate to 4.5 per cent in Q3:2021-22 before increasing to 5.8 per cent in Q4:2021-22. Actual inflation outcomes were higher than projections by around 50 bps in Q3, but the gap narrowed to 20 bps in Q4 (Chart II.2). The overshoot in Q3 was primarily on account of vegetables prices shooting up disproportionately and falling out of alignment with projections in the months of October-November 2021 as a result of crop damage from heavy unseasonal rainfall. In addition, crude oil prices, which were assumed to be at US\$ 75 per barrel during H2:2021-22, averaged US\$ 82 per barrel in October itself, pushing domestic pump prices to the then historic high levels³ by the beginning of November. Subsequent reductions in excise duties and State value-added taxes (VATs) in early November led to a reduction in pump prices. Thereafter, barring tax cuts, pump prices remained unchanged in rest of Q3 even as crude oil

prices moderated. In Q4 (up to February 2022), actual outcomes have turned out to be closer to projections, as the seasonal correction in some vegetable prices materialised as anticipated; but it turned out to be shallower, resulting in the overshoot over projections. Moreover, cereal prices were provided some upside, by rising export unit values – India is the world's largest exporter of rice; it has also exported 19.1 million tonnes of rice during April 2021 to February 2022.

II.1 Consumer Prices

The sequential rise in CPI inflation from September 2021 was initially driven up by a pick-up in price momentum, followed by adverse base effects even as price momentum declined.⁴ In October and November 2021, price momentum increased across food and core categories, but this was couched by favourable base effects in food prices. With the winter setting in, a sharp correction in food prices caused the price momentum to decline in December 2021, but this was more than offset by large unfavourable base effects, resulting in headline inflation hardening by 75 basis points. In January 2022, the decline in food price momentum deepened, but adverse base effects pushed up headline inflation to 6.0 per cent. In February, the CPI headline price momentum turned positive on price pressures from fuel and core categories even though the food price momentum remained negative (Chart II.3).

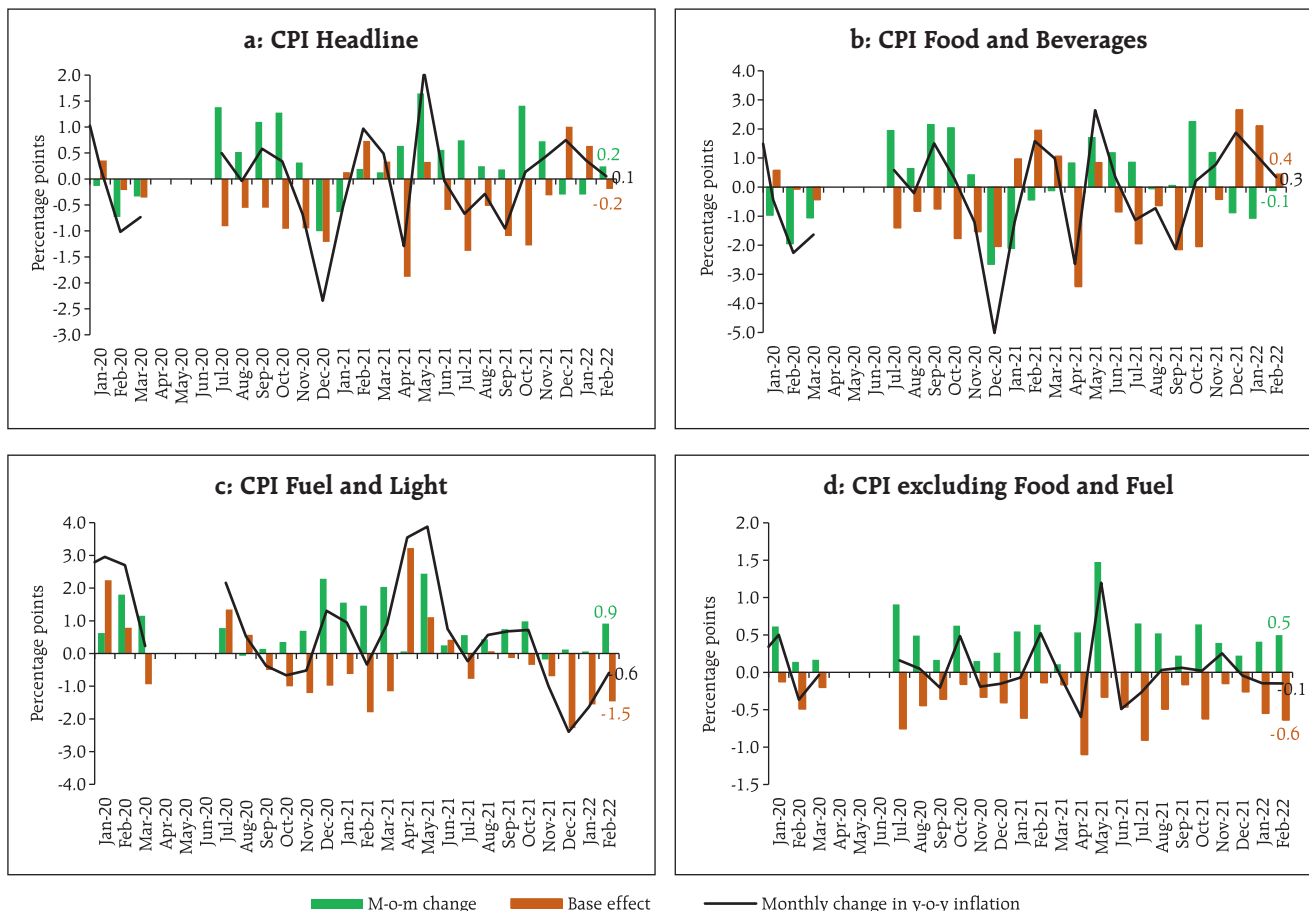
The distribution of CPI inflation during the financial year reveals a high dispersion of inflation rates in the CPI basket, with a considerable positive skew co-existing with a sharp rise in volatility. The



³ Retail selling price (RSP) for petrol was at ₹ 110.76 per litre on November 2, 2021 and for diesel, the RSP was at ₹ 102.30 per litre on November 1, 2021, based on the average RSPs of Indian Oil Corporation Limited (IOCL) in the four major metros (Delhi, Kolkata, Mumbai and Chennai).

⁴ A change in CPI year-on-year (y-o-y) inflation between any two months is the difference between the current month-on-month (m-o-m) change in the price index (momentum) and the m-o-m change in the price index 12 months earlier (base effect). For more details, see Box I.1 of the MPR, September 2014.

Chart II.3: CPI Inflation – Momentum and Base Effects



Note: The y-o-y inflation for April and May 2021 have been calculated based on the imputed index for April and May 2020 released by NSO.
Sources: NSO; and RBI staff estimates.

large positive skew reflected outliers – oils and fats, fuel and transport – which registered inflation in double digits. The increase in volatility reflected surges and sharp deflation in vegetables prices (Chart II.4). Diffusion indices increased sharply during January-February 2022 across goods and services, indicating a broadening of price pressures (Chart II.5).⁵

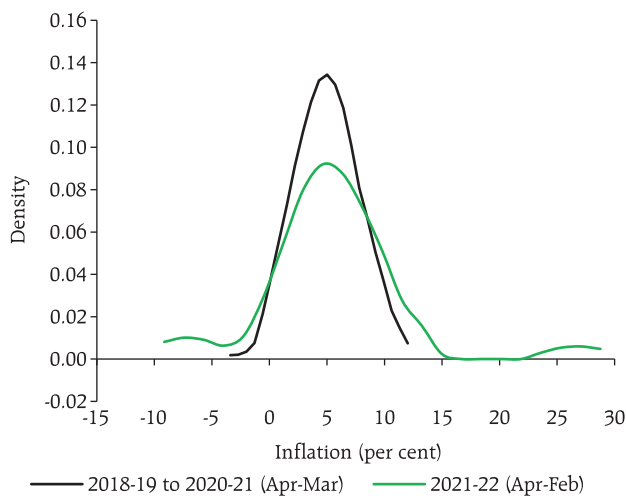
II.2 Drivers of Inflation

A historical decomposition of inflation using vector autoregression (VAR) estimates⁶, to ascertain the various macro-factors that drove inflation dynamics, indicate that the inflationary pressures in H2:2021-22

⁵ The CPI diffusion index, a measure of dispersion of price changes, categorises items in the CPI basket according to whether their prices have risen, remained stagnant or fallen over the previous month. A reading above 50 for the diffusion index signals a broad expansion or generalisation of price increases and a reading below 50 signals broad-based price decline.

⁶ Historical decomposition estimates the contribution of each shock to the movements in inflation over the sample period (Q4:2010-11 to Q4:2021-22) based on a vector autoregression (VAR) with the following variables (represented as the vector Y_t) – crude oil prices; exchange rate (INR per US\$), asset price (BSE Sensex), CPI; the output gap; rural wages; the policy repo rate; and money supply (M_3). All variables other than policy repo rate are growth rates. The VAR can be written in reduced form as: $Y_t = c + A Y_{t-1} + e_t$, where e_t represents a vector of shocks. Using Wold decomposition, Y_t can be represented as a function of its deterministic trend and sum of all the shocks e_t . This formulation facilitates decomposition of the deviation of inflation from its deterministic trend into the sum of contributions from various shocks.

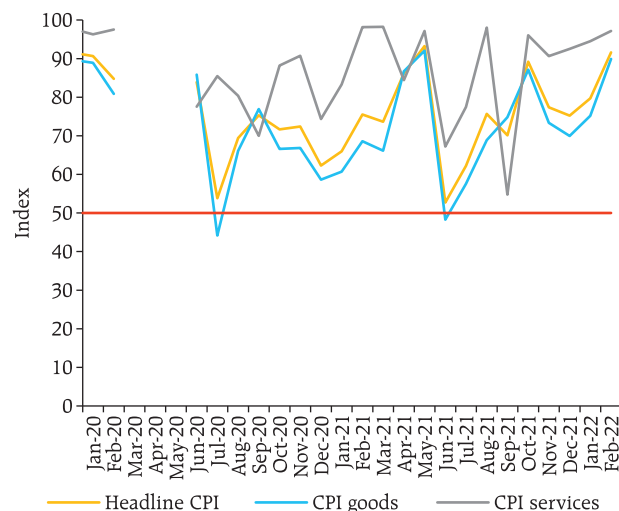
**Chart II.4: Average CPI Inflation (y-o-y)
(Kernel Density Estimates)**



Note: The period 2020-21 refers to June-March.

Sources: NSO; and RBI staff estimates.

**Chart II.5: Diffusion Indices: CPI
(M-o-M Seasonally Adjusted)**



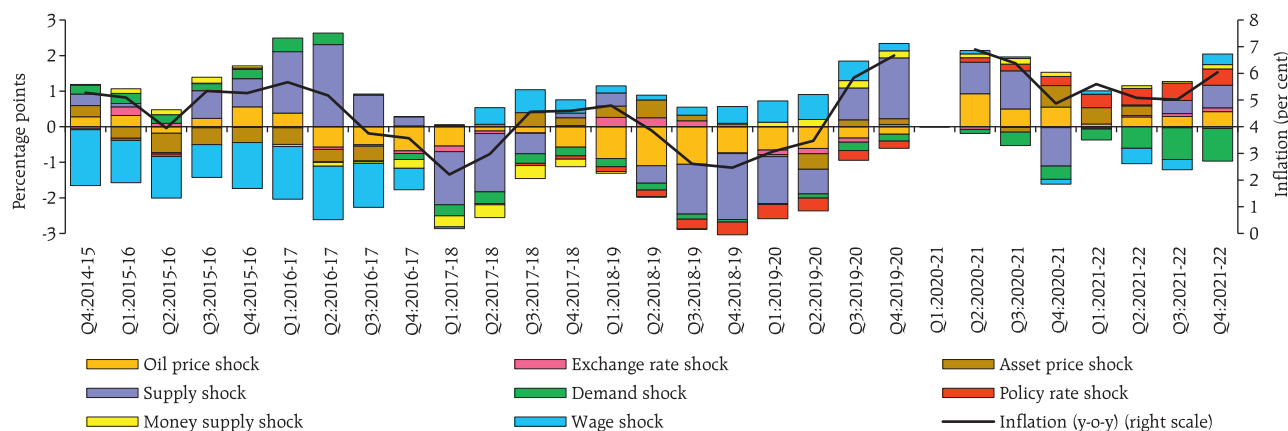
Sources: NSO; and RBI staff estimates.

can be attributed mainly to adverse cost-push factors, coming from supply-side shocks in food and fuel prices, even as weak aggregate demand conditions continued to exert downward pressure on inflation (Chart II.6a).

The pick-up in inflation since September 2021 was driven largely by goods inflation, particularly perishables such as vegetables (non-durable goods with a 7-day recall⁷). The contribution of semi-perishable goods (non-durable goods with a 30-day recall) edged

Chart II.6: Drivers of CPI Inflation

a: Decomposition of CPI Inflation*



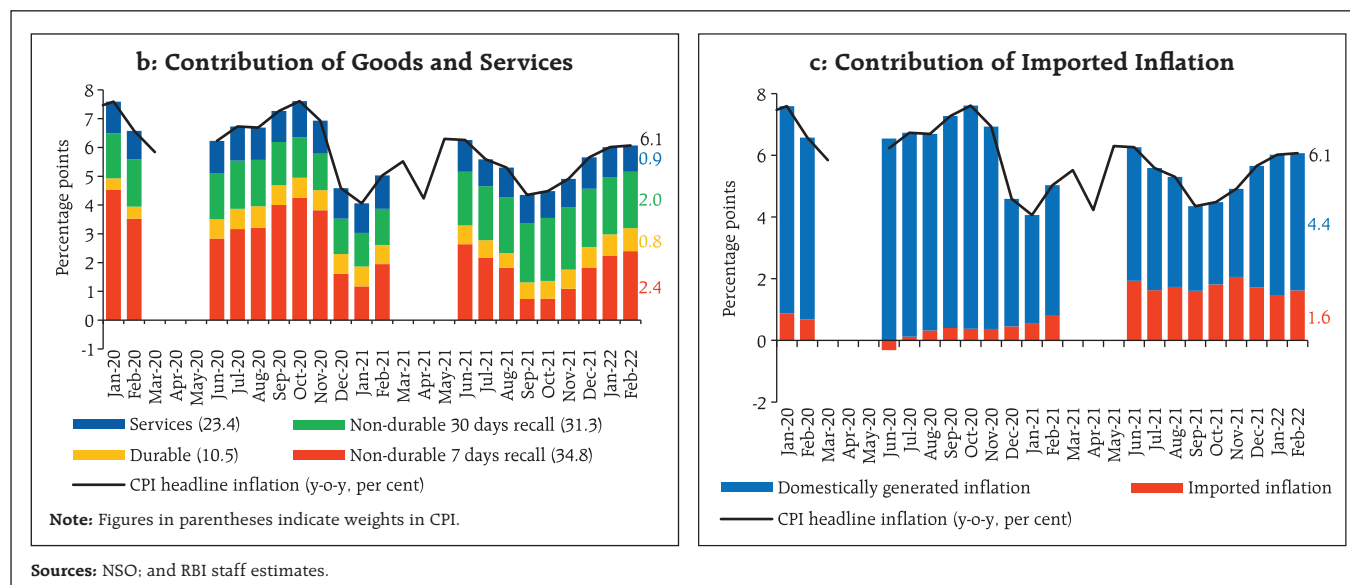
* Deviation from deterministic trend.

Note: Estimated using a vector autoregression (see footnote 6 for details).

Sources: NSO; RBI; Petroleum Planning & Analysis Cell (PPAC); BSE; Labour Bureau; and RBI staff estimates.

(Contd.)

⁷ The CPI weighting diagrams use the modified mixed reference period (MMRP) data based on the 2011-12 Consumer Expenditure Survey conducted by the National Sample Survey Office (NSSO). Under MMRP, data are collected on expenditure incurred for frequently purchased items – edible oil, eggs, fish, meat, vegetables, fruits, spices, beverages, processed foods, pan, tobacco and intoxicants – during the last seven days; for clothing, bedding, footwear, education, medical (institutional), durable goods, during the last 365 days; and for all other food, fuel and light, miscellaneous goods and services including non-institutional medical services, rents and taxes, data relate to the last 30 days.



up till October, but declined thereafter, reflecting primarily the movement in petroleum products inflation (Chart II.6b). Durable goods inflation has transmitted heightened cost-push pressures in the manufacturing sector.

The increase in international prices of precious metals, edible oil and petroleum products led to an increase in the contribution of imported components to headline inflation – from 1.8 percentage points (or 40.4 per cent) in October to 2.1 percentage points (41.9 per cent) in November 2021. The decline in international commodity prices in December contributed to lower imported inflation. The cut in central excise duties on petrol and diesel during November, and the series of cuts in edible oils import duties helped in containing the contribution of domestically generated inflation pressures (Chart II.6c).

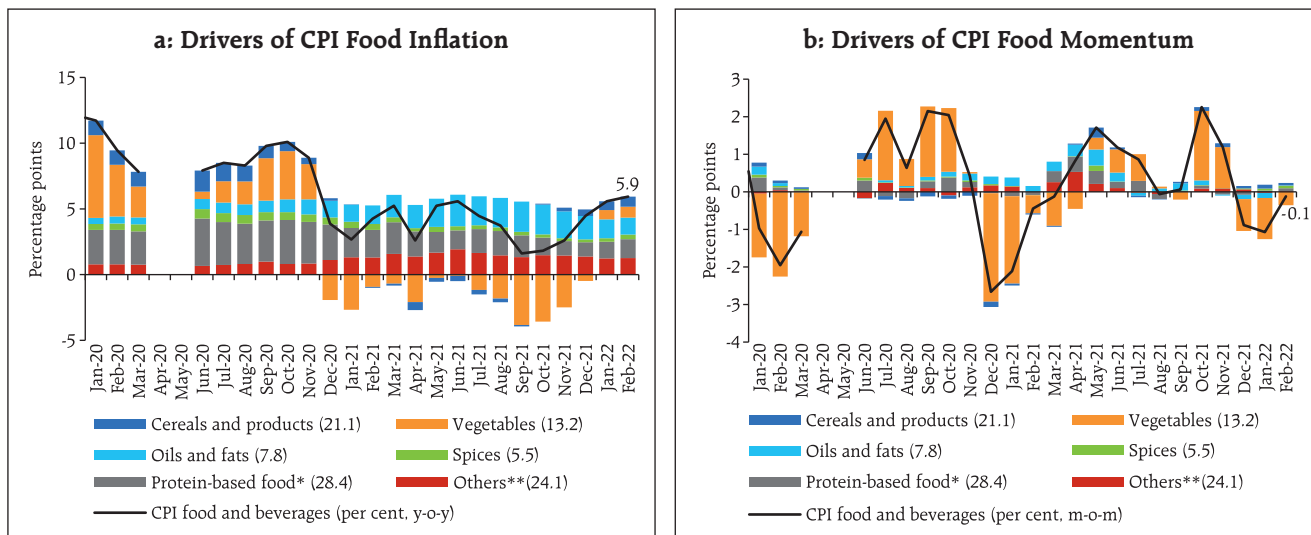
Food

Food and beverages (weight of 45.9 per cent in the CPI basket) inflation rose steadily between September 2021 and February 2022. The food price build-up in 2021-22 (up to February) was higher than historical patterns, driven by vegetable and edible oil prices even as protein-based products (milk, egg, meat and fish, and pulses), cereals, fruits and prepared meals

experienced lower food price build-ups (Chart II.7a and b). In case of edible oil prices, however, the price declines during November 2021 to January 2022 have not proved sufficient to meaningfully offset the sustained price increases seen in the earlier part of the year, resulting in the price build-up remaining much above historical averages (Chart II.8).

Prices of cereals (weight of 9.7 per cent in headline CPI and 21.1 per cent in the CPI food and beverages group), on a year-on-year basis, emerged out of eight months of deflation in October 2021 and reached 4.0 per cent in February 2022. Within cereals, wheat prices have increased sharply since September on higher exports (336.8 per cent y-o-y increase during April 2021-January 2022) and larger procurement. The increase in production (1.6 per cent as per 2021-22 second advance estimate (AE) over 2020-21 final estimates (FE), ample buffer stocks (1.5 times the buffer norms as on March 16, 2022) and free distribution under *Pradhan Mantri Garib Kalyan Anna Yojana* (PMGKAY) helped contain inflation. In the case of rice, prices remained relatively stable, as the pick-up in exports (by 28.2 per cent y-o-y during April 2021-January 2022) was supported by higher production (2.9 per cent as per 2021-22 2nd AE over 2020-21) and buffer stocks (7.5 times the norm).

Chart II.7: CPI Food Inflation



*: Includes meat and fish, egg, milk and pulses.

**: Includes fruits, sugar, non-alcoholic beverages and prepared meals.

Note: Figures in parentheses indicate weights in CPI food and beverages.

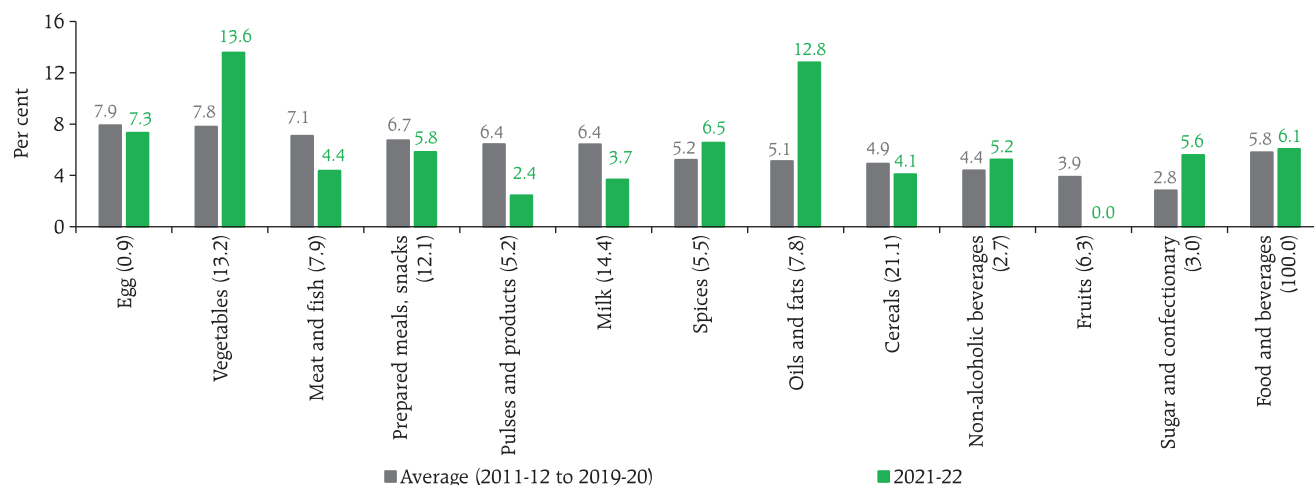
Sources: NSO; and RBI staff estimates

Vegetables prices (weight of 6.0 per cent in headline CPI and 13.2 per cent in the CPI food and beverages group) were in deflation under the weight of large favourable base effects during September-December 2021, despite price pressures due to excess rain induced crop damage. Vegetables prices, however,

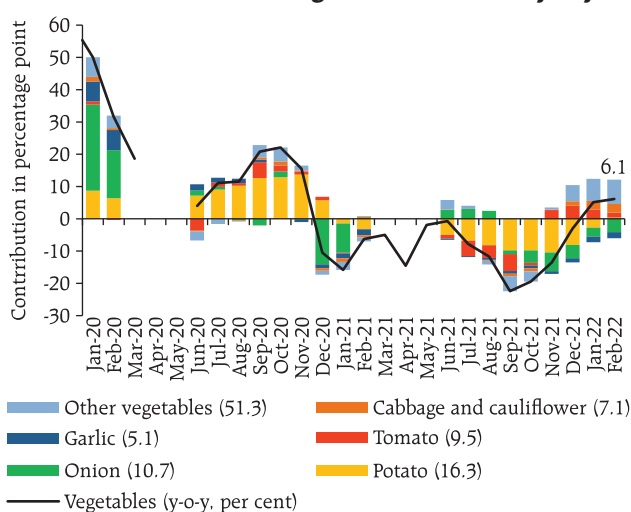
started receding from December, but adverse base effects drove up inflation in this category to 6.1 per cent in February 2022 (Chart II.9).

Among the inflation-sensitive vegetables, onion prices hardened during October-November 2021 on account of damages to the stored *rabi* crop in

Chart II.8: Financial Year Price Build-up (February over March)



Note: Figures in parentheses indicate weights in CPI- food and beverages.

Chart II.9: Drivers of Vegetable Inflation (y-o-y)

Note: Item level data were not released by NSO for the months of March, April and May 2020.

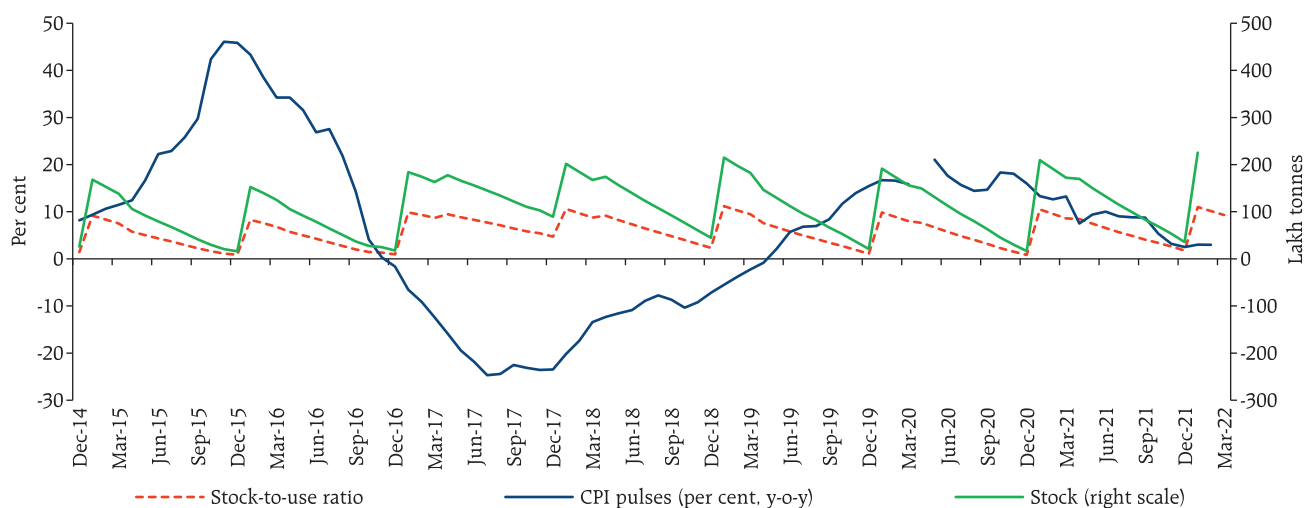
Source: NSO; and RBI staff estimates.

Maharashtra and Gujarat from cyclone *Tauktae* in May 2021, followed by damages to *kharif* crops due to heavy rains in major producing states. Subsequently, prices softened as a result of effective supply side interventions – 2.1 lakh tonnes of onion were released under the price stabilisation fund (PSF) scheme and exports were reduced ((-) 8.5 per cent y-o-y during April 2021-January 2022). Potato

prices also escalated during October-November 2021 on account of unseasonal rains. Fresh crop arrivals and ample stocks in cold storages have, however, kept price pressures subdued in subsequent months. Tomato prices also picked up sharply during the same period due to delay in arrivals on account of erratic rains in Punjab, Uttar Pradesh, Haryana and Himachal Pradesh, coupled with supply shortages because of heavy rains in major producing states — Tamil Nadu, Andhra Pradesh, Telangana and Karnataka.

Inflation in prices of fruits (weight of 2.9 per cent in the headline CPI and 6.3 per cent within the food and beverages group) moderated from a three-year high of 11.8 per cent in May 2021 to 2.3 per cent in February 2022, owing to decline in prices of bananas and apples, with apple production higher by 7.1 per cent in 2021-22 (1st AE) over 2020-21 (FE).

The record production of pulses during 2021-22 at 269.6 lakh tonnes (2nd AE) has significantly augmented availability. The higher stock-to-use (STU) ratio at end-March 2022 over last March is reflective of improved supply conditions (Chart II.10). Supply-side measures such as moving

Chart II.10: Pulses Inflation and Stock-to-Use Ratio: Monthly Balance Sheet

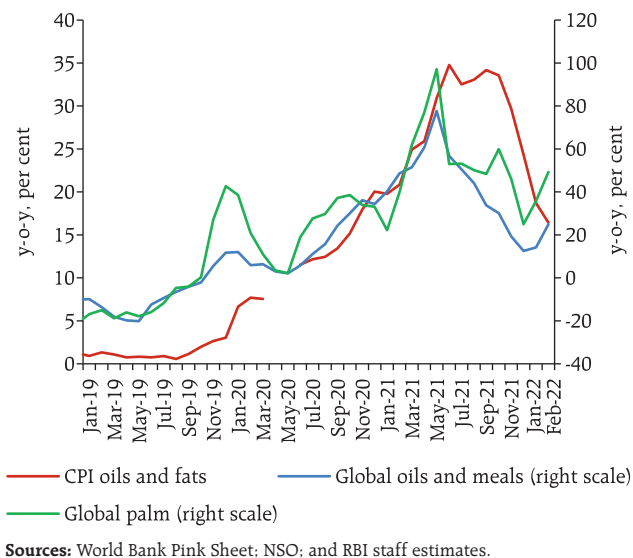
Sources: MOSPI; DGCIIS; CACP; Ministry of Agriculture; and RBI staff estimates.

imports of *tur*, *urad* and *moong* from restricted to 'free category' from May 15, 2021; removing import duty on *masur* and reducing Agriculture Infrastructure and Development Cess (AIDC) to 10 per cent from July 27, 2021; releasing *masur* from buffer stocks at discounted price; higher imports of pulses (1.9 per cent y-o-y during April 2021-January 2022); and open market intervention by the National Agricultural Cooperative Marketing Federation of India (NAFED) helped to keep pulses price inflation (weight of 2.4 per cent in the CPI and 5.2 per cent in the food and beverages group) on a moderating trajectory since September 2021.

As regards to animal-based protein items, prices declined in the case of meat and fish (weight of 3.6 per cent in the CPI and 7.9 per cent within the food and beverages group) largely during September 2021-January 2022, primarily reflecting easing feed costs with the import of 12 lakh tonnes of genetically modified soya meal and gradual normalisation of supplies. Prices increased in February 2022 due to winter demand. In the case of eggs, price pressures set in during November 2021-January 2022 and eased in February in accordance with the usual seasonal pattern. Inflation in milk and products gradually increased to 4.1 per cent in January 2022, before easing to 3.8 per cent in February 2022 on favourable base effects, due to successive upward revisions in milk prices by milk co-operatives in various states after July 2021, following the increase in prices by around ₹2 per litre by major milk co-operatives like Amul and Mother Dairy.

Inflation in prices of oils and fats (weight of 3.6 per cent in the CPI and 7.8 per cent within the food and beverages group) continued to rule in double digits since September 2021 *albeit* with some moderation on the back of supply-side measures and improved prospects for the *rabi* crop (*rabi* oilseeds production was higher by 9.1 per cent as per 2nd AE 2021-22) and moderation in international prices of edible oils

Chart II.11: Movement in Edible Oil Inflation: Global vs Domestic



(Chart II.11). Some important steps taken to ebb price pressures include imposition of stock limits on edible oils and oilseeds pan India, except for six states (Bihar, Himachal Pradesh, Karnataka, Rajasthan, Telangana and Uttar Pradesh which imposed their own stock limit order) up to June 30, 2022, and significant reduction in import duty in a gradual manner on palm oil, soyabean oil and sunflower oil. Overall, during the period from October 2021 to February 2022, the effective import duty on the three major imported crude edible oils, viz. palm oil, soyabean oil and sunflower oil, was reduced by 19.25 percentage points to a weighted average of 5.5 per cent. During the same period, the effective import duty of RBD palmolein/ RBD palm oil and refined soyabean/ sunflower oil was also reduced by 22.0 percentage points and 16.5 percentage points, respectively, to 13.75 and 19.25 per cent.

Prices of sugar and confectionery (weight of 1.4 per cent in the CPI and 3.0 per cent in the food and beverages group) emerged out of deflation in September 2021 and averaged 5.2 per cent during September 2021 to February 2022, reflecting, higher

exports (54.0 per cent y-o-y in April 2021-January 2022, as per DGCIS), the government's enhanced target of 10 per cent ethanol blending (against 8.5 per cent earlier) and adverse base effects. Prices declined during December 2021-February 2022 due to the onset of domestic production season, coupled with the decision to extend the sale of unsold sugar quota of previous months in November 2021 and January 2022 and moderation in international sugar prices since December 2021.

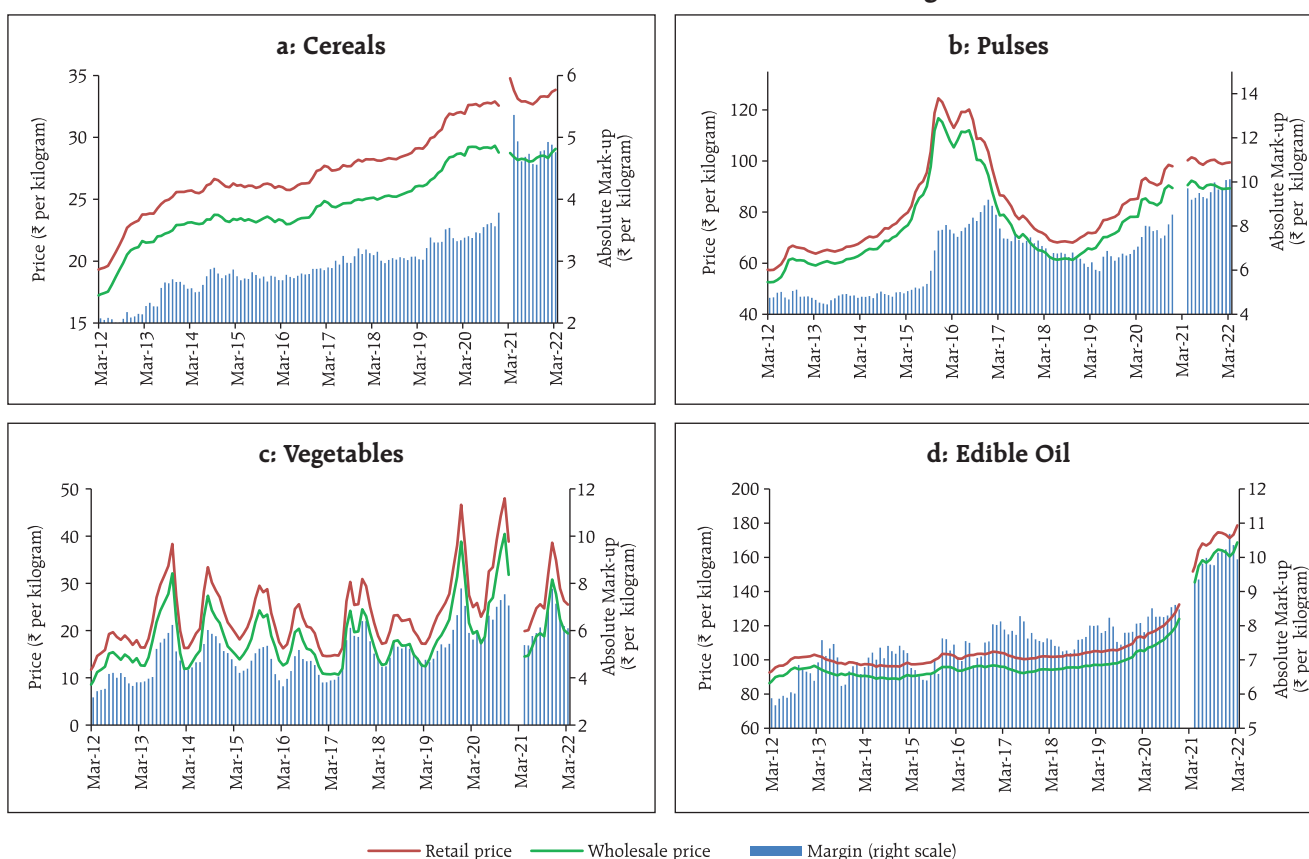
Among other food items, prices hardened in the case of prepared meals, driven by cooked meals and

cooked snacks as increased input costs fed through. For non-alcoholic beverages, tea prices rose on lower production and higher consumption. In the case of spices, price pressures emerged since December 2021 on account of production shortfalls.

Retail Margins

The retail price margin⁸, defined as the difference of retail and wholesale prices, for cereals, pulses, and edible oil remained elevated till March 2022. On the other hand, margins in the case of vegetables softened, particularly for tomatoes, as per the seasonal pattern, but remained higher than in the past (Chart II.12).

Chart II.12: Retail, Wholesale Prices and Margin



Sources: Department of Consumer Affairs, Ministry of Consumer Affairs, Food and Public Distribution; and RBI staff estimates.

⁸ Item level retail and wholesale prices are aggregated at respective subgroup using item level CPI weights. Data for January-March 2021 have been excluded due to changes in price collection mechanism and item varieties by DCA.

Impact of the Russia Ukraine War on Domestic Food Prices

The Russia-Ukraine conflict poses considerable upside risks to prices of key food items. Even as adverse spillovers through direct trade remain limited (Chapter III), the Russia-Ukraine war may have a significant impact on inflation through the global commodity markets channel (Chapter V).

In the case of edible oils, the loss of supplies of sunflower oil from Black Sea region is likely to keep domestic prices under pressure. The Black Sea region accounts for around 75 per cent of global production of sunflower oil and is a key supplier to India. The situation is being compounded by the tightness in global soybean market and the increase in export levies as well as export restrictions by key producing countries. On the other hand, the significant increase in domestic mustard production is likely to provide some cushion to the price pressures.

Russia and Ukraine account for about a quarter of global wheat exports. Since the beginning of the Ukraine war, international wheat prices have soared. India is not an importer of wheat, but exports from India have picked up sharply in the current year (336.8 per cent y-o-y during April 2021-January 2022). Therefore, international prices could set a floor for domestic wheat prices through the export channel, even if domestic prices do not move in sync with global prices. However, ample stocks along with a bumper production may help to keep any price increase range bound.

Fuel

Fuel inflation surged from 12.9 per cent in August 2021 to 13.6 per cent in September and further to 14.3 per cent in October, reaching new peaks in these three consecutive months (Chart II.13a). The key driver of this pick-up was the sharp rise in international prices of kerosene and liquefied petroleum gas (LPG) and its transmission to domestic prices (Chart II.13b and c). From

November, fuel inflation moderated sequentially to 8.7 per cent in February 2022, enabled by the abrupt slip in electricity prices to deflation since November and LPG prices remaining unchanged since October 2021. Kerosene prices moderated during December 2021-January 2022, reflecting the fall in international prices. In February, as international prices picked up and pass-through became evident, domestic prices also registered a sharp increase. LPG prices were also increased by ₹50 per cylinder on March 22, 2022.

Core

Core inflation, *i.e.*, CPI inflation excluding food and fuel, remained elevated at around 6 per cent in 2021-22 as relentless cost-push pressures impinged on goods and services selling prices (Table II.1).

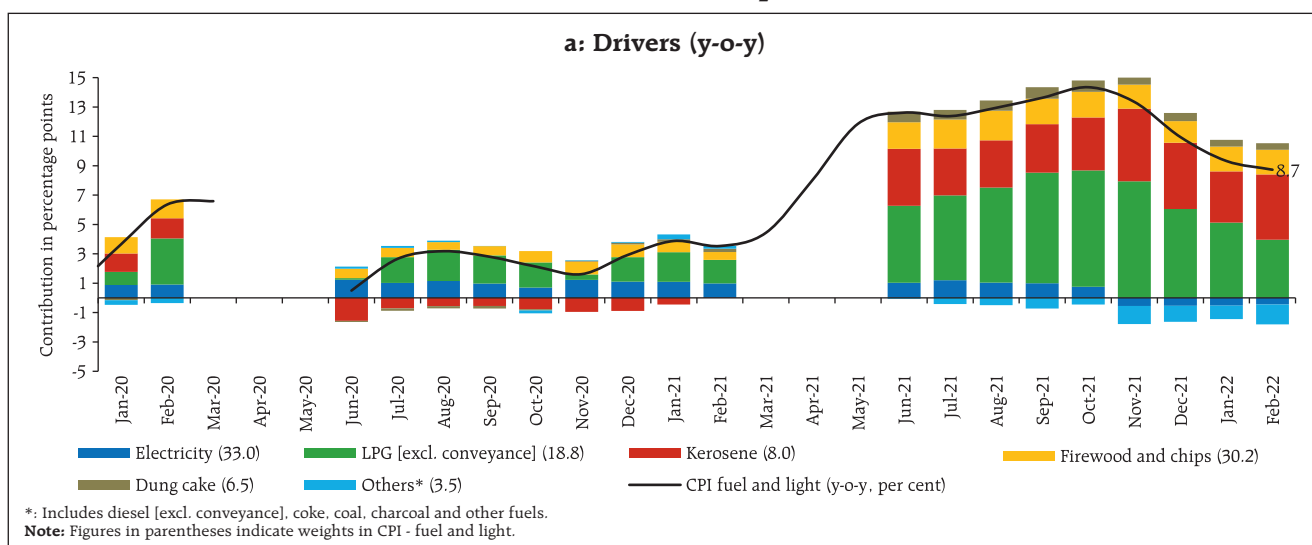
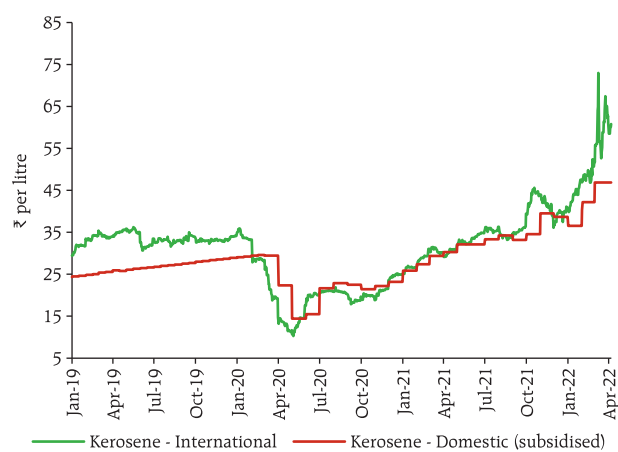
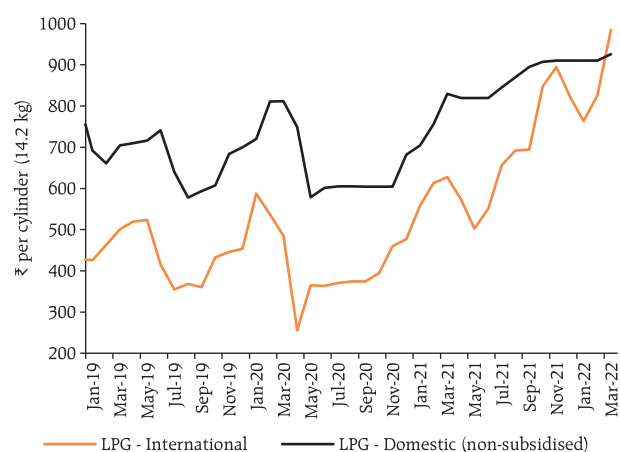
Table II.1: Exclusion-based Measures of Inflation (y-o-y)

Period	Exclusion based measures		
	CPI excluding food and fuel (47.3)	CPI excluding food fuel petrol diesel (45.0)	CPI excluding food fuel petrol diesel gold silver (43.8)
Jun-19	4.1	4.6	4.6
Sep-19	4.2	4.9	4.5
Dec-19	3.8	3.7	3.3
Mar-20	3.9		
Jun-20	5.4	5.3	4.6
Sep-20	5.4	5.2	4.5
Dec-20	5.6	5.3	4.7
Jan-21	5.5	5.2	4.7
Feb-21	6.0	5.5	5.1
Mar-21	5.9		
Apr-21	5.3		
May-21	6.6		
Jun-21	6.1	5.3	5.4
Jul-21	5.8	5.1	5.3
Aug-21	5.8	5.1	5.6
Sep-21	5.9	5.2	5.6
Oct-21	5.9	5.0	5.4
Nov-21	6.2	5.5	5.7
Dec-21	6.1	5.6	5.9
Jan-22	6.0	5.6	5.8
Feb-22	5.8	5.6	5.7

Note: (1) Figures in parentheses indicate weights in CPI.

(2) Derived as residual from headline CPI.

Sources: NSO; and RBI staff estimates.

Chart II.13: CPI Fuel Group Inflation**b: Kerosene: Domestic and International Prices****c: LPG: Domestic and International Prices**

Notes: (1) The international price for LPG is based on spot prices for Saudi Butane and Propane, combined in the ratio of 60:40, respectively. These international product prices are indicative import prices. Further details are available at www.ppac.org.in.
(2) The indicative international price for kerosene is the Singapore Jet Kero spot price.
(3) The domestic prices of LPG and kerosene represent the average prices at the four metros from Indian Oil Corporation Limited (IOCL). Domestic prices of LPG are monthly average prices.

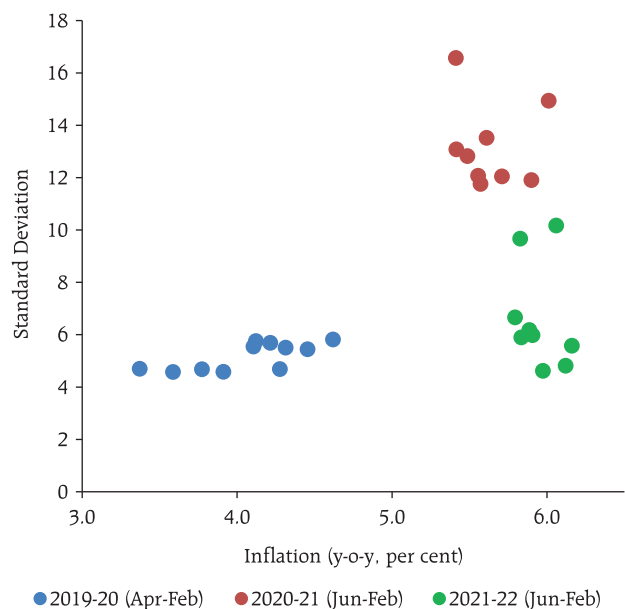
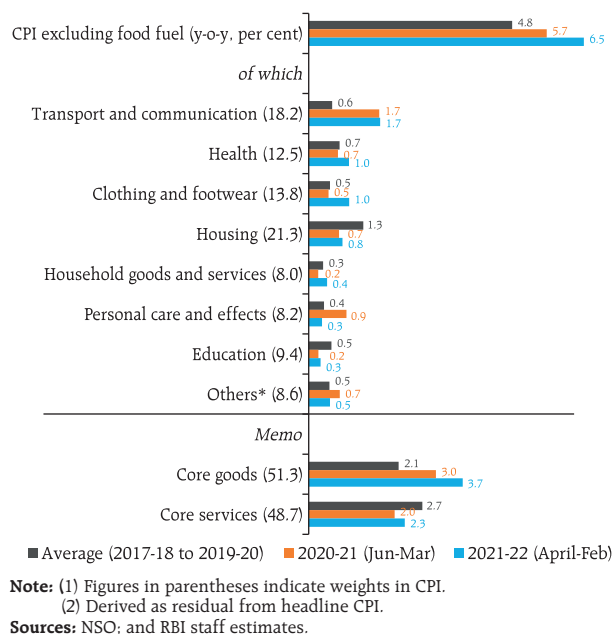
Sources: NSO; Bloomberg; IOCL; and RBI staff estimates.

Core inflation was sticky and higher than in the pre-COVID period during 2021-22, with elevated core price pressures coexisting with significantly lower volatility than a year ago (Chart II.14).

A comparative assessment of the drivers of core inflation in 2021-22 (April-February) *vis-à-vis* pre-COVID years (*i.e.*, 2017-18 to 2019-20) and 2020-21

(June 2020 to March 2021⁹) shows that core goods as well as core services inflation were higher in 2021-22. Also, inflation rates across core sub-groups, barring housing and education, were higher than in 2020-21. Transport and communication, in addition to health,

⁹ The inflation prints of April and May 2020 were not available due to country-wide lockdown.

Chart II.14: CPI excluding food and fuel: Pre-pandemic and post-pandemic**Chart II.15: Contribution to CPI excluding Food Fuel (Core) Inflation (in percentage points)**

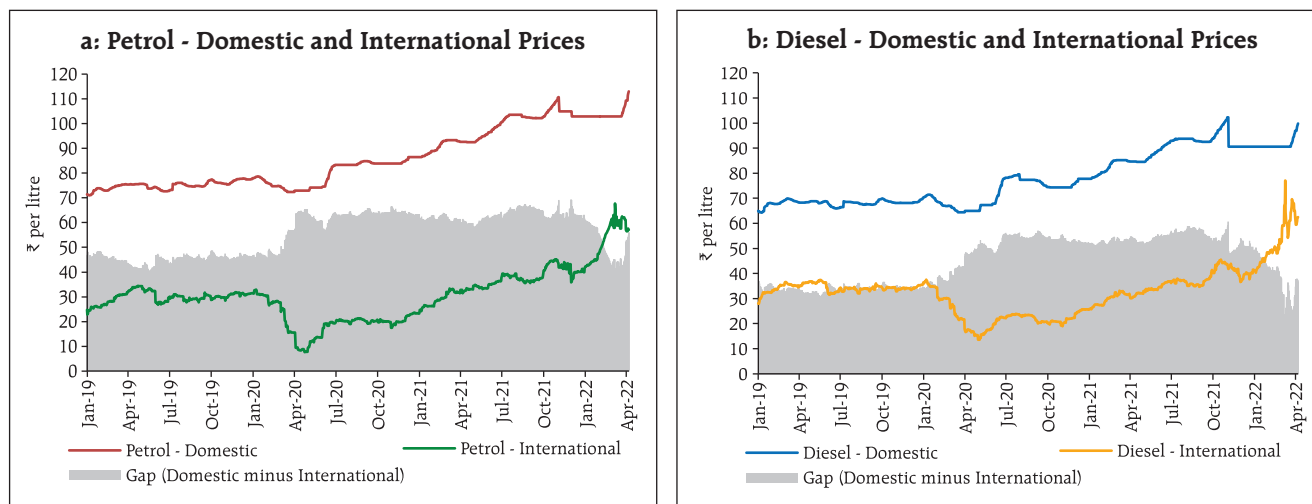
remained the key drivers, as in 2020-21. While the contribution of clothing and footwear to overall core inflation edged up sharply in 2021-22, the contribution of personal care and effects declined (Chart II.15).

A key source of core inflationary pressures during September 2021 to February 2022 has been petrol and diesel. Some softening since November was facilitated by the cut in central excise duties on petrol by ₹5 per litre and on diesel by ₹10 per litre on November 4, 2021 along with a reduction in State VATs in petrol and/or diesel by 28 States/UTs during November-December 2021. As a result, pump prices scaled down from historic highs recorded during November 1-3, 2021. However, Oil Marketing Companies (OMCs) after adjusting for the tax cuts kept the retail selling prices unchanged till the third week of March, even as international crude oil prices exhibited two-way movement – a moderation during December 2021 before reversing course since early January 2022 and a precipitous rise from end-February on Russia-Ukraine conflict (Chart II.16). Since March 22, with OMCs commencing

the pass-through of high international crude oil prices to domestic pump prices, petrol and diesel retail selling prices have registered a cumulative increase of around ₹10 per litre in 14 revisions so far (till April 6, 2022).

Various measures of core inflation have remained elevated in a range of 5.0-6.2 per cent during September 2021-February 2022 (Table II.1). Decomposing CPI excluding food, fuel, petrol, diesel, gold and silver into its goods and services components points to contrasting movements. Inflation in the goods component (with a weight of 20.7 per cent in the headline CPI) increased consecutively from August 2020, reaching 7.0 per cent in November 2021 and plateauing thereafter. This was driven primarily by clothing and footwear – readymade garments and uniforms; health care goods —medicines, household goods and personal care items and toiletries (Chart II.17a). On the other hand, services inflation (with a weight of 23.0 per cent in the headline CPI) which was at 4.5 per cent in August 2021, softened to 4.2 per cent in October before firming up to 4.7

Chart II.16: Petrol and Diesel Prices



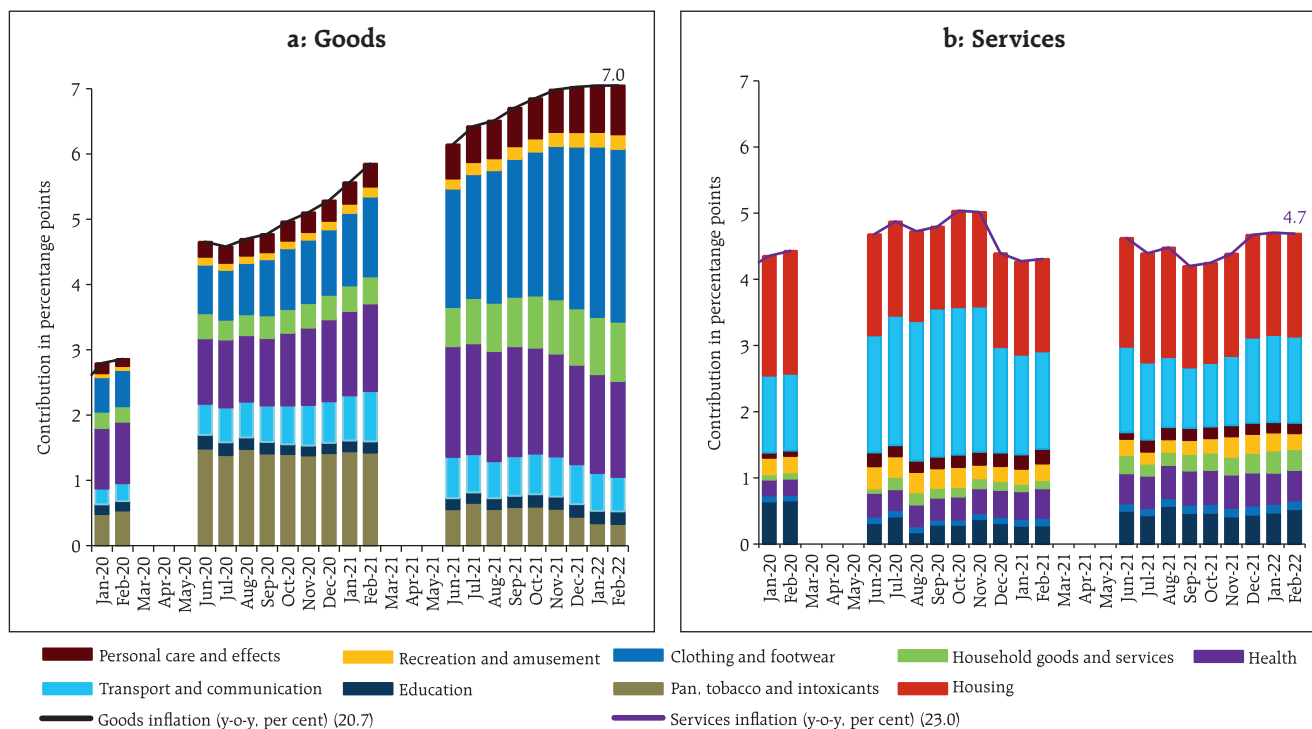
Note: International petrol and diesel prices denote the spot price of Singapore gasoline and gasoil, respectively. Domestic petrol and diesel prices represent the average pump prices of four metros as reported by Indian Oil Corporation Limited (IOCL).

Sources: PPAC; NSO; Ministry of Commerce and Industry; and RBI staff estimates.

per cent during December 2021-February 2022 (Chart II.17b). The pick-up in services inflation was on account of the transport and communication sub-

group, coming from an increase in mobile telephone charges during December 2021-January 2022. The contribution of household services (which includes

Chart II.17: Contributions to CPI Inflation excluding Food, Fuel, Petrol, Diesel, Gold and Silver



Note: Figures in parentheses indicate weights in CPI.

Sources: NSO; and RBI staff estimates.

domestic servant/cook/sweeper charges, monthly maintenance charges) and recreation and amusement services (cinema; club; hotel lodging charges) also increased during this period. The contribution of services to core inflation continued to remain lower, on an average, than what was seen in the pre-pandemic period, particularly on account of relatively subdued growth in house rentals (Chart II.15).

In order to filter noise out of CPI inflation, two common approaches are (i) excluding a fixed set of components from the CPI basket that display volatile price movements, and (ii) excluding different components each month if they are located in the tails of the inflation distribution. The exclusion-based measures show high and persistent inflationary pressures during September 2021-February 2022

(Table II.1). Inflation measured by trimmed means also edged up during this period (Table II.2).

Other Measures of Inflation

Inflation measured by sectoral CPIs for agricultural labourers (CPI-AL) and rural labourers (CPI-RL) has persisted below CPI headline inflation for the past 20 months. By February 2022, however, the extent of divergence gradually narrowed. Both food and fuel inflation were generally lower in the CPI-AL and CPI-RL *vis-à-vis* CPI, resulting in lower inflation prints. Inflation in terms of the CPI for industrial workers (CPI-IW) has moved broadly in line with the headline CPI during September to January 2022. In February 2022, however, there was a substantial divergence on account of lower food inflation in CPI-IW *vis-à-vis* headline CPI.

WPI inflation, which was in double digits since the start of 2021-22, edged up further since September 2021, reaching an all-time high of 14.9 per cent (as per the WPI series, 2011-12=100) in November 2021. A sharp and broad-based surge in price momentum, despite strong favourable base effects, drove the pick-up in WPI inflation. Persistently high WPI core¹⁰ inflation, which remained in double digits from May to December 2021, reflected high commodity and input price pressures as well as supply-side disruptions. WPI inflation moderated somewhat to 14.3 per cent and further to 13.0 per cent in December 2021 and January 2022, respectively, before picking up marginally to 13.1 per cent in February 2022. In line with WPI inflation, the deflators for gross value added (GVA) and gross domestic product (GDP) remained elevated between Q1:2021-22 to Q3:2021-22.

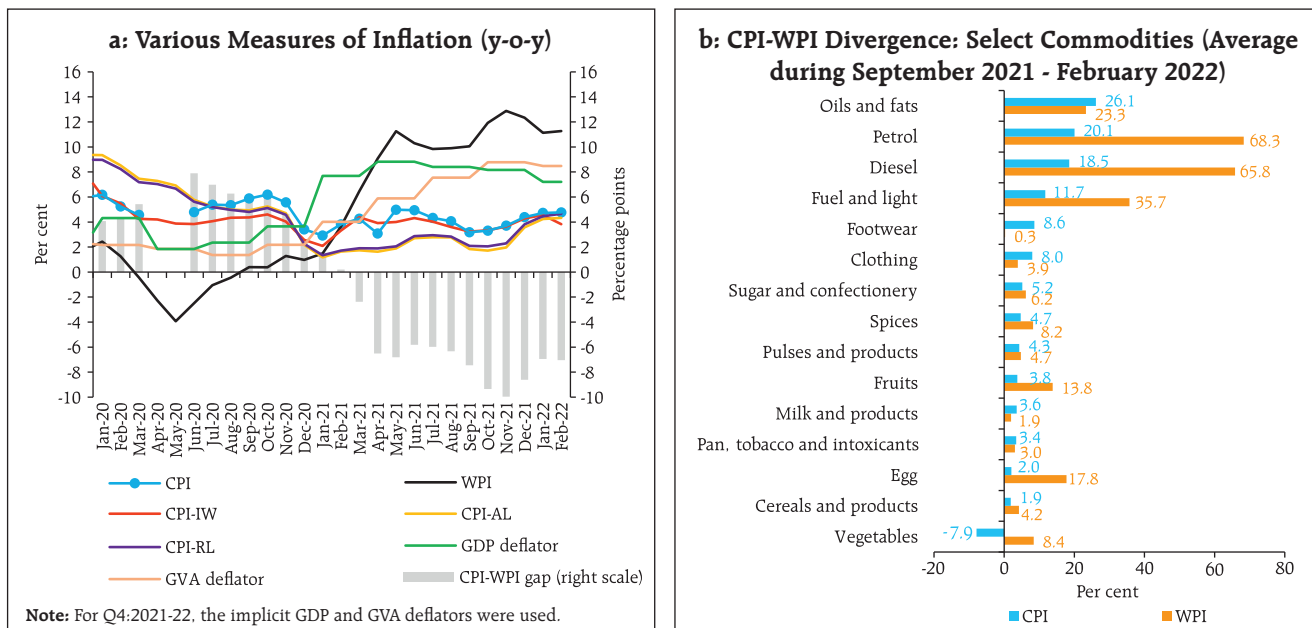
In H2:2021-22, WPI and CPI inflation have diverged markedly (Chart II.18a). During September

Table II.2: Trimmed Mean Measures of Inflation (y-o-y)

Month	5% trimmed	10% trimmed	25% trimmed	Weighted Median
Jun-19	3.0	3.1	3.0	2.8
Sep-19	3.3	3.2	3.1	2.8
Dec-19	4.4	4.0	3.7	4.0
Mar-20				
Jun-20	5.8	5.4	5.1	4.9
Sep-20	6.2	5.6	4.7	5.1
Dec-20	5.6	5.1	4.3	4.0
Jan-21	5.0	4.8	4.0	3.6
Feb-21	5.1	4.9	4.1	3.7
Mar-21				
Apr-21				
May-21				
Jun-21	5.7	5.2	5.0	5.2
Jul-21	5.8	5.3	5.0	4.6
Aug-21	5.5	5.1	4.9	4.3
Sep-21	5.0	4.9	4.8	4.3
Oct-21	5.2	4.9	4.7	4.6
Nov-21	5.5	5.1	5.0	5.0
Dec-21	5.8	5.4	5.2	4.7
Jan-22	5.9	5.6	5.3	5.1
Feb-22	6.0	5.7	5.3	5.6

Sources: NSO; and RBI staff estimates.

¹⁰ WPI Non-Food Manufactured Products.

Chart II.18: Alternative Measures of Inflation

Sources: NSO; Labour Bureau; Ministry of Commerce and Industry; and RBI staff estimates.

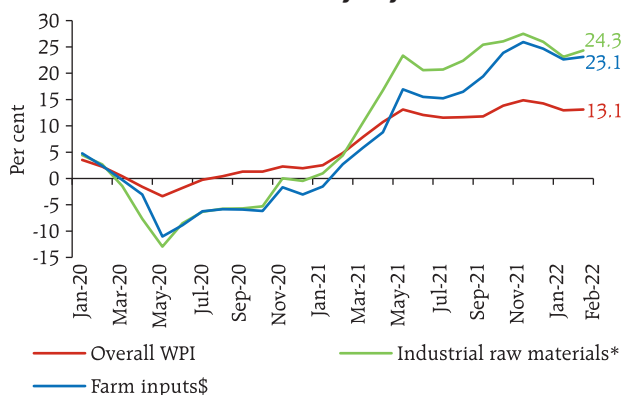
2021 to February 2022, all the major subgroups of WPI, namely, food, fuel and excluding food and fuel (core) remained substantially above the corresponding subgroups in the CPI. Year-on-year growth in prices of petrol and diesel diverged considerably between CPI and WPI (Chart II.18b) as the CPI, which records prices inclusive of taxes, moderated following the reduction in excise duties and State VATs in November-December 2021. Among food sub-groups, fruits and eggs registered higher price increases on a y-o-y basis in the WPI relative to the CPI. In the WPI, vegetable inflation remained elevated whereas in the CPI, prices of vegetables recorded deflation during September-December 2021, before turning up.

II.3 Costs

Costs, as measured by WPI inflation in industrial raw materials and farm inputs, remained elevated during H2:2021-22 (Chart II.19). Disruptions in global

supply chain in the form of logistics bottlenecks, increase in shipping costs, and longer delivery times resulted in input cost pressures.

The firming up of global crude oil prices was the main factor that impacted the prices of industrial inputs such as naphtha, aviation turbine fuel, bitumen, petroleum coke and furnace oil. They also contributed to double-digit inflation in high-speed diesel, which in turn drove up farm input price inflation. Other contributory factors comprise fertiliser prices that edged up in sympathy with international prices, and prices of some non-food articles that remained in double digits – raw cotton and oilseeds. Price of electricity – a key input in both industrial and farm inputs – also increased sharply during the period in line with revival in demand. Inflation in industrial raw materials and farm inputs, however, eased during December 2021-January 2022 on account of softer prices of petroleum products but picked up again in

Chart II.19: Farm and Non-farm Input Cost Inflation (y-o-y)

* : Comprise primary non-food articles, minerals, coal, aviation turbine fuel, high speed diesel, naphtha, bitumen, furnace oil, lube oil, petroleum coke, electricity, cotton yarn and paper and pulp from WPI.

\$: Comprise high speed diesel, fodder, electricity, fertilisers, pesticides, and agricultural and forestry machinery from WPI.

Sources: Ministry of Commerce and Industry; and RBI staff estimates.

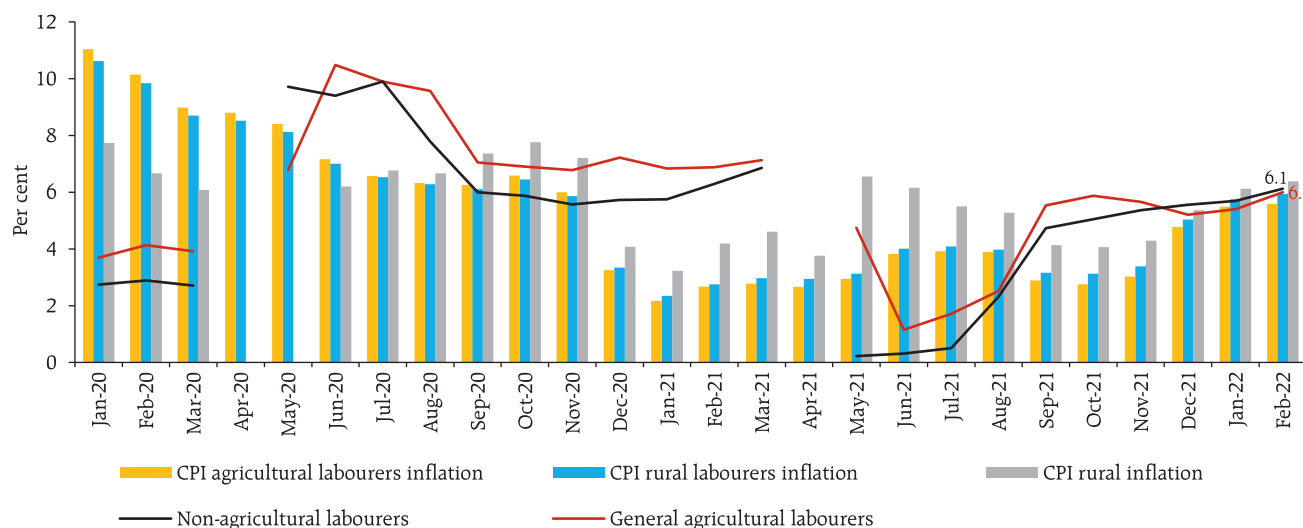
February 2022 amidst rising international prices and heightened geopolitical uncertainties.

The ongoing conflict in the Black Sea region and ensuing sanctions have hampered global supply chains and have also sent prices soaring with

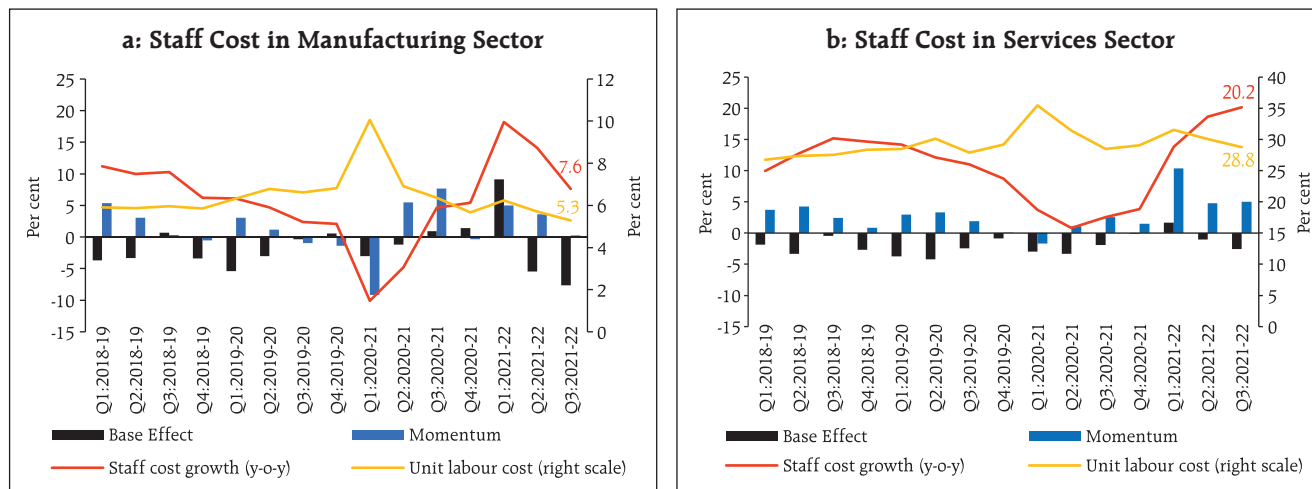
aluminium and nickel prices rising to highest level in the last decade. Russia is one of the largest producers of aluminium, widely used in transportation and construction industry, and of nickel, mostly used for high grade steel manufacturing and in batteries. Further geopolitical tension in the region is likely to aggravate global chip shortage and could impact prices of vehicles and electronic products.

Nominal rural wages for both agricultural and non-agricultural labourers picked up during H2:2021-22, with easing of restrictions/lockdowns imposed by states and restoration in economic activity. However, the wage growth remained soft (Chart II.20).

In the organised sector, staff cost growth (y-o-y) for both manufacturing and services picked up in Q1 of 2021-22 but decelerated for manufacturing and remained steady for services in the next two quarters, with softer momentum in Q2 and Q3. Unit labour costs also moderated in Q3:2021-22 owing to the sharp increase in growth in value of production of the listed firms both in manufacturing and services

Chart II.20: Wage Growth (y-o-y) and Inflation in Rural Areas (y-o-y)

Sources: NSO; Labour Bureau; and RBI staff estimates.

Chart II.21: Labour Cost in Manufacturing and Services

Note: Unit labour cost = Staff cost/value of production.
The staff cost growth (y-o-y) is based on common set of companies.
Sources: Capitaline database; and RBI staff estimates.

vis-à-vis staff costs during Q2 and Q3:2021-22 (Chart II.21a and b).

Manufacturing firms polled for the purchasing managers' index (PMI) reported a sustained increase in input prices in March 2022. Also, the PMI services sector reported continued increase in input prices till March 2022 with firm momentum, mainly driven by

higher fuel, raw material, chemical, retail, vegetable and transportation costs. However, the pace of output prices for both manufacturing and services sectors so far remained modest as compared to input prices, reflecting restricted pass-through amidst firms' limited pricing power due to the prevalent slack in the economy (Box II.1).

Box II.1: An Analysis of Sensitivity of Output Prices to Input prices

Input cost prices have been rising during 2021-22, though its pass-through to output prices has remained muted in view of the continuing slack in demand (Patra, 2022). The gap between input and output prices has remained wide during 2021-22 (Chart II.1.1). In advanced economies like the United States and the Euro area, pricing power of firms has increased significantly against intense pressures from elevated input prices and in the presence of strong demand (Vijlder, 2022).

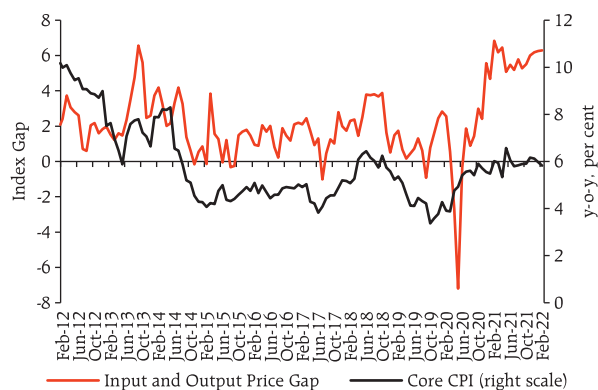
In the Indian context, PMI price indices have significant predictive power about changes in wholesale price inflation (WPI) (Khundrakpam and George, 2013)¹¹.

Granger causality tests using monthly data from January 2011 to February 2022 confirm that PMI input prices do influence output prices and core CPI, a measure of inflation exclusive of volatile components *i.e.*, food and fuel, with no evidence of reverse causality¹². To further examine the strength of the relationship, ordinary least

(Contd.)

¹¹ Studies in the US have successfully used PMI price indices, along with other variables, to forecast inflation (Banerjee and Marcellino, 2006; and Wright, 2008).

¹² The null of no causality is rejected for PMI input prices to output prices and input prices to core CPI at 5 per cent level of significance. While for the former it holds from first lag to higher lags of input prices, significance reduces for higher lags for input prices to core CPI.

Chart II.1.1: Input-Output Price Gap and Core Inflation

Sources: IHS Markit; NSO; and RBI staff estimates.

squares (OLS) and autoregressive distributed lag (ARDL) models are used depending upon the degree of integration of the variables.¹³

Empirical analysis in an OLS framework suggests pass-through from lagged PMI composite input prices to corresponding output prices, after controlling for future output¹⁴ (Table II.1.1a). The pass-through is, however, less than complete, reflecting, *inter alia*, the role of other demand side factors.

Analysis of PMI composite input prices and core CPI inflation along with PMI future output for the period April 2012 to February 2022 in an ARDL model of co-integration, which allows for use of variables of different degrees of integration, confirms the existence of a long run co-integrating relationship

Table II.1.1: Empirical Results: Input to Output prices**a. OLS: Composite PMI Input to Output prices**

Dependent Variable: Output prices	
Constant	31.213*** (0.00)
Input Prices (lagged)	0.233*** (0.00)
Future Output	0.130*** (0.00)
Dum_Apr20	-9.563*** (0.00)
Adjusted R-square	0.74

b. ARDL: Composite PMI Input prices to Core CPI

Bounds test for Co-integration@	F-statistic	3.50*
Note: "Ho: No Co-integration"; "H1: There is long run co-integrated relationship"; @: Future output as a control; Conventional significance based on F-statistics as extracted from Narayan (2005).		
Long run estimation (Dependent variable: Core CPI)		
PMI input prices		0.108*** (0.00)

Note: ***, ** and * indicate the rejection of the null hypothesis at 1, 5 and 10 per cent levels of significance. Figures in parenthesis are p-values. The ARDL models are chosen based on automatic selection by AIC criteria. OLS model is with four lags.

The results are estimated for period: April 2012-February 2022.

Source: RBI staff estimates.

(Table II.1.1b). The long run pass-through coefficient from PMI input prices to core CPI at 0.11 is modest.

References:

Khundrakpam, J. K., & George, A. T., (2013), "An Empirical Analysis of the Relationship between WPI and PMI-Manufacturing Price Indices in India", Reserve Bank of India, WPS (DEPR):06

Patra, M.D. (2022), "Taper 2022: Touchdown in Turbulence" speech at the IMC Chamber of Commerce and Industry", March.

Vijlder, W., (2022), "Companies' Pricing Power and the Inflation Outlook", BNP Paribas.

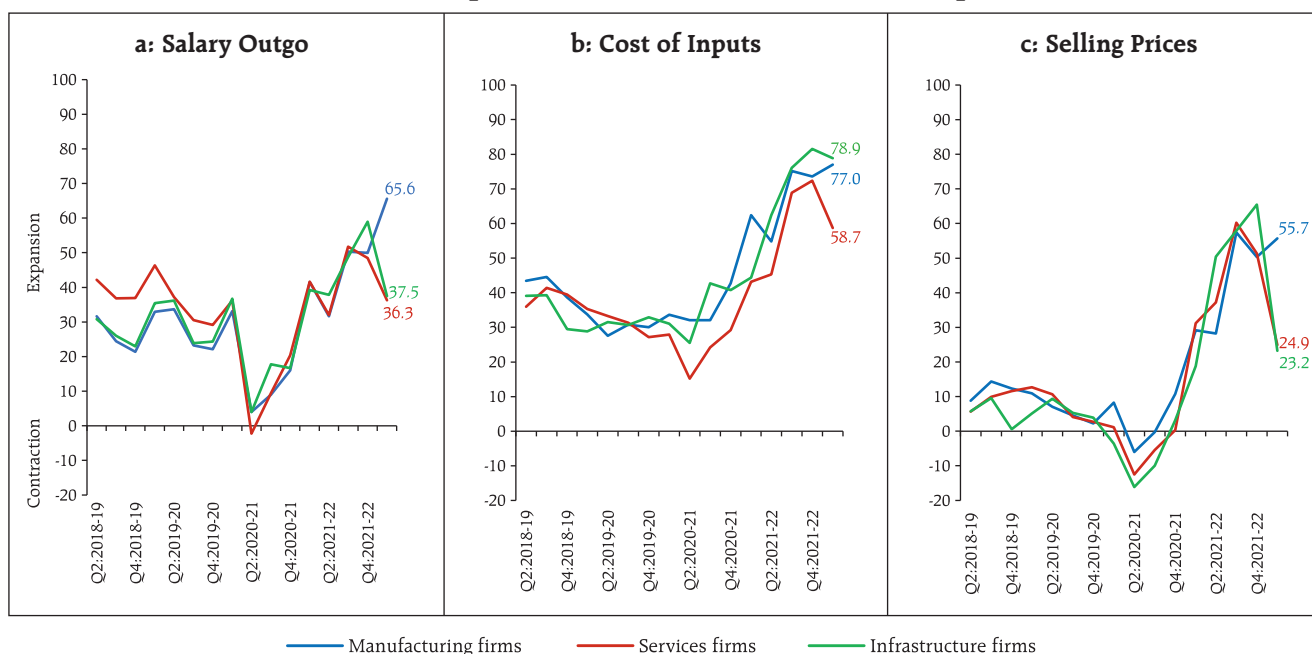
The salary outgo for the manufacturing, services and infrastructure firms polled in Reserve Bank's

¹³ The results of unit root tests indicate that while the null hypothesis of the presence of unit root is rejected for PMI Composite input and output price series making them I(0) variables, it is not rejected for core CPI making it an I(1) variable. Accordingly, OLS is adopted for PMI input to output prices while controlling for the activity parameter, ARDL model is adopted for PMI Input prices to Core CPI.

¹⁴ The future output index of composite PMI is used as an indicator of expected demand.

enterprise surveys¹⁵ reported an increase in Q3:2021-22. For manufacturing firms, the pace of increase moderated in Q4:2021-22 and expected to pick up again in Q1:2022-23, but in the case of services and infrastructure firms, it is expected to moderate in Q1:2022-23. Input cost pressures remained elevated for manufacturing, services and infrastructure firms

¹⁵ Industrial Outlook Survey; and Services and Infrastructure Outlook Survey.

Chart II.22: Expectations of Cost Conditions (Net Response)

Note: 'Net response' is the difference between the percentage of respondents reporting increase in prices and those reporting decrease.

Sources: Reserve Bank's Industrial Outlook Survey; Services & Infrastructure Outlook survey; and RBI staff estimates.

during Q3 and Q4:2021-22. During Q1:2022-23, manufacturing input costs are expected to remain elevated while some moderation in pace of increase may occur for services and infrastructure firms. Manufacturing firms may charge higher selling prices in Q1:2022-23, *vis-à-vis* their services and infrastructure sector counterparts (Chart II.22). One year ahead business inflation expectations¹⁶ polled by the Indian Institute of Management, Ahmedabad, rose sequentially, crossing 6 per cent in February 2022. The businesses polled in the survey reported further heightening of cost pressures, which along with weak demand conditions impacted profit margins of the sampled firms.

¹⁶ The monthly Business Inflation Expectations Survey (BIES) of the Indian Institute of Management, Ahmedabad, polls a panel of business leaders primarily from the manufacturing sector about their inflation expectations in the short and medium term. The latest survey pertains to February 2022 round based on the responses of around 1,000 companies.

II.4 Conclusion

Recent geopolitical events have accentuated upside risks to inflation. Global supply shocks are still unfolding and their ambit across commodities is widening. Input costs, including energy costs, for various manufacturing goods and services are also likely to go up. The impact of recent events will also be conditioned by the outlook for aggregate demand going forward. Persistent commodity price pressures along with the resurgence of global supply chain and logistics disruptions pose risk of their pass-through to domestic inflation. Though the pass-through so far has been limited due to weak demand conditions, going forward it may need to be monitored carefully. The headroom available for supply side measures remain critical to limit the extent of transmission of adverse cost conditions onto retail prices of goods and services.

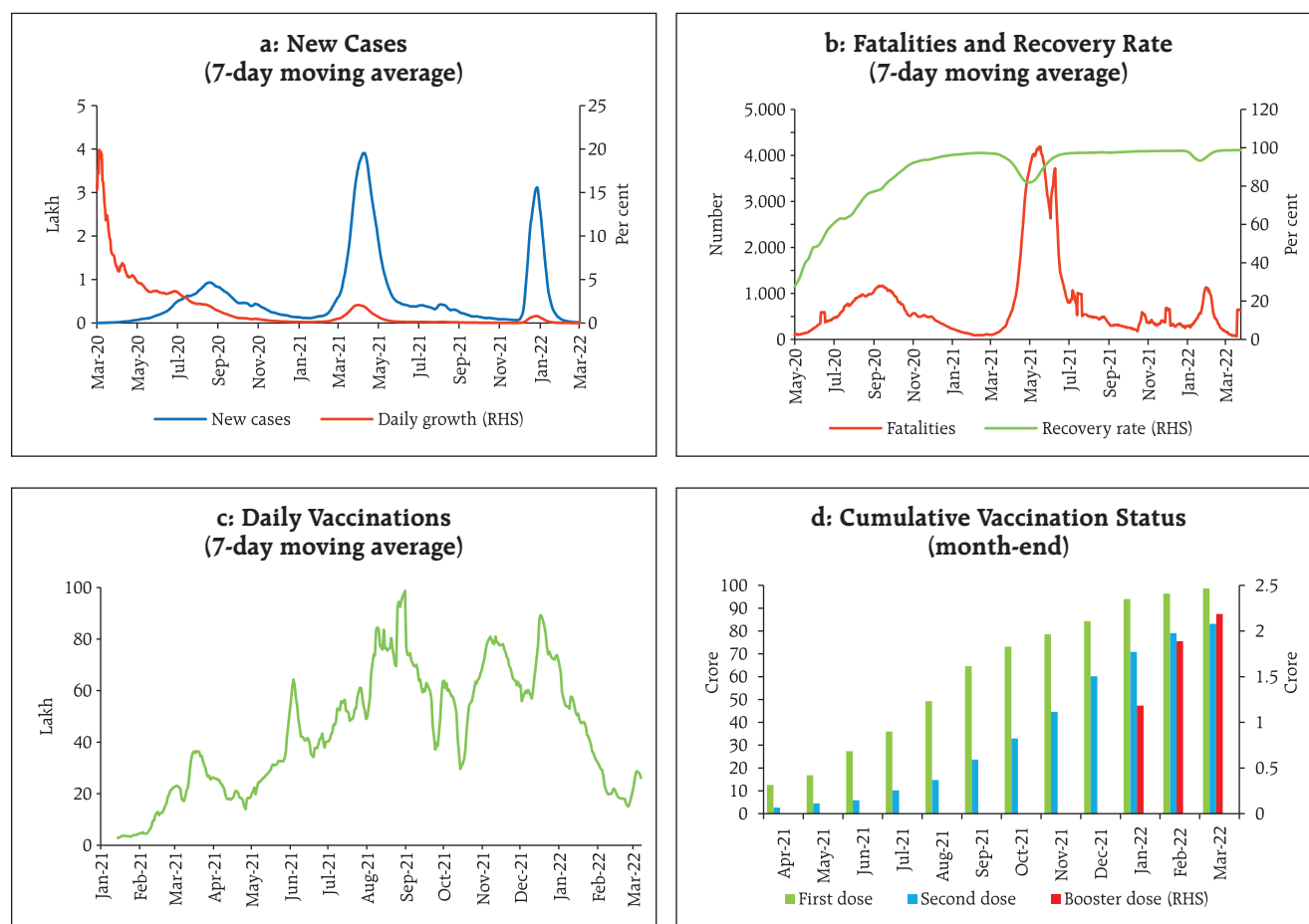
III. Demand and Output

The recovery in aggregate demand lost some momentum in H2:2021-22 with the emergence of the Omicron variant. External demand remained buoyant. The intensification of geopolitical tensions, the surge in global oil and commodity prices to multi-year highs and intense financial market volatility pose significant downside risks to global economic activity and could have spillovers on domestic growth prospects.

The recovery in aggregate demand that had resumed with the ebbing of the second wave of the pandemic lost some momentum in H2:2021-22 with the emergence of the Omicron variant.

Although more transmissible, the third wave turned out to be less severe and short-lived relative to the second wave (Chart III.1). As a result, GDP in H2 is estimated to be higher by 6.8 per cent than the corresponding pre-pandemic levels, with the demand for contact-intensive activities impacted in December 2021-January 2022 and the informal sector and micro, small and medium enterprises (MSMEs) still lagging. External demand, on the other hand, remained buoyant, with merchandise exports clocking double-digit growth for the thirteenth month in a row in March 2022. On the aggregate supply side, manufacturing weakened in the face of headwinds from persisting global supply bottlenecks and muted discretionary consumption

Chart III.1: COVID Infections and Vaccination



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

Table III.1: Real GDP Growth

(y-o-y, per cent)

Item	2020-21	2021-22	Weighted Contribution*		2020-21				2021-22			
	(FRE)	(SAE)	2020-21	2021-22	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4#
Private final consumption expenditure	-6.0	7.6 (1.2)	-3.4	4.4	-23.7	-8.3	0.6	6.5	14.2 (-13.0)	10.2 (1.1)	7.0 (7.6)	1.5 (8.1)
Government final consumption expenditure	3.6	4.8 (8.6)	0.4	0.5	13.6	-22.9	-0.3	29.0	-4.4 (8.6)	9.3 (-15.8)	3.4 (3.1)	11.7 (44.0)
Gross fixed capital formation	-10.4	14.6 (2.6)	-3.3	4.4	-45.3	-4.5	-0.6	10.1	62.5 (-11.2)	14.6 (9.5)	2.0 (1.4)	1.3 (11.5)
Exports	-9.2	21.1 (9.9)	-1.8	4.0	-25.5	-6.4	-8.6	3.7	40.4 (4.6)	20.5 (12.7)	20.9 (10.5)	7.8 (11.8)
Imports	-13.8	29.9 (11.9)	-3.2	6.3	-41.1	-17.9	-5.2	11.7	60.7 (-5.3)	40.7 (15.5)	32.6 (25.8)	1.3 (13.2)
GDP at market prices	-6.6	8.9 (1.8)	-6.6	8.9	-23.8	-6.6	0.7	2.5	20.3 (-8.3)	8.5 (1.3)	5.4 (6.2)	4.8 (7.4)

Note: *: Component-wise contributions to growth do not add up to GDP growth because change in stocks, valuables and discrepancies are not included. Figures in parentheses are growth rates over 2019-20. FRE: First revised estimates; SAE: Second advance estimates. #: Implicit.

Source: National Statistical Office (NSO).

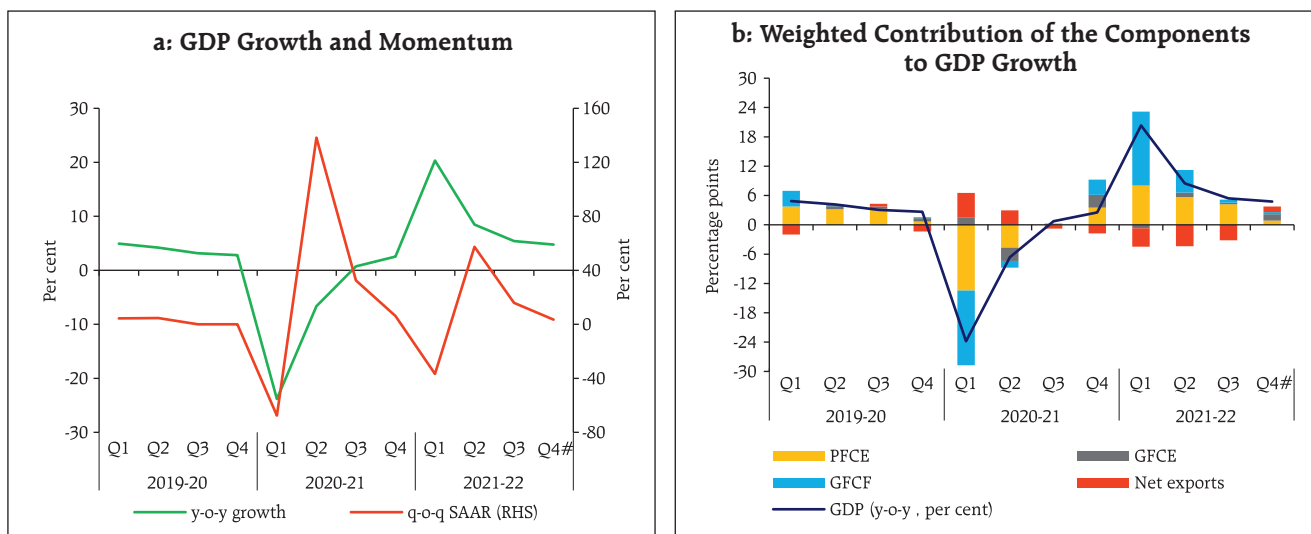
and investment spending domestically. In contrast, agriculture and allied activities remained buoyant on the back of a record *kharif* production and expansion in sowing acreage in the *rabi* season relative to a year ago.

III.1 Aggregate Demand

Aggregate demand, measured by real gross domestic product (GDP), decelerated to 5.4 per cent year-on-year (y-o-y) in Q3:2021-22 (Table III.1 and

Chart III.2a). All its major constituents surpassed their pre-pandemic levels, as recovery gained traction. With the fast ebbing of the third wave, the demand for contact-intensive services also recovered in February-March 2022. For the financial year 2021-22, real GDP is estimated to have risen by 8.9 per cent, taking its level 1.8 per cent above that recorded in 2019-20.

Private consumption and government expenditure were the key drivers of aggregate demand in H2

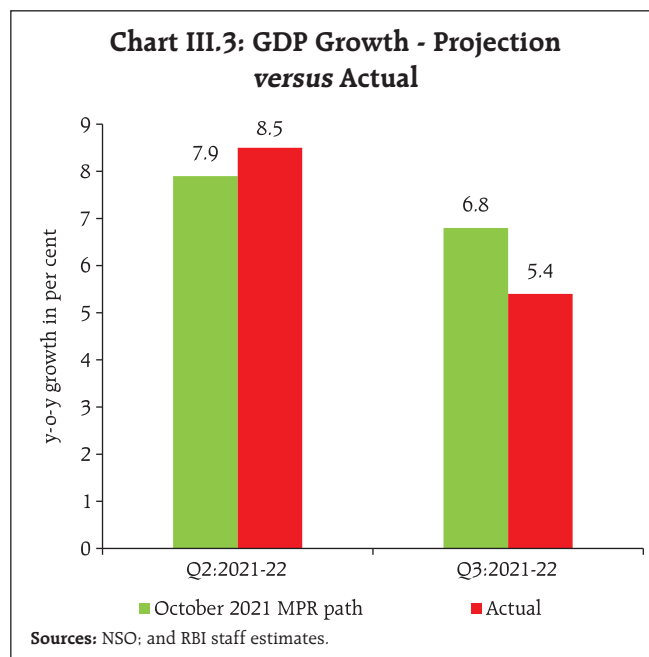
Chart III.2: GDP Growth and its Constituents

Notes: 1. #-Implicit growth. 2. SAAR – Seasonally adjusted annualised rate.
Sources: NSO; and RBI staff estimates.

(Chart III.2b). The negative contribution of net exports to aggregate demand moderated.

GDP Projections versus Actual Outcomes

The October 2021 Monetary Policy Report (MPR) had projected real GDP growth at 7.9 per cent for Q2:2021-22, 6.8 per cent for Q3 and 6.1 per cent for Q4. Actual growth in Q2 overshoot the projection by 60 basis points (bps) while it undershot the projection by 140 bps in Q3 (Chart III.3). These upside and downside surprises stemmed mainly from a stronger than expected release of pent-up demand and a pick-up in investment on the back of government capex in Q2, followed by a loss of momentum in Q3. Data for Q4:2021-22 are scheduled for release by the NSO on May 31, 2022.



III.1.1 Private Final Consumption Expenditure

Private final consumption expenditure (PFCE) – the mainstay of aggregate demand – regained some traction, but its share in overall GDP dropped to 56.6 per cent in 2021-22 from 57.3 per cent in the previous

year, weighed down by incomplete recovery in the labour force participation rate, the third wave and weak consumer confidence (Box III.1). The sluggish recovery in the informal sector and among MSMEs also restrained private consumption. Expanding

Box III.1: Drivers of Private Consumption

Income, wealth, inflation, interest rate and consumer confidence are potential determinants of private consumption (Singh, 2012; Vihriälä, 2017; Wong, 2017; Dossche, *et. al.*, 2018). According to unit root tests, private consumption and income (real GDP) are non-stationary¹. For the pre-pandemic period, *i.e.*, 2004-19, quarterly data indicate a long-run co-integrating relationship between

$$\ln \text{PFCE} = -0.707 + 1.017 \ln \text{GDP} \quad \dots(1)$$

(0.000) (0.000)

$$\Delta (\ln \text{PFCE})_t = -0.133\Delta (\ln \text{PFCE})_{t-1} - 0.324\Delta (\ln \text{PFCE})_{t-2} + 0.389\Delta (\ln \text{GDP})_t - 0.283\Delta (\ln \text{GDP})_{t-1} - 0.280\Delta (\ln \text{PFCE})_t - 0.684\Delta (\text{WACR})_{t-3} \\ - 0.029 \text{Dum2010Q4} - 0.036 \text{Dum2012Q2} + 0.024\text{Dum2013Q4} - 0.024\text{Dum2014Q4} - 0.534 \text{ECT}_{t-1} \quad \dots(2)$$

(0.088) (0.000) (0.000) (0.000) (0.056) (0.025) (0.068) (0.003) (0.000) (0.009) (0.010) (0.000)

Note: Figures in parentheses are p-values; Adjusted $R^2 = 0.80$; Breusch-Godfrey LM test for null of no serial correlation (2 lags) (p-value) = 0.125; Breusch-Pagan Godfrey Heteroskedasticity test (p-value) = 0.158. Δ represents quarter-on-quarter change in the respective variables. PFCE: PFCE deflator; WACR: weighted average call money rate, real; ECT: error correction term.

Source: RBI staff estimates.

(Contd.)

¹ Wealth effects captured through stock market capitalisation were not found to be significant, perhaps reflecting the still limited ownership of stocks amongst households.

² Auto regressive distributed lag (ARDL) methodology is deployed to study the relationship. ARDL(3,2) model is selected based on the Akaike Information Criterion.

References:

Dossche, M., M Forsells, L Rossi, G Stoevsky (2018), "Private Consumption and its Drivers in the Current Economic Expansion", Economic Bulletin, European Central Bank.

Singh, Bhupal (2012), "How Important is the Stock Market Wealth Effect on Consumption in India?", *Empirical Economics*, Vol. 42, pp. 915-927.

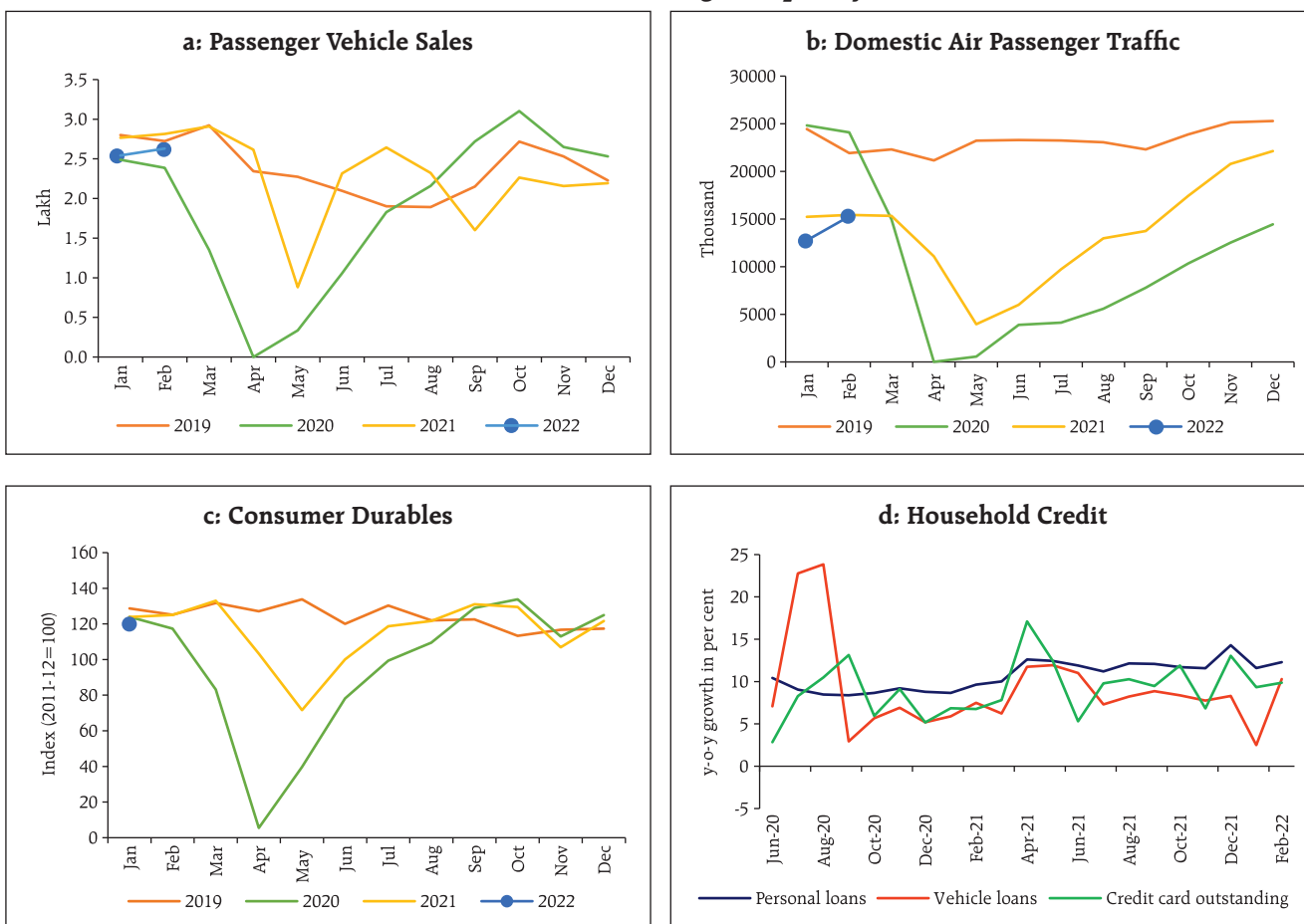
Vihriälä, E. (2017), "Household Consumption in Japan- Role of Income and Asset Developments", IMF Working Paper WP/17/23.

Wong, M. (2017), "Revisiting the Wealth Effect on Consumption in New Zealand", Reserve Bank of New Zealand Analytical Note, AN2017/03.

vaccination coverage, and relaxation of restrictions on mobility and activity enabled a recovery in demand for contact-intensive services such as air travel, hotels and restaurants, recreation and culture in February-March 2022.

Urban consumption was lifted by a recuperation in domestic air passenger traffic, especially during February-March, and a moderation in the contraction of passenger vehicle sales that had been hit by shortages in respect of semi-conductor chips (Chart III.4). Consumer durables production, on the

Chart III.4: Urban Demand: High Frequency Indicators



Sources: Directorate General of Civil Aviation (DGCA); Society of Indian Automobile Manufacturers (SIAM); NSO; and RBI.

other hand, fell in Q3 and January due to subdued discretionary spending.

As regards rural demand, sales of two-wheelers recorded y-o-y contraction during H2, indicative of pressures on discretionary household spending and slow recovery in the informal sector. Tractor sales were lower during November-February partly due to protracted and heavy precipitation in some areas. Fertiliser sales also remained lower during January-February, reflecting inventory de-stocking and lower imports amidst rising international prices. Consumer non-durables production, on the other hand, rebounded in January 2022 (Chart III.5).

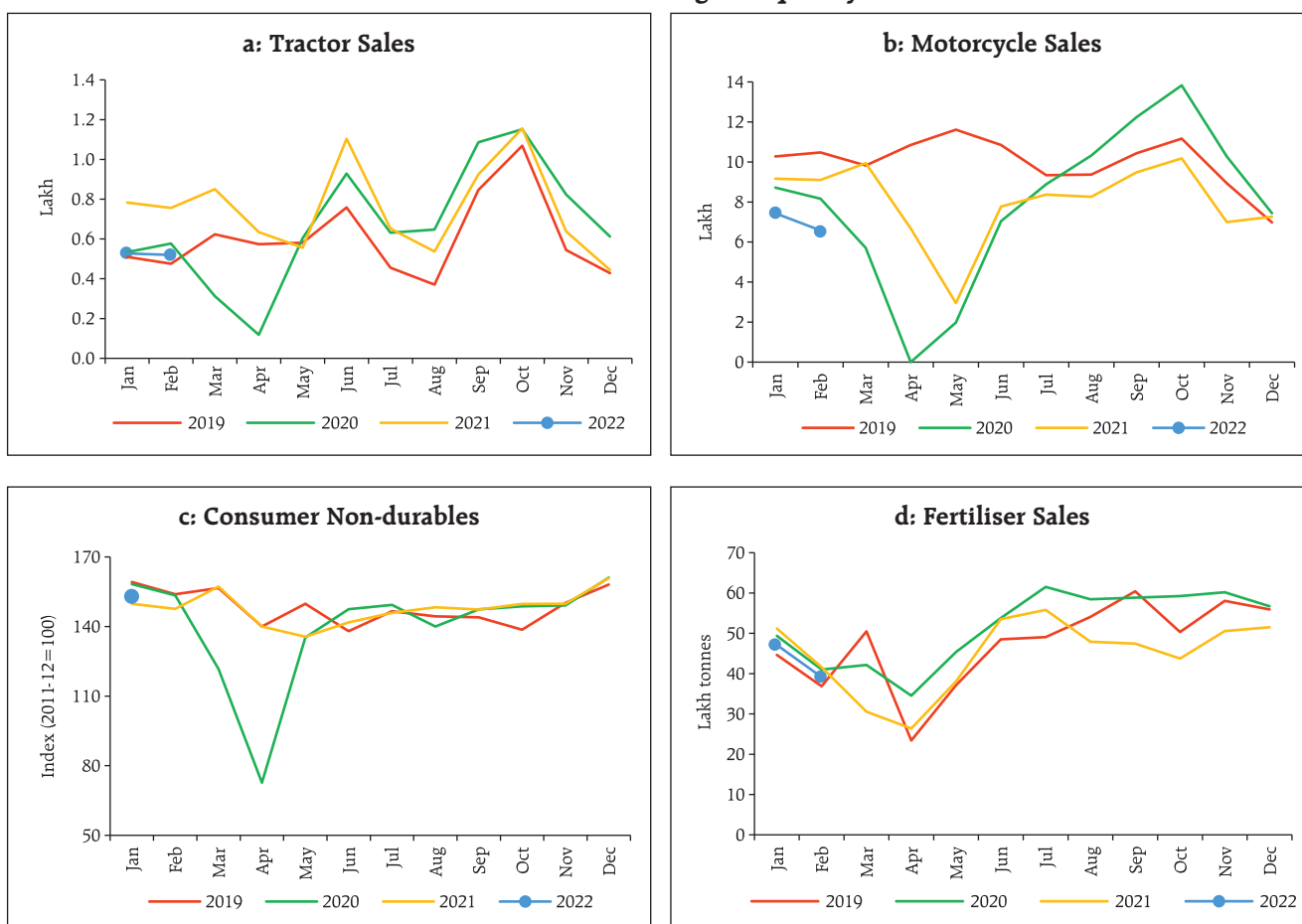
Consumer pyramids household survey data of the CMIE show that the labour force participation

rate (LFPR) fell from 40.9 per cent in December to 39.5 per cent in March 2022; the unemployment rate, however, dropped from 7.9 per cent to 7.6 per cent over the same period and remained lower than the levels recorded during the first and second waves (Chart III.6a). Employment conditions improved in Q3 and January in the organised sector (Chart III.6b).

III.1.2 Gross Fixed Capital Formation

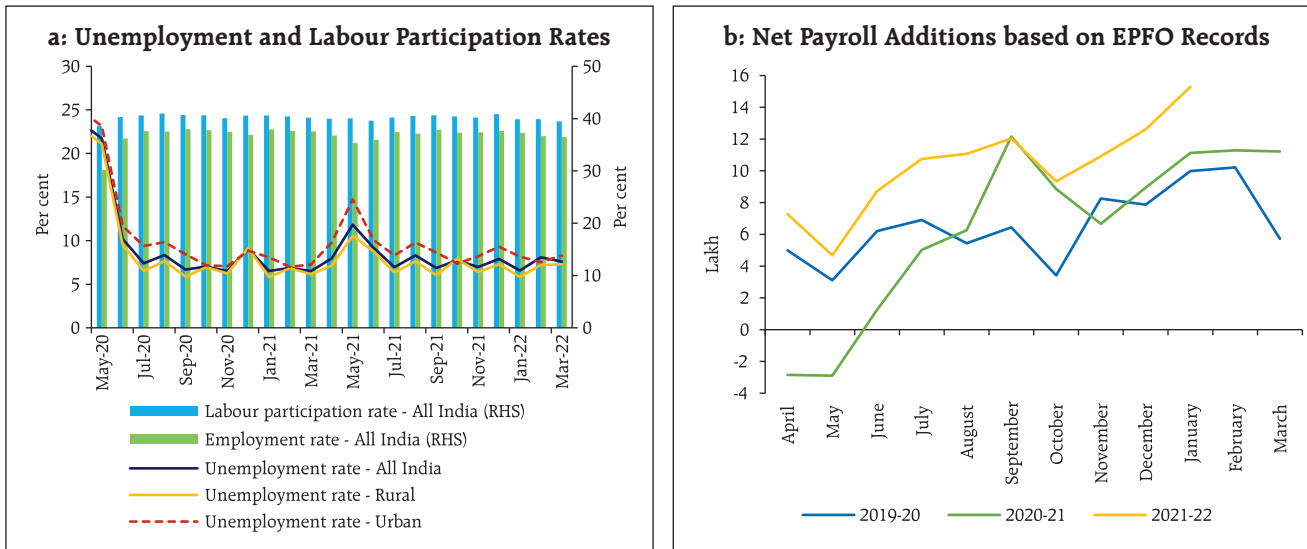
Gross fixed capital formation (GFCF) expanded by 14.6 per cent in 2021-22 on the back of a favourable base (-10.4 per cent in 2020-21) and its share in GDP rose marginally to 32.0 per cent as against 31.8 per cent in 2019-20. In H2, however, investment activity weakened, driven down by sluggish construction

Chart III.5: Rural Demand: High Frequency Indicators



Sources: Tractor Manufacturers Association; SIAM; NSO; and Ministry of Chemicals and Fertilisers.

Chart III.6: Employment Situation in India

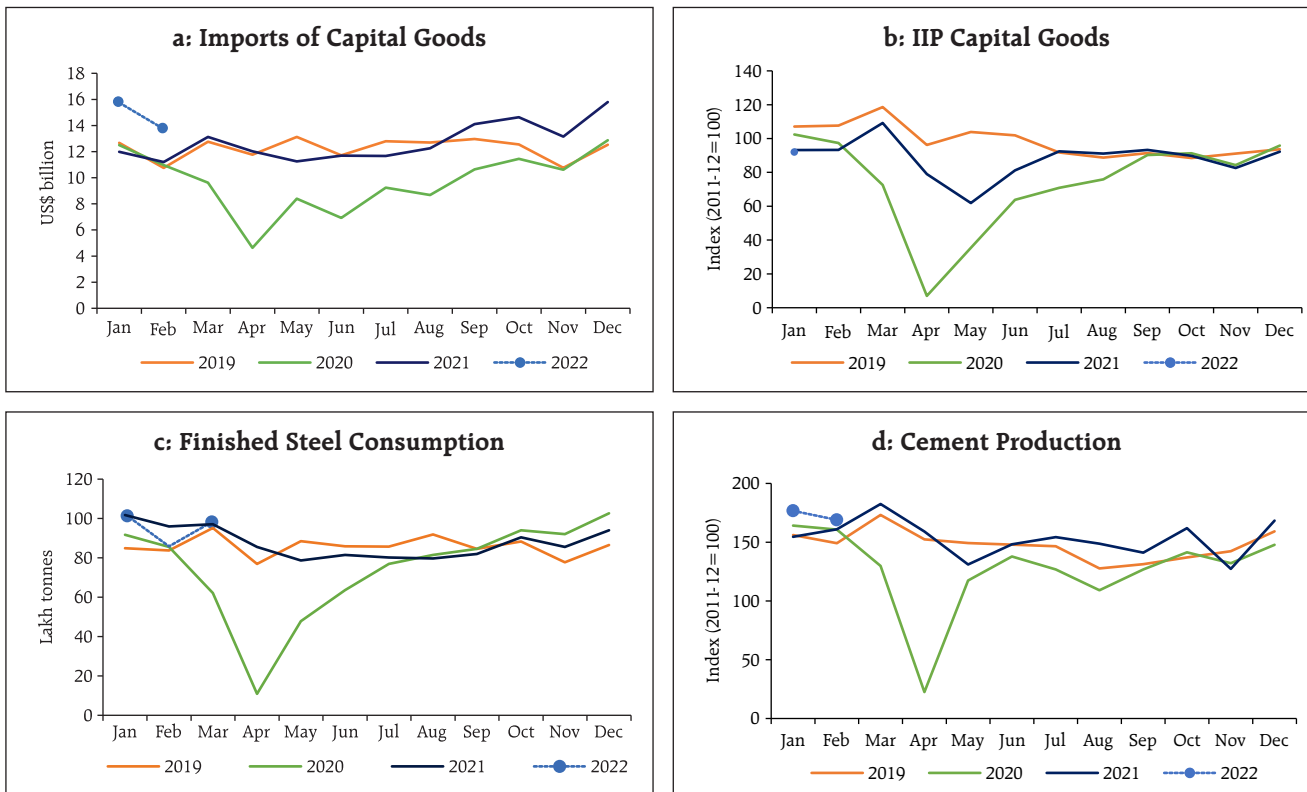


Sources: CMIE; and Employees' Provident Fund Organisation (EPFO).

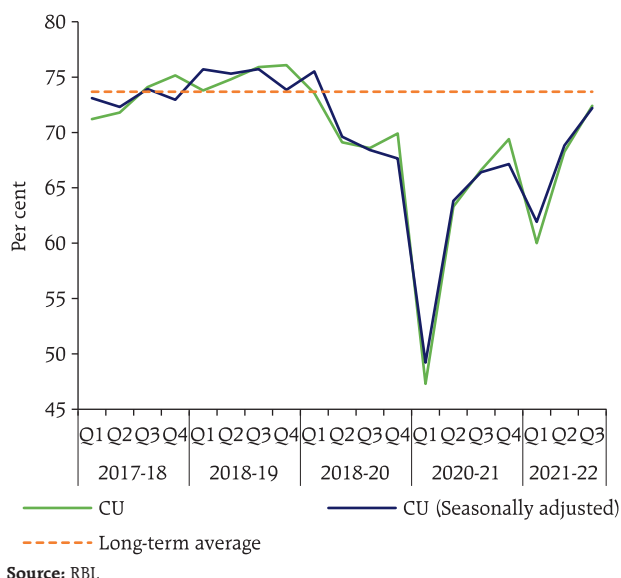
activity (reflected in steel consumption and cement production) due to unseasonal rains, rising input costs

and shortage of manpower (Chart III.7). The domestic production of capital goods slipped into contraction

Chart III.7: Indicators of Investment Demand

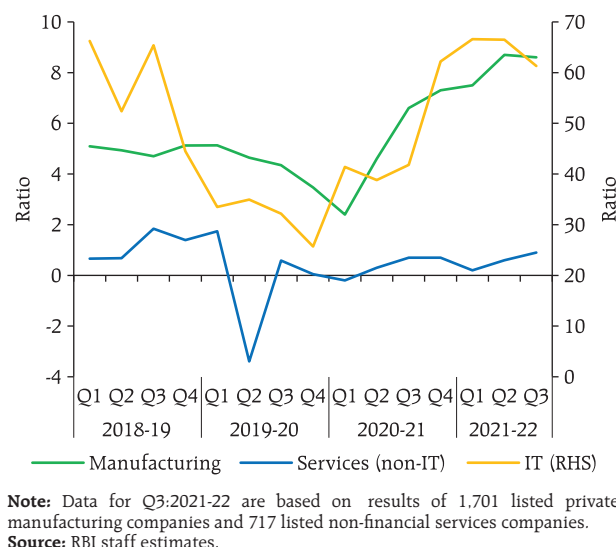


Sources: DGCI&S; NSO; Joint Plant Committee; and Office of Economic Adviser.

Chart III.8: Capacity Utilisation in Manufacturing

in Q3:2021-22 and January 2022, weighing on overall investment activity, even as imports of capital goods expanded during Q3 and Q4.

Capacity utilisation (CU) in the manufacturing sector recovered to 72.4 per cent in Q3:2021-22 from 68.3 per cent in the previous quarter (72.2 per cent from 68.6 per cent on a seasonally adjusted basis) (Chart III.8); it reached the pre-pandemic levels, although it was below the long-period average.

Chart III.9: Interest Coverage Ratio in Manufacturing and Services Firms

The interest coverage ratio (ICR)³ of listed non-financial private companies in the manufacturing and information technology (IT) sectors remained steady in Q3:2021-22 (Chart III.9). Stronger corporate balance sheets – comfortable ICR and deleveraging – can be expected to support capacity expansion further (Box III.2).

Under the production-linked incentives (PLI) scheme, the government approved a programme of ₹2.3

Box III.2: Private Sector Investment Cycle Drivers: An Investigation with Firm-Level Data

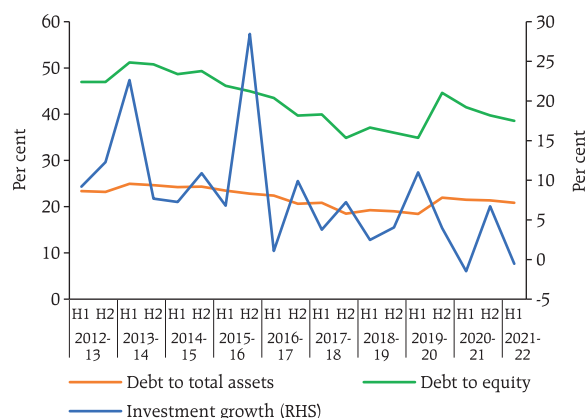
A revival in the investment cycle is vital for ensuring a durable recovery. Despite congenial financial conditions and a strengthening of corporate balance sheets – moderation in listed firms' leverage in terms of debt/asset and debt/equity ratios – private investment remains weak in India (Chart III.2.1).

Using a panel data of a common set of 1,054 listed non-government non-financial (NGNF) companies over the past twenty half year periods (H2:2011-12 to H1:2021-22), it is observed that firm-specific factors – leverage

(measured by either debt to total assets or debt to equity); demand conditions (own sales); internal resources and funding costs (own cash flows and effective cost of borrowings); and size of the firm have diverse effects on investment. Leverage exerts a negative impact on fixed investment, while demand in terms of own sales and cash flows has a positive effect (Table III.2.1). The cost of borrowings dampens investment, and firm size has a negative impact on capacity expansion (*i.e.*, the small-

(Contd.)

³ Interest coverage ratio is the ratio of earnings before interest and taxes to interest expenses and measures a company's capacity to make interest payments on its debt.

Chart III.2.1: Leverage and Investment Growth

sized firms add more to their existing capital stock compared with large-sized firms). Aggregate demand conditions in the economy, especially expected growth prospects, have a positive and statistically significant impact.

References:

Das, S., and V. Tulin (2017), "Financial Frictions, Underinvestment, and Investment Composition: Evidence from Indian Corporates", IMF Working Paper, WP/17/134.

Shukla, A. K., and T. S. Shaw (2020), "Impact of Leverage on Firms' Investment: Decoding the Indian Experience", RBI Working Paper, WPS 07/2020.

lakh crore to position India as a global hub for electronics manufacturing. *Gati Shakti* – the National Master Plan for Multi-modal Connectivity – incorporates the infrastructure schemes of various Ministries and State Governments such as *Bharatmala*, *Sagarmala*, inland waterways, dry/land ports and UDAN for integrated planning and coordinated implementation of infrastructure connectivity projects. The multi-modal plan will help improve India's logistics network and competitiveness, providing integrated and seamless connectivity for the movement of people, goods and services from one mode of transport to another.

Table III.2.1: Panel Regression Results
(Period: H1:2012-13 – H1:2021-22)

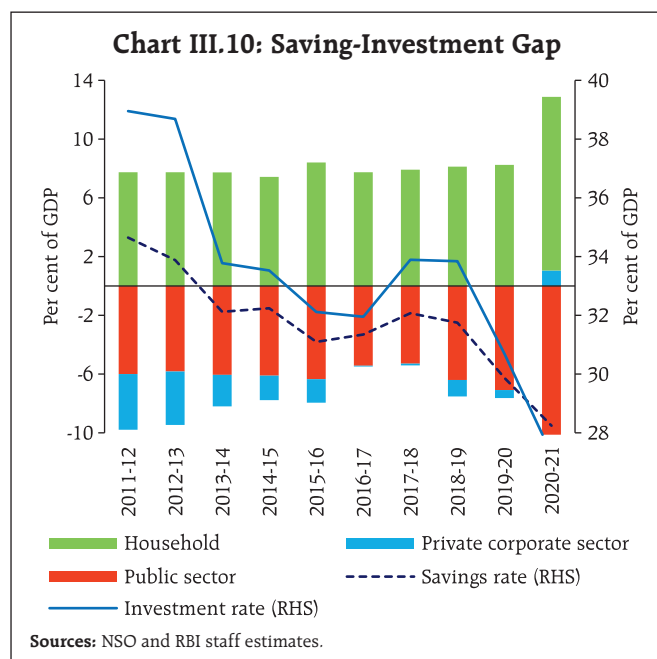
Dependent Variable: Investment growth	All Listed NGNF Companies		Manufacturing	
Constant	13.458*** (3.506)	16.724*** (4.088)	16.388*** (4.370)	21.900*** (4.947)
Debt to total assets _{t-1}	-0.119*** (0.019)		-0.101*** (0.023)	
Debt to equity _{t-1}		-0.024*** (0.005)		-0.021*** (0.006)
Demand _{t-1}	0.006*** (0.001)	0.006*** (0.001)	0.008*** (0.001)	0.008*** (0.001)
Cash flow _{t-1}	0.016*** (0.005)	0.016*** (0.005)	0.039*** (0.008)	0.044*** (0.009)
Cost of borrowings _{t-1}	-0.048*** (0.016)	-0.041*** (0.016)	-0.037* (0.020)	-0.038* (0.021)
Size _{t-1}	-2.849*** (0.611)	-3.665*** (0.724)	-3.239*** (0.720)	-4.390*** (0.829)
Real GDP growth _{t-1}	0.150*** (0.027)	0.138*** (0.029)	0.127*** (0.032)	0.104*** (0.034)
Expected growth _{t+1}	0.504*** (0.108)	0.588*** (0.115)	0.485*** (0.114)	0.609*** (0.120)
WPI inflation _{t-1}	0.127** (0.049)	0.137*** (0.051)	0.075 (0.056)	0.093 (0.058)
Observations	18,972	17,878	12,744	12,002
Number of firms	1,054	1,038	708	697

Notes: ***, ** and * indicate statistical significance at 1 per cent, 5 per cent and 10 per cent, respectively. Fixed effect estimates, with robust standard errors in parenthesis. Variables are defined as follows: Demand is annualised sales scaled by the beginning of the period gross fixed assets; cash flow as annualised net profits plus depreciation scaled by the beginning of period gross fixed assets; size is log of total assets; expected growth is taken as one year ahead growth projection from the survey of professional forecasters.

Sources: RBI staff estimates; and Capitaline database.

Wang, J., M. Gochoco and N. Sotocinal (2013), "Corporate Investments in Asian Emerging Markets: Financial Conditions, Financial Development, and Financial Constraints", ADB Economics Working Paper Series, 346.

The gross domestic saving rate fell to 28.2 per cent in 2020-21 from 29.9 per cent of GDP in 2019-20, dampened by increased dissaving of the government due to a rise in spending to ameliorate the stress of the pandemic (Chart III.10). Net household financial saving inched up to 11.6 per cent of GDP in 2020-21 from 8.0 per cent in 2019-20, driven by the pandemic-induced forced as well as precautionary savings. With the investment rate declining from 30.7 per cent of GDP to 27.3 per cent, the saving-investment gap turned positive in 2020-21 (for the first time since 2004-05), mirrored in a current account surplus recorded in the



balance of payments. Net household financial saving rate fell to 10.7 per cent in H1:2021-22 from 14.1 per cent in the same period of 2020-21.

III.1.3 Government Consumption

The pace of government final consumption expenditure (GFCE) moderated in Q3 on a y-o-y basis due to adverse base effects. Government capital spending, on the other hand, surged in Q3, reflecting the push to infrastructure (Chart III.11).

During 2021-22, the fiscal position of the Central Government strengthened (Table III.2 and Chart III.12). The centre's net tax revenue increased by 21.8 per cent during April-February 2021-22. Corporate tax collections jumped by 61.3 per cent, supported by strong corporate performance while customs duties collections rose by 46.6 per cent on increased imports. Excise duty collections, however, rose relatively modestly by 5.4 per cent, owing to the cut in excise duty on petrol and diesel in November. GST collections surpassed ₹1 lakh crore mark consistently in H2, driven by the revival in economic activity and improved tax compliance

Table III.2: Central Government Finances

Indicator	Per cent to GDP			
	2019-20	2020-21	2021-22 (RE)	2022-23 (BE)
1. Revenue receipts	8.4	8.3	8.8	8.5
a. Tax revenue (Net)	6.8	7.2	7.5	7.5
b. Non-Tax revenue	1.6	1.0	1.3	1.0
2. Non-debt capital receipts	0.3	0.3	0.4	0.3
3. Revenue expenditure	11.7	15.6	13.4	12.4
a. Interest payments	3.0	3.4	3.4	3.6
b. Major subsidies	1.1	3.6	1.8	1.2
4. Revenue expenditure excluding interest payments and subsidies	7.5	8.6	8.1	7.5
5. Capital expenditure	1.7	2.2	2.5	2.9
6. Capital outlay	1.6	1.6	2.3	2.4
7. Total expenditure	13.4	17.7	15.9	15.3
8. Gross fiscal deficit	4.7	9.2	6.7	6.4
9. Revenue deficit	3.3	7.3	4.6	3.8
10. Primary deficit	1.6	5.7	3.3	2.8

Sources: Union Budget 2022-23 and RBI staff estimates.

(Chart III.12c). Centre's revenue and capital expenditure rose y-o-y by 10.2 per cent and 19.7 per cent, respectively, during April-February 2021-22.

Overall, the centre's gross tax revenues improved from 10.2 per cent of GDP in 2020-21 to 10.6 per cent

Chart III.11: Growth in Centre's Revenue Expenditure and Capital Expenditure during 2021-22

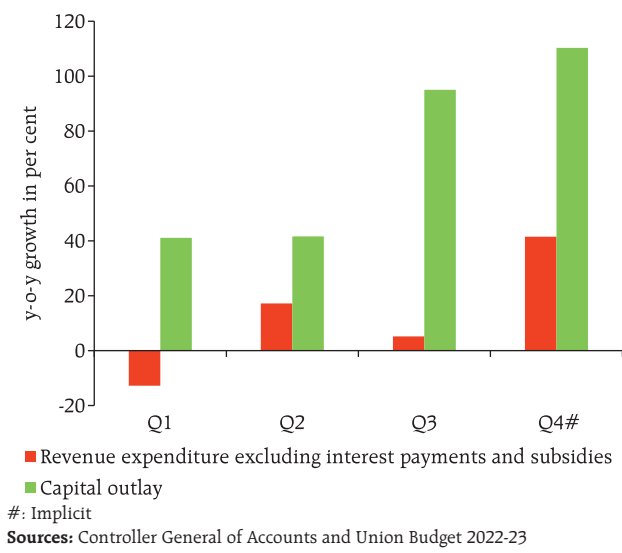
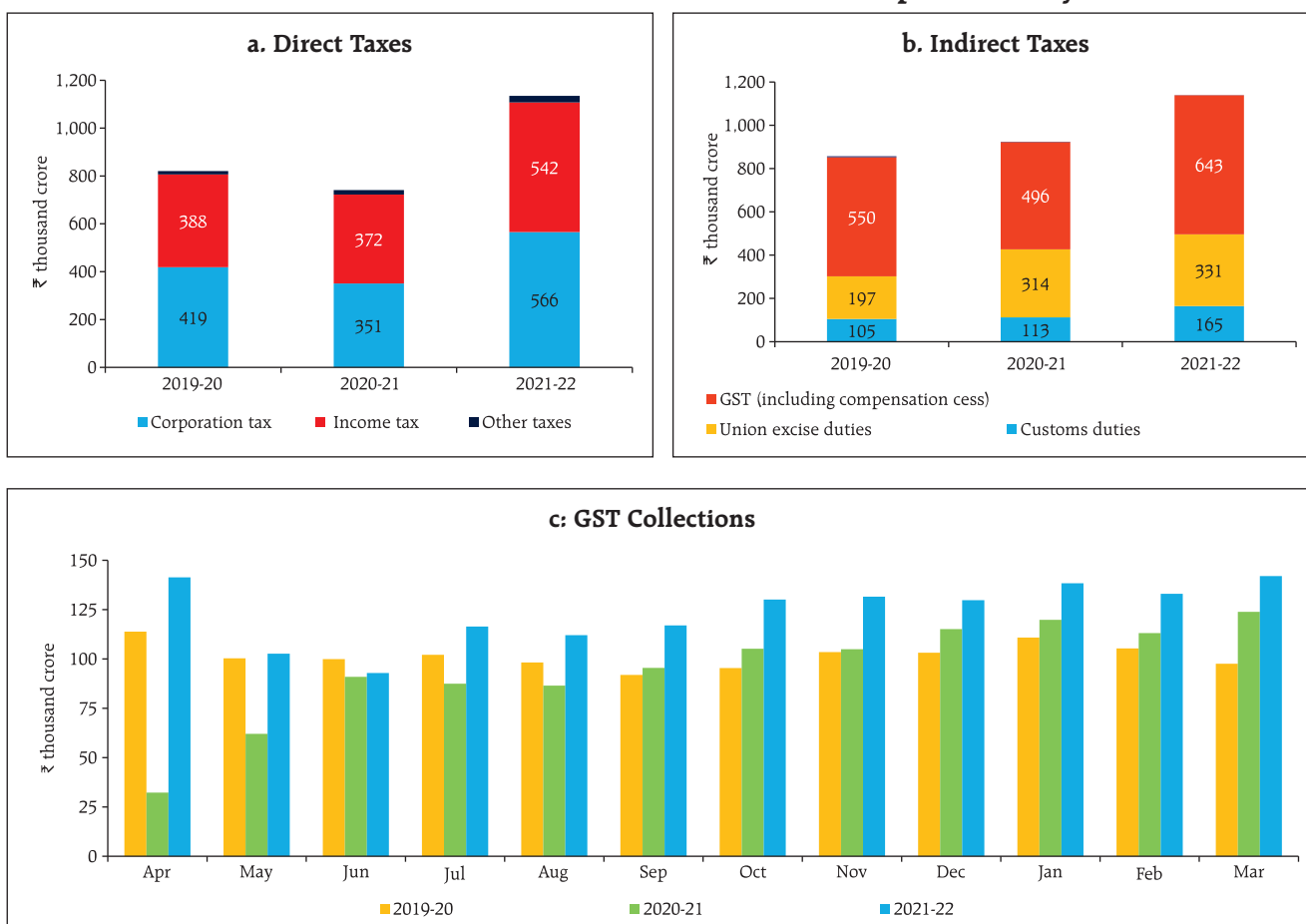


Chart III.12: Central Government Tax Collections: April - February

Sources: Controller General of Accounts, Ministry of Finance.

in 2021-22 (Table III.3). Higher revenues along with the containment of revenue expenditure contributed to fiscal consolidation in 2021-22.

Table III.3: Central Government Tax Revenues

Indicator	Per cent to GDP			
	2019-20	2020-21	2021-22 (RE)	2022-23 (BE)
1. Direct tax	5.2	4.8	5.3	5.5
(i) Corporation	2.8	2.3	2.7	2.8
(ii) Income	2.5	2.5	2.6	2.7
2. Indirect tax	4.8	5.4	5.3	5.1
(i) GST	3.0	2.8	2.9	3.0
(ii) Customs	0.5	0.7	0.8	0.8
(iii) Excise	1.2	2.0	1.7	1.3
3. Gross tax revenue (1+2)	10.0	10.2	10.6	10.7
4. Net tax revenue	6.8	7.2	7.5	7.5

Note: BE: Budget Estimates. RE: Revised Estimates.

Source: Union Budget, 2022-23.

The central government's revenue expenditure excluding interest and subsidy payments is budgeted to fall to 7.5 per cent in 2022-23 – back to the pre-pandemic position – from 8.1 per cent of GDP in 2021-22 (Table III.2). Capital expenditure increased to 2.5 per cent in 2021-22 from 2.2 per cent of GDP in 2020-21 and is budgeted to rise further to 2.9 per cent in 2022-23, reflecting the government's emphasis on public infrastructure such as road transport, railways.

The centre's market borrowing programme for 2021-22 remained at elevated levels for the second successive year (Table III.4). Ample surplus liquidity, open market operations (OMO), including the secondary market government securities acquisition

Table III.4: Centre's Borrowings

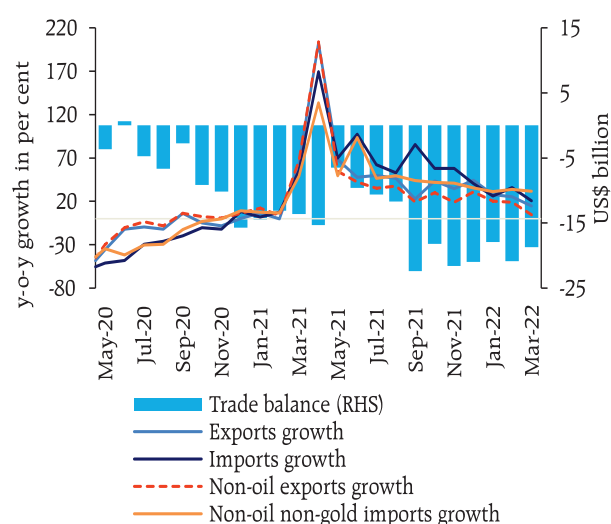
(₹ Lakh Crore)

Item	2019-20	2020-21	2021-22 (RE)	2022-23 (BE)
I Net borrowings (G-Sec)	4.7	10.4	7.8	11.1
Repayments	2.4	2.3	2.7	3.8
Gross borrowings (G-Sec)	7.1	12.6	10.5	14.9
II T-Bills/Cash management bills (Net)	1.5	2.0	1.0	0.5
III Net market borrowings (I+II)	6.2	12.4	8.8	11.6
IV Securities against small savings	2.4	4.8	5.9	4.3
V State provident fund	0.1	0.2	0.2	0.2
VI Other receipts	0.4	0.1	-0.9	0.4
VII External debt	0.1	0.7	0.2	0.2
VIII Total debt (III to VII)	9.3	18.3	14.2	16.6
IX Drawdown on cash balances	0.1	-0.1	1.7	0.0
X Total funding (VIII+IX)	9.4	18.2	15.9	16.6

Sources: Government of India; and RBI staff estimates.

programme (GSAP), facilitated the completion of the borrowing calendar in a non-disruptive manner at a weighted average cost of 6.28 per cent in 2021-22 (5.79 per cent in 2020-21). The weighted average maturity of the central government issuances was further elongated to a record 16.99 years in 2021-22 from 14.49 years during 2020-21. States' gross borrowings of ₹7.02 lakh crore were completed at a weighted average cost of 6.97 per cent during 2021-22 (6.52 per cent in 2020-21).

The Union Budget 2022-23 has placed gross market borrowings at ₹14.95 lakh crore (44.2 per cent above the previous year). Taking into account the switch operations conducted on January 28, 2022, the gross market borrowings through dated securities for 2022-23 are estimated at ₹14.31 lakh crore. In H1:2022-23, gross market borrowings of the central government through dated securities have been planned at ₹8.45 lakh crore, 59.0 per cent of the estimated gross borrowing for the year. The central government has been provided ways and means advances (WMA) limit of ₹1.50 lakh crore for H1:2022-23 for bridging short-term mismatches between receipts and payments. The WMA limit for state governments has been fixed at ₹47,010 crore with effect from April 1, 2022.

Chart III.13: Merchandise Trade

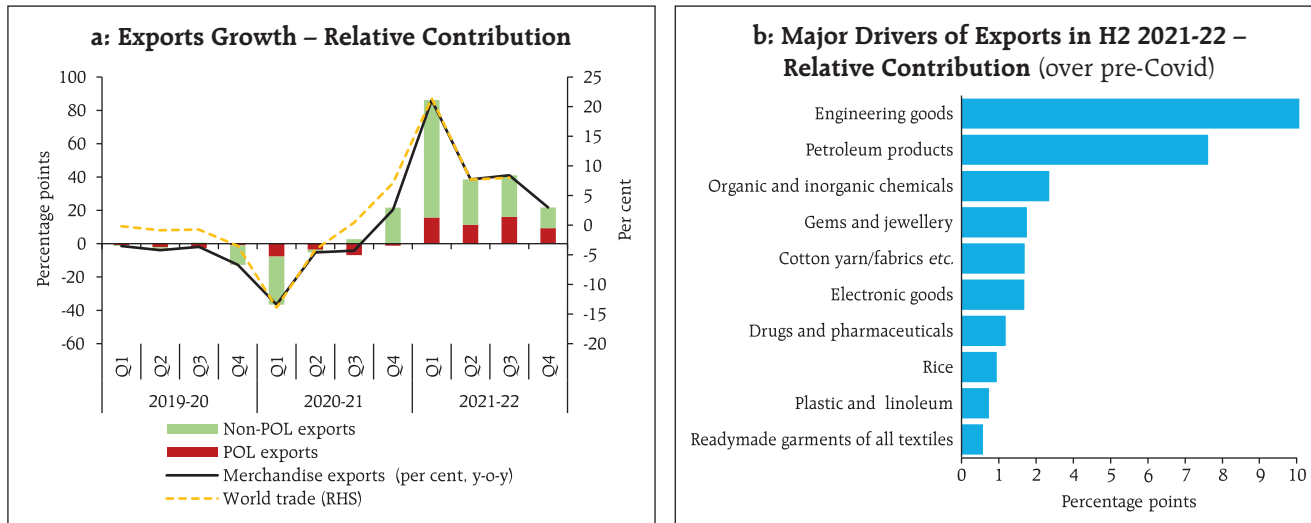
Source: DGCI&S.

III.1.4 External Demand

Merchandise exports and imports remained buoyant in H2:2021-22. With the expansion in imports outpacing exports, the trade deficit widened in H2. Exports at US\$ 40.4 billion touched a new record in March 2022 and remained above US\$ 30 billion for the thirteenth consecutive month (Chart III.13). During 2021-22, merchandise exports at US\$ 417.8 billion crossed the target of US\$ 400 billion.

Merchandise exports were driven by engineering goods, petroleum products, chemicals, gems and jewellery, cotton textiles, and electronic goods (Chart III.14a and b). Ready-made garments, primarily labour-intensive, also contributed positively, reversing the losses observed during April-September 2021. Exports from the Special Economic Zones (SEZs) contribute around 30 per cent to India's total exports. The Union Budget 2022-23 proposal to replace the Special Economic Zone Act with new legislation is expected to further enhance SEZ exports through efficiency gains from more effective leveraging of the existing infrastructure, reduction in the compliance burden and integration of the SEZs and customs administration. The free trade agreement

Chart III.14: Merchandise Exports



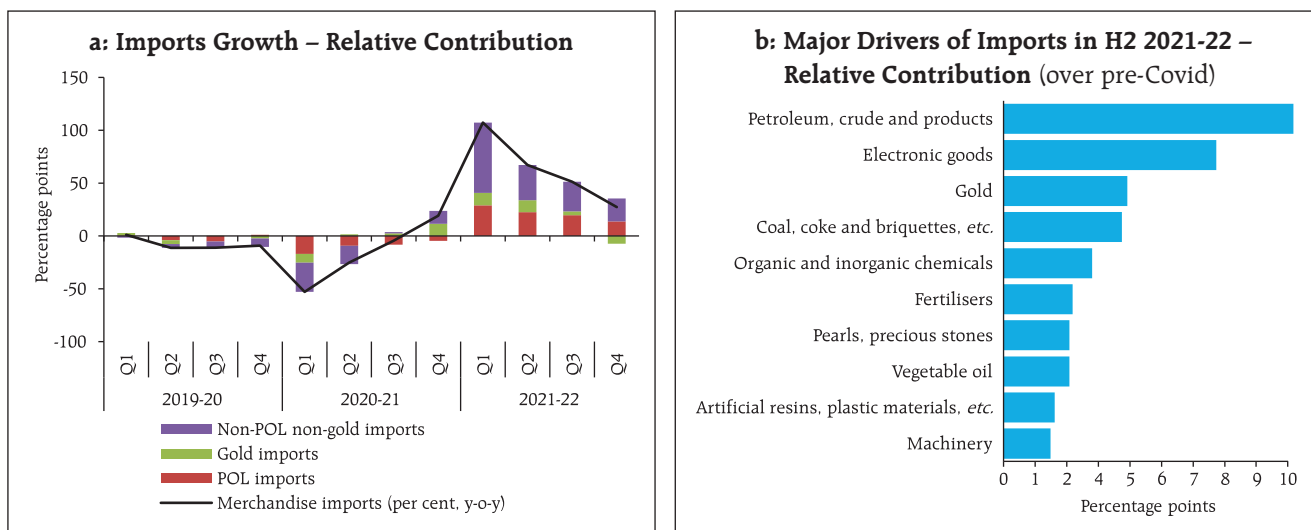
Sources: DGCIS and CPB, Netherlands.

(FTA) with the United Arab Emirates (UAE) – the second-largest export destination for India – will boost India's labour-intensive exports such as gems and jewellery, textiles, leather and footwear and engineering goods and pharmaceuticals and enhance India's market access to the Middle East and African regions. The recently signed Economic Cooperation

and Trade Agreement (ECTA) with Australia provides preferential access to India on 100 per cent of Australian tariff lines and is expected to double the bilateral trade to almost US\$ 50 billion in five years.

Merchandise imports reached an all-time high of US\$ 60.3 billion in December 2021 and remained above US\$ 50 billion for the seventh consecutive

Chart III.15: Merchandise Imports



Source: DGCIS.

month in March 2022. During H2:2021-22, oil imports (US\$ terms) were higher by 38.5 per cent over the corresponding pre-pandemic period; in volume terms, however, oil imports were still below the pre-pandemic levels. After registering a robust growth for three consecutive quarters, gold imports posted decelerated growth in Q3:2021-22 but contracted during Q4 as festival demand waned (Chart III.15a). The rise in non-oil non-gold imports during H2 was led by electronic goods, coal, coke and briquettes and chemicals (Chart III.15b). The trade deficit widened to US\$ 118.2 billion in H2:2021-22 from US\$ 76.3 billion a year ago.

In the context of the recent geopolitical developments, India's merchandise exports to Russia and Ukraine are only 0.8 per cent and 0.1 per cent of total exports while the corresponding import shares are 1.5 per cent and 0.5 per cent, respectively (Table III.5). The direct spillovers from Russia-Ukraine developments on India's overall merchandise trade and output are thus expected to be limited although the indirect channels – global slowdown, surge in commodity prices, risk aversion and financial market volatility – could have a more sizeable impact.

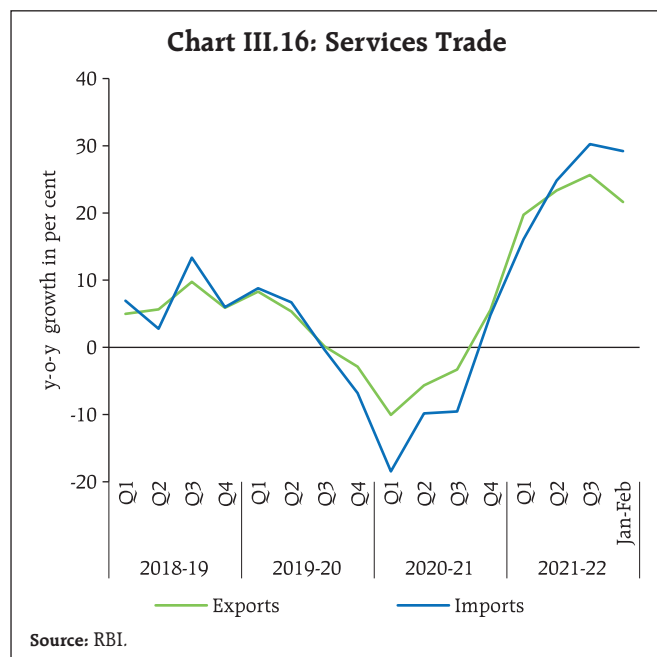
Services sector trade recovered during 2021-22, surpassing pre-pandemic levels (Chart III.16).

Table III.5: India's Merchandise Trade with Russia and Ukraine

(US\$ million)

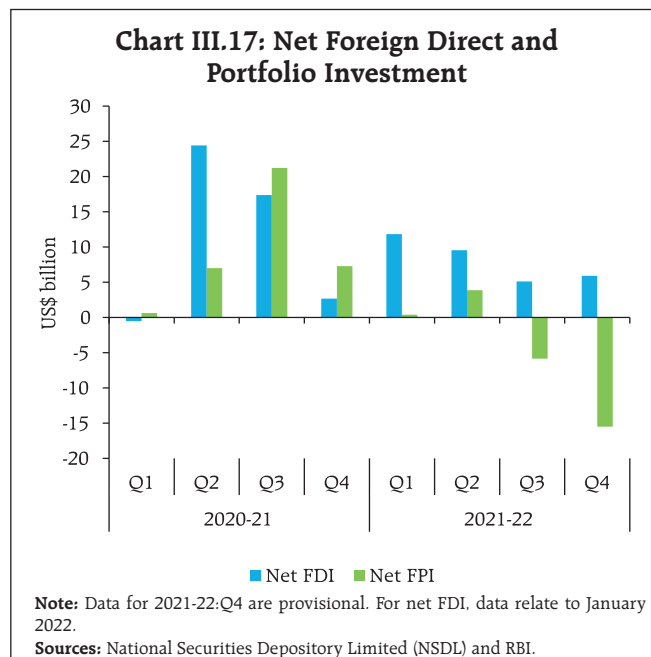
Commodities	Exports			Commodities	Imports		
	2019	2020	2021		2019	2020	2021
A. Trade with Russia							
Drug formulations, biologicals	461	269	503	Petroleum crude	1,470	781	2,306
Telecom instruments	455	174	384	Coal, coke and briquettes	970	532	1,121
Iron and steel	106	93	193	Petroleum products	440	363	969
Marine products	100	56	130	Pearl and stones	504	316	861
Bulk drugs & intermediates	97	70	118	Fertilisers manufactured	458	458	483
Residual chemicals and allied	66	57	106	Project goods	440	318	399
Auto components	77	40	106	Gold	0	98	325
Tea	105	64	85	Vegetable oils	156	338	304
Other construction machinery	57	32	75	Other rubber products	91	56	151
Machinery for dairy	165	38	66	Silver	138	145	137
Total of top 10	1,689	894	1,765	Total of top 10	4,668	3,405	7,055
Total exports to Russia	2,977	1,835	3,331	Total imports from Russia	6,238	4,608	8,436
Share in India's total exports (%)	0.92	0.91	0.84	Share in India's total imports (%)	1.28	1.77	1.47
B. Trade with Ukraine							
Drug formulations, biologicals	107	93	150	Vegetable oils	1,553	1,081	1,852
Telecom instruments	35	27	25	Fertilisers manufactured	115	158	341
Iron and steel	19	9	24	Inorganic chemicals	70	63	200
Agro chemicals	8	9	19	Project goods	9	18	37
Auto tyres and tubes	7	6	16	Plywood and allied products	23	15	34
Coffee	14	8	15	Machinery for dairy	20	19	20
Ceramics and allied products	8	9	15	Plastic raw materials	71	39	18
Marine products	4	5	12	Iron and steel	69	16	15
Plastic sheet, film, etc	8	8	11	Processed minerals	16	7	15
Machinery for dairy	8	4	11	Railway transport equipment	0	0	12
Total of top 10	219	178	297	Total of top 10	1,946	1,416	2,545
Total exports to Ukraine	456	306	510	Total imports from Ukraine	2,093	1,483	2,599
Share in India's total exports (%)	0.14	0.15	0.13	Share in India's total imports (%)	0.43	0.57	0.45

Source: DGCI&S.



Software services, constituting more than 40 per cent of India's total services exports, exhibited a strong growth in 2021-22 led by banking, financial and insurance services; retail and consumer business; communication, media and technology; and healthcare segments. The migration towards cloud services and the strengthening of infrastructure specifically to meet the pandemic-centric demand significantly aided the sector. The overall growth in the services exports rose to 25.6 per cent in Q3:2021-22 (the highest since Q2:2011-12) and stayed strong in Q4. Inward remittances remained buoyant in Q3:2021-22. Notwithstanding the resilience in the services exports and remittances, the current account deficit rose to 2.7 per cent of GDP in Q3 from 1.3 per cent in Q2 mirroring the widening merchandise trade deficit.

Turning to the financial account, capital flows moderated during H2:2021-22 (Chart III.17). Net FDI flows fell to US\$ 11.0 billion in H2:2021-22 (October-January) from US\$ 18.9 billion a year ago on the back of higher outward FDI flows and repatriations by FDI companies. Foreign portfolio investors, net



buyers in Q2:2021-22, turned net sellers from Q3 in view of the resurgence of COVID-19 infections, concerns over the pace of US Fed's monetary policy normalisation, correction in the equity market and geopolitical tensions. Net inflows under external commercial borrowings remained at US\$ 2.5 billion during H2 (October-February), around the same level as a year ago, the funds being used for on-lending/sub-lending, refinancing of rupee loans, repayment of the earlier borrowings, working capital, and new projects. Accretions under non-resident deposit accounts moderated to US\$ 1.0 billion during H2 (October-January) from US\$ 3.1 billion a year ago. As on March 31, 2022, India's foreign exchange reserves stood at US\$ 607.3 billion, equivalent to 12 months of merchandise imports in 2021-22 or 98.8 per cent of outstanding external debt at end-December 2021.

III.2 Aggregate Supply

Growth in gross value added (GVA) moderated to 4.4 per cent in H2:2021-22 from 13.0 per cent in H1. Overall, GVA expanded by 8.3 per cent in 2021-22 and exceeded its 2019-20 level by 3.1 per cent (Table III.6).

Table III.6: Real GVA Growth

(y-o-y, per cent)

Sector	2020-21 (FRE)	2021-22 (SAE)	Weighted Contribution		2020-21				2021-22			
			2020-21	2021-22	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4#
Agriculture, forestry and fishing	3.3	3.3 (6.7)	0.5	0.5	3.0	3.2	4.1	2.8	3.5 (6.6)	3.7 (7.0)	2.6 (6.8)	3.5 (6.5)
Industry	-1.8	10.4 (8.4)	-0.4	2.3	-28.1	3.0	6.2	11.6	40.4 (0.9)	6.6 (9.8)	1.4 (7.6)	3.0 (15.0)
Mining and quarrying	-8.6	12.6 (2.9)	-0.2	0.3	-17.8	-7.9	-5.3	-3.9	17.6 (-3.3)	14.2 (5.2)	8.8 (3.1)	10.7 (6.4)
Manufacturing	-0.6	10.5 (9.8)	-0.1	1.9	-31.5	5.2	8.4	15.2	49.0 (2.1)	5.6 (11.0)	0.2 (8.6)	1.7 (17.2)
Electricity, gas, water supply and other utilities	-3.6	7.8 (3.9)	-0.1	0.2	-14.8	-3.2	1.5	3.2	13.8 (-3.0)	8.5 (5.0)	3.7 (5.2)	5.4 (8.8)
Services	-7.8	8.8 (0.4)	-4.9	5.4	-24.3	-10.4	0.0	4.3	15.5 (-12.5)	10.0 (-1.4)	6.7 (6.7)	4.7 (9.2)
Construction	-7.3	10.0 (1.9)	-0.6	0.8	-49.4	-6.6	6.6	18.3	71.4 (-13.2)	8.2 (1.0)	-2.8 (3.6)	-2.6 (15.2)
Trade, hotels, transport, communication	-20.2	11.6 (-10.9)	-4.1	2.0	-49.9	-18.8	-10.1	-3.4	34.3 (-32.8)	9.5 (-11.1)	6.1 (-4.6)	7.2 (3.6)
Financial, real estate and professional services	2.2	4.3 (6.6)	0.5	1.0	-1.1	-5.2	10.3	8.8	2.3 (1.2)	6.2 (0.6)	4.6 (15.3)	4.2 (13.3)
Public administration, defence and other services	-5.5	12.5 (6.4)	-0.7	1.6	-11.4	-10.2	-2.9	1.7	6.3 (-5.8)	19.5 (7.4)	16.8 (13.4)	7.1 (8.9)
GVA at basic prices	-4.8	8.3 (3.1)	-4.8	8.3	-21.4	-5.9	2.1	5.7	18.4 (-7.0)	8.4 (2.0)	4.7 (6.9)	4.1 (10.1)

Note: FRE: First revised estimates; SAE: Second advance estimates.

Figures in parentheses are growth rates over 2019-20. #: Implicit.

Source: NSO.

III.2.1 Agriculture

GVA in agriculture and allied activities expanded by 3.0 per cent in H2, supported by adequate and well-spread southwest and northeast monsoon rains, good reservoir levels and improved soil moisture, which helped *rabi* acreage to increase by 1.5 per cent over the previous year. Foodgrains production touched a new record in 2021-22 with both *kharif* and *rabi* output exceeding the final estimates for 2020-21 as well as the targets (Table III.7). The production of pulses in 2021-22 rose by 5.9 per cent, while oilseeds and sugarcane production achieved record levels.

Horticulture production fell by 0.4 per cent to 3,332.5 lakh tonnes during 2021-22 due to lower output of tomato, other vegetables, spices, flowers, aromatics and medicinal plants; the output of total fruits and onion production, on the other hand, rose.

Table III.7: Agricultural Production in 2021-22
(Second Advance Estimates)

(Lakh tonnes)

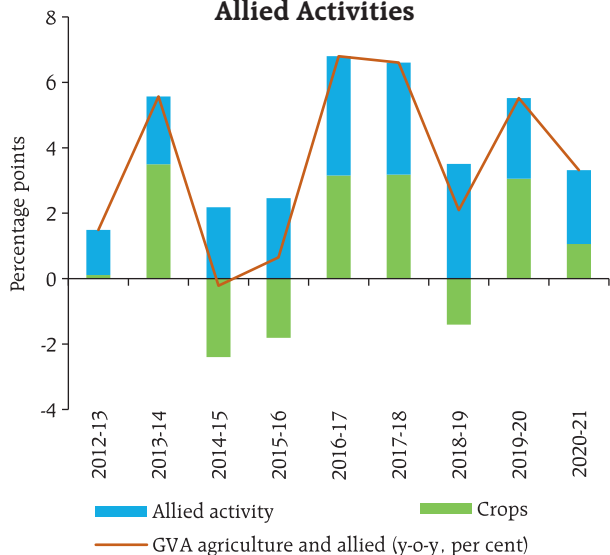
Crop	2020-21		2021-22		Variation in 2021-22 (Per cent)		
	SAE	Final	Target	SAE	Over SAE 2020-21	Over Final 2020-21	Over Target
Foodgrains	3033.4	3107.4	3107.4	3160.6	4.2	1.7	1.7
<i>Kharif</i>	1479.5	1505.8	1505.8	1535.4	3.8	2.0	2.0
<i>Rabi</i>	1554.0	1601.7	1601.7	1625.3	4.6	1.5	1.5
Rice	1203.2	1243.7	1211.0	1279.3	6.3	2.9	5.6
Wheat	1092.4	1095.1	1100.0	1113.2	1.9	1.7	1.2
Pulses	244.2	254.6	254.6	269.6	10.4	5.9	5.9
Oilseeds	373.1	359.5	384.0	371.5	-0.4	3.3	-3.3
Sugarcane	3976.6	4054.0	3970.0	4140.4	4.1	2.1	4.3
Cotton #	365.4	352.5	370.0	340.6	-6.8	-3.4	-7.9
Jute & Mesta ##	97.8	93.5	106.0	95.7	-2.1	2.3	-9.7

#: Lakh bales of 170 kgs. each.

##: Lakh bales of 180 kgs. each.

SAE: Second advance estimates.

Source: Ministry of Agriculture and Farmers' Welfare, Government of India.

Chart III.18: Contribution of Crops and Allied Activities

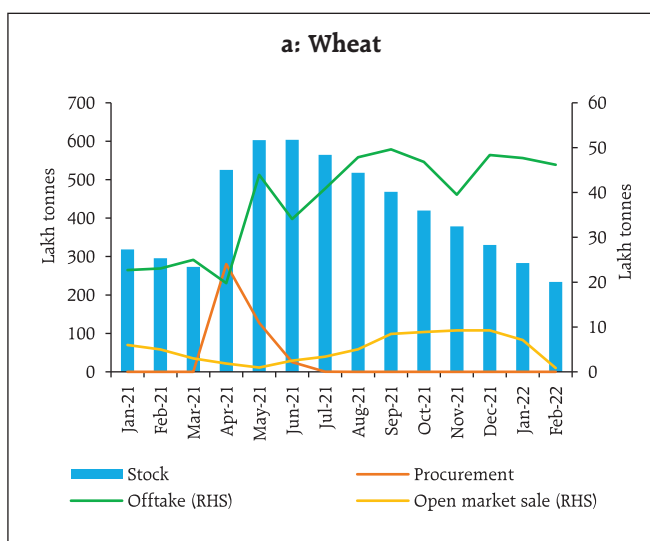
Sources: NSO; and RBI staff estimates.

Allied activities – livestock, forestry and fishing – impart substantial resilience to the agricultural sector as a whole. Though allied activities have a share of around 45 per cent in the overall GVA of the sector, their contribution to growth in aggregate agricultural GVA for 2020-21 was higher at 68 per cent (Chart III.18).

As on March 31, 2022, the overall procurement of rice touched 503.42 lakh tonnes which is 8.2 per cent higher than a year ago. Buffer stocks remained above the norms – 571.6 lakh tonnes for rice (7.5 times the norm) and 212.7 lakh tonnes for wheat (1.5 times the norm) at mid-March 2022, notwithstanding the offtake of 365.7 lakh tonnes of cereals (April-February 2021) for COVID-19 relief (mainly the *Pradhan Mantri Garib Kalyan Anna Yojana, PM-GKAY*) (Chart III.19).

High-frequency indicators of the rural economy suggest a mixed picture during H2 (Table III.8). Agriculture and allied exports and agriculture credit registered robust growth in H2. Demand for jobs under the *Mahatma Gandhi* National Rural Employment Guarantee Scheme (MGNREGS) was lower than a year ago due to higher *rabi* sowing, although it was still above pre-pandemic levels. Sales of tractors, fertilisers and two-wheelers remained lower than in the previous year.

The agricultural sector will benefit from measures announced in the Union Budget 2022-23 which include strengthening public and private

Chart III.19: Stock, Procurement and Offtake – Wheat and Rice

Source: Food Corporation of India, GoI.

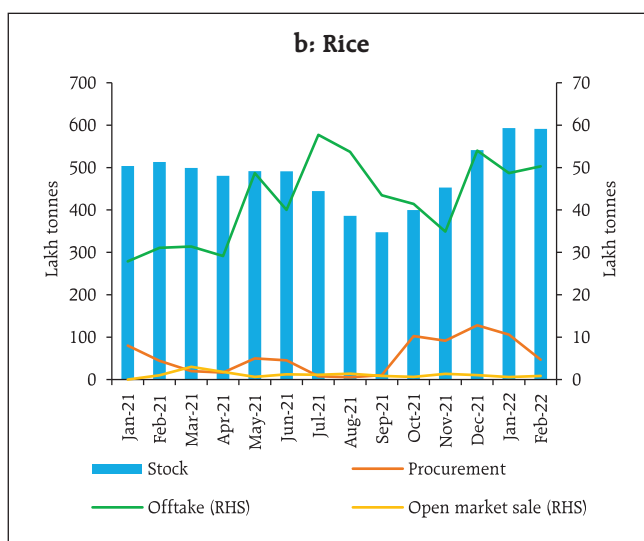


Table III.8: Rural Economy - High Frequency Indicators

Item	Unit	H1 (Apr-Sep)			H2 (Oct-Feb)		
		2019-20	2020-21	2021-22	2019-20	2020-21	2021-22
Tractor sales	Number (in lakh)	3.6	4.0	4.4	3.2	4.1	3.3
Two-wheeler sales	Number (in lakh)	97.0	59.9	65.2	68.5	76.4	57.6
Fertiliser sales	Lakh tonnes	256.8	294.2	257.9	254.6	268.9	232.0
Demand for employment (MGNREGA)	Crore households	11.9	17.6	16.7	8.6	12.9	11.2
Agriculture and allied sector exports	USD billion	17.1	17.9	22.7	15.1	18.5	22.2
Agriculture credit growth	y-o-y	7.4	6.2	9.9	10.6	8.6	10.4
Rice stock to buffer norm	Ratio	2.0	1.8	2.6	6.6	6.7	7.8
Wheat stock to buffer norm	Ratio	1.4	1.6	1.7	2	2.1	1.7

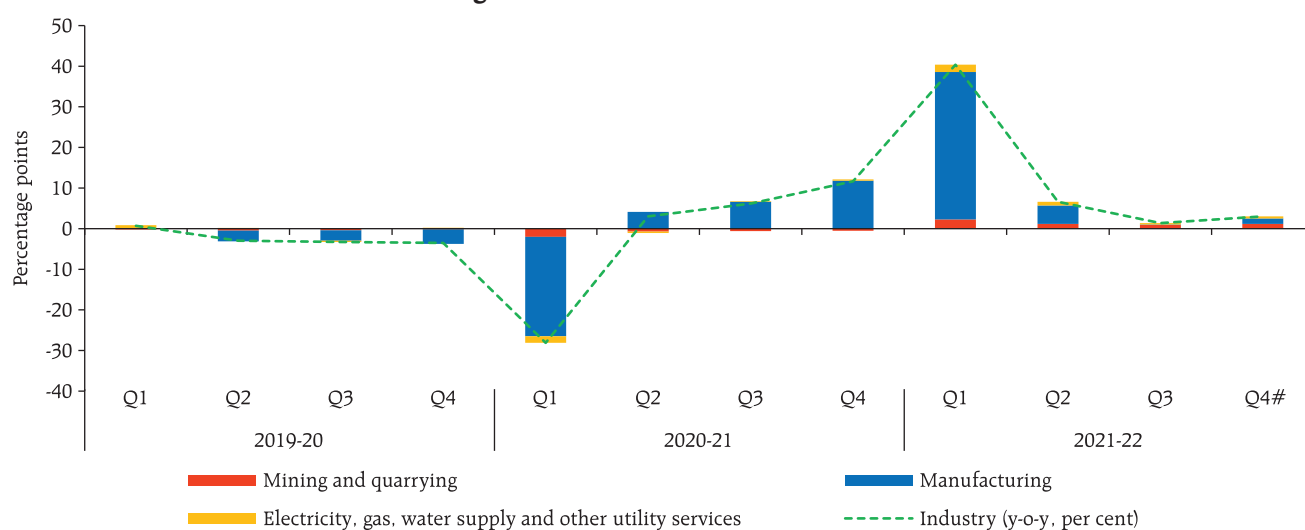
Sources: Tractor Manufacturers Association; SIAM; Ministry of Chemicals and Fertilisers; Ministry of Rural Development; CMIE; RBI; and Food Corporation of India.

investment in agriculture, research and education, promotion of domestic oilseed production, use of *Kisan* drones, delivery of digital and high-tech agriculture services. The *Ken-Betwa* River Linking Project with an outlay of ₹44,605 crore aims to bring 9.1 lakh hectare area under irrigation. Under the PM *Gati Shakti* plan, transport and infrastructure facilities will be expanded/upgraded to revamp agri-supply chain efficiency.

III.2.2 Industry

Industrial activity lost momentum in H2, as manufacturing was affected by supply side shortages and input cost pressures (Chart III.20). Mining activity was supported by coal and natural gas, offsetting the contraction in crude oil production.

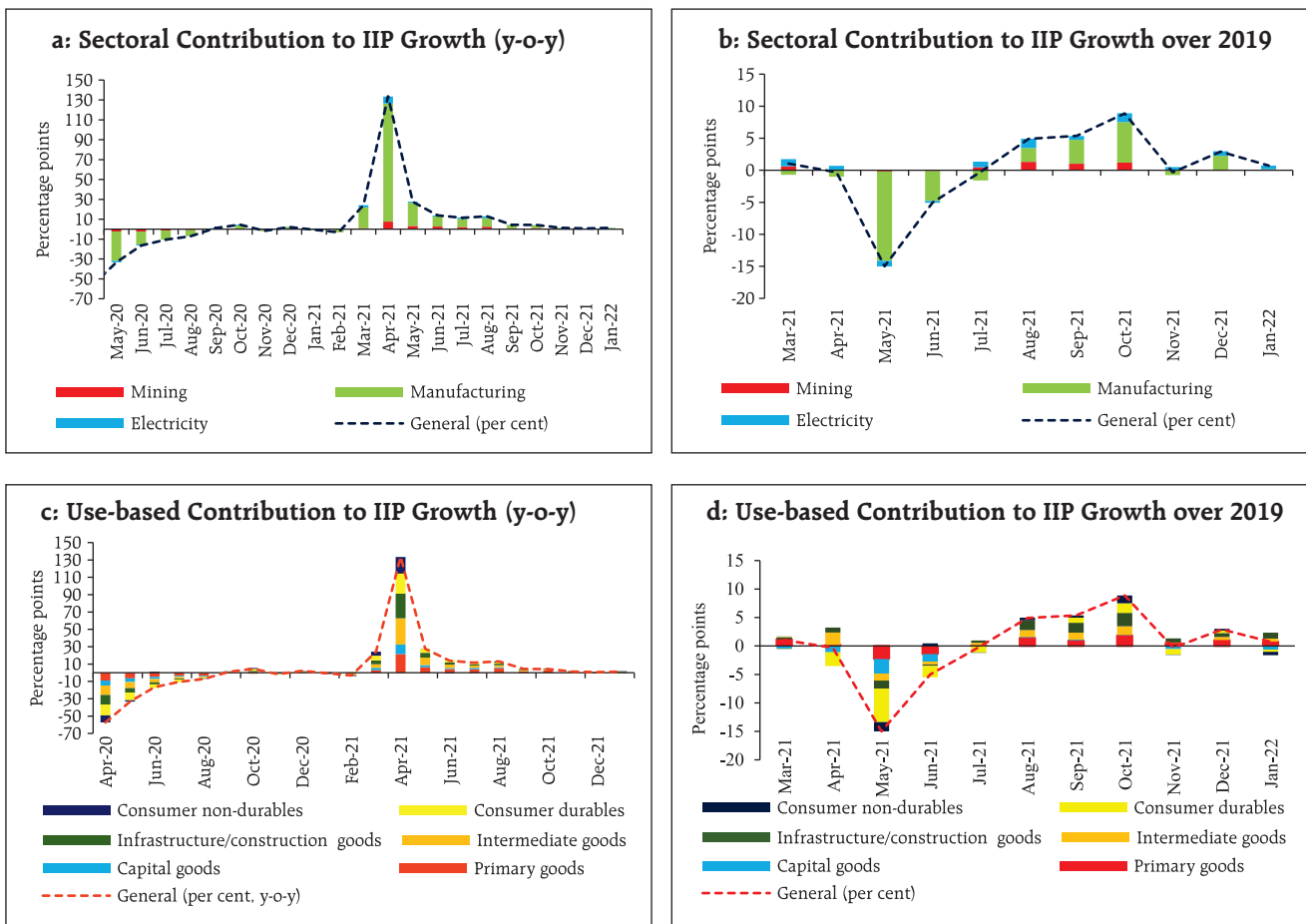
Industrial production (IIP) growth decelerated to 2.1 per cent in Q3 from 9.5 per cent in Q2, as the

Chart III.20: Weighted Contribution to Industrial GVA Growth

#: Implicit.

Sources: NSO and RBI staff estimates.

Chart III.21: Index of Industrial Production (IIP)



Sources: NSO; and RBI staff estimates.

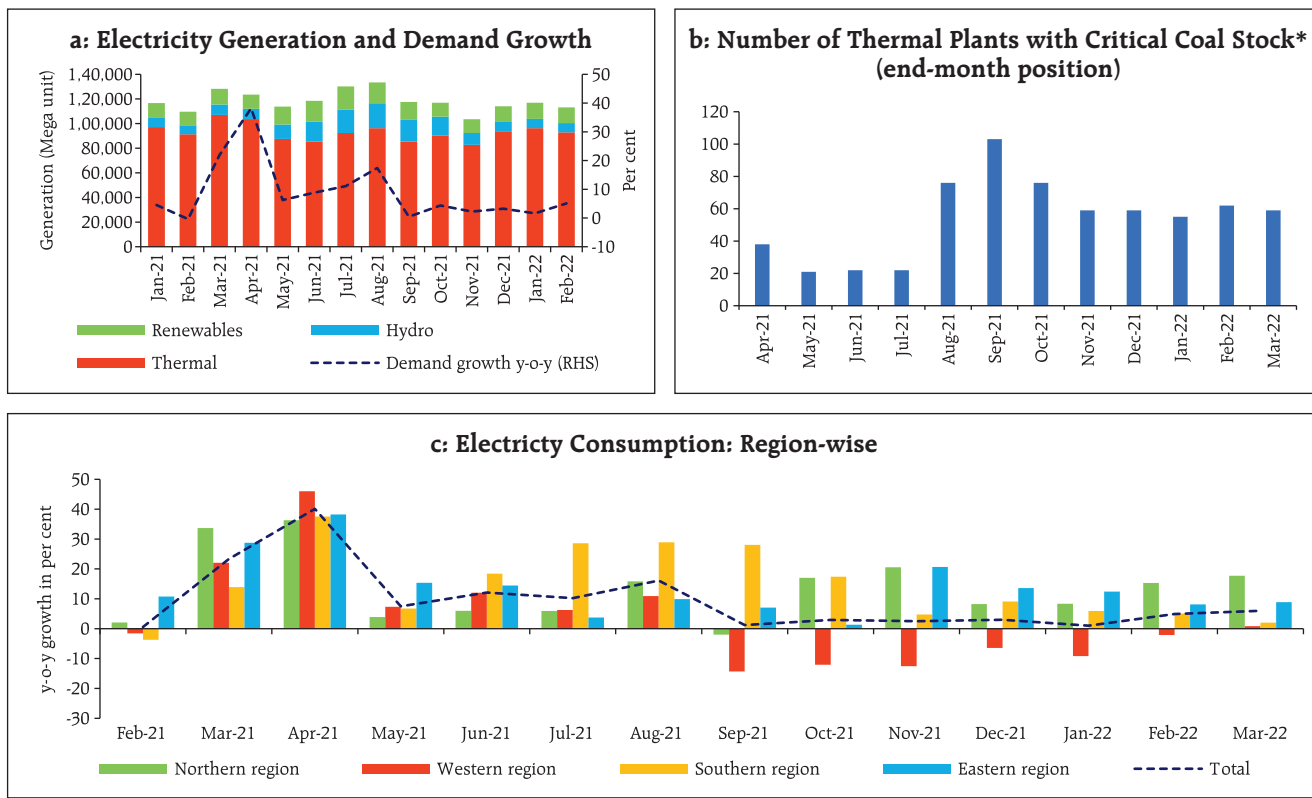
production of electrical and machinery equipment, chemical products, and transport equipment declined in Q3. On the other hand, petroleum products, electronic products, metals, and textiles output expanded. In terms of the use-based classification, capital goods and consumer durables contracted in Q3, while primary goods, infrastructure goods, and intermediate goods rose, *albeit* at a decelerating pace. In Q4, IIP rose by 1.3 per cent in January 2022, but capital goods and consumer durables remained in contraction territory (Chart III.21).

Electricity generation edged up by 2.4 per cent in Q3 over the corresponding period of the previous year and 7.6 per cent over its 2019-20 level. Electricity generation from thermal and renewable

sources increased by 1.0 per cent and 6.0 per cent, respectively, in Q3 (Chart III.22a). The thermal generation was hindered for a short period due to coal supply bottlenecks owing to unseasonal rains impacting domestic coal production and dispatches on the one hand and higher import prices of coal sharply curtailing imports on the other (Chart III.22b). In Q4, electricity generation growth improved to 4.0 per cent (Chart III.22c).

Robust corporate profits supported the manufacturing sector's GVA in Q3 (Chart III.23). According to the Reserve Bank's industrial outlook survey, business expectations index suggest expansion in 2022-23:Q1, although at a slower pace than in the previous survey round. The manufacturing purchasing

Chart III.22: Electricity Generation and Consumption



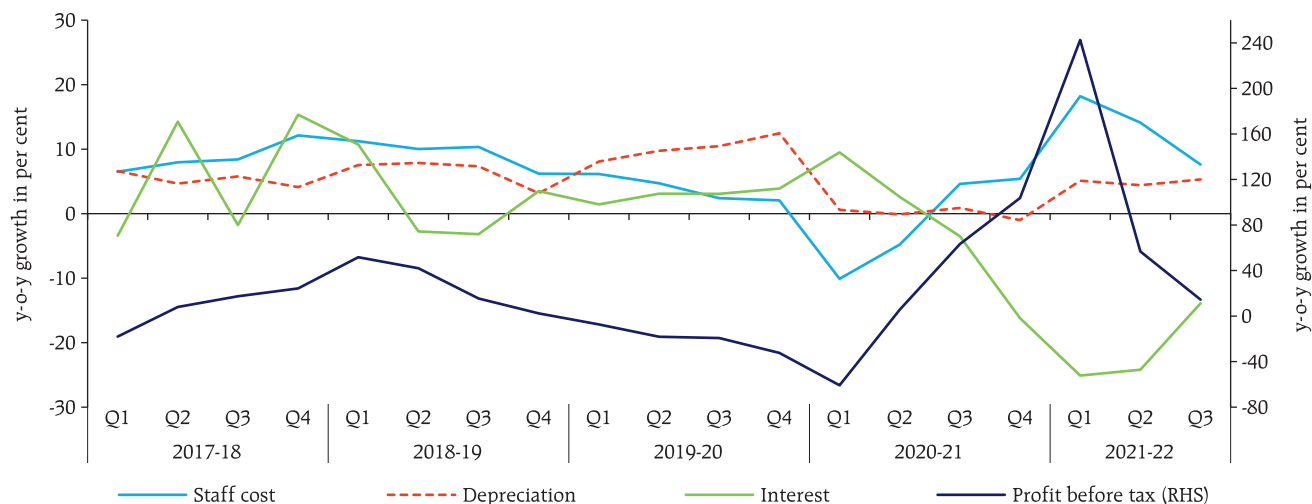
*Critical coal stock is defined in terms of 6 days of stock till November 2021 and subsequently, in terms of less than 25 per cent of the normative stock.

Sources: Central Electricity Authority and Power System Operation Corporation Limited (POSOCO).

managers' index (PMI) remained in expansion zone, although moderated to 54.0 in March from 54.9 in

February reflecting lower increase in output and new export orders (Chart III.24a).

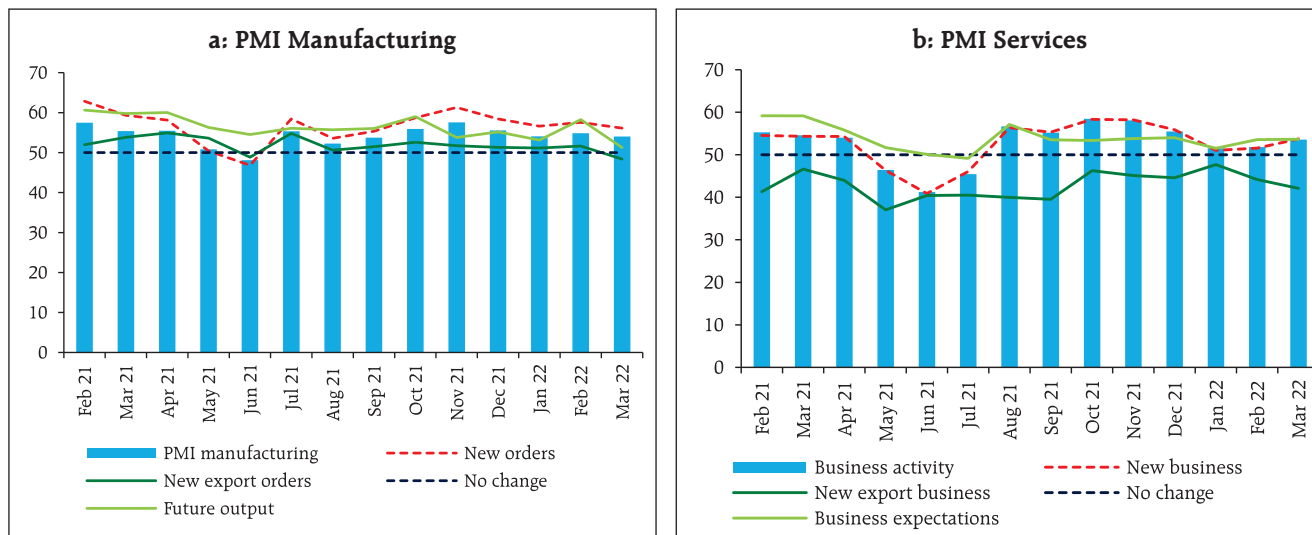
Chart III.23: Manufacturing Sector's Profitability



Note: Data for Q3:2021-22 are based on results of 1,701 listed private manufacturing companies.

Source: RBI staff estimates based on data published by listed companies.

Chart III.24: PMI Manufacturing and Services



Note: >50: Expansion, < 50: Contraction.

Source: S & P Global.

While overall manufacturing activity in H2 remained above 2019-20 levels, the production of two-wheelers and passenger vehicles trailed pre-pandemic

levels due to the persistence of supply shortages as well as subdued demand (Table III.9).

Table III.9: Industrial Sector: Progress towards Normalisation

(Ratio to the respective month/quarter of 2019-2020)

Indicators	2020-21				2021-22					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Jan	Feb	Mar
I Industrial Production										
PMI: Manufacturing (>50 indicates growth over previous month)	35.1	51.6	57.2	56.9	51.5	53.8	56.3	54.0	54.9	54.0
II Index of Industrial Production										
IIP: Manufacturing	64	94	102	106	93	103	104	101		
IIP: Capital goods	60	94	102	107	91	102	103	100		
IIP: Infrastructure & construction goods	35	87	99	109	74	102	97	90		
IIP: Consumer durables goods	53	98	105	110	98	110	109	108		
IIP: Consumer non-durables goods	32	90	107	118	72	99	103	97		
III Eight Core Industries Index										
ECI: Steel	83	100	103	105	98	101	103	97		
ECI: Cement	76	95	100	103	96	104	105	105	102	
Electricity demand	51	100	103	113	97	108	105	112	108	
	62	89	96	110	97	110	104	108	105	
	84	99	106	108	98	108	110	106	104	
IV Production of Automobiles										
Passenger vehicles	16	93	116	117	83	94	98	93	103	
Two wheelers	21	95	118	129	60	89	91	91	90	
Three wheelers	23	45	66	84	61	60	67	65	77	
Production of tractors	60	123	162	167	133	142	118	106	89	

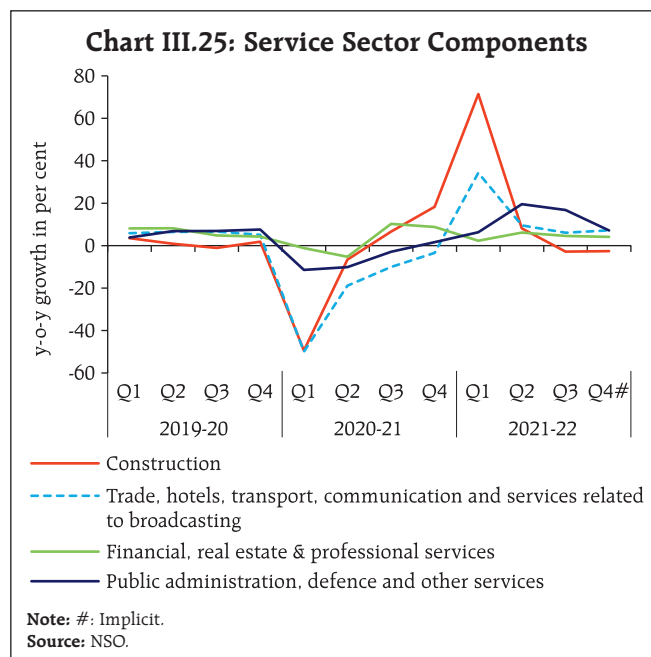
Sources: CMIE; CEIC; NSO; SIAM; and RBI staff estimates.



III.2.3 Services

Services sector activity grew by 5.7 per cent in H2 and crossed its pre-pandemic level (8.0 per cent over 2019-20). The contact-intensive services, viz., trade, hotels, transport, and communication inched towards normalisation, though their rebound was held back by the Omicron variant. Construction activity contracted in H2 due to unseasonal rains in Q3 (Chart III.25). Among its proximate indicators, finished steel consumption contracted in Q3 as well as Q4, while cement production rose in December-February after a temporary setback in November (Chart III.7c and d).

Collections under the goods and services tax (GST) and issuance of E-way bills in Q4 point towards further normalisation of domestic trading activity (Table III.10). After a rebound in Q3, domestic air traffic moderated in January due to the spread of the Omicron variant; however, it picked up again from February as



infections receded. Commercial vehicle sales remained in expansion in Q3 and crossed pre-pandemic levels,

Table III.10: Services Sector: Progress towards Normalisation
(Ratio to the respective month/quarter of 2019-2020)

Indicators	2020-21				2021-22					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Jan	Feb	Mar
PMI: Services (>50 indicates growth over previous month)	17.2	41.9	53.4	54.2	47.2	52.4	57.3	51.5	51.8	53.6
I Construction										
Steel consumption	49	93	114	122	98	92	107	110	108	159
Cement production	62	89	96	110	97	110	104	108	105	
II Trade, hotels, transport, communication and services related to broadcasting										
Commercial vehicle sales	15	80	99	143	51	99	100			
Domestic air passenger traffic	7	25	50	72	31	53	81	52	63	
Domestic air cargo	26	68	90	105	78	86	93	93	81	
International air cargo	43	77	87	101	94	96	100	88	90	
Freight traffic	79	105	111	113	110	118	119	117	112	
Port cargo	80	91	102	106	102	97	104	103	102	113
Toll collection: volume	184	349	295	174	548	699	513	248	221	
Petroleum consumption	74	88	101	100	86	94	97	95	97	
GST E-way bill	54	100	115	128	107	127	128	121	121	
GST revenue	59	92	108	114	107	118	130	127	126	146
III Financial, real estate and professional services										
Bank credit y-o-y growth (per cent)	5.6	5.1	6.2	5.6	5.9	6.7	9.3	8.2	8.9	9.6
Bank deposits y-o-y growth (per cent)	9.6	10.5	10.8	11.4	10.3	9.4	10.3	8.3	8.6	8.9
Life insurance first year premium	81	116	97	135	87	122	107	106	148	
Non-life insurance premium	95	106	105	114	108	118	113	123	120	

Sources: CMIE; CEIC; NSO; MOSPI; IRDAI; RBI staff estimates.

Note: In this MPR, bank credit growth and related variations/ratios for all fortnights since December 3, 2021 are adjusted for past reporting errors by select scheduled commercial banks (SCBs).

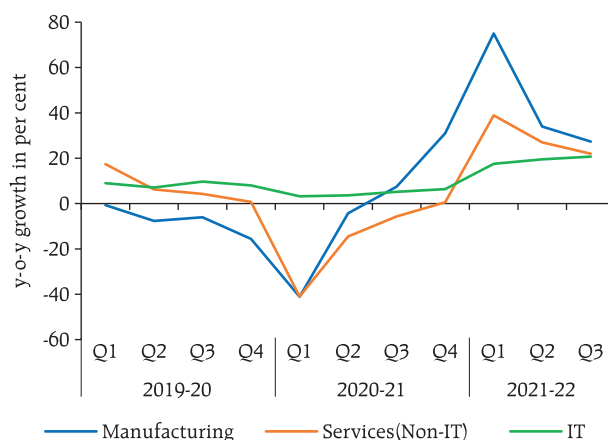


while other indicators of transportation services – toll collections and rail freight traffic – grew robustly in Q3 and Q4. Communication services also performed well in Q3, driven by pandemic-induced digitisation. The services PMI rose sharply to 53.6 in March from 51.8 in the preceding month on improving demand conditions and relaxation of COVID-19 restrictions (Chart III.24b). The PMI composite output index also improved to 54.3 in March from 53.5 in February.

The IT sector exhibited steady growth in Q3, supported by sustained domestic and international demand, as noted earlier. Non-IT services also recorded robust growth in sales, with the gradual pick-up in contact-intensive services (Chart III.26).

Real estate activity improved in Q3, with higher new launches and sales on the back of low mortgage rates and improving affordability; the inventory overhang also declined, *albeit* marginally (Chart III.27a). Housing prices inched up in Q3:2021-22, led by Kochi, Ahmedabad, Jaipur and Mumbai (Chart III.27b). Public administration, defence and other services (PADO) maintained robust expansion in

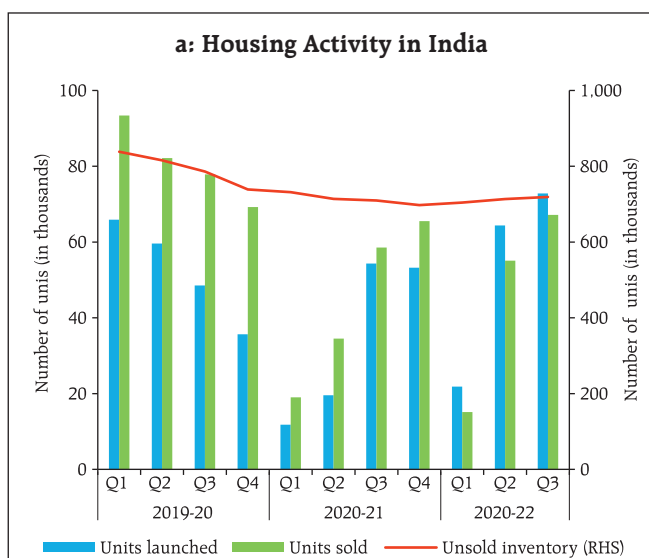
Chart III.26: Nominal Sales Growth in Industrial and Services Sectors



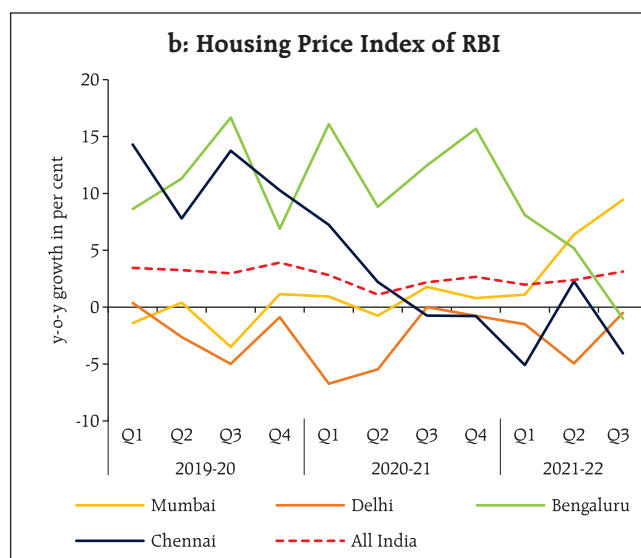
Note: Data for Q3:2021-22 are based on results of 1,701 listed private manufacturing companies and 717 listed non-financial services companies.
Source: RBI staff estimates.

H2. Amidst subdued growth in central government revenue expenditure, private services appear to have been the main driver of PADO in Q3. Centre's revenue expenditure excluding interest payments and subsidies rose by 44.2 per cent (y-o-y) during January-February.

Chart III.27: Housing Sector – Launches, Sales and Prices



Sources: PropTiger and RBI.



III.3 Conclusion

The thrust of the government on capital expenditure and infrastructure development, and manufacturing activities through the PLI scheme should give an impetus to private investment activity, which would also benefit from the improving capacity utilisation, stronger corporate balance sheets and conducive financial conditions. The intensification of geopolitical tensions following

the Russia-Ukraine conflict and the concomitant surge in global oil and commodity prices to multi-year highs amidst high financial market volatility pose significant downside risks to global economic activity and could have spillovers on domestic growth prospects. The uncertainty associated with the pace of monetary policy normalisation in the major advanced economies and the future course of the pandemic would also weigh on domestic industry.

IV. Financial Markets and Liquidity Conditions

During H2:2021-22, domestic financial markets remained relatively stable amidst surplus liquidity conditions with intermittent bouts of volatility caused by several factors such as Omicron's outbreak, faster pace of monetary policy normalisation in advanced countries, domestic inflation, government borrowing programme, geopolitical conflict and the sympathetic jump in crude oil prices. Going forward, the RBI's market operations will contextually factor in the developments in global markets to insulate domestic financial markets from spillovers.

Introduction

Since the October 2021 MPR, global financial markets experienced dramatic swings from buoyancy in the first half of Q3 (October-December 2021) to a whirlpool of volatility amidst heightened uncertainties over the Omicron variant and imminent tapering of asset purchases and rate hikes by the US Federal Reserve (Fed) and other leading central banks. During Q4, the sharp escalation of geopolitical tensions in late February culminating in military intervention in Ukraine stunned global markets across asset classes. Global oil and commodity prices spiked to multi-year highs, equity markets in a number of advanced economies (AEs) and emerging market economies (EMEs) experienced sharp declines, sovereign bond yields in major AEs fell with flights to safety – partly reversing the earlier hardening over inflation and monetary tightening concerns – and the US dollar strengthened on safe haven demand while EME currencies weakened. As the Fed commenced raising rates in March along with guidance for quantitative tightening beginning May, the US dollar softened on profit taking, bond yields firmed up, equities traded

higher and commodity prices, especially oil, witnessed correction. Overall, global financial markets remained volatile in Q4 and shadowed by turbulence.

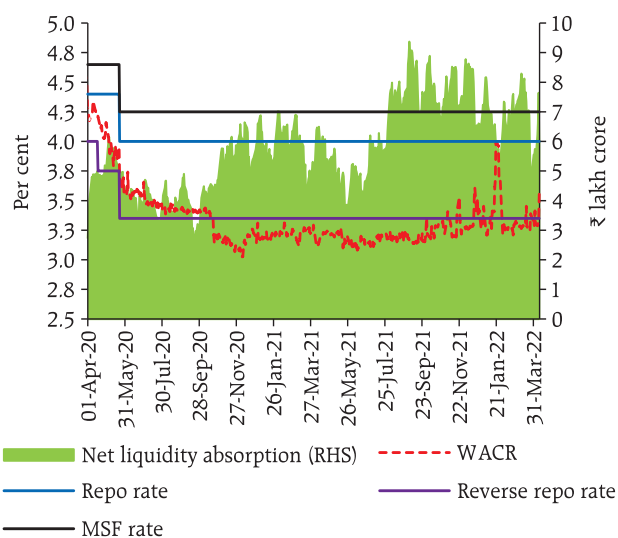
IV.1 Domestic Financial Markets

Domestic financial markets remained relatively stable in H2:2021-22 amidst surplus liquidity conditions with intermittent bouts of volatility caused by Omicron's outbreak, faster than anticipated pace of normalisation in advanced countries, domestic inflation concerns, bearishness about the large government borrowing programme and, more recently, geopolitical conflict and the sympathetic jump in crude oil prices. Amidst portfolio outflows in Q4:2021-22, a pick-up in government spending has kept short-term liquidity conditions comfortable.

IV.1.1 Money Market

During H2:2021-22, money market rates firmed up in closer alignment with the reverse repo rate – the lower bound of the policy rate corridor – reflecting the rebalancing of surplus liquidity from the overnight fixed rate reverse repo window towards the variable rate reverse repo (VRRR) auctions of varying maturities (Chart IV.1). As a result, the weighted average call rate (WACR) – the operating target of monetary policy – traded 2 basis points (bps) below the reverse repo rate, on average, in H2 as compared with 17 bps below in H1. The WACR sporadically firmed up above the reverse repo rate due to transient factors such as the occurrence of public holidays towards the end of the reserve maintenance cycle in the third week of November 2021, advance tax payments in the second half of December 2021 and March 2022, and larger than anticipated collections under the goods and services tax (GST).

In the overnight call money segment, the weighted average rate (WAR) of traded deals was 16 bps above the reverse repo rate while that on reported

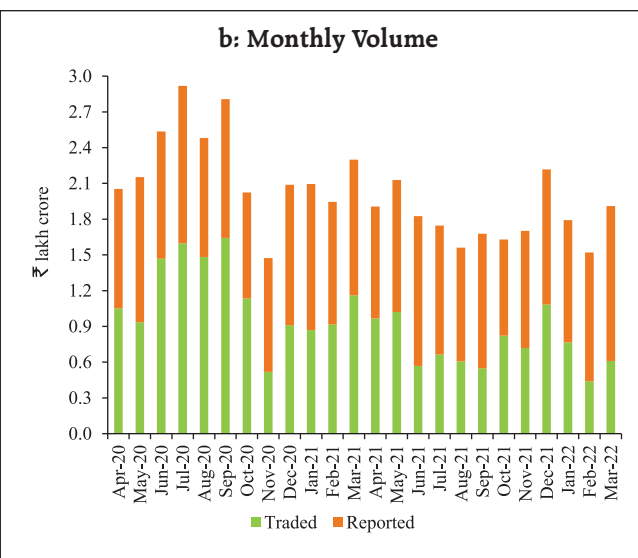
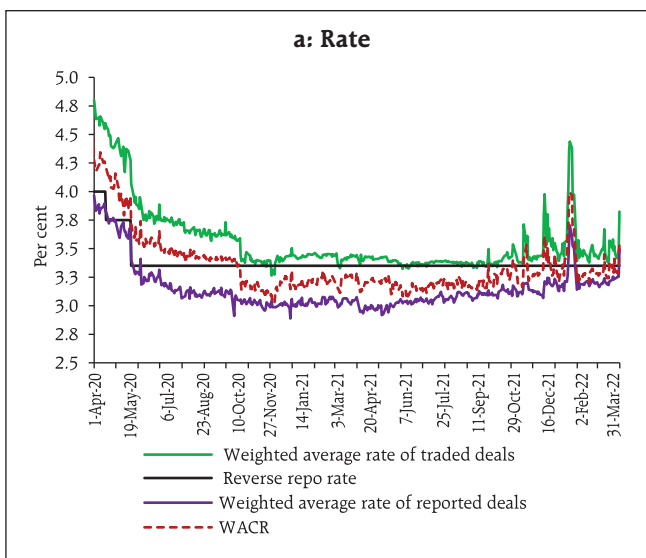
Chart IV.1: Liquidity, Policy Corridor and WACR

Source: Reserve Bank of India (RBI).

deals¹ was 16 bps below, reflecting market segmentation as small cooperative banks – principal lenders in reported deals – lend at lower rates towards the close of market hours (Chart IV.2a). The average monthly volume of reported deals in H2 at ₹1.06 lakh crore exceeded that in the traded segment of ₹0.74

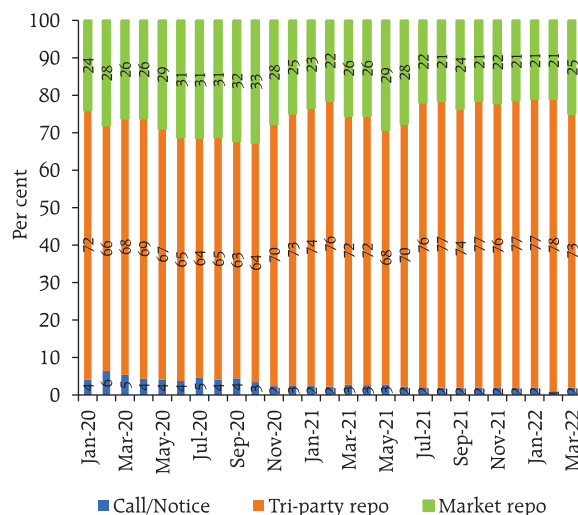
lakh crore (Chart IV.2b) which, along with lower rates in the reported deals, pulled down the WACR below the reverse repo rate. The greater share of the reported deals in the total volume of the call money market reflected the increased share of lending by co-operative banks (85 per cent in March 2022 as against 80 per cent in September 2021).

The share of the uncollateralised call money market in the total overnight money market volume at 2.0 per cent in H2 was the same as in H1. In the collateralised segment, the share of tri-party repo increased to 76 per cent in H2 from 73 per cent in H1, with a corresponding decline in the market repo share to 22 per cent from 25 per cent (Chart IV.3). Mutual funds – the major lender in both the collateralised segments – increased their participation from 68 per cent in H1 to 72 per cent in H2 in the tri-party repo segment; their share in the market repo, however, declined from 70 per cent in H1 to 56 per cent in H2. On the borrowing side, the share of public sector banks (PSBs) in the tri-party repo segment increased

Chart IV.2: Traded and Reported Deals in the Call Money Market – Volume and Rate

Sources: Clearing Corporation of India Ltd. (CCIL) and RBI.

¹ 'Traded deals' are negotiated directly on the NDS-Call platform whereas 'reported deals' are over-the-counter (OTC) deals which are reported on the NDS-Call platform after the completion of negotiation of deals.

Chart IV.3: Share in Overnight Money Market Volumes

Sources: CCIL and RBI.

from 52 per cent in H1 to 64 per cent in H2 and from 8 per cent to 16 per cent in market repo, driven by low-cost funds from mutual funds.

With increasing amounts absorbed under the VRRR auctions at higher cut-offs (see section IV.3 for details), the effective reverse repo rate (ERRR)²

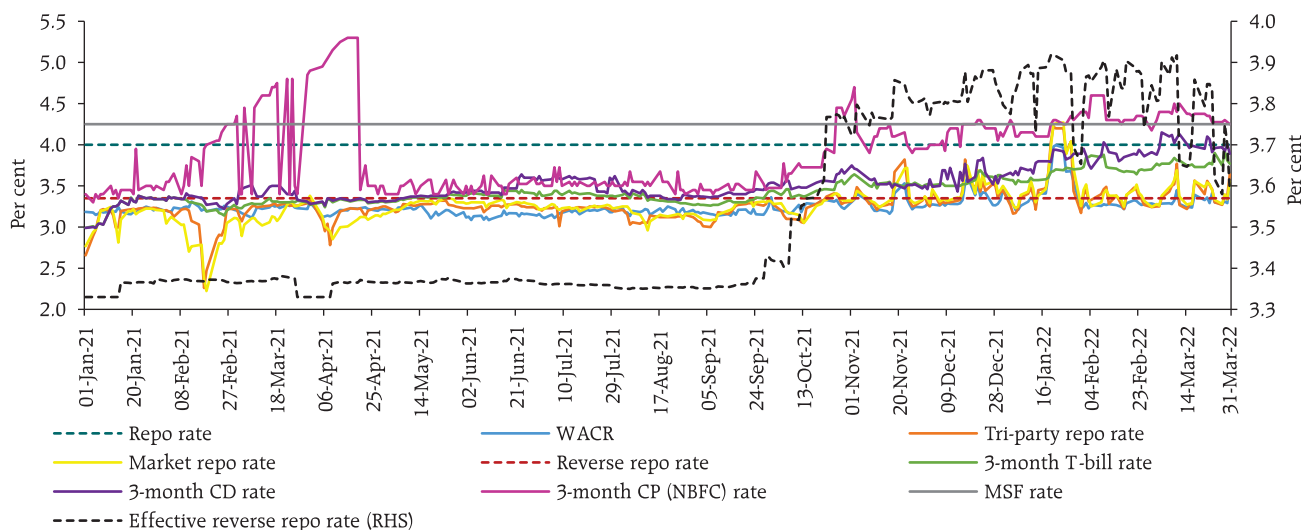
Table IV.1: Correlation of Money Market Rates with the ERRR

	Overnight Rates			Short-term Rates (3-month)		
	WACR	Tri-party Repo	Market Repo	T-bill	CDs	CPs (NBFC)
Correlation Coefficient	0.51	0.61	0.61	0.77	0.67	0.86
p-value	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Note: Based on daily data for August 13, 2021 to March 31, 2022.

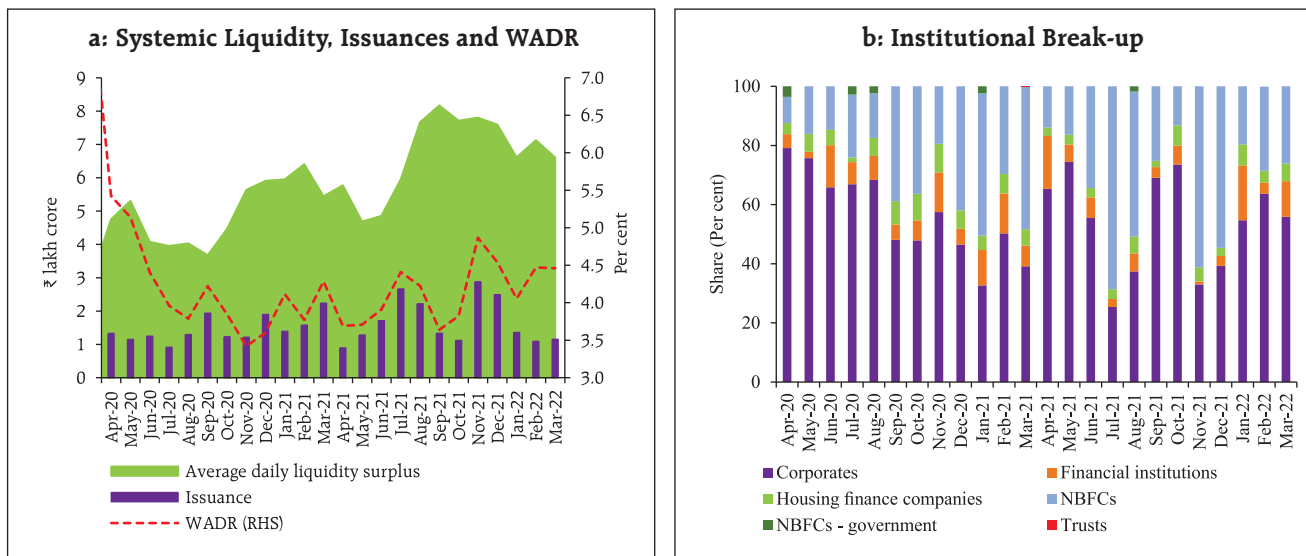
Source: RBI staff estimates.

increased from 3.39 per cent in September 2021 to 3.78 per cent in March 2022, inching closer to the repo rate (Table IV.1). The overnight segment rates – the weighted average call rate (WACR), the tri-party repo rate and the market repo – which traded below the reverse repo rate during H1:2021-22 – gradually trended upwards. Similarly, the rates on 3-month T-bill, certificates of deposit (CDs) and commercial paper issuances by non-banking financial companies (CP-NBFCs) moved higher, with their spreads at 26 bps, 38 bps and 80 bps, respectively, above the reverse repo rate during H2 as against 1 bps, 8 bps and 28 bps during H1 (Chart IV.4).

Chart IV.4: Effective Reverse Repo and Money Market Rates

Sources: RBI, Bloomberg and RBI staff estimates.

² The effective reverse repo rate is the weighted average of the fixed rate reverse repo rate and the VRRR auctions of varying maturities with the weights being the amounts absorbed under the respective windows.

Chart IV.5: Primary Issuances of Commercial Paper

Source: RBI; CCIL-F-TRAC; and RBI staff estimates.

Issuances of CDs increased to ₹1.73 lakh crore in H2 from ₹0.60 lakh crore in H1, reflecting additional fund mobilisation by banks alongside an uptick in bank credit. Commercial paper (CP) issuances remained at ₹10.1 lakh crore during H2, unchanged from H1, supported by ample surplus liquidity and congenial financing conditions (Chart IV.5.a). Short-term CP issuances were boosted by the rush of initial public offerings (IPOs) and their financing by non-banking financial companies (NBFCs) (Chart IV.5.b). Monthly CP issuances and weighted average discount rate (WADR) peaked in mid-November 2021, tracking IPO issuances.

Outstanding CPs moderated to ₹3.52 lakh crore in March 2022 from ₹3.71 lakh crore in September

Table IV.2: Maturity Profile of CP Issuances

(₹ lakh crore)

Tenor	Mar-21	Sep-21	Dec-21	Mar-22
7-30 days	1.08	0.32	1.53	0.15
31-90 days	0.66	0.54	0.56	0.42
91-180 days	0.31	0.36	0.24	0.39
181-365 days	0.18	0.12	0.15	0.19
Total@	2.24	1.34	2.48	1.16
Outstanding	3.64	3.71	3.50	3.52

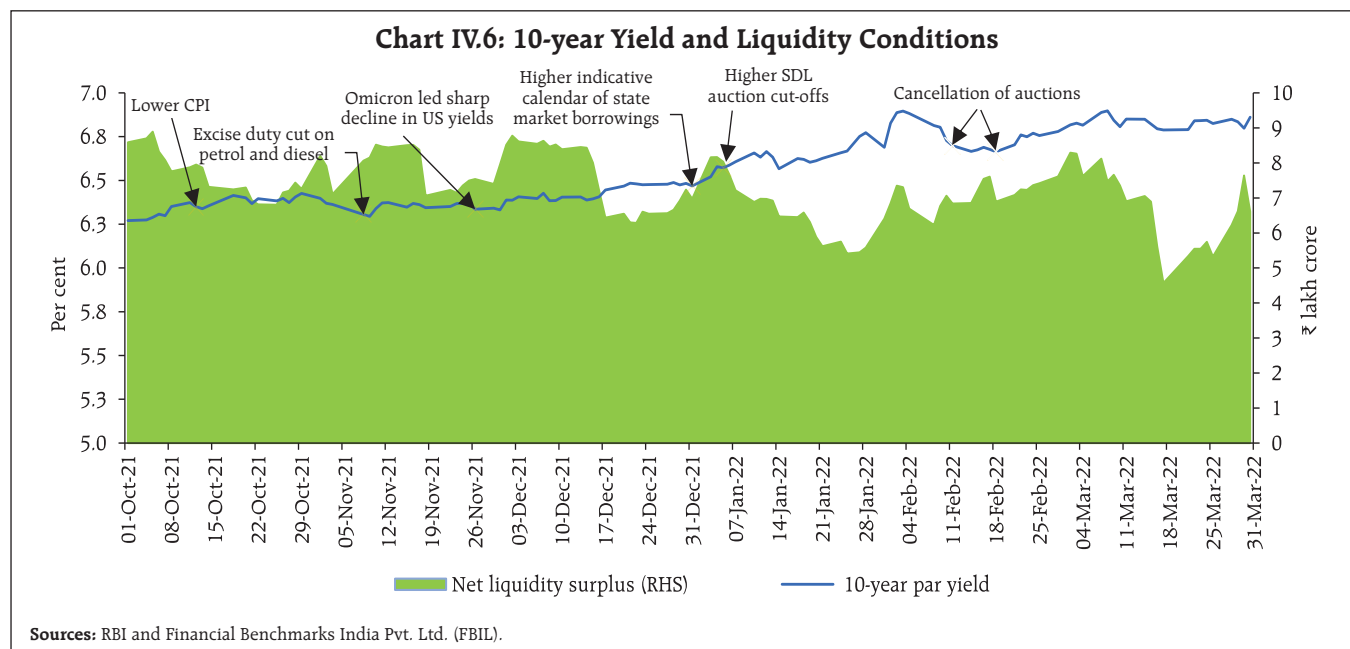
@: Total issuances during the month.

Source: CCIL, F-Trac and RBI.

2021, reflecting higher issuances of short tenors (Table IV.2).

IV.1.2 Government Securities (G-sec) Market

During H2:2021-22, the 10-year G-sec yield hardened by 63 basis points, reflecting global and domestic factors (Chart IV.6). It rose by 24 bps during Q3, driven by higher international crude oil prices, domestic inflation and increasing government bond yields in major economies including the US, which more than offset the intermittent softening owing to the lower-than-expected CPI print for India for September, tax cuts on petrol and diesel, and a sharp decline in US yields following the outbreak of the Omicron variant of COVID-19. In Q4, the benchmark yield firmed up by a further 39 bps owing to higher-than-expected indicative calendar of market borrowings of State Governments/Union Territories, planned market borrowings by the Centre indicated in the Union Budget 2022-23 and the rise in US yields, international crude oil and other commodity prices over escalating geopolitical tensions. The cancellation of two consecutive central government bond auctions, however, tempered the hardening of domestic yields.

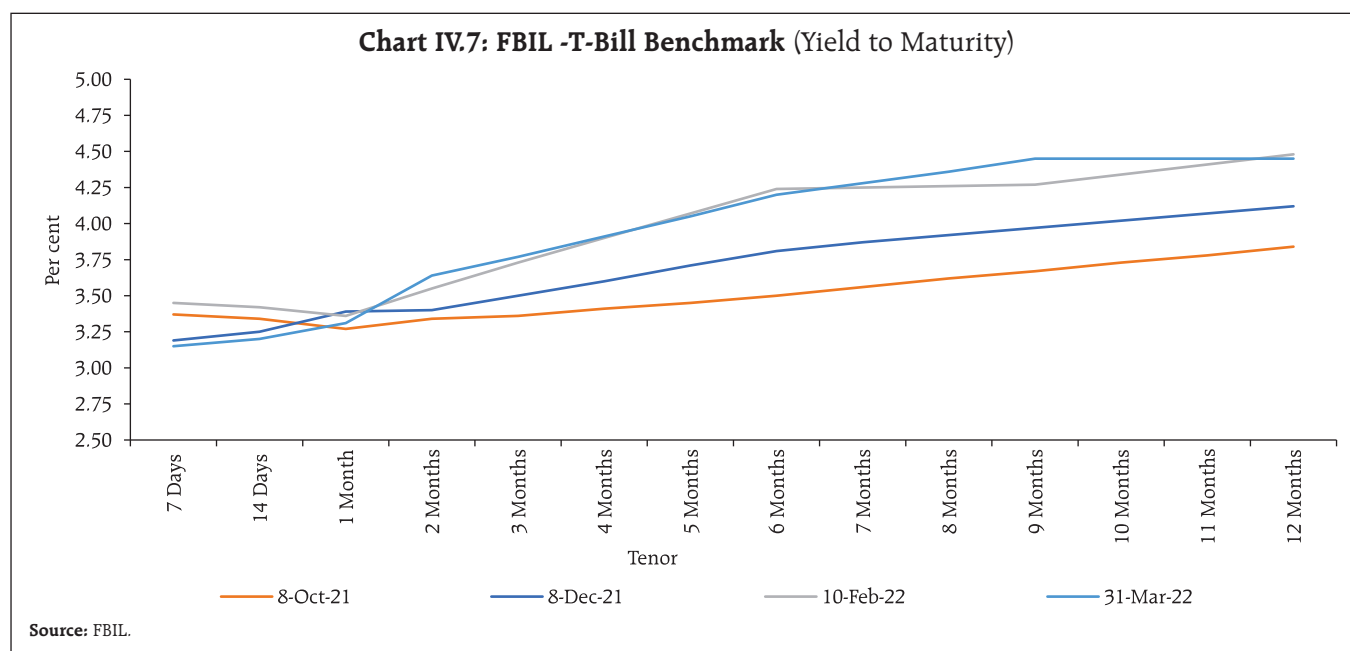


At the shorter end of the primary market segment, yields on T-bills firmed up in sync with the increase in the effective reverse repo rate (Chart IV.7).

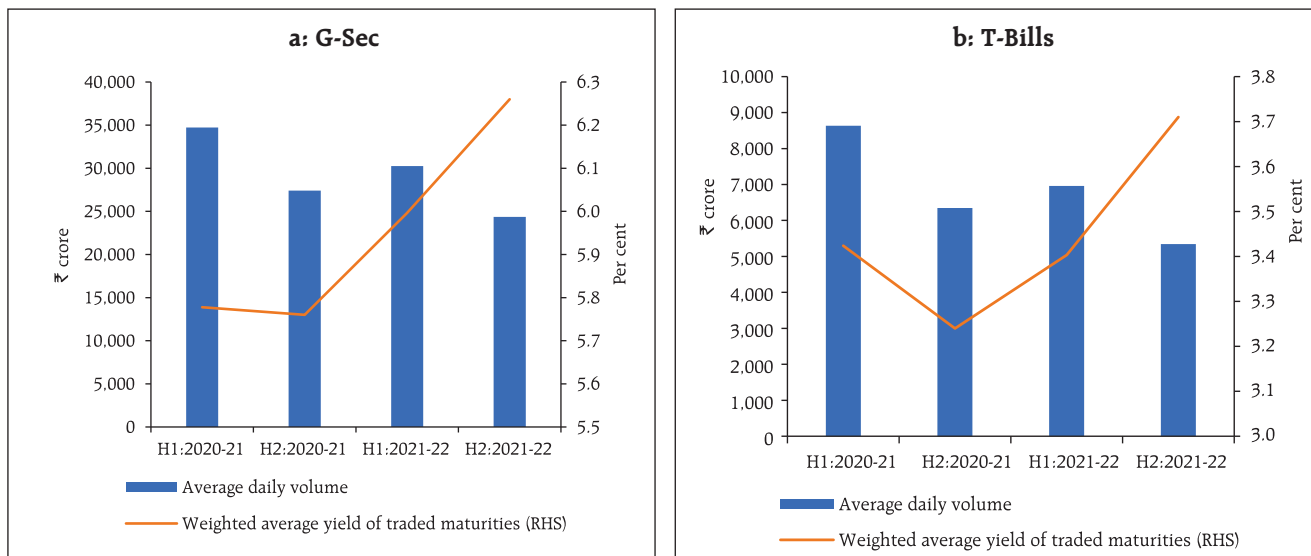
Average trading volume in both G-secs and T-bills dipped in H2:2021-22, amidst rising yields and elevated uncertainty (Chart IV.8).

The average level of yield increased by 38 bps during H2. The slope flattened by 41 bps in view of the sharper increase in the short-term rates on account of the liquidity rebalancing (Chart IV.9)³.

To facilitate debt consolidation, the Reserve Bank conducted five switch operations on behalf of



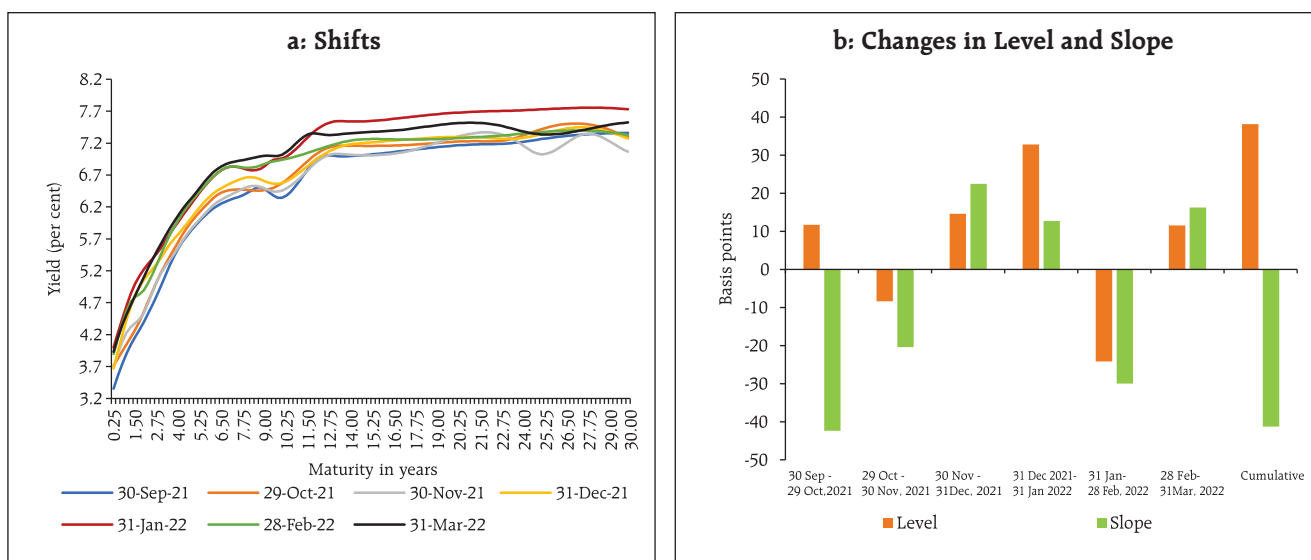
³ While the level is the average of zero coupon yields of all tenors up to 30-years published by FIBIL, the slope (term spread) is the difference in zero coupon yields of 3-months and 30-year maturities.

Chart IV.8: Trading Volumes and Yield

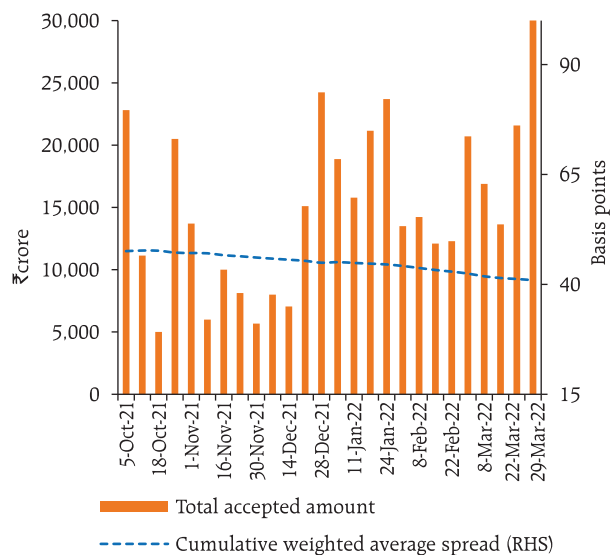
Sources: CCIL and RBI staff estimates.

the central government amounting to ₹1.7 lakh crore during H2:2021-22. The weighted average maturity (WAM) of the outstanding stock of G-secs increased to 11.71 years as on March 31, 2022 from 11.57 years as at end-September 2021. The weighted average coupon (WAC) at 7.11 per cent was lower than 7.15 per cent over the same period.

The weighted average spread of cut-off yields on state development loans (SDLs) over G-sec yields of comparable maturities moderated to 36 bps in H2 from 48 bps in H1 (Chart IV.10). The average inter-state spread on securities of 10-year tenor (fresh issuances) was 4 bps in H2, the same as in H1.

Chart IV.9: G-Sec Yield Curve

Sources: FBIL and RBI staff estimates.

Chart IV.10 SDLs - Amount Raised and Spread

IV.1.3 Corporate Bond Market

Tracking G-sec yields, corporate bond yields moved higher and risk premia compressed amidst moderation in new issuances. The yields on AAA-rated 3-year bonds issued by NBFCs increased by 66 bps to 5.98 per cent in H2 and those on corporates and public sector undertakings (PSUs), financial institutions (FIs)

Table IV.3: Financial Markets - Rates and Spread

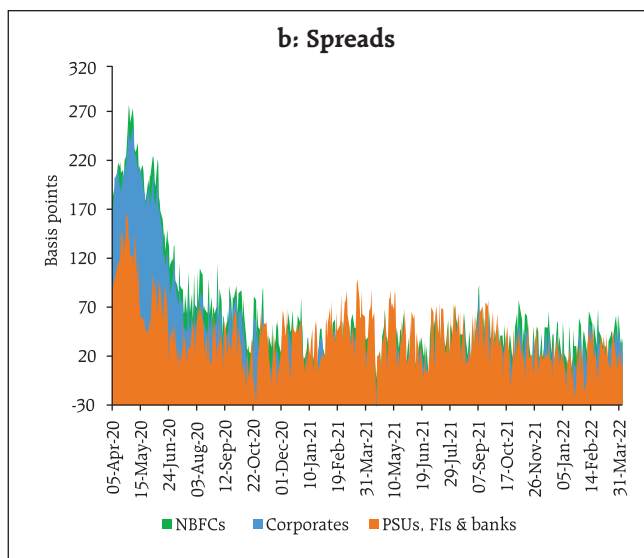
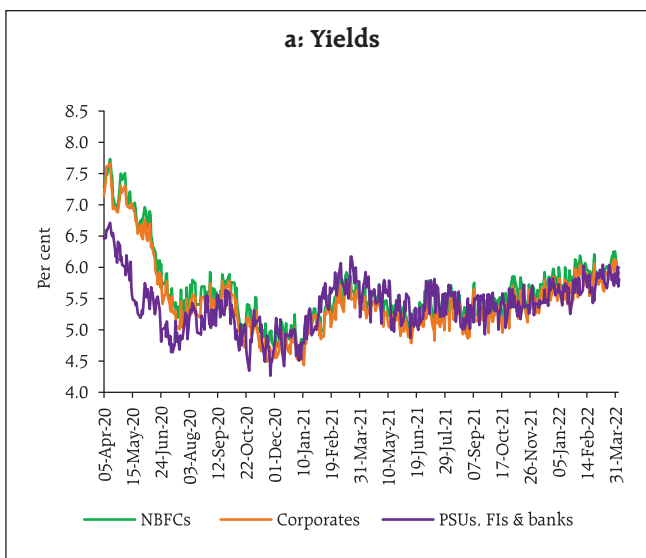
Instrument	Interest Rates (per cent)			Spread (bps) (over corresponding risk-free rate)		
	Sep 2021	Mar 2022	Variation (in bps)	Sep 2021	Mar 2022	Variation (in bps)
1	2	3	(4 = 3-2)	5	6	(7 = 6-5)
Corporate Bonds						
(i) AAA (1-yr)	4.17	5.04	87	35	29	-6
(ii) AAA (3-yr)	5.24	5.88	64	40	26	-14
(iii) AAA (5-yr)	5.88	6.43	55	4	0	-4
(iv) AA (3-yr)	6.07	6.59	52	124	97	-27
(v) BBB-minus (3-yr)	9.99	10.25	26	516	464	-52
10-yr G-sec	6.18	6.82	64			

Note: Yields and spreads are computed as monthly averages.

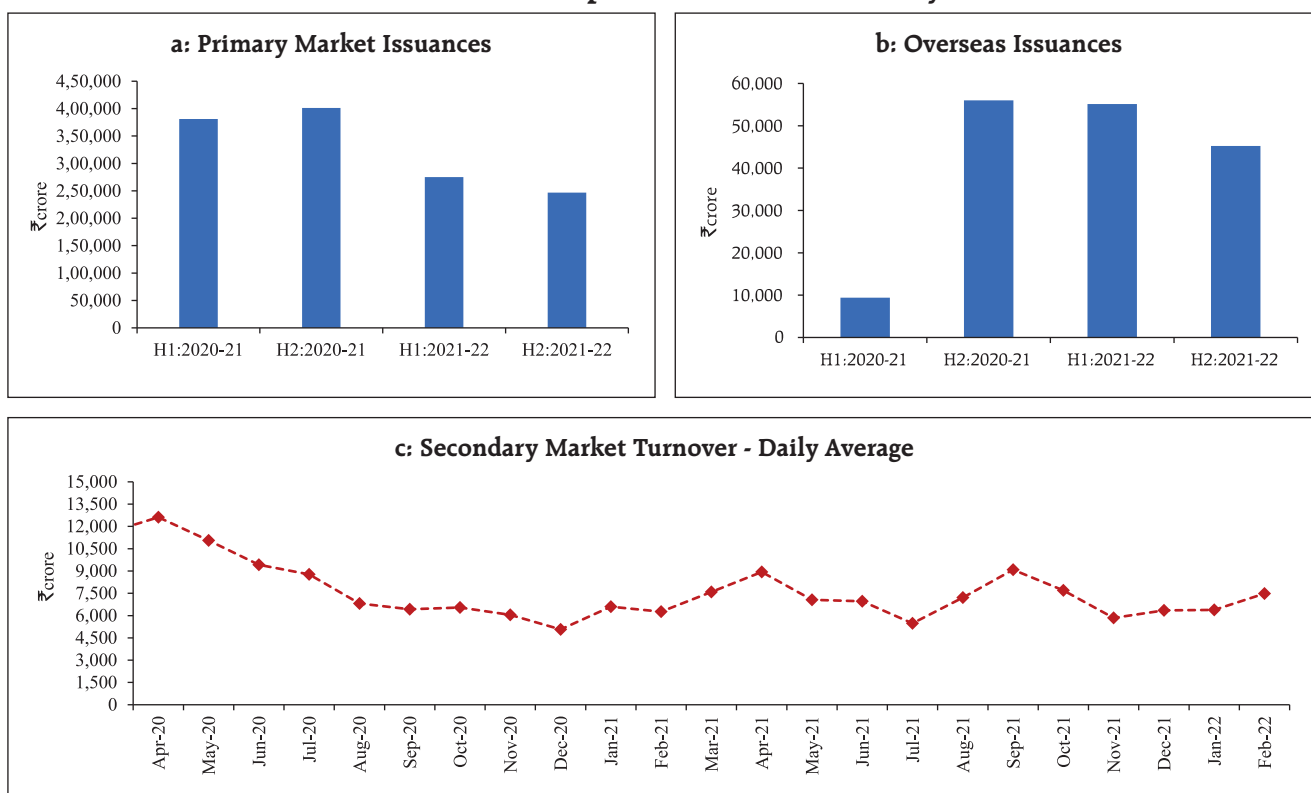
Source: FIMMDA and Bloomberg.

and banks by 64 bps and 51 bps to 5.88 per cent and 5.84 per cent, respectively (Chart IV.11a). The risk premium or spread over 3-year G-sec yields declined from 49 bps to 37 bps in H2 for NBFCs, from 50 bps to 23 bps for PSUs, FIs and banks and from 40 bps to 26 bps for corporates (Chart IV.11b).

The moderation in the risk premia (spreads) was seen across tenors and rating spectrum in H2 (Table IV.3). The 3-year credit default swap (CDS) spreads for the State Bank of India and ICICI Bank trading

Chart IV.11: AAA-rated 3-Year Corporate Bond Yields and Spreads

Source: Fixed Income Money Market and Derivatives Association of India (FIMMDA).

Chart IV.12: Corporate Bond Market Activity

Sources: Securities and Exchange Board of India (SEBI), and Prime Database.

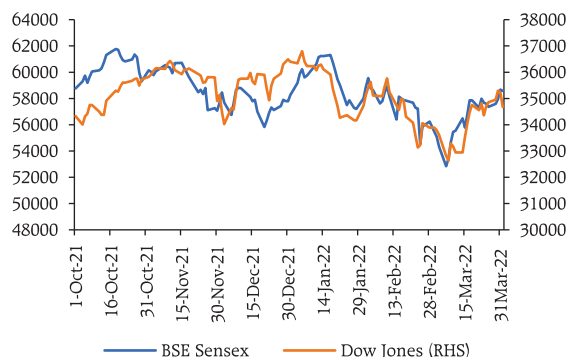
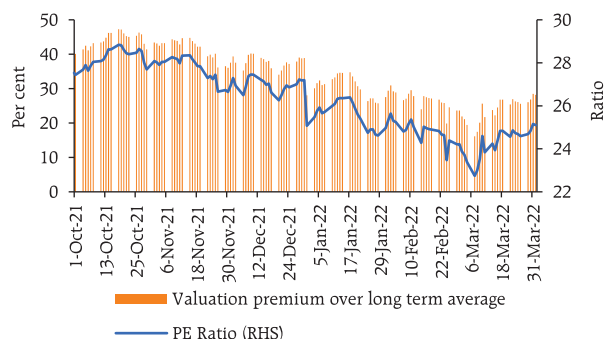
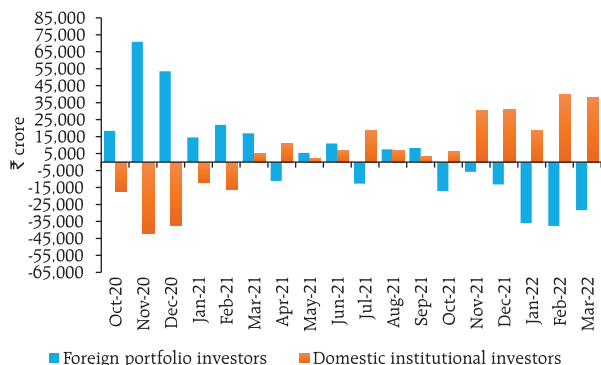
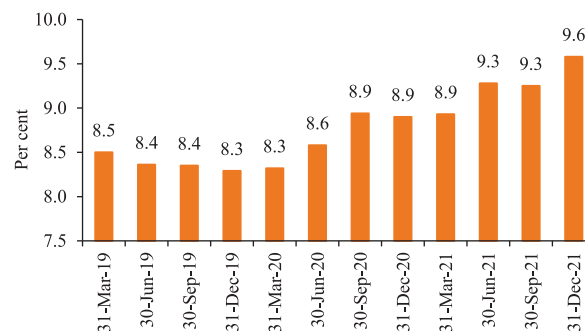
overseas increased by 2 bps and 10 bps, respectively at end-March 2022 from end-September 2021.

Issuances of corporate bonds in the primary market declined to ₹2.47 lakh crore during H2 (up to February 2022) from ₹3.06 lakh crore during the corresponding period of 2020-21 as corporates' resource requirements moderated with the capex cycle being still at a nascent stage (Chart IV.12a). Corporates resorted to increased overseas issuances in 2021-22, taking advantage of lower cost of funds abroad (Chart IV.12b). Competitive lending rates offered by banks also contributed to lower domestic bond issuances. Nearly the entire resource mobilisation in the corporate bond market (98.2 per cent) was through the private placement route. The outstanding investments by foreign portfolio investors (FPIs) in corporate bonds declined marginally from ₹1.28 lakh crore at end-September 2021 to ₹1.21 lakh crore at end-March 2022, pulling down the utilisation of

the approved limits from 22.3 per cent to 19.9 per cent. The daily average secondary market trading volume increased by 10.6 per cent to ₹6,730 crore during H2 (up to February 2022) over the corresponding period of the previous year (Chart IV.12c).

IV.1.4 Equity Market

Indian equity markets corrected marginally in H2:2021-22 amidst high volatility triggered by the outbreak of the Omicron variant of COVID-19, hawkish monetary policy stances of global central banks, elevated crude oil prices and escalating geopolitical tensions. Domestic equities witnessed sharp selloffs in the second half of February and early March 2022 over Ukraine-Russia tensions but recovered in the second half of March. Overall, the BSE Sensex lost 0.9 per cent in H2 to close at 58,569 (Chart IV.13a). The correction in the stock prices, coupled with higher

Chart IV.13: Stock Market Performance and Institutional Investments**a: BSE Sensex and Dow Jones Industrial Average****b: PE Ratio of BSE Sensex and Premium over Long Term Average****c: Net Investment in Equity by Institutional Investors****d: Holdings of Retail and High Net Worth Individuals in NSE-Listed Companies**

Sources: Bloomberg; NSDL; Prime Database; SEBI and RBI staff estimates.

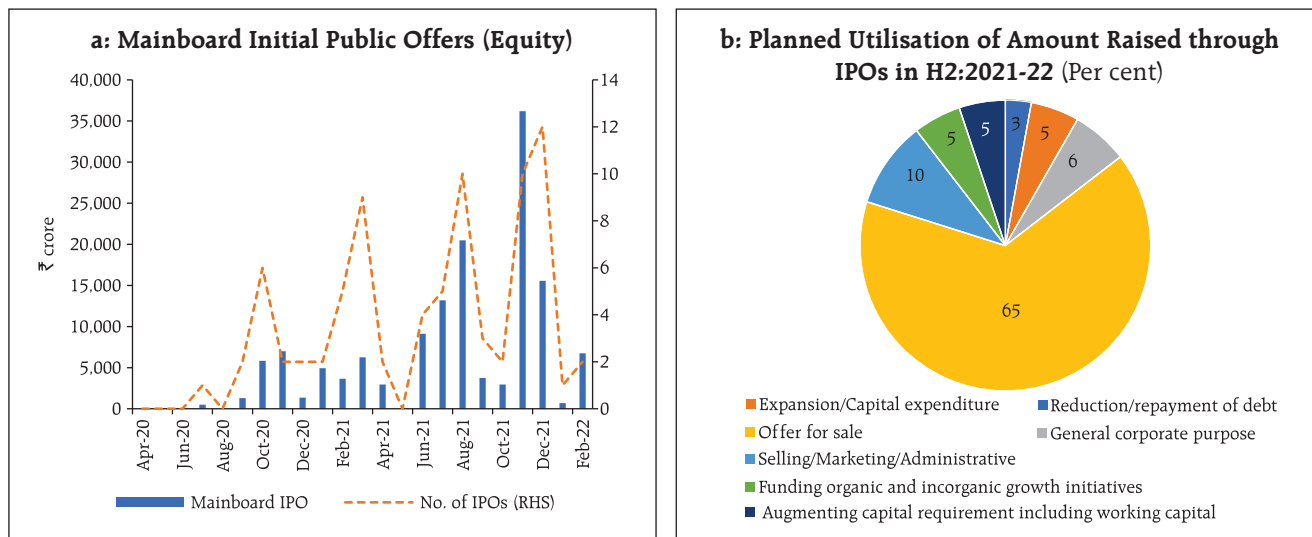
corporate earnings, led to the price-to-earnings ratio (of BSE Sensex) falling to 25.1 at end-March 2022 from 27.6 at end-September 2021, moderating the valuation premium over its long-term average (Chart IV.13b).

Apprehensions over the faster than anticipated pace of normalisation by the US Fed, the rise in the US treasury yields and the rush to safe haven amidst escalating tensions around Russia-Ukraine triggered a selling spree by the FPIs amounting to ₹1.38 lakh crore from the domestic equity market in H2. These sales, however, were more than offset by purchases by domestic institutional investors (DIIs) to the tune of ₹1.64 lakh crore (Chart IV.13c). Amongst domestic buyers, retail participation (including

high net worth individuals) in equities rose further during H2, extending the buying interest noted in H1 (Chart IV.13d).

The vibrancy in the IPO segment continued during H2 (up to February 2022), with 27 issuances mobilising ₹0.62 lakh crore (₹0.23 lakh crore in the corresponding period of the previous year) (Chart IV.14a). The amounts raised through the rights issues also increased to ₹0.25 lakh crore in H2 (up to February) from ₹0.04 lakh crore during the corresponding period of the previous year. A large chunk (nearly two-third) of the amount raised in the IPOs was through the offer for sale (OFS) route while around five per cent and three per cent

Chart IV.14: IPO Issuances and Planned Utilisation



Note: Mainboard IPOs exclude IPOs raised on SME platforms.

Sources: SEBI, Bloomberg, Offer documents and RBI staff estimates.

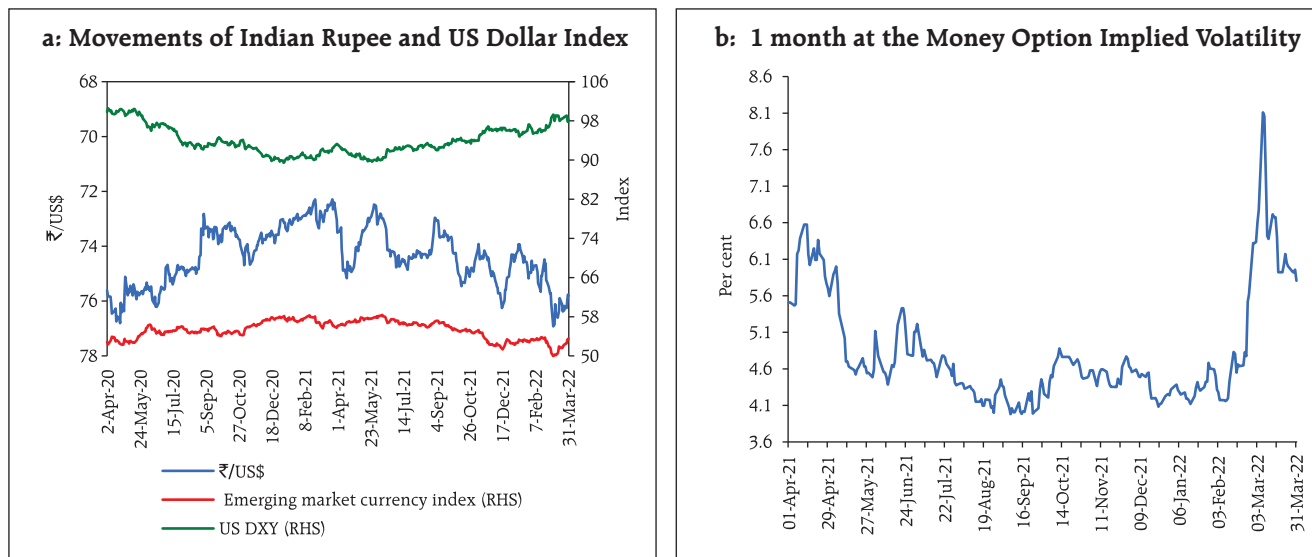
were envisaged for capital expenditure and debt repayment, respectively (Chart IV.14b).

IV.1.5. Foreign Exchange Market

The Indian rupee (INR) exhibited two-way movements in H2:2021-22, and depreciated on an average basis (Chart IV.15a). The INR traded with

an appreciating bias between mid-October and mid-November 2021. In the following months, it depreciated amidst FPI outflows, the strengthening US dollar, increasing market expectations of a faster than anticipated monetary policy normalisation by the US Fed and other major AEs, rise in crude oil prices and escalating geopolitical tensions, touching a low of

Chart IV.15: INR US\$ Movements



Sources: FBIL; Bloomberg; and Thomson Reuters.

₹ 76.92⁴ per US\$ on March 7, 2022. The INR reversed some of these losses in the subsequent days with the correction in crude oil prices and was at ₹ 75.81 on March 31, 2022. Volatility measured by 1-month at the money (ATM) option implied volatility⁵ of the INR surged, surpassing levels observed during the second wave of the pandemic; it however, eased in the second half of March (Chart IV.15b).

In terms of the 40-currency nominal effective exchange rate (NEER) and real effective exchange rate (REER), the INR depreciated by 1.1 per cent and 2.1 per cent, respectively, between September 2021 and March 31, 2022 (Table IV.4).

The nominal and real movements in the Indian rupee exchange rate against the US dollar were muted in relation to a number of other emerging market currencies. This reflects the underlying stability of the

Table IV.4: Nominal and Real Effective Exchange Rate Indices (Trade-weighted)
(Base: 2015-16 = 100)

Item	Index: March 31, 2022 (P)	Appreciation (+) / Depreciation (-) (Per cent)
		March 31, 2022 over September (average) 2021
40-currency REER	103.3	-2.1
40-currency NEER	93.5	-1.1
6-currency REER	102.2	-1.5
6-currency NEER	86.8	-1.2
₹/US\$	75.8	-3.0

P: Provisional.

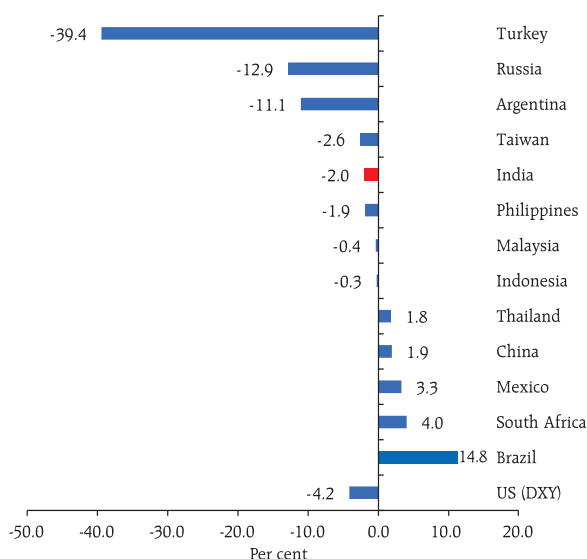
Sources: RBI; and FBIL.

INR even as some other emerging market peers faced sharp depreciation (Chart IV.16).

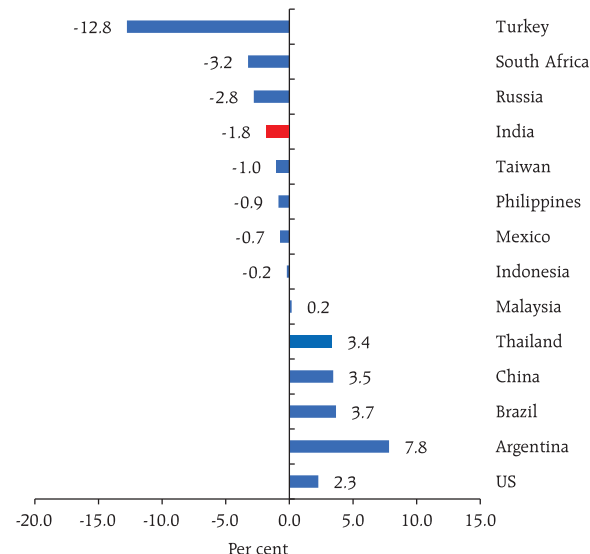
Forward premia generally firmed up during H2, especially for longer maturities (Chart IV.17).

Chart IV.16: Cross-Currency Movements

a: Movement of Major EME Currencies against US Dollar
(End-March 2022 over end-September 2021)



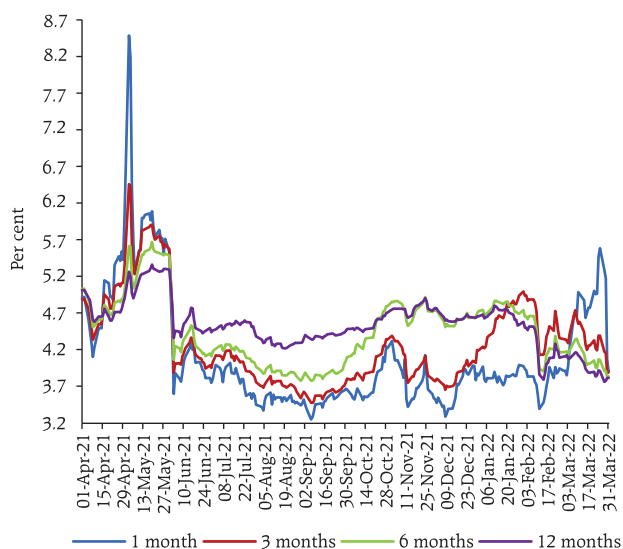
b: Movement in REER
(February 2022 over September 2021)



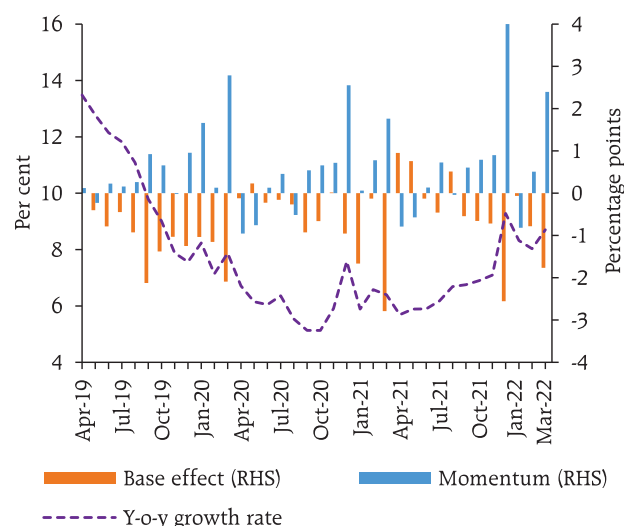
Sources: RBI; FBIL; IMF; Thomson Reuters; and Bank for International Settlements (BIS).

⁴ Reference rate published by FBIL.

⁵ Implied volatility is derived from an option's price and depicts the markets' expectations about the future volatility of the currency.

Chart IV.17: Forward Premium

Source: Bloomberg.

Chart IV.18: Non-food Credit Growth of SCBs

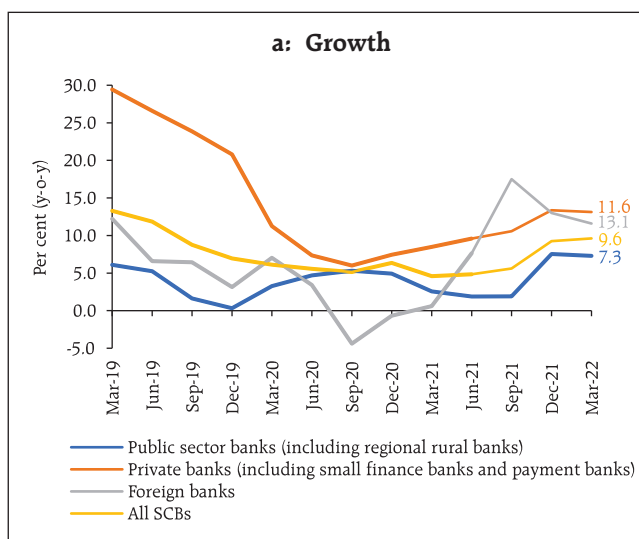
Source: RBI.

IV.1.6 Credit Market

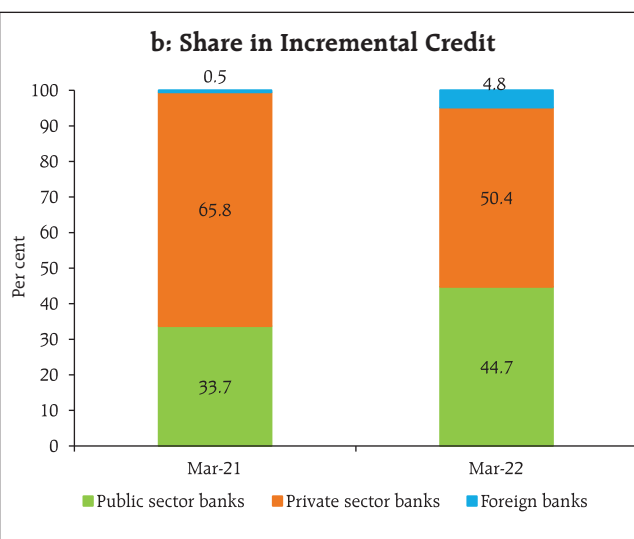
Credit offtake picked up during 2021-22, with the gradual return of normalcy after the pandemic. Non-food credit extended by scheduled commercial banks (SCBs) rose by 9.7 per cent (y-o-y) as on March 25 (4.5 per cent a year ago) (Chart IV.18).

The recovery in bank credit was led by private sector banks that provided the bulk (50.4 per cent) of the incremental y-o-y credit (up to March 25, 2022), followed by PSBs (44.7 per cent) (Chart IV.19b).

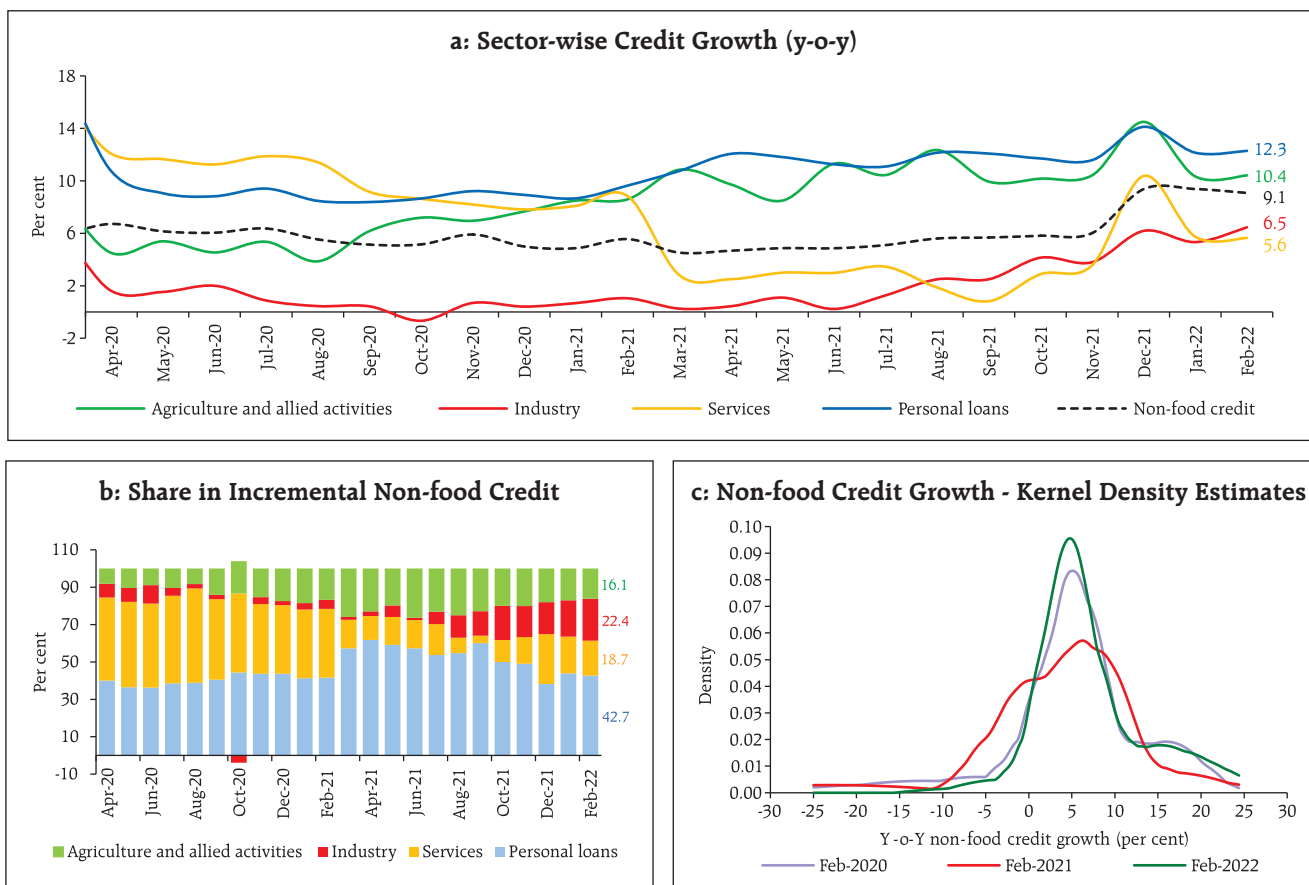
Credit growth was driven by all the major economic sectors⁶. Credit to agriculture accelerated

Chart IV.19: Credit Flow across Bank-Groups

Source: RBI.



⁶ Data on non-food credit are based on fortnightly 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 94 per cent of total non-food credit extended by all SCBs.

Chart IV.20: Sectoral Deployment of Bank Credit

Source: RBI and staff estimates.

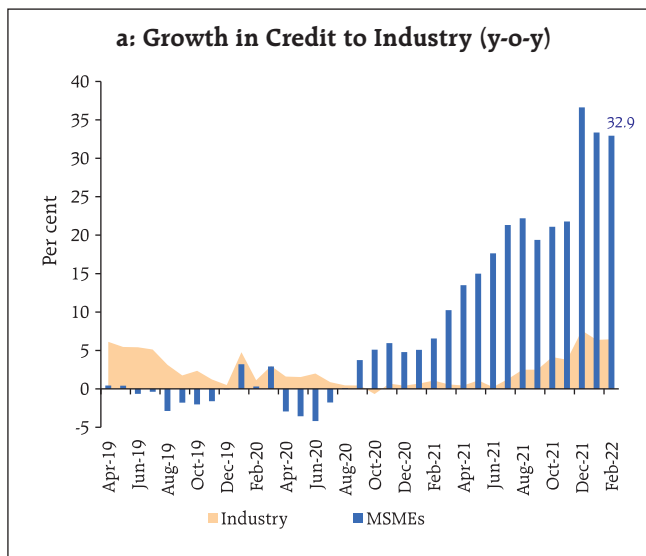
to 10.4 per cent (y-o-y) in February 2022 from 8.6 per cent in February 2021 on the back of a higher target⁷, the interest subvention scheme and priority sector lending. Growth in credit to industry recovered to 6.5 per cent in February 2022 from a low of 1.0 per cent a year ago, aided by higher flows to MSMEs and a turnaround in large industry. Personal loans remained the key driver of overall bank credit, with a share of 42.7 per cent in incremental offtake (y-o-y) in February 2022 (Chart IV.20a and b). The uptick in credit growth was seen across banks (Chart IV.20c)⁸.

Within industry, credit to MSMEs benefitted from the launch of the Emergency Credit Line Guarantee

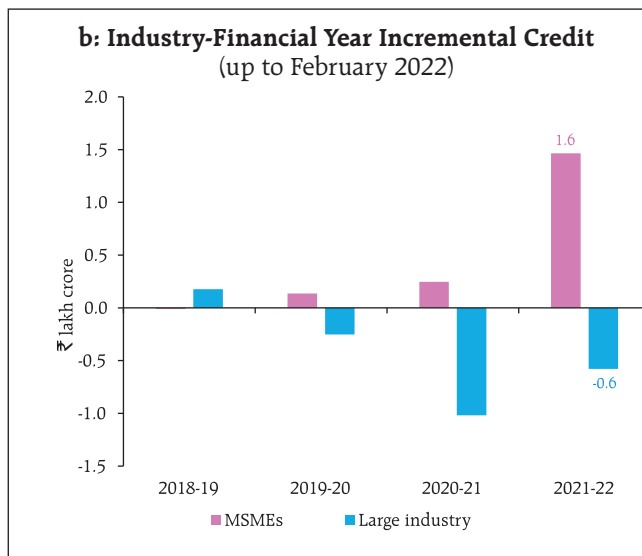
Scheme (ECLGS) in May 2020 and the subsequent expansions in its scope, which helped push up credit growth to micro and small industries to 19.9 per cent in February 2022 (3.1 per cent a year ago) and to medium industries to 71.4 per cent (30.6 per cent a year ago) (Chart IV.21a and b). The Union Budget 2022-23 has extended the ECLGS to March 2023, with the guarantee cover increasing by ₹ 50,000 crore to a total cover of ₹5 lakh crore. Credit to large industry emerged out of an extended period of contraction/slow growth and recorded 0.5 per cent growth in February 2022, supported by key industries such as engineering; chemicals and chemical products; food processing; leather and leather products; and rubber, plastic, and their products. Infrastructure credit – 38 per cent of the total industrial credit – logged a robust

⁷ The government raised the target for agriculture credit flow from ₹15 lakh crore for 2020-21 to ₹16.5 lakh crore for 2021-22.

⁸ Based on data for 31 SCBs.

Chart IV.21: Bank Credit Growth in Industry and MSME Sectors

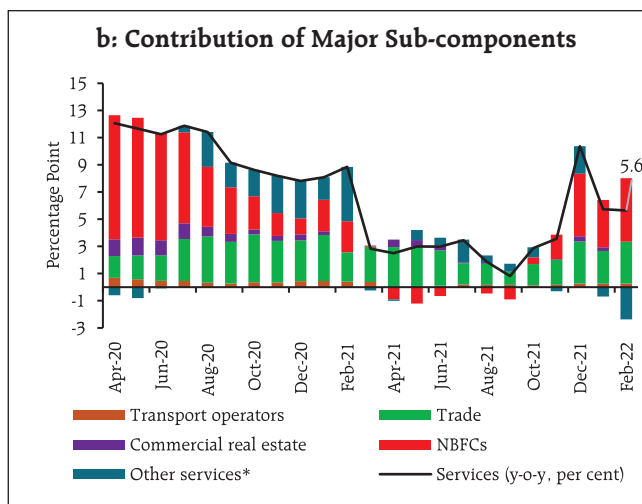
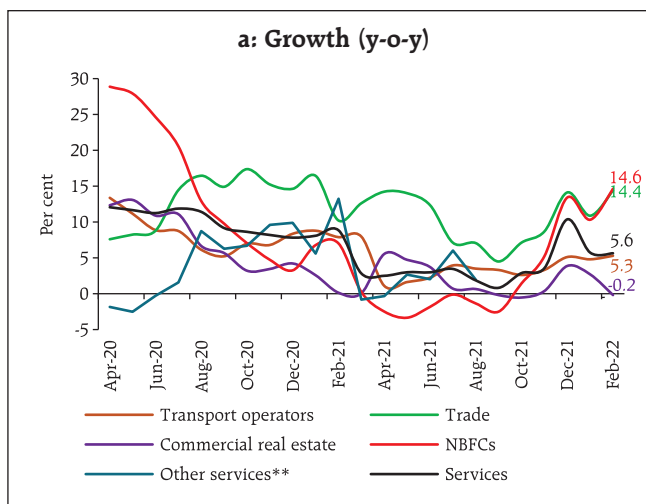
Source: RBI.



growth of 11.9 per cent in February 2022, driven by road and power sectors and the government's push to capex.

Credit expansion in the services sector was led by NBFCs and trade, which together constitute around 58 per cent of the total services sector credit. Credit growth to the NBFCs moved out of negative

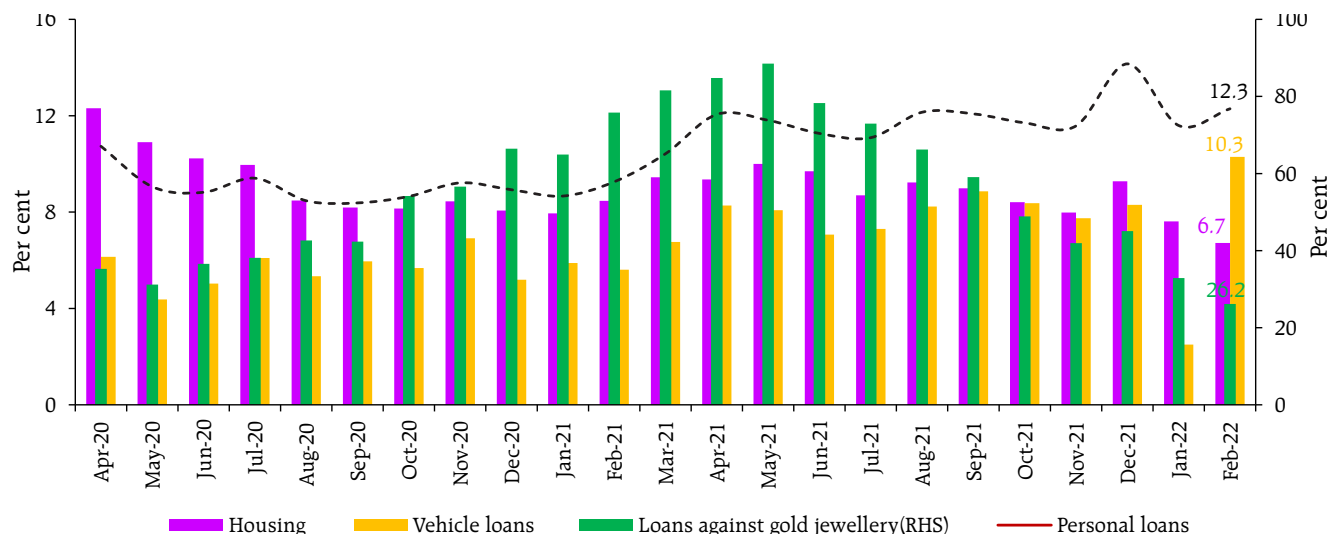
territory in October 2021 and rose sharply to 14.6 per cent in February 2022 from 7.0 per cent a year ago. Credit to the trade sector remained strong, while that to transport operators recovered after remaining subdued for over a year. NBFCs and trade sectors were the major contributors to the overall credit growth to the services sector in February 2022 (Chart IV.22a and b).

Chart IV.22: Credit Growth in Service Sector

**Other services include services such as professional services, computer software, tourism, hotels & restaurants, shipping, aviation, mutual fund (MFs), banking and finance other than NBFCs and MFs.

Source: RBI.

Chart IV.23: Credit Growth in Personal Loans



Source: RBI.

Personal loans grew by 12.3 per cent in February 2022 (9.6 per cent a year ago), primarily driven by

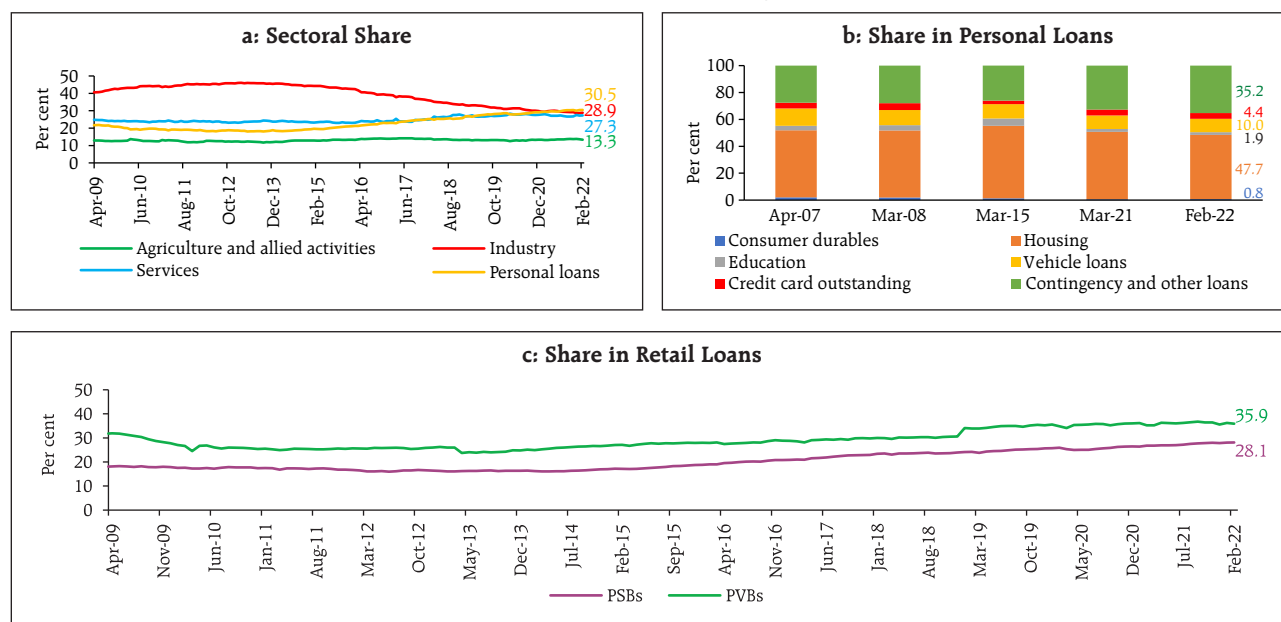
housing, followed by vehicle loans and loans against gold jewellery (Chart IV.23 and Box IV.1).

Box IV.1: Retail Lending Behaviour of Banks

Retail loans have emerged as the main driver of bank credit in recent years and now have the largest share

in the outstanding credit of SCBs, displacing industrial loans (Chart IV.1.a). Within retail, housing loans have

Chart IV.1.1: Retail Credit Dynamics



Source: RBI.

(contd.)

the largest share (Chart IV.1.1b). The importance of retail loans has increased for both private sector banks (PVBs) and public sector banks (PSBs) (Chart IV.1.1c).

Retail loans have been supported by banks' transformation from being traditional 'financial intermediaries' to lending for consumption purposes, driven by the new generation private sector banks, credit information bureaus, technological and product innovations, and alternate delivery channels (Jappelli and Pagano, 1993). In view of subdued profitability and deleveraging by corporates, risk-averse banks shifted their focus away from large infrastructure and industrial loans towards retail loans (Das, 2020).

To analyse factors affecting retail credit relative to overall lending and industrial credit, key banking health variables (asset quality and profitability) and macroeconomic variables (overall economic activity) are considered for the period 2007-2020 using annual data in a dynamic panel setting, with the sample including both public sector and private sector banks (Table IV.1.1). The empirical analysis suggests that credit growth to the retail sector is less sensitive to asset quality than industrial credit. Given the higher incidence of NPAs in industry, risk aversion has contributed to credit growth in retail sector outpacing the growth in credit to industry. Furthermore, industrial loans demand tends to be more cyclical relative

Table IV.1.1: Determinants of Banks' Sectoral Lending

	(1)	(2)	(3)
	Dependent variables		
Explanatory variables	Overall bank credit growth	Industrial loan growth	Retail loan growth
Lag dependent variable	0.526**	0.219***	0.160*
Lag NPA ratio	-0.695**	-1.625**	-1.109**
Lag RoA	2.825*	8.316**	3.434**
Interest rate	-3.264***	-4.893***	-3.803***
Lag nominal GDP growth rate	0.404**	0.924**	0.814**
constant	0.416***	0.564***	0.356**
N	288	288	288
AR(1) Test	0.001	0.005	0.004
AR(2) Test	0.100	0.112	0.782
Sargan Test	0.076	0.084	0.650

* p<0.1, ** p<0.05, *** p<0.01

Source: RBI staff estimates.

to retail. Overall, as economic activity picks up and with the banking system well capitalised, credit offtake can be expected to turn more broad-based.

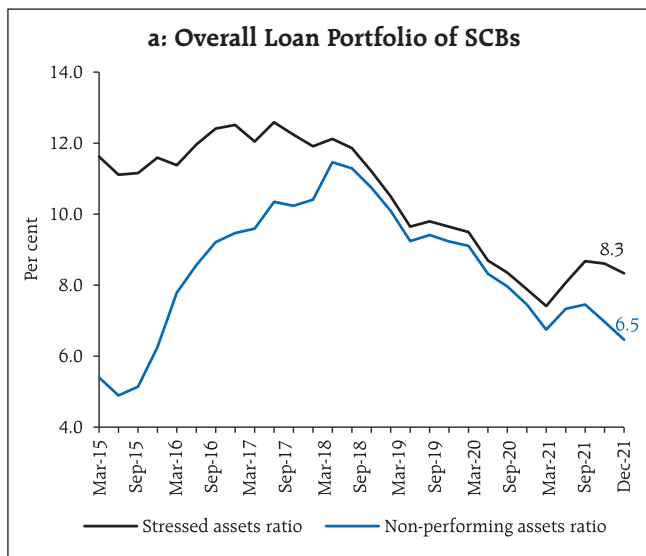
References:

- Das, S. (2020), "Banking Landscape in the 21st Century", RBI Bulletin, March.
- Jappelli, T., and M. Pagano (1993), "Information Sharing in Credit Markets", *Journal of Finance*, 48(5).

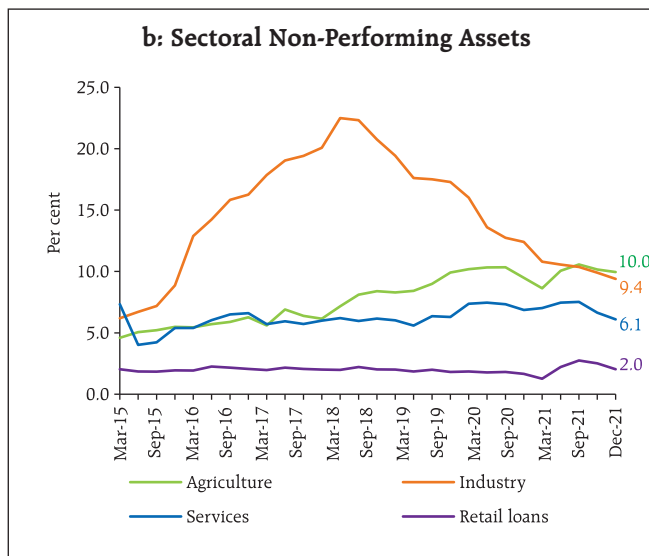
The asset quality of SCBs improved further during 2021-22, with the overall non-performing assets (NPA) ratio declining to 6.5 per cent in December 2021 from 6.8 per cent a year ago, driven by lower NPAs in credit to industry (Chart IV.24).

During H2, the expansion in banks' non-SLR investments in bonds, debentures and shares of

public and private corporates was more than offset by reduction in their commercial paper holdings (Chart IV.25a). Adjusted non-food credit (*i.e.*, banks' non-food credit *plus* non-SLR investments) growth accelerated to 9.1 per cent on March 25 from 4.2 per cent a year ago, mirroring non-food credit dynamics (Chart IV.25b).

Chart IV.24: Stressed Assets and Non-Performing Assets of SCBs

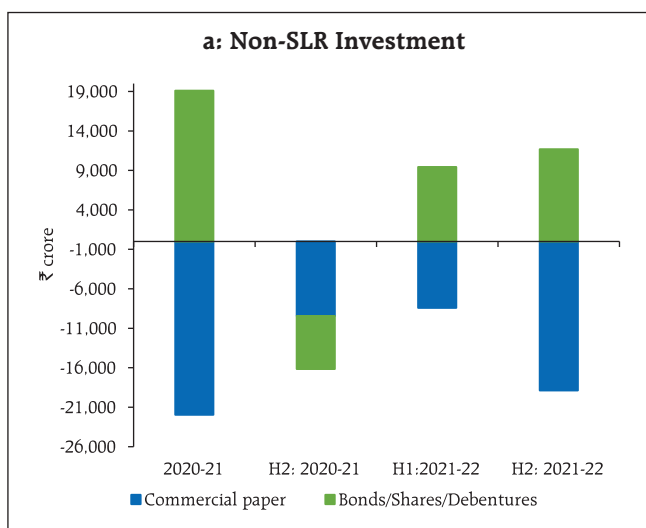
Source: RBI.



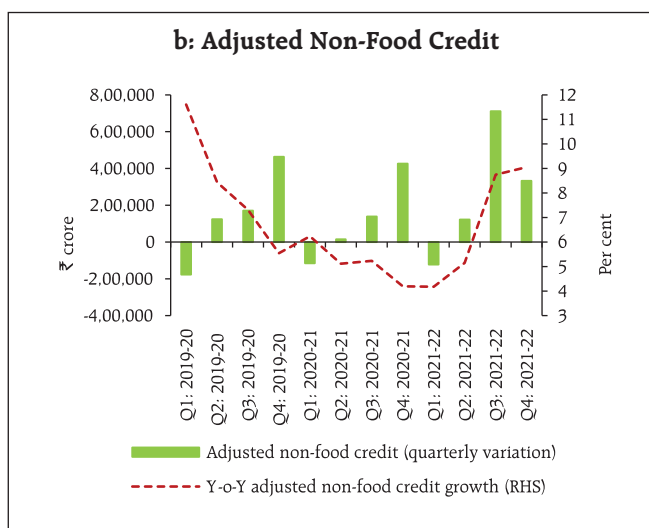
Amidst improving credit offtake, growth in banks' holdings of government securities decelerated, pulling down their excess SLR investments to 10.6 per cent of net demand and time liabilities (NDTL) as on February 25, 2022 from 11.0 per cent at end-March 2021 (Chart IV.26).

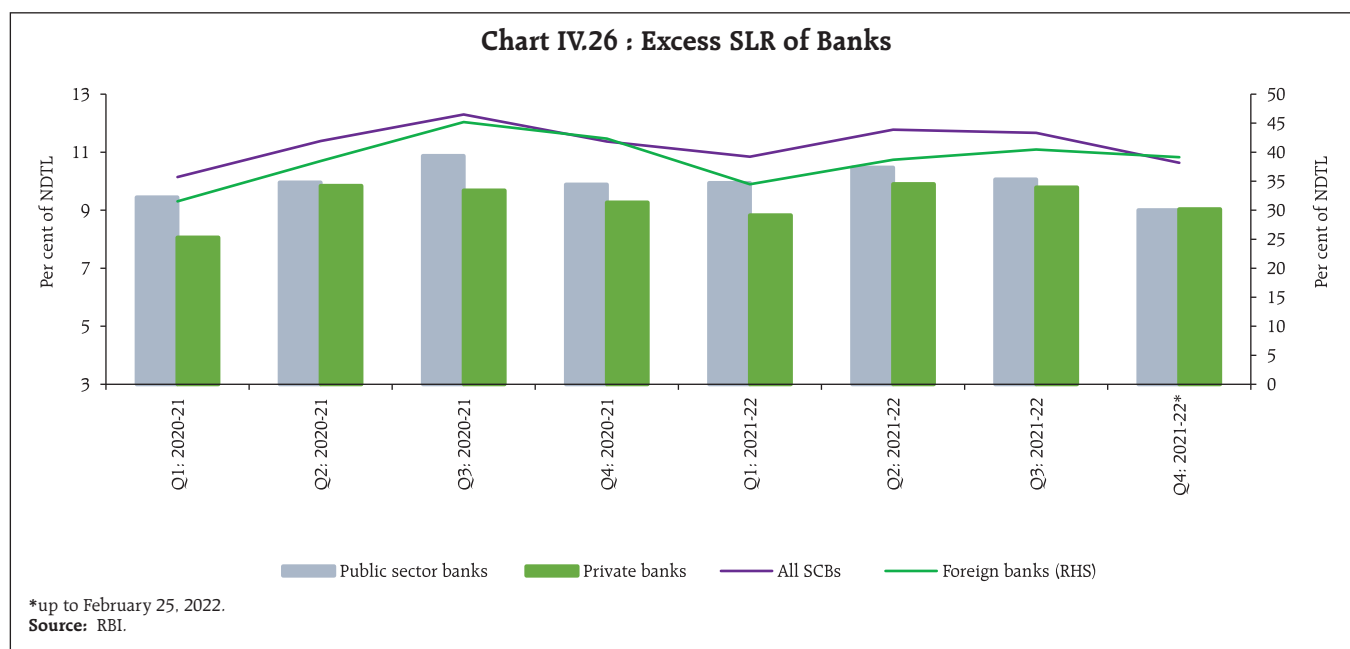
IV.2 Monetary Policy Transmission

The accommodative stance of monetary policy, ample surplus liquidity, and the floating rate loans linked to marginal cost of funds-based lending rate (MCLR) getting reset lower contributed to some

Chart IV.25: Non-SLR Investment and Adjusted Non-Food Credit

Source: RBI.





further easing in commercial bank's lending rates in H2:2021-22. In response to the 250 basis points (bps) reduction in the policy repo rate since February 2019 (when the current easing phase started), the weighted average lending rates (WALRs) on fresh and outstanding rupee loans have declined by 213 bps and 143 bps, respectively (Table IV.5).

The proportion of floating rate loans linked to the external benchmarks rose further to 39.2 per cent in

December 2021 from 28.6 per cent in March 2021 and 9.3 per cent in March 2020, which would strengthen transmission further going forward. Correspondingly, the share of MCLR-linked loans has come down, although these still have the largest share (53.1 per cent in December 2021) (Table IV.6). The sustained decline in the MCLRs and the periodic resetting of such loans at lower rates benefitted existing borrowers and led to a softening of WALR on outstanding loans.

Table IV.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)
February 2019 - September 2019 (Pre-External Benchmark)	-110	-9	-8	-30	0	-43
October 2019 – March 2022* (External Benchmark Period)	-140	-180	-181	-128	-143	-170
March 2020 - March 2022* (COVID period)	-115	-150	-143	-95	-124	-140
February 2019 – March 2022* (Current Easing Cycle)	-250	-208	-189	-155	-143	-213
April 2021 –September 2021	0	0	-21	-5	-18	-2
October 2021 – March 2022*	0	0	-5	0	-11	-8

*: Latest data on WALRs and WADTDR pertain to February 2022.

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.

Table IV.6: Outstanding Floating Rate Rupee Loans of SCBs across Interest Rate Benchmarks

(Per cent to total)

	March 2020	March 2021	June 2021	December 2021
Base rate regime	10.2	6.4	6.5	5.3
MCLR regime	77.7	62.8	60.3	53.1
External benchmark regime	9.3	28.6	32.2	39.2
Others	1.7	1.5	0.5	1.9

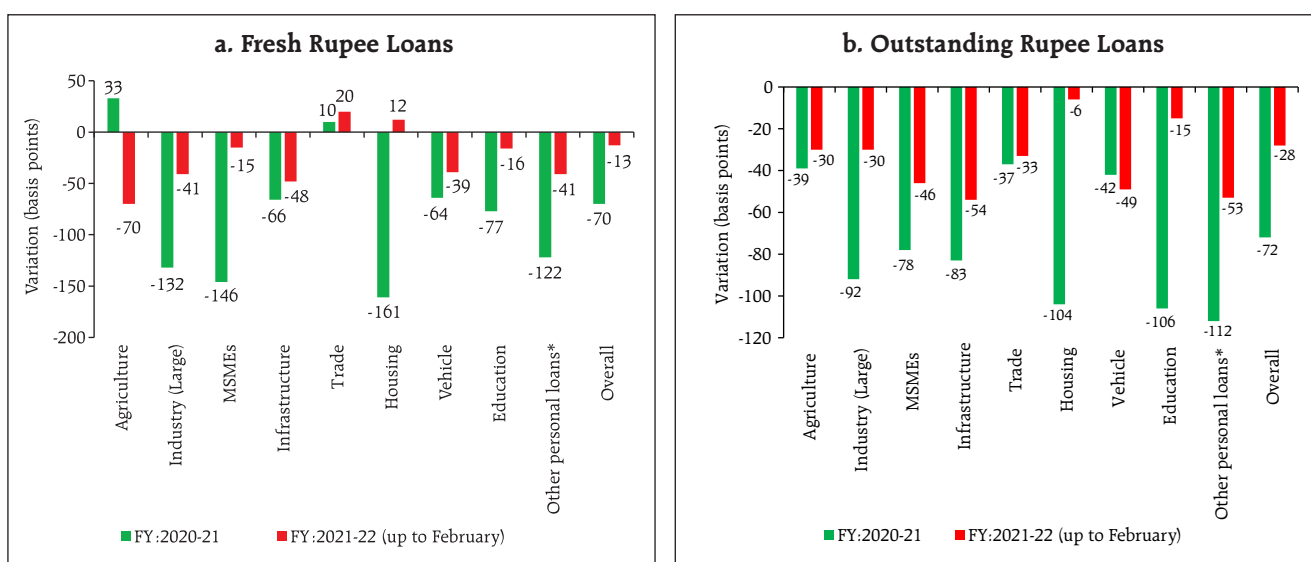
Note: Data pertain to 74 scheduled commercial banks.**Source:** RBI.

The reduction in lending rates was seen across most sectors in 2021-22, adding to the softening recorded in 2020-21. The decline was the sharpest for agricultural loans, infrastructure, large industry and other personal loans in the case of fresh rupee loans and for infrastructure, other personal loans, vehicle

and micro, small and medium enterprises (MSMEs), in the case of outstanding rupee loans (Chart IV.27).

In February 2022, lending rates (outstanding loans) were the lowest in respect of housing loans, reflecting the lower risk of default and the availability of collaterals. Other personal loans, *i.e.*, loans other than housing, vehicle and educational loans are mostly unsecured and hence they have higher credit risk and spreads (Chart IV.28). In the case of fresh loans, large industry got loans at the lowest rates, followed by infrastructure and housing loans⁹.

Monetary transmission to WALR on fresh rupee loans in retail and MSME sectors, where new floating rate loans have been mandatorily linked to an external benchmark¹⁰, registered substantial improvement (Chart IV.29).

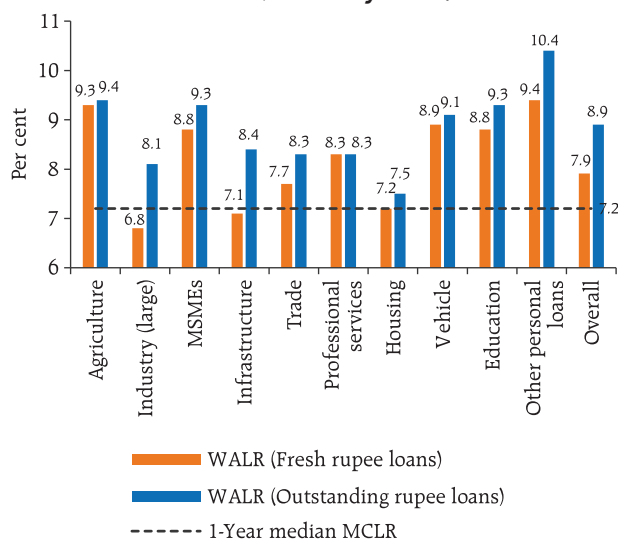
Chart IV.27: Sector-wise Transmission to WALRs of Domestic Banks

*: 'Other personal loans' include personal loans other than housing, vehicle, education and credit card loans.

Source: RBI.

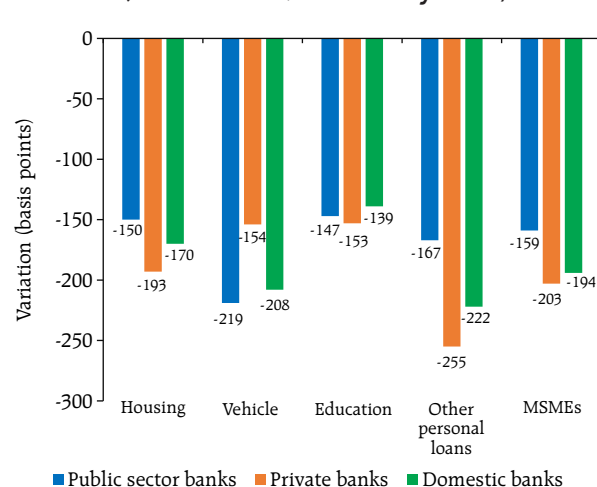
⁹ The share of outstanding loans linked to external benchmarks increased from 4.7 per cent in March 2020 to 20.4 per cent in December 2021 for industry (large) and from 8.9 per cent to 20.8 per cent for infrastructure segment.

¹⁰ The Reserve Bank mandated that all scheduled commercial banks (excluding regional rural banks) should link all new floating rate personal or retail loans and floating rate loans to micro and small enterprises (MSEs) to an external benchmark, *viz.*, the policy repo rate or 3-month T-bill rate or 6-month T-bill rate or any other benchmark market interest rate published by Financial Benchmarks India Private Ltd. (FBIL) effective October 1, 2019. The directive was extended to medium enterprises effective April 1, 2020.

Chart IV.28: Sector-wise WALRs of Domestic Banks (February 2022)

The spreads charged by domestic banks over the policy repo rate (in the case of loans where the repo rate is the external benchmark) moderated during H2, and were the lowest for other personal loans and housing loans in February 2022 (Table IV.7).

The external benchmark-based pricing of loans (which has hastened adjustments by banks in their cost of funds to maintain net interest margins), weak credit demand and ample surplus liquidity improved

Chart IV.29: Transmission to WALR (Fresh Loans) on Personal Loans and Loans to MSMEs (October 2019 - February 2022)

transmission to term deposit rates (Chart IV.30a). The median term deposit rate (MTDR) – the prevailing card rates on fresh deposits – has moderated by 150 bps since March 2020, led by shorter tenor deposits of maturity of up to one year (Chart IV.30b). Concomitantly, the weighted average domestic term deposit rate (WADTDR) on outstanding deposits declined by 143 bps. Banks with higher WADTDR have undertaken more rate cuts in the current easing cycle (Chart IV.30c).

Table IV.7: Loans linked to External Benchmark – Spread of WALR (Fresh Rupee Loans) over the Repo Rate

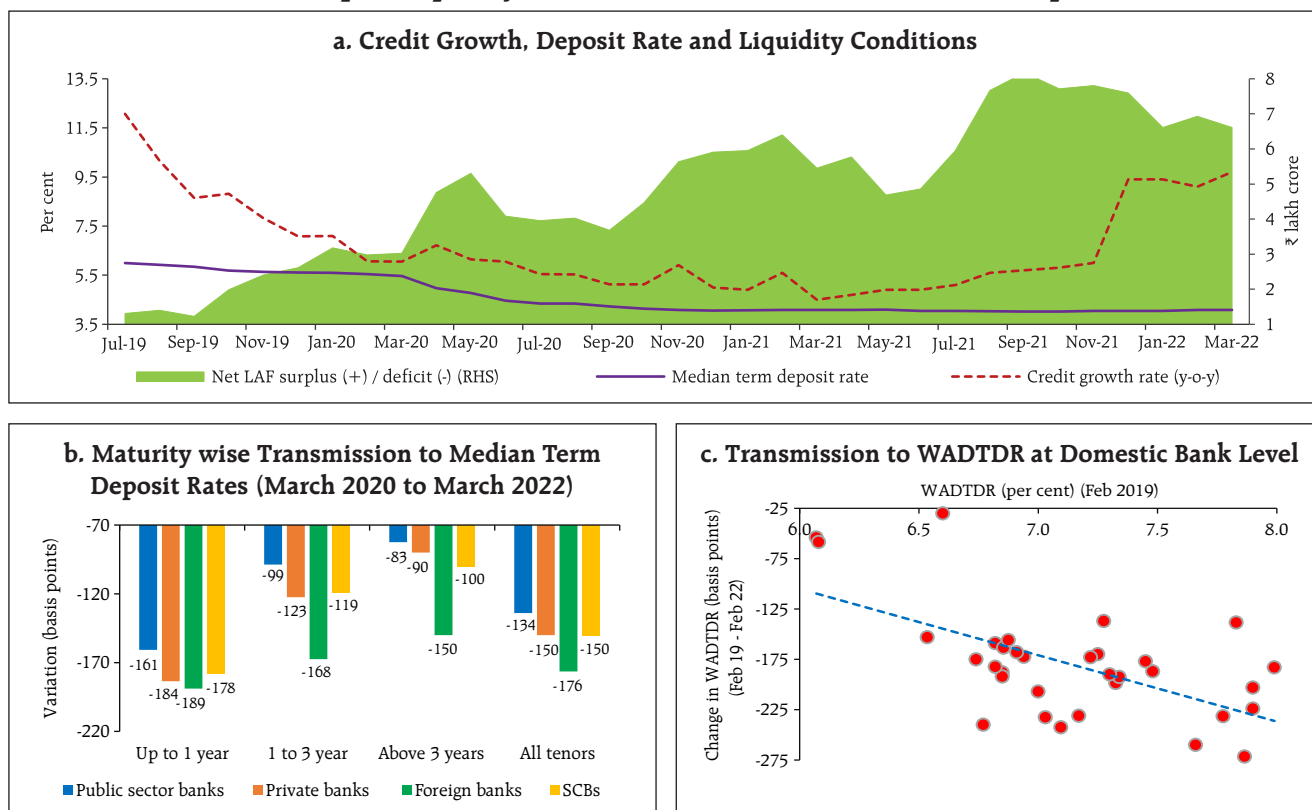
(Per cent)

Sectors	September 2021			February 2022		
	Public sector banks	Private banks	Domestic banks	Public sector banks	Private banks	Domestic banks
MSME loans	5.13	3.98	4.72	4.24	3.92	4.07
Personal loans						
Housing	3.14	3.17	3.16	2.92	3.50	3.28
Vehicle	3.49	4.09	3.55	3.24	3.82	3.30
Education	4.43	6.03	4.76	4.44	5.09	4.59
Other personal loans	5.17	3.54	4.97	3.11	4.79	3.19

Sources: RBI; and RBI staff estimates.

The decline in the MTDR of PvBs exceeded that of PSBs, leading to a greater alignment in the levels of deposit rates across the two bank groups. With improving credit demand, however, banks have started pricing in their deposits at higher rates to mobilise stable funding. As a result, the WADTDR on fresh deposits has increased by 24 bps since October 2021. The median saving deposit rate for domestic banks has remained sticky in the range of 2.9 to 3 per cent since June 2020.

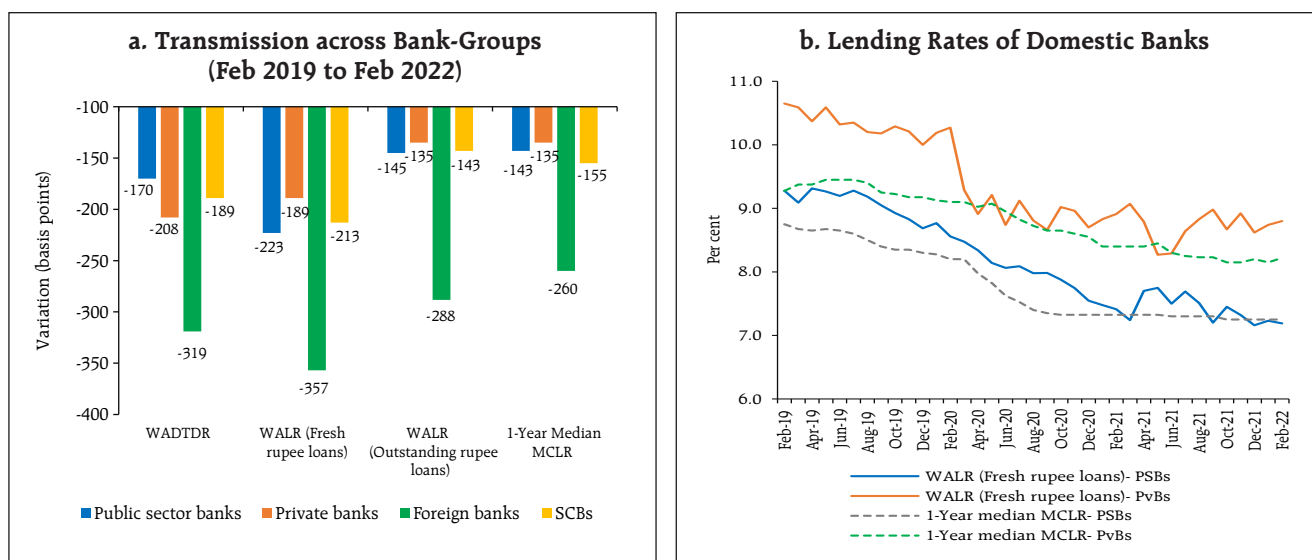
The decline in the lending rates (both fresh and outstanding rupee loans) was higher in the case of PSBs relative to PvBs, contrary to the movements in

Chart IV.30: Surplus Liquidity, Credit Condition and Transmission to Deposit Rates

Sources: RBI; and RBI staff estimates.

deposit rates (WADTDR) (Chart IV.31a). Lending rates (WALRs as well as MCLR) of PSBs continue to remain

below PvBs (Chart IV.31b). The transmission to lending and deposit rates was the maximum in the case of

Chart IV.31: Bank Group wise Transmission to Lending and Deposit Rates in Current Easing Cycle

Sources: RBI; and RBI staff estimates.

Table IV.8: Interest Rates on Small Savings Instruments – Q1:2022-23

Small Savings Scheme	Maturity (years)	Spread (Percentage point) \$	Average G-sec Yield (%) of Corresponding Maturity (Dec 2021 -Feb 2022)	Formula based Rate of Interest (%) (applicable for Q1:2022-23)	Government Announced Rate of Interest (%) for Q1:2022-23	Difference (basis points)
(1)	(2)	(3)	(4)	(5) = (3) + (4)	(6)	(7) = (6) - (5)
Savings Deposit	-	-	-	-	4.00	-
Public Provident Fund	15	0.25	6.76	7.01	7.10	9
Term Deposits						
1 Year	1	0	4.32	4.32	5.50	118
2 Year	2	0	4.76	4.76	5.50	74
3 Year	3	0	5.21	5.21	5.50	29
5 Year	5	0.25	6.10	6.35	6.70	35
Recurring Deposit Account	5	0	5.21	5.21	5.80	59
Monthly Income Scheme	5	0.25	6.07	6.32	6.60	28
Kisan Vikas Patra	124 Months#	0	6.76	6.76	6.90	14
NSC VIII issue	5	0.25	6.24	6.49	6.80	31
Senior Citizens Saving Scheme	5	1.00	6.10	7.10	7.40	30
Sukanya Samriddhi Account Scheme	21	0.75	6.76	7.51	7.60	9

\$: Spreads for fixing small saving rates as per Government of India Press Release of February 2016.

#: Current maturity is 124 months.

Note: Compounding frequency varies across instruments.

Sources: Government of India; FBIL; and RBI staff estimates.

foreign banks, as a higher share of low cost and lower duration wholesale deposits in their total liabilities facilitated faster adjustment in interest rates.

The Government has left the interest rates on various small savings instruments (SSIs) – which are fixed on a quarterly basis with a spread of 0-100 bps over and above G-sec yields of comparable maturities – unchanged since Q2:2020-21, *i.e.*, for the eighth successive quarter. In view of the increase in the G-sec yields in recent months, the excess of the announced interest rates on SSIs over the respective formula-based rates moderated to 9-118 bps for Q1:2022-23 from 42-168 bps in Q4:2021-22 (Table IV.8).

IV.3 Liquidity Conditions and the Operating Procedure

The RBI Act, 1934 requires the Reserve Bank to place the operating procedure relating to the implementation of monetary policy and changes

thereto from time to time, if any, in the public domain. As part of the monetary policy and other announcements of April 8, 2022 certain changes have been effected in the operating procedure to further refine it by improving its flexibility, efficiency in liquidity management and operational convenience, as set out below (Box IV.2).

In consonance with the accommodative stance of monetary policy, the Reserve Bank maintained ample surplus liquidity in the system during H2, aimed at nurturing and supporting the nascent growth impulses by ensuring adequate flow of credit to the productive sectors of the economy. Simultaneously, with the objective of restoring the revised liquidity management framework – suspended in March 2020 after the outbreak of COVID-19 – the RBI continued with rebalancing of liquidity from the passive fixed rate overnight reverse repo window towards longer tenors through VRRR auctions in a gradual, calibrated and non-disruptive manner.

Box IV.2: Refinements in the Operating Framework of Monetary Policy in India

The amendment to Section 17 of the RBI Act in 2018 enables the Reserve Bank to introduce the Standing Deposit Facility (SDF). By removing the binding collateral constraint on the central bank, the SDF strengthens the operating framework of monetary policy. The SDF as the floor of the LAF corridor would provide symmetry to the operating framework of monetary policy by introducing a standing absorption facility at the bottom of the LAF corridor, similar to the standing injection tool at the upper end of the corridor, namely the marginal standing facility (MSF). Thus, at both ends of the LAF corridor, there will be standing facilities – one to absorb and the other to inject liquidity. Accordingly, access to SDF and MSF will be at the discretion of banks, unlike repo/reverse repo, OMO and CRR which are available at the discretion of the Reserve Bank. The SDF is also a financial stability tool in addition to its role in liquidity management.

The SDF rate will be 25 bps below the policy rate, and it will be applicable to overnight deposits at this stage. It would, however, retain the flexibility to absorb liquidity of longer tenors as and when the need arises, with appropriate pricing. The MSF rate will continue to be 25 bps above the policy repo rate. Thus, the width of the LAF corridor is restored to the pre-pandemic configuration of 50 bps, symmetrically around the policy repo rate, which will be at the centre of the corridor.

The fixed rate reverse repo (FRRR) rate is retained at 3.35 per cent. It will remain as part of RBI's toolkit and its operation will be at the discretion of the RBI for purposes specified from time to time. The FRRR along with the SDF will impart flexibility to the RBI's liquidity management framework.

Both MSF and SDF will be available on all days of the week, throughout the year.

Drivers and Management of Liquidity

Currency demand was the prime source of liquidity leakage while drawdown of government cash balances emerged as the main driver of liquidity accretion during H2. Currency in circulation (CiC) increased by ₹2.1 lakh crore during H2 (up to March 25, 2022), driven by festival season demand and *rabi*

crop harvesting. RBI's forex operations also sucked out liquidity to the tune of ₹1.0 lakh crore in H2 on account of FPI outflows, contrary to a substantial injection of ₹3.0 lakh crore during H1¹¹. The drainage of liquidity due to these factors was to an extent offset by accretion on account of higher government spending to the tune of ₹1.5 lakh crore in H2 (Table IV.9). Open market

Table IV.9: Liquidity – Drivers and Management

(₹ crore)

	2020-21	2021-2022						
		Q1	Q2	H1	Q3	Q4*	H2*	2021-22*
Drivers								
(i) CiC	-4,06,452	-1,26,266	54,921	-71,344	-61,794	-1,48,617	-2,10,411	-2,81,755
(ii) Net Forex Purchases	5,10,516	1,60,843	1,42,395	3,03,238	-17,242	-79,136	-96,378	2,06,860
(iii) GoI Cash Balances	-1,81,999	-2,23,740	-5,600	-2,29,340	1,34,537	19,430	1,53,967	-75,373
Management								
(i) Net OMO Purchases	3,13,295	1,38,965	97,960	2,36,925	-15,060	-7,880	-22,940	2,13,985
(ii) CRR Balances	-1,46,617	29,392	-16,470	12,922	-77,606	32,996	-44,611	-31,689
(iii) Net LAF Operations	-1,52,302	-60,759	-2,86,162	-3,46,921	60,823	1,65,269	2,26,092	-1,20,829

*: Data are up to March 25, 2022.

Note: Data pertain to the last Friday of the respective period.

Source: RBI.

¹¹ The two-year USD-INR sell/buy swap of US\$ 5 billion conducted on March 8, 2022 with a view to elongating the maturity profile of the forward book (deferring liquidity injection through forward delivery to the far leg) mopped up liquidity amounting to ₹0.39 lakh crore.

operations (OMOs) drained liquidity in H2 in contrast to a sizeable injection in H1 from the secondary market G-Sec Acquisition Programme (G-SAP) (Box IV.3). G-SAP was discontinued in H2, given the

ample liquidity surplus, the absence of additional borrowing for goods and services tax (GST) compensation and the expected expansion of liquidity on account of higher government spending.

Box IV.3: Impact of G-Sec Acquisition Programme

Asset purchase programs (APPs) have been undertaken by several central banks (including EMEs) following the COVID-19 outbreak to ease monetary and financial conditions in support of economic recovery (IMF, 2020). APPs lower yields through two main channels, *viz.*, (i) the supply channel by which an APP announcement can immediately moderate the risk premium in anticipation of reduced net supply of government bonds in the market; and (ii) the signalling channel as market participants may perceive the recourse to an APP as an indication that the economic outlook is weak necessitating lower policy rates for a longer period (Arora *et al.*, 2021).

In the Indian context, the Reserve Bank purchased G-secs of ₹2.2 lakh crore under G-SAP in H1:2021-22 to anchor yield expectations in the context of the large borrowing programme of the Government. Asset purchases under G-SAP were different from regular open market operation (OMO) purchases as (i) these provided an upfront commitment on amounts in contrast to regular OMOs, which are discretionary; (ii) the size of

G-SAP auctions was larger than conventional OMOs; and (iii) purchases included both liquid and illiquid securities (RBI, 2021). The market response to the nine G-SAP auctions was favourable (Chart IV.3.1). The last two auctions were liquidity neutral with purchases being offset by simultaneous sales of an identical amount (special OMOs).

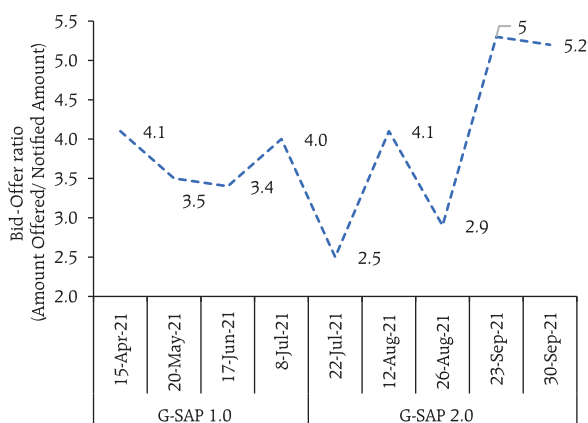
To assess the announcement effect of the G-SAP on yields in an event study (ES) framework, daily changes ($close_t - close_{t-1}$) in the benchmark 10-year G-sec yield (Gsec) for April-September 2021 (period during which G-SAP was conducted) are regressed on the proximate macroeconomic and financial market drivers of yields: (i) change in yield on the previous day to account for hysteresis effects (persistence); (ii) changes in US 10-year bond yield (US10Y) and crude oil prices (Crude) to capture the impact of global factors on domestic yields; and (iii) domestic inflation surprises ($\Delta Inflation$) which is defined as the difference between actual CPI inflation and consensus forecasts. The impact of G-SAP on yields is captured by inclusion of a dummy for the policy day (April 4) when G-SAP was announced (GSAP_GS) and for each of the respective G-SAP announcement (GSAP_IA) dates¹².

$$\begin{aligned} \Delta Gsec_t = & \alpha_0 + \sum_{i=1}^n \beta_i * \Delta Gsec_{t-i} + \sum_{i=1}^n \lambda_i * \\ & \Delta US10Y_{t-1}^i + \sum_{i=1}^n \psi_i * \Delta Crude^i + \\ & \sum_{i=1}^6 \eta_i * \Delta Inflation^i + \mu_i * GSAP_GS^i + \\ & \sum_{i=1}^9 \delta_i * GSAP_IA^i + \omega_i * D_Switch^i + \gamma_i * D_NB^i + \varepsilon_t \end{aligned}$$

The estimated coefficients suggest a statistically significant impact of domestic and global factors (domestic inflation, US bond yields and crude oil prices) on yields (Table IV.3.1). The G-SAP announcements cumulatively

(contd.)

Chart IV.3.1: Bid-Offer Ratio of G-SAP Auctions



Source: RBI.

¹² Idiosyncratic events/factors which impacted yields during this period – conversion/switch operation conducted on April 15 (D_Switch) and the introduction of a new 10-year benchmark announced on July 5 (D_NB) – are also controlled for in the regression.

Table IV.3.1: G-SAP Impact on 10-year G-Sec Yields

Variables	Coefficient
Constant	-0.000
Lag (-1)	-0.084
Δ US10Y (-1)	0.107**
Δ Crude_Oil	0.003***
Δ Inflation	0.026***
G-SAP_GS	-0.037***
Σ GSAP	-0.092***
D-Switch	0.100***
D-New Benchmark	0.097***
Diagnostic tests (p-value)	
BG LM test for autocorrelation of residuals	0.397
Breusch-Pagan-Godfrey – Heteroscedasticity Test	0.987

Note: *, **, *** denote significance at 10, 5 and 1 per cent level, respectively. Sample period for the analysis is April 1-September 30, 2021

Source: RBI staff estimates.

softened the benchmark bond yield by 9 basis points in spite of gross market borrowings remaining elevated for the second successive year and recurrent supply shocks that kept inflation elevated. Thus, G-SAP operations facilitated congenial and orderly financing conditions that provided a conducive environment for the domestic recovery.

References:

International Monetary Fund (2020), *Global Financial Stability Report*, October.

Arora, R., S. Gungor, J. Nesrallah, G. O. Leblanc and J. Witmer (2021), "The Impact of the Bank of Canada's Government Bond Purchase Program", Bank of Canada, Staff Analytical Note 2021-23.

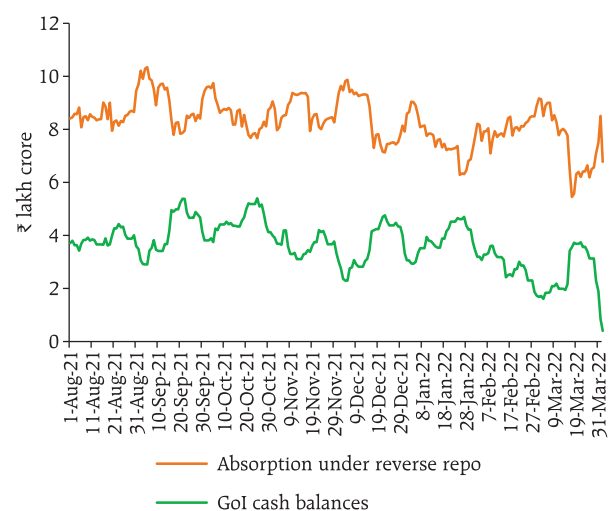
Liquidity absorption through the reverse repo mirrored movements in government cash balances, given the latter's transient role in driving frictional liquidity (Chart IV.32).

Liquidity Rebalancing

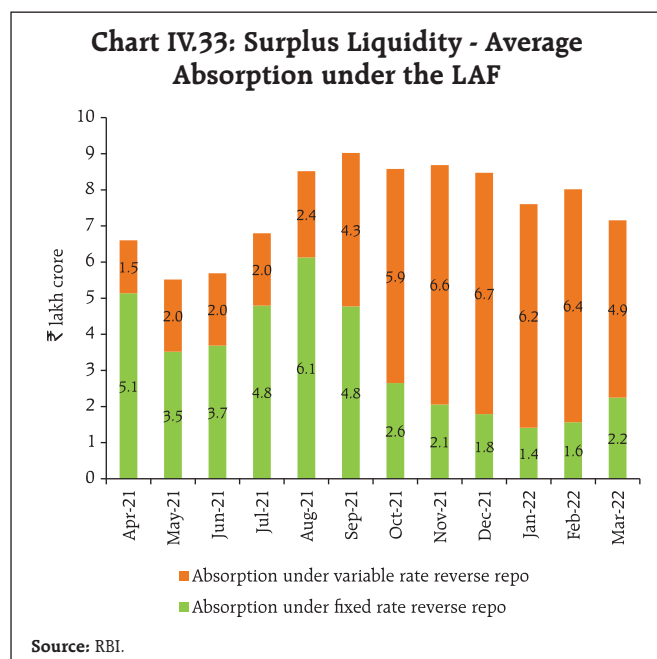
The Reserve Bank progressively enhanced the size of the 14-day VRRR auctions in H2 to re-establish

them as the main liquidity management operation, complemented by fine tuning operations of varying sizes and maturities (3-28 days). The 14-day VRRR auction amount was increased in a calibrated and pre-announced path from ₹4.0 lakh crore on October 8 to ₹7.5 lakh crore by December 31, 2021. Due to their higher remuneration relative to the fixed rate reverse repos, the VRRR auctions drew favourable market responses. Reflecting these developments, the amount absorbed under the fixed rate reverse repo declined to a daily average of ₹2.0 lakh crore in H2 from ₹4.7 lakh crore in H1, with a concomitant increase in absorption through variable rates (both main and fine-tuning operations) to ₹6.2 lakh crore from ₹2.3 lakh crore over the same period (Chart IV.33). The Reserve Bank's commitment to flexibly conduct fine tuning operations was reinforced through three variable rate repo (VRR) auctions of 1-3-day maturity, cumulatively injecting ₹2.0 lakh crore during January 20-24, 2022 to address transient liquidity tightness on account of higher than anticipated collections under the GST.

As a step towards rebalancing the liquidity surplus, it was decided to provide one more option to banks to prepay the outstanding amount of

Chart IV.32: Absorption under Reverse Repo and GoI Cash Balance

Source: RBI.



funds availed under the targeted long term repo operations (TLTRO 1.0 and 2.0) conducted during March-April 2020. Accordingly, banks cumulatively returned ₹39,882 crore in two tranches – ₹2,434 crore in December 2021 over and above ₹37,348 crore paid earlier in November 2020. Moreover, given the limited recourse by banks to the marginal standing facility (MSF) in the post-pandemic period due to surplus liquidity conditions, the normal dispensation of allowing banks to dip up to 2 per cent (instead of 3 per cent) of their NDTL was reinstated effective January 1, 2022. At the same time, the RBI extended the deadlines of key targeted liquidity facilities, given the needs of the stressed sectors: special long-term repo operations (SLTRO) facility for small finance banks (SFBs) were made available till December 31, 2021, while also making it on tap; the liquidity facilities of ₹50,000 crore to ease access to emergency health services and ₹15,000 crore for contact-intensive sectors were extended up to June 30, 2022 from March 31, 2022.

With the progressive return of normalcy, and in order to restore the revised liquidity management

framework, the RBI announced on February 10, 2022 that (i) the variable rate repo (VRR) operations of varying tenors would be conducted as and when warranted by the evolving liquidity and financial conditions within the CRR maintenance cycle; (ii) VRRs and VRRRs of 14-day tenor will operate as the main liquidity management tool based on liquidity conditions, conducted to coincide with the CRR maintenance cycle; (iii) the main operations will be supported by fine-tuning operations to tide over any unanticipated liquidity changes during the reserve maintenance period while auctions of longer maturity will also be conducted, if required; and (iv) effective March 1, 2022, the windows for fixed rate reverse repo and the MSF operations would be available during 17.30-23.59 hours on all days (as against 09.00-23.59 hours since March 30, 2020 as an interim measure to provide market participants greater flexibility in their liquidity management in view of COVID-19). Market participants were advised to shift their balances out of the fixed rate reverse repo into VRRR auctions and avail the automated sweep-in and sweep-out (ASISO) facility in the e-Kuber portal for operational convenience¹³.

IV.4 Conclusion

Domestic financial markets have moved broadly in sync with the accommodative monetary policy stance. The rebalancing of liquidity from the fixed rate window to variable rate reverse repo auctions is firming up money market rates. Bond yields have risen from historic lows on the back of higher crude oil prices and the expected monetary policy normalisation by advanced economy central banks. Nevertheless, financial conditions remain conducive

¹³ ASISO is an optional facility introduced in August 2020 to provide greater flexibility to banks in managing their day-end CRR balances under which banks pre-set a specific (or range) amount that they wish to maintain at the end of the day. Any shortfall or excess balances maintained will automatically trigger MSF or reverse repo bids, as the case may be, under the ASISO facility.

to growth and credit offtake is gaining traction. The RBI's market operations remain supportive of the recovery. Going forward, they will contextually factor in the developments in global financial and

commodity markets, which are witnessing volatility due to worsening geopolitical situations and monetary policy normalisation in the major AEs, so as to insulate domestic financial markets from spillovers.

V. External Environment

The global economy has been buffeted by severe shocks since the October 2021 MPR. The sharp increase in geopolitical tensions since January 2022 escalating into a full-fledged war in February is imposing a threat to the world economy and its financial system architecture. Meanwhile, inflation is at multi-decadal highs and increasingly getting persistent across major advanced economies and several emerging market economies.

The global economy has been buffeted by severe shocks since the October 2021 MPR. In November, the highly transmissible Omicron variant of the virus emerged, but its impact on lives and livelihoods

turned out to be benign relative to earlier waves and, on the global economy, transient. Furthermore, supply chain disruptions intensified, posing a risk to the global recovery. More recently, the sharp increase in geopolitical tensions since January 2022 escalating into a full-fledged war in February is imposing a bigger threat to the world economy and its financial system architecture. Meanwhile, inflation is at multi-decadal highs and increasingly getting persistent across major advanced economies (AEs) and several emerging market economies (EMEs). The tectonic upward shift in commodity prices, including food and energy, due to the war is making the macroeconomic picture murkier (Box V.1).

Box V.1: Impact of the Russia-Ukraine War on the Global Macroeconomy

Geopolitical hostilities in Ukraine are casting a strong downside to the global macroeconomy. The immediate direct hit on commodities and financial markets has aggravated, with financial sanctions and retaliation. The closure of shipping routes and air space, suspension of logistic and shipping services and shutting down of pipelines, on account of sanctions/apprehensions/voluntary private decisions are creating a new wave of supply disruptions. This is likely to further add to freight costs, ultimately feeding into inflation and impacting trade and output. A surge in geopolitical risk is associated with significant economic contraction, particularly in emerging market economies (Cheng and Chiu, 2018).

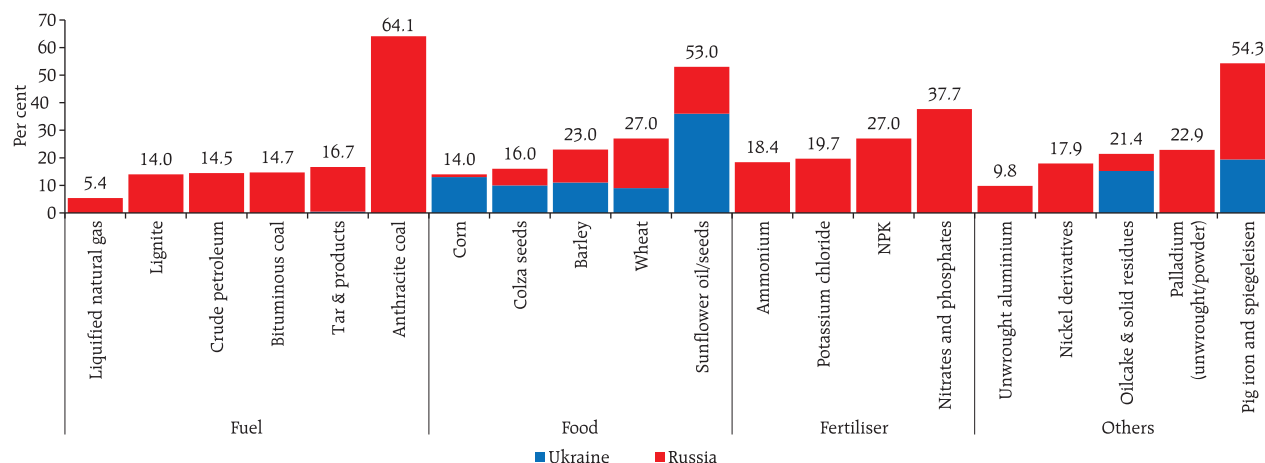
Russia and Ukraine were the 11th and 55th largest economies in the world in 2020, accounting for about 1.7 per cent and 0.2 per cent, respectively, of the world's nominal GDP. Their shares in world exports at 2.3 per cent and 0.3 per cent, respectively, notwithstanding, they have a dominant influence on supplies of key commodities, resulting in an outsized impact on inflation, trade and output at the global level (Chart V.1.1). The world runs a high exposure to fuel, gas, some agro, wood products,

edible oil, wheat, minerals and metals produced by these two countries (Chart V.1.2).

Global food inflation and food security are hostage to the war, as are energy-dependent nations and fertiliser importers, including India. There are second-order spillovers too – it is estimated that the global light vehicle production would be reduced by 2.6 million units in 2022 and 2023 as the conflict has disrupted supplies of vehicle components, including electric power communication parts, palladium, aluminium, nickel and semiconductor-grade neon.

If commodity and financial market shocks persist for at least one year, it is estimated that in 2022, global GDP growth could be reduced by more than 1 percentage point and the global consumer price inflation could be raised by around 2.5 percentage points (OECD, 2022). Europe is likely to be the most impacted in view of high dependence on energy imports. Moreover, it is seeing a massive refugee influx. The OECD estimates that the cost of accommodating 3 million refugees – the total inflow in the first three weeks of the war – in 2022 would be around 0.25 per cent of the European Union's GDP.

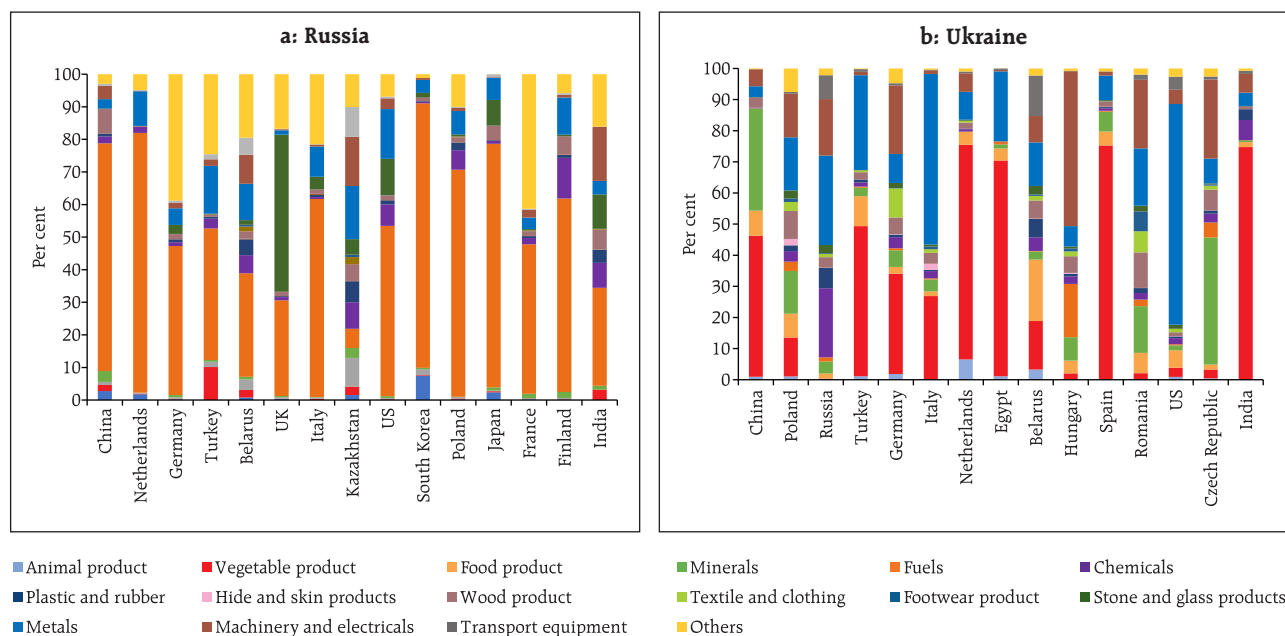
(Contd.)

Chart V.1.1: World Dependence on Russia and Ukraine

Sources: UNCTAD; Trade Map, International Trade Centre; and RBI staff estimates.

The longer-term economic ramifications of the war/sanctions could be deterrence to decarbonisation, higher defence spending, move towards autarky, fragmentation

of payments systems and opaque diversification of foreign exchange reserves.

Chart V.1.2: Export Profile – Major Countries

Source: World Integrated Trade Solution, World Bank.

References:

OECD (2022), "Economic and Social Impacts and Policy Implications of the War in Ukraine", Economic Outlook, Interim Report, March.

Cheng, C. H. J. and Chiu, C.-W.(J.) (2018): "How Important are Global Geopolitical Risks to Emerging Countries?" *International Economics*, doi:10.1016/j.inteco.2018.05.002

V.1 Global Economic Conditions

While there was a pick-up in the momentum of global growth in Q4:2021, more recent high frequency indicators point to some loss of pace in Q1:2022. The US economy registered impressive gains in Q4:2021 primarily due to strong consumer/business spending and non-residential fixed investment (Table V.1). Furthermore, private inventory investment and exports also contributed positively. As a result, US GDP grew by 5.7 per cent in 2021 – the highest since 1984 – as against a contraction of 3.4 per cent in 2020. As 2022 began, the rapid spread of the Omicron variant appeared to be causing a slowdown in some sectors of the economy but the virus spread has been receding since mid-January. The S&P Global US composite Purchasing Managers' Index (PMI) after touching an 18-month low of 51.1 in January bounced back to 55.9 in February 2022 as virus containment measures were scaled back and further rose to an 8-month high in March with broad-based acceleration in activity. The US labour market continued to tighten, with wages rising 4.5 per cent in 2021 – the fastest pace since 1983 – although the labour force participation rate remained below pre-pandemic levels. Stronger household balance sheets, rising employment and adaptation to the pandemic by businesses are factors supporting the outlook whereas the war and the pandemic are the major headwinds.

The Euro area's GDP grew by 1.0 per cent (q-o-q, saar) in Q4:2021, its slowest rate in three quarters, as the Omicron variant's spread necessitated restrictions, creating labour shortages and denting consumer confidence. The composite PMI for the Euro zone registered its highest monthly jump in five months in February 2022 as containment measures abated but slid in March as business activity slowed down particularly in manufacturing. The growth outlook for 2022 is overcast by the war and persistently high and rising energy costs.

Table V.1: Real GDP Growth

(Per cent)

Country	Q1: 2021	Q2: 2021	Q3: 2021	Q4: 2021	2020	2021 (E)	2022 (P)	2023 (P)
Quarter-on-quarter, seasonally adjusted annualised rate (Q-o-q, SAAR)								
Canada	4.8	-3.6	5.5	6.7	-	-	-	-
Euro area	-0.5	9.1	9.3	1.0	-	-	-	-
Japan	-2.2	2.4	-2.8	4.6	-	-	-	-
South Korea	7.1	3.1	1.3	5.0	-	-	-	-
UK	-4.6	24.6	4.0	5.2	-	-	-	-
US	6.3	6.7	2.3	6.9	-	-	-	-
Year-on-year								
Advanced Economies								
Canada	0.2	11.7	3.8	3.3	-5.2	4.8	4.1	2.8
Euro area	-0.9	14.6	4.0	4.6	-6.4	5.3	3.9	2.5
Japan	-1.8	7.3	1.2	0.4	-4.5	1.8	3.3	1.8
South Korea	1.9	6.0	4.0	4.2	-0.9	4.0	3.0	2.9
UK	-5.0	24.6	7.0	6.6	-9.3	7.4	4.7	2.3
US	0.5	12.2	4.9	5.5	-3.4	5.7	4.0	2.6
Emerging Market Economies								
Brazil	1.3	12.3	4.0	1.6	-3.9	4.6	0.3	1.6
China	18.3	7.9	4.9	4.0	2.2	8.1	4.8	5.2
India	2.5	20.3	8.5	5.4	-6.6	8.9	9.0	7.1
Indonesia	-0.7	7.1	3.5	5.0	-2.0	3.7	5.6	6.0
Philippines	-3.9	12.0	6.9	7.7	-9.6	5.6	6.3	6.9
Russia	-1.8	-0.7	10.5		-3.0	4.7	2.8	2.1
South Africa	-2.4	19.6	2.9	1.7	-6.4	4.9	1.9	1.4
Thailand	-2.4	7.7	-0.2	1.9	-6.2	1.6	4.1	4.7
Memo:								
World	2020		2021 (E)		2022 (P)		2023 (P)	
Year-on-year								
Output	-3.1		5.9		4.4		3.8	
Trade Volume	-8.2		9.3		6.0		4.9	

E: Estimate

P: Projection.

Note: India's data correspond to fiscal year (April-March); E.g., 2020 pertains to April 2020-March 2021.

Sources: Official statistical agencies; Bloomberg; IMF WEO Update, January 2022; and RBI staff estimates.

In the UK, GDP grew 5.2 per cent (q-o-q, saar) in Q4:2021 but still remained 0.1 per cent below its pre-pandemic level, *i.e.*, Q4:2019. As the economic impact of the Omicron variant ebbed, GDP increased to 0.8 per cent above its pre-pandemic level in January 2022, driven by growth in all sectors, including consumer-facing services, production and

construction. The unemployment rate continued to decline despite closure of the furlough scheme at end-September 2021. The composite PMI hit an 8-month high of 59.9 in February 2022 driven by strong recovery in consumer spending on travel, leisure and entertainment and rose further in March. The growth outlook is, however, mired in uncertainty as the soaring of energy prices due to the war portends adversely for already high inflation.

Japan's GDP grew by 4.6 per cent (q-o-q, saar) in Q4:2021, in contrast to the 2.8 per cent contraction logged in Q3. The upturn marked the strongest pace of quarterly growth in a year, as both household consumption and business investment revived amidst a decline in COVID-19 cases, easing restrictions and the advancing vaccination campaign. Overall, the Japanese economy expanded by 1.8 per

cent in 2021 but it remains below its pre-pandemic level of output. There was a resurgence of COVID-19 cases in the beginning of 2022. The au Jibun Bank Japan composite PMI improved to 50.3 in March 2022 from 45.8 in February – first rise in output after three consecutive months of contraction with services continuing to be in decline. Japan's economy would likely recuperate as containment measures fade but the war may pose a downside.

Moving to EMEs, the Chinese economy grew by 8.1 per cent in 2021, exceeding the government's target of above 6 per cent; however, growth of 4.0 per cent (y-o-y) in Q4:2021 was the slowest pace of expansion since Q2:2020 (Table V.2). The government's zero tolerance approach to COVID-19 has exacerbated pandemic-related disruptions and muted consumer spending, while the real estate sector is beset with a

Table V.2: Select Macroeconomic Indicators for BRICS Economies

Real GDP Growth Rate (Per cent)	Country	2020	2021(E)	2022(P)	General Govt. Gross Debt (Per cent of GDP)	Country	2020	2021(E)	2022(P)
	Brazil	-3.9	4.6	0.3		Brazil#	98.9	90.6	90.2
	Russia	-3.0	4.7	2.8		Russia	19.3	17.9	17.9
	India	-6.6	8.9	9.0		India	89.6	90.6	88.8
	China	2.2	8.1	4.8		China	66.3	68.9	72.1
	South Africa	-6.4	4.9	1.9		South Africa	69.4	68.8	72.3
CPI Inflation Rate (Per cent)	Country	2020	2021(E)	2022(P)	Current account balance (Per cent of GDP)	Country	2020	2021(E)	2022(P)
	Brazil	3.2	7.7	5.3		Brazil	-1.8	-0.52	-1.72
	Russia	3.4	5.9	4.8		Russia	2.4	5.7	4.4
	India	6.1	5.4	4.9		India	0.9	-1.0	-1.4
	China	2.4	1.1	1.8		China	1.8	1.6	1.5
	South Africa	3.3	4.4	4.5		South Africa	2.0	2.9	-0.9
General Govt. Net Lending/Borrowing (Per cent of GDP)	Country	2020	2021(E)	2022(P)	Forex Reserves* (in US\$ billion)	Country	2020	2021	2022
	Brazil	-13.4	-6.2	-7.4		Brazil	355.6	362.2	357.7
	Russia	-4.0	-0.6	0.0		Russia	596.1	630.6	630.2
	India	-12.8	-11.3	-9.7		India	588.4	635.3	633.8
	China	-11.2	-7.5	-6.8		China	3536	3578.2	3576.6
	South Africa	-10.8	-8.4	-7.0		South Africa	54.2	57.821	57.8

E: Estimate. P: Projection.

*: Forex reserves for 2022 pertains to February 2022 except Russia (January 2022)

#: Gross debt refers to the nonfinancial public sector, excluding Eletrobras and Petrobras, and includes sovereign debt held by the central bank.

Notes: 1. India's data correspond to fiscal year (April-March).

2. The imputed CPI prints for April and May 2020 for India have been regarded as a break in the CPI series.

Sources: Official statistical agencies; WEO October 2021 database and January 2022 Update, IMF; Fiscal Monitor Update, October 2021, IMF; and IRFCL, IMF.

steep downturn in the property sector. In March, China registered its highest daily infection tally, with several regions including Shanghai going into lockdown. The Caixin China general manufacturing PMI was 48.1 in March, lowest since February 2020 amid the new wave of COVID-19 flare-ups. Looking ahead, several weaknesses lurk in the economy, ranging from rising production and raw material costs to a doubtful demand recovery and the war. The government has set a growth target of 5.5 per cent for 2022, the lowest since 1991.

Brazil's GDP growth decelerated for the second consecutive quarter to 1.6 per cent (y-o-y) in Q4:2021, with industry and agriculture registering a decline. Labour market indicators showed consistent job recovery. Exports have benefited from robust global demand for commodities. Supply bottlenecks, higher interest rates and policy uncertainty have, however, slowed the pace of recovery. The manufacturing PMI hit a 6-month high in March but overall remained in contraction in Q1:2022. Going forward, elevated interest rates and a fragile fiscal position weigh on activity, with the ongoing war-related uncertainty remaining a key risk to the outlook.

South Africa's GDP growth decelerated to 1.7 per cent (y-o-y) in Q4:2021. In January 2022, South Africa experienced its heaviest rainfall on record, which caused extensive crop damage and was declared a national disaster by the authorities. The composite PMI for March, however, signalled expansion for the third successive month due to increase in employment even as inflation weighed on activity. Looking ahead, the growth outlook is fraught with risks, including the emergence of new COVID-19 variants, low vaccination levels, poor jobs outlook and continued disruptions to power supply.

The Russian economy ended 2021 on a strong footing on sturdier industrial production growth, which more than offset a slowdown in the services

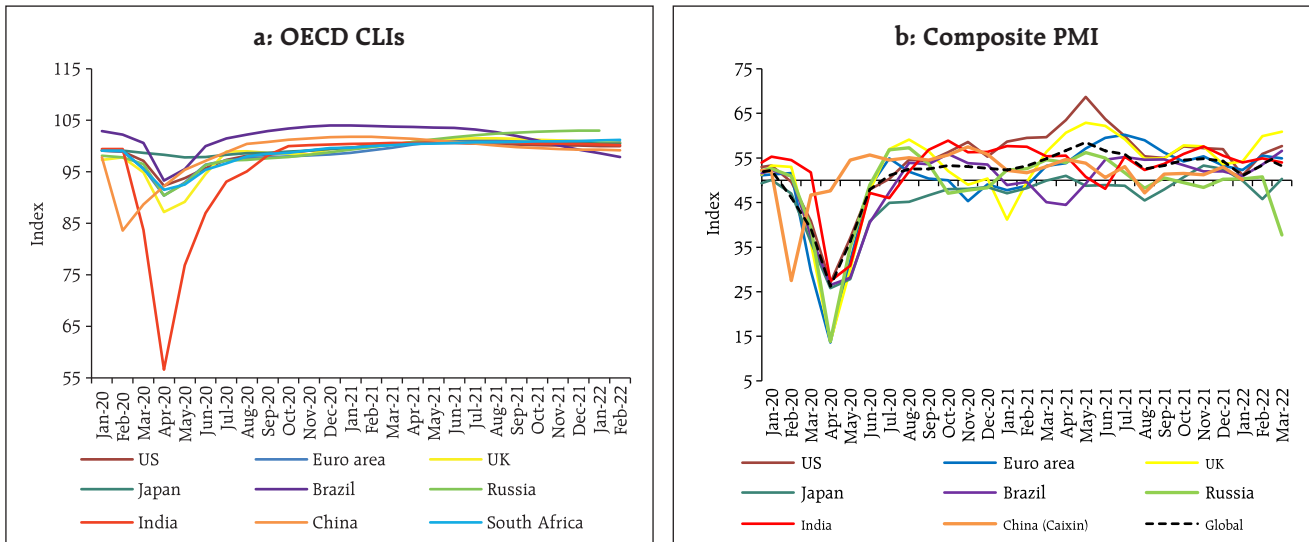
sector amidst cooling retail sales. GDP expanded 4.7 per cent in 2021, recording the strongest upturn since 2008. In February 2022, the composite PMI was at a 7-month high of 50.8 but slid in March 2022 to its lowest level since May 2020, registering a marked contraction in business activity. Furthermore, international sanctions are expected to lead to a sharp downward plunge in the economy.

South-east Asian economies recovered in Q4:2021 as pandemic-induced restrictions eased and inoculation rates improved. The manufacturing PMI for the ASEAN economies in March 2022 eased to a 6-month low amidst softer demand conditions. The region faces headwinds due to the war and its fallout on commodity prices, especially wheat and potassic fertiliser.

The OECD composite leading indicators (CLIs) available up to February 2022 suggest moderate deceleration across most major AEs and divergent movements for major EMEs (Chart V.1a). The global composite PMI suggests easing of momentum at end of Q1:2022 with the March reading moderating to 52.7 as output growth slowed in both services and manufacturing (Chart V.1b).

World trade momentum has moderated since H2:2021 as pent-up demand normalised (Chart V.2a). This is corroborated by the World Trade Organization (WTO)'s Goods Trade Barometer reading of 98.7 in December 2021, which is below the barometer's baseline value of 100. The WTO, in an October 2021 release, expected merchandise trade growth to moderate to 4.7 per cent in 2022 from 10.8 per cent in 2021. The Baltic Dry Index – a measure of shipping costs for a wide variety of bulk commodities such as coal, iron ore and grain – has moderated after peaking in October 2021. Rising uncertainty and disruptions due to the war, however, have put pressure on shipping costs (Chart V.2b).

Chart V.1: Survey Indicators



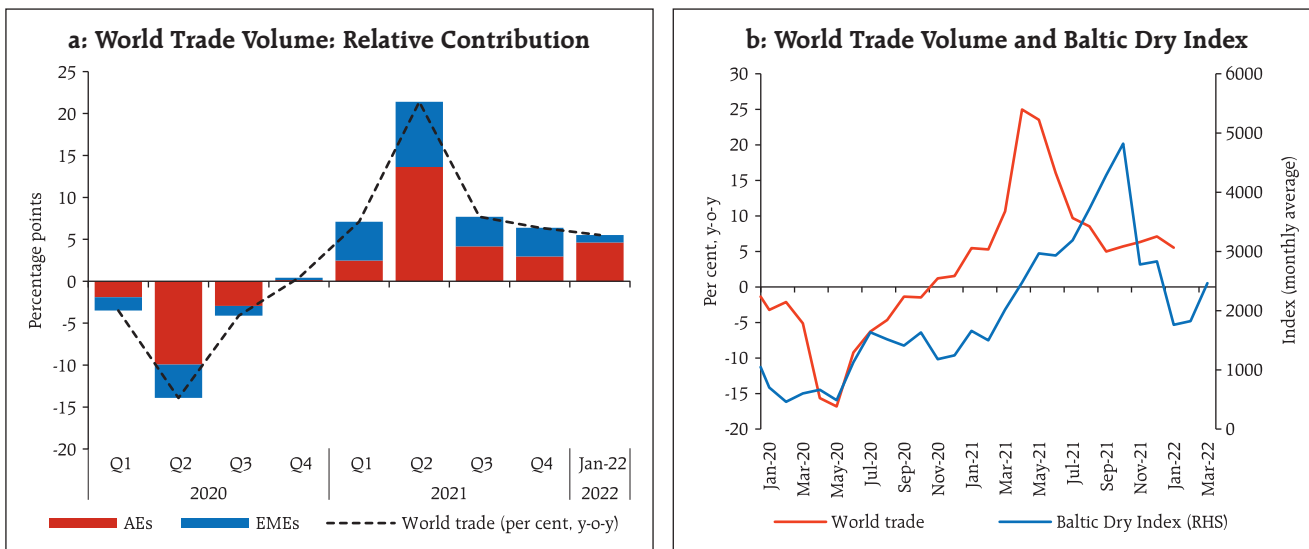
V.2 Commodity Prices and Inflation

Following a blip in November 2021 on account of the Omicron's onset, global commodity prices resumed rallying in December with the outbreak of the war sending fresh shock waves across markets from end-February. As a result, prices of most commodities soared, pushing the Bloomberg commodity price index

to an 8-year high in early-March. Notwithstanding some moderation thereafter, the index increased by 23.5 per cent between September 2021 and March 2022.

The food price index of the Food and Agriculture Organization (FAO) increased by 8.9 per cent between September 2021 and February 2022

Chart V.2: World Trade Volume



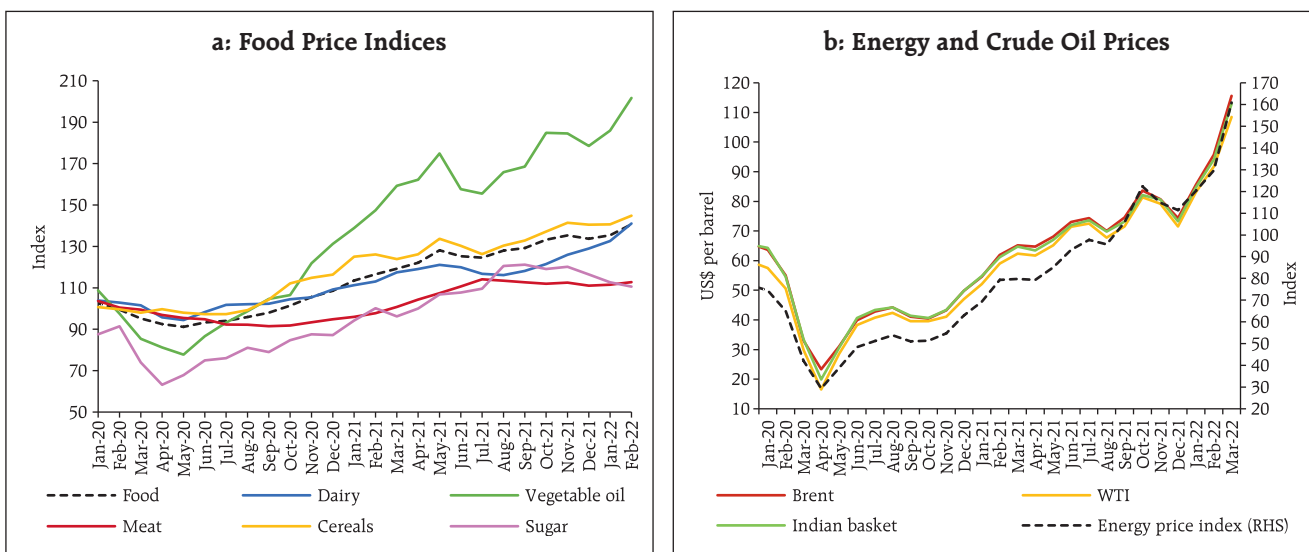
(Chart V.3a). Prices hit an all-time high in February, rising 20.7 per cent (y-o-y) primarily on strong vegetable oil and dairy prices – the former reaching a new record on concerns over global supply flows. For sugar, however, favourable production prospects in major exporting countries have kept price pressures muted since December. Food prices are likely to pick up further in coming months as fertiliser prices have soared in March on fears of prolonged disruption in global supply of potash and nitrogen crop nutrients.

Crude oil prices ended 2021 51.4 per cent higher year-on-year, on the back of a rally in October and early November. They resurged in early 2022, breaching US\$90 per barrel towards end-January – the first time in seven years – as demand remained robust while supply faced capacity constraints and escalated geopolitical tensions (Chart V.3b). With the Russia-Ukraine war propelling risks of outright supply losses and OPEC *plus* providing no respite, crude oil prices rocketed to a 14-year high of US\$133 per barrel in the

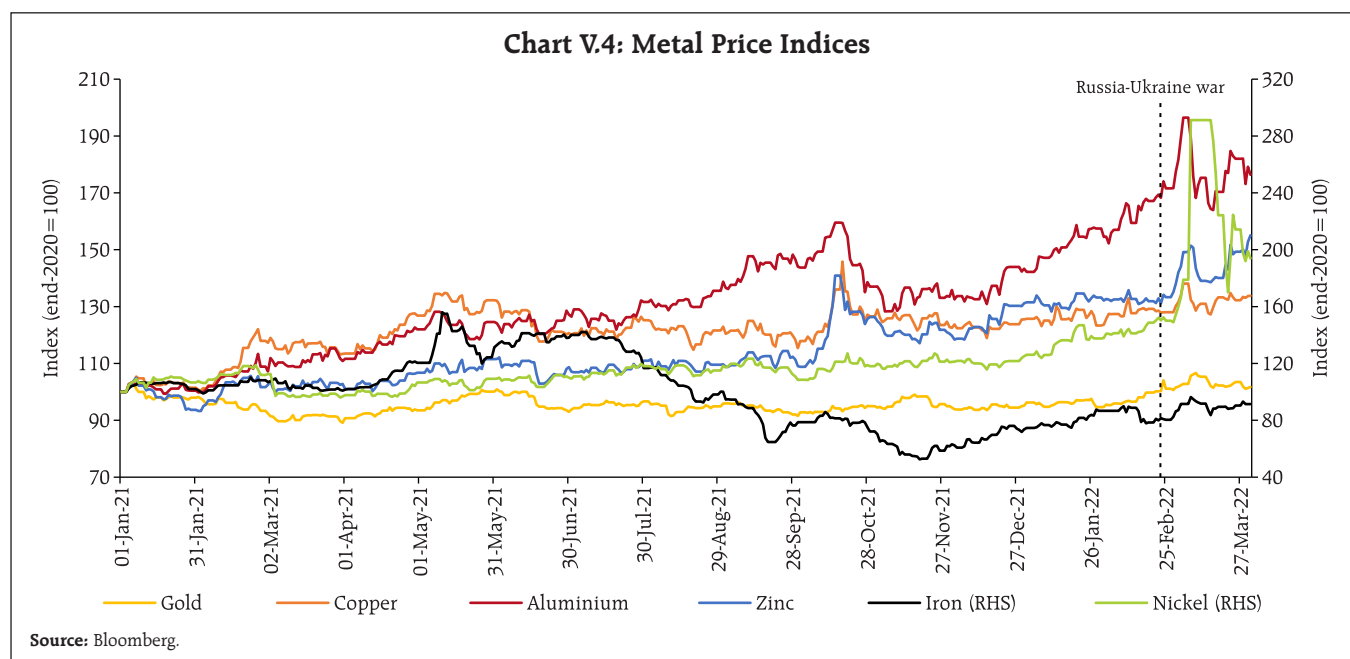
first week of March. Prices have remained volatile thereafter fluctuating around US\$110 per barrel. Notwithstanding the volatility, Brent crude oil prices surged by 38 per cent in Q1:2022.

Base metal prices, measured by Bloomberg's base metal spot index, increased by 25.0 per cent between September 2021 and March 2022 (Chart V.4). From end-December there has been a broad-based pick up in metal prices, underpinned by improved demand prospects as also strained supplies due to disruptions in a few major metal exporting countries. The war upended the markets and most metals scaled multi-year highs, with aluminium and nickel leading. Following the unprecedented surge in prices, the London Metal Exchange suspended nickel trading for over a week in the second week of March. Gold prices inched up and stayed around the psychological level of US\$1,800 per troy ounce in Q4:2021 and January 2022. Bullion prices spurted from February on increased flight to safety before paring some gains in the second half of March.

Chart V.3: Commodity Prices



Sources: FAO; and World Bank.



Inflation ratcheted up across economies on cost push pressures from persistent supply chain bottlenecks, high commodity prices and spiralling wage pressures. Headline inflation has soared to multi-decadal highs across most AEs, barring Japan; for EMEs too, barring China and Indonesia, it continued to hover at elevated levels (Table V.3). High energy and food costs are the major drivers for inflation in AEs besides, price pressures in durable goods, particularly used cars and trucks, and services such as rents. For most EMEs, however, inflation is essentially driven by supply shocks with demand-pull pressures remaining relatively weak, given the slack in economic activity.

In the US, headline inflation in terms of both the CPI and the personal consumption expenditure (PCE) price index – the Federal Reserve (Fed)’s preferred measure of inflation – edged up to fresh 40-year high of 7.9 per cent and 6.4 per cent, respectively, in February 2022 (Chart V.5a). The monthly momentum of inflation quickened from October 2021 primarily on surging energy, food and durable goods prices. Moreover, spiralling rents and building wage pressures mirrored in the multi-decadal high annual wage growth are

Table V.3: Inflation

(Per cent)

Country	Inflation Target	Q1:2021	Q2:2021	Q3:2021	Q4:2021	Q1:2022
Advanced Economies						
Canada	2.0	1.4	3.4	4.1	4.7	5.4
Euro area	2.0	1.0	1.8	2.9	4.7	6.2
Japan	2.0	-0.5	-0.8	-0.2	0.5	0.7
South Korea	2.0	1.4	2.5	2.5	3.6	3.8
UK	2.0	0.6	2.0	2.8	4.9	5.9
US	2.0	1.8	3.9	4.3	5.5	6.2
Emerging Market Economies						
Brazil	3.50 ± 1.5	5.3	7.7	9.6	10.5	10.5
Russia	4.0	5.6	6.0	6.9	8.3	8.9
India	4.0 ± 2.0	4.9	5.6	5.1	5.0	6.0
China	–	0.0	1.1	0.8	1.8	0.9
South Africa	3.0 - 6.0	3.1	4.8	4.8	5.5	5.7
Mexico	3.0 ± 1.0	4.0	6.0	5.8	7.0	7.2
Indonesia	3.0 ± 1.0	1.4	1.5	1.6	1.8	2.3
Philippines	3.0 ± 1.0	4.0	4.0	4.1	3.6	3.3
Thailand	1.0 - 3.0	-0.5	2.4	0.7	2.4	4.7
Turkey	5.0	15.6	17.1	19.3	25.8	54.8

Notes: (1) Quarterly inflation is the simple average of inflation in each month of the quarter. For Q1:2022, the full quarterly average is only for the Euro area, South Korea, Indonesia, Thailand, Philippines and Turkey while for others it is Jan-Feb average.
 (2) Inflation for US is in terms of year-on-year change in personal consumption expenditure price index.
 (3) The Bank of Canada aims to keep inflation at the 2 per cent mid-point of an inflation control target range of 1-3 per cent.
 (4) Brazil's inflation target for 2021 was 3.75 ± 1.5 per cent.

Sources: Central bank websites; and Bloomberg.

fuelling broad-based price pressures. Core CPI inflation has also accelerated with shelter, used cars and trucks remaining the major contributors for most months. In February, other core components such as recreation, household furnishings and operations, personal care, and airline fares also registered increases.

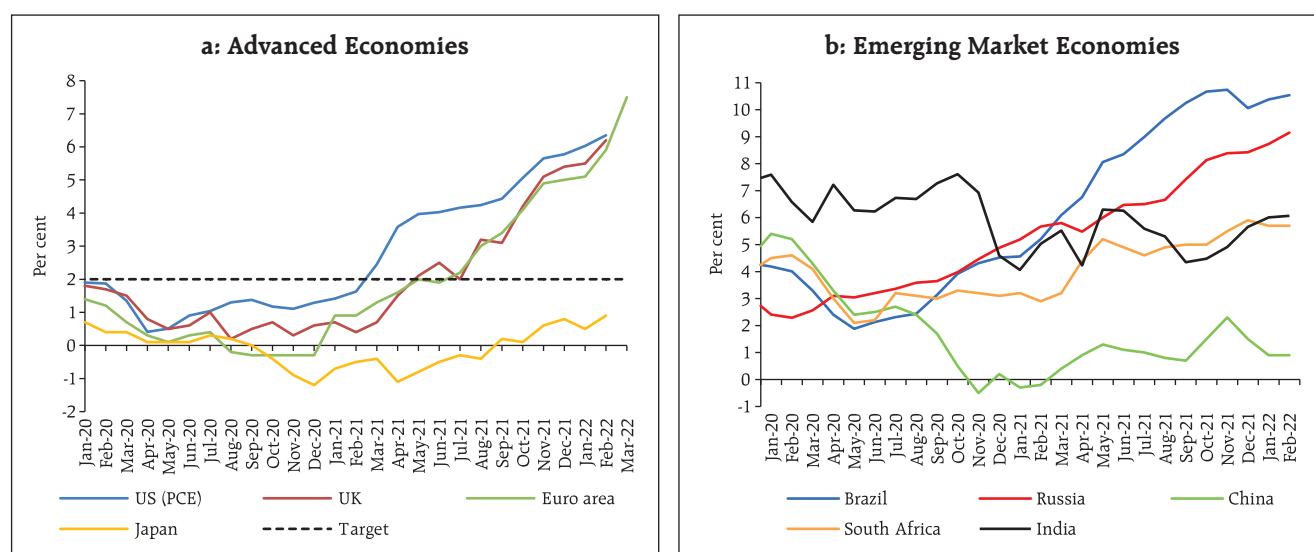
In the Euro area, CPI inflation has been trading above the European Central Bank (ECB)'s target of 2 per cent since July 2021, with the headline reading scaling historical high of 7.5 per cent in March 2022. Steep increase in energy prices, especially of natural gas, remained the major driver with ripple effects for other sectors. High costs of non-energy industrial goods as also rising food prices, and high transportation and fertiliser costs have been fuelling price pressures. Market-based measures of longer-term inflation expectations, however, have remained broadly stable at just below 2 per cent, thereby supporting the ECB's expectation of moderation in prices over the course of the year once supply bottlenecks ease.

CPI inflation in the UK accelerated since Q4:2021 to 6.2 per cent in February 2022 – its highest in the Office of National Statistics' series which began in January 1997¹. Transport cost due to soaring energy prices contributed 1.6 percentage points to the increase. Inflationary pressures are high for food and durable goods as well, while broadening to the services sector partly due to change in value added tax (VAT) rates for hospitality services.

Inflation remained relatively benign in Japan though deflation ended in September 2021. In February, inflation accelerated to a 3-year high of 0.9 per cent as high energy prices overshadowed the effects of weak housing cost and low telecom charges. The pick-up notwithstanding, inflation remains way below the Bank of Japan (BoJ)'s 2 per cent target.

Among major EMEs, inflation in Brazil and Russia has risen to levels more than twice their respective targets since Q4:2021 despite monetary policy being tightened since March 2021 (Chart V.5b). In Brazil,

Chart V.5: CPI Inflation – Select Economies



Sources: Official statistical agencies; and Bloomberg.

¹ As per the historical modelled series, the February 2022 print is the highest since the March 1992 reading of 7.1 per cent.

increase in prices have become more widespread in recent months. Apart from elevated costs for industrial goods, acceleration in services inflation has also added to the upside. CPI inflation in Russia rose to 9.2 per cent in February 2022 with cost-push pressures stemming from commodity prices, labour shortages and capacity shortfalls spiralling amidst a steady demand recovery. In South Africa, CPI inflation has edged up but remains within the central bank's target range. In January, however, inflation eased to 5.7 per cent following some softening in the cost of fuel and health services and remained steady in February. In China, unlike in other BRICS economies, CPI inflation remained subdued reflecting broad moderation in both food, especially pork, and non-food prices. Even core inflation has remained muted due to weakening demand for services amidst sporadic COVID-19 flare-ups and associated stringent restrictions. Producer price inflation has been easing since November after hitting a 26-year high in October, as price stabilisation measures cooled off the rally in raw material prices.

Recent research² suggests that global inflation in 2022 could be 1.5 percentage points higher because of the increase in shipping costs in 2021. This is because the impact of rise in shipping costs peaks in 12 months and lasts up to 18 months. The increased supply disruptions due to the war and China lockdowns could further exacerbate the inflation upside.

V.3 Monetary Policy Stance

COVID-19 saw an unprecedented policy response mounted by governments and central banks. The IMF estimates that up to September 2021, US\$16.9 trillion or 16.4 per cent of global GDP had been pledged as fiscal support in response to the pandemic, with US\$14.5 trillion by AEs and US\$2.4 trillion by EMEs,

Table V.4: Fiscal Support in Response to COVID-19
(Up to September 2021)

(Amount in US\$ billion; Per cent as proportion of GDP)

Country	Amount	Per cent
<i>Advanced Economies</i>		
Canada	327	19.9
European Union	1,361	10.5
Japan	2,273	45.1
UK	975	36.0
US	5,838	27.9
<i>Emerging Market Economies</i>		
Brazil	222	15.4
Russia	96	6.5
India	275	10.3
China	903	6.1
South Africa	30	9.4
World	16,910	16.4

Source: IMF.

including the low-income developing countries (Table V.4). The total monetary support offered in response to the pandemic is estimated at US\$19.0 trillion or 18.4 per cent of global GDP, of which US\$16.1 trillion was by AE central banks and US\$2.9 trillion by EME central banks.

In the US, the Fed began tapering monthly asset purchases of US\$120 billion in mid-November 2021 and wound-up purchases in four months. In its January meeting, the Fed issued a set of principles for reducing the size of its balance sheet: (i) target range for the federal funds rate would be the primary means of adjusting the stance of monetary policy; (ii) reduction in balance sheet size would commence after a lift-off of interest rates; (iii) size of holdings would go down by adjusting the amount of re-investment of maturing securities; (iv) to eventually hold quantum of securities as needed to implement monetary policy efficiently and effectively in an ample reserves regime; and (v) to eventually hold primarily Treasury securities. In its March 2022 meeting, Fed raised the target range for the Federal Funds rate by 25 bps to 0.25-0.5 per cent, the first

² Carrière-Swallow, Y., Deb, P., Furceri, D., Jiménez, D., & Ostry, J. D. (2022). "Shipping Costs and Inflation", *IMF WP/22/61*, March

rate hike since December 2018. To operationalise the rate hike, the Fed revised up the interest rates on reserve balance and overnight reverse repurchase agreement by 25 bps each to 0.4 per cent and 0.3 per cent, respectively. According to the Summary of Economic Projections released in March 2022, the majority of FOMC participants expect interest rate to be 1.75-2.0 per cent by end-2022, *i.e.*, a further 150 bps hike this year.

In its October meeting, the ECB announced a slower pace of asset purchases under the Pandemic Emergency Purchase Programme (PEPP) in Q4:2021 than in the previous two quarters. In December, it further reduced the pace of purchases for Q1:2022 and announced discontinuation of PEPP at end-March 2022 but extended the reinvestment horizon by one year at least until end-2024. To smoothen the transition from end of PEPP purchases, the ECB announced doubling of monthly purchase under the Asset Purchase Programme (APP) to €40 billion (approximately US\$45.3 billion)³ in Q2:2022, to gradually revert to €20 billion (approximately US\$22.7 billion) by October 2022. In its March meeting, the ECB lowered the monthly purchases under APP from €40 billion (approximately US\$43.9 billion) in each month of the quarter to a reduced schedule of €40 billion in April, €30 billion (approximately US\$33 billion) in May and €20 billion (approximately US\$22 billion) in June and announced end of APP purchases in Q3:2022.

The Bank of England (BoE) maintained a pause on its policy rate in its November meeting. In December 2021, it raised the Bank Rate by 15 bps and in February by another 25 bps. Also, in keeping with the guidance

of its August 2021 MPR⁴, the BoE announced that it would stop re-investing for its maturing stock of government bonds. It would begin selling from its portfolio of government bonds only after the Bank Rate reaches 1 per cent, conditional on economic circumstances at that time. The BoE also announced that it would stop re-investing for maturing corporate bonds and that it would initiate a programme of corporate bond sales to be completed not earlier than end-2023. In March 2022, the BoE raised the Bank Rate by a further 25 bps to 0.75 per cent, suggesting that further modest tightening would be appropriate in the coming months.

In its December meeting, BoJ extended the Special Program to Support Financing in Response to the Novel Coronavirus by six months until end-September 2022. It also signalled the completion of additional purchases of commercial paper and corporate bonds by end-March 2022 and reversion to the pre-pandemic quantum of purchases from April 2022. In its March meeting, the BoJ said that inflation is likely to remain in positive territory for some time but maintained an overall dovish stance.

Among other AE central banks, the Reserve Bank of Australia discontinued its yield curve control policy in November 2021 and halted weekly bond purchases in early February 2022. The Bank of Canada ended its weekly bond-buying programme in October 2021 and raised rate by 25 bps in March 2022 to 0.5 per cent. The Bank of Korea raised rates in November 2021 and January 2022 by 25 bps each to 1.25 per cent, while the Reserve Bank of New Zealand has cumulatively increased its policy rate by 75 bps since October 2021, taking it up to 1.0 per cent in February 2022 (Chart V.6a).

³ The US\$ approximations for all amounts mentioned in another currency in this Chapter are based on the exchange rate (Bloomberg) on the date of announcement of the measure.

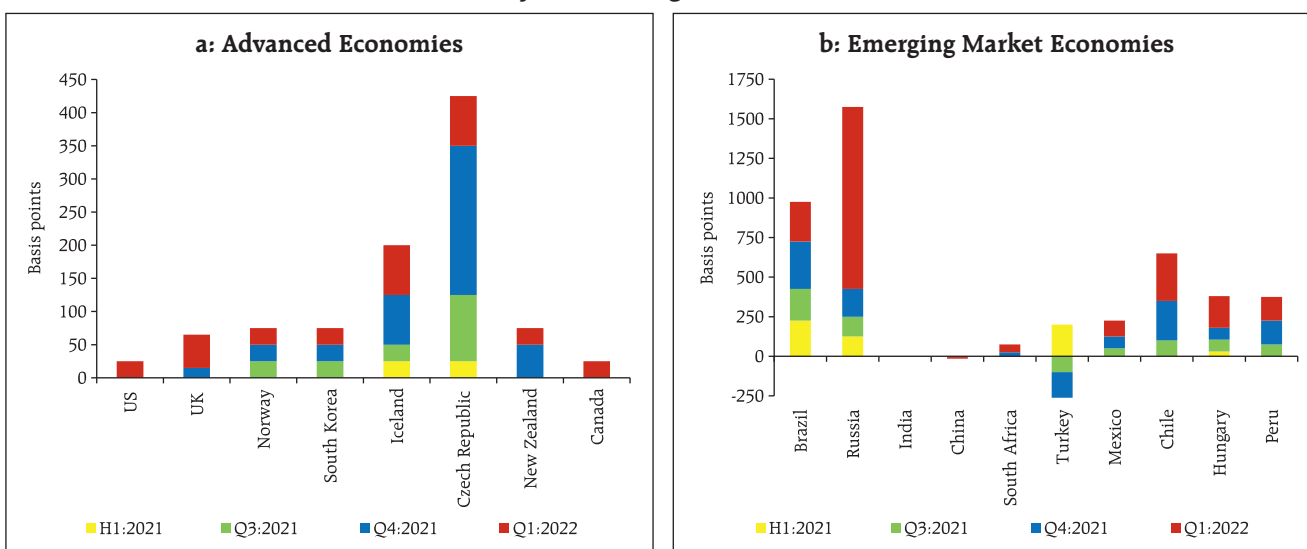
⁴ To begin unwinding asset purchases only after the Bank Rate reached 0.5 per cent.

On the other hand, the People's Bank of China (PBoC) effected a 50 bps cut in the reserve requirement ratio from December 15, 2021, which injected 1.2 trillion yuan (approximately \$188.3 billion) liquidity into the economy. The PBoC also initiated a monetary policy easing cycle by reducing the 1-year Loan Prime Rate (LPR) by 5 bps in December, followed by a 10 bps cut in January 2022, supported by a 5 bps reduction in the 5-year LPR and 10 bps reductions in the interest rate on 1-year medium-term lending facility loans and 7-day reverse repurchase agreements. Since then, the PBoC has maintained a pause.

In contrast, most other EME central banks continued with policy tightening in Q4:2021 and into Q1:2022. The Banco Central do Brazil (BCB) effected three consecutive 150 bps hike in October 2021, December 2021 and February 2022 and a 100 bps hike in March, thereby, raising the Selic rate to 11.75 per cent. The South African Reserve Bank raised its policy rate by 25 bps in November 2021 – first hike in three years – and followed it up with two more 25 bps hikes in January and March 2022, taking the policy rate to 4.25 per cent (Chart V.6b).

The Bank of Russia (BoR) had raised its key rate by 275 bps in three steps between October 2021 and early February 2022 on heightening inflation concerns. On February 28, 2022, in an emergency move, the BoR increased its key rate by 10.5 percentage points to 20 per cent to compensate for a sharp rouble depreciation and inflation risks amidst the geopolitical upheaval. It also undertook unbound fine-tuning operations to meet all liquidity needs of the banking system, besides other measures to shore up liquidity and the financial markets. As the structural liquidity deficit in the banking system continued to build, the BoR reduced the reserve requirement for banks to 2 per cent, releasing 2.7 trillion rouble (approximately US\$26 billion) liquidity. The sanctions have precluded BoR's access to its currency reserves in dollar and euros. Moreover, exclusion of major Russian banks from the Society for Worldwide Interbank Financial Telecommunications (SWIFT) would affect financial transactions with the rest of the world. The BoR maintained a pause on policy rate in its March meeting but announced purchase of government bonds to limit financial stability risks.

Chart V.6: Policy Rate Changes – Select Central Banks



Source: Central bank websites.

Banco de México hiked its policy rate in two steps for a total of 75 bps in Q4:2021 and by another 100 bps in Q1:2022 through 50 bps hikes each in February and March, taking the benchmark rate to 6.5 per cent. The central banks of Chile, Peru and Hungary continued their monetary tightening. The central bank of Turkey, on the other hand, followed up the 100 bps reduction in key rate in September with cuts of 200 bps in October and 100 bps each in November and December. It has, however, maintained a pause in 2022 so far, with its benchmark interest rate at 14 per cent. To normalise excess liquidity conditions, Bank Indonesia began a 300 bps increase in domestic currency reserve requirement for commercial banks in three steps from March to September 2022.

V.4 Global Financial Markets

Global financial markets remained largely buoyant, although the Omicron variant and policy pivots towards quicker normalisation caused sharp shifts in Q4:2021. Geopolitical tensions, however, took centre stage in Q1:2022, plunging them into a tailspin.

Equity markets in most AEs and a few EMEs, shed the resilience of Q4 and went into a downswing for most part of Q1 before recouping some ground from mid-March (Chart V.7a). Bond yields had hardened across maturities, although slid briefly towards end-February as investors dashed to safe haven. The US dollar strengthened on hawkish Fed statements and safe haven demand, while EME currencies broadly weakened until mid-March.

Among AEs, US equities rallied in October and early November, driven by upbeat corporate earnings data for Q3:2021 before giving up some gains towards end-November as Omicron and escalating headline inflation unnerved investors. The correction, however, proved short-lived, with the US S&P index paring losses in December as fears over the severity

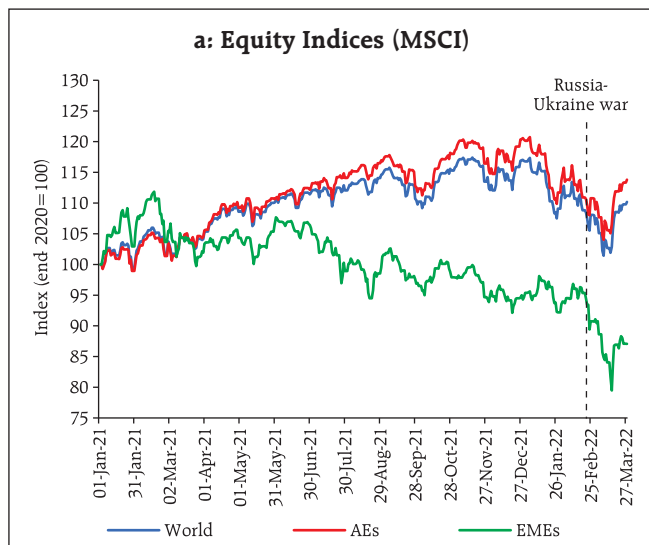
and economic impact of the new variant dissipated. It registered net gains in Q4 while ending 2021 almost 27 per cent higher – the third successive year of double digit gains. Escalating Russia-Ukraine tensions alongside Fed's hawkish pivot triggered sharp sell-offs in January, which intensified in late February and then rallied from mid-March to end of the quarter.

European stock markets remained broadly supported in Q4:2021 by strong quarterly earnings and the ECB's highly accommodative stance. In Q1:2022, however, markets turned extremely volatile, reversing all early gains on inflationary risks from soaring energy prices and heightened geopolitical tensions. From second week of March, European indices recovered partially on conflict resolution optimism.

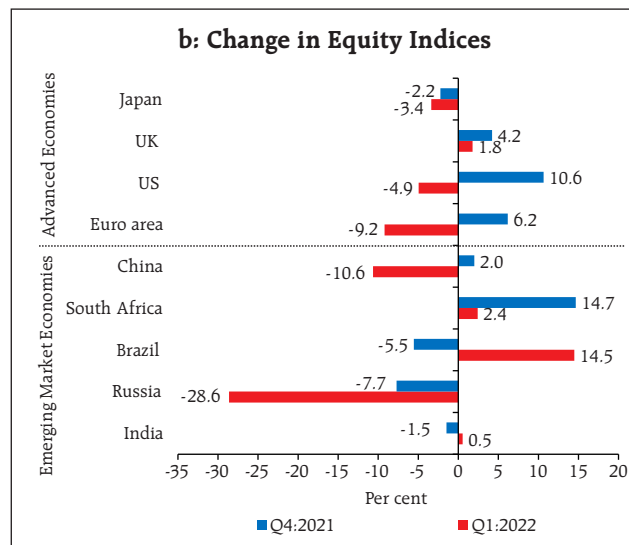
The Nikkei continued to lag other major AE stock indices, largely due to a relatively slower recovery in the Japanese economy. It ended Q4 in negative territory and plunged to a 15-month low in end-January as market priced in faster rate hikes by the US Fed. The downtrend steepened further, with Nikkei dipping to a 16-month low in early March following outbreak of the war, but positive developments lifted sentiments thereafter.

The UK stock indices, on the other hand, have strengthened since Q4, *albeit* with intermittent corrections. Since mid-February, however, markets trimmed gains, tracking global cues, to close the month in the red. This was followed by a sharp plunge in the first week of March amid turbulent geopolitical conditions. In line with other AEs, stock markets in the UK picked up from the second week of March.

EME stock markets underperformed developed markets, with the MSCI EME stock index posting negative returns in Q4:2021 as also for the full year. Country-specific factors weighed heavily on market sentiments along with the threats to the recovery from Omicron. Weakness intensified in Q1:2022 as

Chart V.7: Equity Markets

Sources: Bloomberg; and RBI staff estimates.



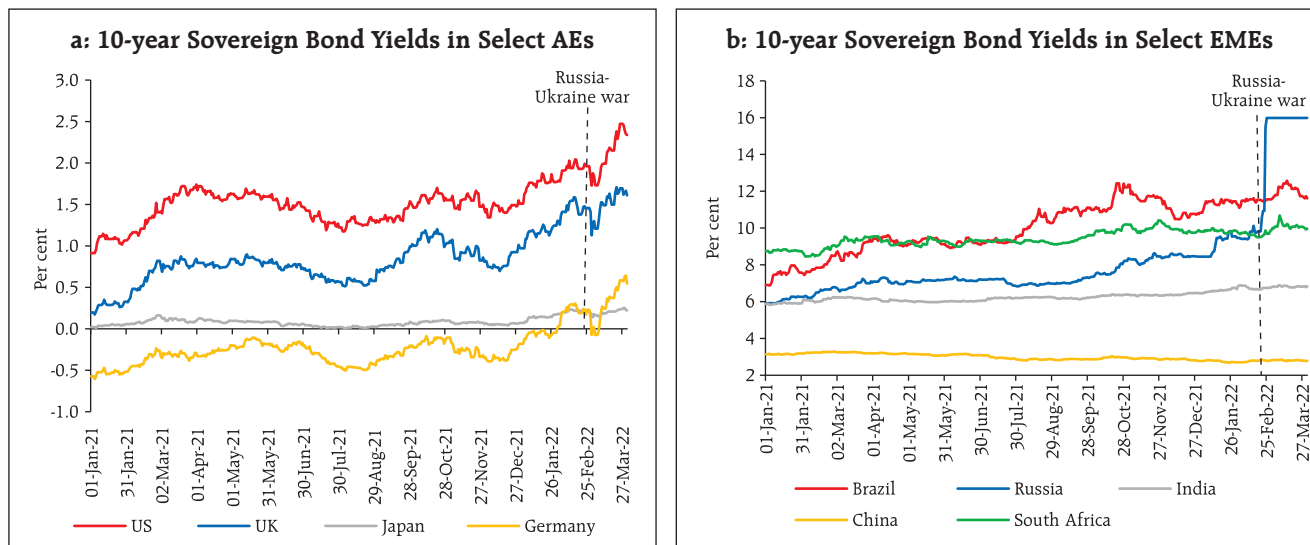
most EME equity indices, barring a few commodity exporters, traded in the red on concerns over early policy tightening, mounting inflationary risks and worsening geopolitical conditions (Chart V.7b). Russian stocks plummeted by more than 30 per cent after the outbreak of war, following which trading was halted for almost a month before resuming gradually from March 24. For most other EME markets, optimism on intermittent peace talks revived confidence from mid-March, resulting in modest rise.

In treasury markets, bond yields across major AEs broadly rose in Q4:2021, as investors tussled with protracted inflation risks and withdrawal of monetary accommodation by major central banks (Chart V.8a). The increase was particularly sharp at the front end of the curve. As a result, the yield curve (10-year over 2-year) which was steepening till September, flattened since Q4. The significant hardening in bond yields since mid-December, however, reversed briefly in end-February and early March on flight to safety. Bond yields shifted higher thereafter in response to hawkish signals from the US Fed.

The US 10-year bond yield raced up above 2.0 per cent in early February before retreating on safe haven demand. With the tightening cycle commencing, the 10-year bond yield moved up from mid-March, hitting a 3-year high of 2.5 per cent in the last week of the month. Tracking global cues, Japanese bond yields jumped to their highest level in six years in February, while German 10-year bond yield moved decisively into positive territory for the first time since May 2019 before dipping back into negative zone in early March amidst heightened tensions. From the second week of March, however, bond yields across AEs started increasing again, as the ECB pivoted towards normalisation, while the UK effected its third consecutive hike.

Bond yields in major EMEs remained highly volatile and traded with a hardening bias as financial conditions tightened (Chart V.8b). 10-year bond yields in major EMEs show strong co-movement with the US 10-year treasury yield, though the strength of the co-movement varies across countries (Box V.2). Chinese bond yields, however, have generally softened on

Chart V.8: Bond Yields



Source: Bloomberg.

rising monetary accommodation. Bond yields have hardened for most EMEs from mid-February, with a

notable spike in Russia, followed by some softening in second half of March.

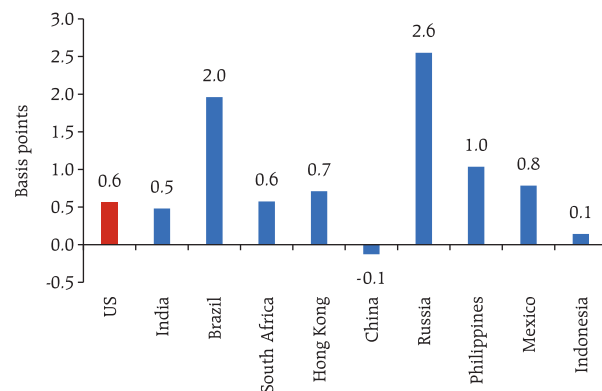
Box V.2: Interest Rate Spillovers from the US to Emerging Market Economies

The US long-term yields impact other countries through various channels, with consequent portfolio rebalancing and capital outflows putting pressure on emerging market exchange rates and bond prices (Chart V.2.1).

Correlation of movements in 10-year government bond yields of the US and eight EMEs⁵ viz., Brazil, Russia, India, China, South Africa, Indonesia, Mexico and Philippines and one AE⁶, i.e., Hong Kong is positive and significant (Table V.2.1). The forecast error variance decomposition (FEVD) based on a vector autoregression (VAR)⁷ examines sensitivity of long-term bond yields in EMEs to changes in US bond yields (Belke *et. al*, 2017).

Measures of spillover intensities from the US to other countries and *vice versa* are estimated by using a spillover

Chart V.2.1: Change in Bond Yields (January 2022 over July 2021)



Source: Thomson Reuters.

(Contd.)

⁵ Covering BRICS and all constituents of the "fragile five" of 2013, barring Turkey for which data was not available for the full sample.

⁶ Due to its currency's peg to the dollar and being a regional financial hub, Hong Kong is a conduit of transmission of US yields to a broad set of EMEs in the ASEAN region.

⁷ VAR framework has been used as it allows all variables to be considered endogenous – considering the possibility of spillback effects among EMEs as well as to the US primarily through trade, financial, and commodity price channels. Further, to control for the potential spillovers from market volatility and linkages between bond yields and exchange rate, VIX, Brent crude prices and MSCI EME currency index were used as exogenous variables in the model.

Table V.2.1: Correlation between 10-Year Bond Yields

	US	India	Brazil	South Africa	China	Russia	Hong Kong	Philippines	Mexico	Indonesia
US	1.0									
India	0.2*	1.0								
Brazil	0.2*	0.1*	1.0							
South Africa	0.2*	0.1	0.4*	1.0						
China	0.1	0.3*	0.0	0.1	1.0					
Russia	0.0	0.0	0.1	0.2*	0.0	1.0				
Hong Kong	0.8*	0.3*	0.2*	0.3*	0.2*	0.1	1.0			
Philippines	0.2*	0.2*	0.2*	0.3*	0.1	0.1	0.2*	1.0		
Mexico	0.4*	0.2*	0.3*	0.5*	0.1*	0.2*	0.4*	0.4*	1.0	
Indonesia	0.2*	0.1	0.4*	0.4*	-0.1	0.1	0.1	0.4*	0.4*	1.0

*: Statistically significant at 1 per cent level.

Note: Based on data for the period May 2003 to February 2022.

Source: RBI staff estimates.

index (Diebold and Yilmaz, 2009). The Total Spillover Index (TSI)⁸ in our estimate measures the proportion of overall change in yields in the peer group that is due to shocks to other countries' yields⁹.

The estimated generalised impulse responses for the VAR¹⁰ suggest that one standard deviation positive shock

to the US bond yield leads to significant positive reactions in bond yields of most EMEs under consideration up to two months ahead (Chart V.2.2).

The long-term co-movement in bond yields among countries, with the US generating strong spillovers have ramifications for financial and real variables in most

Table V.2.2: Spillover during May 2003 to February 2022

	US	India	Brazil	South Africa	China	Russia	Hong Kong	Philippines	Mexico	Indonesia	From Others
US	45.8	3.0	2.9	2.4	1.7	1.0	27.9	2.2	10.2	2.9	54.2
India	6.0	67.4	2.3	3.5	6.7	0.2	7.5	2.1	1.6	2.7	32.6
Brazil	6.0	0.8	58.5	10.0	2.4	2.4	3.6	1.0	8.7	6.7	41.5
South Africa	2.9	0.1	8.7	52.4	0.4	1.9	3.4	6.4	10.7	13.0	47.6
China	5.1	5.9	1.0	1.3	73.0	1.5	5.2	1.4	1.8	3.7	27.0
Russia	0.6	1.0	2.1	4.8	0.0	75.3	3.0	3.7	4.3	5.3	24.7
Hong Kong	30.6	3.2	2.1	2.8	1.9	1.9	45.6	1.7	7.3	2.7	54.4
Philippines	5.2	2.1	0.8	6.9	0.9	2.8	3.5	57.5	9.3	10.9	42.5
Mexico	14.1	0.5	6.2	9.1	1.0	2.9	7.8	8.1	44.1	6.1	55.9
Indonesia	5.6	0.6	3.9	12.6	3.8	1.3	3.5	7.7	7.3	53.8	46.2
Contribution to others	76.2	17.2	30.1	53.4	18.9	15.9	65.3	34.3	61.2	54.0	426.5
Contribution including own	122.0	84.7	88.6	105.8	91.9	91.2	110.9	91.8	105.3	107.9	
Directional Spillover Index	62.5%	20.3%	34.0%	50.5%	20.6%	17.4%	58.9%	37.4%	58.1%	50.0%	
Total Spillover Index											42.6%

Note: The ij th entry in the Table V.2.2 is the estimated contribution to the forecast error variance of country i coming from innovations to country j . Hence the off-diagonal column sums (labelled Contributions to Others) or row sums (labelled Contributions from Others), when totalled across countries, give the numerator of the Total Spillover Index. Similarly, the column sums or row sums (including diagonals), when totalled across countries, give the denominator of the Total Spillover Index. Directional spillover from country i to others is given by the ratio of i th country's contribution to others over total contribution of i th country including own.

Source: RBI staff estimates.

(Contd.)

⁸ The TSI for N countries is:

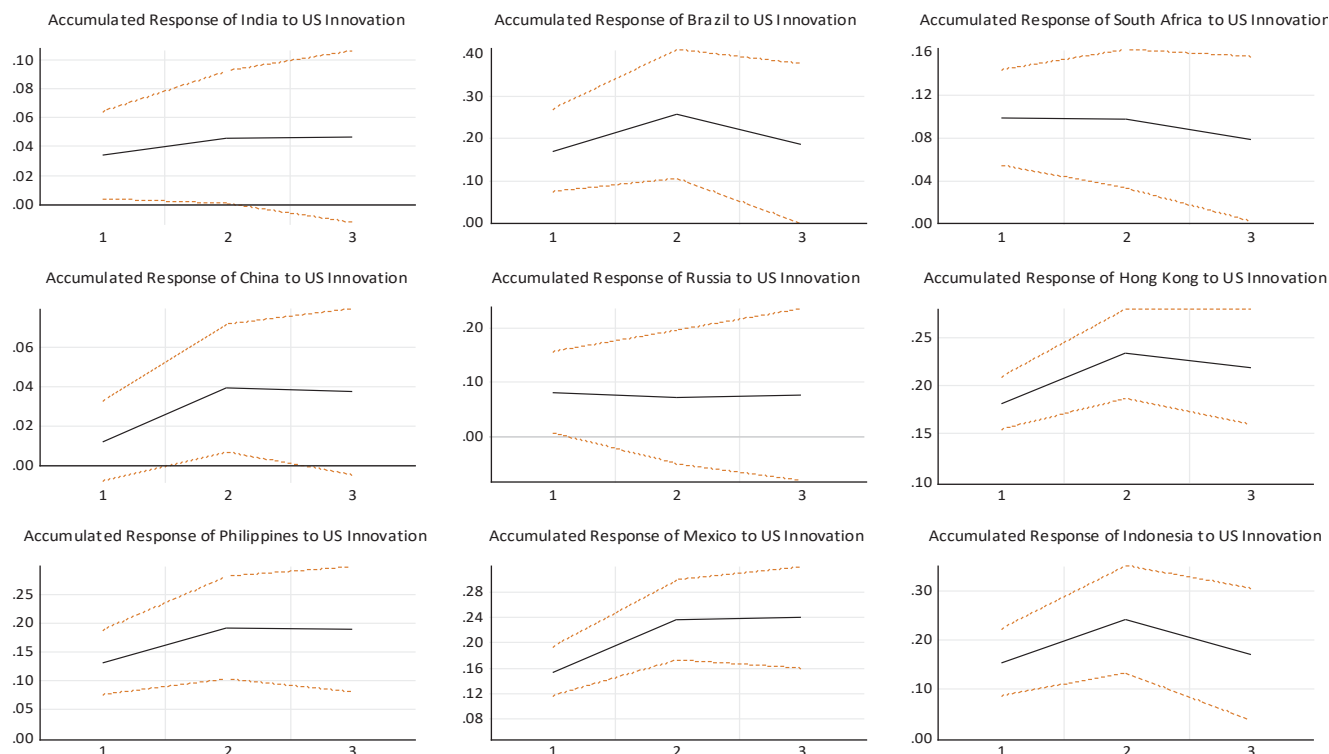
$$TSI(H) = \frac{\sum_{i \neq j} \sum_{j=1}^N \theta_{ij}^g(H)}{\sum_{i,j=1}^N \theta_{ij}^g(H)} * 100,$$

where $\tilde{\theta}_{ij}^g$ is the normalised value of H -step ahead FEVD ($\theta_{ij}^g(H)$), so that $\tilde{\theta}_{ij}^g(H) = \frac{\theta_{ij}^g(H)}{\sum_{j=1}^N \theta_{ij}^g(H)}$

⁹ To measure the portion of TSI that comes from i th country to all other countries, a Directional Spillover Index (DSI _{i}) is calculated as $DSI_i(H) = \frac{\sum_{j=1}^N \tilde{\theta}_{ij}^g(H)}{\sum_{j=1}^N \tilde{\theta}_{ij}^g(H)} * 100$

¹⁰ The results are based on a VAR model of order 6 (lag length selected based on length criteria and diagnostic checks) estimated on the first difference of all the variables under consideration. The regression diagnostics – no autocorrelation and constant variance in errors – are found to be satisfactory.

Chart V.2.2: Accumulated Response to Shocks (Generalized One S.D. Innovations ± 2 S.E.s) Emanating from the US



EMEs. Yet, own shocks have the highest contribution to yield movements even for EMEs.

References:

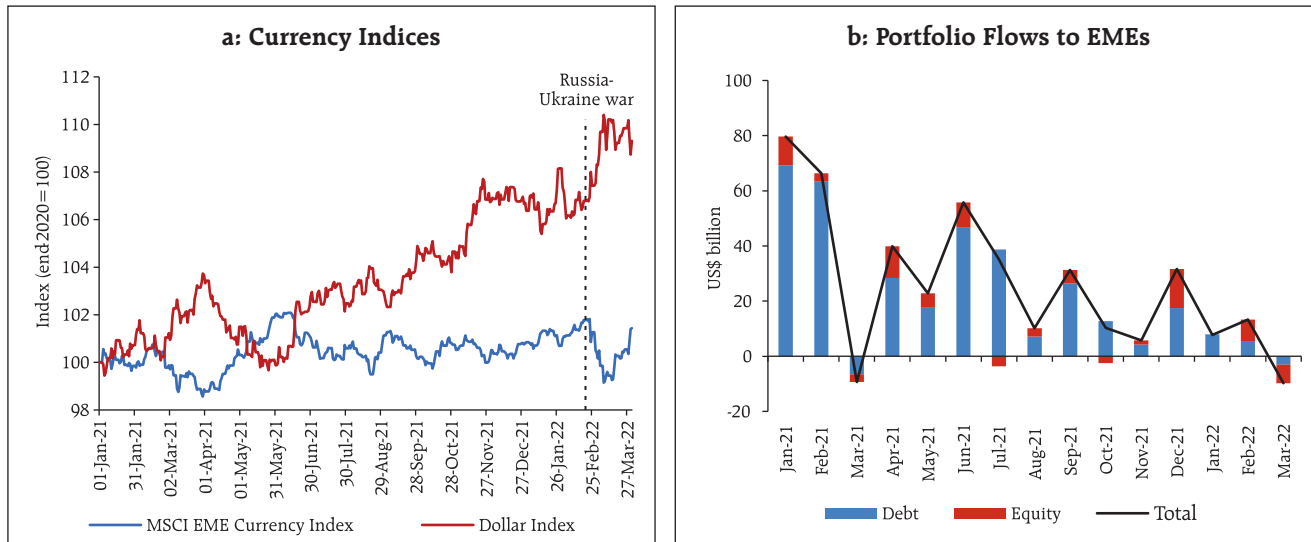
Belke, A., Dubova, I., and Volz, U. (2017) "Long-term Interest Rate Spillovers from Major Developed

Economies to Emerging Asia", *ADB Working Paper No. 705*, March

Diebold, F. X., & Yilmaz, K. (2009). Measuring Financial Asset Return and Volatility Spillovers, with Application to Global Equity Markets. *The Economic Journal*, 119(534), 158-171.

In the currency markets, the US dollar rallied strongly in Q4:2021 on Fed policy pivot (Chart V.9a). In Q1, after a brief spell of correction in early January, the US dollar recovered strongly but hit a patch of volatility. From the latter half of February, however, it rose steadily on safe haven demand due to the ongoing geopolitical upheaval, in addition to the anticipated US policy rate lift-off in March. It remained elevated in March with fluctuations

in market sentiments imparting volatility. EME currencies moved in reverse tandem and broadly depreciated, barring a few commodity exporters. The index, however, moved up from mid-March. The MSCI Emerging Market Currency Index increased by 0.7 per cent in Q4:2021 and changed negligibly in Q1:2022. There has been retrenchment in capital flows since Q4:2021 culminating into net outflows in March (Chart V.9b).

Chart V.9: Currency Movements and Capital Flows

Sources: Bloomberg; and IIF.

V.5 Conclusion

Monetary authorities have begun exiting from the extraordinary accommodation prompted by the once-in-a-century COVID-19 crisis. The Russia-Ukraine war and its ramifications for global growth, inflation

and financial conditions have overwhelmed the global outlook. With increasing risks to growth and financial stability, policy authorities need to steer a knife-edge course to avoid a crash landing.

SPEECHES

Taper 2022: Touchdown in Turbulence –
Michael Debabrata Patra

Importance of Governance and
Assurance Functions in Financial Institutions
Shri M. K. Jain

*Taper 2022: Touchdown in Turbulence**

Michael Debabrata Patra

Shri Juzar Khorakiwala, President, Shri Anant Singhania, Vice-President, Shri Ajit Mangrulkar, Director General, Shri Sanjay Mehta and Ms. Sheetal Kalro, Deputy Director Generals, esteemed members of the IMC Chamber of Commerce and Industry, and friends, I thank you for inviting me to deliver the keynote address in the Thought Leadership Series. From the time of its establishment in 1907, the IMC Chamber of Commerce and Industry has always been a thought leader itself, with a membership base of above 5000 and over 150 trade associations affiliated to it. By providing vital inputs and recommendations, the Chamber plays a key role in shaping the contours of public policymaking and debate on a wide range of issues that impinge on sustainable economic development. Hence, it is a privilege to be among you all and to share my thoughts. In the context of the recent challenging global developments and the overcast near-term outlook, I thought I will choose 'Taper 2022: Touchdown in Turbulence' as the theme of my address today.

Hawkish tones in systemically important policy pivots in early 2022 confirmed the worst fears of financial markets – the age of abundant liquidity is drawing to a close. Financial assets, which were buoyed by liquidity into stretched valuations, are being re-priced. The ubiquitous acronym QE or quantitative easing is giving way to another – QT or quantitative tightening – in the lexicon of monetary policy. As central banks, the world's biggest buyers of bonds, prepare to turn into sellers, their trajectory

has been likened to landing on a short runway amidst fierce crosswinds.

Now, as the drumbeats of conflict rise to a crescendo and economic warfare is unleashed, volatility is hitting high notes. Sudden shifts in risk sentiment and exodus to safe assets render financial markets shaken and stirred as investors struggle to reassess this violent turn in the wind. Already snarled by supply bottlenecks, persistent high inflation and tightening financial conditions, the global economy is being dragged to the edge of a precipice. The immediate implications are expected to be lower growth, higher inflation and disruptions to financial markets. The longer-term implications are disruptions to global supply chains if physical infrastructure such as pipelines and ports are destroyed. If sanctions turn away demand, trade and investment, there could even be de-globalisation. Talk of stagflation has leapfrogged into the discourse on global economic prospects.

The question that is uppermost is: will monetary policy still be tightened just enough to quell persisting inflation? Or will it turn out to be excessive and snuff out the global recovery? Already high frequency indicators suggest that global growth is losing steam in the first quarter of 2022 with the surge and ebb of Omicron. Multilateral institutions expect that in the baseline scenario, the pace of global GDP growth may lose up to 2 percentage points over this year and the next. Private sector estimates indicate that if the price of crude rises to \$150 per barrel, it will knock off another 1.6 per cent of global GDP, while raising global inflation by another 2 per cent.

On one issue at least, there seems to be some certainty. Although monetary policy has a predominantly domestic orientation, the effects of the imminent shift in gears will not be confined domestically. It will spill over to emerging market economies (EMEs), and it will spill back to systemically important ones. It is always easier to go into accommodation than to come out. This brings

* Keynote Address delivered by Michael Debabrata Patra, Deputy Governor, Reserve Bank of India organised by the IMC Chamber of Commerce and Industry, Mumbai on March 11, 2022. Valuable comments from Sitikantha Pattanaik, Rajeev Jain, Binod B Bhoi, Abhilasha and editorial help from Vineet Kumar Srivastava are gratefully acknowledged.

back memories of 2013 and the infamous 'taper tantrum'. It also focuses the spotlight on India. In 2013, India became one of the 'fragile five' economies that were roiled by financial market turbulence and, therefore, perceived as most at risk when tapering would actually begin. The Indian rupee or INR was among the worst affected currencies at that time, as foreign investors pulled out funds from EMEs as an asset class in anticipation of rising yields in advanced economy markets. Will this time be different?

In the rest of my address, I propose to deal with this vexing subject head-on by assessing global macroeconomic and financial conditions then and now, the state of the Indian economy in terms of its underlying fundamentals, and the health of India's external sector which will bear the brunt of global spillovers. I will conclude with a few remarks on the way forward.

The Global Setting

Global economic conditions in 2013 resembled those that are set to unfold in 2022. The global economy was weak then, with the recovery from the global financial crisis of 2008-09 still incomplete, and paths were diverging between jurisdictions. Advanced economies (AEs) were mending and gaining pace despite fiscal consolidation, but emerging market economies (EMEs) were slowing due to the tightening of external financing conditions.

The big difference was inflation. Commodity prices had fallen amidst improving supply conditions and, moreover, demand from key EMEs for commodities was subdued. As a result, both fuel and non-fuel commodity prices recorded small declines. The pick-up in growth in the AEs was not enough to pull in the slack in these economies and output gaps¹ remained

large and negative. Consequently, inflation actually eased in AEs. In EMEs, on the other hand, the picture was somewhat similar to conditions prevailing today, with inflation turning out to be persistent and range-bound, and pushed up by the pass-through of currency depreciation.

Although monetary policy was in accommodative mode, financial markets were volatile amidst considerable uncertainty about the future course of monetary policy. In particular, markets were anticipating more tightening of US monetary policy than projected by the Fed and this was the factor that caused larger than expected spillovers. In EMEs, these spillovers interacted with underlying vulnerabilities, triggering capital outflows and a significant tightening of financial conditions in some of them, especially among the 'fragile five'. As events unfolded, however, markets were found to be racing ahead of the real economy – the Fed decided not to begin tapering in September, resulting in a modest easing of bond yields.

Circling back to 2022, the global recovery is once again on a weak wicket – edgy and prone to mishits. The omicron wave has taken its toll and there is growing evidence of loss of pace in the first quarter of 2022, as I alluded to earlier. As in 2013, the paths for AEs and EMEs are diverging, with AEs expected to cross pre-pandemic trends while EMEs lag behind. Also, financial markets are highly volatile now, as they were in the fateful summer of 2013. War has added a whole new dimension to the outlook, and in fact, a weighty downside.

With regard to other macroeconomic and financial conditions, however, 2022 and 2013 are studies in contrast. AEs are struggling with inflation at multi-decadal/record highs this year. In several EMEs too, inflation is way above targets, prompting them to be first movers in raising policy rates, with AEs following this time around. In terms of financial conditions, it is sobering to keep in mind that the US taper

¹ The output gap is a measure of the difference between actual output and its potential level or trend. When actual output is above potential, demand is rising, and the output gap is positive. When actual output is below its potential, demand is weak, and the output gap is negative.

involved winding down a US\$ 85 billion monthly purchase programme in a span of ten months in 2014. In contrast, a US\$120 billion monthly purchase programme is being wound up in four months by March 2022. Before the commencement of the 2014 taper, the Fed had expanded its balance sheet by around US\$ 3.1 trillion over a period of 64 months. In response to the pandemic, the Fed's balance sheet has expanded by US\$ 3.1 trillion in nine months from March to November 2020. It expanded another US\$1.3 trillion in the ensuing eleven months up to October 2021 and continued to grow till early March.

Then, there is an elephant in the room in 2022, which is making the biggest inter-temporal difference. Financial markets reacted to the first missiles and air strikes on February 25 with a bloodbath across the world. Equity and currency markets tanked, and stampedes to safety lifted the prices of US treasuries, gold and the US dollar as also some safe house currencies like the yen. These are externalities or spillovers which have been seen before, however. In fact, equity markets recovered towards the close of trading on the same day and through the next, although they sank again when fresh sanctions, including SWIFT exclusion, were announced on February 27.

There are some spillovers which we have not seen before. Commodity prices have been surging in a synchronised manner. Energy prices, in particular, are shattering what were widely regarded as glass ceilings. International crude prices crossed US\$ 100 for the first time since 2014. With new rounds of sanctions, US\$ 125-150 levels could be tested. Natural gas futures surged 50-70 per cent in Europe. Benchmark prices of nickel, copper, aluminium and palladium are at their highest levels in a decade. Wheat and corn futures are at multi-year highs. The world is also bracing up for higher fertiliser prices and restrictions on energy supplies. Although the situation today is significantly

different from the oil shocks of the 1970s, energy markets are global and price waves find their way around the world. Household spending could be sapped and the risk of a recession could intensify.

Domestic Macro Fundamentals

In a dynamic international environment fraught with high uncertainty and elevated perceptions of risk, it is ultimately the strength and resilience of the macroeconomic fundamentals that will determine our ability to manage external shocks. It is useful in this context to draw lessons from the 2013 experience.

In 2009, India was among the first nations to bounce back from the global financial crisis (GFC) on the wings of fiscal and monetary stimulus. Aspirations about India's underlying potential seemed within reach. History would, however, ordain otherwise. With the gradual unwinding of the stimulus, the economy lost steam. This was accompanied by a persistent deceleration in the investment rate, led by the private corporate sector, a slowing down of bank credit and a widening of external imbalances to which I will revert shortly. Over the period 2011-14, however, private consumption remained strong and the mainstay of growth in India.

Cut to the present. Ahead of the pandemic, a cyclical downturn had taken the growth of the economy in 2019-20 to its lowest rate since the GFC, but even this *nadir* has become a reference point for evaluating the recovery from the pandemic. At the height of the first wave of infections, India plunged into one of the deepest recessions in the world, with GDP declining by as much as 23.8 per cent in the first quarter of 2020-21. A gradual recovery took hold during the second half of the year, only to be interrupted by the second wave. During the year, the Indian economy contracted by 6.6 per cent. The brunt of the second wave was felt in the first quarter of 2021-22. Camouflaged by statistical base effects, the level of GDP fell 8.3 per cent below pre-pandemic (or corresponding 2019-20) levels. While

the third wave that began in late December 2021 has had a relatively milder impact as reflected in high frequency indicators. GDP is expected to rise only 1.8 per cent above pre-pandemic levels in the year 2021-22. Private consumption is just a shade above its pre-pandemic level, with discretionary consumption spending lacking traction. Private investment is yet to participate in the recovery.

In essence, India's growth story remains as weak as it was at the time of the 2013 taper tantrum. The recent reverberations of war have, in fact, tilted the balance of risks downwards. The government's thrust on capital expenditure in 2022-23 can, however, be the gamechanger this time around by enhancing productive capacity, crowding in private investment and strengthening aggregate demand amidst the conducive financial conditions engendered by the RBI, and improving business and consumer confidence. Another silver lining is export performance to which I shall turn presently, but unlike domestic investment, exports are in some sense hostage to global developments. Considering all these factors in February 2022, the RBI projected the growth of the Indian economy at 7.8 per cent in 2022-23. The breakout of hostilities in Ukraine and its fallout may necessitate a review. The choice of a bi-monthly meeting cycle for the Monetary Policy Committee (MPC) ensures that this will be done, with all available data arrivals and analytical updates, in the forthcoming meeting in April.

It is in the character of inflation that the key difference between 2013 and today emerges, with several lessons. The main fault line in India's fundamentals then was inflation. First, inflation measured by the wholesale price index (WPI) had acquired elevation and persistence by December 2009. In terms of the consumer price index (CPI)², inflation pressures were signalled even earlier. Second, food

prices had been ruling in double digits from as early as October 2008 (even earlier in the CPI) and the failed monsoon of 2009 only stoked these pressures. Food inflation has a dominant influence on inflation expectations and tends to spill over to non-food non-fuel components, leading to generalised inflation as was the case during 2011-13. Thus, early warning signs were flashing from the CPI, but they were looked through. Third, rural wages adjusted for inflation rose at an annual rate of 7.4 per cent during 2009-13, pushing up core retail inflation through wage price spirals. Fourth, international crude prices were ruling above US\$ 100 per barrel, but domestic pump prices were cushioned by a low tax component and moreover, pass-through was held back administratively. Fifth, monetary policy followed a multiple indicator approach with no explicit nominal anchor.

Current inflation dynamics are markedly different from those troubled times, but that experience offers valuable policy guidance. Today, monetary policy in India operates under a well-defined institutional framework, with price stability defined as 4 per cent CPI inflation as the primary objective. Deviations from the target are allowed within a tolerance band of ± 2 per cent and three consecutive quarters of inflation breaching the tolerance band is regarded as a failure, warranting prescribed corrective actions. Since the onset of the pandemic, India has been encountering episodes of rising inflation, but headline inflation has stayed in single digits and has tended to revert back to the target as each supply-side shock receded. For the most part, inflation has been driven up by rising food prices, but this time around, resolute and strategic actions to augment the supplies of inflation-sensitive commodities (edible oil; pulses; potatoes; and onions) broke the back of these price spikes and tamed headline inflation. India has also transformed its food economy from deficits in key food items to surpluses and exports. Global spillovers are impacting core inflation on an ongoing basis and keeping it elevated,

² Consumer price index for industrial workers

but the absence of second round effects on wages and rentals, and low pricing power among corporates and excise duty cuts on petroleum products have tempered these upside pressures. Furthermore, with the tax component of pump prices still being substantial in the wake of increases during the pandemic, there is headroom available for reducing these taxes and cushioning the transmission of international crude prices to retail inflation. Finally, the evolution of CPI inflation up to January 2022 shows that statistical base effects have been keeping it elevated; the momentum or month over month changes in prices have actually declined during December 2021 and January 2022.

As a result of these developments, inflation is less persistent and less generalised than it was in 2013. The RBI's latest survey of January 2022 shows that households' inflation expectations have moderated by 170-190 basis points three months ahead and a year ahead, respectively. Accordingly, in February 2022, the RBI projected inflation to ease to around 4 per cent by the third quarter of 2022-23. Clearly, recent geopolitical developments pose an upside risk to these projections and the upcoming meeting of the MPC in April will provide a thorough re-assessment, but the focus of monetary policy on price stability with clear accountability and the government's proactive responses to keep prices in check provides confidence that India will weather this storm.

Spillovers and External Resilience

It is the health of a country's external sector that shields it from international spillovers in a globalised world. The state of the external sector reflects the underlying macroeconomic fundamentals, which I have just discussed. To illustrate, the domestic saving-investment gap of the private and public sectors is the mirror image of the difference between exports and imports of goods and services or what is widely known as the current account balance which, in turn, is financed by capital flows. If net capital flows exceed

or fall short of the current account balance, there is either a build-up or drawdown of foreign exchange reserves. Likewise, inflation seeps into the external sector by influencing the prices of exports, while being influenced by the prices of imports. Inflation differentials between a country and the rest of the world determine the underlying level of the exchange rate. Typically, a country enjoying robust growth prospects with price stability becomes a preferred habitat for capital flows from abroad while a country with a poor growth outlook and/or high inflation is likely to face capital outflows. While spillovers are global and inescapable, macro-fundamentals are national and offer a bulwark against shocks that originate beyond national borders.

In 2022, India faces similar risks as in 2013 from surging international crude prices and the volume of gold imports. Yet, the external sector is much more viable than it was in 2013. Even with import demand strong on the back of a recovering economy and the average international crude prices currently above US\$ 100 per barrel, the current account deficit is expected to remain within 2.5 per cent of GDP, having averaged 1.1 per cent of GDP during 2014-21. By contrast, Taper 2013 had been preceded by the current account deficit averaging 3.7 per cent during 2009-13, with a peak of 6.8 per cent in the third quarter of 2012-13. The improvement in the current account in the recent period and going forward draws strength from robust export performance, both goods and services, with targets set at US\$ 450 billion and US\$ 300 billion, respectively, for 2022-23. In 2012-13, however, exports of goods and services were flat and remained subdued in the following year. Adding to the export potential going forward into 2022-23 is the focus on bilateral trade agreements and the steps being taken to impart competitiveness to exports through the production linked incentive (PLI) scheme, dedicated industrial parks and by expanding the availability of critical raw materials and intermediates. With inflation

differentials between India and trading partners narrowing, price competitiveness of Indian products in overseas markets is improving.

External financing is no longer a binding constraint. Stable flows such as foreign direct investment (FDI) dominate net capital flows to India. In fact, FDI alone fully finances the current account gap today. By comparison, FDI constituted less than a third of net capital flows during 2009-13, leading up to a situation when total capital flows fell short of the financing requirement, necessitating the drawdown of reserves in 2011-12. In 2022-23, a strong pipeline of FDI is ready to be tapped.

India's external debt profile has undergone a compositional shift that adds to resilience. Ahead of the 2013 taper, India had accumulated short-term debt to the extent that its share in total external debt had risen from around 18.3 per cent at end-March 2006 to 42.1 per cent by March 2013. Since then, the share of short-term debt has remained broadly unchanged. In fact, the share of short-term debt in GDP has declined from 9.4 per cent at end-March 2013 to 8.6 per cent at end-September 2021. It is also noteworthy that India's ratio of external debt to GDP is one of the lowest among EMEs.

Perhaps the greatest strength of India's external sector is the buffer provided by the holdings of foreign exchange reserves. The level of reserves has risen from 16.0 per cent of GDP at end-March 2013 to the current level of 20.5 per cent. The import cover provided by the reserves on a prospective basis has doubled while short-term external debt on a residual maturity basis has declined over the same period from 59.0 per cent of reserves to 40.3 per cent. It is comforting to note that India currently has the fifth largest holdings of international reserves in the world. In fact, India's international assets cover three-fourth of India's external liabilities, including debt, equity and all other forms of contractual obligations.

In addition, there are second lines of defence in the form of forward assets and swap lines.

In a world of heightened uncertainty in which spillover tsunamis can overwhelm both advanced and emerging economies, India cannot be immune. Yet a strong and resilient external sector can cushion these shocks, mitigate their impact and provide headroom for monetary policy to pursue national objectives without being derailed by these tidal waves from abroad.

Conclusion

Geopolitical conflict has drastically altered the global environment and the context in which monetary policy operates. As investors re-assess risks and sizable reallocations appear imminent, there is no clarity on the direction and magnitude of capital flows for any specific country. Meanwhile, persisting global supply chain disruptions, resurgent commodity prices and volatility in financial markets are distracting policy attention from domestic concerns.

For India, direct trade and finance exposures in the context of the ongoing conflict are limited. Contagion could, however, impact India through a broader fall out on EMEs as an asset class. The main transmission channel is likely to be global liquidity conditions, which are tightening. If worry were to give way to panic, liquidity, especially US dollar funding, could dry up and markets could malfunction. With crude oil still above US \$100 per barrel, new macroeconomic headwinds could be a second channel of contagion. A third channel could be the reassessment of geopolitical risk by markets and investors, which could inflate country-risk premiums, raise the cost of funding for EMEs and reduce investment volumes.

These factors may trigger re-calibration of forecasts. Stress testing baseline forecasts for normal times with extreme initial assumptions to approximate recent developments suggests that India's recovery from the pandemic may continue to

gain strength and traction on the innate strength of macroeconomic fundamentals, but is yet to be broad-based. While agriculture and allied activities, exports and the plans for public capital expenditure are bright spots that illuminate the outlook with multiplier effects, the recovery of private consumption and investment is still work in progress. Contact-intensive services remain below pre-pandemic levels.

Consequently, the policy stance has to be carefully calibrated. Monetary policy remains in accommodative mode and continues to engender financial conditions that are supportive of growth. Even though fiscal consolidation is underway, there is still some stimulus in the economy that will last through 2022-23, as estimates of the fiscal impulse³ suggest.

As regards inflation, international crude prices present an overwhelming risk, though headroom to adjust excise duties can delay the passthrough to pump prices. On the other hand, prospects for the easing of food inflation remain bright with record production and buffer stocks. Strong supply-side interventions and increase in domestic production can check inflation-sensitive pulses and edible oil prices, though spillovers from the geopolitical situation cannot be ruled out. While cost-push pressures on core inflation remain elevated, selling prices of businesses remain subdued due to low passthrough of input cost pressures, given the large amount of slack in the economy. While the fallout of the geopolitical situation is being assessed and will be factored into our projections, it is reasonable to treat it as a supply shock at this stage in the setting of monetary policy.

³ Fiscal impulse is defined as the change in the cyclically adjusted primary deficit.

*Importance of Governance and Assurance Functions in Financial Institutions**

M. K. Jain

Introduction

Delegates from various financial institutions, guest speakers and colleagues from CAFRAL, a very Good Morning to all. At the outset, let me thank CAFRAL for hosting this learning program. The lingering Covid-19 pandemic and the potential economic disruptions due to the latest geo-political events in Europe have again brought to the fore the reality that the nature and frequency of risks faced by the financial system of today are quite unparalleled and unpredictable. Also, the banking sector today is much different from what it was a decade ago and is constantly evolving.

While the Reserve Bank is deploying various tools at its disposal to maintain the stability of the financial system, individual financial institutions, more specifically banks, need to be watchful of the economic impact of risk events and take adequate measures to maintain their resilience. In this regard, it is important to recognise the inter-linkages between quality of governance and resilience of financial institutions. Even as high-quality governance enhances resilience, poor corporate governance is a source of risk to the financial institutions as well as to the financial system.

Corporate Governance

While good corporate governance is essential for all institutions, the governance structure and processes of banks are expected to be even more robust. Banks and financial institutions are different

from other business entities in many ways. Their business model is very different from other business entities – they enjoy high leverage as they can raise substantial amount of uncollateralised deposits, and they perform the function of liquidity and maturity transformation. Hence, the governance structures and practices in banks should prioritise protection of the interests of their depositors.

Oversight and Assurance Functions

With the growth in size and complexity of the financial institutions, there is an increased focus on adequacy of the governance framework for identifying, addressing and managing risk. Towards this, the '**three lines of defence**' have pivotal responsibilities: (i) 'the business functions' (first line of defence), which are the risk takers and owners of the risk, have the responsibility of managing the risk generated by virtue of their day-to-day business activities; (ii) the 'risk management function' and the 'compliance function' (second line of defence) have the responsibility of exercising oversight on the business functions to ensure that their activities are within the risk and compliance policies of the bank; and (iii) the 'internal audit function' (third line of defence) has the responsibility of identifying gaps from prescribed requirements and reporting to the board / audit committee. Collectively, these three functions have to provide assurance to the board / senior management about the adequacy and effectiveness of the governance framework and that the board approved policies and business strategies are adhered to by the financial entity in conduct of its business.

RBI Initiatives and Measures

Reserve Bank attaches a lot of importance to the strengthening of governance and internal control functions in banks and financial institutions. Recent guidelines issued by the RBI are intended to provide greater clarity on supervisory expectations, avoid

* Keynote address delivered by Shri M. K. Jain, Deputy Governor, Reserve Bank of India – at CAFRAL on March 10, 2022. The inputs provided by Shri Rohit Jain Executive Director, Shri Rajnish Kumar General Manager, Ms Monica D Soni DGM and Shri B. Netaji DGM DOS are gratefully acknowledged.

conflict of interest, provide sufficient authority, resources and independence to these functions, among others:

Compliance: In September 2020, RBI issued revised guidelines for compliance function in banks and role of Chief Compliance Officers (CCOs) to bring uniformity in approaches followed by banks, so as to align the supervisory expectations from CCOs with global best practices.

Internal Audit: Earlier in January 2020, RBI issued guidelines for strengthening governance with regard to risk based internal audit (RBIA) in banks, which included, *inter alia*, enhancing the authority, stature, and independence of the internal audit function. Similar set of guidelines were issued for select Non-Banking Financial Companies (NBFCs) and Urban Cooperative Banks (UCBs) in February 2021, which were later extended to select Housing Finance Companies (HFCs) as well.

Risk Management: Though RBI issued guidelines on risk management systems for banks way back in 1999, to bring uniformity in approaches followed by banks, as also to align the risk management system with the global best practices. Guidelines on the role of Chief Risk Officer (CRO) in banks were issued in April 2017. Similar guidelines for NBFCs and UCBs were issued in May 2019 and June 2021 respectively. RBI has also undertaken sensitisation sessions with CCOs, CROs and HIAs over the past year to communicate its expectations on oversight and assurance functions.

Governance in Commercial Banks: Through a discussion paper published in June 2020, Reserve Bank proposed substantial improvements to the governance framework of banks. Major highlights of the discussion paper were:

- i. Empower the Board of Directors to
 - a. set the culture and values of the organisation;
 - b. recognise and manage conflicts of interest;
 - c. set the appetite for risk and manage risks within the appetite;
 - d. improve the supervisory oversight of senior management;
- ii. Strengthen the oversight and assurance functions through various interventions;
- iii. Achieve clear division of responsibilities between board and management; and
- iv. Encourage the separation of ownership from management.

Based on the suggestions and feedback received on the Discussion Paper, the Reserve Bank issued instructions regarding the Chair and meetings of the Board; composition of certain Committees of the Board; age, tenure and remuneration of Directors; and appointment of whole-time directors (WTDs) in April 2021. With respect to the other proposals contained in the discussion paper, a Master Direction on Governance will be issued by RBI.

Enhanced Supervisory Focus on Oversight and Assurance Framework – RBI's Assessment and Findings

During recent years, assessment of oversight and assurance functions has been bestowed enhanced focus in view of their importance in addressing the root cause of problems. Some of the common weaknesses that have been observed in these functions are:

- a) **Compliance Function** – Failure / delay in detection and reporting of non-compliances, persisting sub-par compliance, deficiencies in compliance testing with respect to inadequate coverage and limited transaction testing, persisting irregularities due to non-addressing of root causes and not ensuring sustainability of compliance were observed.

Further, compliance setup was not resourced with adequate number and quality of staff in many cases.

- b) Risk Management** – Disconnect was observed between the risk appetite framework approved by boards and actual business strategy and decision making, weakening the risk culture which was amplified by absence of guidance from senior management, improper risk assessment, repeated exceptions to risk policies, conflict of interest especially in related party transactions, and absence or faulty enterprise risk management. Operational risk was seen to be high on account of people risk (high attrition rate, lack of succession planning, involvement of staff in fraudulent practices, etc.), elevated technology risk (lack of adequate investment in technology, lack of technically qualified personnel, business disruptions and weak business continuity plan (BCP) / disaster recovery (DR) arrangements, etc.), and high outsourcing risks (overdependence on vendors, lack of monitoring, gaps in contractual arrangements, etc.).
- c) Internal Audit** - Inability to capture irregularities, non-coverage of certain areas under the scope of audit, non-collaboration between compliance and audit, lack of ownership and accountability, inadequate review of practices that require alignment to address interests of all stakeholders, and non-compliance/delay in compliance with audit observations were some of the major concerns identified.

Supervisory Expectations on Governance and Assurance Functions

Some of our expectations from the supervised entities in this regard are:

(i) Effective Engagement and Support from the Top

Oversight and assurance functions have a key role in value creation for a financial institution, strengthening public confidence, preserving and enhancing its reputation, and maintaining the integrity of its business and management. The boards should engage with the oversight and assurance functions and assure them of direct and unfettered access. The "tone from the top" would set the pace for a sound organisation culture that values honesty and integrity.

(ii) Independence of Oversight and Assurance Functions

Appointment and removal of heads of oversight and assurance functions should have stringent barriers and they must be independent of executive management. Assurance functionaries should not be performing any of the tasks on which they are required to take a view independent of the risk takers.

(iii) Close Engagement and Collaboration

Maintaining independence does not preclude constructive engagement with management and business functions. Indeed, to be effective, heads of oversight and assurance functions must work closely with other functionaries and collaborate amongst themselves.

(iv) Sustainable Compliance

Several weaknesses and irregularities have been recurring despite the averments of remediation made by bank managements. Banks should make serious efforts towards overall improvement and sustainability in their compliance functions.

(v) Risk Governance

Risk appetite and risk tolerance levels must be clearly defined, keeping in view past and forward-looking assessment of likely internal and external risk environment and actual business decision making should align with these limits, as also with the capacities available with the institution. Senior management should communicate the risk management policies, risk appetite statement and risk management expectations to the business units for proper understanding and compliance.

(vi) Quality of Board Discussions and Time Given for Important Matters

The board members should focus on strategic and important matters. The quality of deliberations, level of challenge provided to executive management, and time allocated to important agenda items is often found to be inadequate. Many times, large number of agenda items are included, which do not allow for proper evaluation of proposals. The boards also need to work in a cohesive manner.

(vii) Role of Board and Senior Management in Cybersecurity and Technology

RBI has mandated banks to have awareness programmes for their Board of Directors and senior leadership team to familiarise them with IT and relevant cybersecurity concepts. The boards must start looking at cyber risk as an enterprise risk management issue, rather than a pure IT security issue, owing to its firm-wide implications. Adequate level of investments in technology should be ensured. In its oversight role, the boards need to oversee the overall cybersecurity management, including appropriate risk

mitigation strategies, systems, processes, and controls. Whether the institution has the appropriate skills, resources, and approaches in place to minimise cyber risk and mitigate any damages that may occur also needs to be seen.

(viii) Dominance of Individuals

It is important to ensure that financial institutions are board-driven and do not end up being dominated by individuals. Experience has shown that this leads to undesirable consequences.

(ix) Oversight over Related Party Transactions (RPTs) and Connected Lending

While various regulations are in place to check improper RPTs, including their disclosures, etc, it is important that boards and audit committees exercise close oversight over such matters and get satisfactory assurances.

Detecting Red Flag in Board Reports

A bank's board needs concise, accurate and timely reports to perform its fiduciary responsibilities. I would like to list out some illustrative areas that should invite questions from directors:

- Is the bank's strategic plan realistic for the bank's circumstances?
- Is the bank's business risk-taking in alignment with its approved risk appetite?
- Is management meeting the goals established in the planning process? If not, why?
- Do earnings result from the implementation of planned bank strategies, or from transactions generating short-term earnings, but posing longer term risk?
- Are policies and procedures in place that safeguard against conflicts of interest, insider fraud and abuses?

- Does the bank have sufficient capital to support its risk profile and business strategies?
- Are financial reports and statements accurate, or reflect true financial condition of the bank?
- Are the strategies of the bank aligned with its future needs and requirements?
- Is the bank spending adequately on IT systems to maintain robust infrastructure and make it scalable as per the growing needs and challenges?

Conclusion

Let me now conclude. An efficient and vibrant financial system is crucial for economic development and social well-being of the country. The governance framework surrounding the individual players in the

financial system assumes a central role not only in terms of value creation for various stakeholders but also in ensuring the oversight of the Board on risk appetite and risk culture of individual institutions.

Effective internal defences will help in building organisations that are strong, resilient and disciplined; and enjoy the benefits of sustained growth and customer confidence. It will also pre-empt supervisory actions and attendant reputational risks that arise in case transgressions are detected.

I am quite hopeful that proceedings of this seminar will add value to all of you and I am also confident that all of you will espouse a robust governance culture at the institutions you are associated with. I once again thank CAFRAL for hosting this important seminar and giving me the opportunity to address you.

Stay safe and thank you.

ARTICLES

State of the Economy

Measuring Supply Chain Pressures on India

Monetary Transmission to Banks' Interest Rates:
Implications of External Benchmark Regime

What Drives the Forward Premia –
An Analytical Perspective

Foreign Exchange Reserves Buffer in Emerging Market Economies:
Drivers, Motives and Implications

Digitisation in Urban Cooperative Banks:
Depth and Differentiation

State of the Economy*

India enters Samvat 2079 having crested the third wave of the pandemic with economic activity returning to speed in several sectors. These gains are, however, at risk from disruptive spillovers from geo-political hostilities as increasingly evident in inflation prints, tightening financial conditions and a terms of trade shock accompanied by portfolio outflows. India faces these challenges with improving fundamentals and strong buffers. Going forward, spurring private investment remains a key thrust area for sustaining growth on a durable basis.

Introduction

The global economy is in the throes of a geo-political cataclysm, with heightened uncertainty obscuring the outlook. Choked supplies and mounting commodity prices, especially of food and energy, have stoked inflationary pressures, exacerbating policy trade-offs for central banks. Emerging economies are experiencing disruptive spillovers in terms of tightening financial market conditions, besides capital outflows and currency depreciations. Given these unsettled conditions, investors sporadically seek the shelter of safe-haven assets alternating between phases of risk-on activity with every positive news being priced in as a cessation of war. Consequently, financial markets are on edge.

India too is experiencing tremors from these developments. The fallout of the war and retaliatory sanctions is already evident in inflation prints and

balance of payments developments. Nonetheless, some domestic factors provide some measure of comfort. As India enters Samvat 2079¹, the third wave seems to be well behind us and, with the removal of all restrictions alongside a broadening of vaccination coverage, economic activity is returning to speed. Most sectors of the economy are reaching or have exceeded pre-pandemic levels. Notably, bank credit has gathered pace and the job market is gathering steam. There is an acceleration in the travel and hospitality sectors. The construction and real estate sector have also registered a pick-up.

The Resolution of the monetary policy committee (MPC) of April 8, 2022 marks a turning point in the conduct of monetary policy in India. As pointed out in the statement of Governor Shri Shaktikanta Das on the same day, the sharp escalation in geopolitical tensions has significantly changed the external and domestic landscape. Global Inflation is running well above targets in major countries and sizeable adverse impacts on output are expected across geographies. Taking stock of recent developments and the evolving outlook, the MPC decided to keep the policy rate unchanged. Several noteworthy features distinguish this *status quo*, however. First, the forecasts – which function as the intermediate targets of monetary policy – have undergone significant shifts, with the average inflation projected for 2022-23 raised by 120 basis points (to 5.7 per cent) and growth lowered by 60 basis points (to 7.2 per cent) relative to the February 2022 configuration, mirroring the impact of the geopolitical conflict. Second, in consonance with this outlook, the MPC reprioritised price stability among its objectives “to ensure that inflation remains within the target going forward, while supporting growth”. Third, the MPC decided to remain accommodative, but to focus “on withdrawal of accommodation” in sync with the projections and the reordering of policy objectives. Fourth, the RBI announced innovative

* This article has been prepared by Shahbaaz Khan, Shashidhar M. Lokare, Kunal Priyadarshi, Rajeev Jain, Vineet Kumar Srivastava, Barkha Gupta, Priyanka Sachdeva, Prashant Kumar, Rishabh Kumar, Saksham Sood, Satyam Kumar, Deepika Rawat, Jibin Jose, Satyarth Singh, Sudhanshu Goyal, Yuvraj Kashyap, Ashish Santosh Khobragade, Shelja Bhatia, Deba Prasad Rath and Samir Ranjan Behera. Views expressed in this article are those of the authors and do not necessarily represent the views of the Reserve Bank of India.

¹ Hindu New Year.

refinements in the operating procedure of monetary policy in order to implement the MPC's decision, as set out in Section IV.

Before we turn to global and domestic developments, an area of concern that we would flag is the currently raging heat wave. Temperatures are breaking all-time records in many pockets of the country. The country as whole saw the hottest March (average maximum temperature) in the last 122 years. As per the India Meteorological Department (IMD), this unseasonal phenomenon is believed to have occurred due to advance formation of anti-cyclonic circulations in Western India and scanty rains in the Central States. The IMD has forecasted that these heat waves are likely to continue beyond mid-April. The increasing frequency of these unseasonal fluctuations reveals the impact of climate change and underscores the urgency of reductions in carbon footprints and integrating the relevant climatic variables in the development strategies.

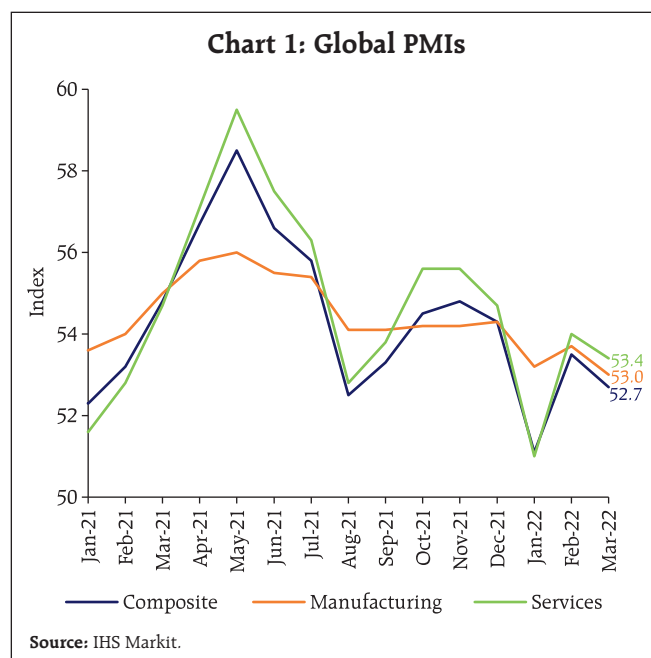
Set against this backdrop, the remainder of the article is structured into four sections. Section II covers the rapidly evolving developments in the global economy. An assessment of domestic macroeconomic conditions is set out in Section III. Section IV encapsulates the financial conditions in India, while the last Section sets out concluding remarks.

II. Global Setting

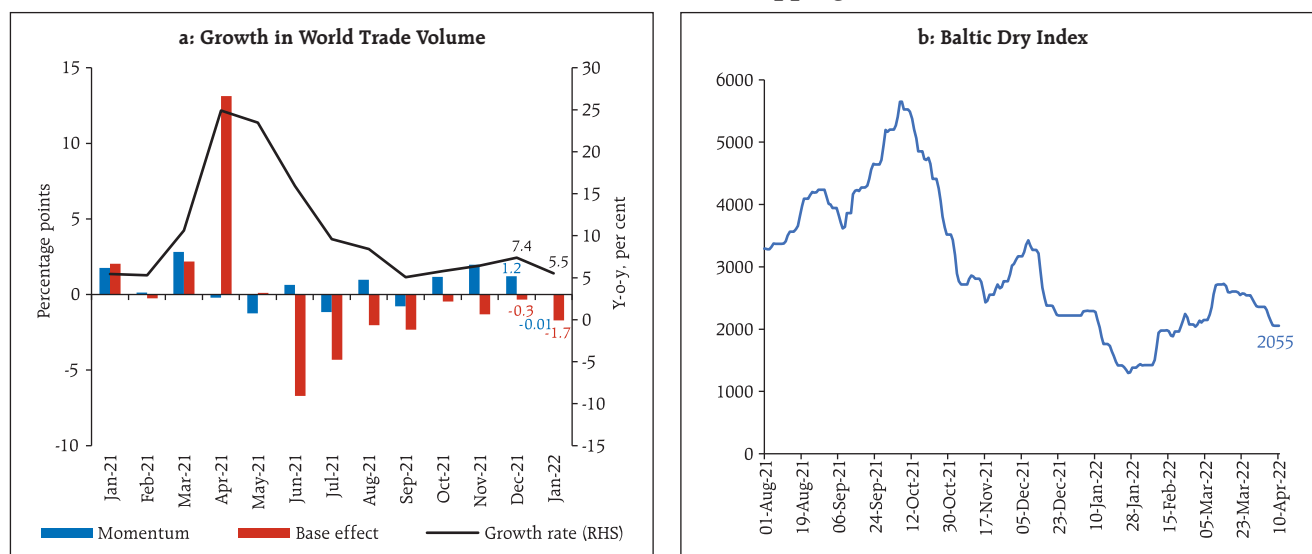
Geo-political hostilities and their spillovers are weighing heavily on global economic activity. International commodity prices, which were already on an upward spiral amidst demand-supply imbalances, hardened precipitously in early March 2022 and remained volatile at elevated levels thereafter. Reflecting the pass-through of high commodity prices, headline inflation in many advanced economies spiked further to new record levels forcing central banks to hasten unwinding of accommodative monetary policy stances despite rising risks to growth.

In its Interim Economic Outlook released on March 17, 2022 the OECD projects global growth to be lower by over 1 percentage point in 2022 from its December forecast of 4.5 per cent. This downward revision presumes that the commodity and financial market shocks seen in the first two weeks of the conflict persist for at least a year. Reflecting similar concerns, the United Nations Conference on Trade and Development (UNCTAD)'s Trade and Development Report released on March 24, 2022 projects that global growth would reduce by 1 percentage point to 2.6 per cent from its October forecast of 3.6 per cent², amounting to approximately US\$1 trillion foregone income. This is premised on the assessment that the sanctions and supply chain disruptions will last through 2022 even if the war ends.

Among high frequency indicators, the global composite Purchasing Managers Index (PMI) moderated to 52.7 in March from 53.5 a month ago, suggesting loss of momentum on escalated geopolitical tensions and other lingering headwinds from strained supply chains and COVID-led disruptions (Chart 1). Both services and manufacturing PMIs



² UNCTAD's global growth estimate is measured on constant US dollars at market exchange rate, while OECD's growth estimate is on purchasing power parity weighted aggregate.

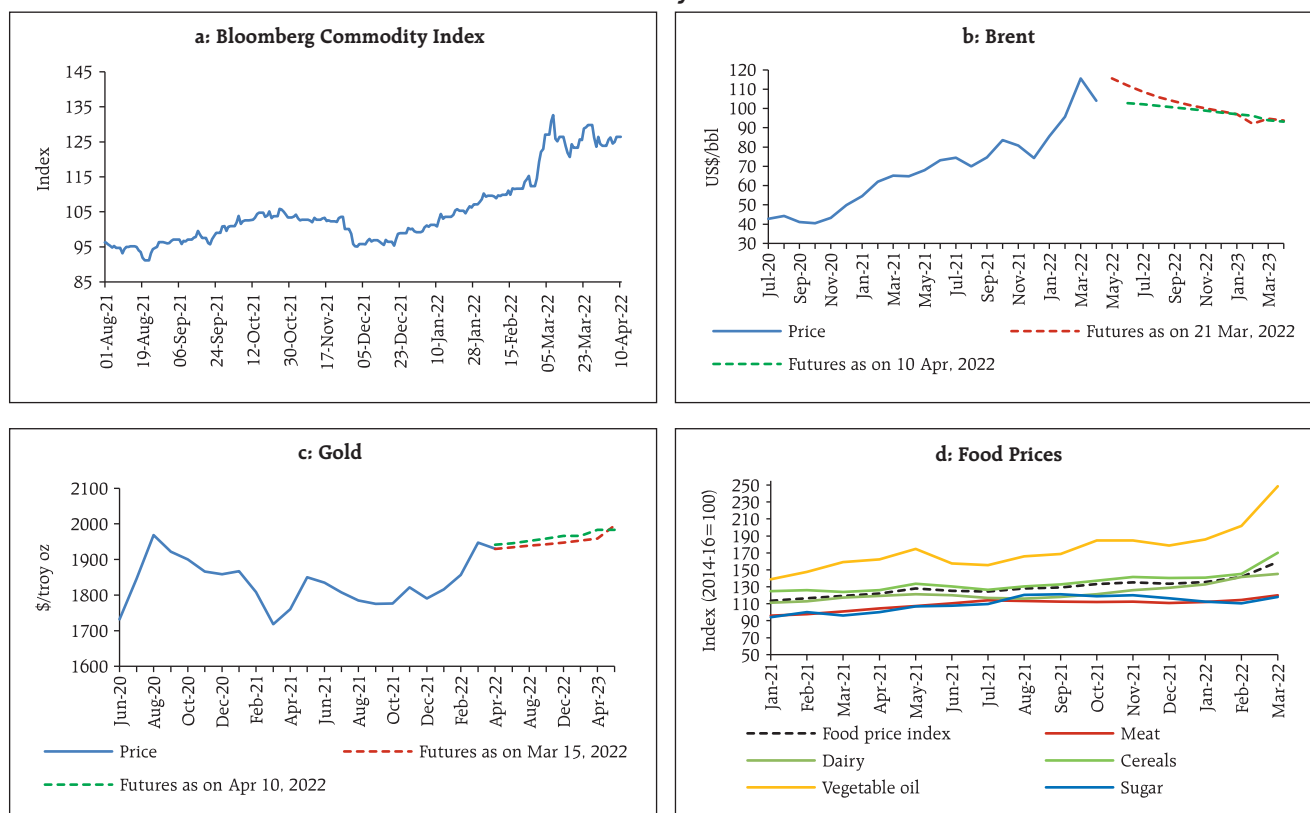
Chart 2: World Trade and Shipping Costs

Sources: CPB Netherlands; and Bloomberg.

eased, with the latter slipping to an 18-month low as growth in output and new orders slowed while new export business contracted. North America and Europe remained bright spots, while China and Russia registered contraction in their composite PMIs, the latter marking the steepest decline since May 2020.

Monthly data from the CPB World Trade Monitor point to deceleration of the growth in world trade volume to 5.5 per cent (y-o-y) in January 2022 following three consecutive months of acceleration (Chart 2a). Overall, emerging economies including China showed negative m-o-m growth in both imports and exports (-2.7 per cent and -1.5 per cent), but trade in the Euro area accelerated. The UNCTAD has estimated a likely 5-8 per cent increase in the Asia-Europe ocean freight demand, which could further exacerbate price pressures. Early signs are already visible in a 400 per cent rise in the Black Sea–Med Aframax and Suezmax tanker freight rates. The Baltic Dry Index, which remained high in March 2022 amidst renewed supply disruptions, has eased somewhat in April so far (up to April 10) (Chart 2b).

The Bloomberg Commodity Index hit an 8-year high in early March, with prices soaring across the board on war-induced supply shocks (Chart 3a). Since mid-March, however, it has been exhibiting two-way movements. Crude oil prices rocketed to a 14-year high of US\$ 133 per barrel in the first week of March (Chart 3b). Although they eased subsequently, high volatility has characterised their movements. The announcement by the US of a release of 180 million barrels from its strategic oil reserves capped gains towards end-March. Brent crude prices are trading above US\$100 per barrel, registering 31.6 per cent gain in 2022 so far (up to April 10). Basking in safe haven and inflation hedge appeal, gold prices have also rallied since February. Although prices consolidated in the latter half of March on hardening bond yields, the yellow metal ended the month with net gains (Chart 3c). Base metal prices too exhibited a similar trend, with nickel, aluminum and palladium – key exports of Russia-Ukraine – rising the most. The FAO food price index at 159.3 in March marked its highest monthly jump on record to hit an all-time high. The increase was seen across the board, with

Chart 3: Commodity and Food Prices

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

vegetable oil and cereals sub-indices exhibiting the maximum acceleration (Chart 3d).

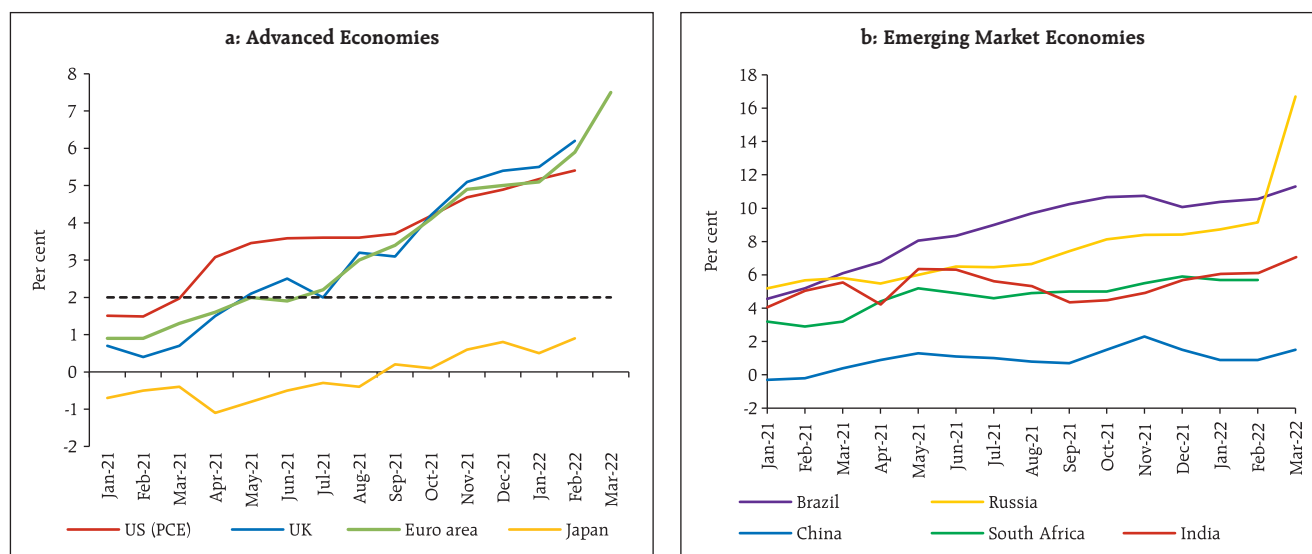
Inflation continues to mount, while turning more entrenched and broad-based across economies. Ongoing geopolitical crisis and the fear of prolonged supply disruptions have accentuated inflationary risks. Accordingly, the OECD has revised up projection for global inflation by approximately 2.5 percentage points for 2022 from its December forecast of 4.2 per cent. Euro area inflation jumped to a historical high of 7.5 per cent (y-o-y) in March from 5.9 per cent in February as energy and food prices accelerated sharply more so on war-led disruptions (Chart 4a). The US personal consumption expenditure (PCE) inflation inched up to a new record of 6.4 per cent in February, reflecting increases in energy and food prices. Core PCE inflation also remained elevated

at a 39-year high. In the UK, inflation scaled a new record of 6.2 per cent in February as price pressures turned more broad-based, with rising energy, food and durable goods prices providing the impetus. Among BRICS economies, inflation in Brazil at 11.3 per cent in March remained in double digits for the seventh consecutive month, while in China, it rose to a three-month high of 1.5 per cent (Chart 4b). In Russia, following sanctions and a sharp depreciation in rouble, inflation jumped to a double-digit figure of 16.7 per cent in March – first time since 2015 – from 9.2 per cent in February.

Globally, energy intensity has shown a downtrend, implying increased efficiency in its usage over the years (Chart 5a).³ India's

³ Energy intensity measures as to how efficiently the economy uses energy to produce every dollar of GDP.

Chart 4: Inflation

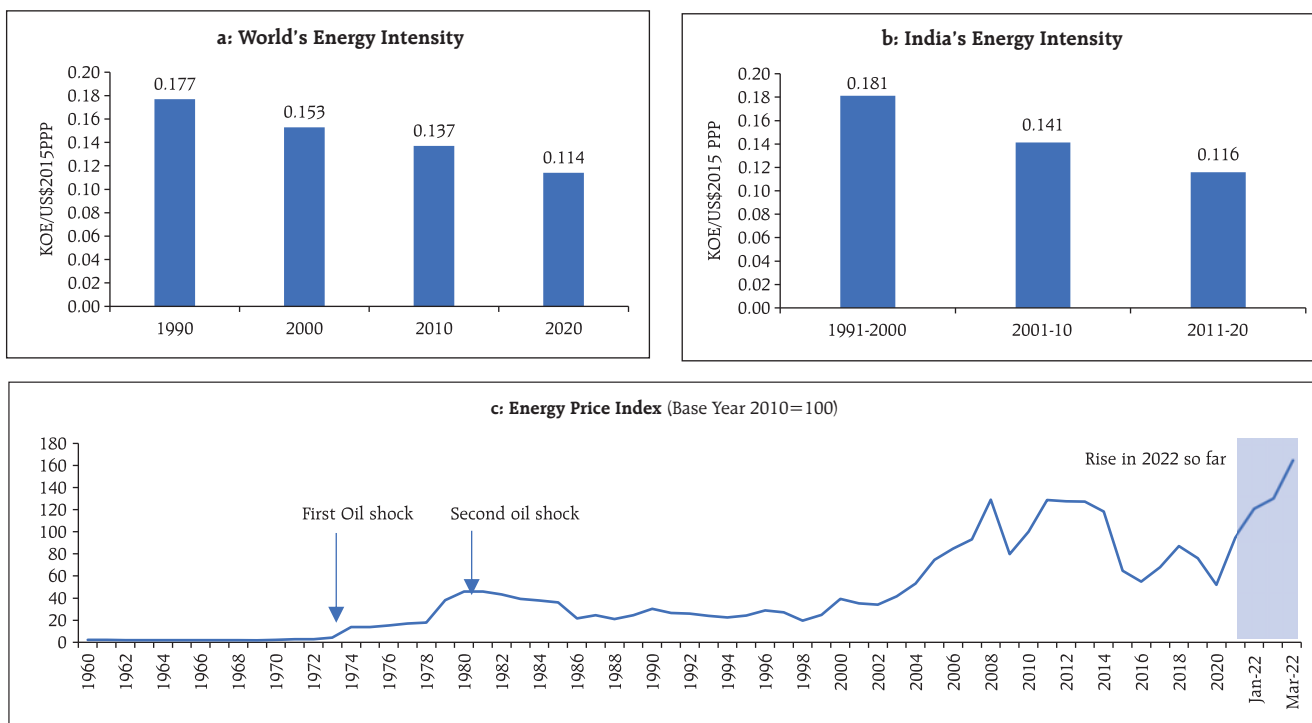


Source: Bloomberg.

energy intensity has also recorded a secular decline, implying *inter alia*, that structural changes are

underway in the output structure of the economy (Chart 5b).

Chart 5: Inter-temporal Trend in Energy Intensity



Note: KOE means Kilogram oil equivalent.

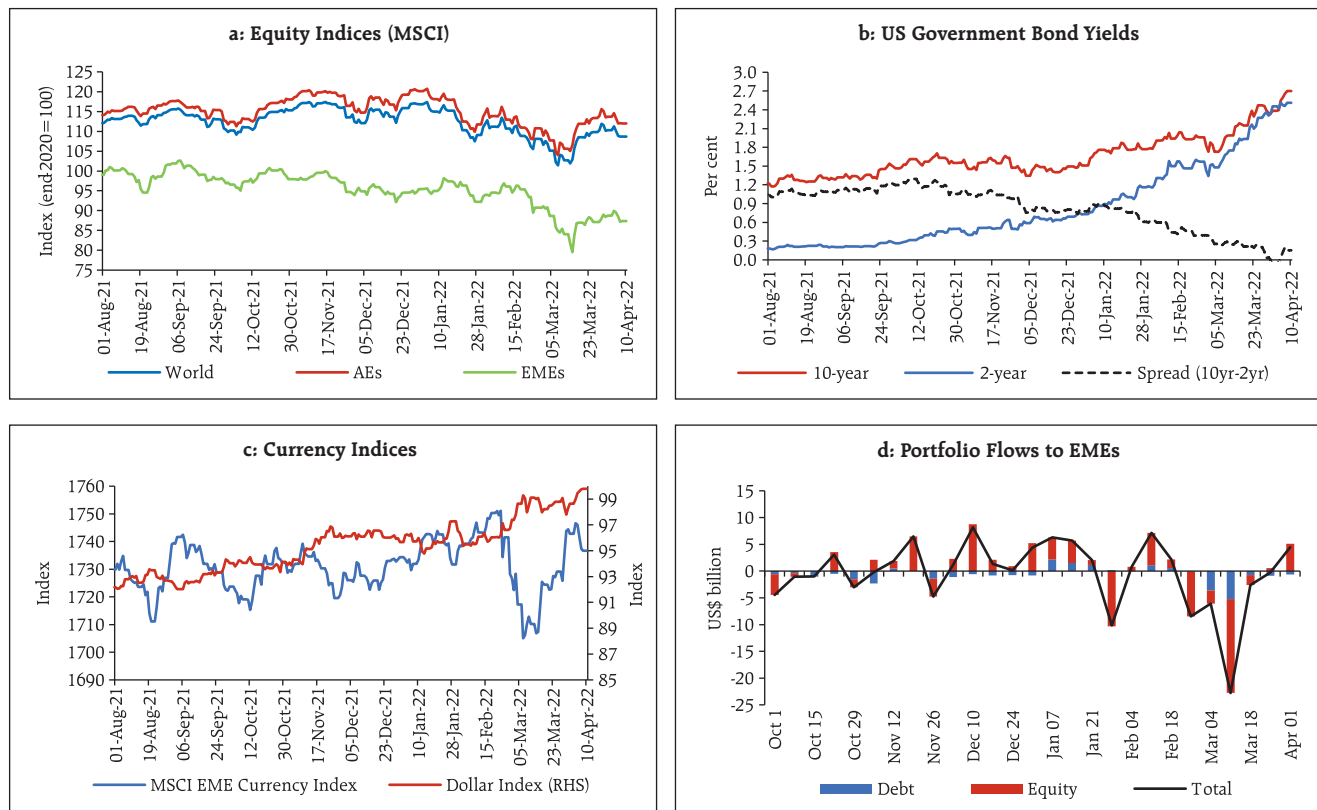
Source: World Bank; and Enerdata.

Global financial markets were hit by bouts of turbulence as heightened war-induced uncertainties and policy normalisation kept investors on edge. Global equity markets, plummeted by mid-March, but they recouped losses and eked out a monthly gain of 2 per cent in March (Chart 6a). The MSCI world equity index is in the red on a year-to-date basis, with most stock indices in both advanced economies (AE) and emerging market economies (EME) clocking negative returns in 2022 so far (up to April 10). Among AEs, the US S&P stock indices ended March with net gains as upbeat economic data and ceasefire optimism bolstered risk-on sentiments, offsetting early March sell-offs. EME stocks underperformed their AE counterparts, with Chinese stock indices remaining the worst performers in March as shutdown of various cities and manufacturing facilities amidst rising infections weighed on growth prospects.

In the bond markets, the 10-year US treasury yields, which had undergone a transient softening on flight to safety, hardened from mid-March. With markets pricing in faster rate hikes, short-term yields leaped, causing a transient inversion in the yield spread in the 10-year *minus* 2-year segment (Chart 6b).

In the currency markets, the US dollar exhibited two-way movements since mid-March. Fluctuations in market sentiments can impart high volatility (Chart 6c). Concomitantly, the MSCI Emerging Markets Currency Index rebounded from steep declines in the first half of March, primarily underpinned by strengthening of a few major commodity exporters' currencies and retrenchment in capital outflows in the later part of the month in EMEs (Chart 6d).

Chart 6: Financial Markets

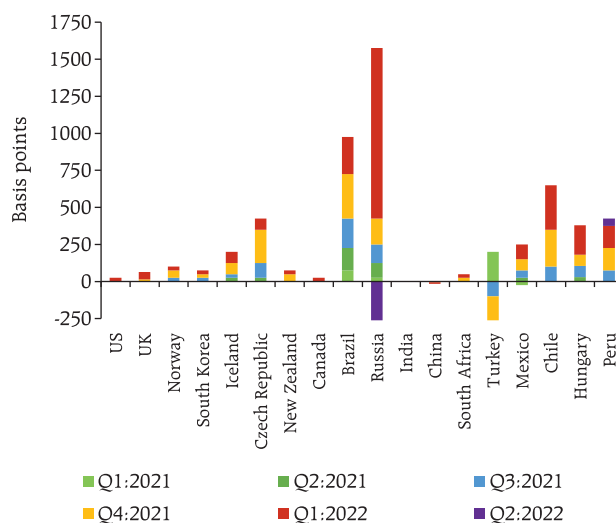


Sources: Bloomberg; and IIF.

Globally, monetary policy actions and policies have been targeted at unwinding of stimulus and normalisation, *albeit* at differing paces. In its March meeting the US Fed, effected its first rate hike since December 2018, raising the target range for the Federal Funds rate by 25 basis points (bps) to 0.25-0.5 per cent while also undertaking balance sheet reduction. The Bank of England continued with monetary policy tightening, raising its policy rate by 25 bps in March – the third such hike in a row, taking the benchmark interest rate to 0.75 per cent. Among other AEs, Norges Bank hiked rates again by 25 bps after two rate hikes in 2021. Among EMEs, Brazil raised its policy rate by another 100 bps, taking the total cumulative increase to 975 bps in one year of its tightening cycle. South Africa raised its rate for the third consecutive time by 25 bps, cumulating the total increase to 75 bps since November 2021. Among other EMEs, Chile, Hungary, and Mexico raised their benchmark rates by 150 bps, 100 bps, and 50 bps, respectively, in March. China and Turkey, on the other hand, continued to maintain *status quo* in their second and third consecutive meetings, respectively, in March. Bank of Russia after an emergency rate hike of 10.5 percentage points in late-February, reduced its policy rate by 300 bps to 17 per cent in an unscheduled meeting on April 08, 2022 following signs of stabilisation in their financial system (Chart 7).

The global outlook remains hostage to the spillovers from geo-political forces. Recent surge in risk-off sentiments in the wake of heightened volatility has embroiled financial markets with implications for global economic activity, going forward. Moreover, with strained supplies and concomitant bulging commodity prices, inflation figures are shooting up to new heights, thus putting the policymakers in a conundrum of quelling the ratcheting inflationary pressures without numbing the growth impulses with higher interest rates.

Chart 7: Rate Actions of Central Banks of Select Countries



Source: Central bank websites.

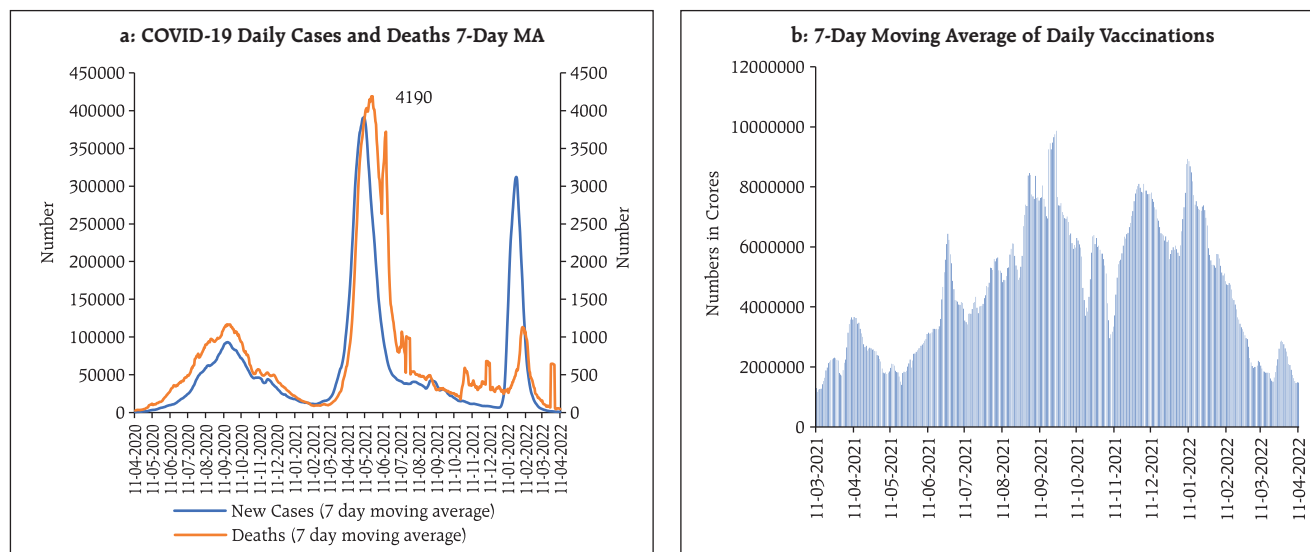
III. Domestic Developments

The domestic macroeconomic conditions have begun to improve with the rapid retreat in COVID-19 infections and the resumption of economic activity in normal modes of functioning. Daily infections plunged to 861 on April 11, 2022 from a peak of 3.47 lakh on January 20, 2022 (Chart 8a). The daily positivity rate plummeted to 0.32 per cent from 17.94 per cent during the same period.

Over 84 per cent of the adult population (80 crore) and 3.9 crore *plus* children in the 15-18 year age group are fully vaccinated, while 2.2 crore children in the 12-14 year age group have been inoculated with the first dose. The total vaccination doses have crossed 185 crore as on April 11, 2022 (Chart 8b). The Central government has removed all COVID-19 related restrictions, except face masks and hand hygiene⁴, since March 31, 2022.

Mobility remains well above pre-Covid levels. Google mobility improved across all categories in April (till April 11, 2022), as compared to a month

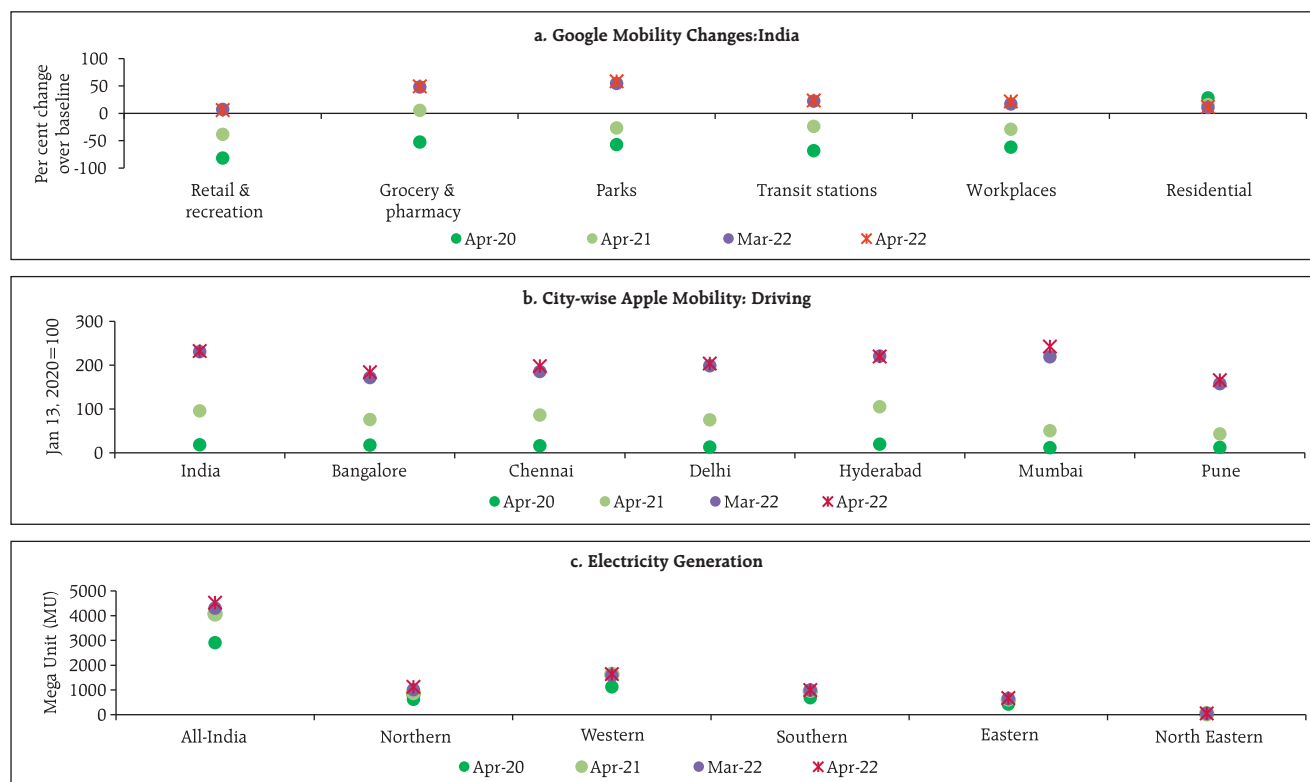
⁴ https://www.mha.gov.in/sites/default/files/ChiefSecretaries_23032022.pdf

Chart 8: COVID-19 Daily Cases and Vaccinations

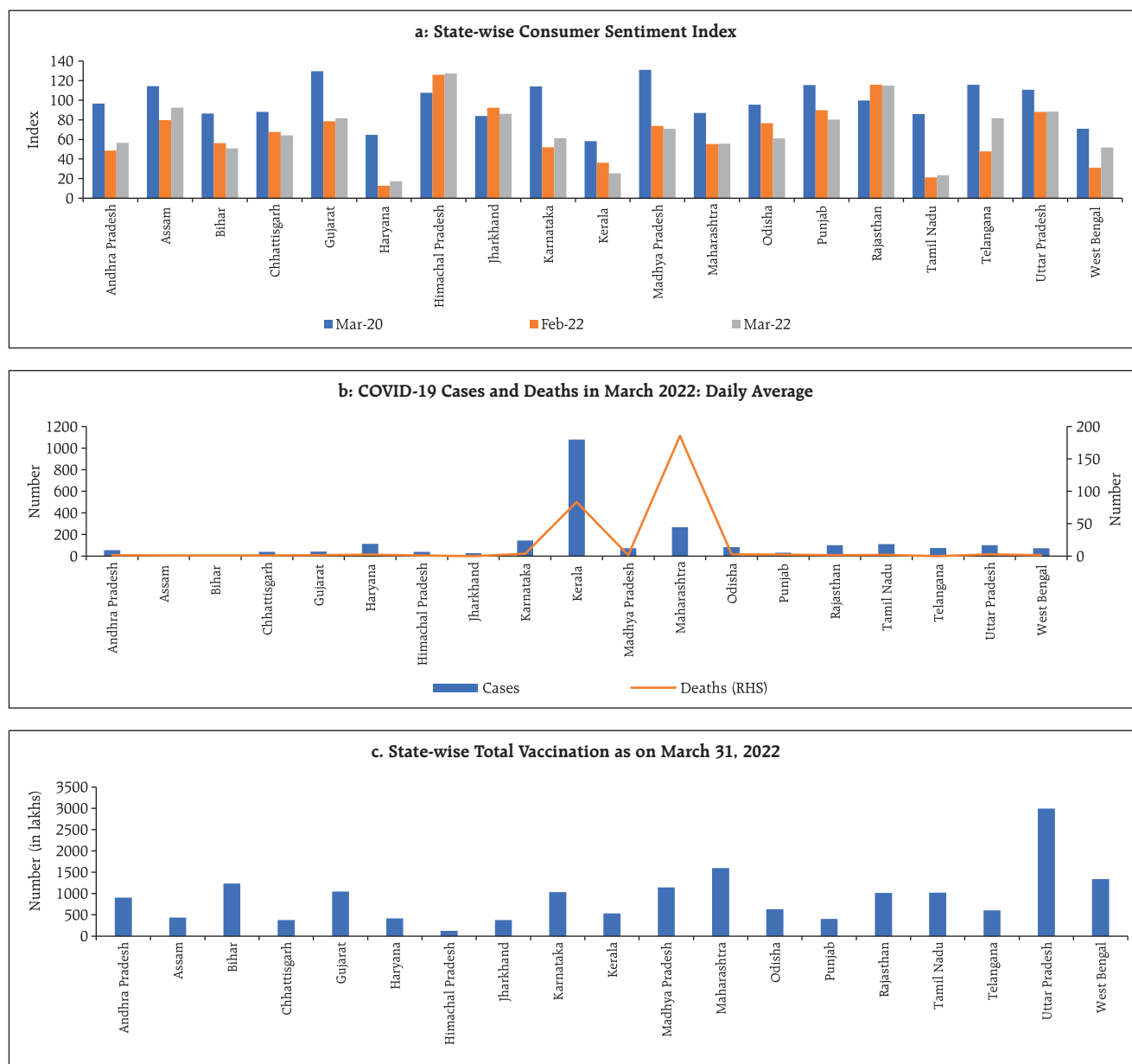
Source: Ministry of Health and Family Welfare (MoH&FW).

ago, surging above 50 per cent over the baseline numbers around grocery, pharmacy and parks (Chart 9a). Apple mobility index too recorded strong improvement in April (Chart 9b). With the opening of

services sector outlets, electricity generation picked up in April across all jurisdictions, surpassing pre-pandemic levels and the levels recorded a month ago (Chart 9c).

Chart 9: Impact of Third Wave of COVID-19 on Economic Activity

Sources: Google; CEIC; and POSOCO.

Chart 10: State-wise Consumer Sentiments and Vaccinations

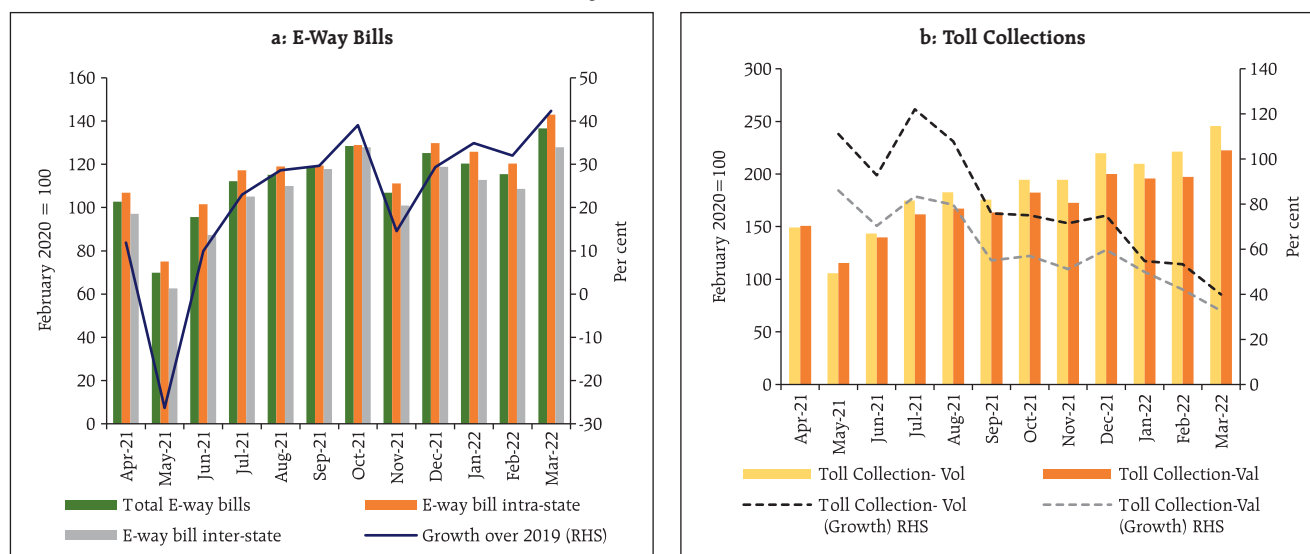
Source: CMIE.

As an outcome of these developments, consumer sentiment improved sequentially in most States in March (Chart 10).

Aggregate Demand

Indicators of aggregate demand picked up in March 2022, with E-way bills recording a 48-month

high and exceeding pre-pandemic levels by 37 per cent. The increase was led by intra-state e-way bills (Chart 11a). Toll collections remained upbeat in March, doubling from pre-pandemic levels for the fourth consecutive month (Chart 11b).

Chart 11: E-way Bills and Toll Collections

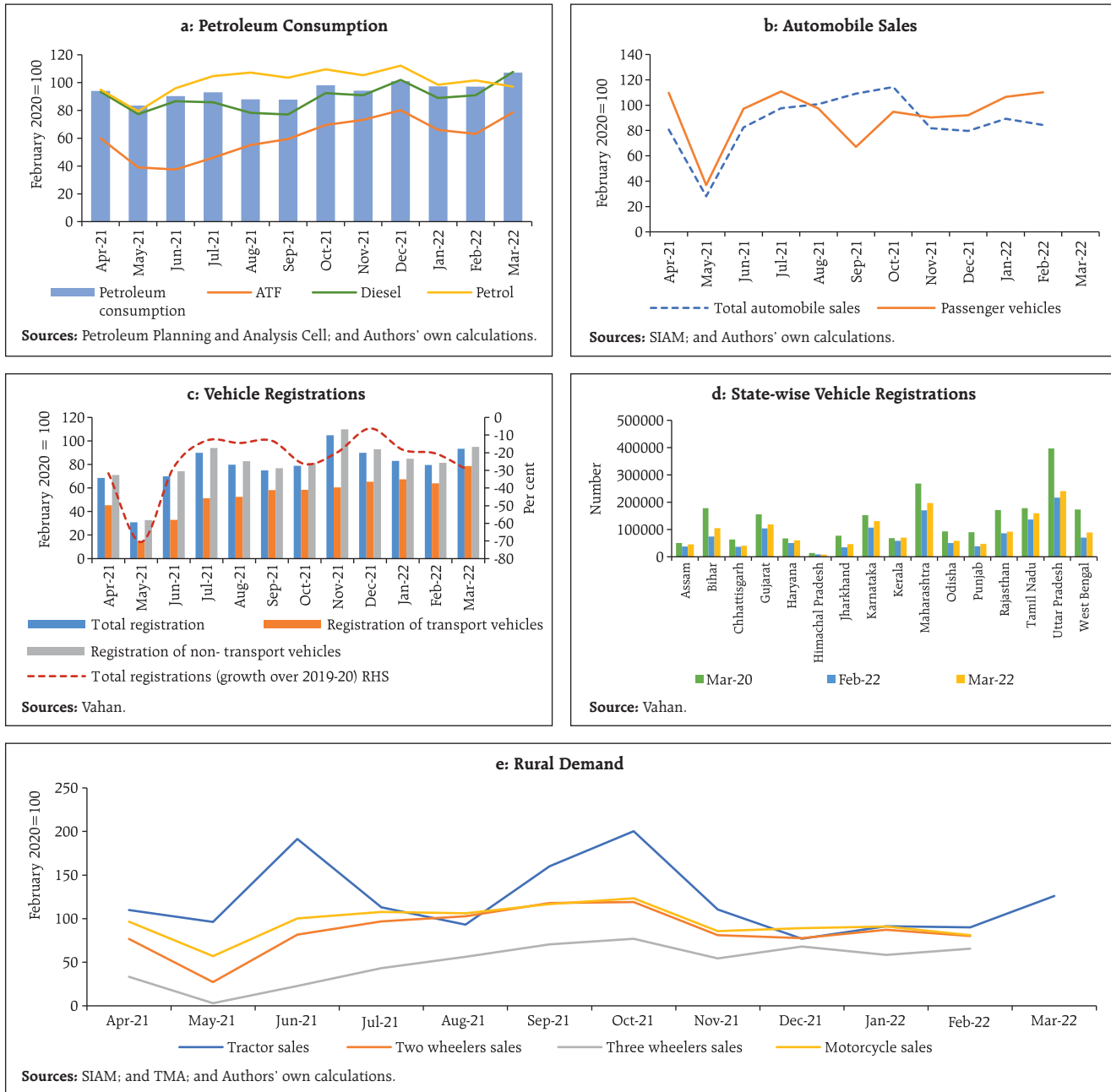
Sources: GSTN; Reserve Bank of India; and Authors' own calculations.

Fuel consumption improved amidst price hikes as demand recovered. Aviation Turbine Fuel (ATF) and diesel consumption improved sequentially. But high fuel inflation led to moderation of petrol consumption (Chart 12a).

Automobile sales remained muted in March, led by a dip in sales of two wheelers, even as wholesale dispatches of passenger vehicles from Original Equipment Manufacturers (OEMs) recorded an uptick with sustained demand momentum (Chart 12b). As per industry experts, sales of commercial vehicles are expected to be flat as diesel price hikes may dampen demand. Retail sales of automobiles inched up, led by an increase in the registrations of transport vehicles (Chart 12c). Maharashtra and Uttar Pradesh were the top two States in terms of vehicle registrations in March (Chart 12d). The electric vehicle segment continues to outperform other segments, but shortages in key raw materials like nickel are expected

to raise input costs for electric vehicle (EV) batteries. Likewise, supplies of rare-earth metals and neon gas used in the production of semiconductor chips are vulnerable to disruptions. Within rural demand, tractor sales show strong sequential growth in March 2022 (Chart 12e).

As per the household survey of the Centre for Monitoring Indian Economy (CMIE), the labour participation rate slipped from 39.9 per cent in February to 39.5 per cent in March 2022. The employment rate (worker population ratio) declined by 20 basis points, but the unemployment rate fell to 7.6 per cent in March from 8.1 per cent a month ago. While the unemployment rate fell across rural areas by over a percentage point, it increased in urban areas (Chart 13a). Though most states witnessed a reduction in employment rates in March over February, states like Gujarat, Maharashtra, Haryana and Odisha have shown a remarkable recovery and

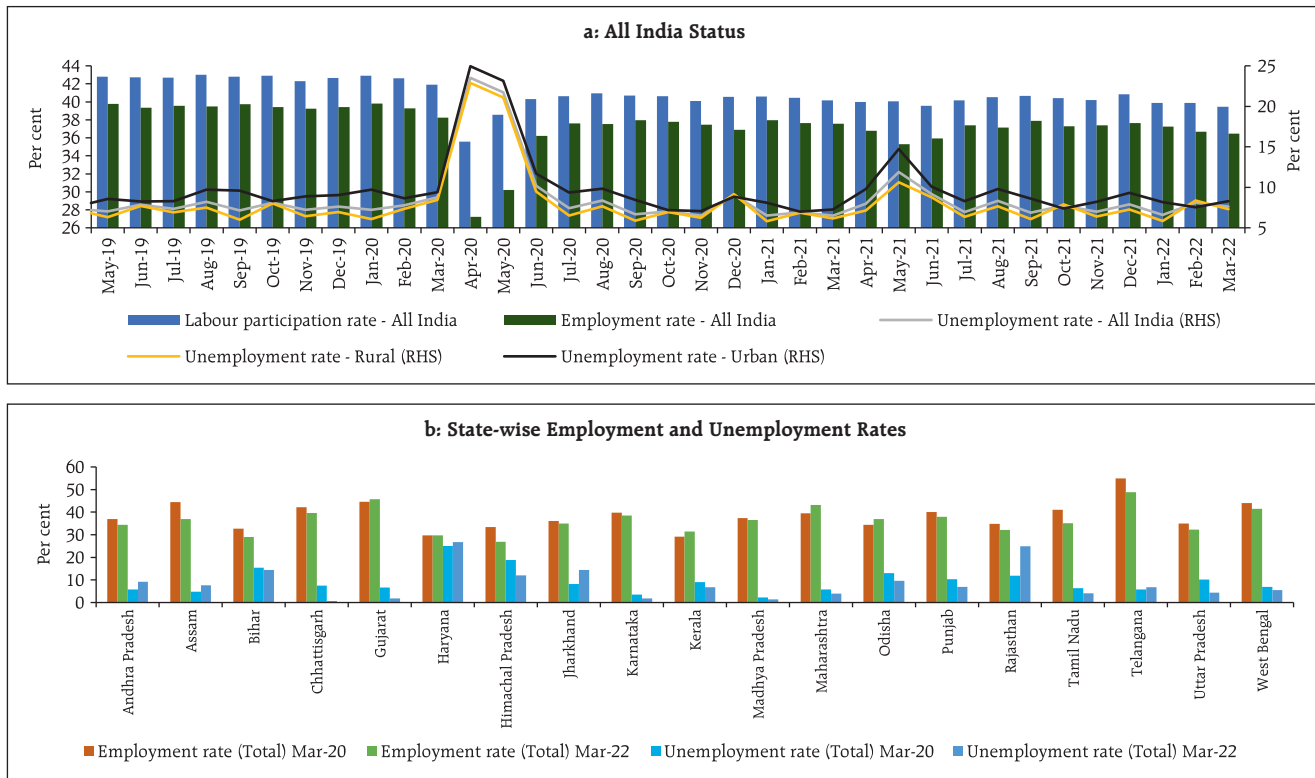
Chart 12: Transport Sector Indicators

surpassed their pre-pandemic employment rates (Chart 13b).

CMIE's employment statistics show that the total number of employed workers fell for the third consecutive month (Chart 14a). As per the category of occupation, number of businessmen and salaried workers fell between February and March, while

the number of farmers and small traders increased. The labour force participation rate (LFPR) has inched closer to pre-pandemic levels across several states and in some it has even risen beyond (Chart 14b).

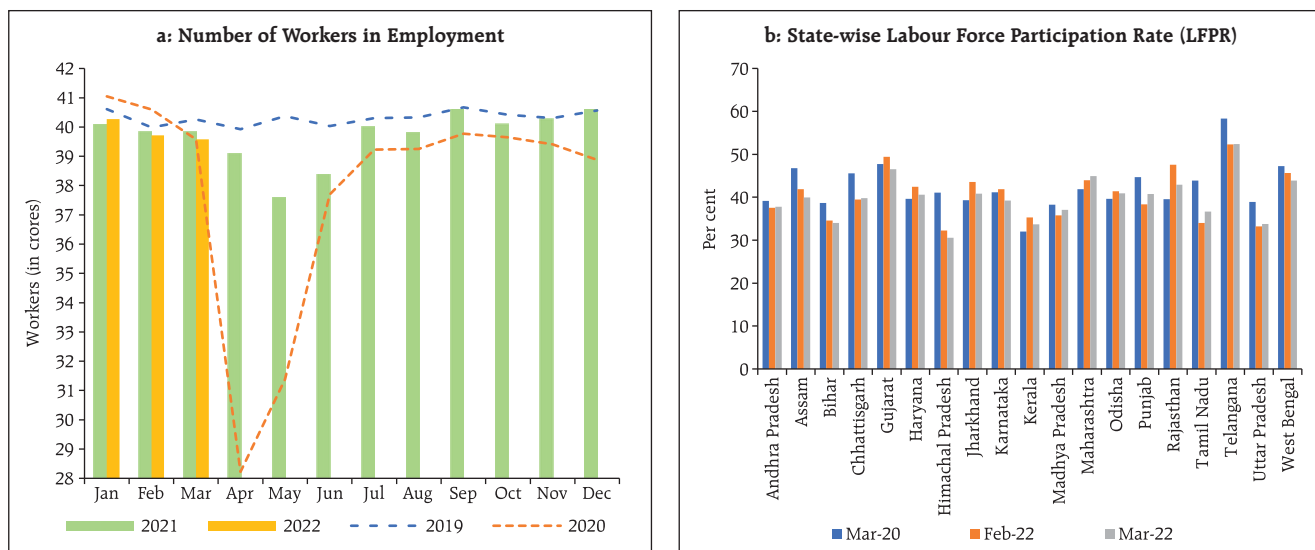
PMIs show that employment conditions in manufacturing sector improved in March, as the index entered expansion after three months of

Chart 13: Employment, Unemployment and Labour Participation Rates

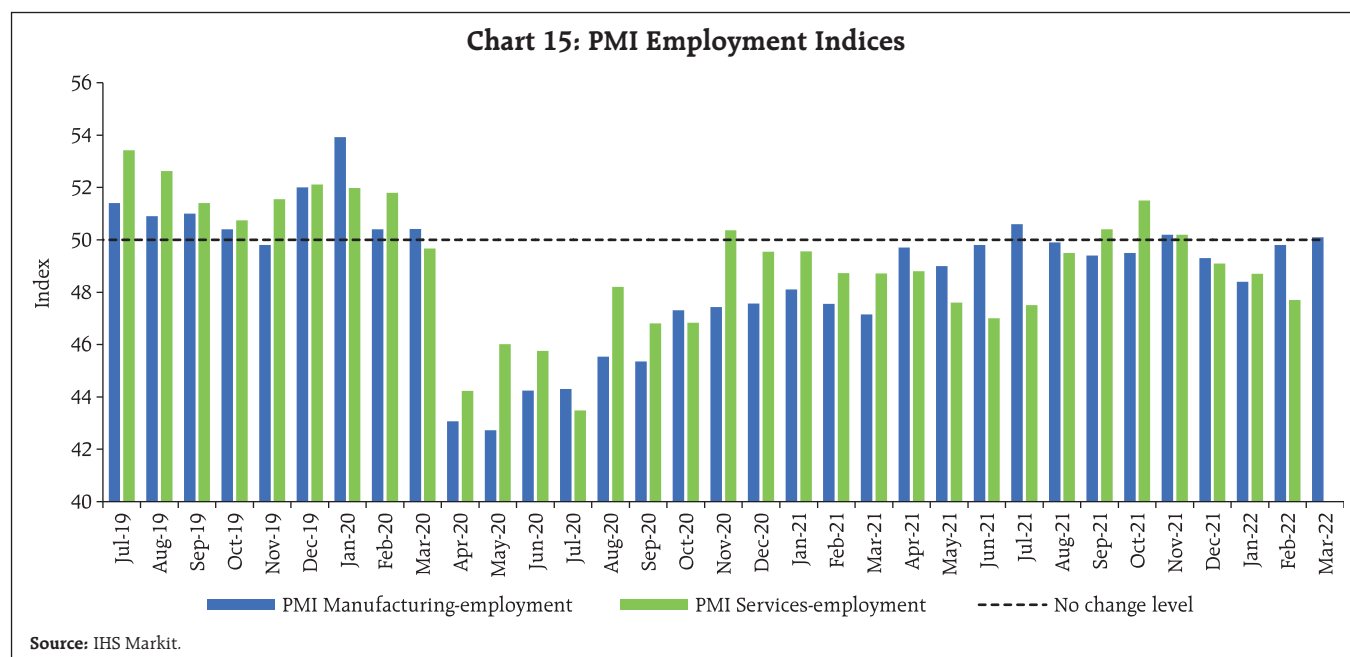
Source: CMIE.

contraction. PMI for services sector employment improved too after four successive months of decline (Chart 15).

The latest available results from the Periodic Labour Force Survey (PLFS) by the Ministry of Statistics and Programme Implementation (MoS&PI) for April-

Chart 14: Number of Workers in Employment and LFPR

Source: CMIE.



September 2021 period allows an evaluation of the impact of the two waves of the pandemic on the labour market. A comparison of major labour market indicators such as the labour participation rate (LPR), worker population ratio (WPR) and the unemployment rate (for 15 years and above category) across July-September period of 2019 and 2021 shows that the labour market has recovered substantially, but the

recovery was incomplete as unemployment rate remains high. The labour participation and worker population ratio are marginally behind their pre-covid September 2019 levels. Although all indicators fare worse for the female labour force, the impact of the pandemic has been equally worse across genders (Chart 16). Pandemic has significantly altered the labour market and industry dynamics across the globe.

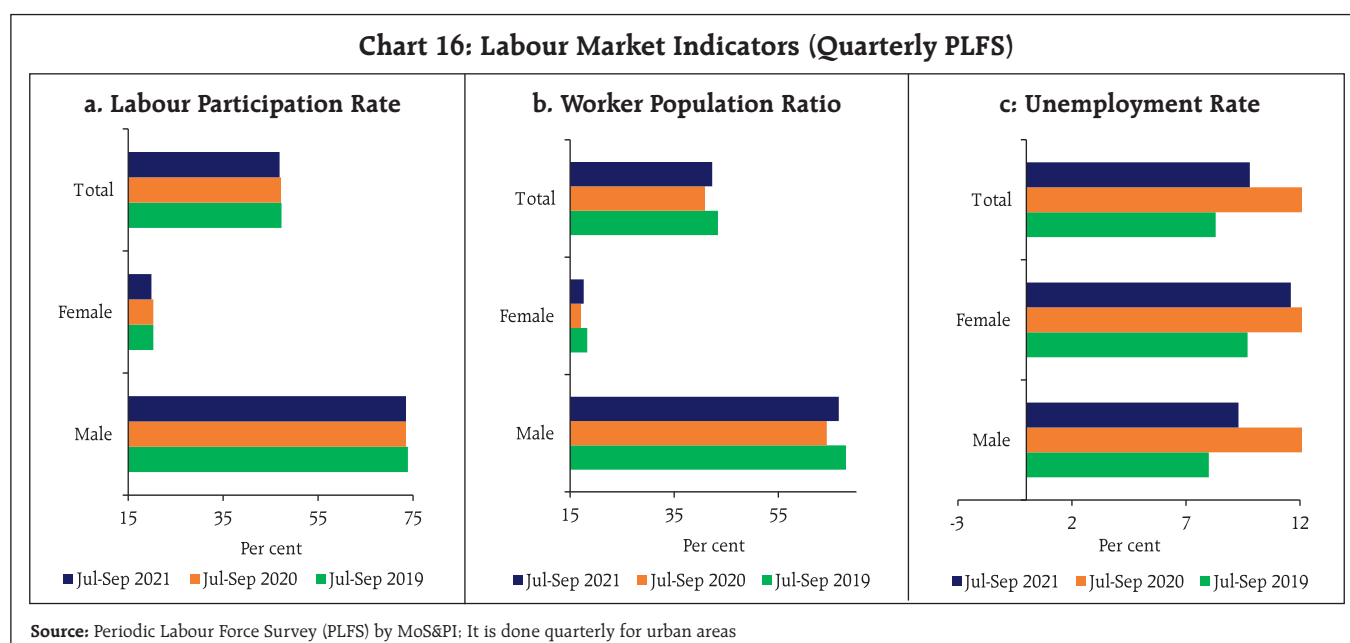
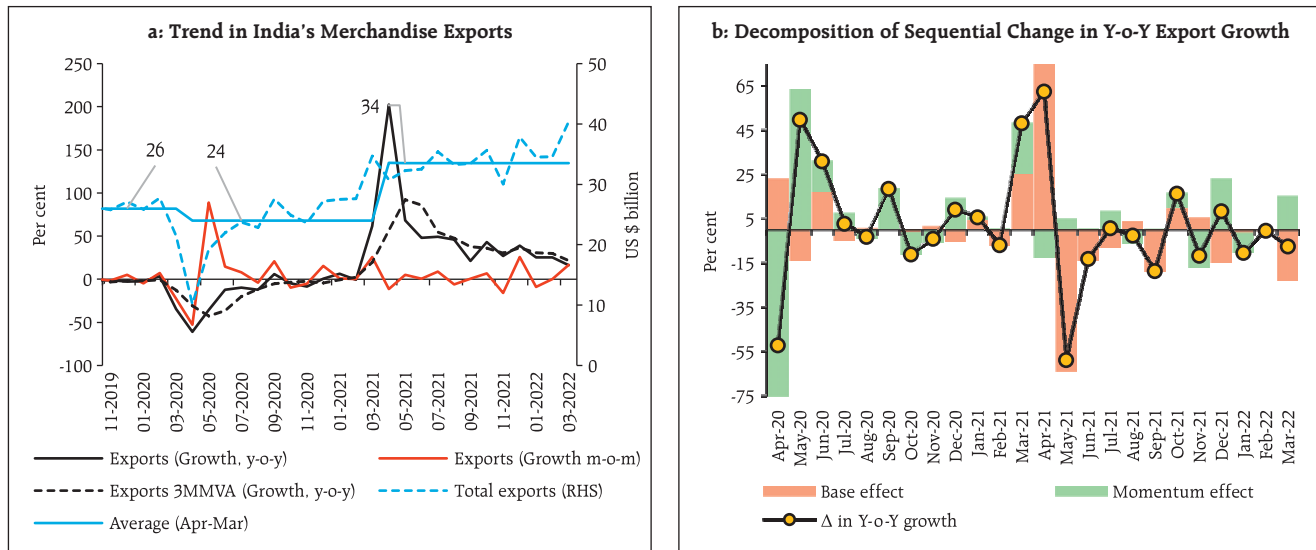


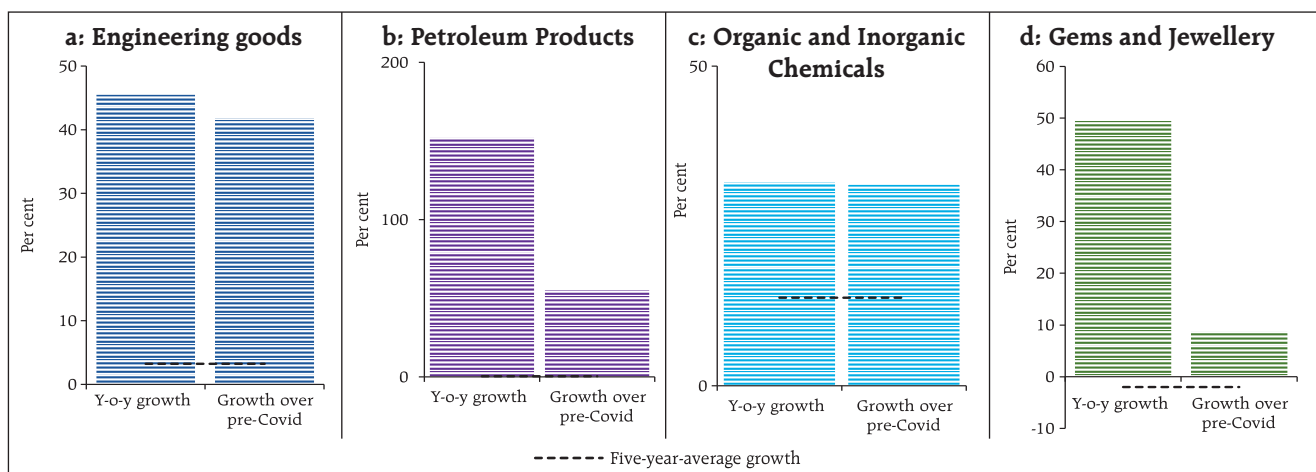
Chart 17: India's Merchandise Exports – March 2022

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

As the Industry 4.0⁵ is gaining momentum, there is a case for re-examination of the impact of robotics on productivity and labour share in GDP (Annex).

India's merchandise exports reached a monthly historic high level of US\$ 40.4 billion in March 2022, reaching US\$ 417.8 billion for the whole year as against the target of US\$ 400 billion set for 2021-22 (Chart 17). Multiple initiatives including product diversification to export hi-tech goods, Geographic Indicator (GI)

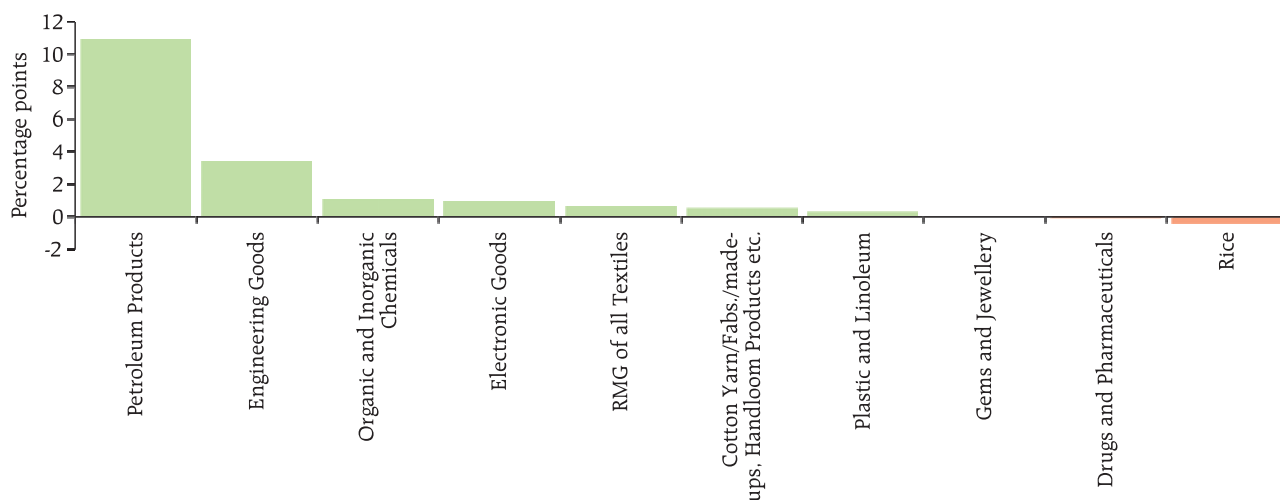
products, roll out of export incentives schemes such as Remission of Duties and Taxes on Export Products (RoDTEP) and Rebate of State and Central Taxes and Levies (RoSCTL) have contributed to the robust export performance. The exports of major commodities, viz., engineering goods, petroleum products, chemicals and gems and jewellery, accounting for more than half of the exports, witnessed robust expansion during 2021-22 (Chart 18).

Chart 18: Analysis of Key Export Commodities during 2021-22

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

⁵ Industry 4.0 refers to smart way of manufacturing which utilises the power of Internet of Things, Cloud computing, Artificial Intelligence and Machine Learning etc to enhance productivity.

Chart 19: India's Merchandise Exports – Relative Contribution to Export Growth
(March 2022 vis-a-vis March 2021)

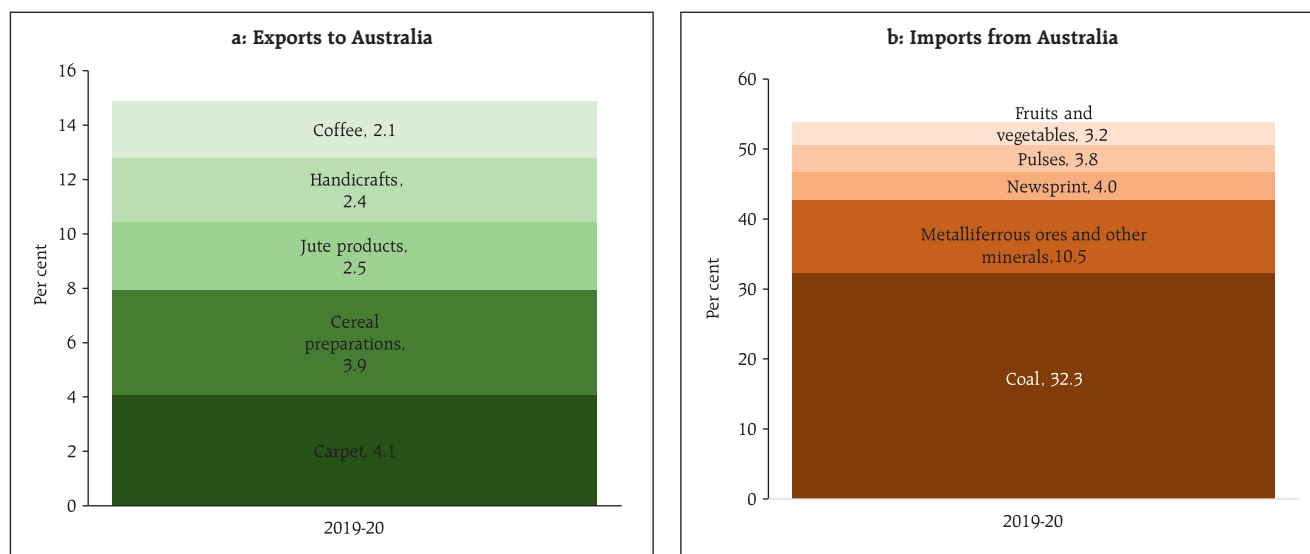


Source: PIB; DGCI&S; and Authors' own calculations.

8 out of 10 major commodity groups accounting for more than 70 per cent of exports recorded an expansion over a year ago. Buoyant external demand for petroleum products, engineering goods and chemicals bolstered export growth (Chart 19). Engineering goods exports at US\$ 10.4 billion crossed US\$ 10 billion mark for the first time, aided by robust shipment of automobile exports.

India has signed the Economic Cooperation and Trade Agreement (ECTA) with Australia on April 2, 2022, to enhance bilateral trade in goods and services to US\$ 45-50 billion in the next five years from US\$ 27.5 billion in 2021. The ECTA is expected to further bolster India's merchandise export potential in textile and apparel, leather, and gems and jewellery (Chart 20).

Chart 20: India's Merchandise Trade with Australia



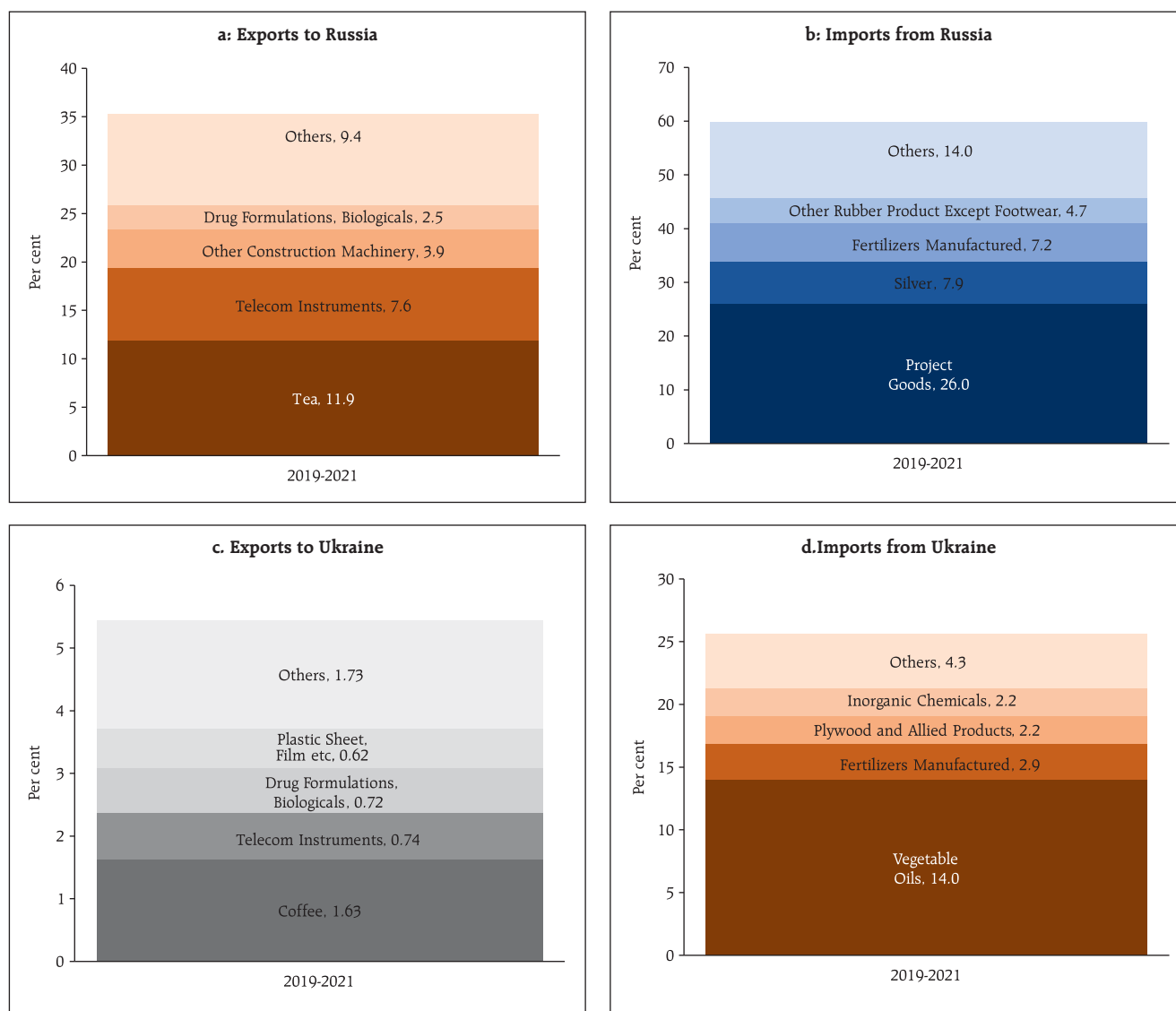
Sources: PIB; DGCI&S; and authors' own calculations.

India's direct trade exposure to Russia and Ukraine is limited - Russia accounts for 0.9 per cent and 1.5 per cent of India's merchandise exports and imports, respectively, whereas Ukraine's share in India's exports and imports is miniscule to the tune of 0.1 per cent and 0.5 per cent, respectively. India's

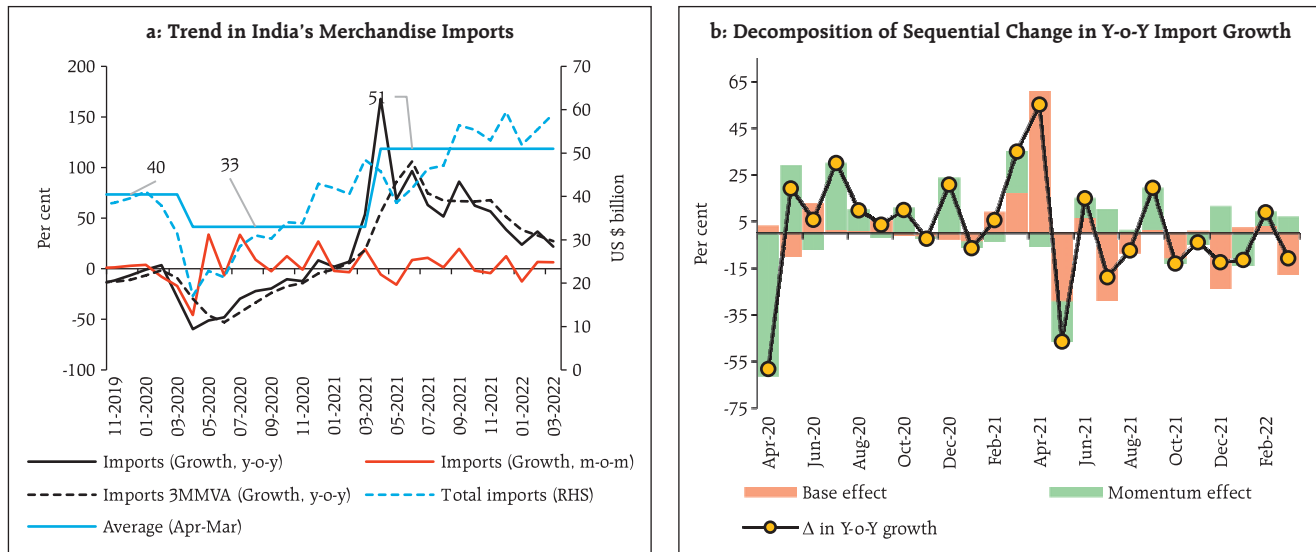
trade exposure to Russian and Ukraine markets is limited to few commodities (Chart 21).

Merchandise imports at US\$ 59.1 billion in March 2022 remained above US\$ 50 billion for the seventh consecutive month and registered a growth of more than 20 per cent on a y-o-y basis (Chart 22).

Chart 21: India's Merchandise Trade with Russia and Ukraine



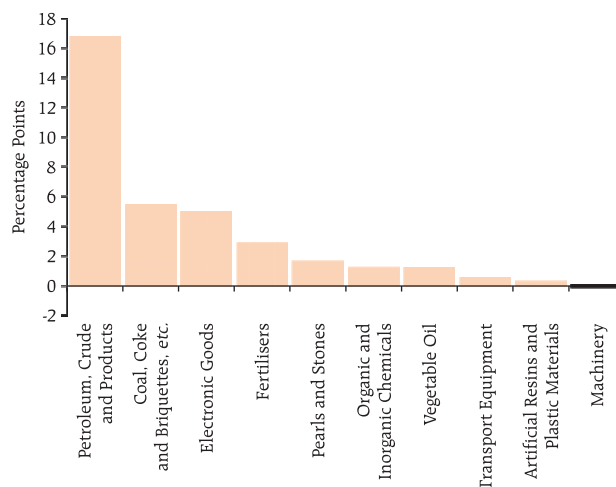
Sources: PIB; DGCI&S; and authors' own calculations.

Chart 22: India's Merchandise Imports – March 2022

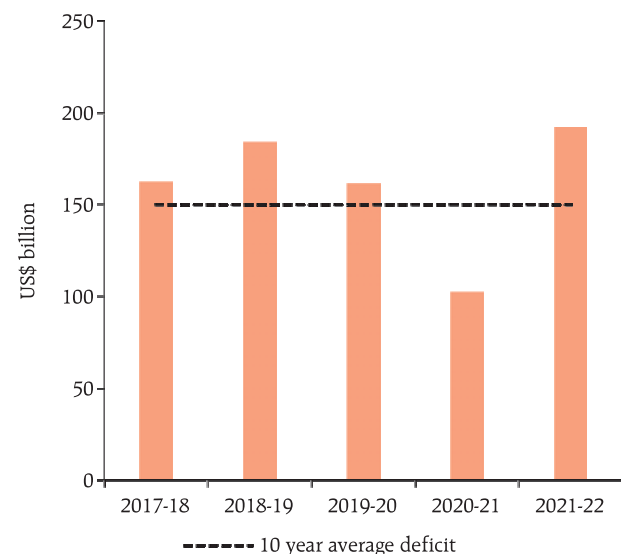
Sources: PIB; DGCI&S; and authors' own calculations.

Import growth was broad-based and driven by higher demand for petroleum products, coal and electronic goods (Chart 23). Oil imports nearly doubled in March compared to a year ago, reflecting the increase in crude prices by 74.4 per cent y-o-y. Gold imports recorded an 8-month low value of US\$ 1 billion in March 2022 due to a sequential rise in gold prices.

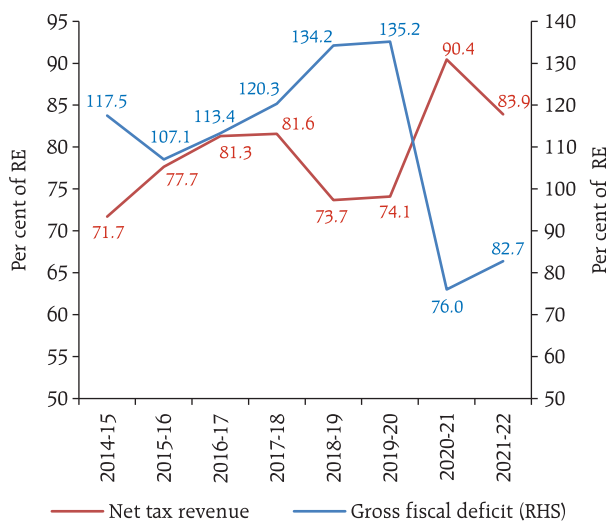
India's trade deficit widened to US\$ 18.7 billion in March 2022 from US\$ 13.1 billion in March 2021; however, it moderated on a sequential basis. On an annual basis, the merchandise trade deficit recorded an all-time high of US\$ 192.4 billion during 2021-22 as against US\$ 102.6 billion a year ago (Chart 24).

Chart 23: India's Merchandise Imports – Relative Contribution to Import Growth (March 2022 vis-a-vis March 2021)

Source: PIB; DGCI&S; and authors' own calculations.

Chart 24: India's Merchandise Trade Deficit

Source: PIB; DGCI&S; and authors' own calculations.

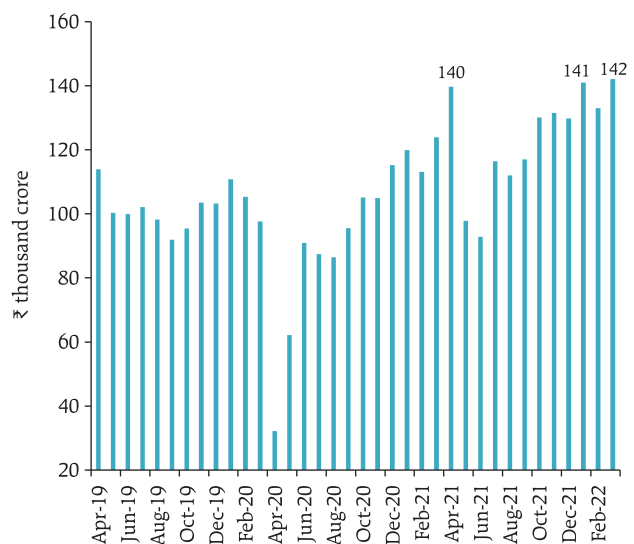
Chart 25: Fiscal Position of the Union Government during April-February

Source: Controller General of Accounts, Ministry of Finance.

During April-February 2021-22, the fiscal position of the Union government posted an improvement over previous years' trend (Chart 25). As per latest available information, gross tax revenue of the Union government exceeded the budget estimates by ₹4.9 lakh crore in 2021-22. Total expenditure during April-February 2021-22 grew by 11.5 per cent over 2020-21, with capital expenditure and revenue expenditure recording a y-o-y growth of 19.7 per cent and 10.2 per cent, respectively. During April-February, capital outlay (capital expenditure net of loans and advances) recorded a y-o-y growth of 61.2 per cent. In order to meet the RE, however, capital expenditure in March 2022 will need to grow by 458.4 per cent y-o-y.

In March 2022, GST collections recorded an all-time high of ₹1.42 lakh crore, breaching the previous high of ₹1.41 lakh crore achieved in January 2022. With this, the average monthly collection in 2021-22 stands at ₹1.24 lakh crore and the average monthly collection in Q4:2021-22 stands at ₹1.39 lakh crore (Chart 26).

The revenue receipts of States posted a robust growth of 23.8 per cent through April-January 2021-

Chart 26: Monthly GST Revenue

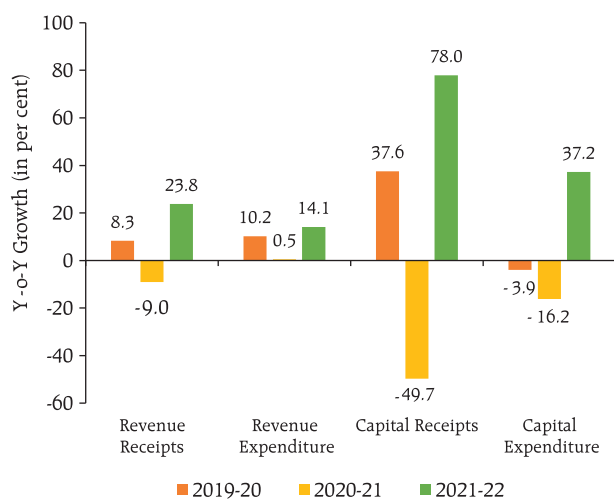
Source: Press Information Bureau.

22, as against a decline of 9 per cent a year ago, and have moved past their pre-pandemic levels of January 2020. This was reflected in the strong growth in both tax (including GST, sales tax, and states' share in the Union's gross taxes) and own non-tax revenues of the states.⁶ Grants-in-aid and contribution to the states from the centre dipped by 8.8 per cent in April-January 2021-22 y-o-y. Similarly, capital receipts of the States posted a sharp growth during the same period, but remained below their pre-pandemic levels.

During April-January 2021-22, the revenue expenditure of States grew at 14.1 per cent over the same period a year ago. The sustained growth in the States' capital expenditure during April-January 2021-22 after a sudden dip (a year ago), augurs well for a long-term growth through cascading effects of the fiscal multiplier in conjunction with the Union government's push for capital investment (Chart 27).

⁶ **Own Non-Tax Revenues** includes interest receipts, dividends and profits, general services, social services, fiscal services, and economic services.

Non-Tax Revenue is sum of State's own non-tax revenue plus grants and aids-in-contribution from the Centre.

Chart 27: Trends in the States' Revenues and Expenditure (April-January)

Note: Data pertain to 23 states.
Source: Comptroller and Auditor General.

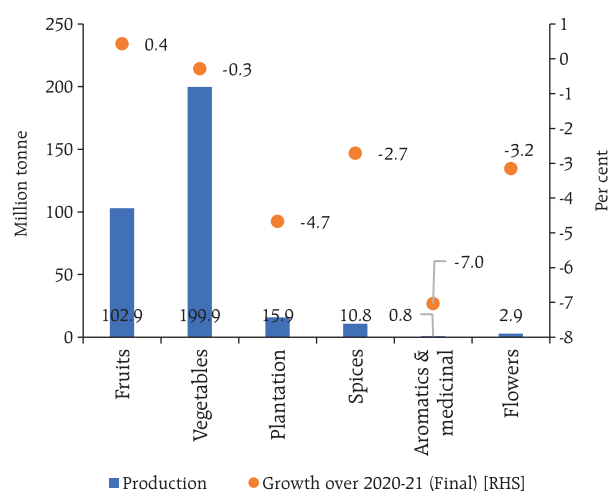
Buoyant growth of revenue and capital receipts, combined with moderate revenue expenditure growth, resulted in decline in both the gross fiscal deficit and the revenue deficit by 7.2 per cent and 45.4 per cent, respectively during April-January 2021-22 on a y-o-y basis. It is notable that the states are 33.3 per cent below their budgeted gross fiscal deficit

this year so far, providing space for further increase in expenditure during the remaining part of the fiscal year.

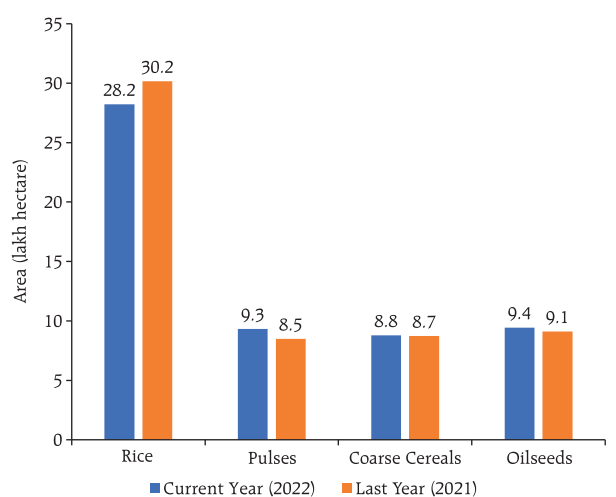
Aggregate Supply

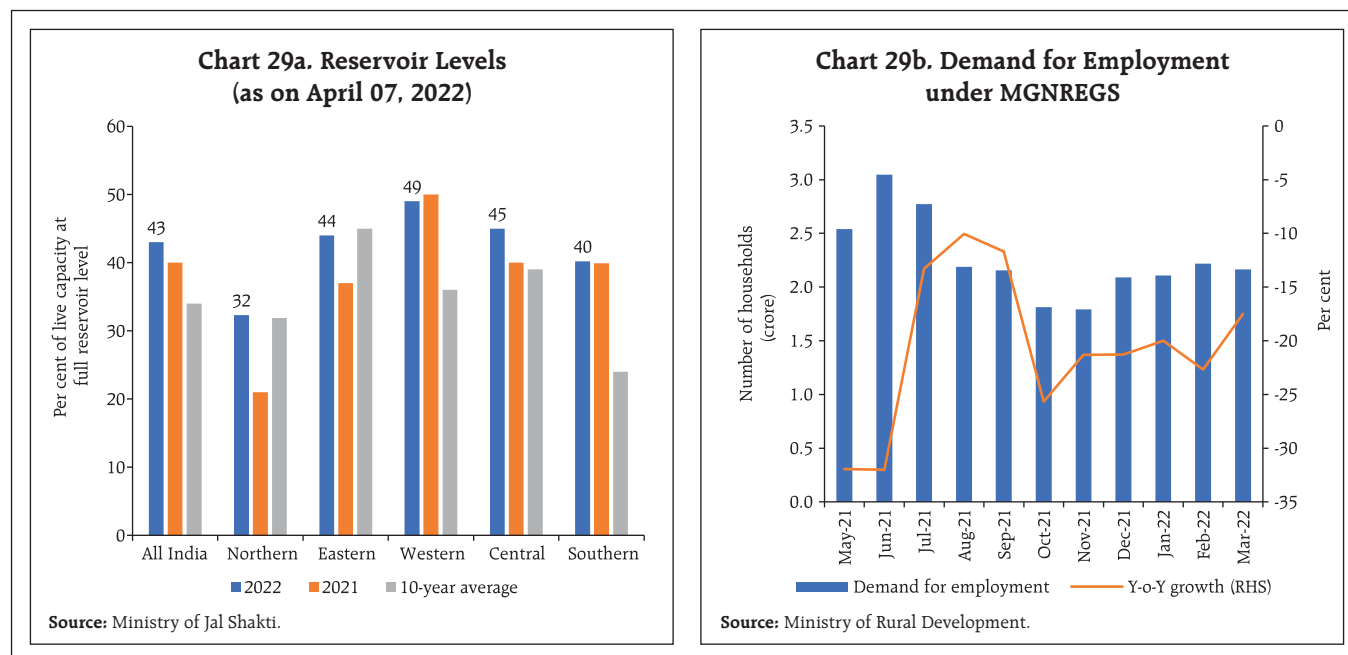
As per the first advance estimates (AE) released on March 28, 2022 horticulture production was pegged at over 333.3 million tonnes, which is higher by 2.0 per cent over the 1st AE and marginally lower than the final estimates for 2020-21 (Chart 28a). Production of vegetables - potatoes (-4.6 per cent); and tomatoes (-4.2 per cent) - declined, while onion production increased by 16.8 per cent due to increased acreage (17.9 per cent). The production of fruits also increased marginally over 2020-21.

Summer or *zaid* season is a short intervening period between *rabi* and *kharif* starting from March till May. As on April 08, 2022, the total summer crop sown area reached 55.8 lakh hectare, 1.3 per cent lower than a year ago, mainly due to lower acreage under rice (Chart 28b). The total live storage in 140 major reservoirs as on April 07, 2022, was higher at 43 per cent of the full reservoir level (FRL) as compared

Chart 28: Agriculture Production**a: Horticulture Production for 2021-22 (1st Advance Estimate)**

Source: Ministry of Agriculture and Farmers' Welfare.

b: Progress of Zaid (Summer) Sowing (as on April 08, 2022)



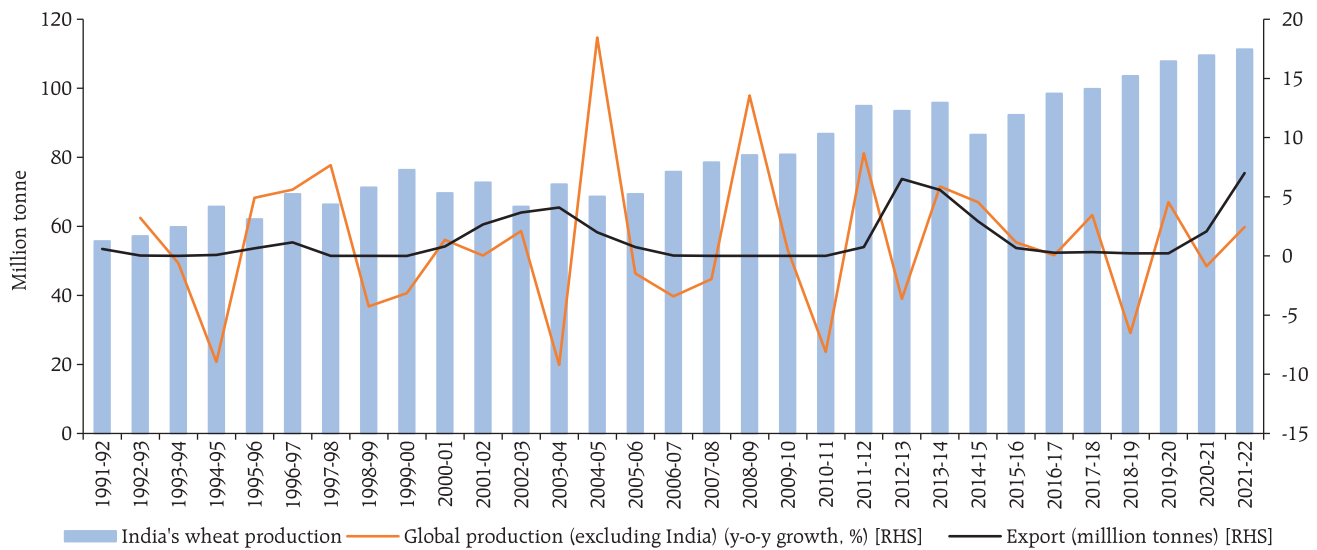
to 40 per cent of FRL during the previous year. The current level of water stands higher than the last 10-year average of 34 per cent of FRL (Chart 29a).

Demand for employment under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), remains lower than the levels witnessed a year ago, despite the lean agriculture season, indicating higher employment opportunities in the non-agriculture sectors.

As of April 12, 2022, the overall procurement of rice during the ongoing *kharif* marketing season touched 50.6 million tonnes cumulatively, as against 47.1 million tonnes a year ago. The target for rice procurement in this complete season is set at 52.8 million tonnes. With record harvest of wheat, the procurement of wheat under the *rabi* marketing season has also commenced in some of the states with the target of 44 million tonnes set for this season. Free distribution of foodgrains (5 kg/month) under *Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)* has been extended for another six months (April to September), with an additional outlay of ₹80,000 crore. Comfortable stock levels (7.2 and 1.4 times the buffer norms for

rice and wheat, respectively) would auger well for this initiative. The global wheat supply has tightened in view of the ongoing geo-political crisis. The estimated exports from Russia and Ukraine, which accounted for 28 per cent of global wheat exports in 2020-21, has been revised down significantly. This, in turn, may trigger trade reallocation and demand rationing in the rest of the world. India, along with Australia, are expected to cater to a significant portion of the global demand gap with ample and competitively priced tradable surplus. With the similar variety of wheat produced in India as compared to Russia and Ukraine, and the record harvest being completed by March and April, India is expected to export a record 10 million tonnes of wheat this year (Chart 30).

In the industrial sphere, the headline manufacturing PMI expansion of PMI at first use moderated to 54.0 in March 2022 from 54.9 in February, as companies reported softer expansions in new orders and production. The Future Output index fell below its long-run average to a two year low, amidst economic uncertainties caused by geopolitical risks (Chart 31a).

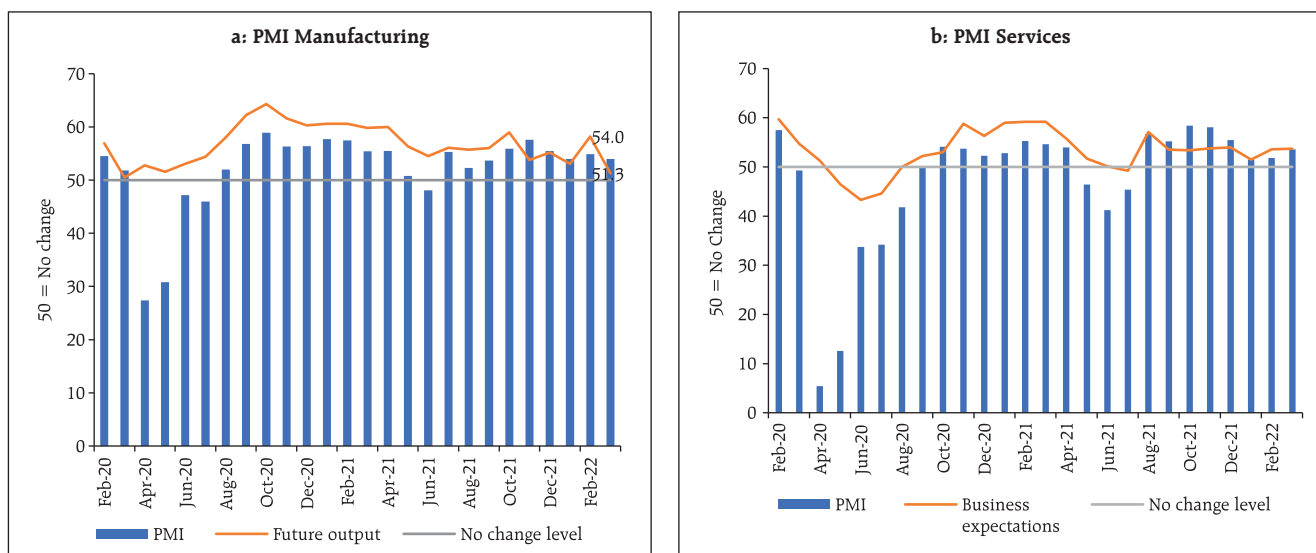
Chart 30: Co-movement of Indian Wheat Exports with Global Production

Sources: Ministry of Agriculture and Farmers' Welfare; Ministry of Commerce; and Food & Agriculture Organisation.

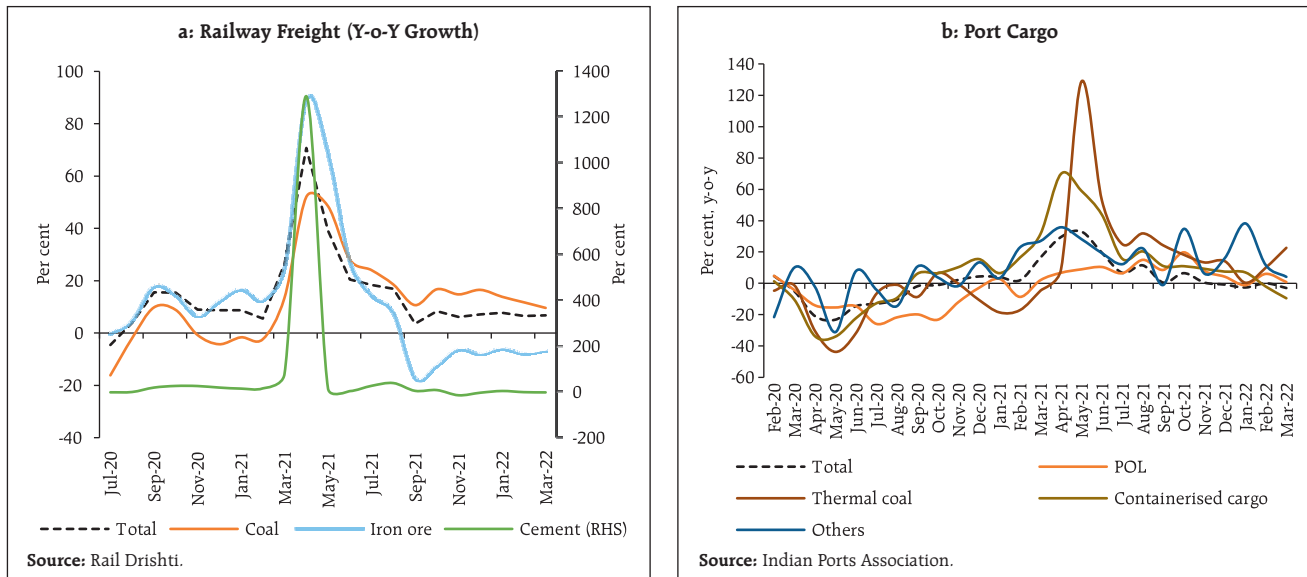
The PMI services improved to 53.6 in March from 51.8 a month ago, recording the strongest rate of expansion since December 2021 and stretching an expansionary run to the eighth consecutive month. The Business Expectations Index (Future Activity Index) also improved marginally *vis-à-vis* February 2022 (Chart 31b). In the services sector, transport

indicators recorded an expansion, with railways freight traffic increasing by 6.7 per cent (y-o-y) in March, despite a high base recorded last year (Chart 32a).

An increase in freight traffic was recorded in coal even as iron-ore and cement declined on a high base a year ago. Cargo at major ports recorded an uptick in

Chart 31: Purchasing Managers' Index

Source: IHS Markit.

Chart 32: Railway and Cargo Traffic

March, with cargo for all major commodities recording levels beyond or comparable to pre-pandemic figures. On a y-o-y basis, it recorded a contraction on a high base. In 2021-22, cargo increased by 7.1 per cent over the corresponding period a year ago. Over 2019-20, cargo recorded a compounded annual growth rate of 1.1 per cent (Chart 32b).

Activity in the construction sector picked up during February-March 2022, with cement production and steel consumption recording expansion over pre-pandemic levels (Chart 33). The sustained pick-up comes despite rising prices backed by demand stimulated by infrastructure activity in the economy.

The Indian aviation sector continued to recover in March 2022. Daily domestic airport footfalls averaged 6.8 lakh per day – an expansion of 25.5 per cent over the preceding month. International airport footfalls too improved by 25.1 per cent sequentially, while in the cargo segment, domestic and international cargo grew by 5.4 per cent and 4.0 per cent, respectively. In the first ten days of April, domestic airport footfalls

remained steady over the corresponding period in March. The Government of India decided to resume scheduled commercial international passenger services from March 27, which could boost the aviation sector in the upcoming months (Table 1).

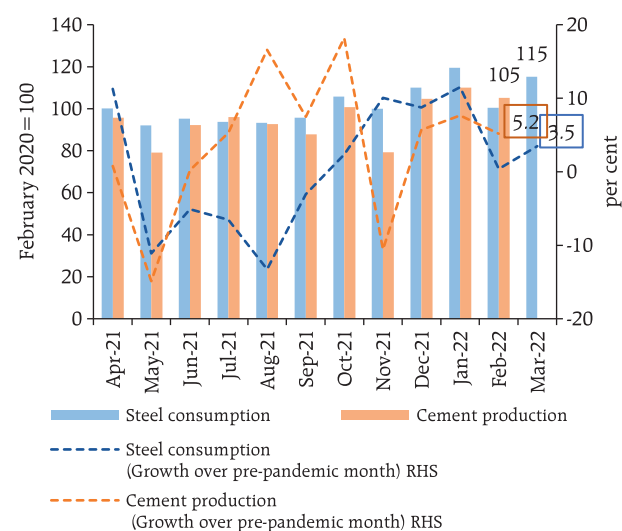
Chart 33: Construction Sector Indicators

Table 1: High Frequency Indicators- Services

High Frequency Indicators- Services Growth (y-o-y, per cent)									Growth over pre-pandemic month				
Sector	Indicator	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Nov 21/ Nov 19	Dec 21/ Dec 19	Jan 22/ Jan 20	Feb 22/ Feb 20	Mar 22/ Mar 19
Urban Demand	Passenger Vehicles Sales	-41.2	-27.1	-18.6	-13.3	-8.1	-6.5		-14.8	-1.5	2.2	10.2	
Rural Demand	Two Wheelers Sales	-17.4	-24.9	-34.4	-10.8	-21.1	-27.3		-25.5	-4.2	-15.9	-19.8	
	Three Wheelers Sales	53.8	19.1	-6.6	27.0	-8.5	-1.1		-59.7	-47.7	-60.4	-34.5	
	Tractor Sales	-14.8	0.4	-22.5	-27.5	-32.6	-31.3	-14.3	17.2	3.8	-1.2	-10.0	17
Trade, hotels, transport, communication	Commercial Vehicles Sales	24.5		0.9						-0.3			
	Railway Freight Traffic	3.6	8.4	6.1	7.2	7.7	6.6	6.7	15.6	16.5	17.1	12.4	16.3
	Port Cargo Traffic	0.5	6.3	-0.2	-0.4	-2.9	-2.7		3.9	4.0	1.0	2.0	
	Domestic Air Cargo Traffic	10.1	6.7	-1.7	2.0	-6.1	-6.3		-11.4	-1.1	-14.8	-12.5	
	International Air Cargo Traffic	18.1	23.8	11.7	10.5	5.2	-0.4		-5.0	-3.6	-7.6	-10.2	
	Domestic Air Passenger Traffic	76.5	68.7	65.5	53.3	-16.2	-1.0		-17.6	-12.5	-48.6	-36.6	
	International Air Passenger Traffic	155.9	162.9	140.2	121.7	67.5	66.6		-58.6	-54.5	-61.3	-56.0	
	GST E-way Bills (Total)	18.3	14.5	5.9	11.6	9.5	8.3	9.7	14.5	29.3	20.9	20.9	42.4
	GST E-way Bills (Intra State)	15.6	14.1	7.3	13.4	11.4	10.3	11.8	17.6	33.0	25.9	26.3	49
	GST E-way Bills (Inter State)	22.3	15.1	3.9	8.9	6.6	5.3	6.6	10.1	24.0	13.8	13.3	33
	Tourist Arrivals	278.8	337.0	255.0	235.5	140.4			-76.9	-75.2	-82.0		
Construction	Steel Consumption	-3.2	-3.8	-7.1	-8.3	0.5	-10.6	1.4	10.1	8.7	11.5	0.4	3.5
	Cement Production	11.3	14.5	-3.6	13.9	14.3	5.0		-10.6	5.7	7.6	5.2	
PMI Index	Manufacturing	53.7	55.9	57.6	55.5	54.0	54.9	54.0					
	Services	55.2	58.4	58.1	55.5	51.5	51.8	53.6					

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

Inflation

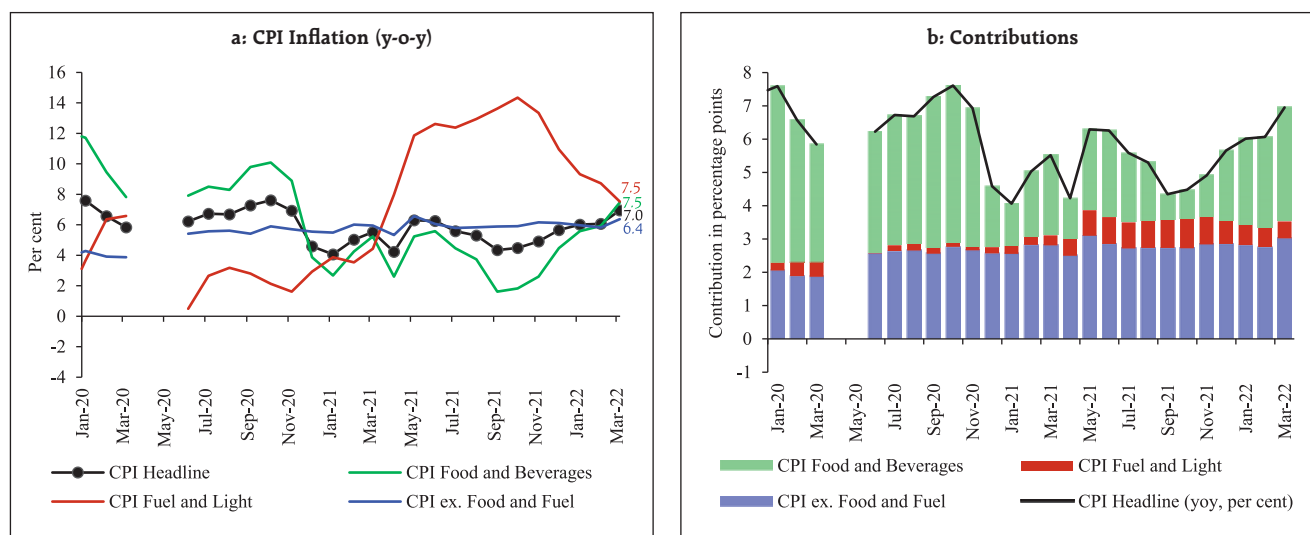
Provisional CPI data for March 2022 released by the NSO on April 12, 2022 reveal that a positive price momentum (month-on-month change in prices in the current month) of around 100 bps in March, offset by favourable base effects (month-on-month change in prices a year ago) of around 10 bps, resulted in a sharp increase in headline inflation by close to 90 bps between February and March, *i.e.*, from 6.1 per cent to 7.0 per cent (Chart 34a).

Food and beverages inflation was the main driver, rising to 7.5 per cent in March from 5.9 per cent in February. In terms of sub-groups, inflation edged up in cereals, meat and fish, milk, edible oils, fruits, vegetables, sugar, spices and prepared meals. On the other hand, inflation softened in eggs, pulses and non-alcoholic beverages.

CPI fuel inflation softened for the fifth consecutive month – from 8.7 per cent in February to 7.5 per cent in March – primarily due to moderation in LPG inflation. On the other hand, kerosene (PDS) inflation continued to increase sharply. Electricity prices remained in deflation in March. CPI fuel (weight of 6.84 per cent in the CPI basket) contributed around 7.3 per cent of headline inflation in February (Chart 34b).

CPI inflation excluding food and fuel⁷ or core inflation edged up by 50 bps to 6.4 per cent in March from 5.8 per cent a month ago (Chart 34a). The increase was largely due to pressures emerging from personal care and effects, pan, tobacco and intoxicants, clothing and footwear, household goods and services, health and recreation and amusement. Inflation in housing,

⁷ CPI excluding food and fuel is worked out by eliminating the groups 'food and beverages' and 'fuel and light' from the headline CPI.

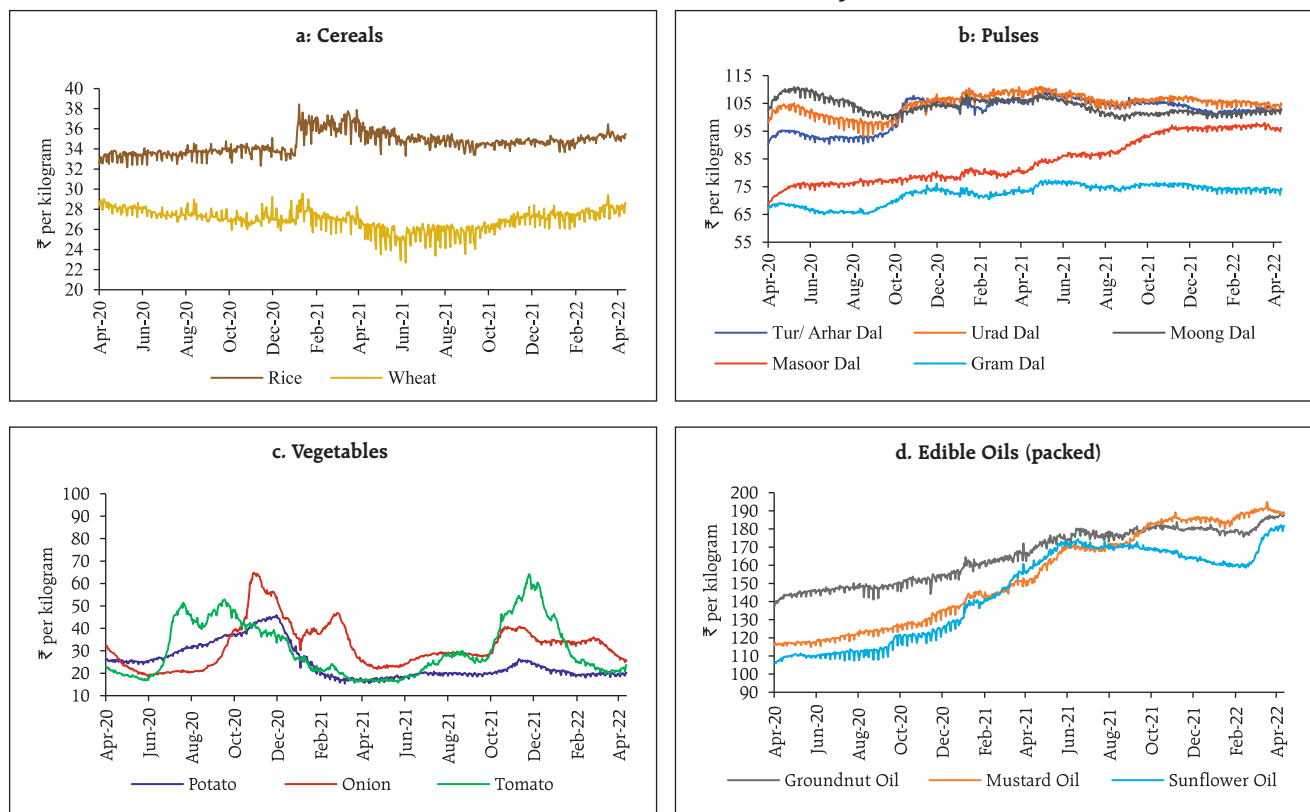
Chart 34: CPI Inflation

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.

transport and communication and education sub-groups moderated.

High frequency food price data from the Ministry of Consumer Affairs, Food and Public Distribution

Chart 35: DCA Essential Commodity Prices

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

(Department of Consumer Affairs) for April so far (April 1-12, 2022) indicate some softening in rice prices even as wheat prices are firming up. Pulses prices registered correction, except for moong. In the case of edible oils, refined oils like soya, sunflower and groundnut oil continued to experience price pressures, while prices of mustard oil declined. Among vegetables, potatoes and onions witnessed price declines, while tomato prices have increased in April so far (Chart 35).

Pump prices of petrol and diesel registered increases from March 22, 2022. As on April 12, 2022 retail selling prices of petrol and diesel registered a cumulative increase of around ₹10 per litre and stood at ₹112.97 per litre (average of the pump prices in the four major metros) and at ₹100.55 per litre, respectively. LPG prices increased by ₹50 per cylinder on March 22, 2022 for the first time since October 6, 2021. Kerosene prices remained steady in the first half of April after rising in March (Table 2).

Input costs rose further in March across manufacturing and services as reflected in the PMIs. While selling prices edged up to a five-month high across manufacturing, they rose only marginally across services.

Table 2: Petroleum Products Prices

Item	Unit	Domestic Prices			Month-over-month (per cent)	
		Apr-21	Mar-22	Apr-22 ^	Mar-22	Apr-22
Petrol	₹/litre	92.64	103.98	112.06	1.1	7.8
Diesel	₹/litre	84.54	91.62	99.65	1.2	8.8
Kerosene (subsidised)	₹/litre	30.32	46.87	46.87	11.3	0.0
LPG (non-subsidised)	₹/cylinder	819.63	926.25	960.13	1.8	3.7

^ : For the period April 1-12, 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.

IV. Financial Conditions

In consonance with the recalibration of the stance of monetary policy in the MPC's resolution of April 8, 2022, the Reserve Bank also instituted changes in its operating procedure, which are excerpted from Governor Shri Shaktikanta Das's statement on the same day so as draw out the key implications:

- "The amendment to Section 17 of the RBI Act in 2018 empowered the Reserve Bank to introduce the Standing Deposit Facility (SDF). By removing the binding collateral constraint on the central bank, the SDF strengthens the operating framework of monetary policy. Accordingly, it has now been decided to introduce the SDF as the floor of the LAF corridor. This would provide symmetry to the operating framework of monetary policy by introducing a standing absorption facility at the bottom of the LAF corridor, similar to the standing injection tool at the upper end of the corridor, namely the marginal standing facility (MSF). Thus, at both ends of the LAF corridor, there will be standing facilities – one to absorb and the other to inject liquidity. Accordingly, access to SDF and MSF will be at the discretion of banks, unlike repo/reverse repo, OMO and CRR which are available at the discretion of the Reserve Bank. Notably, the SDF is also a financial stability tool in addition to its role in liquidity management.
- The SDF rate will be 25 bps below the policy rate, and it will be applicable to overnight deposits at this stage. It would, however, retain the flexibility to absorb liquidity of longer tenors as and when the need arises, with appropriate pricing. The MSF rate will continue to be 25 bps above the policy repo rate. Thus, the width of the LAF corridor is restored to the pre-pandemic configuration of 50 bps, symmetrically around the policy

repo rate, which will be at the centre of the corridor.

- The fixed rate reverse repo (FRRR) rate is retained at 3.35 per cent. It will remain as part of Reserve Bank's toolkit and its operation will be at the discretion of the Reserve Bank for purposes specified from time to time. The FRRR along with the SDF will impart flexibility to the Reserve Bank's liquidity management framework.
- Both MSF and SDF will be available on all days of the week, throughout the year.
- It has also been decided to restore the opening time for financial markets regulated by the Reserve Bank to the pre-pandemic timing of 9:00 am with effect from April 18, 2022, without any change in their closing time prevailing at present."

The Reserve Bank also indicated that it will engage in a gradual and calibrated withdrawal of liquidity over a multi-year time frame in a non-disruptive manner beginning this year. The objective is to restore the size of the liquidity surplus in the system to a

level consistent with the stance of monetary policy. The Reserve Bank also reiterated its commitment to ensure the availability of adequate liquidity to meet the productive requirements of the economy. The Reserve Bank committed to remain focussed on completion of the borrowing programme of the Government and towards this end deploy various instruments as warranted.

During the second half of March 2022 through April 8, liquidity absorptions moderated to ₹7.3 lakh crore from ₹8.4 lakh crore during the second fortnight of February through mid-March 2022 on account of advance tax outflows. The average daily absorption under the FRRR window stood at ₹2.9 lakh crore while 61 per cent of total absorption on average was through the variable rate reverse repo (VRRR) auctions (both main and fine-tuning) during mid-March to April 7. Overnight money market rates traded in a range-bound manner, with the weighted average call rate (WACR) remaining closely aligned to the lower bound of the corridor. Interest rates on longer term money market instruments such as 3-month T-bills and certificates of deposit (CDs), however, ruled higher, drifting towards the policy repo rate (Chart 36).

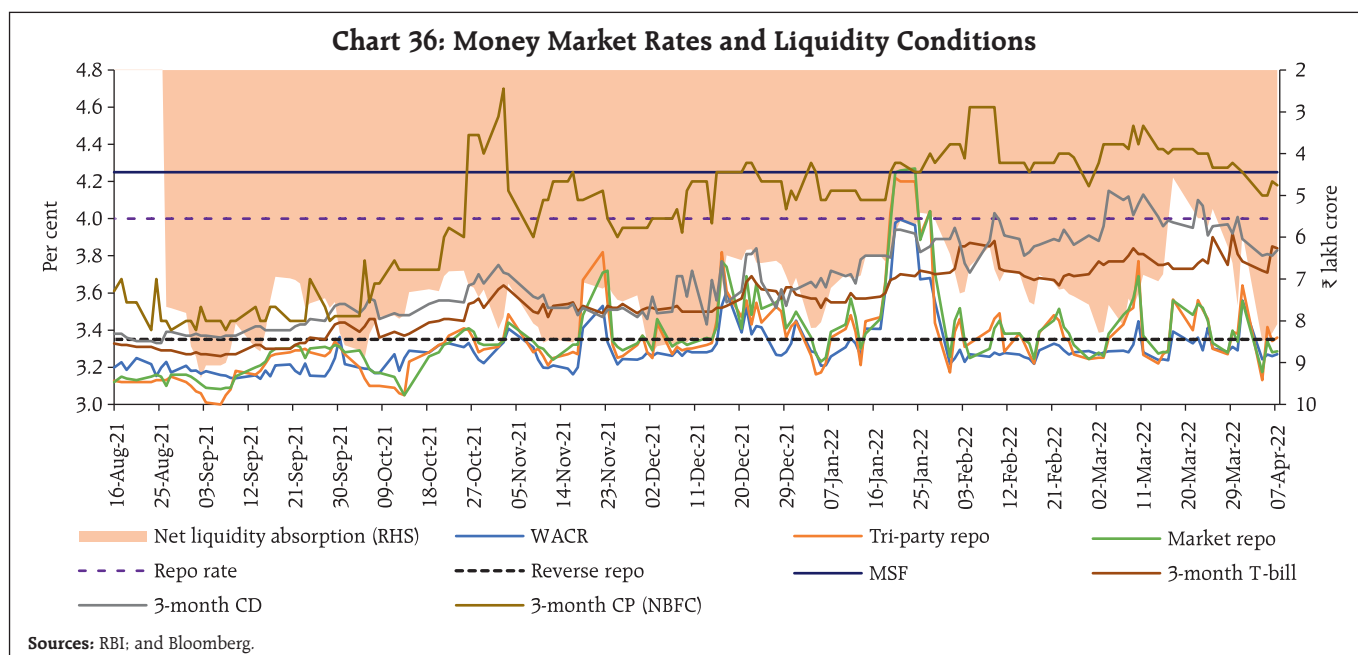
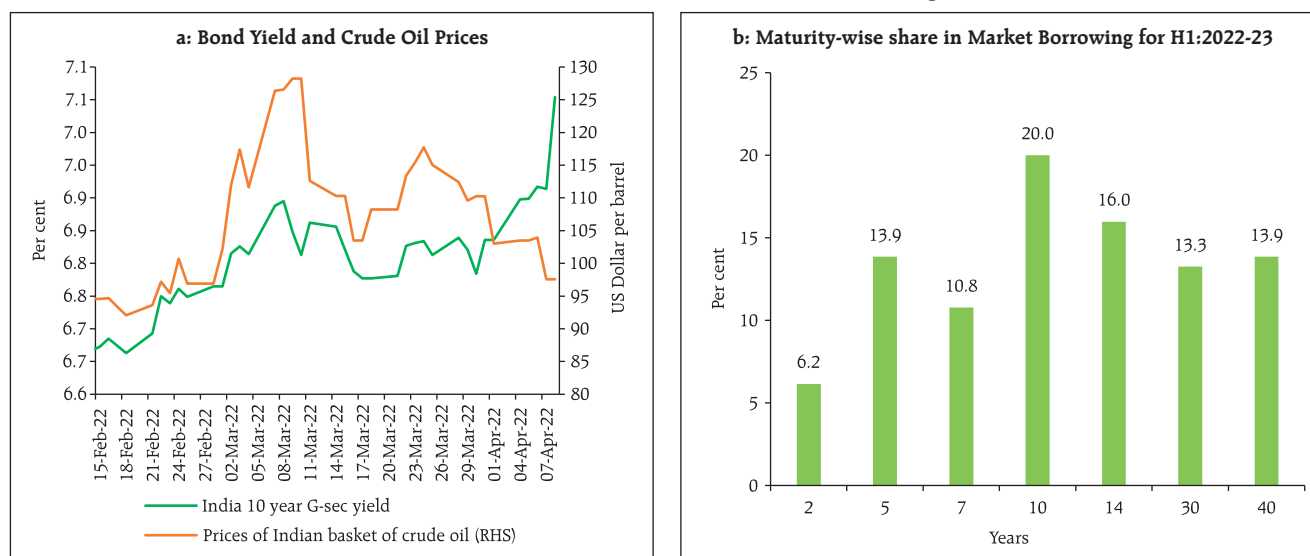


Chart 37: Bond Yield and Market Borrowing

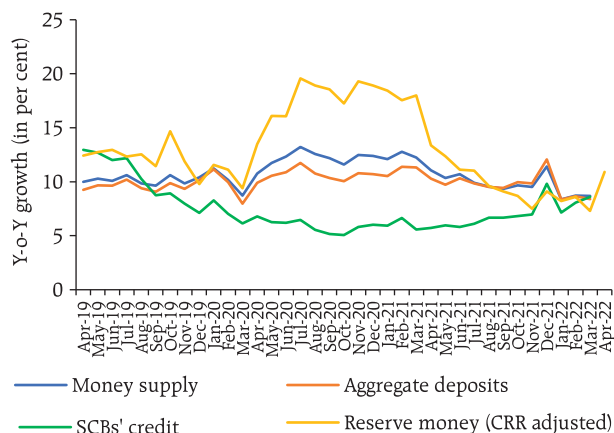
Sources: Bloomberg; and Press Information Bureau (PIB), Government of India.

After softening since March 16 in tandem with the easing of crude oil prices, the yield on the 10-year benchmark security surged on April 4, 2022 following the release of the Central government's borrowing calendar (Chart 37a). Subsequently, bond yields hardened across the maturity spectrum, with the 10-year benchmark yield (6.54% GS 2032) closing at 7.12 per cent on April 8, 2022. The rise in US treasury yields exacerbated the dampening of market sentiment. The market borrowing calendar was frontloaded with 59 per cent of the gross market borrowing or ₹8.5 lakh crore scheduled for H1:2022-23. The borrowing is scheduled to be completed in 26 weekly tranches of ₹32,000-33,000 crore, with the bulk of the borrowing concentrated in the 10-year segment (Chart 37b). With a view to enable banks to better manage their investment portfolio during 2022-23, the Reserve Bank decided on April 8, 2022 to enhance the present limit under Held to Maturity (HTM) category from 22 per cent to 23 per cent of NDTL till March 31, 2023. It was also decided to allow banks to include eligible SLR securities acquired between April 1, 2022 and March 31, 2023 under this enhanced limit. The HTM limits would be restored

from 23 per cent to 19.5 per cent in a phased manner starting from the quarter ending June 30, 2023.

Monetary and credit conditions evolved in line with the monetary policy stance. Reserve money (RM), excluding the first-round impact of the cash reserve ratio (CRR) restoration, grew at 10.9 per cent y-o-y as on April 1, 2022 (14.5 per cent a year ago), with currency in circulation – its major constituent – expanding at 9.8 per cent (16.2 per cent a year ago). Concomitantly, money supply (M_3) grew at 8.7 per cent as on March 25, 2022 (12.3 per cent a year ago), primarily driven by the growth in aggregate deposits with banks at 8.4 per cent (11.3 per cent a year ago). The growth in scheduled commercial banks' (SCBs') credit to the commercial sector, accelerated to 8.6 per cent as on March 25, 2022 (5.6 per cent a year ago) [Chart 38].

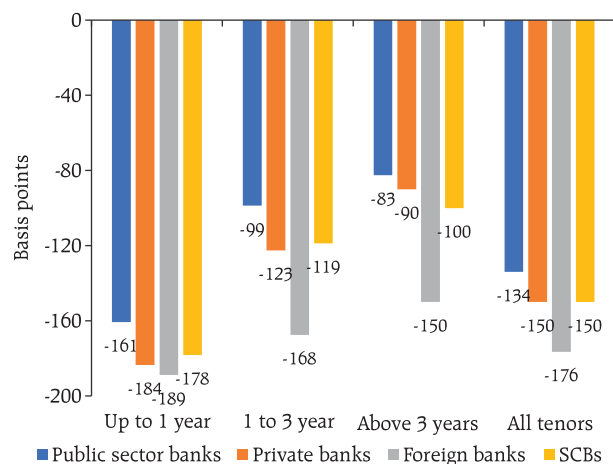
The introduction of the external benchmark system has facilitated monetary transmission to lending and deposit rates, aided by surplus liquidity conditions. The weighted average lending rates (WALRs) on fresh and outstanding rupee loans have declined by 140 bps and 124 bps, respectively, since

Chart 38: Monetary and Credit Aggregates

Notes: 1. Data pertain to the 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 April, however, reserve money data are as on April 1, 2022.

Source: RBI.

Chart 40: Maturity-wise Transmission to the Median Term Deposit Rate (March 2020 to March 2022)

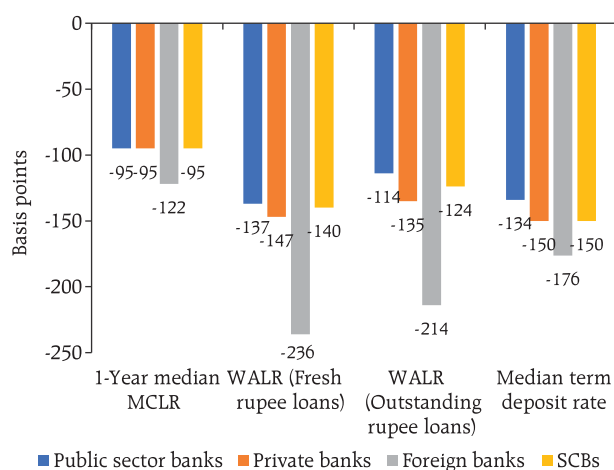
Sources: RBI; and RBI staff estimates.

March 2020. The one-year median marginal cost of funds-based rate (MCLR) of SCBs has moderated by 95 bps (Chart 39).

The median term deposit rate (MTDR) of SCBs has declined by 150 bps over the same period (Chart 40). The pass-through is maximum across shorter tenor deposits of up to one year. Amongst bank groups, foreign banks have exhibited better transmission to

deposit rates across all the tenors compared to their counterparts. With the rising profile of credit demand, major domestic banks have hiked their term deposit rates.

The Government of India left interest rates on various small savings instruments (SSIs) unchanged for Q1:2022-23. Thus, the existing interest rates on SSIs are 9 to 118 bps higher than the formula-based rates.

Chart 39: Transmission to Lending and Deposit Rates (March 2020 to March 2022)

Note: Latest data on WALRs pertain to February 2022.

Sources: RBI; and RBI staff estimates.

Domestic equities gained in tandem with global equity markets in the second half of March, shrugging off the first interest rate hike by the US Fed since 2018. Despite concerns over Russia-Ukraine war, equity markets moved higher in early April buoyed by encouraging GST collections in March 2022, the announcement of merger of HDFC and HDFC bank and moderation in international crude oil prices. Thereafter, markets exhibited correction amidst negative global cues from the minutes of the latest Federal Open Market Committee (FOMC) meeting of March 15-16, 2022, which hinted at increased reduction in the size of the Fed's balance sheet. Markets rebounded following the Reserve Bank's announcement of status quo in the policy

Table 3: Equity Flows

(US\$ million)

Month	China	India	Indonesia	Korea	Malaysia	Philippines	Thailand	Vietnam	Brazil	Turkey	South Africa
Apr 21	11377	-1489	-244	68	-276	-285	-107	-33	1509	-274	526
May 21	12038	749	247	-7964	-40	-253	-1061	-497	2372	198	55
Jun 21	5485	1498	342	-792	-283	-87	-314	-191	2054	-66	-841
Jul 21	5253	-1706	67	-4222	-318	-183	-522	209	-1154	-98	-1156
Aug 21	7837	1012	312	-5089	251	33	175	-277	-540	515	-1355
Sep 21	2910	1139	305	884	179	-47	338	-348	-1593	171	150
Oct 21	2332	-2271	926	-3228	378	8	474	-253	423	-155	-530
Nov 21	4357	-756	-214	3043	41	-3	-324	-397	217	1073	-363
Dec 21	15821	-1741	101	2639	-270	1696	695	-129	-1430	-1136	-843
Jan 22	1484	-4817	425	-3275	80	-56	432	-128	2160	-370	527
Feb 22	654	-5018	1220	418	679	141	1931	-23	5804	-156	1501
Mar 22	-6278	-3693	584	-3640	783	-204	1006	-156	5743	-779	1748
H1: 2021-22	44901	1204	1029	-17115	-486	-823	-1491	-1136	2649	446	-2621
H2: 2021-22	18370	-18297	3042	-4043	1690	1581	4214	-1085	12918	-1523	2041
2021-22	63271	-17093	4070	-21158	1203	759	2723	-2222	15566	-1077	-580

Note: Data are provisional.**Sources:** Institute of International Finance; and NSDL.

repo rate and monetary policy stance remaining in accomodation. However, markets pared gains subsequently following weak cues from global markets amidst rising global bond yields and Covid-19 surge in China. Overall, the BSE Sensex has gained 4.1 per cent since end-February to close at 58,576 on April 12, 2022.

Foreign portfolio investors (FPIs) turned net sellers in domestic equities in March 2022 for the sixth consecutive month amidst concerns over the Russia-Ukraine war, with large outflows from financial services and software services sector (Table 3 and Chart 41).

Noteworthy differences in the impact of the spike in crude oil price on stock prices has been observed among the oil-importing and exporting nations (Chart 42). India, a major importer of crude oil, remains vulnerable to volatility in crude oil prices and oil supply shocks.

Through April-February 2021-22, gross inward foreign direct investment (FDI) at US\$ 76.9 billion remained comparable with its level a year ago. Manufacturing, computer services, communication

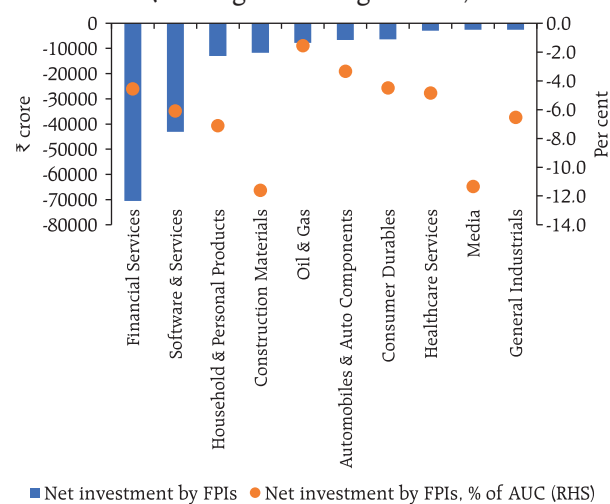
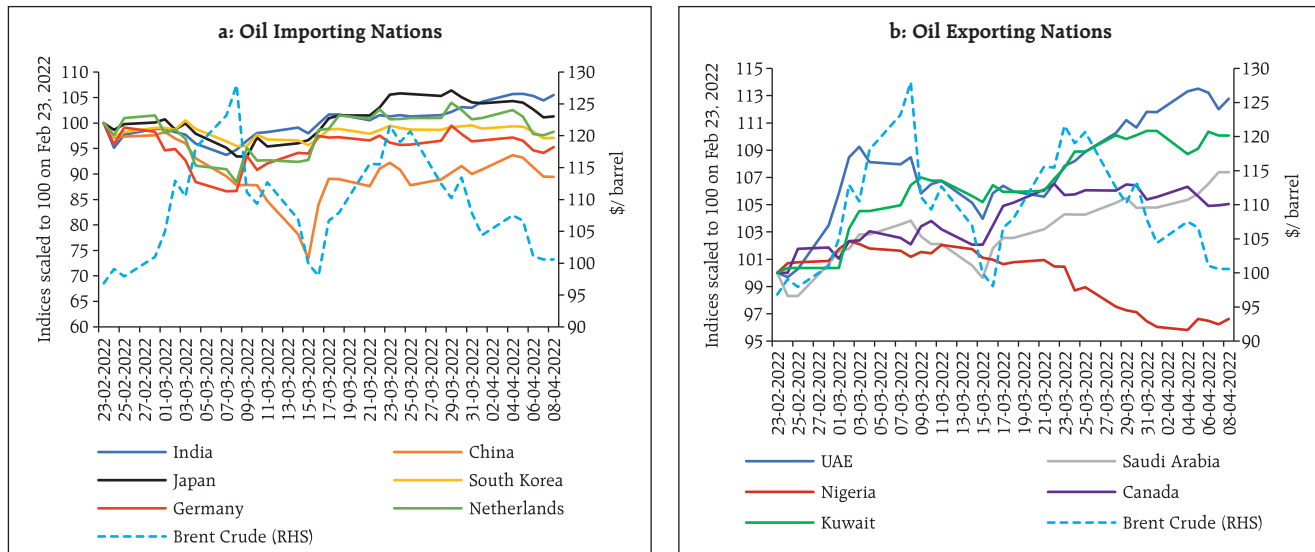
Chart 41: Net Investment by FPIs in H2:2021-22
(10 Largest Selling Sectors)**Source:** NSDL.

Chart 42: Movement of MSCI Indices

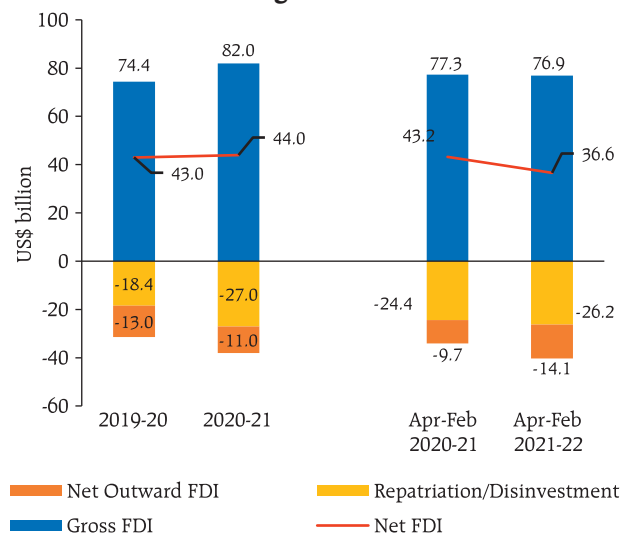
Sources: Bloomberg; and RBI staff calculations.

services, financial services, and retail and wholesale trade sector managed to attract most of the investment. However, net FDI came down to US\$ 36.6 billion from US\$ 43.2 billion a year ago, due to an increase in net outward FDI from India (Chart 43).

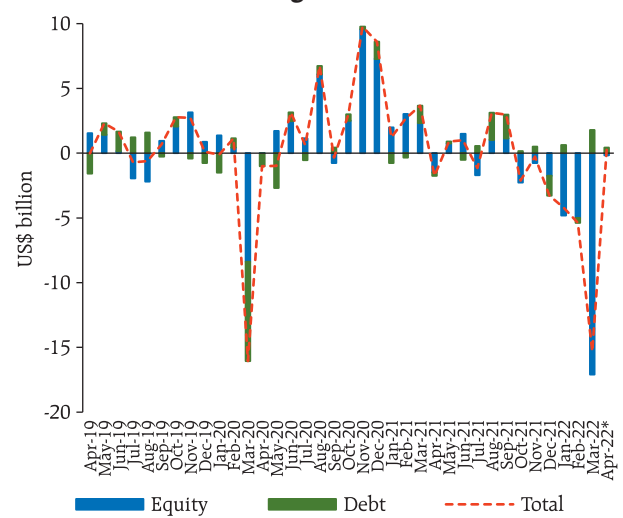
FPIs continued to pull out of domestic market, reporting net outflows of US\$ 15.3 billion in

FY 2021-22. In March 2022, FPI were net sellers in both equity and debt markets (Chart 44).

Net disbursements of external commercial borrowings (ECB) to India, including inter-company borrowings, were to the tune of US\$ 11.1 billion during April-February 2021-22 as compared with US\$ 1.9 billion a year ago, while net disbursements

Chart 43: Foreign Direct Investment

Source: RBI.

Chart 44: Net Foreign Portfolio Investment

*: Up to April 11, 2022.

Source: NSDL.

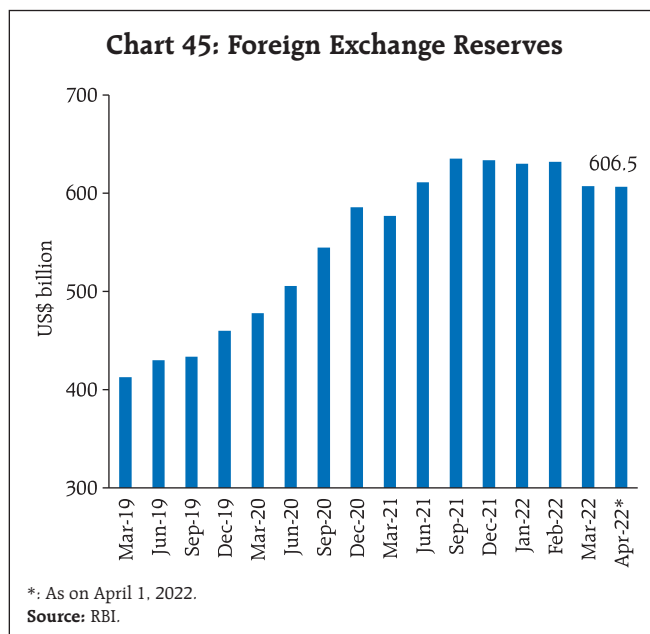
excluding both repayments and inter-company borrowings amounted to US\$ 7.0 billion as against net repayment of US\$ 1.8 billion a year ago. In February, a considerable amount of borrowing was routed for refinancing of rupee loans, on-lending/sub-lending, and for working capital.

The foreign exchange reserves stood at US\$ 606.5 billion as on April 1, 2022 equivalent to about 12 months of imports during 2021-22 (Chart 45).

The hardening oil import cost and portfolio outflows continued to mount pressure on the Indian rupee (INR), which depreciated against the US dollar by 1.6 per cent (m-o-m) in March 2022. In both nominal and real effective terms (40-currency basket), the INR depreciated by 0.5 per cent in March 2022 over its level a month ago (Chart 46).

Payment Systems

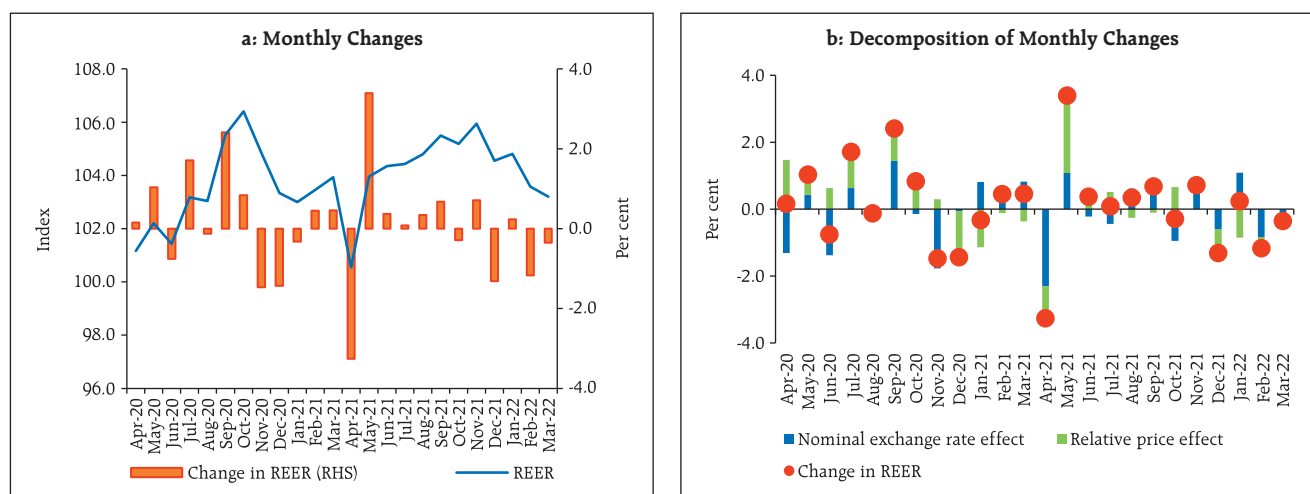
Through the three waves of the pandemic, digital transactions have proliferated. Offline digital payments initiatives, the Unified Payments Interface (UPI) for feature phones (UPI123Pay), broad basing of payment system by inclusion of non-banks into



centralised payment systems, and enhancement of pre-paid card outstanding limits up to ₹2 lakh should further catalyse this growth (Table 4).

In the large value payment segment, transactions through the Real Time Gross Settlement (RTGS) recorded strong growth (y-o-y) across all months of the year. With the annual closing of accounts in March,

Chart 46: Monthly Movements in 40-Currency Real Effective Exchange Rate (REER)
(Base: 2015-16 = 100)



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

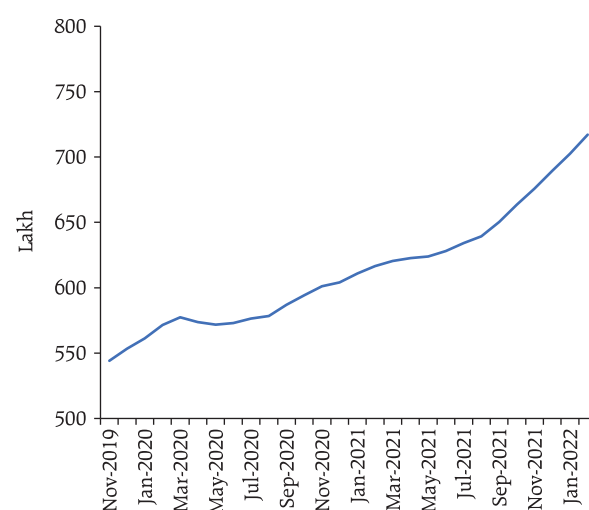
Table 4: Growth Rates in Select Payment Systems

Payment System	Transactions Volume Growth (y-o-y), per cent				Transactions Value Growth (y-o-y), per cent			
	Q1:2021-22	Q2:2021-22	Q3:2021-22	Q4:2021-22	Q1:2021-22	Q2:2021-22	Q3:2021-22	Q4:2021-22
RTGS	62.5	36.9	24.9	14.5	23.6	27.3	25.6	12.9
NEFT	40.1	35.1	25.2	26.1	27.0	12.8	7.2	14.2
UPI	123.4	112.7	99.1	98.6	142.4	107.0	98.3	92.4
IMPS	85.8	49.4	26.8	31.5	70.9	34.7	34.2	38.5
NACH	-12.0	-3.0	13.4	20.2	3.6	13.5	11.0	13.3
NETC	197.7	100.0	73.9	48.6	157.7	71.8	56.1	40.8
BBPS	155.2	162.7	146.7	116.6	197.7	180.0	168.7	134.0

Source: RBI.

RTGS transactions peaked at 2.3 crore transactions worth ₹145 trillion. On the retail side, digital payments posted annual volume growth of 64 per cent (28 per cent growth in value terms). Digital transaction volumes were dominated by the UPI. Other notable performers in the retail segment were the National Electronic Funds Transfer (NEFT), the Immediate Payment Service (IMPS), the Bharat Bill Payment System (BBPS). The Aadhaar enabled Payment Services (AEPS) also grew substantially due to direct benefit transfers under various welfare schemes. The number of FASTags issued under National Electronic Toll Collection (NETC) system expanded by 89 per cent in 2021-22, taking the total number of outstanding tags to approximately 4.8 crore. A notable feature of the digital ecosystem in 2021-22 was the resurgence of credit cards, with the average transaction size rising at double digit rates since March 2021 (Chart 47).

Ascertaining the geographical spread of the payment infrastructure is necessary to develop targeted intervention strategies for inclusive digital payments. Accordingly, the Reserve Bank released the framework for Geo-tagging of Payment System Touch Points on March 25, 2022.⁸ The framework requires banks and non-bank payment system operators to submit geo-tagging information related to Point-of-Sale (PoS) terminals and paper-based/soft QR codes

Chart 47: Number of Credit Cards Outstanding

Source: RBI.

to the Reserve Bank. Enabling customer authorisation through the use of UPI is in the pipeline, which will encourage card-less cash withdrawal facility across all banks and all ATM networks/operators.

V. Conclusion

The near-term global outlook appears grim, caught up in a vortex of geo-political risks materialising rapidly, strained supply chains and the quickening pace of monetary policy normalisation. Emerging market economies are bracing up to contend with swift shifts in risk sentiments and tightening of global financial conditions that could produce real economy consequences which may thwart incipient recoveries

⁸ <https://www.rbi.org.in/Scripts/NotificationUser.aspx?Id=12260&Mode=0>

or even precipitate rocketing inflation and economic downturns.

The Indian economy is not immune to these negative externalities. The surge in commodity prices is already posing inflation risks, especially through the conduit of surging imports. Rapidly widening trade and current account deficits co-existing with portfolio capital outflows weigh on external sustainability, although the strength of underlying

fundamentals and the stock of international reserves provide buffers.

India faces these challenges from a position of strength built on broadened vaccine coverage, financial sector resilience, robust export and remittances and fiscal reprioritisation to spur capital spending on infrastructure. Going forward, spurring private investment remains a key thrust area for sustaining growth on a durable basis.

Annex

Impact of Robotics on Productivity and Labour Share in GDP

Pandemic has triggered the rate of robot adoption⁹ worldwide with large scale unavailability of workers and restricted physical proximity (Sedik *et al*, 2021). However, Georgieff *et al*, predicts risk to 14 per cent of the low-end jobs owing to automation in OECD countries. On the other hand, McKinsey Global Institute predicts an increase in the productivity from automation in the range of 0.8-1.4 per cent for the period 2015-2065. This has reignited the debate on the impact of automation on productivity and employment. The total market size of robotics industry is estimated to increase to US\$ 165.4 billion by 2028 from US\$ 55.4 billion in 2020 (Statista). With its 52 per cent automation potential (McKinsey Global Institute), the impact of Robotics on India can be significant in terms of growth of productivity and displacement of low-end workers. According to International Federation of Robotics, India has witnessed a 20 per cent average annual growth rate of new installations of robots for the period 2008-2020 as against the 15 per cent recorded worldwide.

The literature on the impact of robotics on productivity and employment is divided in two schools of thought as illustrated by Aghion *et al*, the first view, *i.e.*, the displacement effect focuses on the negative impact of automation on employment and labour share, while the second view (productivity effect) believes the existence of positive impact of automation on employment at the firm level. However, the consensus appears to be emerging on the existence of both displacement and productivity effect.

In order to empirically examine the hypothesis regarding the dominance of productivity and displacement effects, a sample of 14 countries is analysed using fixed effect panel estimation for the period 2008 to 2018. The model is based on Fu *et al* (2021), with new installations of robots taken as the independent variable to account for the impact of rapid change in technology. The control variables of export and import share in GDP are incorporated to account for trade openness while population and capital stock are included as traditional parameters of growth. Secondary school

enrolment rate and number of patents filled are taken as proxy for educational and technological advancement. The result suggests that an increase of 1 per cent in new robots installed leads to 0.031 per cent increase in labour productivity. While the impact of automation on share of labour compensation is not statistically significant.

The results also highlight the negative impact of human capital on share of labour compensation in GDP when taken as a control variable to study the impact of robotics. This highlights the need to educate and retrain the workforce, in order to optimally utilise the full productivity gains brought on by the introduction of robotics. This is substantiated by the change in impact of human capital, number of patents and new robots installed, on the share of labour compensation in GDP when a lag of three periods in human capital is taken as an independent variable. These results appear to be in line with Berg *et al* (2016), which suggests an increase in labour productivity and a higher share of capital in the total income. Overall, the results suggest that the productivity effect dominates

Estimated Effects of Robotics on Labour Productivity and Share of Labour in GDP

	(1)	(2a)	(2b)
	Dependent Variables		
	Output per Worker	Share of Labour Compensation in GDP	Share of Labour Compensation in GDP
Log of New Robots Installed	0.0316**	-0.00583	0.0000287
Share of Exports as a Percentage of GDP	-0.00169	-0.0120***	-0.0177**
Share of Imports as a Percentage of GDP		0.00951**	0.0154**
Human Capital	0.00351**	-0.00126*	
Human Capital (lagged)			0.00300
Log of Total Population	0.00475*		
Capital Stock		0.0755***	0.0792**
Log of No of Patents filled by Residents		-0.0253	0.0233
Constant	10.26***	1.091**	0.0876
Observations	127	126	90
R-squared	0.748	0.209	0.194

Note: ***, **, * denote the level of significance at 1%, 5%, and 10% respectively.

(Contd.)

⁹ Measured by new robot installations per 1000 employees.

over displacement effect for the sample of countries analysed during 2008-2018, thereby corroborating the major findings obtained by Fu *et al* (2021). Moreover, the negative effects of the displacement can be minimised by recalibrating the existing skillset of low-medium skill workers.

Reference:

Aghion P, Antonin C, Bunel S, Jaravel X. The Direct and Indirect Effects of Automation on Employment: A Survey of the Recent Literature (forthcoming).

Fu, X., Bao, Q., Xie, H., Fu, X. (2021). Diffusion of Industrial Robotics and Inclusive Growth: Labour Market Evidence from Cross Country Data. *Journal of Business Science*.

Georgieff, A., Milanez, A. (2021). What happens to jobs at high risk of automation? OECD Social, Employment and Migration Working Papers.

Sedik, T.S., Yoo, J. (2021). Pandemics and Automation: Will the Lost Jobs Come Back? IMF Working Paper.

Measuring Supply Chain Pressures on India*

Supply chain disruptions have forced their way into policymakers' radars in the wake of the pandemic. An index of supply chain pressures for India (ISPI), developed by extracting common factors latent in 19 domestic and global variables for the period March 2005 through March 2022, is found to track supply pressures on the Indian economy efficiently. It contemporaneously predicts industrial production, GDP and input costs and displays lead indicator properties in respect of export volumes and inflation. The most recent elevation in the ISPI warrants careful monitoring of supply chain pressures, highlighting the importance of the ISPI in a macroeconomic early warning system for the Indian economy.

The COVID-19 pandemic has delivered the biggest and broadest shock to global value chains (GVCs) in living memory, putting at risk trade in intermediate goods that accounts for two-thirds of global exports. Ships stacked high with containers wait at ports around the world for their turn to unload, sometimes at anchor for months. Shipping costs have risen around six times. Delivery times have lengthened by more than two days during the second half of 2021 relative to the first half across key ports. Truck and air freight prices have also surged in double digits over pre-pandemic levels, exacerbated by labour shortages. High frequency indicators suggest that global growth and trade have lost pace in the first quarter of 2022, with anecdotal evidence of production pauses, order backlogs and build-ups of precautionary inventories, all sapping global demand. The elevation in prices has been such that central banks, their mandates and credibility challenged, have been stung into tightening

monetary policy and normalising pandemic-response liquidity overhangs despite the weak recovery, with emerging markets ahead and advanced economies following. It is estimated that it may take a year or more for these snarls to unravel and return to normal functioning (Sea-Intelligence, 2021)¹.

In the now burgeoning literature on the theme, the focus has been on idiosyncratic shocks to supply chains, as for instance, dependence on single type customers and suppliers (Wagner and Bode, 2006), the issue of integrating upstream suppliers (Antras and Choe, 2013; Alfaro, et al, 2019), and country-level and industry-level production impediments (Antras, 2020; Melitz, 2003). With the onset of the pandemic, this traditional approach is giving way to the view that aggregate macroeconomic shocks do matter and under their impact, shortages and inflationary pressures tend to acquire persistence (Jiang, Rogobon and Rigobon, 2021)².

As the revenge spending swing from services to goods collides with the pandemic-induced supply disruptions and bottlenecks, attention is accordingly focused on GVCs, their benefits and costs and particularly on their potential to increase risks and vulnerabilities to shocks. While GVCs are exposed to different types of shocks, depending on their geographical footprint, those with the highest production/export concentration in a few countries are more exposed than others, with the semiconductor value chain being a case in point,³ although labour-intensive value chains such as apparel have also been found to be highly prone to pandemic-related disruptions (McKinsey, 2020). Practices such as just-in-time production, sourcing from a single supplier and

* This article is prepared by Michael Debabrata Patra, Harendra Behera and Dharendra Gajbhiye, Reserve Bank of India. The views expressed in this article are those of the authors and do not represent the views of the Reserve Bank of India.

¹ <https://www.bloomberg.com/news/articles/2021-11-16/container-shipping-rates-may-take-two-years-to-fall-to-normal?sref=QF6yuiF0>

² This paper also provides a comprehensive review of the literature on the subject.

³ The largest semiconductor vendors are based in the US, Korea, Europe and Japan, but many outsource capital-intensive manufacturing, assembly and testing to firms localised in Taiwan, China and Singapore (OECD, 2019)

relying on customised products with few substitutes amplify disruptions.

In fact, questions are being raised about the gains from deepening and expanding GVCs and whether GVCs may themselves adapt to become more localised production networks, providing greater security against the disruptions the world faces today. Some of these shifts are already underway – companies are chartering entire ships exclusively for their own cargo; new orders are going out for smaller container ships; passenger aircraft are being refitted for freight; carmakers and smartphone producers are being supplied chips ahead of computer servers; shipping is becoming prohibitively costly for bulky low-value goods, turning them away; investment plans are being tailored accordingly; governments are incentivising 'reshoring' of production; and global trade is on the cusp of becoming more regionalised. In the literature too, as alluded to earlier, there is a shift in interest to supply chain flexibility and resilience or the ability to adapt to aggregate shocks (Zhao and You, 2019; Antras and De Gortari, 2020).

Currently, the received wisdom is that localised production could become associated with lower levels of activity than GVCs, fewer opportunities for trade diversification, and amplification of domestically originating disruptions (OECD, 2020; BIS, 2020). Nonetheless, it is estimated that 16-26 per cent of global merchandise could conceivably move to new locations in the light of the pandemic experience. Alternatively, strengthening risk management capacities in GVCs – building supply and transportation redundancies; holding more inventories; reducing product complexity; creating flexible production across the chain; financial resilience; and even centralised rules set by global consensus for supply chain management can limit the economic consequences of shifts to more localised production (McKinsey, 2020). In other words, the pandemic will move GVCs from a just-in-

time strategy to a 'just-in-case' one (Jiang, *et al.*, *ibid*).

In view of the foregoing, it is important to monitor supply chain pressures to gauge their implications for macroeconomic conditions, globally and in India, as well as to assess their role in shaping the future of international manufacturing, trade and commerce with potential spillovers to national economies. Several measures are used to assess the pressures from supply disruptions. The common approach is to observe the evolution over time of a set of indicators of underlying logistics, shipping costs and delivery times, among others. They, however, tend to provide information on specific aspects of supply chains. A recent approach is the construction of a global supply chain pressure index by extracting common factors latent in a set of indicators of cross-border transportation costs, country-level purchasing managers' indices of economies that are significantly interlinked through GVCs and sub-components of the PMIs, all purged of demand effects (Benigno *et al.*, 2022). The objective is to create a parsimonious but comprehensive measure of supply disruptions that captures all factors impinging on GVCs, both globally and in the US. Another recent approach is to calculate foreign exposure for each industry by taking the ratio of foreign value added to exports and then multiplied it with a measure of supply chain disruptions such as backlogs or delivery time to obtain exposures to supply bottlenecks (Santacreu and LaBelle, 2022). Drawing from these recent strands of work, we attempt to develop an index of supply chain pressures specific to India (ISPI). Our ISPI appears to track supply pressures on the Indian economy quite well, as evident in the close co-movement with indicators such as inflation, the growth of industrial production, export volume and GDP, especially through the period of the pandemic. We also detect strong coincident indicator properties reflected in correlations, time-varying Granger causality and the capturing of turning points.

The rest of the paper is organised into four sections. The next section deals with the specific indicators that go into the ISPI and the rationale for their choice. Section III lays out the methodology for the index, given the caveats listed above. Section IV evaluates the ISPI in terms of its co-movement with important macroeconomic variables such as GDP, inflation, industrial production and merchandise exports. The final section concludes the paper with some perspectives.

II. Choice of Variables

The index of supply chain pressure for India (ISPI) that is proposed in this paper takes into account select domestic and global variables that impinge upon supply and logistics pressures specific to India. These indicators are classified under two broad categories: (i) transportation and logistics; (ii) essential intermediates in manufacturing.

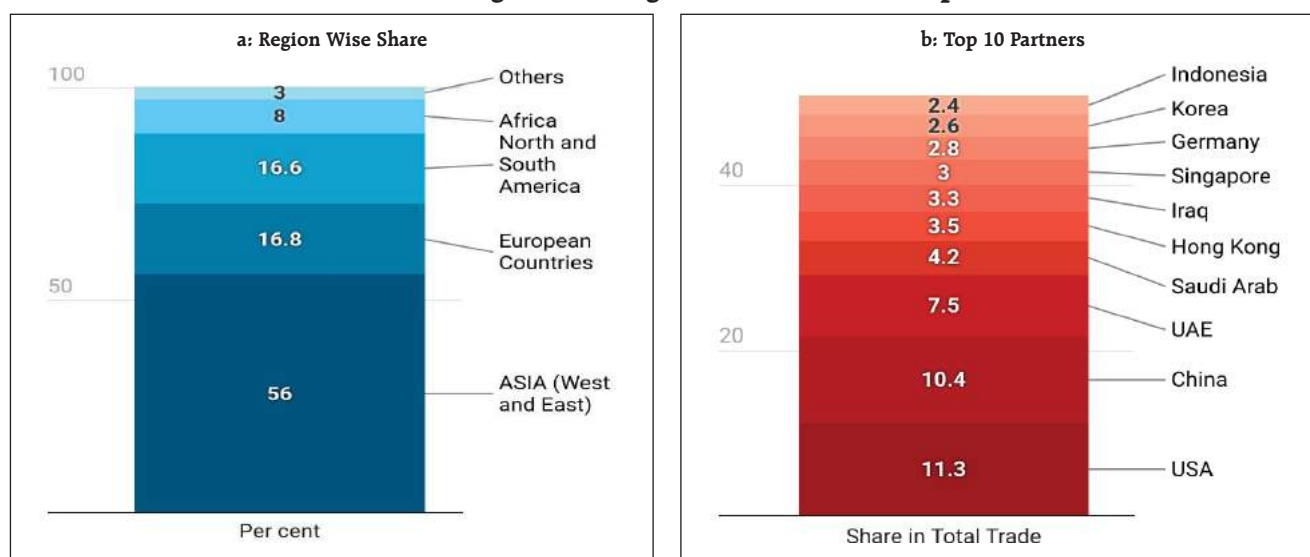
Around 95 per cent of India's merchandise trade in volume terms and 70 per cent in value terms is routed through sea transport (IBEF, 2021). 60 per

cent of cross-border trade is with Eastern and West Asian countries, 17 per cent with the USA and EU countries, and 8 per cent with African countries. The top 10 countries from these regions account for more than 50 per cent of India's total merchandise trade (Chart 1).

Over the last two decades, India's exports and imports comprise about 40 per cent and 65 per cent, respectively, of raw materials and intermediate goods that are susceptible to shocks emerging from supply chains (Chart 2).

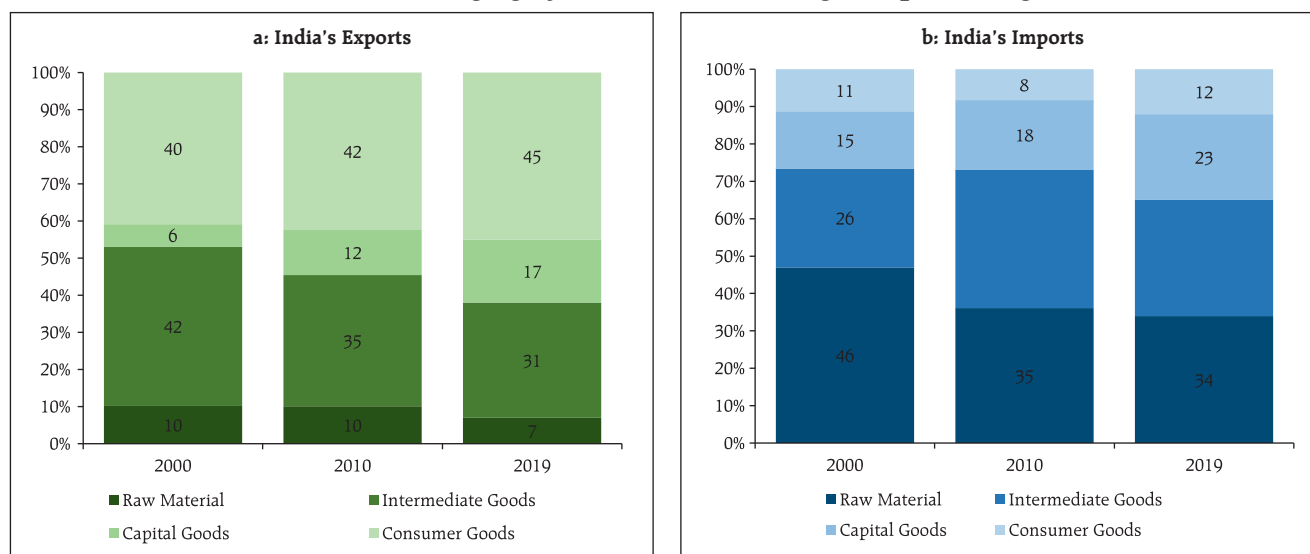
Under **transportation and logistics** indicators, the Freightos index, which measures global container freight rates for 40-foot containers on 12 global trade lanes, is widely regarded as a comprehensive indicator of freight rate movements with data inputs on real time. In view of limitations relating to data availability, however, shipping rates in our ISPI are proxied by the Baltic Dry Index, a composite index of three different sizes of dry carriers - Capesize, Panamax and Supramax⁴ - and the Harpex Index,

Chart 1: India's Foreign Trade: Region Wise Share and Top 10 Partners



Sources: Ministry of Commerce and Industry, Government of India.

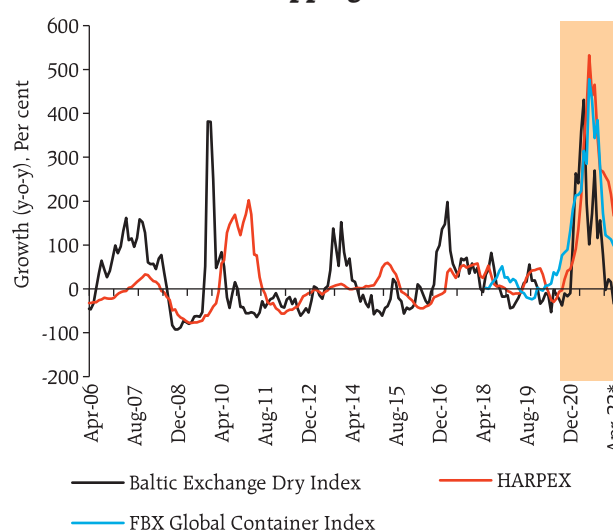
⁴ Capesize-operating on 10 routes with a carrying capacity of 180,000mt dwt and maximum age 10 years; Panamax- operating on 11 routes with a carrying capacity of 82,500mt dwt and maximum age 12 years; Supramax- operating on 10 routes with a carrying capacity of 58,328mt dwt and maximum age 15 years (Source: Reuters).

Chart 2: Changing dynamics of India's stages of processing

Source: World Integrated Trade Solution (WITS), World Bank.

which tracks container shipping rates on a weekly basis in eight classes of all-container ships only. During 2021, container shipping costs surged by six times their pre-pandemic levels and peaked around the middle of the year. In the first four months of 2022, rates have remained elevated, particularly for US-China trading routes, due to (i) strict containment measures in China; and (ii) container shortages at Asian ports owing to lockdown measures that piled up containers at wrong places - companies in Asia are reported to be paying premium rates to get containers back (Attinasi *et al.*, 2021c). Ports congestions in the US and Europe also contributed to elevated wait times at ports, impacting the reliability of the schedules of global container services, which declined to the lowest levels on record (Sea-Intelligence, 2022)⁵. Rising shipping costs were compounded by limited air freight capacity. More recently, however, shipping and logistics pressure have started to ease (Chart 3).

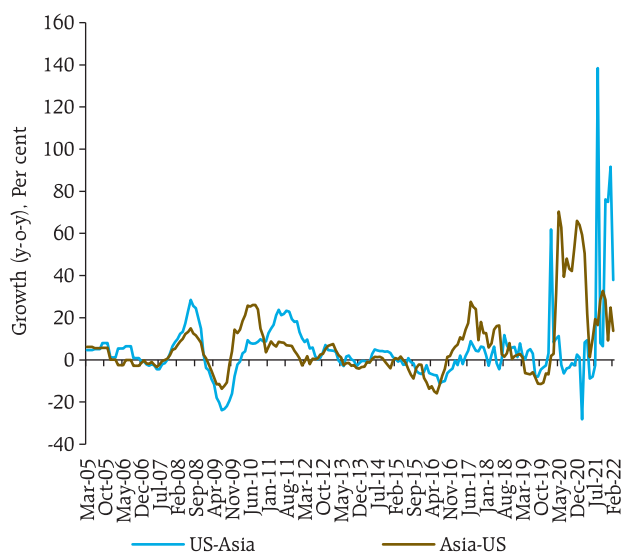
International air freight rates are also included in the ISPI, proxied by US-Asia and Asia-US rates obtained from the US Bureau of Labor Statistics. Notably, Asia-US rates peaked ahead of US-Asia counterparts, but both have been easing through the second half of 2021 and into the early months of 2022 (Chart 4).

Chart 3: Container Shipping Rates are moderating

*: Upto April 11, 2022

Source: Refinitiv.

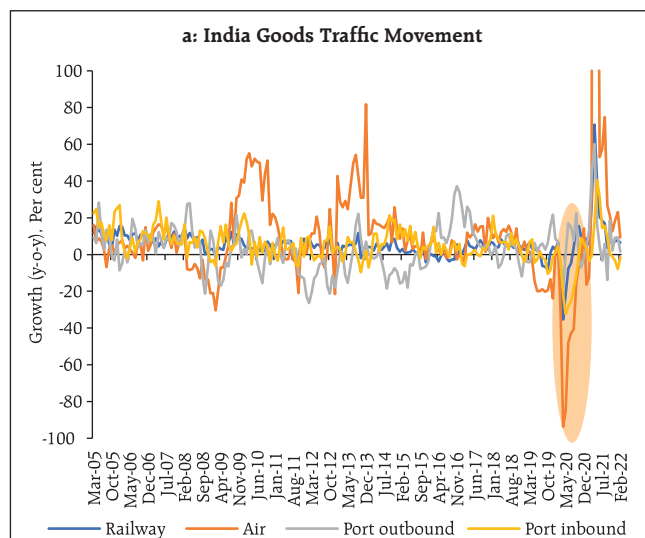
⁵ <https://www.gtreview.com/news/global/no-end-in-sight-for-shipping-chaos-as-schedule-reliability-hits-record-low/>

Chart 4: International Air Freight Cost

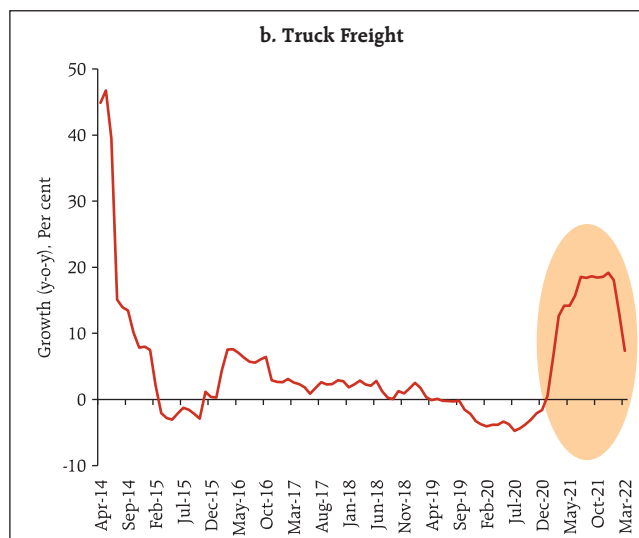
Domestic transportation costs are incorporated into the ISPI by considering inland truck freight rates as well as domestic railway and air freight traffic⁶. Port activity embodied in inbound and outbound

shipments and turnaround time are also included to reflect port congestion. Domestic goods movements recorded the severest disruptions during the first wave of the pandemic, including truck freight (Chart 5). All these indicators have exhibited robust recoveries from the second half of 2021.

Turning to indicators of **supply of intermediates in manufacturing**, a host of indicators have been used. Global indicators include (1) the delivery time sub-indices⁷ in the global manufacturing purchasing managers index (PMI) and in the global electronics equipment PMI as a measure of the extent to which supply chain delays impact production; (2) share prices of semiconductor manufacturers (de-trended) listed in the PHLX Semiconductor Sector Index⁸; and (3) delivery time and backlog sub-components of the US and China manufacturing PMIs to represent leading trade partner country conditions in terms of volume of orders received pending starting of work, and supply chain delays, respectively.

Chart 5: India's Logistic and Transportation Sector

Source: Authors' calculation; CMIE.



⁶ Source: Centre for Monitoring Indian Economy (CMIE)

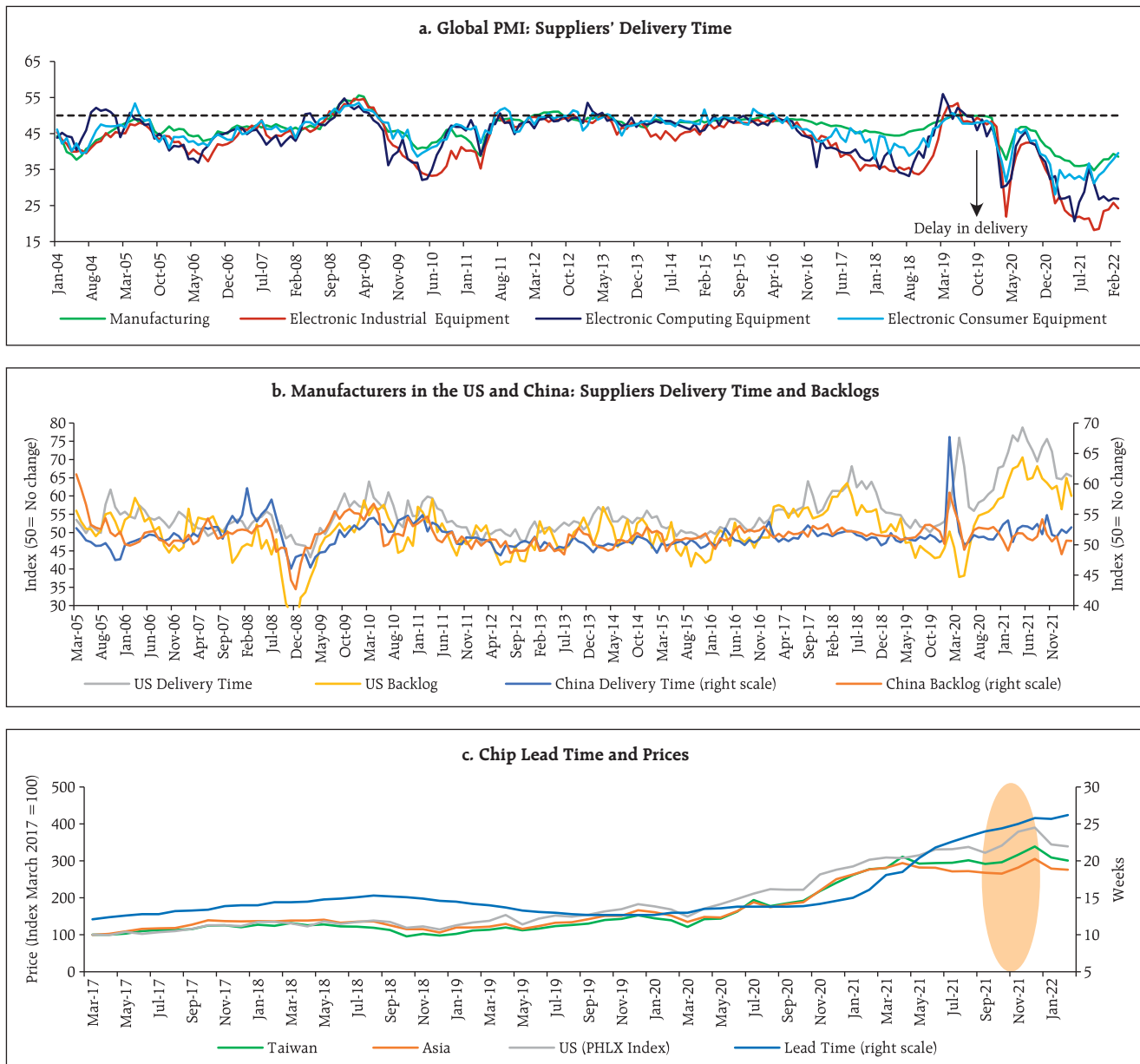
⁷ Sourced from IHS Markit.

⁸ The PHLX index is produced by Nasdaq and tracks major companies in the world that are involved in the production and sale of semiconductors worldwide. The Index is observed to closely co-move with chip lead time - the lag between when a chip is ordered and delivered.

Movements in global PMIs for different manufacturing sub-sectors show how the sharp rebound in new orders for inputs of production from a trough in the second quarter of 2020 has been boosted by a strong rise in supplier delivery times and an increase in input price pressures - both lead time and share prices peaked in December 2021 (Chart 6a). The sectors experiencing the severest disruptions in supply

chains are basic materials, machinery and equipment, and cars. US manufacturing output growth accelerated in the first quarter of 2021, reflecting pent up demand, despite shortages of inputs leading to rising backlogs in work. These backlogs started to moderate from the second half of 2021 as delivery time started to improve. China's backlog peaked in February 2020, following stringent lockdown measures imposed to

Chart 6: Global PMI: Suppliers' Delivery Time, Chip Lead time and Backlogs



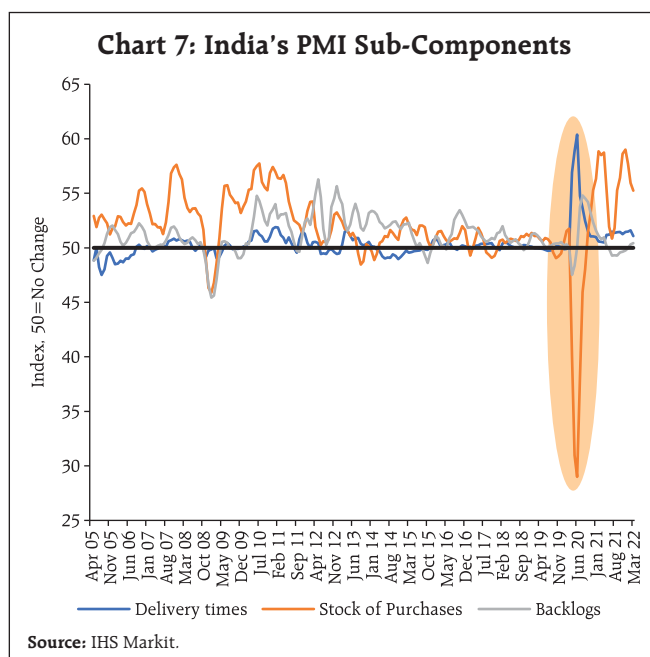
Source: IHS Markit.

contain the spread of COVID-19 infections. Backlogs started to normalise in subsequent quarters with the relaxation of containment measures (Chart 6b).

As lockdown measures gripped the world at the beginning of 2020, the sales of semiconductors to the motor vehicle industry collapsed. This was exacerbated by strong demand from computer and electronic equipment producers owing to the shift to remote working and distance learning (Attinasi *et al.*, 2021a). Global chips sales have grown strongly over the last 24 months, resulting in an unprecedented increase in the ratio of new orders to suppliers' delivery time in the global electronics PMI, particularly in industries such as auto and auto parts and technology equipment. China, Taiwan and Hong Kong continue to dominate the global exports and imports of semiconductors (Chart 6c). India's domestic auto sales are yet to recover from chip shortages, although auto exports came out of a trough early and remained in positive territory as manufacturers preferred to maintain export market shares.

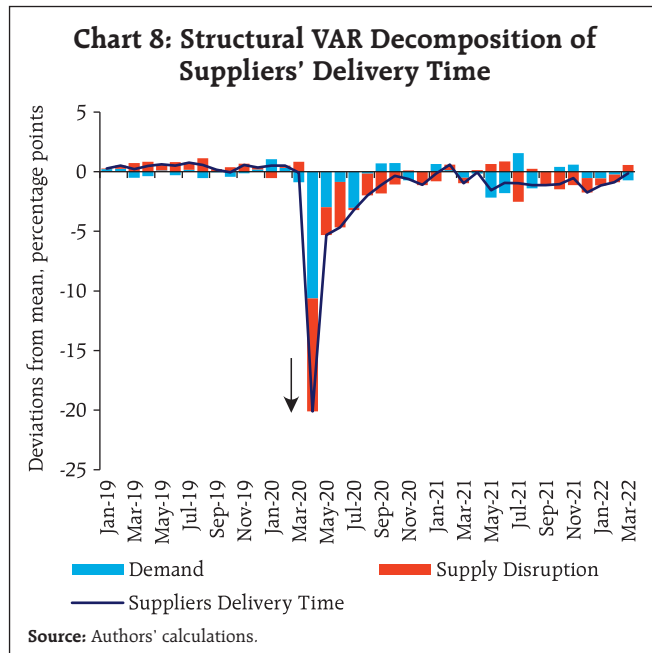
Domestic indicators of supply disruptions in manufacturing include sub-components of the manufacturing PMI for India: (1) suppliers' delivery time – a valuable indicator that captures supply chain delays, capacity constraints and price pressures; (2) backlog of work – a measure that gauges the volume of orders a company has received but has yet to either start work on or complete; and (3) stock purchases, – which provide insights into the level of inventories held by companies in anticipation of supply chain pressures.

COVID-19 induced demand-supply disruptions pushed India's manufacturing PMI to a record low in the second quarter of 2020, with delivery times peaking and inventories reaching their lowest levels since PMI data collection began in March 2005. This adversely impacted firms' order books, resulting in a rise in backlogs. Manufacturing activity started gaining momentum in the second half of 2020 due



to an acceleration in sales, supported by an upturn in production. As a result, companies scaled up input buying, leading to the second quickest accumulation in stock of purchases in the last 17 years. Delivery time pressure started to dissipate, and inventory management of firms and companies became more efficient in response a more calibrated approach towards containment, resulting in moderation in backlogs.

The suppliers' delivery time sub-index in the PMI quantifies developments in the time required for the delivery of inputs to firms. One key advantage of this indicator is that it is able to capture capacity constraints of various types (e.g., intermediate goods shortages; transportation delays; labour supply shortages), making it an all-encompassing barometer of strains in production networks. Since suppliers' delivery time can also be influenced by a rise in demand beyond existing capacity, it is necessary to segregate movements associated with cyclical fluctuations. A structural vector autoregression (SVAR) of the new orders component of the manufacturing PMI – proxying demand conditions - and the manufacturing PMI supply delivery time shows that



more than half of the lengthening of suppliers' delivery time was due to demand during the first wave of the pandemic. More recently, however, delays are mostly due to supply bottlenecks that have emerged in the wake of geopolitical hostilities (Chart 8).

From the stylised analysis presented in this section, it is evident that supply chain pressures confronting India stem mainly from global spillovers reflected in supply delivery delays in various areas of manufacturing and acute in respect of electronics equipment. The global escalation in freight rates has also imposed supply constraints for India's trade, with implications for inflation and economic activity. It is noteworthy, however, that air freight increases have little significance for supply chain dislocations relevant to India, presumably reflecting the low volume of trade carried by air freight relative to sea traffic. Domestic factors mainly operate in conjunction with global factors. Nevertheless, backlogs, railway freight cargo and domestic air freight impact supply delivery time within India quite significantly. By and large, domestic supply chains have normalised faster than global chains, but truck freight rates remain elevated, with associated lingering effects on domestic supply chains. These variables form

the basis of our empirical investigation, which is discussed in the following section.

III. Methodology

Each of the variables identified in the preceding section reflects supply disruptions in a specific segment of the economy. Hence, a composite measure that captures all the information embedded in these indicators is necessary to gauge the economy wide dimensions of overall supply chain pressures and their persistence or transience.

A popular method of dimension reduction is principal component analysis (PCA), which can extract common components out of the underlying variables. A limitation of PCA is that it can be employed only on a balanced panel. Moreover, the common factors identified through PCA are static in nature and fail to capture the time-varying characteristics of these variables which, as shown in the preceding section, evolve dynamically over time. Accordingly, our choice of methodology favours a dynamic factor model (DFM), which can extract unobserved underlying factors common to a large number of variables. This can be accomplished by employing a Kalman filter that is robust to misspecification errors, nonlinearities and non-stationarity, thereby producing time-varying parameters. Additionally, a DFM allows for weak correlations in idiosyncratic errors and is preferred over a vector autoregression (VAR) model as it overcomes the limitations of restrictive assumptions on the structure of the economy as well as on the maximum number of variables that can be included and therefore, the number of shocks.

The following DFM specification is used to extract the common factors⁹:

$$x_{it} = \lambda_i F_t + \varepsilon_{it}$$

$$F_t = BF_{t-1} + u_t$$

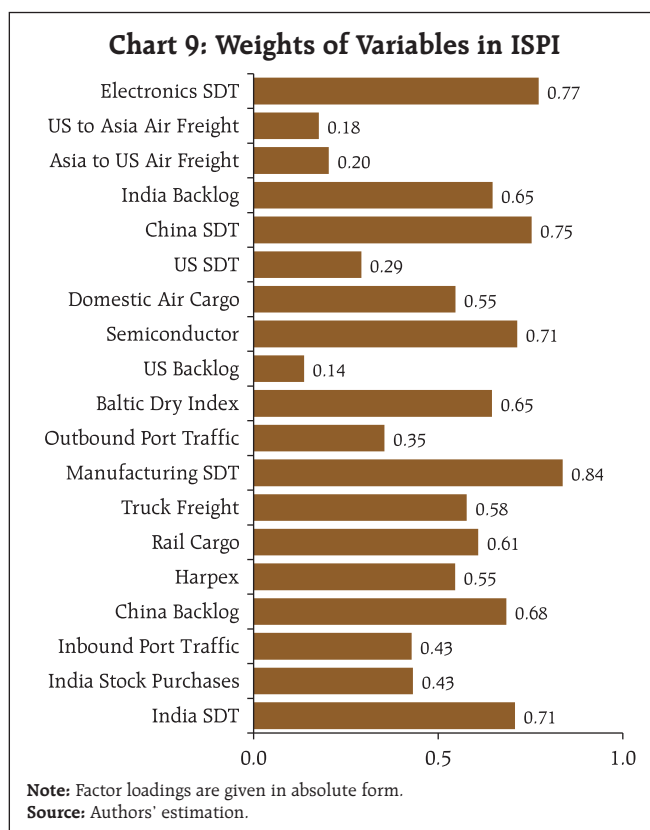
⁹ Before estimating the DFM, a principal component is extracted from domestic freight variables in order to fill data gaps relating to truck freight rates over the period April 2005 to March 2013 (Stock and Watson, 2002).

where F_t is a vector of common factors that follows a VAR(p) process; λ_i is the factor loading of F_t , showing the relevance of each variable x_{it} in the ISPI and ε_{it} represents idiosyncratic shocks specific to the i^{th} variable at time 't'. In order to avoid misspecification with respect to dynamic and cross-sectional properties, the common factors are estimated in two steps. First, preliminary parameter estimates are derived from PCA to set up the initial values. Second, the factors are re-estimated by mean squared error-optimal linear projection from a Kalman smoother while allowing for idiosyncratic cross-sectional heteroscedasticity and common factor dynamics as well as an unbalanced panel (Doze *et al.*, 2011).

IV. Empirical Results

The DFM is estimated by using monthly data on 19 relevant variables referred to in Section II for the period March 2005 through March 2022 (Annex Table A1)¹⁰. As the variables embody both demand and supply influences, demand effects are stripped out by regressing the contemporaneous value as well as up to two lags of the PMI sub-component "new orders" of each country/sector on each of the other 18 variables¹¹. The residuals from these regressions are then standardised and used as inputs in the ISPI (Benigno *et al.* 2022).

The estimated factor loadings confirm our stylised assessment that global factors like supply delivery delays in various categories of manufacturing, especially in semiconductors, have a dominant influence on domestic supply chain pressures (Chart 9). As India imports a significant amount of intermediate inputs and raw materials from China, supply disruptions in that country impact the ISPI



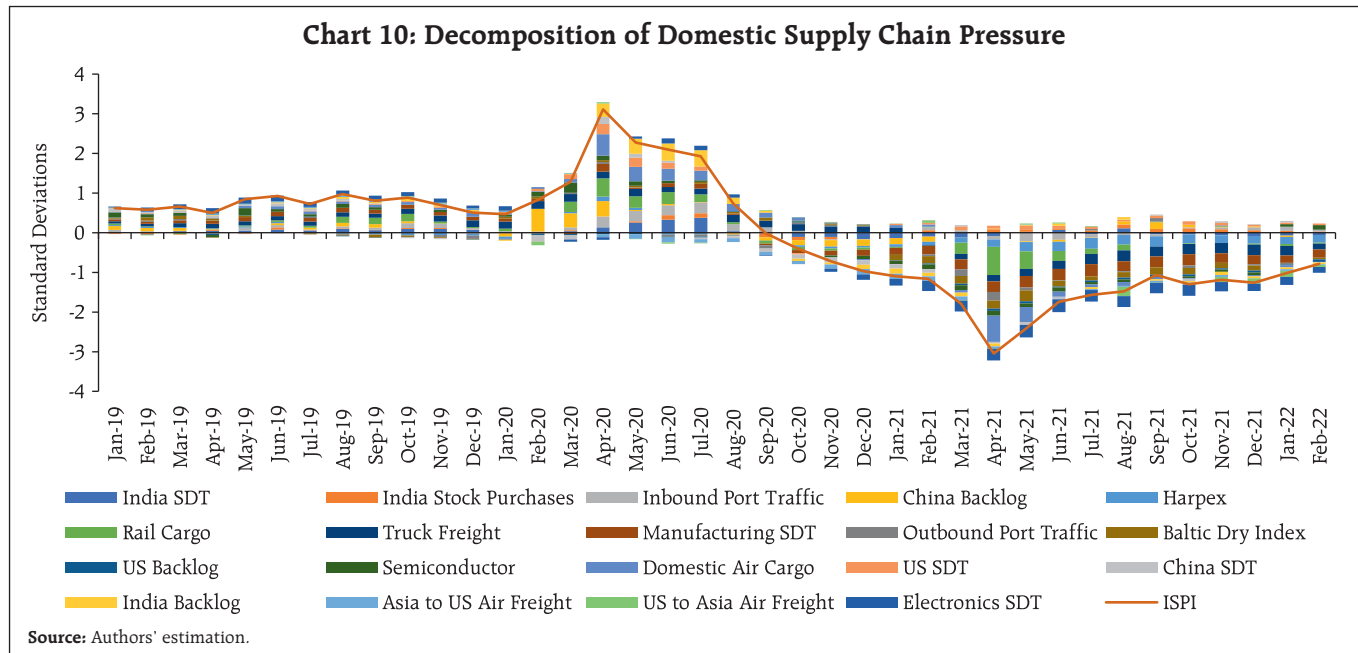
more than supply bottlenecks in advanced economies like the US.

The calculated contribution of each variable to the ISPI shows that recent improvements in domestic supply conditions are mainly due to railways and air cargo traffic movements (Chart 10). On the other hand, problems in advanced countries as reflected in semiconductor production, inbound port traffic movements and delivery delays in the US are still imposing upward pressure on the ISPI.

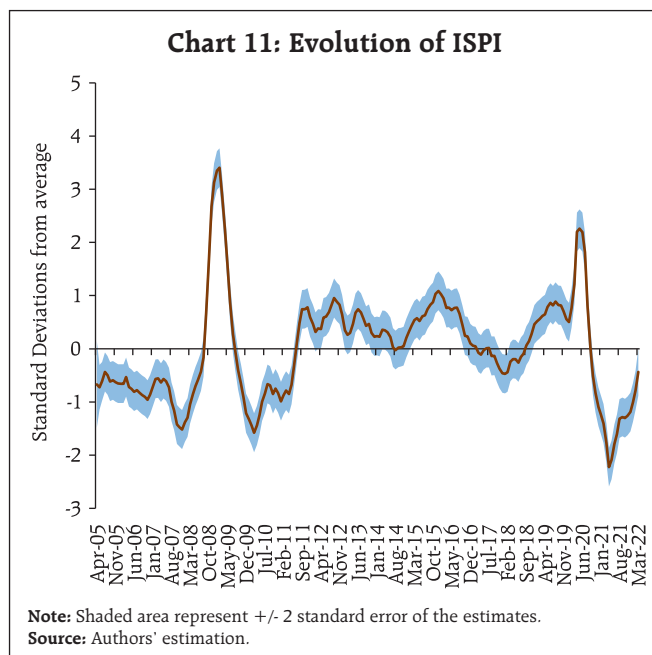
In terms of its performance, the ISPI closely tracks two major supply disruptions *i.e.*, during the global financial crisis (GFC) and in the first wave of the pandemic (Chart 11). Thereafter, the ISPI eased to a trough in April 2021 as pandemic related containment measures were progressively eased. As mobility improved, pent-up demand was reflected in normalisation of the movements of manufactured goods and rebalancing of supply-demand mismatches.

¹⁰ The sample period begins with March 2005 mainly because of PMI data for India are available from that month. The objective of this article to estimate the supply chain pressure index that is relevant to India.

¹¹ Only in the case of semiconductor sector, the supply disruption is captured through detrended PHLX Semiconductor Sector Index.



From May 2021, however, with the onset of the second wave, the ISPI started moving upward, though the index remained in negative territory up to March 2022. The most recent elevation in the ISPI warrants careful monitoring in view of the renewal of supply chain pressures on geopolitical developments. This highlights the importance of the ISPI in the macroeconomic early warning system.



This is corroborated by the tracking power of the ISPI with regard to key macroeconomic variables in India either as a lead or coincident or lagged indicator. Dynamic correlations *i.e.*, considering upto 12 leads/lags show statistically strong contemporaneous correlation between the ISPI and export volume growth of emerging Asia excluding China, which is a close proxy for Indian export volumes.¹² Dynamic correlation is highest between the ISPI and one period ahead export growth, implying lead indicator properties. Similarly, the ISPI tracks wholesale price non-food manufactured products (core) inflation with a lead of 3 months. The ISPI is contemporaneously correlated with IIP growth and with PMI input and output prices (Table 1 and Chart 12). The dynamic correlation between quarterly GDP growth (y-o-y) and the ISPI is the highest at (-)0.58 for the contemporaneous period; however, the correlation is greater for the ISPI as lead than as lag indicator.

In order to formally assess how supply chain disruptions cause macroeconomic outcomes, time-

¹² DGCI&S export volume growth and CPB export volume growth for emerging Asia (excluding China) show a positive correlation of 0.73.

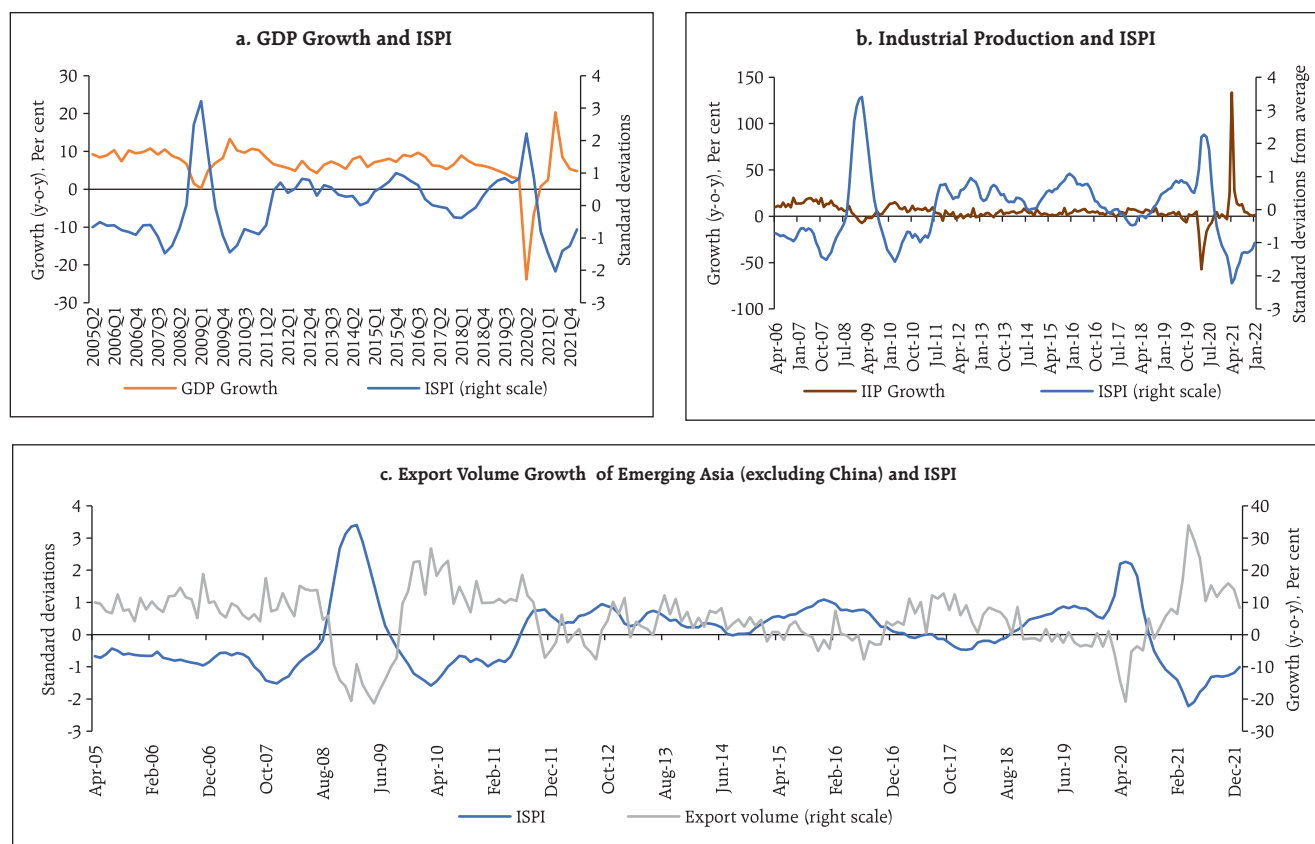
Table 1: Dynamic Correlations between ISPI and Select Macroeconomic Indicators

Lag/Lead	ISPI, Exports growth(t-i)	ISPI, Exports growth(t+i)	ISPI, IIP growth(t-i)	ISPI, IIP growth(t+i)	ISPI, WPI Core Inflation(t-i)	ISPI, WPI Core Inflation(t+i)	ISPI, Input price(t-i)	ISPI, Input price(t+i)	ISPI, Output price(t-i)	ISPI, Output price(t+i)
0	-0.80	-0.80	-0.54	-0.54	0.50	0.50	0.51	0.51	0.45	0.45
1	-0.75	-0.81	-0.51	-0.50	0.42	0.56	0.49	0.47	0.40	0.42
2	-0.65	-0.78	-0.45	-0.44	0.33	0.61	0.43	0.42	0.31	0.37
3	-0.54	-0.74	-0.37	-0.40	0.24	0.64	0.33	0.35	0.18	0.31
6	-0.19	-0.51	-0.17	-0.26	0.04	0.63	0.02	0.20	-0.13	0.20
9	0.04	-0.09	-0.01	-0.01	-0.06	0.44	0.11	0.08	-0.22	0.12
12	0.17	0.26	0.17	0.13	-0.11	0.17	0.17	-0.01	-0.25	0.08

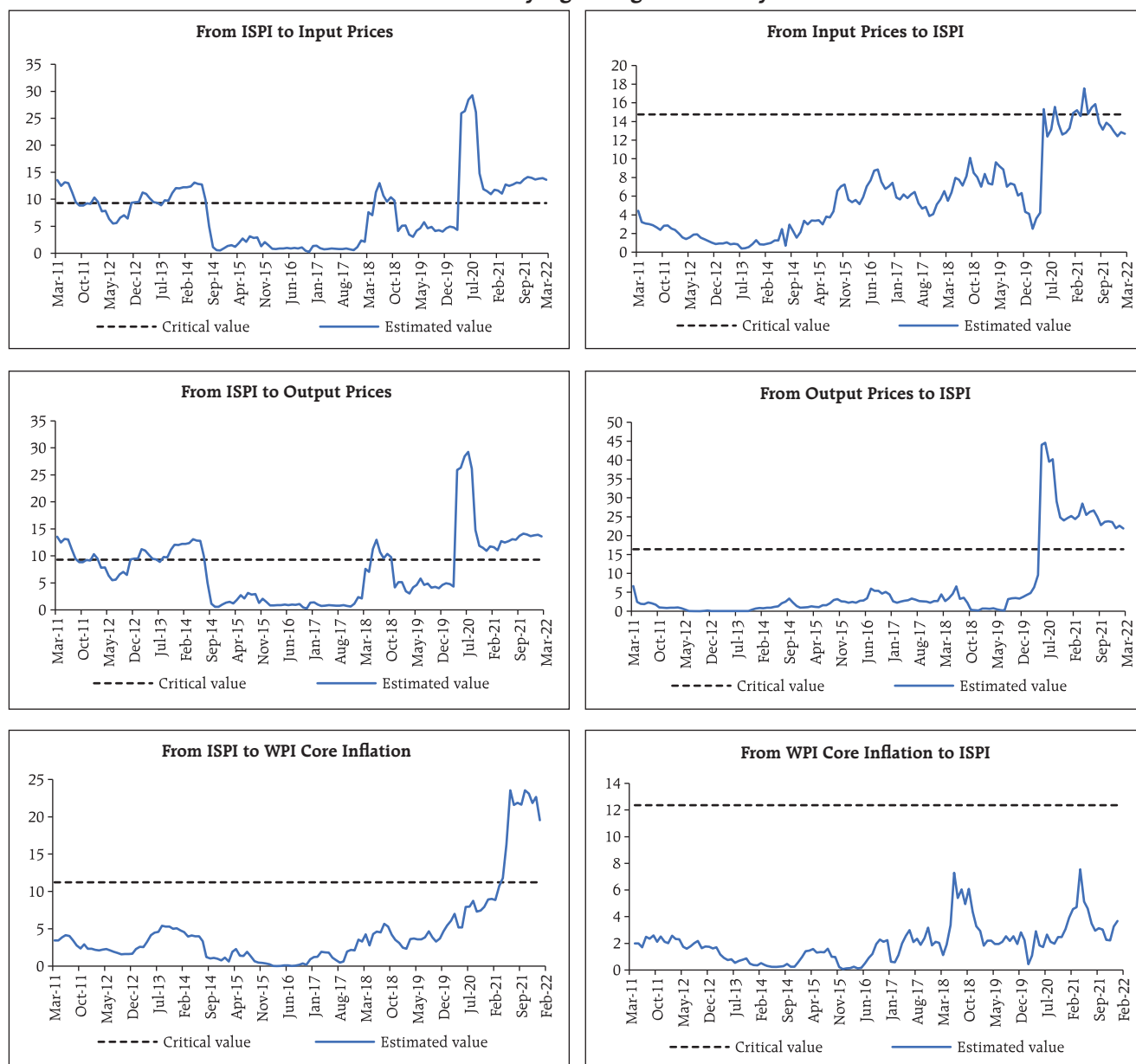
Source: Authors' calculation.

varying causality is estimated through a rolling window algorithm with a window size of 72 months that utilises subsample tests of Granger causality within a lag-augmented VAR framework (Shi *et al.*, 2020). The results provide evidence of Granger causality running from the ISPI to input

prices, to output prices and WPI core inflation since the beginning of the pandemic, with no or weak evidence of reverse causation. Causality is also found to run from the ISPI to export volume changes and to change in industrial production (Chart 13 and Chart 14).

Chart 12: Relationship between ISPI and Economic Activity

Source: Authors' calculation.

Chart 13: Time-varying Granger Causality Tests

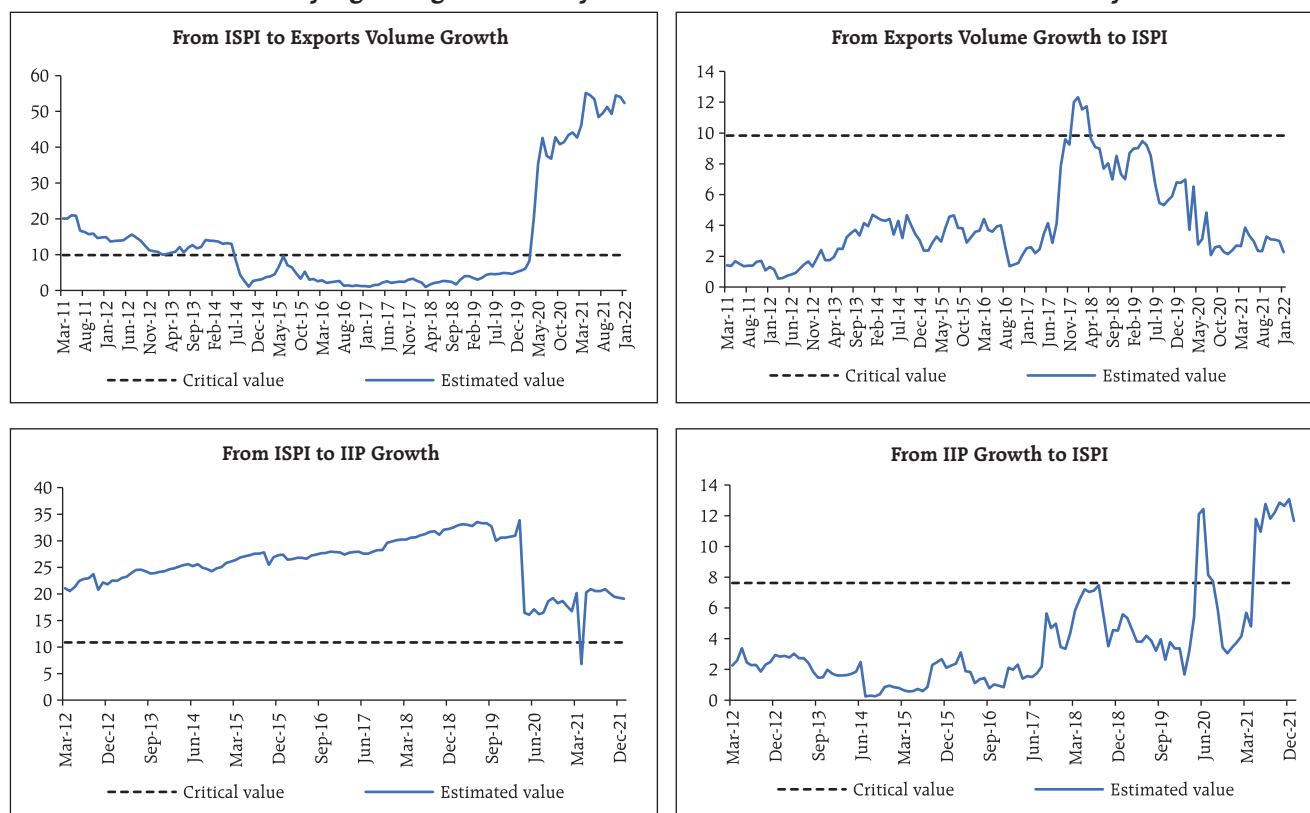
Note: The null hypothesis of no Granger causality is rejected when the estimated value is higher than the critical value where 5 per cent bootstrap critical values are obtained from 499 repetitions. Size of rolling window for the test is selected as 72.

Source: Authors' estimation.

V. Conclusion

Supply chain disruptions have forced their way into the radars of policy makers in the wake of the pandemic. It is estimated that these disruptions have lowered the growth of world trade by 2.7 per cent and world industrial production by 1.4 per cent (Attinasi *et al.*, 2021b) while contributing 1.5 per

cent of global inflation (OECD 2021). The escalation of geo-political hostilities since late February 2022 has exacerbated supply chain pressures. It is estimated that as a result, global GDP growth could reduce by over 1 percentage point in 2022 and push up global consumer price inflation by approximately 2.5 percentage points (OECD, 2022). The pandemic

Chart 14: Time-varying Granger Causality Tests between ISPI and Economic Activity Indicators

Note: The null hypothesis of no Granger causality is rejected when the estimated value is higher than the critical value where 5 per cent bootstrap critical values are obtained from 499 repetitions. Size of rolling window for the test is selected as 72.

Source: Authors' estimation.

has starkly revealed that while GVCs were designed for efficiency, cost-saving and proximity to markets, they were not calibrated to risk exposure, especially of the overwhelming type that is being experienced today¹³. It is in this context that the index of supply chain pressures for India (ISPI) that is constructed in this paper and tested for signal properties assumes a timely significance. We find that exposure to global supply chain disruptions are quickly transmitted to domestic supply chains, especially from those countries from which India sources the large part of its requirements of raw materials and

intermediates. While our ISPI contemporaneously traces industrial production, GDP and input costs, it displays lead indicator properties in respect of export volumes and inflation. This suggests that the prevailing upside risks to inflation and downward risks to export performance may persist. Looking ahead, co-ordinated actions are required to fast track consensus-based supply chain protocols, gaps in the physical and digital infrastructure, labour shortages and shortfall in investment in capacity creation.

References

Alfaro, L., Antràs, P., Chor, D. and Conconi, P. (2019). Internalizing Global Value Chains: A Firm-Level Analysis. *Journal of Political Economy*, 127 (2): 509-559.

¹³ Industries most at risk are electronics, communication equipment, computers, automobiles, apparel in which companies are expected to find a year's earnings erased.

- Antràs, P. (2020). Conceptual Aspects of Global Value Chains. *The World Bank Economic Review*, 34(3), 551-574.
- Antràs, P., and Chor, D. (2013). Organizing the Global Value Chain. *Econometrica*, 81(6), 2127-2204.
- Attinasi, M. G., De Stefani, R., Frohm, E., Gunnella, V., Koester, G., Tóth, M., and Melemenidis, A. (2021a). The Semiconductor Shortage and Its Implication for Euro Area Trade, Production and Prices. *ECB Economic Bulletin*, Issue 4, 78-82.
- Attinasi, M. G., Balatti, M., Mancini, M., & Metelli, L. (2021b). Supply Chain Disruptions and the Effects on the Global Economy. *ECB Economic Bulletin*, Issue 8, 51-57.
- Attinasi, M. G., Bobasu, A., and Gerinovic, R. (2021c). What is Driving the Recent Surge in Shipping Costs? *ECB Economic Bulletin*, Issue 3, 26-32.
- Antràs, P. and Gortari, A. D. (2020). On the Geography of Global Value Chains. *Econometrica*, 88 (4), 1553-1598.
- Bank for International Settlements (2020). *Annual Economic Report 2020*. June.
- Benigno, G., Groen, J. J., Noble, A. I., & di Giovanni, J. (2022). *A New Barometer of Global Supply Chain Pressures* (No. 20220104). Federal Reserve Bank of New York *Liberty Street Economics*, January 4.
- Doz, C., Giannone, D., and Reichlin, L. (2011). A Two-step Estimator for Large Approximate Dynamic Factor Models based on Kalman Filtering. *Journal of Econometrics*, 164(1), 180–205.
- IBEF (2021). *Ports*. November, available at: <https://www.ibef.org/download/Ports-November-2021.pdf>
- Jiang, B., Rigobon, D. E., and Rigobon, R. (2021). From Just in Time, to Just in Case, to Just in Worst-Case: Simple models of a Global Supply Chain under Uncertain Aggregate Shocks, *NBER Working Paper*, No. w29345, National Bureau of Economic Research.
- Melitz, M. J. (2003). The Impact of Trade on Intra-industry Reallocations and Aggregate Industry Productivity. *Econometrica*, 71(6), 1695-1725.
- McKinsey (2020). Risk, Resilience, and Rebalancing in Global Value Chains, McKinsey Global Institute, August 6.
- OECD (2019). Measuring Distortions in International Markets: The Semiconductor Value Chain. *OECD Trade Policy Papers*, No. 234.
- OECD (2020). The Trade Policy Implications of Global Value Chains. *Trade Policy Brief*, February.
- OECD(2021). *Economic Outlook*. December.
- OECD(2022). *Economic Outlook*. Interim Report, March.
- LaBelle, J. and Santacreu, A. M. (2022). Global Supply Chain Disruptions and Inflation During the COVID-19 Pandemic. *Federal Reserve Bank of St. Louis Review*. Forthcoming.
- Shi, S., Hurn, S., and Phillips, P. C. (2020). Causal change detection in possibly integrated systems: Revisiting the money–income relationship. *Journal of Financial Econometrics*, 18(1), 158-180.
- Stock, J. H. and Watson, M. W. (2002). Forecasting using principal Components from a Large Number of Predictors. *Journal of the American Statistical Association*, 97(460), 1167-1179.
- Wagner, S.M. and Bode, C. (2006). An Empirical Investigation into Supply Chain Vulnerability. *Journal of Purchasing & Supply Management*, 12(6), 301-312.
- Zhao, S. and You, F. (2019). Resilient Supply Chain Design and Operations with Decision-Dependent Uncertainty using a Data-driven Robust Optimization Approach. *AIChE Journal*, 65 (3), 1006-1021.

Annex Table A1: Variables used in ISPI
(Period: March 2005 March 2022)

List of Variable	Item/Sub-item	Source
Inbound Port Traffic	Unloaded, Cargo Traffic at Major Ports	Centre for Monitoring Indian Economy (CMIE)
Outbound Port Traffic	Loaded, Cargo Traffic at Major Ports	Centre for Monitoring Indian Economy (CMIE)
Rail Cargo	Railway Goods Traffic	Centre for Monitoring Indian Economy (CMIE)
Truck Freight	Truck Freight Rates from Delhi to Various Cities in India	Centre for Monitoring Indian Economy (CMIE)
Domestic Air Cargo	Cargo handled at India's Domestic Airport	Centre for Monitoring Indian Economy (CMIE)
India SDT	Suppliers' Delivery Times, India Manufacturing PMI	IHS Markit
India Stock Purchases	Stock of Purchases, India Manufacturing PMI	IHS Markit
India Backlog	Backlogs of Work, India Manufacturing PMI	IHS Markit
China SDT	Suppliers' Delivery Times, China Manufacturing PMI	IHS Markit
China Backlog	Backlogs of Work, China Manufacturing PMI	IHS Markit
Manufacturing SDT	Suppliers' Delivery Time, Global Manufacturing PMI	IHS Markit
Electronics SDT	Suppliers' Delivery Time, Global Electronics PMI	IHS Markit
US Backlog	Backlogs of Orders, US Manufacturing PMI	Institute for Supply Management (ISM)
US SDT	Suppliers' Delivery, US Manufacturing PMI	Institute for Supply Management (ISM)
Harpex	Harpex Index	Refinitiv
Baltic Dry Index	Baltic Dry Index	Refinitiv
Semiconductor	PHLX Semiconductor Sector Index	Refinitiv
Asia to US Air Freight	Inbound Price Index (International Services): Air Freight for Asia	U.S. Bureau of Labor Statistics
US to Asia Air Freight	Outbound Price Index (International Services): Air Freight for Asia	U.S. Bureau of Labor Statistics

Note: Truck freight rate used in the article is a distance-based weighted average of city level freights. New Orders data used in the regression are from respective country/sector PMI.

*Monetary Transmission to Banks' Interest Rates: Implications of External Benchmark Regime**

The transmission to banks' lending and deposit rates has improved notably since October 2019, facilitated by the introduction of external benchmark linked lending rate (EBLR) system, accommodative monetary policy stance, large surplus liquidity and subdued credit demand. The weighted average lending rates (WALRs) on fresh as well as outstanding rupee loans have declined across sectors. Banks have extended the benefits to existing borrowers by reducing the WALR more than the repo rate cuts during the EBLR period. Empirical estimation based on autoregressive distributed lag framework establishes improvement in the pace and extent of monetary transmission to lending and deposit rates in the EBLR regime. The pace of transmission is expected to improve going forward as the proportion of external benchmark linked loans increases further.

Introduction

The adoption of flexible inflation targeting (FIT) framework following the amendment to the RBI Act in 2016 has made price stability the primary objective of monetary policy, while keeping in mind the objective of growth. The introduction of FIT has increased the importance of interest rate channel of monetary transmission – the process through which changes in the central bank's policy rate gets transmitted to the real economy. There are two components in this mechanism (Rangarajan, 2020). The propagation of monetary policy impulse from the central bank to the banking system is termed as the inside leg. The process

begins with anchoring overnight inter-bank money market rates at or around the policy rate set by the central bank through its active liquidity management operations. The impulses of short-term rates are then transmitted to the longer end of the curve including government securities yield, corporate bonds yield and credit market rates. A smooth transmission of monetary policy impulses to the long-term interest rates is essential to influence aggregate demand conditions that determine the desired combination of output and price level at which an economy operates within its supply constraints. This process is categorised as the outside leg of transmission mechanism.

Monetary policy transmission is characterised by long and variable lags. Hence, the efficacy of monetary policy depends on the pace at which policy rate changes are transmitted to the real economy in pursuit of the ultimate objectives of monetary policy, viz., price stability and growth. The pace of transmission in the inner leg is usually fast in advanced economies (Rangarajan, 2020). In contrast, transmission is generally sluggish in developing economies on account of underdeveloped financial markets (Mishra *et al*, 2012). In case of India, transmission has been smooth at the short end of the maturity spectrum of interest rates, while the pass-through to bank lending and deposit rates had till recently been relatively sluggish. Around 50 per cent of the pass-through from a change in the repo rate to deposit rate occurs in 12 months and a longer time of 17 months in case of transmission to lending rates (Das, 2015). Apart from differential lags, there is evidence of asymmetry in pass-through from policy repo rate changes to banks' lending and deposit rates (Singh, 2011).

Until October 2019, banks used benchmarks, which were internal and, hence, varied across banks; it also made the entire process of setting lending rates by banks opaque and hindered the

* This article has been prepared by Avnish Kumar, Anand Prakash and Shubhangi Latey of Monetary Policy Department. The authors are thankful to Muneesh Kapur, Adviser for his guidance and encouragement. Data support provided by Rushikesh S. Dingare is acknowledged. The views expressed in the article are those of the authors and do not represent the views of the Reserve Bank of India.

monetary transmission (RBI, 2017). In case of internal benchmark-based pricing of loans, transmission from the policy rate to bank lending rates is indirect since lending rates are determined on a cost-plus basis. If the response of banks' cost of funds to policy rate variations is lagged and incomplete, this creates a wedge in the pricing of bank credit and, thus, delays transmission. In recognition of this asymmetry, the Reserve Bank mandated the introduction of an external benchmark system of lending rates for select sectors in October 2019.¹ Under this system, any change in the benchmark rate is mandated to be passed on to the lending rates for new and existing borrowers on a one-to-one basis and banks are restricted from adjusting their spreads for existing borrowers for a period of three years in the absence of any significant credit event.

In this background, this article reviews monetary policy transmission in the deposit as well as credit segments of the financial market under different lending rate systems, with focus on external benchmark linked lending rate (EBLR) regime. The article is structured in the following manner. Section II assesses the transmission of policy rate changes to banks' interest rates at aggregate as well as disaggregated level in current easing cycle juxtaposed with monetary transmission in the EBLR regime. Section III presents an empirical estimation of the extent and speed of adjustment in lending and deposit rates. Finally, Section IV concludes with key takeaways.

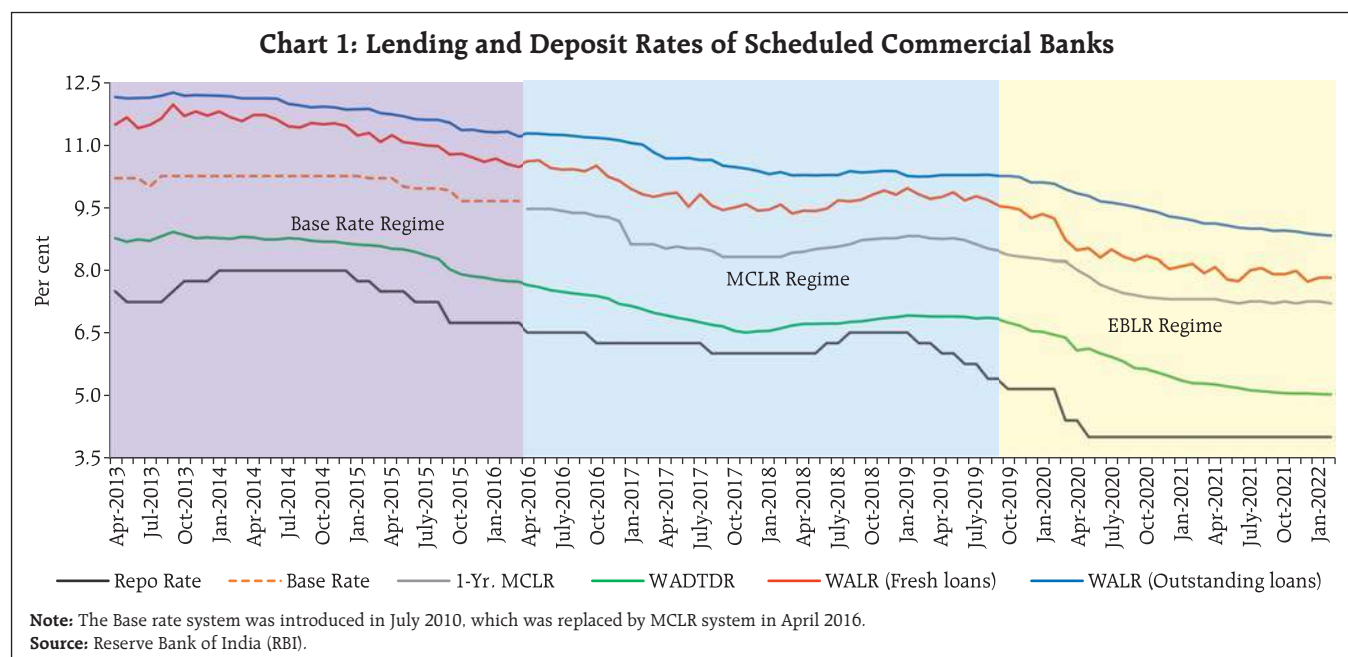
II. Transmission to Lending and Deposit Rates of Banks

In a bank dominated system like India, the transmission of monetary policy signals to banks' deposit and lending rates is the key to successful implementation of monetary policy. With the objective of improving the magnitude and pace of monetary transmission to actual lending rates of banks and imparting transparency to the lending rates setting process, the Reserve Bank has periodically refined the process of setting interest rates by banks through the introduction of the prime lending rate (PLR) system in 1994, the benchmark prime lending rate (BPLR) system in 2003, the base rate system in 2010 and the marginal cost of funds-based lending rate (MCLR) system in 2016.² While the transmission improved partially due to these measures, it continued to be sluggish, as all these systems relied on banks' own cost of funds, *i.e.*, internal benchmarks, and exhibited weak co-movement with the policy rate (Chart 1). Additionally, internal benchmark-based systems suffered from opacity, especially regarding the interest rate resetting practices for existing borrowers.

The transmission to banks' interest rates, however, has improved with the introduction of external benchmark-based pricing of loans in October 2019. The transmission has exhibited further improvement since March 2020 on account of sizeable policy rate cuts and persisting surplus liquidity conditions resulting from various system level as well as targeted measures introduced by the Reserve Bank in the aftermath of COVID-19 pandemic (Kumar and Sachdeva, 2021).

¹ The Reserve Bank mandated that all scheduled commercial banks (excluding regional rural banks) should link all new floating rate personal or retail loans and floating rate loans to micro and small enterprises (MSEs) to an external benchmark, *viz.*, the policy repo rate or 3-month T-bill rate or 6-month T-bill rate or any other benchmark market interest rate published by Financial Benchmarks India Private Ltd. (FBIL) effective October 1, 2019. The directive was extended to medium enterprises effective April 1, 2020.

² RBI (2017) gives a detailed discussion on the evolution of lending rate system in India and discusses the weaknesses and rigidities observed in monetary transmission to banks' interest rates under different lending rate regimes.



Transmission at aggregate bank level

In the credit segment of financial markets, transmission to lending and deposit rates improved in the current easing cycle and more so after the introduction of EBLR system (Table 1).

The increase in the share of loans linked to external benchmark in total outstanding floating rate loans has facilitated transmission to weighted

average lending rate (WALR) on outstanding rupee loans (Table 2). In addition, the sustained decline in MCLR and the periodic resetting of such loans at lower rates have also helped the existing borrowers, as banks have extended the benefits to them by reducing WALR on outstanding rupee loans more than the policy repo rate cuts during the EBLR period. Forward guidance on accommodative stance of monetary policy coupled with surplus liquidity in

Table 1: 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)
Feb 2019 – Mar 2022* (Current Easing cycle)	-250	-208	-189	-155	-143	-213
Memo						
Feb 2019 - Sep 2019 (Pre-External Benchmark)	-110	-9	-8	-30	0	-43
Oct 2019 – Mar 2022* (External Benchmark Period)	-140	-180	-181	-128	-143	-170
Mar 2020 - Mar 2022* (COVID Period)	-115	-150	-143	-95	-124	-140
Apr 2021 – Mar 2022* (Financial Year: 2021-22)	0	0	-26	-5	-29	-10

Note: Latest data on WALRs and WADTDR pertain to February 2022.

WALR: Weighted average lending rate; WADTDR: Weighted average domestic term deposit rate;

MCLR: Marginal cost of funds-based lending rate; TDR: Term deposit rate.

Sources: RBI; and Authors' calculations.

Table 2: Share of Floating Rate Linked Outstanding Rupee Loans of SCBs: Interest Rate Benchmarks

(Per cent to total)

Bank Group	Base Rate				MCLR				External Benchmark			
	Sep-19	Mar-20	Mar-21	Dec-21	Sep-19	Mar-20	Mar-21	Dec-21	Sep-19	Mar-20	Mar-21	Dec-21
Public sector banks (11)	14.6	11.9	7.8	6.6	83.1	79.5	68.7	61.4	0.4	4.8	20.3	28.3
Private sector banks (21)	8.3	6.8	3.9	3.0	86.7	75.5	53.0	39.9	4.6	17.5	43.0	57.0
Foreign banks (42)	6.8	5.2	2.7	1.7	67.3	56.7	30.7	24.8	25.7	37.9	66.6	73.3
SCBs (74)	12.5	10.2	6.4	5.3	83.8	77.7	62.8	53.1	2.4	9.3	28.6	39.2

Notes: (i) Figures in parentheses refer to the number of banks.

(ii) Figures in table do not add up to hundred because residual loans are linked to BPLR.

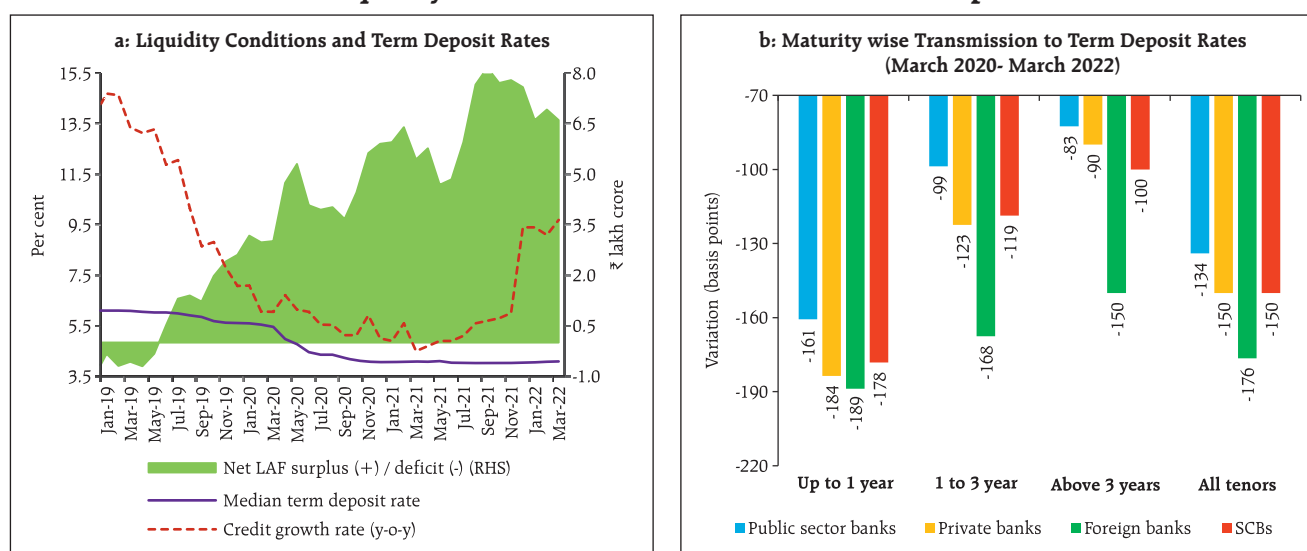
Sources: Information collected from banks; and Authors' calculations.

the system have facilitated transmission to lending rates in FY 2021-22.

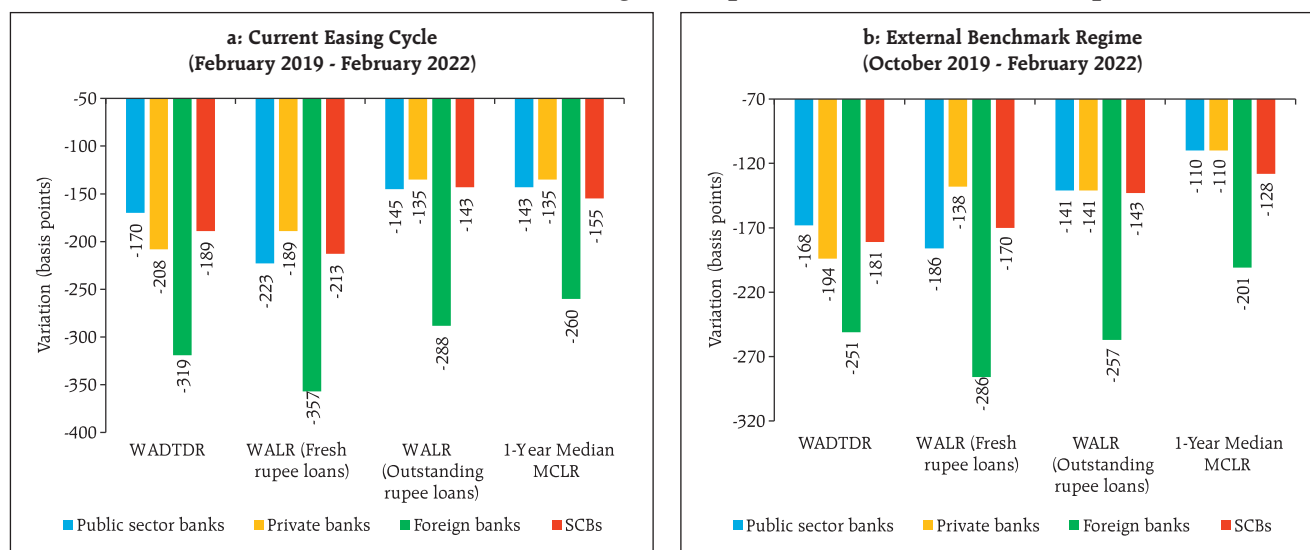
Apart from the adoption of external benchmark-based pricing of loans, surplus liquidity conditions amidst muted credit demand have facilitated downward adjustment in deposit rates (Chart 2a). The median term deposit rate (MTDR) - average card rates on fresh term deposits – moderated considerably during the period October 2019 and March 2022, with the maximum pass-through witnessed in case of shorter tenor deposits of up to one year maturity.

Across domestic banks, private banks exhibit a higher pass-through to term deposit rates compared to their state-owned peers (Chart 2b). However, with uptick in credit demand and moderation in deposit growth in the recent months, banks have started pricing in their deposits at higher rates to mobilise stable funding. As a result, the weighted average domestic term deposit rate (WADTDR) on fresh deposits has increased by 24 basis points (bps) since October 2021.³

The pass-through of policy rate changes to interest rates on term deposits appears larger as

Chart 2: Liquidity Conditions and Transmission to Term Deposit Rates**Sources:** RBI; and Author's calculations.

³ The credit growth (y-o-y) increased from 5.6 per cent in August 2021 to 9.7 per cent in March 2022. The deposit growth moderated from 9.5 per cent to 8.9 per cent during the same period.

Chart 3: Transmission to Lending and Deposit Rates across Bank Groups


Sources: RBI; and Authors' calculations.

compared to lending rates. However, this does not present the complete picture, and banks' deposit liabilities in the form of current account and savings account (CASA) deposits also need to be taken into account. Term deposits constituted only 56.2 per cent of aggregate deposits of banks in March 2022, while current account and savings account deposits constituted 9.8 per cent and 33.8 per cent, respectively. Current account balances do not earn any interest and, hence, are largely impervious to policy rate changes. Transmission to savings account rate is typically more subdued and modest, relative to term deposits. The median savings deposit rate of domestic banks declined by 60 bps from 3.5 per cent in January 2019 to 2.9 per cent in March 2022.

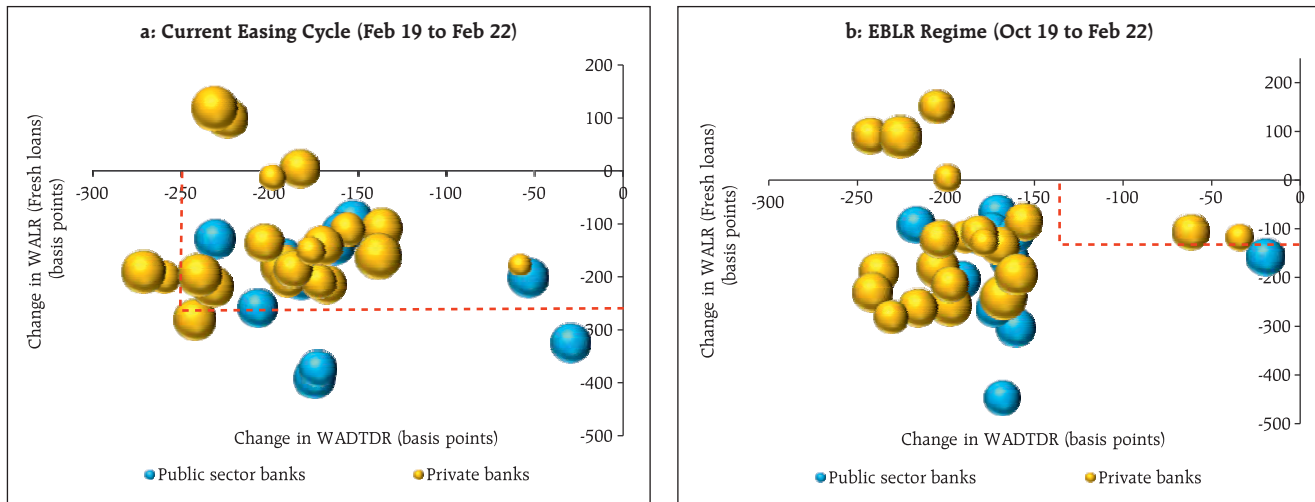
Transmission across bank groups

At the bank group level, the pass-through to lending and deposit rates has been uneven reflecting idiosyncratic factors. Foreign banks exhibited maximum transmission to lending and deposit rates in the current easing cycle (Chart 3a). Across domestic banks, the decline in the WALRs (fresh and

outstanding rupee loans) was higher in the case of public sector banks (PSBs) relative to private banks (PvBs), contrary to the trends seen in their deposit rates. Historically, WALR and WADTDR of private banks have been higher than those offered by PSBs. In the current easing cycle, private banks exhibited a higher pass-through to term deposit rates, resulting in a greater alignment in the levels of deposit rates across domestic banks. The degree of pass-through across bank groups improved after the introduction of EBLR regime in October 2019 (Chart 3b).

Transmission across banks

At a disaggregated level, most domestic banks (PSBs and PvBs) witnessed decline in WALRs on fresh rupee loans and WADTDR on outstanding deposits during the current easing cycle (Chart 4a). The transmission has improved notably at bank level since October 2019, facilitated by the introduction of EBLR regime, accommodative monetary policy stance, large surplus liquidity condition, and subdued credit demand (Chart 4b).

Chart 4: Transmission to Lending and Deposit Rates at Bank Level**Notes:**

- a. Size of bubble shows reduction in 1-year MCLR.
 b. Dotted red lines in **Chart a** represent repo rate reduction of 250 bps in the current easing cycle.
 c. Dotted red lines in **Chart b** represent repo rate reduction of 140 bps in the EBLR regime.

Sources: RBI; and Authors' calculations.

Transmission across sectors

In the wake of introduction of external benchmark regime for select sectors in October 2019, personal loans and MSMEs loans segments have witnessed significant increase in share of outstanding loans linked to external benchmark. Banks are voluntarily pricing their loans linked to external benchmark in other sectors as well (Table 3).

The WALRs on personal loans and loans to MSMEs have declined significantly during the period October

2019-February 2022. The decline was sharpest in the case of other personal loans (222 bps) followed by vehicle loans (208 bps) and loans to MSMEs at 194 bps (Chart 5).

Since March 2020, most sectors have witnessed decline in WALRs on fresh rupee loans. The decline is significant in case of commercial real estate followed by other personal loans and loans to large industry. The WALRs on outstanding rupee loans have declined across all sectors during the same period (Annexure Table A1).

Table 3: Sector-wise Share of Outstanding Floating Rate Loans across Interest Rates Benchmarks

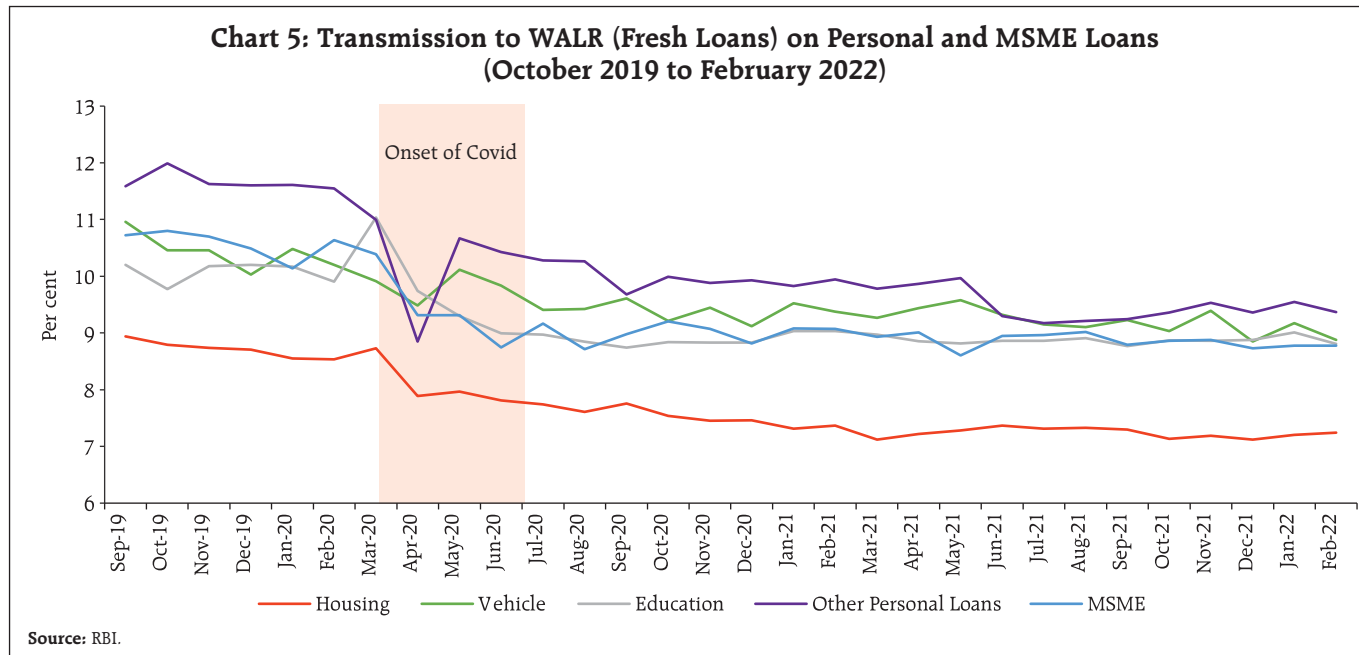
(Per cent to total)

Sectors	Sep-19			Mar-21			Dec-21		
	Base rate	MCLR	External benchmark	Base rate	MCLR	External benchmark	Base rate	MCLR	External benchmark
Industry (Large)	10.6	85.3	3.2	7.1	79.2	12.7	5.9	70.9	20.4
Trade	5.3	92.4	2.1	3.1	55.6	40.7	2.9	46.2	49.4
MSMEs	11.5	85.5	1.8	5.5	34.8	58.6	4.0	24.2	69.2
Personal Loans	15.4	82.0	1.6	6.1	57.2	35.2	4.3	45.1	46.2
Housing	17.4	79.5	2.1	7.2	42.0	49.1	5.5	33.1	58.2
Vehicle	8.7	90.3	0.6	2.6	73.6	23.5	1.3	60.0	31.1
Education	43.4	51.8	0.3	25.1	53.2	18.8	23.4	49.2	23.0
Other Personal Loans	6.9	92.5	0.3	1.9	78.4	19.0	1.2	60.7	31.5

Notes: (i) The data are collected from 74 SCBs.

(ii) Figures in table do not add up to hundred because residual loans are linked to BPLR.

Sources: Information collected from banks; and Authors' calculations.



In respect of fresh rupee loans linked to the policy repo rate, the spread (WALR – fresh rupee loans over the repo rate) charged by domestic banks across sectors reflected credit risk profiles and business strategies. In personal loans segment, the median spread charged by domestic banks is the lowest in respect of housing loans, reflecting lower defaults and the availability of collaterals. 'Other personal loans' *i.e.*, loans other than housing, vehicle and educational loans - are mostly unsecured and involve higher credit risk; hence, the spread charged is the highest for this category. The spread charged on fresh loans extended in retail segments (except education) and MSMEs remained range bound during October 2019 to February 2022 (Chart 6a). Among the bank groups, the median spreads charged by PSBs for personal loans and loans to MSME segment were lower than those of PvBs as at end February 2022. Across domestic banks, there is more variability in spreads charged by private banks as compared to PSBs, possibly reflecting more diverse lending operations across sectors by private banks (Chart 6b).

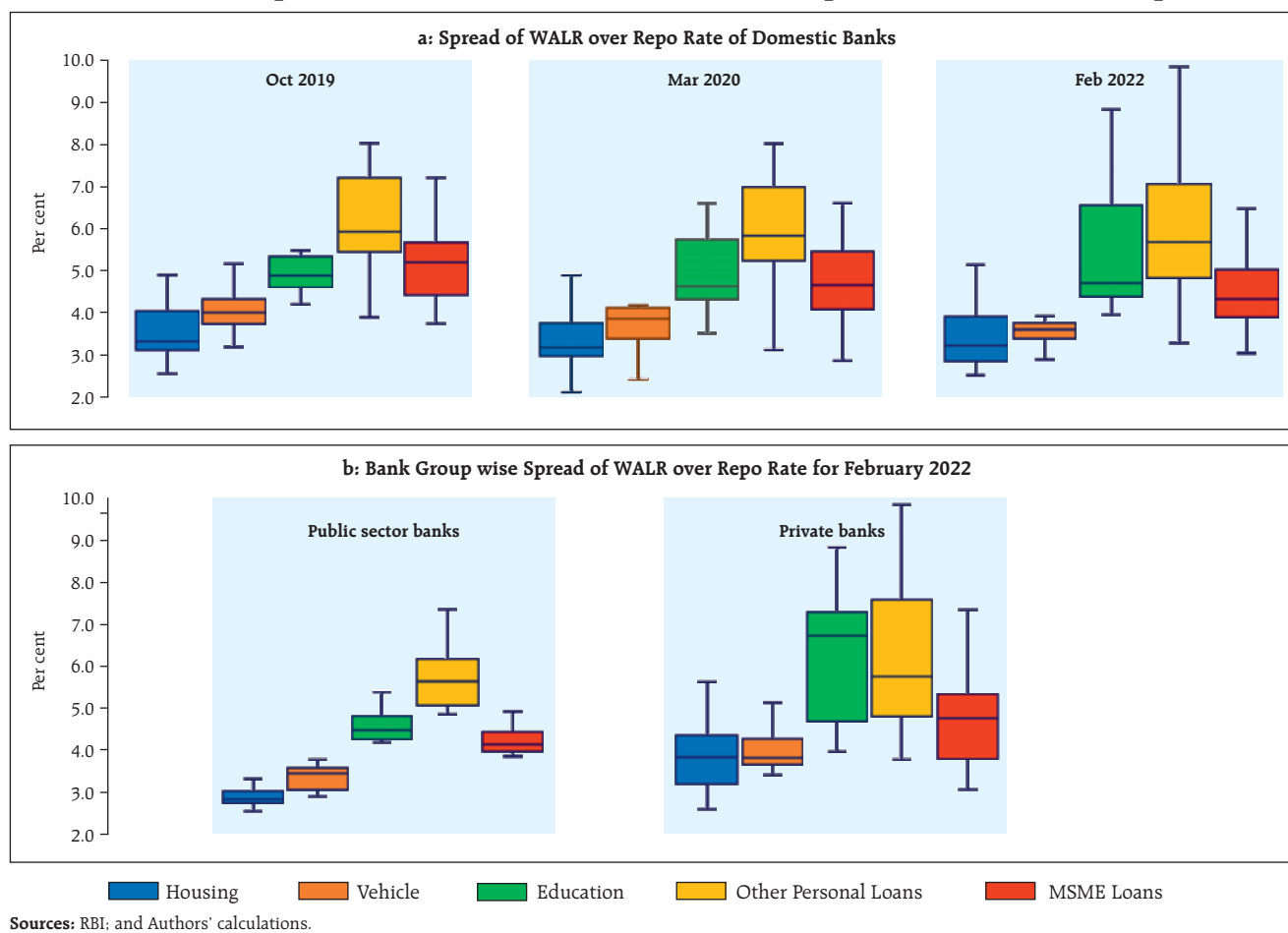
III. Empirical Analysis

In this section, an attempt has been made to empirically estimate the degree and speed of pass-through of policy rate changes to lending and deposit rates of SCBs in a cointegration/error correction framework using autoregressive distributed lag (ARDL) modelling approach.

$$Y_t = \alpha + \beta X_t + u_t \quad \dots A$$

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \alpha_i \Delta Y_{t-i} + \sum_{i=1}^p \delta_i \Delta X_{t-i} + \varphi ECT_{t-1} + \omega_t \quad \dots B$$

Y_t denotes dependent variable and X_t are set of explanatory variables. ECT is error correction term and measures speed of adjustment of the dependent variable in the event of a deviation in the long-term relationship between the dependent and the explanatory variables. u_t and w_t are residual terms. **Equation A** captures long-run relationship between the dependent and explanatory variables and **Equation B** captures short-run dynamics and is estimated by including the ECT extracted from equation A.

Chart 6: Fresh Rupee Loans Linked to External Benchmark – Spread of WALR over the Repo Rate

Data and Methodology

Drawing from Pesaran *et al.* (2001), an ARDL model is employed for the empirical estimation based on monthly data for the period January 2013 to October 2021.⁴ The choice of this model is based on two considerations: first, it has good small sample properties as compared to alternative econometric techniques (Narayan, 2005). Secondly, in ARDL framework, estimates of the long-run coefficients are unbiased and consistent; irrespective of the regressors being non-stationary at level and first difference form⁵ (Harris and Solis, 2003).

⁴ The analysis of median term deposit rate is for the period January 2014 to November 2021.

⁵ All variables (*viz* dependent and explanatory variables) used in empirical estimation are integrated of order 1.

The empirical analysis is undertaken for both lending and deposit rates and, in turn, for interest rates on fresh as well as outstanding loans and deposits – thus, four separate equations are estimated. Furthermore, given the structural differences across banks, the empirical analysis for all SCBs is complemented by separate analysis for PSBs and PvBs. The first two equations, *i.e.*, equations (1) and (2) in Table 4 analyse WALR on fresh rupee loans (*WALR_F*) and WALR on outstanding rupee loans (*WALR_O*) respectively; repo rate (*REPO*) and credit to deposit ratio (*CD Ratio*) are included as dynamic explanatory variables in both the equations. CD ratio is a measure of banking system's lending capacity given its deposit funding. A high CD ratio, *ceteris paribus*, could allow banks pricing power to raise their lending rates, while a moderation in their

CD ratio, reflecting subdued credit demand conditions could be expected to put downward pressure on their lending rates. $WALR_F$ and $WALR_O$ of banks are expected to be positively associated with $REPO$ and $CD\ Ratio$. Equations (3) and (4) estimate the impact of policy rate changes on deposit rates. The weighted average domestic term deposit rates on outstanding deposits ($WADTDR_O$) and median term deposit rate on fresh deposits ($MTDR_F$) are used as dependent variables in the two sets of equations; repo rate ($REPO$) and liquidity captured by LAF adjusted for NDTL ($LQDY$) are used as dynamic explanatory variables. An increase in systemic liquidity in the banking system is expected to have a softening impact on the deposit rates. Scatter plots based on panel of banks suggest a correlation on the expected lines between the dependent and explanatory variables for both public and private sector bank groups (Annex Chart A1 and A2).

Given the short period for which the external benchmark system has been in place, its impact on transmission is examined in the short run error correction equations by incorporating interaction term $(\Delta REPO_t * Dum_{EBLR})$, where Dum_{EBLR} is time dummy for the external benchmark period, *i.e.*, October 2019 to October 2021. Time dummies for demonetisation (Dum_{DEMO}) and taper tantrum (Dum_{TAPR}) for the periods November 2016 to March 2017 and July 2013 to September 2013, respectively, are also incorporated in short-run estimation.

Estimation

Table 4 reports the summary of results of econometric analysis in the study with lending and deposit rates as dependent variables for the full sample of banks at aggregate level, *i.e.*, for SCBs. Estimates for public and private sector bank groups are also reported.⁶

⁶ Summary results in Table 4 are based on Annexure Tables A2 to A7.

Table 4: Pass-through of Repo Rate changes to Lending and Deposit Rates - Long-run Estimates and Short-run Adjustments in ARDL Framework

	Dependent Variable	Explanatory Variables	PSBs	PvBs	SCBs
Equation 1	$WALR_F$	REPO	0.78***	0.87***	0.90***
		CD Ratio	0.13**	-0.01	0.12*
		ECT(-1)	-0.14***	-0.16***	-0.14***
		$(\Delta REPO_t) * (Dum_{EBLR})$	0.20***	0.37	0.43**
		Adjusted R^2	0.28	0.25	0.44
Equation 2	$WALR_O$	REPO	0.51	0.78***	0.72***
		CD Ratio	0.34	0.03	0.24*
		ECT(-1)	-0.01***	-0.06***	-0.05***
		$(\Delta REPO_t) * (Dum_{EBLR})$	0.07***#	-0.17	0.08*#
		Adjusted R^2	0.47	0.14	0.43
Equation 3	$MTDR_F$	REPO	0.69***	0.64***	0.79***
		LQDY	-0.16**	-0.13***	-0.12**
		ECT(-1)	-0.10***	-0.15***	-0.16***
		$(\Delta REPO_t) * (Dum_{EBLR})$	0.15*	0.13*	0.27***
		Adjusted R^2	0.48	0.45	0.32
Equation 4	$WADTDR_O$	REPO	0.69***	0.62***	0.69***
		LQDY	-0.24**	-0.26**	-0.24**
		ECT(-1)	-0.05***	-0.07***	-0.06***
		$(\Delta REPO_t) * (Dum_{EBLR})$	0.09***@	0.07***\$	0.08***@
		Adjusted R^2	0.35	0.33	0.40

Notes:

1. ECT and interaction dummy are estimated in error correction framework.
2. '***', '**' and '*' denote significance at 1%, 5% and 10% respectively.
3. '#', '\$' and '@' denote impact of repo rate on dependent variables with a lag of 2, 3 and 4 months, respectively in EBLR period.

Source: Authors' calculations.

The empirical analysis indicates that the long-run elasticity of $WALR_F$ of SCBs with respect to repo rate is 0.90, which means that, over time, 90 per cent of change in the repo rate gets passed on to fresh lending rates. In case of $WALR_O$ of SCBs, around 72 per cent of change in repo rate gets transmitted to outstanding lending rates over time. The $CD\ Ratio$, as expected, has positive and significant impact on the lending rates on fresh as well as outstanding loans. Across bank groups, the long-run transmission to $WALR_F$ for private banks at 87 per cent per cent was somewhat higher than that of 78 per cent for PSBs over the sample period. In the case of outstanding loans, 78 per cent of a change in repo rate gets transmitted to

lending rate over time for private banks; for PSBs, the coefficient is positive but insignificant.⁷

In the short run dynamics, the coefficient of interaction term ($\Delta REPO_t * Dum_{EBLR}$) is positive and significant for SCBs, suggesting improved transmission to lending rates during the external benchmark period. While the impact is instantaneous in case of fresh rupee loans, the impact is seen with a lag of two months in respect of outstanding rupee loans, as a majority of outstanding floating rate loans are not yet linked to the external benchmark. As may be seen from Table 2, the share of loans linked to MCLR for PSBs and SCBs in December 2021 exceeded that of loans linked to EBLR. The transmission of repo rate cuts to base rate and MCLR linked loans is muted and lagged.

The error correction term is negative and significant for Equation (1) and Equation (2), as reported in Table 4. The coefficient of (-)0.14 indicates that the $WALR_F$ of SCBs adjusts by 14 per cent per month towards long-run equilibrium. At this rate, it would take 5 months to achieve 50 per cent of the pass-through to $WALR_F$ from a change in the repo rate for all SCBs taken together as well as for PSBs; the adjustment is relatively quicker for PvBs at 3 months. The speed of adjustment in case of $WALR_O$ is slower, as expected, in view of factors, such as, the continued dominance of MCLR linked loans with annual reset periods. The speed of adjustment can be expected to improve going forward as the proportion of external benchmark linked loans increases further along with quicker reset periods (3 months relative to 1 year now). This is borne out by the statistical significance of the interaction between the changes in the repo rate and

the dummy representing the external benchmark period ($\Delta REPO_t * Dum_{EBLR}$).

Turning to deposits, estimates show that 79 per cent of a change in the repo rate gets passed on to the deposit rate on fresh deposits of SCBs over time, while in case of outstanding deposits, the transmission is lower at 69 per cent. The long-run pass-through to both fresh and outstanding deposits is higher for PSBs *vis-à-vis* private banks. Liquidity has a soothing impact on deposit rates on outstanding as well as fresh deposits of SCBs as well as deposit rates of the two bank groups.

The coefficient of the interaction term ($\Delta REPO_t * Dum_{EBLR}$) is positive and significant for all bank groups, implying improved transmission to deposit rates during the external benchmark period. Moreover, as noted earlier, weak credit demand during the Covid-19 pandemic period amidst sustained deposit growth prompted banks to lower their deposit rates. The impact of repo rate changes on deposit rates is instantaneous in case of fresh deposits for all bank groups, while it takes around 3-4 months in case of rates on outstanding deposits.

The adjustment coefficient term is negative and significant for deposit rates of all bank groups, as presented in Equation (3) and Equation (4) of Table 4. For SCBs and PvBs, it would take around 4 months to achieve 50 per cent of the pass-through to fresh deposits; for PSBs, the same magnitude of pass-through is achieved in 10 months. The introduction of EBLR regime has enabled quicker adjustments in deposit rates, as alluded to earlier. Banks adjust their term deposit rates faster, as lending rates undergo frequent adjustments in line with the benchmark rates, to protect their profitability and net interest margins (NIMs). The speed of adjustment in $WADTDR_O$ - almost one year to achieve 50 per cent of the pass-through - is expectedly slower, mainly due to relatively longer maturity profile of term deposits contracted at fixed rates.

⁷ During most part of the sample period (*i.e.*, 2013 to 2021), PSBs were saddled with large NPAs. Concomitantly, the credit growth of PSBs was low; hence, the legacy of old loans in total outstanding portfolio was large. Also, banks have passed on the repo rate cuts to new borrowers at the expense of existing borrowers (RBI, 2017). All these factors seem to have contributed to the insignificant coefficient.

IV. Conclusion

The Reserve Bank's endeavour to improve monetary transmission to banks' lending rates have gained traction with the advent of EBLR regime in October 2019. The earlier internal benchmark-based lending rate regimes suffered from a multitude of issues, such as, arbitrariness in calculation of the base rate/MCLR and spreads; long reset clauses, which inhibited efficient monetary transmission. The framework for pricing of loans under an external benchmark system improved the extent and pace of adjustment in lending and deposit rates in response to changes in policy repo rate. The EBLR system has also accelerated the pass-through to MCLR-linked loans, as changes in the benchmark rates lead banks to proactively adjust their deposit rates to protect their NIMs, thereby improving transmission to overall lending and deposit rates. Thus, the impact of the introduction of external benchmark-based pricing of loans on monetary transmission has been felt across various sectors, encompassing even those sectors that are not directly linked to external benchmark-based loan pricing and this has been corroborated by empirical analysis undertaken in this paper.

The pace and extent of monetary transmission to lending and deposit rates have improved in the EBLR regime, facilitated by accommodative monetary policy stance, large surplus liquidity conditions and subdued credit offtake due to the Covid-19 pandemic. Looking ahead, the proportion of loans linked to external benchmarks is expected to increase further along with a commensurate fall in the internal benchmark linked

loans. Coupled with shorter reset periods, monetary transmission can, thus, be expected to strengthen further in case of both deposits and loans.

References

- Das, S. (2015), "Monetary Policy in India: Transmission to Bank Interest Rates", *Working Paper No. WP/15/129*, International Monetary Fund.
- Harris, R., and Solis, R. (2003), *Applied Time Series Modelling and Forecasting*, Wiley, West Sussex.
- Kumar, A. and P. Sachdeva (2021), "Monetary Policy Transmission in India: Recent Developments", *RBI Bulletin, July 2021, Volume LXXV Number 7*.
- Mishra, P., P. Montiel, and A. Spilimbergo (2012), "Monetary Transmission in Low-Income Countries: Effectiveness and Policy Implications," *IMF Economic Review, Vol. 60*, pp. 270-302.
- Narayan, P.K. (2005), "The Saving and Investment Nexus for China: Evidence from Cointegration Tests", *Applied Economics* 37, pp. 1979–1990.
- Pesaran, H.M., Shin, Y., Smith, J.R. (2001), "Bounds Testing Approaches to the Analysis of Relationships", *Journal of Applied Econometrics* 16, 289-326.
- Rangarajan, C. (2020), "The New Monetary Policy Framework – What it Means", *NIPFP Working Paper Series No. 297*.
- Reserve Bank of India (2017), "Report of the Internal Study Group to Review the Working of the Marginal Cost of Funds-based Lending Rate System".
- Singh, B. (2011), "How Asymmetric is Monetary Policy Transmission to Financial Markets in India", *RBI Occasional Paper Volume 32, No. 2*.

Annexure

Table A1: Sector-wise Transmission to Lending Rates of Domestic Banks

	Rates (Per cent)			Transmission (Basis points)
	Dec-21	Jan-22	Feb-22	Mar 2020 to Feb 2022*
Policy Repo Rate	4.00	4.00	4.00	-115
WALR (Fresh rupee loans)				
Agriculture	8.79	8.75	9.29	-64
Large Industry	6.87	7.00	6.83	-187
MSME Loans	8.73	8.78	8.78	-186
Infrastructure	7.50	6.91	7.05	-174
Trade	7.88	7.69	7.69	-5
Professional Services	7.93	8.75	8.27	-62
Housing	7.12	7.20	7.24	-129
Vehicle	8.85	9.17	8.88	-132
Education	8.88	9.01	8.81	-110
Other Personal Loans	9.36	9.55	9.37	-218
Commercial Real Estate	7.13	7.37	7.14	-283
WALR (Outstanding rupee loans)				
Agriculture	9.44	9.42	9.40	-69
Large Industry	8.14	8.12	8.08	-122
MSME Loans	9.37	9.35	9.31	-124
Infrastructure	8.54	8.40	8.36	-137
Trade	8.31	8.24	8.27	-70
Professional Services	8.39	8.14	8.27	-176
Housing	7.53	7.49	7.49	-110
Vehicle	9.24	9.17	9.10	-91
Education	9.31	9.30	9.32	-121
Other Personal Loans	10.52	10.51	10.39	-165

*: Transmission to WALRs on outstanding rupee loans is for the period April 2020 to February 2022.

Source: RBI.

Table A2: Transmission to WALR of SCBs

Long-run Equations			
(ARDL 2,1,3)		(ARDL 1,2,4)	
	WALR_F		WALR_O
REPO	0.90 (0.00)	REPO	0.72 (0.00)
CD Ratio	0.12 (0.09)	CD Ratio	0.24 (0.06)
Short-run Adjustments			
	ΔWALR_F_t		ΔWALR_O_t
ECT _{t-1}	-0.14 (0.00)	ECT _{t-1}	-0.05 (0.00)
$\Delta \text{WALR}_F_{t-1}$	-0.51 (0.00)	$\Delta \text{WALR}_O_{t-1}$	-0.16 (0.00)
$\Delta \text{WALR}_F_{t-2}$	-0.34 (0.00)	ΔREPO_t	0.07 (0.03)
ΔREPO_t	0.31 (0.00)	ΔREPO_{t-1}	0.05 (0.20)
$\Delta \text{CD Ratio}_t$	-0.02 (0.15)	$\Delta \text{CD Ratio}_t$	0.01 (0.41)
$\Delta \text{CD Ratio}_{t-1}$	-0.01 (0.61)	$\Delta \text{CD Ratio}_{t-1}$	-0.02 (0.00)
$\Delta \text{CD Ratio}_{t-2}$	0.004 (0.77)	$\Delta \text{CD Ratio}_{t-2}$	-0.01 (0.02)
$(\Delta \text{REPO}_t) * (\text{Dum}_{\text{EBLR}})$	0.43 (0.02)	$\Delta \text{CD Ratio}_{t-3}$	-0.02 (0.00)
Dum_{DEMO}	-0.13 (0.06)	$(\Delta \text{REPO}_{t-2}) * (\text{Dum}_{\text{EBLR}})$	0.08 (0.07)
Dum_{TAPR}	0.20 (0.00)	Dum_{DEMO}	-0.02 (0.26)
		Dum_{TAPR}	0.04 (0.16)
Adjusted R² = 0.44; F-statistic = 4.63 (3.1, 3.87)		Adjusted R² = 0.43; F-statistic = 11.45 (3.1, 3.87)	

Figures in parentheses are p-values. F-Bounds Test confirms cointegration at 5 per cent level of significance. Breusch – Godfrey LM test confirms no serial correlation at 6 lags.

Δ represents month-on-month change in respective variables.

Table A3: Transmission to Deposit Rates of SCBs

Long-run Equations			
(ARDL 4,4,2)		(ARDL 3,2,0)	
	<i>MTDR_F</i>		<i>WADTDR_O</i>
REPO	0.79 (0.00)	REPO	0.69 (0.00)
LQDY	-0.12 (0.05)	LQDY	-0.24 (0.02)
Short-run Adjustments			
	$\Delta MTDR_{F_t}$		$\Delta WADTR_{O_t}$
<i>ECT</i> _{t-1}	-0.16 (0.00)	<i>ECT</i> _{t-1}	-0.06 (0.00)
$\Delta MTDR_{F_{t-1}}$	-0.09 (0.27)	$\Delta WADTDR_{O_{t-1}}$	0.04 (0.79)
$\Delta MTDR_{F_{t-2}}$	0.11 (0.19)	$\Delta WADTDR_{O_{t-2}}$	0.06 (0.43)
$\Delta REPO_t$	0.17 (0.01)	$\Delta REPO_t$	0.15 (0.01)
$\Delta REPO_{t-1}$	0.11 (0.03)	$\Delta REPO_{t-1}$	-0.09 (0.13)
$\Delta LQDY_t$	-0.01 (0.43)	$(\Delta REPO_{t-4}) * (Dum_{EBLR})$	0.08 (0.00)
$\Delta LQDY_{t-1}$	0.04 (0.01)	<i>Dum</i> _{DEMO}	-0.04 (0.00)
$(\Delta REPO_t) * (Dum_{EBLR})$	0.27 (0.01)	<i>Dum</i> _{TAPR}	0.05 (0.21)
<i>Dum</i> _{DEMO}	-0.04 (0.19)		
<i>Dum</i> _{TAPR}	0.14 (0.00)		
Adjusted R² = 0.32; F-statistic = 4.43 (3.1, 3.87)		Adjusted R² = 0.40; F-statistic = 6.92 (3.1, 3.87)	

Figures in parentheses are p-values. F-Bounds Test confirms cointegration at 5 per cent level of significance. Breusch – Godfrey LM test confirms no serial correlation at 6 lags.

Δ represents month-on-month change in respective variables.

Table A4: Transmission to WALR on Fresh Loans: Bank Group wise

Long-run Equations			
PSBs (AIC 3,1,1)		PvBs (AIC 3,1,0)	
	WALR_F		WALR_F
REPO	0.78 (0.00)	REPO	0.87 (0.00)
CD Ratio	0.13 (0.03)	CD Ratio	-0.01 (0.80)
Short-run Adjustments			
	$\Delta WALR_{Ft}$		$\Delta WALR_{ft}$
ECT _{t-1}	-0.14 (0.00)	ECT _{t-1}	-0.16 (0.00)
$\Delta WALR_{ft-1}$	-0.39 (0.00)	$\Delta WALR_{ft-1}$	-0.40 (0.00)
$\Delta WALR_{ft-2}$	-0.25 (0.00)	$\Delta WALR_{ft-2}$	-0.31 (0.00)
$\Delta REPO_t$	0.21 (0.07)	$\Delta REPO_t$	0.38 (0.01)
$\Delta CD Ratio_t$	-0.03 (0.17)	($\Delta REPO_t$) * (Dum_{EBLR})	0.37 (0.20)
($\Delta REPO_t$) * (Dum_{EBLR})	0.20 (0.07)	Dum_{DEMO}	-0.22 (0.00)
Dum_{DEMO}	-0.10 (0.02)	Dum_{TAPR}	0.17 (0.01)
Dum_{TAPR}	0.14 (0.01)		
Adjusted R² = 0.28; F-statistic = 7.3 (3.1, 3.87)		Adjusted R² = 0.25; F-statistic = 2.38 (3.1, 3.87)	

Figures in parentheses are p-values. F-Bounds Test confirms cointegration at 5/10 per cent level of significance. Breusch – Godfrey LM test confirms no serial correlation at 6 lags.

Δ represents month-on-month change in respective variables.

Table A5: Transmission to Deposit Rates on Fresh Deposits: Bank Group wise

Long-run Equations			
PSBs (AIC 1,3,2)		PvBs (AIC 3,1,0)	
	<i>MTDR_F</i>		<i>MTDR_F</i>
REPO	0.69 (0.01)	REPO	0.64 (0.00)
LQDY	-0.16 (0.03)	LQDY	-0.13 (0.00)
Short-run Adjustments			
	$\Delta MTDR_{-Ft}$		$\Delta MTDR_{-Ft}$
<i>ECT</i>_{t-1}	-0.10 (0.00)	<i>ECT</i>_{t-1}	-0.15 (0.00)
$\Delta REPO_t$	0.11 (0.01)	$\Delta REPO_t$	0.14 (0.04)
$\Delta REPO_{t-1}$	0.16 (0.01)	$\Delta REPO_{t-1}$	0.07 (0.32)
$\Delta REPO_{t-2}$	0.07 (0.19)	$\Delta LQDY_t$	-0.01 (0.32)
$\Delta LQDY_t$	0.01 (0.69)	$\Delta LQDY_{t-1}$	0.04 (0.02)
$\Delta LQDY_{t-1}$	0.03 (0.01)	$(\Delta REPO_t) * (Dum_{EBLR})$	0.13 (0.10)
$(\Delta REPO_t) * (Dum_{EBLR})$	0.15 (0.09)	Dum_{DEMO}	-0.09 (0.02)
Dum_{DEMO}	-0.04 (0.28)		
Adjusted $R^2 = 0.48$; F-statistic = 7.62 (3.1, 3.87)		Adjusted $R^2 = 0.45$; F-statistic = 8.02 (3.1, 3.87)	

Figures in parentheses are p-values. F-Bounds Test confirms cointegration at 5 per cent level of significance. Breusch – Godfrey LM test confirms no serial correlation at 6 lags.

Δ represents month-on-month change in respective variables.

Table A6: Transmission to WALR on Outstanding Loans: Bank Group wise

Long-run Equations			
PSBs (AIC 1,2,2)		PvBs (AIC 2,1,0)	
	<i>WALR_O</i>		<i>WALR_O</i>
REPO	0.51 (0.39)	REPO	0.78 (0.00)
CD Ratio	0.34 (0.35)	CD Ratio	0.03 (0.25)
Short-run Adjustments			
	$\Delta WALR_{O,t}$		$\Delta WALR_{O,t}$
<i>ECT</i> _{t-1}	-0.01 (0.00)	<i>ECT</i> _{t-1}	-0.06 (0.00)
$\Delta REPO_t$	0.02 (0.51)	$\Delta WALR_{O,t-1}$	-0.27 (0.00)
$\Delta REPO_{t-1}$	0.05 (0.19)	$\Delta WALR_{f,t-2}$	-0.31 (0.00)
$\Delta CD Ratio_t$	-0.01 (0.07)	$\Delta REPO_t$	0.19 (0.02)
$\Delta CD Ratio_{t-1}$	-0.01 (0.01)	$(\Delta REPO_t) * (Dum_{EBLR})$	-0.17 (0.20)
$(\Delta REPO_t) * (Dum_{EBLR})$	0.07 (0.02)	<i>Dum</i> _{DEMO}	-0.03 (0.51)
<i>Dum</i> _{DEMO}	-0.01 (0.90)	<i>Dum</i> _{TAPR}	0.06 (0.19)
<i>Dum</i> _{TAPR}	0.03 (0.11)		
Adjusted <i>R</i> ² = 0.47; <i>F</i> -statistic = 15.7 (3.1, 3.87)		Adjusted <i>R</i> ² = 0.14; <i>F</i> -statistic = 3.63 (3.1, 3.87)	

Figures in parentheses are p-values. F-Bounds Test confirms cointegration at 5 per cent level of significance. Breusch – Godfrey LM test confirms no serial correlation at 6 lags.

Δ represents month-on-month change in respective variables.

Table A7: Transmission to Deposit Rate on Outstanding Deposits: Bank Group wise

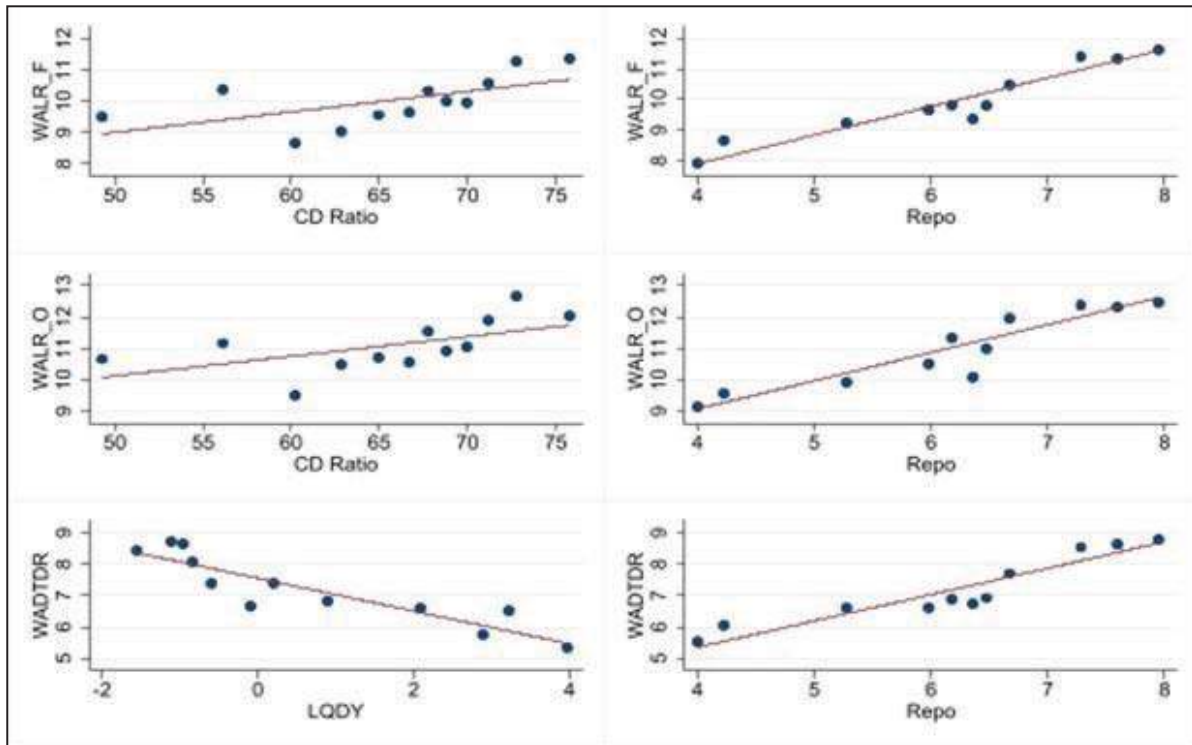
Long-run Equations			
PSBs (AIC 1,3,2)		PvBs (AIC 3,1,0)	
	WADTDR		WADTDR
REPO	0.69 (0.00)	REPO	0.62 (0.00)
LQDY	-0.24 (0.03)	LQDY	-0.26 (0.01)
Short-run Adjustments			
	$\Delta WADTDR_t$		$\Delta WADTDR_t$
ECT_{t-1}	-0.05 (0.00)	ECT_{t-1}	-0.07 (0.00)
$\Delta WADTDR_{t-1}$	-0.07 (0.63)	$\Delta WADTDR_{t-1}$	-0.01 (0.92)
$\Delta WADTDR_{t-2}$	0.12 (0.03)	$\Delta WADTDR_{t-2}$	0.08 (0.40)
$\Delta REPO_t$	0.17 (0.02)	$\Delta REPO_t$	0.11 (0.02)
$\Delta REPO_{t-1}$	-0.10 (0.14)	$(\Delta REPO_{t-3}) * (Dum_{EBLR})$	0.07 (0.02)
$\Delta REPO_{t-2}$	0.08 (0.14)	Dum_{DEMO}	-0.06 (0.00)
$(\Delta REPO_{t-4}) * (Dum_{EBLR})$	0.09 (0.03)	Dum_{TAPR}	0.04 (0.37)
Dum_{DEMO}	-0.04 (0.00)		
Dum_{TAPR}	0.05 (0.13)		
Adjusted $R^2 = 0.35$; F-statistic = 6.5 (3.1, 3.87)		Adjusted $R^2 = 0.33$; F-statistic = 5.63 (3.1, 3.87)	

Figures in parentheses are p-values. F-Bounds Test confirms cointegration at 5 per cent level of significance. Breusch – Godfrey LM test confirms no serial correlation at 6 lags.

Δ represents month-on-month change in respective variables.

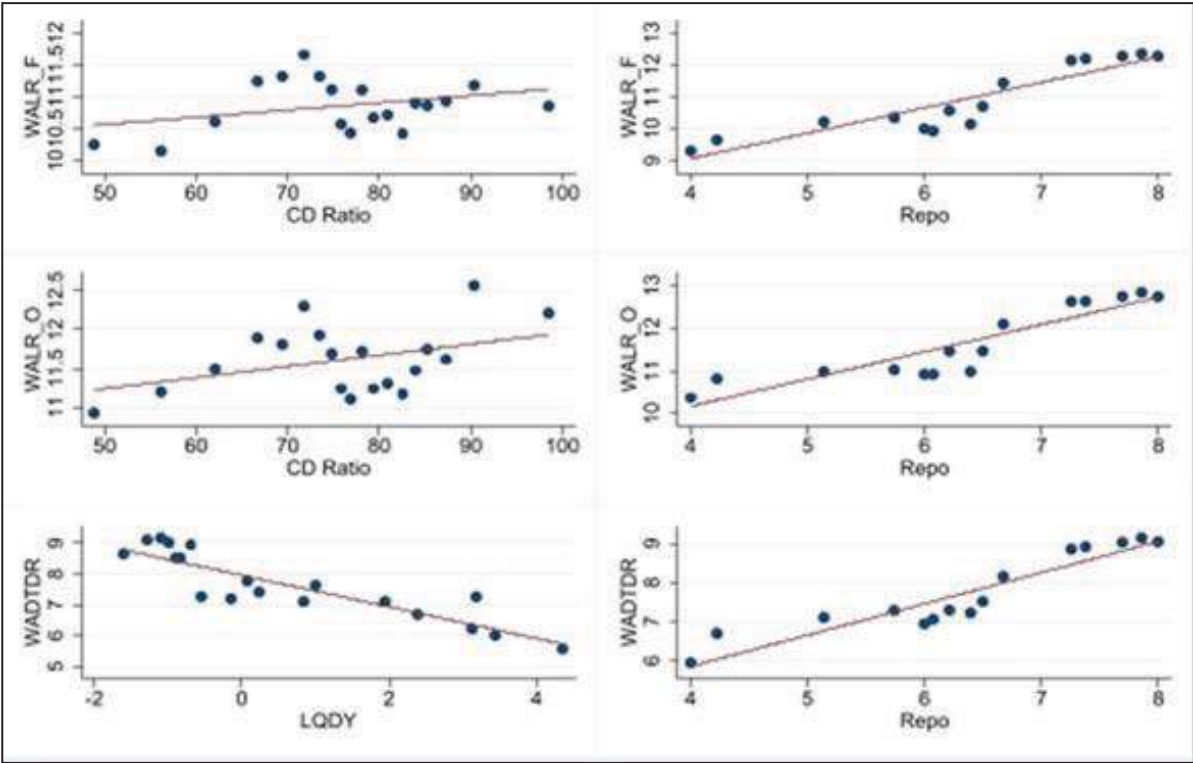
Chart A: Bin Scatter Plot⁸

Chart A1: Lending and Deposit Rates and their Determinants
(Public Sector Banks)



⁸ Binned scatterplots provide a non-parametric way of visualizing the relationship between two variables. Bin scatter groups the x-axis variable into equal-sized bins, computes the mean of the x-axis and y-axis variables within each bin, then creates a scatterplot of these data points. The result is a nonparametric visualization of the conditional expectation function.

Chart A2: Lending and Deposit Rates and their Determinanats
(Private Banks)



*What Drives the Forward Premia – An Analytical Perspective**

The forward premium encapsulates lead information on evolving economic and financial market developments and is determined by the interplay of institutional and regulatory features with market microstructure and flow factors, apart from macroeconomic fundamentals. Using a machine learning technique and based on monthly data since 2010, interest rate differential, global policy uncertainty, domestic banking system liquidity and RBI's intervention in forward markets were found to be the principal determinants of the forward premia across the term structure in both the pre-flexible inflation targeting (pre-FIT) period and during the FIT regime. Regression analysis suggests that surplus liquidity has a sobering impact while greater uncertainty hardens the forward premia, more so in the short term.

Introduction

The collapse of the Bretton Woods System and the gradual transition towards a flexible exchange rate regime since the 1980s has seen greater and faster capital mobility across borders globally. The diffusion of the information technology revolution and the resulting advances in payments and settlements systems worldwide have further intensified movements in capital flows, posing severe challenges for central banks and national authorities. In addition to the above, emerging market economies (EMEs) had to contend with the fallout of global spillovers resulting from policies pursued

in advanced economies (AEs). These spillovers – largely in the form of volatile capital flows – resulted in fluctuations in the exchange rate which often necessitated forex market intervention by the central bank, the latter, in turn, having implications for liquidity management.

Theoretically, the role of foreign exchange intervention in an inflation targeting (IT) framework is contestable as exchange rate flexibility is an intrinsic feature of IT. In practice, however, IT central banks in EMEs closely monitor the exchange rate because sharp exchange rate movements may pose financial stability risks, beside its attendant implications for inflation. As such, foreign exchange intervention is a widely used instrument in the policy toolkit of EME central banks¹ (following IT) although they encounter some challenges, viz., (i) tensions between interventions and monetary policy actions; (ii) whether policy responses are symmetric to appreciation/depreciation pressures, (iii) the costs of intervention; and (iv) intervention under currency mismatches (Chamon *et al.*, 2019). Therefore, transparency of objectives and its clear articulation and communication are key in strengthening the effectiveness of interventions while preserving monetary policy credibility.

Akin to several other EMEs, India has experienced episodic bouts of surges and sudden stops/reversals in capital inflows with the progressive deregulation of the capital account since the initiation of external sector reforms in the early 1990s. While capital inflows are required to finance a sustainable current account deficit in an *ex-ante* sense, they have often exceeded the financing requirement because of favourable interest rate differentials and / or more promising domestic growth outlook. Given the objective of avoiding excess volatility in the exchange rate of the Indian Rupee (INR) and any potential loss

* This article is prepared by Archana Dilip from the Department of Statistics and Information Management, Pradeep Kumar from Secretary's Department and Priyanka Sachdeva, Krishna Mohan Kushwaha, Indranil Bhattacharyya from the Monetary Policy Department. The authors are grateful to the editorial committee and Shri Muneesh Kapur for suggestions and comments. The views expressed in this article are those of the authors and do not represent the views of the Reserve Bank of India.

¹ Even among advanced countries, there are instances of strong intervention: New Zealand during the "Yen carry-trade" episode of 2007 and Switzerland during the Euro crisis of 2012.

of external competitiveness,² the Reserve Bank of India's (RBI's) intervention through forex purchases results in an accretion to foreign exchange reserves. The consequential injection of rupee liquidity, unless neutralised, pose challenges for liquidity management and the conduct of domestic monetary policy (Raj *et al.*, 2018).

Repeated intervention can lead to discrete changes in system liquidity making short-term interest rates volatile. Large or frequent unsterilised interventions can lead to a surfeit of liquidity which may stoke inflation; consequently, policy rate hikes may be warranted to quell such pressures. Policy rate increases, however, widen the interest rate differential that could trigger further inflows. Thus, interventions on a regular basis often undo their very objective; hence, central banks generally conduct sterilisation operations to neutralise the monetary impact of their foreign exchange market operations. Sterilised intervention through continuous open market sale of securities, however, keeps interest rates elevated; moreover, there are limits to intervention as the availability of adequate collateral could act as a binding constraint on central banks for liquidity management operations. As a result, several other instruments including forex swaps have been used with varying degree of effectiveness (BIS, 2013).

After the outbreak of the COVID-19 pandemic, the Reserve Bank deployed several conventional and unconventional³ tools to assuage fears of illiquidity and market disruption. In this regard, large liquidity injections through extended lending operations and asset purchase programmes were undertaken to unfreeze markets, revive trading activity and restore

financial market sentiment. Thus, banking system liquidity turned into a large surplus in consonance with the accommodative stance of monetary policy. In this *milieu*, capital inflows further gained impetus since October 2020, which required forex market intervention.⁴ Intervention in the forward market may affect the forward premia – the proportion by which the forward exchange rate of a currency exceeds its spot rate (Copeland, 2014) which are determined by the interplay of institutional and regulatory features with market microstructure and flow factors, apart from macroeconomic fundamentals (RBI, 2021a).

In this background, this article presents an analytical review of the forward premia in the Indian context and is organised in the following manner. Section II presents a synoptic overview of the theoretical underpinnings and empirical literature followed by a discussion of stylised facts and recent developments in the forward premia market in Section III. An empirical assessment of the determinants of the forward premia across the term structure using the machine learning technique of Random Forest is undertaken in Section IV. The concluding observations are presented in Section V.

II. Received Literature

While central banks frequently resort to forex market intervention to maintain a specific exchange rate between two currencies in a fixed exchange rate regime, the case for intervention is less clear under flexible exchange rates. Standard macroeconomic models suggest that intervention should not impact the exchange rate, *i.e.*, intervention would have no traction. Open economy models (Fleming, 1962; Mundell, 1963; Dornbusch, 1976) typically assume perfect capital mobility for which the uncovered interest parity principle has become a cornerstone, as discussed below.

² Characterised by the "*Dutch Disease*" – a commonly referred paradox in international finance. Specifically, the discovery of natural gas deposits by the Netherlands in the North Sea in the late 1950s led to huge foreign exchange earnings from gas exports (non-tradables) and the resulting appreciation of the Dutch Guilder. Such appreciation, however, led to loss of competitiveness in the export of Dutch dairy products (tradables).

³ For a discussion on the unconventional measures, see Talwar *et al.*, (2021).

⁴ As AEs embarked on heavy monetary stimulus to counter the pandemic, the resultant liquidity moved out in search of return to EMEs – the usual destination of global spillovers.

In an open economy with perfect capital mobility, the interest rate parity condition ensures that domestic and foreign assets denominated in different currencies but similar risk profile yield the same return when measured in the same currency, thus making the investor indifferent between the two alternative investment proposals – the no-arbitrage condition. Thus, the interest rate parity condition equates the difference between foreign and domestic interest rates with difference in spot and future exchange rates. This relationship is commonly known as the uncovered interest rate parity (UIRP) condition and is defined as:

$$\frac{1+r}{1+r^*} = \frac{S^*}{S} \dots\dots\dots (1)$$

where r and r^* stands for domestic and foreign interest rates, respectively, S represents the prevailing exchange rate while S^* is the exchange rate expected to prevail at the end of the period. From equation (1), it is noted that the domestic interest rate must be higher (lower) than the foreign interest rate by an amount equal to the expected depreciation (appreciation) of the domestic currency. If investors are risk-neutral and have rational expectations, any interest rate differential is equalised by the corresponding adjustment in the exchange rate. Thus, UIRP implies that the exchange rate will respond only to (i) changes in the interest rate differential; or (ii) the expected change in the exchange rate. Quantitatively, the hypothesis of the UIRP means that projection of the change in exchange rate on the interest rate differential should reveal a regression coefficient of one (Bansal and Shaliastovic, 2006); however, empirical evidence rejects UIRP with various studies presenting evidence of negative and statistically significant slope coefficients (Fama, 1984; Bansal, 1997; Bansal and Dahlquist, 2000; Backus *et al.*, 2001; Lustig and Verdelhan, 2007). Such empirical irregularity with high interest-bearing currencies showing tendencies to appreciate (rather than

depreciate) relative to lower interest-bearing ones has offered opportunities for investors to engage in carry trade and earn arbitrage returns. This aberration from UIRP in the short run is popularly referred as the *Forward Premium Puzzle* and reflects deviations from the assumptions of risk neutrality and rational expectations embedded in the UIRP.

As risk neutrality does not hold given there is an element of risk involved in foreign currency investments, a part of the risk is eliminated through hedging in forward markets which establishes the covered arbitrage condition – the covered interest rate parity (CIRP) condition. According to CIRP, interest rates on two otherwise identical assets in two different currencies should be equal once the foreign currency risk is hedged. For the CIRP condition, S^* in equation (1) is replaced by F which represents the forward rate appearing in the contract to exchange one currency for the other in the future:

$$\frac{1+r}{1+r^*} = \frac{F}{S} \dots\dots\dots (2)$$

CIRP relies on few assumptions which are unrelated to the behaviour of agents in terms of their expectation formation and utility maximisation. For CIRP to hold, three conditions are required, *viz.*, (i) sufficient funds are available for speculation; (ii) the presence of organised forward exchange markets with information on exchange rates publicly available to traders; and (iii) low or negligible transaction costs (Chamon *et al.*, *op cit*). Numerous studies have shown that arbitrage opportunities under CIRP generally do arise and are attributed to (i) transaction costs (Frenkel and Levich, 1975); (ii) credit risk (Aliber, 1973); (iii) taxes (Levi, 1977); (iv) data imperfections (Agmon and Bronfeld, 1975); (v) capital controls (McCormick, 1979); (vi) market microstructure (Stoll, 1978); (vii) capital market imperfections (Blenman, 1991); and (viii) international capital mobility (Frankel, 1992).

On sterilised intervention, the literature emphasises two main channels through which purchases / sales of foreign exchange can affect the exchange rate: the *portfolio balance* and the *signalling channels*. The *portfolio balance* channel works through the change in the relative supply of domestic and foreign currency assets (Kouri, 1977). If both types of assets were perfect substitutes (*i.e.*, if UIRP hold), then the change in relative supply would not matter. To the extent that assets are imperfect substitutes, however, investors will demand a premium for holding more of the asset whose supply has increased, thus depreciating the currency of that asset. This portfolio balance channel may indeed have played a small quantitative role in AEs, where the magnitude of interventions was very small compared to their large bond markets. In many EMEs, however, the size of foreign exchange reserves is similar to the stock of domestic currency assets of central banks. The magnitudes involved suggest that the cumulative quantitative effects on asset prices through this portfolio channel could be significant, even if the channel has limited traction. The impact could also be higher if the emerging markets are not as well integrated into the global financial system as their advanced counterparts (local and foreign currency assets not being perfect substitutes).

While UIRP implicitly assumes that capital flows would immediately move to arbitrage away any expected return differential, foreign exchange intervention can impact the exchange rate if capital flows respond to return differentials at a slower pace. Despite imperfect capital mobility, the foreign exchange market can always clear, provided that a sufficiently large adjustment in asset prices equilibrates demand and supply. This adjustment, however, may require very large swings in asset prices – including the exchange rate – which may be undesirable for several reasons. Central bank purchases or sales of foreign exchange assets can modulate the magnitude of this adjustment by reducing the amount of excess

supply or demand that needs to be accommodated by the private market.

The *signalling or expectation* channel affects the exchange rate through a change in market expectations about fundamentals (Mussa, 1981). If the central bank has more information about macroeconomic fundamentals (including its future monetary policy stance) than the market, it can use intervention to signal that information. To the extent that it provides signals about the future monetary policy stance, such an intervention would have traction on the exchange rate when announced, even if UIRP holds (since future interest rates would impact today's exchange rate *via* their effect on the expected future exchange rate).

Currency markets are incredibly complex, and it is impossible to completely enumerate all the factors that determine exchange rates. Nevertheless, the exchange rate and the forward premia is broadly dependent on five important factors, *viz.*, (i) macro-fundamentals such as GDP, inflation *etc.*; (ii) financial market prices and traded volumes; (iii) international trade indicators – trade deficits/surpluses, global oil prices; (iv) political stability; and (v) actions of leading central banks (Chamon *et al.*, *op cit*). In this regard, given the thin trading volume in EME markets, there are a host of additional factors that determine forward premia of EME currencies *vis-à-vis* their advanced counterparts.

In the Indian context, demand and supply factors *viz.*, foreign institutional investor (FII) flows and current account balance play a dominant role in determining the forward premia on USD/ INR rather than the usual interest rate differential (Sharma and Mitra, 2006). A subsequent study, however, suggested that the behaviour of the forward premium varied across the term structure – while the behaviour of one-month premium was in conformity with international trends in corroborating the forward premium puzzle, those of longer maturity were found to be contrary (Lingareddy, 2008). Moreover,

the interest rate differential between India and the US, RBI intervention and foreign investment inflows were found to be important in determining the forward premium. Furthermore, evidence from a questionnaire-based survey suggested that qualitative attributes such as market sentiments, expectations, political stability and financial news play a vital role in determination of the forward premia apart from quantitative factors such as interest rate differential, crude oil price, net intervention of RBI, lagged values of forward premia and foreign exchange market turnover (Srikanth and Chittedi, 2014). A recent study, however, reported that while exchange rate volatility positively impacts monthly changes in the forward premia, RBI's forward market intervention does not have any significant impact for the period 2001 to 2016 (Biswas *et al.*, 2018).

III. Stylised Facts

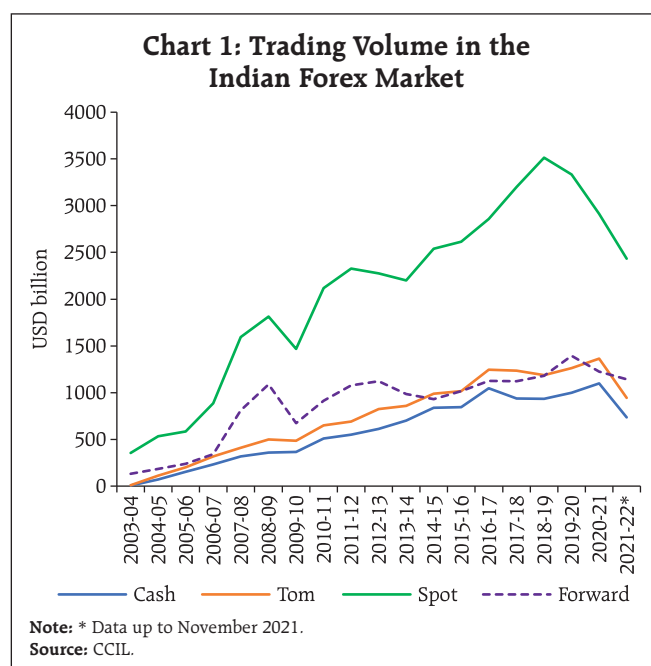
III.1 Forex Market – Overview

In India, the forex market is well-developed with various products being available – both over the counter (OTC) and exchange traded – in spot and derivatives segments. The spot market transactions cater to immediate delivery of currencies wherein settlement happens on T+2 basis (T being the trade date). Cash (settling today) and Tom trades (settlement date being one business day after the trade date) also form part of the spot market. Among the derivatives segment, forwards and swaps are OTC products whereas futures and options are exchange traded. In the forward market, contracts are made to buy or sell currencies for future delivery directly between two counterparties in an OTC (or exchange) market. Options contract, on the other hand, gives the buyer right but not the obligation to buy or sell a currency at pre-agreed exchange rate on a specified date. A forex swap involves exchange of one currency for another and is settled in two parts – the first part being the near-leg where the currencies are switched at the prevailing exchange rate (usually the spot rate); the

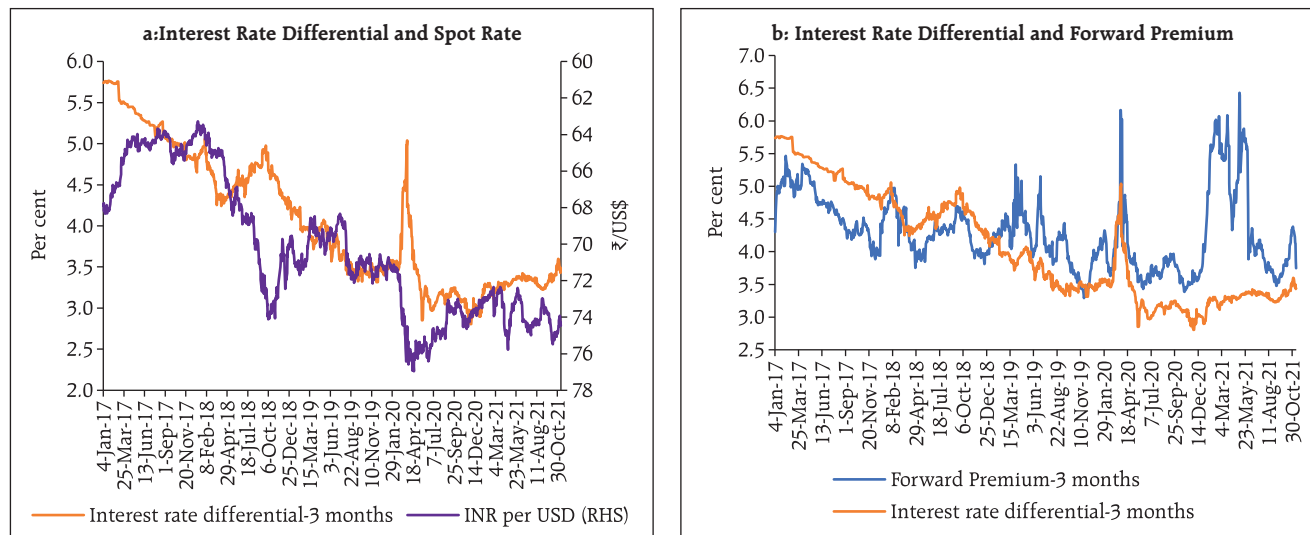
second part is the far-leg when they are again swapped at a prior-contracted mutually agreed exchange rate.

With the increasing openness of the economy, the trading volume in the Indian forex market increased steadily over the years but was subdued in 2020-21 and 2021-22, reflecting the impact of the pandemic on market activity. The spot market is the most active segment with volumes increasing faster than in other segments (Chart 1).

Major participants in the forex market usually include merchants/firms, commercial banks, arbitrageurs and central banks. During normal business operations, merchants, customers buy/sell foreign exchange to hedge their exposures from future exchange rate movements. Banks, on the other hand, are the market makers as they channelise the merchant flows in the interbank market; they may also trade among themselves by taking positions based on their own assessment of premia movements. Foreign banks are the dominant players followed by public-sector and private banks with their shares being about 45 per cent, 28 per cent



⁵ Based on CCIL data for the period January-2015 to October-2021.

Chart 2: Interest Rate Differential, Exchange Rate and Forward Premium

Note: The spot exchange rate changes were found to be more volatile than interest rate differential.

Sources: Bloomberg; and Authors' calculations.

and 26 per cent, respectively⁵, in all four segments (i.e. cash, tom, spot and forward) of the forex market. Arbitrageurs are market participants who tend to exploit the price differential between swap premium in the forward market and other interest rates prevailing across other market segments at any given point of time. As discussed earlier, central banks also actively participate in the forex market, using forex swaps as a sterilisation tool.

III.2 Spot and Forward Exchange Rate

In the Indian context, the co-movement between interest rate differentials (based on three-month treasury bill rates in India and the US) and the INR per USD (Chart 2a) does not provide empirical support for the UIRP. The CIRP is more directly verifiable as evident from the behaviour of the forward premia (Chart 2b) (RBI 2021b).

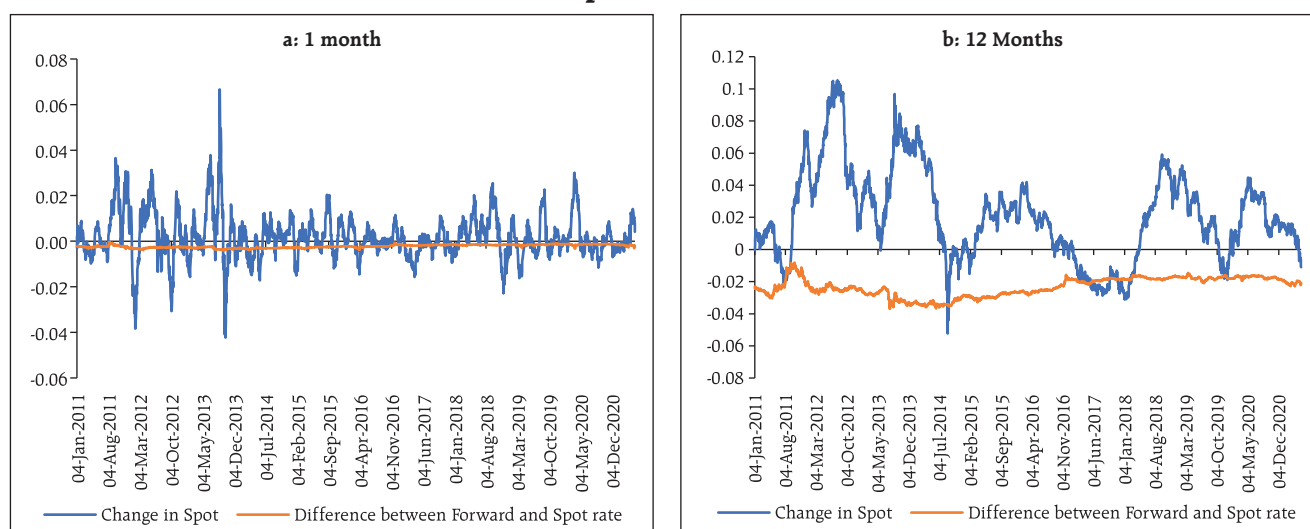
A well-known feature of the forward premia puzzle is noted for the one-month horizon (Chart 3a) – the change in the spot rate being extremely volatile while the forward premium remains virtually flat (Snaith *et al.*, 2013). For the 12-months horizon, however, the relationship is different (Chart 3b). The

contrast suggests that the puzzle or lack of support for unbiasedness is a short horizon phenomenon.

According to the forward rate unbiasedness hypothesis (FRUH), the forward rate is an unbiased predictor of the corresponding expected future spot rate under conditions of risk neutrality and rational expectations (Snaith *et al.*, *op cit*). Moreover, the hypothesis holds if the slope coefficient – estimated by regressing the change in spot prices on the forward premia – is equal to one. The slope coefficients thus estimated⁶ for select Asian EMEs suggest that while it is negative for China and Indonesia (statistically significant), it is positive for India and Philippines (but not significant) although all are less than one (Table 1). A negative slope coefficient implies that the risk premium is more volatile than the expected spot depreciation; however, the opposite is found to hold in the Indian context. Similar negative and insignificant coefficients have been reported in the literature for select economies over a short-term horizon (Chenn

⁶ Based on monthly observations of 1-month forward premia for the period January 2010 to October 2021.

Chart 3: Spot and Forward Rates



Note: Logarithm of spot and forward exchange rates have been used.

Sources: Bloomberg; and Authors' calculations.

and Meredith, 2004). This is further investigated by means of a more disaggregated (period-wise) analysis⁷ based on rolling regression over a 30-months window, which suggest that although the slope coefficients have remained mostly negative for India, it turned positive during the pandemic (February 2020) tracking *inter alia* the movements in global uncertainty. On the other hand, the slope coefficients for Philippines oscillated from negative to positive, turning negative in the recent period.

Table 1: Forward Premia Puzzle of Select Asian EMEs

S.No.	Country	Coefficient	R-Squared
1	India	0.35 (0.63)	0.003
2	China	-0.18 (0.46)	0.001
3	Indonesia	-0.87*** (-30.15)	0.866
4	Philippines	0.002 (0.004)	0.000

Notes: ***, **, and * indicate 1 per cent, 5 per cent and 10 per cent levels of significance, respectively.

Figures in parenthesis are t-statistics.

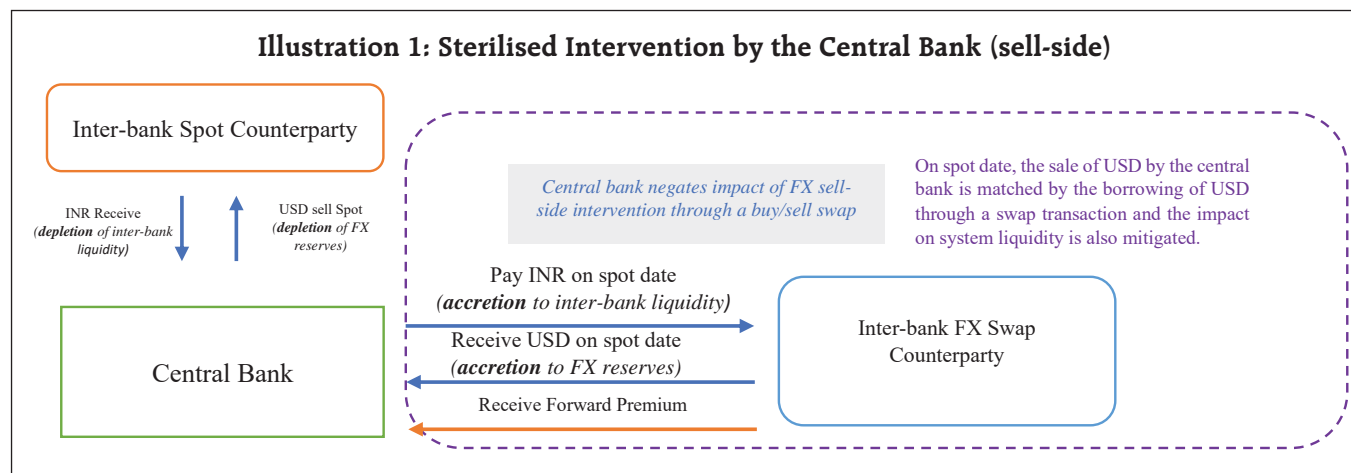
Sources: Bloomberg; CEIC; and Authors' estimates.

⁷ The results are not reported here but available from the authors on request.

III.3 RBI's Intervention in the Forex Market

Sterilisation strategy may differ over time contingent on the central bank's stance of policy and its priorities. Depending upon these, a central bank may sometimes decide to neutralise the impact of its forex operations on domestic liquidity conditions through sterilised intervention, which has its attendant benefits and costs. As mentioned earlier, the central bank can undertake a buy/sell forex swap transaction (Illustration 1). For example, if the Reserve Bank has sold USD against INR in the spot market, it would pay dollars to the counterparty and receive INR on the day of settlement, thereby reducing banking system liquidity. To offset the liquidity impact, it can enter into a buy/sell swap with the same or another counterparty with the same settlement date. On the date of settlement, it will receive USD from the counterparty while paying in INR, effectively reversing the earlier spot (sale) transaction. The liquidity and forex reserve impact of the intervention would now be shifted to the far-leg swap settlement date.

Similarly, the Reserve Bank can postpone the liquidity impact of forex purchases warranted by large

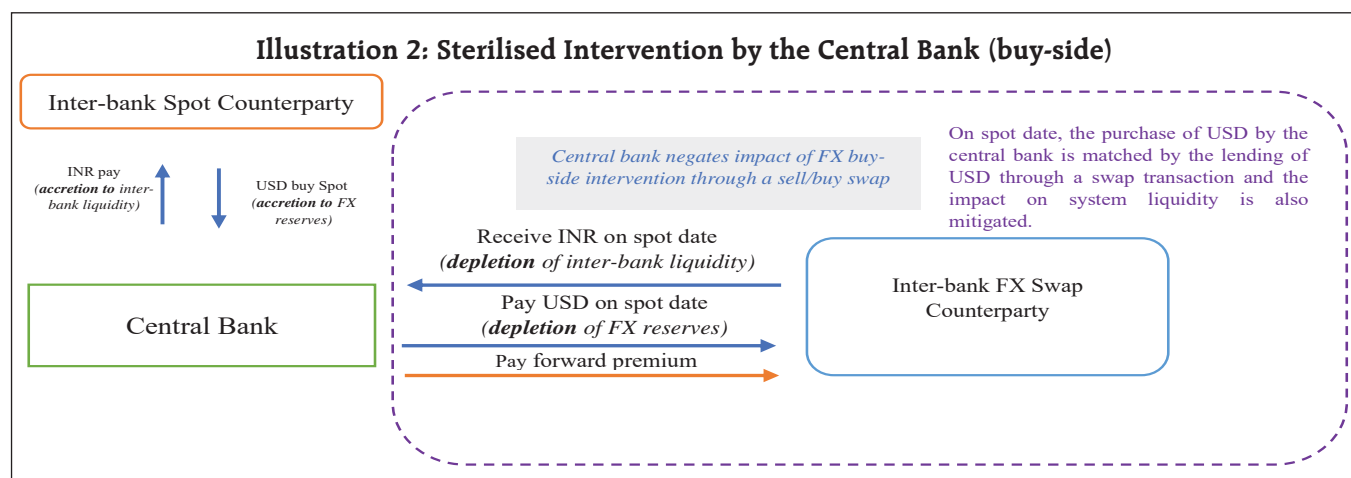


Sources: Authors' adaptation from existing literature and Kang (2019).

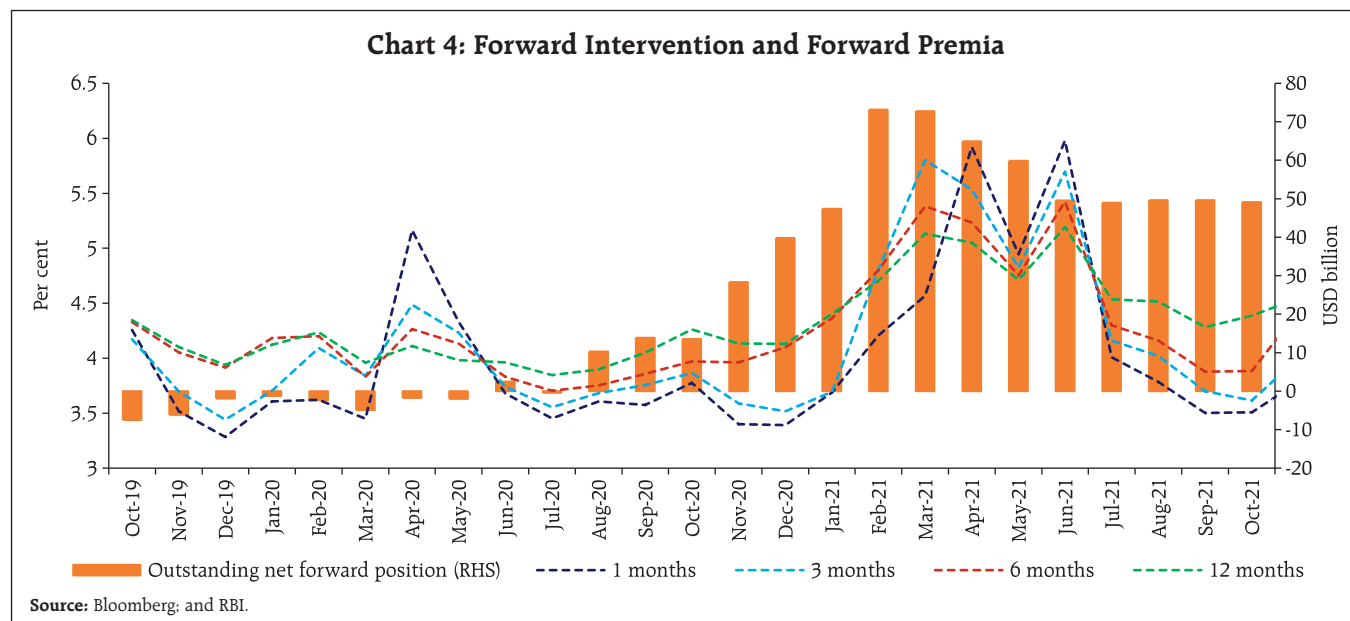
capital inflows by combining sell-buy swap with spot purchases (Illustration 2).

As noted earlier, the forward premia have largely remained stable and closely aligned to the interest rate differential but experienced an uptrend since the beginning of 2021 – out of sync with the interest rate differential, particularly for the near month forwards. During the year 2021, the 1-month forward premium surged to as high as 8.44 per cent on May 3, 2021 surpassing its earlier peak of 7.50 per cent on March 23, 2021; however, premia have eased considerably since then. During the first half of 2021, forex markets experienced large capital inflows, particularly in the

equity segment, including the initial public offering (IPO) related flows. This warranted intervention in the spot market followed by countervailing operations in the forward market through sell/buy swaps to neutralise the liquidity impact (Illustration 2). During 2021, RBI's net forward position at end-March 2021 was placed at USD 72.8 billion - an accretion of nearly USD 58.9 billion over the preceding six months – as the central bank shifted to the forward market to manage the liquidity impact of spot intervention (Chart 4). At the same time, banks' efforts to comply with the large exposure framework (LEF) norms entailed selling dollars for immediate delivery and

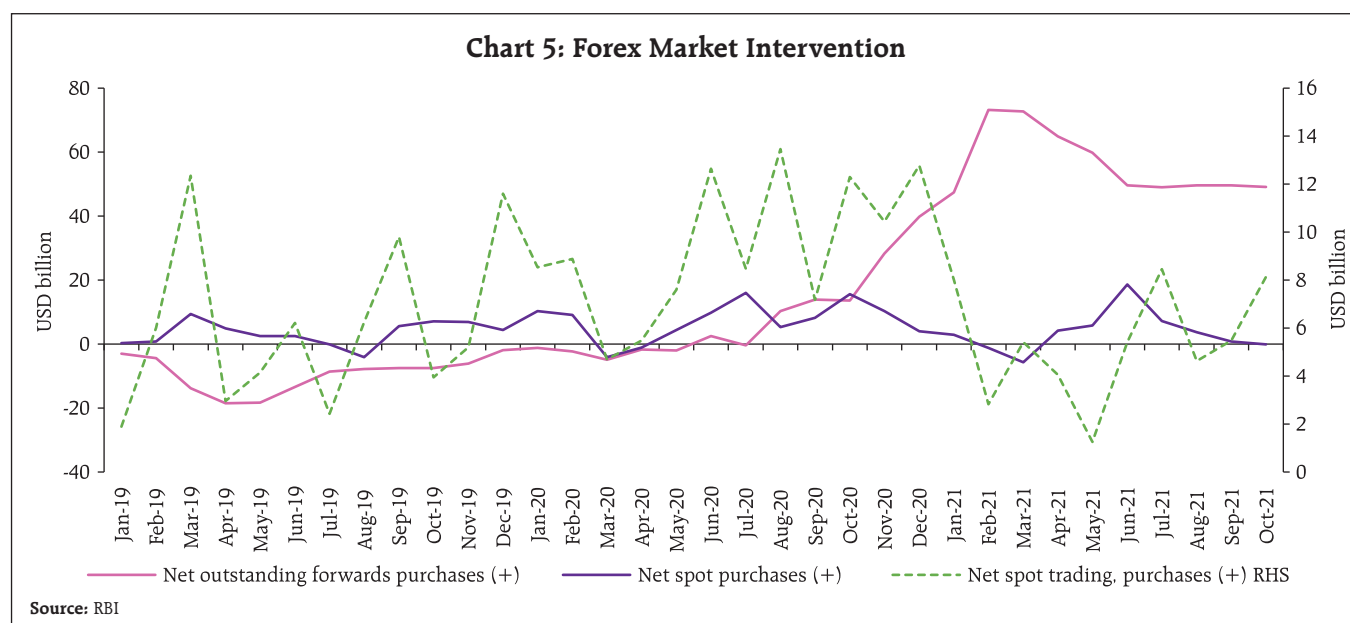


Sources: Authors' adaptation from existing literature and Kang (2019).

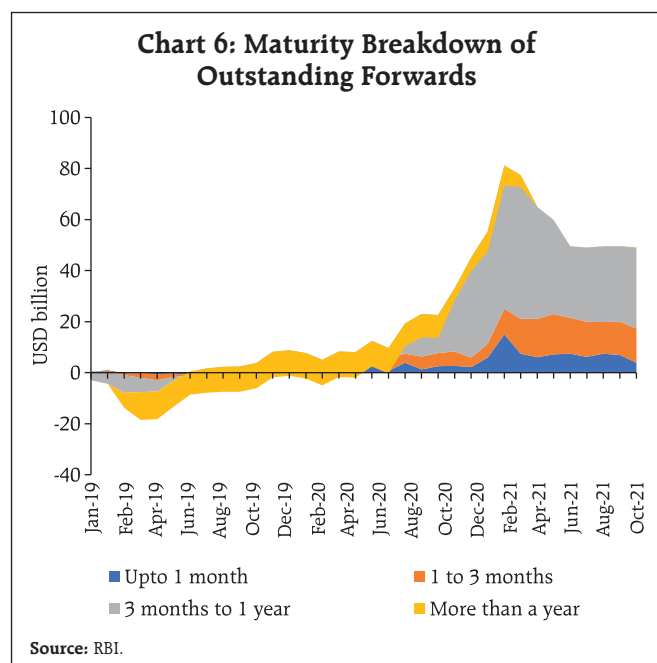


purchasing them for a future date, which further maintained the pressure on premiums.⁸ A combination of all these factors altered the demand-supply balance in the forward market, contributing to the surge in premia across tenors. Since then, however, the market has stabilised with the forward premia moderating close to its long-term levels.

With a view to reducing the excess volatility and discourage speculative activities in the foreign exchange market arising from lumpy demand and supply as well as leads and lags in merchant transactions, the Reserve Bank undertakes sale and purchase operations in the foreign exchange market (Chart 5). While the intervention has been primarily



⁸ These norms were subsequently relaxed on February 24, 2021.



in the spot segment, unprecedented circumstances caused by the COVID-19 pandemic warranted a combination of intervention in both market segments. In this regard, the RBI Governor's statement of June 4, 2021 noted *".....This has necessitated countervailing two sided interventions by the Reserve Bank in spot, forward and futures markets to stabilise financial market and liquidity conditions so that monetary policy retains its domestic orientation and the independence to pursue national objectives. Thus, the Reserve Bank actively engages in both purchases and sales in the foreign exchange market and its various segments"*, which is illustrative of the inherent challenges posed to the conduct of monetary policy from management of capital flows.

As of September 2021, the maturity profile of the Reserve Bank's outstanding net purchases suggests greater concentration of forwards in the 3-months to 1-year horizon (Chart 6).

IV. Empirical Analysis

IV.1 Determinants of the Forward Premia

The received literature suggests that the forward premia are influenced by macroeconomic and financial

variables, central bank operations, financial and geo-political news, uncertainty, policy expectations and market sentiments. This section attempts to find the key determinants of the forward premia across the short, medium and long-term segments that are liquid (1-month, 3-months and 12-months). With the adoption of the flexible inflation targeting (FIT) framework, the relative importance of key macroeconomic and financial variables (detailed in Annex) in influencing the forward premia is also analysed separately for the period before and during FIT.

For ranking the variables in terms of their relative importance, the Random Forest (RF) modelling approach is adopted. A random forest is a non-parametric supervised machine learning algorithm that is used for classification and regression constructed from a set of Classification and Regression Trees (Brieman, 2001). The methodology, which is based on decision tree algorithms, helps in measuring the relative importance of each variable on the prediction (Technical Appendix).⁹ The tree-based strategy used in the algorithm ranks the variables on how well they improve the purity of the node. The prediction accuracy is tested on the out-of-bag (oob) data that is left from the initial sample. The RF algorithm has gained popularity due to its advantage in handling missing data and its appropriateness for non-linear settings. As we expect non-linear effects and interactions among multiple high frequency financial market variables, the RF technique is expected to produce robust results by using a two-step randomisation procedure. The algorithm returns a measure termed as 'Increase in Node Purity' for each variable, which is based on total decrease in node impurities (residual sum of squares) from splitting on the variable, averaged

⁹ The algorithm is implemented in this study using the *random forest* package of the R programming language by using a weighted mean squared error as the splitting rule.

over all trees. This is indicative of accuracy-based importance and provides insights on model selection/ranking of variables.

The findings for the periods before FIT (January 2010-December 2014) and FIT (January 2015-October 2021)¹⁰ suggest that the interest rate differential emerges as the most important variable in determining the 1-month forward premia – both prior to and during FIT (Chart 7a). This is on expected lines; however, it is interesting to observe the increased impact of global uncertainty (based on global economic policy uncertainty index)¹¹ in the more recent period suggesting that the forward premia are partly reflective of the risk perceptions of market participants. The importance of banking system liquidity during FIT – a period in which liquidity was mostly in surplus – was found to be larger than in the preceding period. The impact of RBI's forward intervention on the forward premia, however, was more evident in the pre-FIT period. Other macroeconomic fundamentals like trade deficit and capital flows rank much lower than global and domestic uncertainty, particularly in the FIT period, suggesting that sentiments often drive short-term investments in a globally integrated market.

The key determinants for the 3-months tenor are not markedly different from that of the 1-month in both the FIT and pre-FIT periods; however, the relative importance of forward intervention was marginally lower *vis-à-vis* the 1-month tenor suggesting that RBI's market interventions have a more near-term impact (Chart 7b). For 12-months tenor, it is interesting to observe the higher importance of 'inflation volatility' relative to RBI's intervention operations in the FIT

period. On the other hand, global uncertainty was seen to have a greater impact on long-term forward premia in the pre-FIT period, suggesting that markets factored in global risks in the longer tenor. As in the case of 3-months, RBI's intervention operations were seen to have a larger influence in comparison to inflation volatility on the 12-months tenor in the pre-FIT period (Chart 7c).

IV.2 Impact of RBI Operations

In view of the importance of RBI's forward intervention and system liquidity on the forward premia, we empirically examine the impact of forex market operations on the forward premia for the FIT period January-2015 to October-2021. To address potential endogeneity of the variables, we use the instrumental variable (IV) approach through two-stage least squares (TSLS) regression analysis.¹² In the first stage, we estimate forward intervention [net forward purchases as a percentage of Forex reserves (F_Int)] using the variables (i) forward premia of 1-month tenor (FP1); (ii) 1-month implied volatility of INR per USD rate (Imp1)¹³; (iii) banking system liquidity (LAF) [absorption (+); injection (-)] as a percentage of net demand and time liabilities (NDTL); (iv) Indian VIX (VIX) as a proxy for domestic uncertainty; (v) capital flows as percentage of GDP (C_Flow); and (vi) lagged forward intervention.¹⁴

In the second regression, the actual interventions are replaced by fitted forward interventions

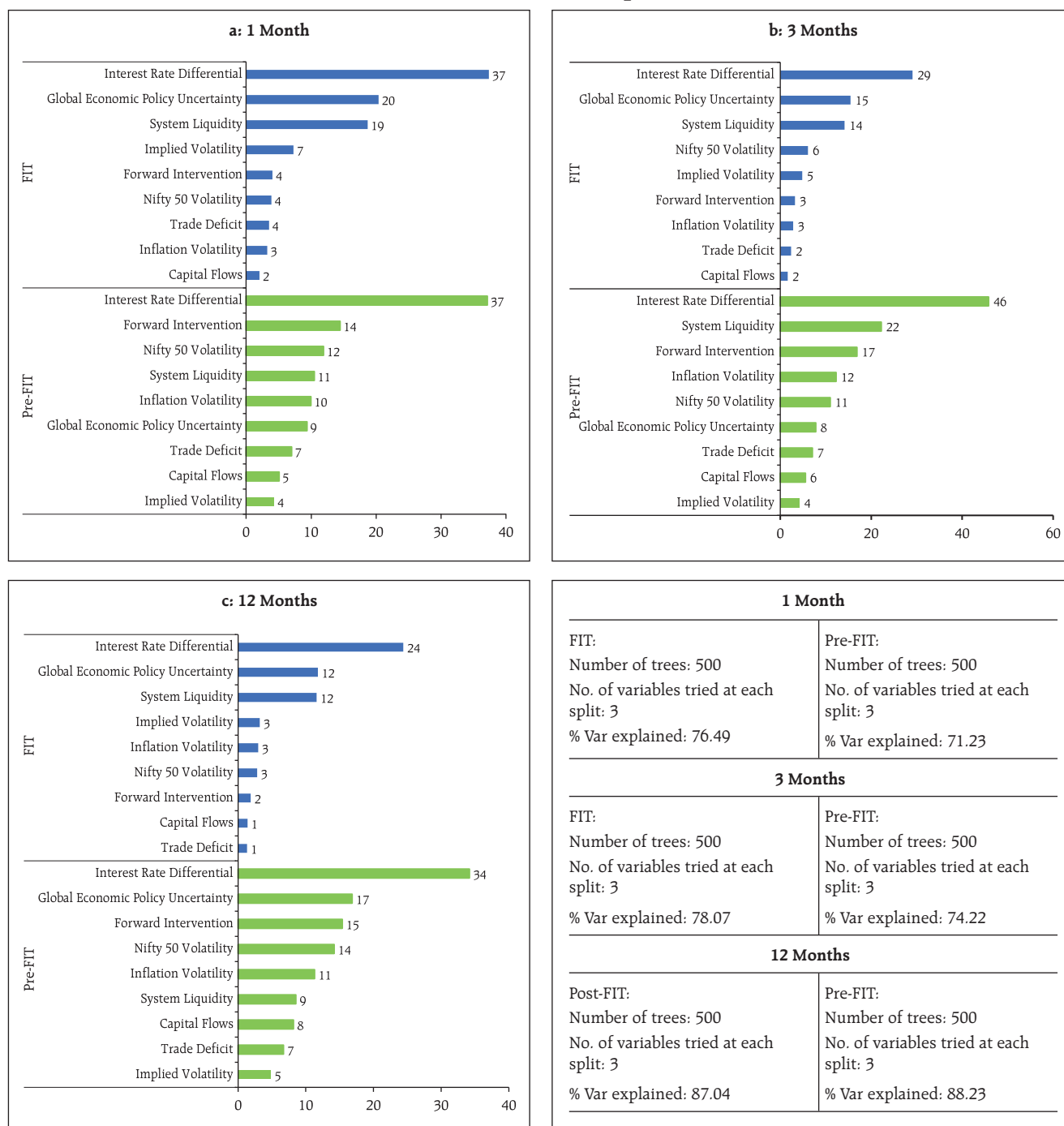
¹⁰ Although the FIT framework was formally adopted in June 2016, FIT was implicitly built into the policy announcements through a glide path for disinflation spelt out in April 2014.

¹¹ The results did not change when the CBOE Volatility Index (US-VIX) was used as a proxy for global uncertainty.

¹² The model specification and estimation methodology are adapted from Domanski *et al.*, (2016) and estimations are carried out after conducting due diligence for the time series properties. These are not reported here but available from the authors on request.

¹³ The efficacy of RBI's intervention in the forex market has been examined using the 1-month implied volatility of the INR/USD exchange rate (Ratho *et al.*, 2020).

¹⁴ The model is estimated after incorporating appropriate dummy variables to account for demonetisation and declaration of COVID-19 pandemic. The regression estimates were robust with an adjusted-R² of 0.61.

Chart 7: Forward Premia - Relative Importance of Variables

Note: The bars represent the relative importance of predictor variables based on the measure 'increase in node purity'.

Source: Authors' estimates.

estimated from the first regression. Forward premia are regressed on fitted intervention (F_Int_Fit) and system liquidity (LAF) with volatility in NIFTY 50 (Nifty_50_Vol) as a control variable

for market sentiments based on the following equation:

$$\Delta FP_{(1,3,12)} = \alpha + \beta_1 \Delta F_Int_Fit + \beta_2 \Delta LAF + \beta_3 Nifty_50_Vol \dots (3)$$

Table 2: Results of Two Stage Linear Regression

Explanatory/Dependent Variables	Change in Forward Premia		
	1 month	3 months	12 months
ΔF_Int_Fit	0.21** (2.27)	0.17** (2.81)	0.13*** (4.18)
ΔLAF	-0.51*** (-3.70)	-0.20** (-2.09)	-0.08 (-1.56)
Nifty_50_Vol	0.02** (2.21)	0.01 (1.48)	0.002 (0.98)
Constant	-0.22* (-1.87)	-0.13 (-1.61)	-0.08* (-1.83)
Adj_R-square	0.23	0.15	0.23
Diagnostics			
Breusch-Godfrey LM test for autocorrelation p-value	0.81	0.24	0.51
LM test for autoregressive conditional heteroscedasticity p-value	0.32	0.18	0.25

Notes: ***, **, and * indicate 1 per cent, 5 per cent and 10 per cent levels of significance, respectively.

Figures in parenthesis are t-statistics based on heteroscedasticity and autocorrelation consistent (HAC) corrected standard errors.

Δ is the difference operator.

Source: Authors' estimates.

Based on the sample, the results suggest that RBI's forward intervention has a positive impact on incremental change in forward premia (with varying statistical significance) across the term structure (Table 2).¹⁵ In terms of magnitude, the highest impact is on the near term (1-month tenor) as suggested to earlier while the most significant impact (statistically) is on the 12 months tenor.¹⁶ On the other hand, banking system liquidity has helped in reducing the forward premia across tenors; the maximum impact being on the near term. As seen in the more recent period, increase in surplus liquidity has resulted in softer interest rates, which, in turn, reduced the interest rate differential, thereby lowering the forward premia. The RBI's conventional and unconventional measures after the outbreak of the pandemic have also reinforced this impact by boosting market sentiments

¹⁵ Sale of US\$ in the forward market implies that investors holding \$ would seek a higher premium to compensate for their loss in holding on to a low interest-bearing asset (\$) vis-à-vis a high interest-bearing one (INR).

¹⁶ It may be noted that forward interventions by the RBI flatten the slope and reduce the curvature while increasing the level of the premia (RBI, 2021a).

and invigorating investor outlook. Finally, greater uncertainty had firmed up the forward premia *albeit* significantly in the near term.

V. Conclusion

As an indicator of market perceptions on future dynamics of the foreign exchange market, the forward premia play a key role in conveying signals to both market participants and the central bank. Therefore, it is apposite to recognise the main determinants of the forward premia across the term structure. Based on a machine learning technique and monthly data spanning more than a decade, the interest rate differential turns out to be the dominant determinant of the forward premia across maturities in both the pre-FIT period and during the FIT regime. While the second most important factor varied between RBI's forward intervention (1-month tenor), system liquidity (3-months tenor) and global economic policy uncertainty (12-months tenor) in the pre-FIT period, the latter was unambiguously so during FIT. System liquidity has also gained importance during FIT. Regression analysis suggests that forward interventions have a positive impact, particularly on the near-term forward premia while surplus liquidity has a sobering effect across tenors during the FIT period. Finally, greater uncertainty hardens the forward premia, more so in the short term. Going forward, the effects of macroeconomic and financial variables on the forward premia needs to be assessed continuously as the findings are sensitive to sample periods and regime shifts.

References

- Agmon, T., & Bronfeld, S. (1975). The International Mobility of Short-term Covered Arbitrage Capital. *Journal of Business Finance & Accounting*, 2(2), 269-278.
- Aliber, R. Z. (1973). The interest rate parity theorem: A reinterpretation. *Journal of political economy*, 81(6), 1451-1459.

- Backus, D. K., Foresi, S., & Telmer, C. I. (2001). Affine term structure models and the forward premium anomaly. *The Journal of Finance*, 56(1), 279-304.
- Bansal, R. (1997). An exploration of the forward premium puzzle in currency markets. *The Review of Financial Studies*, 10(2), 369-403.
- Bansal, R., & Dahlquist, M. (2000). The forward premium puzzle: different tales from developed and emerging economies. *Journal of international Economics*, 51(1), 115-144.
- Bansal, R., & Shaliastovich, I. (2006). Long-run risks explanation of forward premium puzzle. *Manuscript, Duke University*.
- Blenman, L. P. (1991). A model of covered interest arbitrage under market segmentation. *Journal of Money, Credit and Banking*, 23(4), 706-717.
- BIS. (2013). *Triennial Central Bank Survey Foreign exchange turnover in April 2013: preliminary global results*. September 2013.
- Biswas, D., Kumar, S., & Prakash, A. (2018). Do Spot Rate Volatility and Forward Market Intervention by the Central Bank Impact the Forward Premia in India?. *Asian Journal of Economics, Finance and Management*, 1-12.
- Breiman, L. (2001). Random forests. *Machine learning*, 45(1), 5-32.
- Chamon, M. M., Hofman, M. D. J., Magud, M. N. E., & Werner, A. M. (2019). *Foreign exchange intervention in inflation targeters in Latin America*. International Monetary Fund.
- Chinn, M. D., & Meredith, G. (2004). Monetary policy and long-horizon uncovered interest parity. *IMF staff papers*, 51(3), 409-430.
- Copeland, L.S., (2014). *Exchange Rates and International Finance*, Pearson. 6th edition.
- Domanski, D., Kohlscheen, E., & Moreno, R. (2016). Foreign exchange market intervention in EMEs: what has changed?. *BIS Quarterly Review*. September.
- Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of political Economy*, 84(6), 1161-1176.
- Fama, E. F. (1984). Forward and spot exchange rates. *Journal of monetary economics*, 14(3), 319-338.
- Fleming, J. M. (1962). Domestic financial policies under fixed and under floating exchange rates. *IMF Staff Papers*, 9(3), 369-380.
- Frankel, J. A. (1992). Measuring international capital mobility: a review. *American Economic Review*, 82(2), 197-202.
- Frenkel, J. A., & Levich, R. M. (1975). Covered interest arbitrage: Unexploited profits?. *Journal of Political Economy*, 83(2), 325-338.
- Kang, M. W. (2019). Currency Market Efficiency Revisited: Evidence from Korea. *International Journal of Financial Studies*, 7(3), 52.
- Kouri, P. J. (1977). The exchange rate and the balance of payments in the short run and in the long run: A monetary approach. In *Flexible Exchange Rates and Stabilization Policy* (pp. 148-172). Palgrave Macmillan, London.
- Levi, M. D. (1977). Taxation and" abnormal" international capital flows. *Journal of Political Economy*, 85(3), 635-646.
- Lingareddy, T. (2008). Factors influencing forward premia in Indian markets. *Rakshitra*, November.
- Lustig, H., & Verdelhan, A. (2007). The cross section of foreign currency risk premia and consumption growth risk. *American Economic Review*, 97(1), 89-117.
- McCormick, F. (1979). Covered interest arbitrage: Unexploited profits? Comment. *Journal of Political Economy*, 87(2), 411-417.
- Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science*, 29(4), 475-485.
- Mussa, M. (1981). *The role of official intervention*. New York: Group of Thirty.

- RBI. (2021a). *Monetary Policy Report*. October.
- RBI. (2021b). *Report on Currency and Finance 2020-21*. February.
- Raj, J., Pattanaik, S., Bhattacharyya, I. and Abhilasha (2018). Forex Market Operations and Liquidity Management. *RBI Bulletin*, August.
- Ratho, R.S., Rajput, V., Sarangi, S., (2020). Managing Exchange Rate Volatility in the time of COVID-19. *RBI Bulletin*, December.
- Sharma, A. K., & Mitra, A. (2006). What drives forward premia in Indian forex market. *Reserve Bank of India Occasional Papers*, 27(1-2), 119-139.
- Snaith, S., Coakley, J., & Kellard, N. (2013). Does the forward premium puzzle disappear over the horizon?. *Journal of Banking & Finance*, 37(9), 3681-3693.
- Srikanth, M., & Chittedi, K. R. (2014). Perspectives on Forward Premia in India Forex Market: A Study of USD/INR. *Journal of Stock & Forex Trading*, 3(4).
- Stoll, H. R. (1978). The pricing of security dealer services: An empirical study of NASDAQ stocks. *The Journal of Finance*, 33(4), 1153-1172.
- Talwar, B. A., Kushawaha, K.M., Bhattacharyya, I. (2021). Unconventional Monetary Policy in Times of COVID-19. *RBI Bulletin*, March.

ANNEX

Details of Variables			
S.No.	Variable Name	Description	Source
1	Interest Rate Differential	Difference between 3-months treasury bill rates in India and the US	Bloomberg; Authors' calculations
2	Global Economic Policy Uncertainty	GDP-weighted average of national EPU indices for 21 countries:	https://www.policyuncertainty.com/global_monthly.html
3	System Liquidity	Banking system liquidity (LAF) (absorption +; injection -) as a proportion of net demand and time liabilities (NDTL)	Reserve Bank of India; Authors' calculations
4	Implied Volatility	1-month implied volatility of INR per USD rate	Bloomberg
5	Forward Intervention	Net forward purchases as a percentage of Forex reserves	Reserve Bank of India; Authors' calculations
6	Nifty 50 Volatility	Realised volatility of NIFTY 50	CEIC
7	Trade Deficit	Trade deficit as a percentage of GDP	CEIC; Authors' calculations
8	Inflation Volatility	12-months rolling standard deviation of CPI inflation	MOSPI; Authors' calculations
9	Capital Flows	Net capital inflows (FDI+FPI) as a percentage of GDP	CEIC; Authors' calculations

Technical Appendix: Random Forest Algorithm

The algorithm involves the following steps:

- Step 1:* B bootstrap samples are drawn from the original sample. On the average, bootstrap samples exclude 37 per cent of the data known as out-of-bag (oob) data.
- Step 2:* A tree is grown based on the data of each of the bootstrap samples, *i.e.* $b=1, \dots, B$. At each node, a subset of predictors is selected randomly to find the best split among all binary splits as per the splitting criterion. The process is repeated until a stopping criterion is met.
- Step 3:* To obtain a prediction ensemble, information obtained from the nodes of the B trees with no further split (terminal nodes) is aggregated. New data is predicted by aggregating the prediction of all trees.

*Foreign Exchange Reserves Buffer in Emerging Market Economies: Drivers, Motives and Implications**

This article analyses the trend of reserve accumulation in Emerging Market Economies (EMEs), with a focus on key drivers and policy objectives. Evidence from a panel auto regressive distributed lag (ARDL) model using data for 16 EMEs suggests that reserve accumulation is largely driven by precautionary motive. A probit model provides evidence that reserves help reduce the probability of currency crisis. For India, higher reserve cover is observed to lower the cost of foreign borrowings and also the hedging cost.

Introduction

Financial globalization in emerging market economies (EMEs) has exposed them to the spillover effects of shifts in global liquidity conditions in response to monetary policy developments in systemically important advanced economies (AEs). Experience of EMEs during the global financial crisis (GFC), the taper tantrum of 2013 and the recent COVID-19 pandemic underscore the need for adequate foreign exchange reserves buffer to minimise volatility in the value of domestic currencies and safeguard the domestic economy. As a precautionary measure, thus, EMEs have preferred to bolster their safety nets by accumulating reserves, with or without the additional comfort from bilateral, regional or multilateral support lines. Furthermore, SDR allocation equivalent to US\$ 650 billion by the IMF to its member countries in 2021 helped augment reserves buffer. Foreign exchange

reserves help central banks intervene in the foreign exchange market to curb excessive speculation to safeguard financial stability and manage repercussions of capital flows and credit spillovers (Patel and Cavallino, 2019).

The need for holding foreign exchange reserves for precautionary motive was discernible during the episode of sudden stop in early 2020, when several EMEs, including India, used reserves to mitigate volatility in domestic currency markets. However, reserves were partly recouped in EMEs consequent to the recovery in capital inflows in the latter part of 2020 (IMF, 2021). IMF recognises reserves as a first layer self-insurance tool against external shocks, apart from bilateral swap arrangements, regional financial arrangements and its own financial backstop facilities. Nonetheless, IMF in its country assessments has often been prescriptive against holding excess reserves. For instance, in its Article IV Report on India (October 2021), the IMF noted that “further accumulation of reserves is less warranted, and foreign exchange intervention should be limited to addressing disorderly market conditions”. At the same time, the IMF's External Sector Report (2021) has assessed that India has been maintaining external balances in line with its fundamentals each year during 2012-20.

Accretion to India's reserves buffer in recent years had been an outcome of modest levels of current account deficit (CAD) relative to the size of net capital inflows. This is broadly in line with the trend observed across select EMEs in the post-COVID period, partly reflecting the impact of ultra-accommodative monetary policies in major advanced economies (AEs) in pushing capital to flow out in search of higher return. India's CAD recorded a sharp decline in 2019-20 and a surplus in 2020-21. On the other hand, the capital account¹ recorded surplus in both

* This article is prepared by Dr. Dirghau Keshao Raut and Deepika Rawat in the Department of Economic and Policy Research, Reserve Bank of India. The authors are grateful to Dr. Deba Prasad Rath and Dr. Rajeev Jain for their valuable comments and guidance. The views expressed in this article are those of the authors and do not represent the views of the Reserve Bank of India.

¹ Capital account includes FDI, FPI, loans, banking capital, rupee debt service and other capital.

these years led by foreign direct investment (FDI). Consequently, there was an accretion to foreign exchange reserves to the tune of US\$ 147 billion (on BoP basis) during 2019-20 and 2020-21. In 2021-22, reserve accretion (including valuation effect) has been of the order of US\$ 30 billion.

From an accounting perspective, factors driving changes in foreign exchange reserves are easily identifiable from BoP statistics. However, whether the reserve build-up in a country is for precautionary or mercantilist motive is hard to gauge due to lack of objective criteria on the level of reserve adequacy and intangible nature of benefits associated with reserves buffer. While the precautionary demand for reserves is for the purpose of mitigating the impact of external spillovers, mercantilist approach views reserve accumulation as a means to derive trade benefits and promote domestic industry through exchange rate management. Besides holding reserves buffer, central banks also tend to enter into currency swap arrangements as a complementary form of insurance. Incidentally, during GFC and COVID-19 period, the US Federal Reserve offered swap lines to select foreign central banks in order to enhance their capacity to deliver US dollar funding to institutions in their respective jurisdictions during times of market stress. Similarly, India's bilateral swap arrangement with Japan enables to swap local currencies against the US dollar for an amount of up to US\$ 75 billion. Empirically, foreign exchange reserves in EMEs in the long-run are found to be determined by the current account balance, interest rate differentials, average propensity to import and real effective exchange rate (Sooriyan, 2017).

Against this backdrop, this article attempts to answer the question as to why EMEs accumulate reserves and what are the implications of holding reserves. The rest of the article is divided into five sections. Section II provides stylised facts on foreign exchange reserves across EMEs, which is followed by

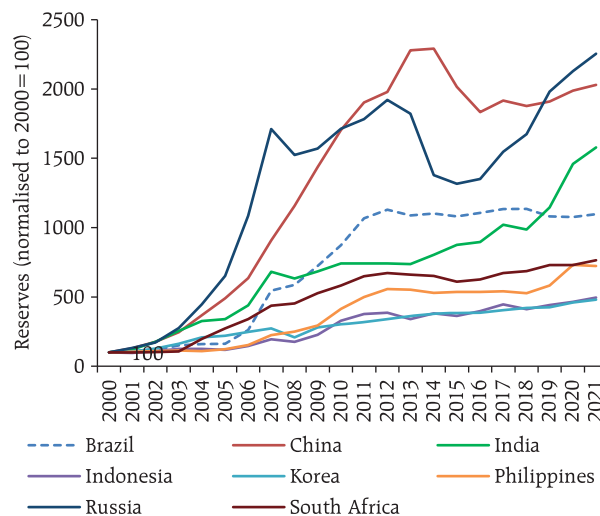
a discussion on sources and composition of India's foreign exchange reserves in Section III. Estimates of determinants of foreign exchange reserves in EMEs are provided in Section IV. Implications of reserves such as for external sector stability and the cost of foreign currency borrowing are set out in Section V. Section VI concludes the article.

II. Stylised Facts

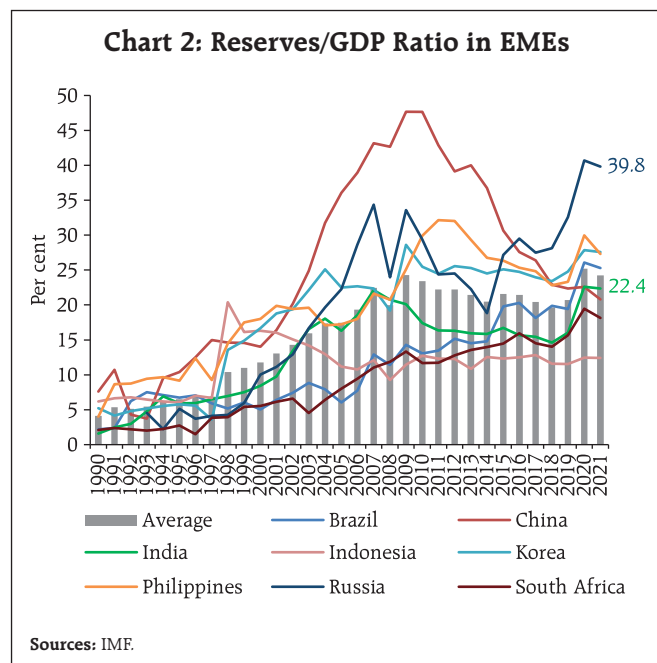
II.1 Foreign Exchange Reserves in EMEs

Foreign exchange reserves of EMEs have increased manifold since 2000 but the pace accelerated since mid-2000s (Chart 1). Reserves to GDP ratio, which was hovering around 10 per cent during the 1990s for majority of the EMEs, rose sharply and surpassed 20 per cent in the pre-GFC year, *i.e.*, 2007 and increased further after a blip in the GFC year (2008). Increase in global liquidity and easy monetary policies in major AEs were the prominent factors causing capital flows to EMEs. Pro-reform policies and gradual opening up of domestic economies were also cited as the factors driving capital flows to EMEs (Mohan, 2008). However, the pace of reserve accumulation appears to have

**Chart 1: Reserve Accumulation in EMEs
(2000=100)**



Sources: IMF.



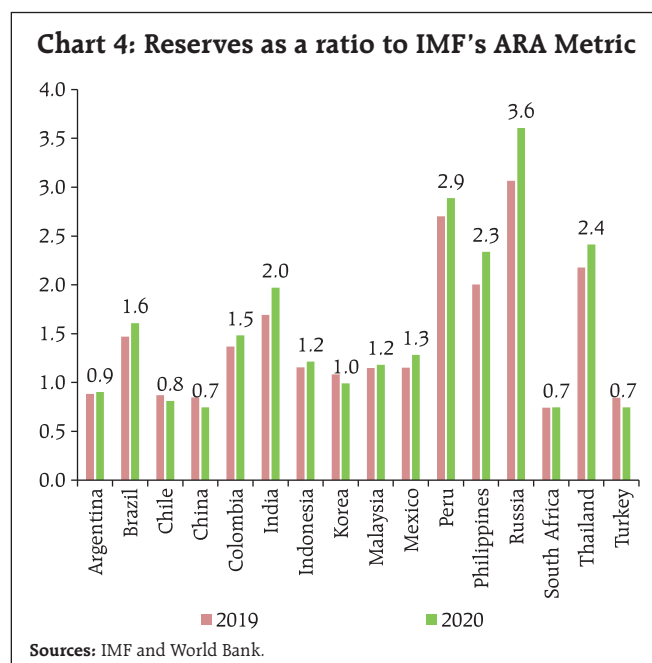
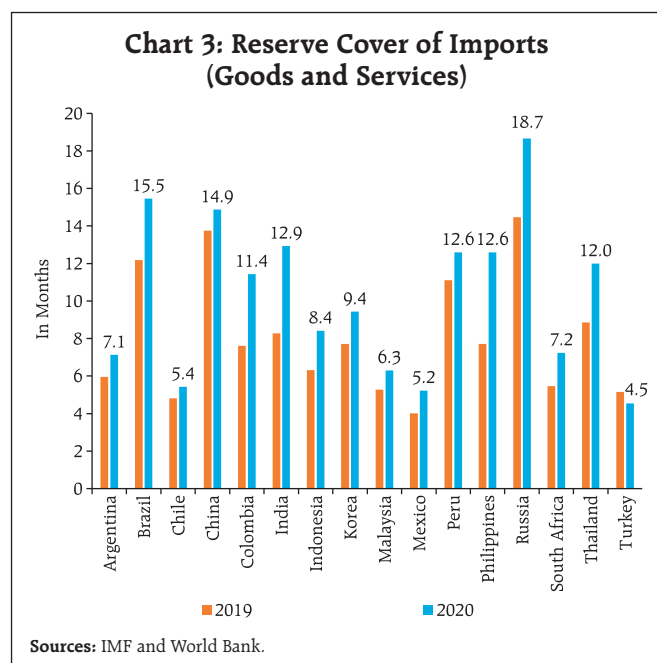
moderated post-2010 reflecting *inter alia* the impact of general trend of de-globalisation as evident from declining trade and financial openness amidst rising trade protectionism, growth slowdown and the impact of lower crude oil prices on trade balances of oil/commodity exporting countries. In the aftermath of COVID-19 in early 2020, many EMEs witnessed sudden stops and depleted reserves. However, with the unprecedented monetary easing and large fiscal stimulus by major AEs, capital inflows to EMEs resumed and along with SDR allocation by the IMF, reserve holdings of EMEs reached record levels and a few of them surpassed their earlier peaks (Chart 2).

II.2 Reserve Adequacy

Uncertainty of oil price movement and interest rates which affects trade balance and capital flows, respectively, impart volatility to reserve levels in EMEs. As there is no universally accepted definition of reserve adequacy, several benchmarks have been used by policymakers to measure reserve adequacy. From the perspective of precautionary motive, reserve adequacy levels are suggested to be

higher for fixed exchange rate countries relative to flexible exchange rate countries. Among different benchmarks, reserve cover of imports, reserve cover of short-term debt (original and residual maturity) and reserves to broad money ratio have been the traditional and most widely applied benchmarks. For example, the popular Guidotti-Greenspan rule suggests an ideal level of reserves to be equal to short-term external debt having maturity of up to one-year. Wijnholds and Kapteyn (2001) suggested reserves to be adequate to cover short-term external debt and an adjusted broad money where the adjustment depends upon the exchange rate regime and country risk. Some studies also suggested model-based reserve adequacy level taking into account the opportunity cost of holding reserves and benefits of smoothing domestic absorption during sudden stops (Jeanne and Rancière, 2011). The IMF's analytical framework uses an assessing reserve adequacy (ARA) metric² which includes some of the above indicators. These indicators encompass multiple channels of market pressure and a broader set of risks that an EME can potentially face. The ARA metric is a composite value which takes into account the short-term external debt, broad money, export income coverage and other liabilities. According to the IMF, the ratio of reserves to ARA metric value between 1-1.5 is considered as an adequate level of reserves. Chart 3 shows reserve cover of imports, the most widely used measure of reserve adequacy, which has shown improvement in 2020 over 2019 for all EMEs except Turkey. The trend in reserves based on IMF's ARA metric also revealed that majority of the EMEs witnessed an improvement in their reserve adequacy. However, Chile, China, Korea and Turkey recorded a decline in their ratio of reserves to ARA metric value in 2020 over 2019 (Chart 4). India's reserve as a ratio to ARA metric stood at 2 indicating that the reserve level is higher than the

² Reserves as a per cent of IMF's ARA metric is provided in IMF's External Sector Report and in Article IV Report of the respective economy.



assessed value.

India's reserves in terms of ratio of IMF's ARA metric reveals that it increased from 1.1 in 2000 to a peak of 2.6 in 2007 before declining during the taper tantrum period to 1.4 and climbing again to 2.0 in 2020. India is not the only country among EMEs

recording an increase in reserves to ARA metric ratio (Table 1). However, experience suggests that reserve adequacy in EMEs assessed based on current data may not be appropriate given the susceptibility of EMEs to global financial developments such as monetary policy actions in major advanced economies and the dynamics of commodity prices like gold and crude

Table 1: Reserve/ARA Metric (Ratio)

	2000	2005	2006	2007	2008	2009	2012	2013	2019	2020
Argentina	0.6	1.0	0.9	1.1	NA	1.4	1.0	0.7	0.9	0.9
Brazil	NA	0.6	0.8	1.2	1.6	1.3	1.6	1.6	1.5	1.6
Chile	1.5	1.1	1.1	0.8	1.0	1.0	1.1	1.1	0.9	0.8
China	NA	1.5	1.6	1.8	2.0	2.0	1.6	1.5	0.8	0.7
Colombia	1.0	1.3	1.3	1.5	1.6	1.5	1.4	1.4	1.4	1.5
India	1.1	2.0	2.2	2.6	2.1	2.0	1.4	1.4	1.7	2.0
Indonesia	NA	1.0	1.1	1.2	1.2	1.2	0.9	1.2	1.2	1.2
Korea	1.1	1.3	1.2	1.1	1.1	1.2	1.1	1.1	1.1	1.0
Malaysia	NA	2.1	2.1	2.1	2.0	1.2	1.1	1.0	1.1	1.2
Mexico	NA	1.0	0.8	0.8	0.8	1.2	1.2	1.2	1.2	1.3
Peru	1.3	1.8	1.8	2.3	2.7	2.5	3.0	3.2	2.7	2.9
Philippines	NA	1.1	1.2	1.5	1.8	2.1	2.6	2.4	2.0	2.3
Russia	NA	1.9	2.3	1.8	1.9	1.9	1.6	1.5	3.1	3.6
South Africa	0.5	0.6	0.7	0.7	0.9	0.8	0.8	0.8	0.7	0.7
Thailand	1.2	1.5	1.6	1.8	2.5	2.9	2.3	2.1	2.2	2.4
Turkey	0.7	0.9	0.9	0.9	0.9	0.9	1.0	1.0	0.8	0.7

Source: IMF.

oil (Reddy, 2006). For example, during the phase of lower oil prices and accommodative monetary policies of major AEs, EMEs like India witnessed reserve accumulation during 2020-21. However, the process of accumulation shifted to depletion with rising trend in oil prices and interest rates in major AEs.

III. Sources and Composition of India's Foreign Exchange Reserves

Foreign exchange reserves include foreign currency assets (which include investment in foreign government treasury bills, deposits with other central banks), gold, Special Drawing Rights (SDR) and Reserve Tranche Position (RTP). Composition of reserves is determined by taking into account factors which *inter alia* includes safety, liquidity and return. Some countries, however, also change their reserve composition due to geopolitical concerns. From the operational perspective, central bank interventions, income on reserve assets and allocation of SDRs by the IMF could be the major sources of accumulation of official foreign exchange reserves. From the economic point of view, reserve accretion can be decomposed into contribution of balance of payments and valuation effect. As reserves are held mainly in the form of foreign currency assets and gold, their value is influenced by movement in exchange rate (*vis-à-vis* the currencies in which reserves are denominated) and the price of gold. Increase in gold price and exchange rate depreciation of the US dollar against major currencies lead to valuation gains resulting into increases in stock of reserves. The valuation gains/losses usually constitute a smaller portion while a larger chunk is driven by balance of payments surplus; a current account surplus – a phenomenon of higher receipts than payments from goods and services trade, transfers and investment income – or a capital account surplus reflecting an increase in foreign liabilities in the form of foreign investment and loans, or a combination of both. The net valuation effect is usually smaller and temporary as gains in a year/month may be followed by losses in the next period

and vice versa. Thus, reserve accumulation is broadly a reflection of long-term surplus in BoP in current account and/or capital account. For example, reserve accumulation in China, Russia and Thailand occurs mainly due to current account surpluses in contrast to India, Indonesia and Turkey where it is usually driven by capital account surpluses. Reserve accumulation in countries with current account deficit indicates excess of capital flows over CAD or inability to absorb capital inflows. In contrast, reserve accumulation in current account surplus countries indicates excess of domestic savings over investment and the resultant capital outflows due to interest rate differentials.

The trend in India's forex reserves reveals that despite liberalization of the economy and adoption of current account convertibility since the early 1990s, reserve level remained low during the 1990s. However, the reserves started rising since 2000 due to various factors. First, India initiated measures towards capital account convertibility which attracted capital inflows. Second, lower oil prices during the early 2000s contained trade deficit. Third, software services exports and remittances from Indians employed overseas improved the current account of balance of payments to a surplus during 2001-04 and a moderate deficit thereafter till 2007-08. Fourth, foreign capital inflows surged since the mid-2000s. Consequently, India witnessed large accretions to foreign exchange reserves, increasing from US\$ 38 billion at end-March 2000 to US\$ 113 billion in 2003-04 and crossed US\$ 300 billion mark in 2007-08. However, reserves depletion during the GFC period was followed by rising oil prices, ballooning of current account deficit and sudden stops during the taper tantrum period which slowed the pace of reserve accumulation during 2008-09 to H1:2013-14. Lower oil prices and the consequent moderation in CAD led to further increase in reserves to US\$ 425 billion in 2017-18, though a surge in CAD and moderation in portfolio flows caused depletion of foreign exchange reserve after a gap of five years in 2018-19.

In subsequent years, the pace of reserve build-up accelerated further amid low external funding requirements. More than half of total reserves of US\$ 607 billion (as on March 31, 2022) has been accumulated since April 2012. Sluggish import demand due to COVID-19 related restrictions on movement of people and the slowdown in the domestic economy, supplemented by lower oil prices, contributed to reducing the trade deficit during 2020-21. On the other hand, invisibles remained broadly stable reflecting lockdown induced external demand for computer services. Consequently, India recorded a current account surplus in 2020-21 after a gap of 16 years. Net capital flows remained broadly strong in 2020-21, despite the transitory impact evident in Q1. For example, FDI bucked the trend at global level and continued to maintain its momentum as evident from an increase in net FDI during 2019-20 and 2020-21. India's capital market also benefitted from portfolio inflows steered by exceptional monetary policy support in major advanced economies. However, with the revival of domestic economy and rising oil prices since Q3:2021-22, India's trade deficit increased sharply during Q3:2021-22. On the other hand,

reversal of monetary policy stances in major AEs and Russia-Ukraine conflict caused portfolio outflows since October 2021. This has reflected in a depletion of foreign exchange reserves during the past few months.

III.1 Episodes of Reserves Accumulation/Depletion

Since 1991, there has been an accumulation in foreign exchange reserves in all years barring five years, viz., 1995-96, 2008-09, 2011-12 and 2012-13, and 2018-19 (Table 2). Usually, episode of a depletion or large accumulation coincide with abnormal global economic and financial developments. For example, the depletion in 2008-09 reflected the use of foreign exchange reserves to ease the external financing conditions during GFC, when India recorded FPI outflows; and in 2011-12 and 2012-13 the depletion was caused by higher CAD due to increase in oil prices and gold imports. Similarly, large accretions to reserves in 2007-08 and 2020-21 were an outcome of abundant supply of global liquidity.

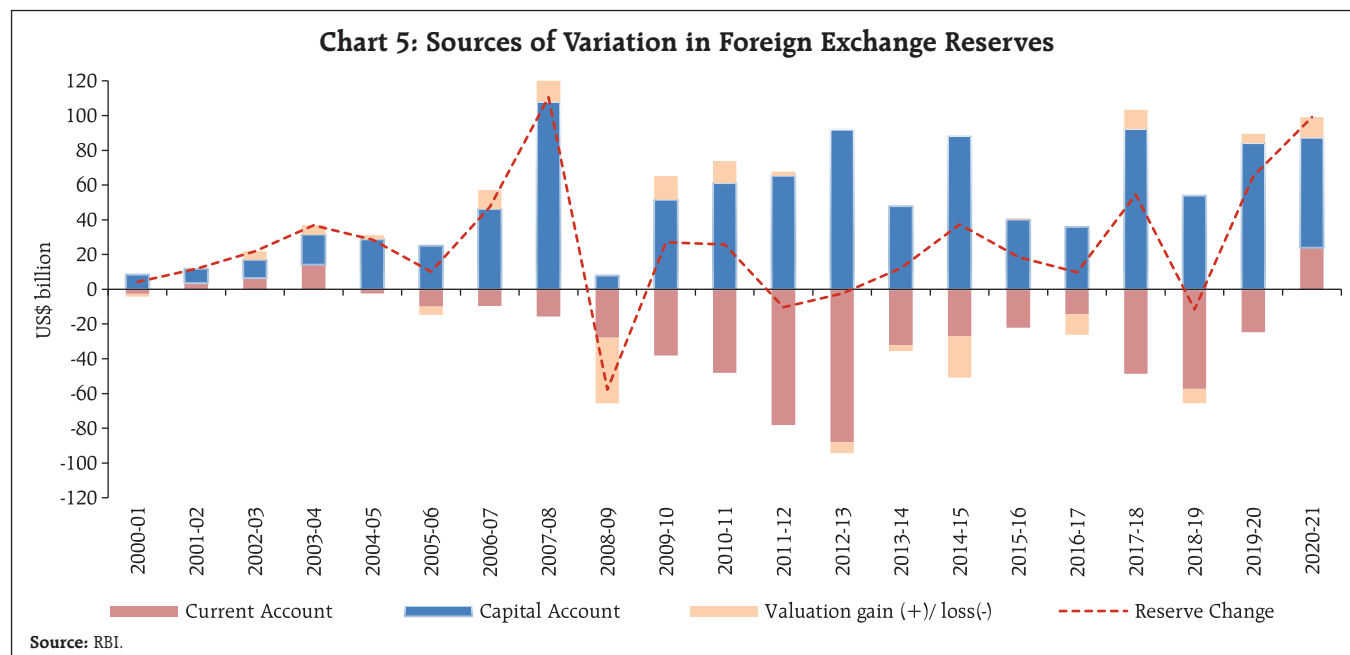
The reserves built-up out of a current account surplus indicates the nation's income earned from foreign countries while reserves contributed by a

Table 2: Reserve Changes and Balance of Payments

(In US\$ Billion)

Depletion										
	Nominal	BoP Basis	CAD	FDI	FPI	Banking Capital	STC	External Assistance	ECB	Other Items
1995-96	-3.5	-1.2	-5.9	2.1	2.7	0.8	0.0	0.9	1.3	-2.9
2008-09	-57.7	-20.1	-27.9	22.4	-14.0	-3.2	-2.0	2.4	7.9	-5.6
2011-12	-10.4	-12.8	-78.2	22.1	17.2	16.2	6.7	2.3	10.3	-9.4
2012-13	-2.4	3.8	-88.2	19.8	26.9	16.6	21.7	1.0	8.5	-2.4
2018-19	-11.7	-3.3	-57.2	30.7	-0.6	7.4	2.0	3.4	10.4	0.5
Accumulation (US\$ 30 billion >)										
2003-04	36.9	31.4	14.1	2.4	11.356	6.0	1.4	-2.9	-2.9	1.9
2006-07	47.6	36.6	-9.6	7.7	7.1	1.9	6.6	1.8	16.1	5.0
2007-08	110.5	92.2	-15.7	15.9	27.4	11.8	15.9	2.1	22.6	12.2
2014-15	37.4	61.4	-27.9	32.6	40.9	11.6	-0.9	1.6	2.7	0.7
2017-18	54.6	43.6	-48.7	30.3	22.1	16.2	13.9	2.9	-0.2	7.0
2019-20	64.9	59.5	-24.7	43	1.4	-5.3	-1.0	3.8	23.0	19.4
2020-21	99.2	87.3	23.9	44	36.1	-21.1	-4.1	11.2	-0.1	-2.6

Source: RBI.



capital account surplus indicate net incurrence of liabilities. Chart 5 shows the contribution of current and capital account in annual change in reserves. As reiterated by the Reserve Bank of India from time to time, India's reserve accumulation has been contributed mainly by capital account surplus. During the last 20 years, India had current account surplus only in four years *i.e.*, 2001-02 to 2003-04 and in 2020-21.

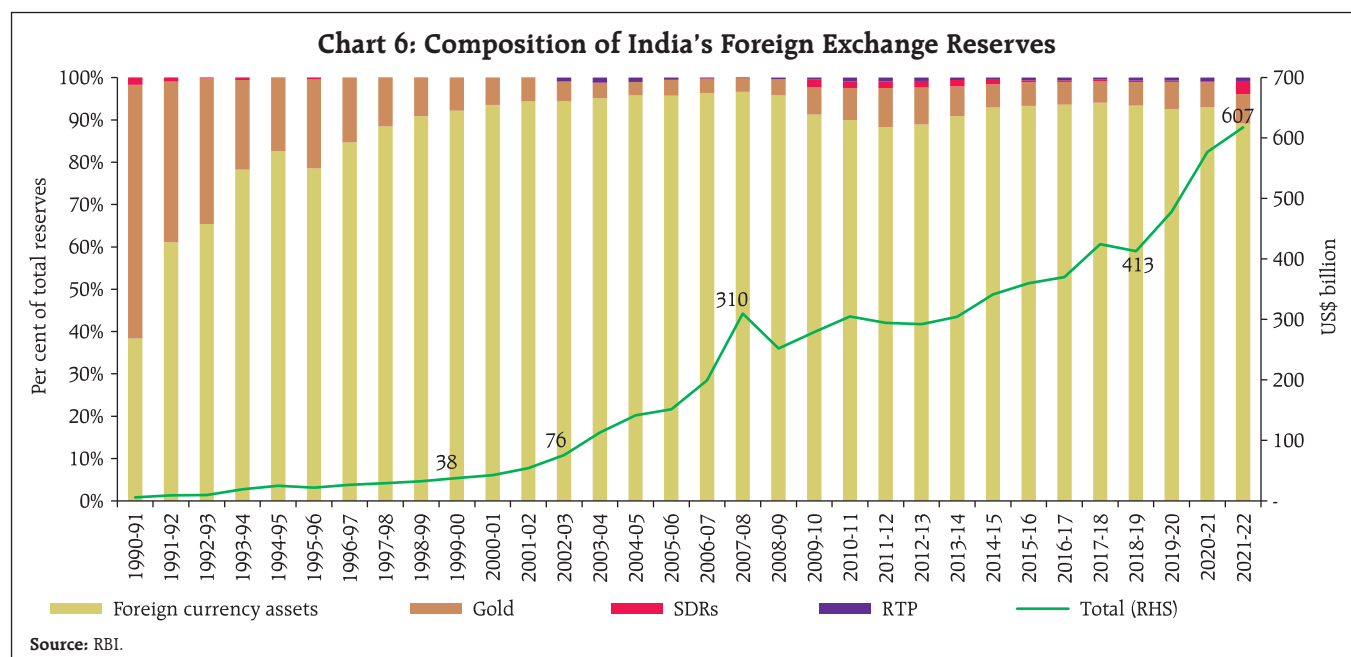
III.2 Composition of Foreign Exchange Reserves

The share of foreign currency assets in total reserves has increased to above 90 per cent from just two-third in 1992-93. Since reserves are maintained as risk buffers, India's reserves are kept in major convertible currencies and reserve management is guided by the principle of safety, liquidity and return. However, appropriate emphasis on diversification of reserves was given from time to time. For example, the value of gold held as foreign exchange reserve which stood at US\$ 10 billion during the GFC year of 2008-09 increased during 2009-10 when the RBI purchased 200

metric tonnes of gold from the IMF in November 2009 (RBI, 2010) and thus the value of gold almost doubled reaching US\$ 18 billion in 2009-10 (Chart 6). The RBI continued to build up gold reserves in the subsequent years *albeit* at a gradual pace from 558 tonnes at end-March 2010 to 744 tonnes at end-September 2021 and thus the value of gold reserves increased from US\$ 18 billion to US\$ 37 billion. Similarly, allocations of SDR by the IMF in 2009 and 2021 also augmented the SDR component of reserves which valued US\$ 19 billion as at end-March 2022. Additions of gold to foreign exchange reserves in an environment of low/negative international interest rates is argued to be beneficial and can benefit a country in terms of sovereign creditworthiness during episodes of financial market volatility and crisis (IIM-A, 2021).

IV. Determinants of Foreign Exchange Reserves: Mercantilist Versus Precautionary Motive

The literature emphasises mainly two motives behind accumulation of reserves, *viz.*, mercantilist and precautionary. According to the mercantilist view, reserves are accumulated to promote an export led



economic growth (Rodrick, 2008, Choi and Taylor, 2017). As per this approach, economies undervalue their currencies using reserves to support exports (Dooley *et al.*, 2004, and Korinek and Serven, 2016). Another strand of literature indicates precautionary motive of holding reserves wherein countries maintain reserves buffer in order to avoid output and consumption losses during 'sudden stops' of capital flows (Jeanne and Rancière, 2011). Aizenman and Lee (2005) found reserve accumulation in developing countries being driven by precautionary motive. Reddy (2002) also pointed out that central banks' demand for reserves is driven by precautionary motive such as intervening in foreign exchange market to curb exchange rate volatility driven by unpredictable flows. However, changes in these motives over a period of time have also been documented (Ghosh *et al.*, 2016). Against this backdrop, an empirical exercise estimating a panel auto regressive distributed lag (ARDL) model was undertaken to identify the long-run determinants of reserves. Following Aizenman and Lee (2005), we estimate demand for foreign exchange reserves for a panel of 16 countries – comprising mainly countries with a floating exchange rate regime.

Annual data from 1980 to 2020 on reserves are sourced from the World Bank database; volume of exports (LEXPV) and imports (LIMPV) in the form of index is obtained from the UNCTAD database; terms of trade data (LTOT) from IMF and real effective exchange rate (REER) from BIS for calculating volatility (ERVOL). While LEXPV and LIMPV underline the importance of the size of a country's cross-border trade transactions, ERVOL is a proxy for capturing instability in foreign exchange market caused by short-term capital flows driven by monetary policy changes in major advanced economies. *A priori*, higher ERVOL means the need for higher reserves. Similarly, the inclusion of LTOT is to capture the gain/loss that may warrant scaling up of reserves depending on the global price shocks relevant for the country's basket of exports and imports. Following Aizenman and Lee (2005), the second lag of growth of three-year moving average of real exports index (DLAVGEXPO) was used as a control variable while the ratio of market exchange rate to PPP exchange rate (ERDEV) is also used to capture the mercantilist motive of holding reserves. For precautionary motive, a dummy variable taking value 1 for a year

after sudden-stop/currency crisis and 0 other wise (DUMCRISIS) was computed.

In view of the mixed evidence with regard to time series properties of the variables chosen *i.e.*, stationary and non-stationary (Annex 1), a panel ARDL model is used. Results in column 2 and 3 in Table 3 reveal that in the long run, favourable terms of trade and an increased volume of exports reduce the demand for reserves. The negative sign of exports coefficient indicates that reserve accumulation in EMEs is not associated with mercantilist approach. In other words, EMEs tend to reduce reserve holdings during high export performance despite their potential implications for export competitiveness. On the other hand, a positive sign of import index and the coefficient of variation (CV) of REER may be pointing to the fact of precautionary demand for reserves driven by increase in volume of imports and volatility of REER. The results provided in Table 3 (column 4 and 5) indicate that the coefficients of variables representing deviations of exchange rate from PPP exchange rates (*i.e.*, ERDEV) and the second lag of growth of three-year moving average of real exports index (DLAVGEXPO) have negative signs.³

Table 3: Determinants of Foreign Exchange Reserves in EMEs (Dependent variable: log of foreign exchange reserves)

	Coefficient	t-Statistic	Coefficient	t-Statistic
1	2	3	4	5
LTOT	-9.490***	-5.44	-4.329***	-7.90
LEXPV	-0.981***	-3.26		
LIMPV	2.280***	7.49	1.202***	28.75
ERVOL	4.647**	2.17		
DLAVGEXPO (-2)			-0.394	-0.86
ERDEV			-0.204***	-6.34
DUMCRISIS			0.203**	2.18
Error correction Term	-0.089**	-1.97	-0.33***	-3.30

Note: *** and ** indicate level of statistical significance at 1 per cent and 5 per cent, respectively.

³ Negative sign of the coefficient of exports index is found to be consistent when used in level form or second lag of growth rate as it was used by Aizenman and Lee (2005).

The negative sign of the coefficient of exchange rate deviation indicates that depreciation of exchange rate relative to PPP exchange rate does not lead to an increase in reserves implying the absence of mercantilist motive. On the other hand, dummy representing a year after sudden-stop/currency crisis which captures precautionary motive has a positive sign confirming EMEs' precautionary motive behind accumulating reserves as a self-insurance.

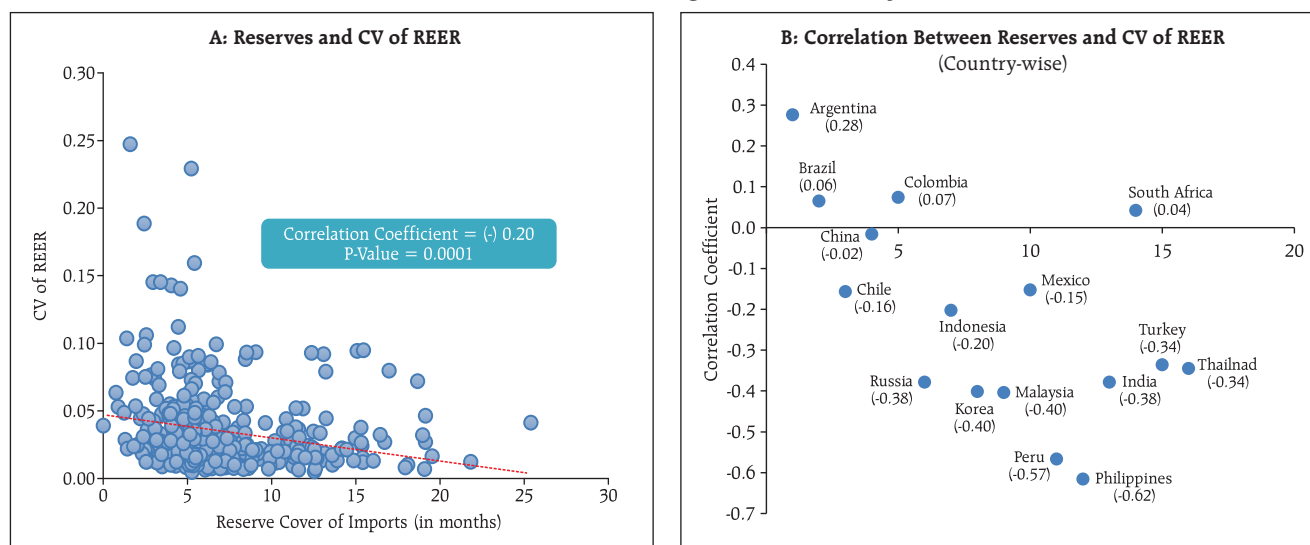
V. Implications of Foreign Exchange Reserves

As per the IMF's balance of payments manual, foreign exchange reserves are useful in directly influencing the exchange rate apart from hidden implications for foreign borrowings and confidence in the economy. To quote the IMF (2009)⁴ "Reserve assets are those external assets that are readily available to and controlled by monetary authorities for meeting balance of payments financing needs, for intervention in exchange markets to affect the currency exchange rate, and for other related purposes (such as maintaining confidence in the currency and the economy and serving as a basis for foreign borrowing)." In this context, evidence with respect to some of the implications of reserves is provided below.

V.1 Volatility of Exchange Rate

Volatility in forex market due to a global macro-financial shocks may affect trade flows through volatile exchange rates; balance sheet positions of banks; and hedging cost of corporates due to volatile forward rates. Therefore, central banks' interventions are aimed at curbing excessive volatility in exchange rate. Since central banks' intervention capacity depends upon the level of reserves, adequacy of reserves matters for the size, frequency and efficacy of interventions to reduce

⁴ Balance of payments and international investment position manual, sixth edition (BPM6), IMF (2009).

Chart 7: Reserves and Exchange Rate Volatility in EMEs

Sources: IMF; BIS; and Authors' calculations.

exchange rate volatility. Against this backdrop, the correlation between coefficient of variation (CV)⁵ of real effective exchange rate⁶ (proxy for exchange rate volatility) and the reserves (represented by reserve cover of imports) are computed for select EMEs using data from 1994-2020 (Chart 7A and 7B). The negative and statistically significant correlation coefficient between reserves and the CV of REER was broadly in line with the evidence of studies on efficacy of central bank intervention in lowering volatility (Berganza and Broto 2012; Fratzscher *et. al.*, 2018).

V.2 Forward Premia

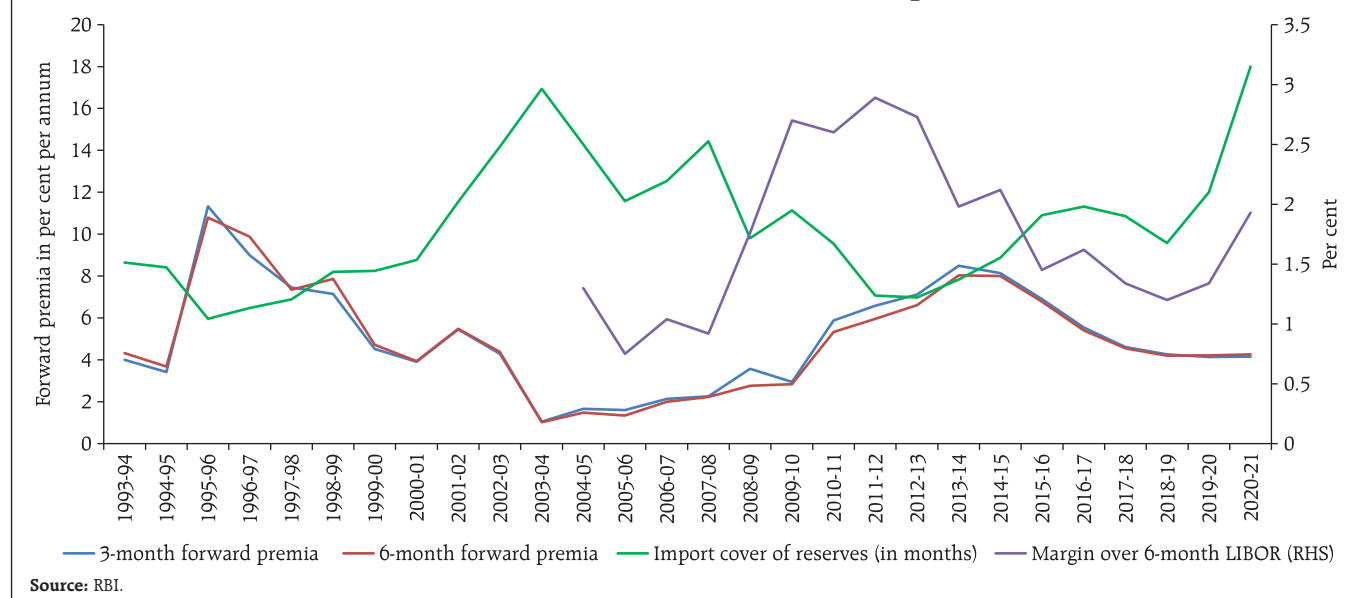
Forward premium, which is the future price of a currency, serves as a benchmark for hedging cost for corporates with foreign currency exposures (e.g., imports and/or foreign borrowings). Empirical evidence suggests that the size of forex reserves acts as a deterrent against speculative attack and, therefore, reduces sovereign risk premium in adverse

economic circumstances (Kohlscheen 2020). Yeyati (2008) argues that reduction in risk premia due to forex reserves through its effects on sovereign credit rating implies lower effective cost of holding reserves. However, forex interventions in the form of forward purchases are found to be associated with increase in forward premia (RBI, 2021). Covered interest rate parity condition suggests that interest rate differential between two countries is reflected in forward rate. In the Indian context, there is a negative relationship between forward premia and the reserve cover of imports (Chart 8). The correlation coefficient of import cover of reserves with 3-month and 6-month forward premia is found to be negative -0.67 (p-value, 0.00) and -0.65 (p-value, 0.00), respectively, for the period from 1993-94 to 2020-21. Further, the correlation of interest rate on external commercial borrowings (ECBs) proxied by weighted average margin over LIBOR (margin over 6-month LIBOR or reference rate for floating rate loans) with reserve cover of imports during 2004-05 to 2020-21 was negative at -0.48 (p-value, 0.05). This implies that adequate level of reserves are accompanied with low cost of foreign currency borrowings.

⁵ Coefficient of variation for the year is calculated using monthly REER data of BIS.

⁶ In order to exclude the impact of domestic inflation, real exchange rate is considered.

Chart 8: Forward Premia and Reserve Cover of Imports in India



V.3 Role of Reserves in External Sector Stability

One of the major arguments given in favour of accumulation of reserves is its role as a deterrence against speculative attack on the currency in the event of sudden stops. A speculative attack can cause sharp depreciation, a currency crisis, which necessitates central banks to intervene in the foreign exchange market or to increase domestic interest rates (Glick and Hutchison, 2011) and the currency crisis raises the probability of a banking crisis (Glick and Hutchison, 2001). Against this backdrop, the role of foreign exchange reserves in currency crisis is examined. A binary response model which takes the value 1 in crisis year and 0 in other years is used and estimated applying a probit model. The sample includes 15 emerging market economies⁷, a mix of both current account deficit and surplus countries. Annual data from 1980 to 2020 on these 15 countries are used and the sample includes 70 data points of currency crises. Country-wise currency crisis data for the period from

1980 to 2000 as provided in Glick and Hutchison⁸ (2001) is used. For 2001-20, country-wise currency crisis years identified using exchange market pressure database of Patnaik *et al.* (2017)⁹ and real effective exchange rate following Esquivel and Larrain¹⁰ (1998).

Following IMF (2020) and Goyal (2012), determinants of currency crisis considered for this study includes (i) net foreign assets as per cent of GDP (*NFA*) [alternatively external liabilities decomposed into debt liabilities as per cent of GDP (*external debt*) and equity liabilities as per cent of GDP (*equity liabilities*)]; (ii) reserve cover of imports of goods and services (*reserve cover*) in months; (iii) *external financing* requirement measured by stock of short-

⁷ Argentina, Brazil, Chile, Colombia, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Russia, South Africa, Thailand and Turkey.

⁸ Currency crisis is defined as changes in currency pressure index (weighted average of monthly real exchange rate changes and monthly reserve losses) exceeding mean plus 2 times country-specific standard deviation.

⁹ mean plus 2 times country-specific standard deviation changes in exchange market pressure index are treated as currency crisis.

¹⁰ Three-month cumulative change in real exchange rate change of 15 per cent or more, or one-month change exceeding 2.54 times the country-specific standard deviation, provided that it also exceeds 4 per cent.

term external debt at the start of the year and current account deficit; and (iv) the real per capita income (PCI) in US dollar (\$). Country-wise net foreign assets data are sourced from 'External Wealth of Nations' database of Lane and Milesi-Ferretti (2017) for 1970-2015¹¹. Similarly, data on the composition of external liabilities in terms of debt and equity is obtained from Lane and Milesi-Ferretti (2017) and World Bank data on external debt. The data on current account deficit and short-term debt are taken from the IMF database and the World Bank, respectively. Nominal GDP in US dollar is sourced from World Bank database and used for computing GDP ratios of NFA, external debt and equity liabilities.

Results of the Probit model presented in Table 4 show improvement in NFA (*i.e.* external assets net of external liabilities) reducing probability of currency crisis as observed in earlier studies (IMF, 2020 and

Goyal, 2012) pointing to the importance of adhering to a sustainable current account deficit¹². However, when NFA is decomposed into debt and equity it reveals that an increase in debt is associated with higher probability of a crisis. On the other hand, an increase in equity liabilities is found to reduce probability of a currency crisis, corroborating the preference for equity inflows over debt in capital account management by EMEs. These findings, *viz.*, probability of a crisis being influenced positively by external debt and negatively by equity liabilities, is in line with the IMF's External Sector Report, 2020. When debt liabilities were replaced by external financing requirement (taking a first lag of short-term external debt and current account balance) their impact on probability of crisis was found to be more pronounced in terms of the size of coefficient. Finally, per capita income representing domestic economic conditions was added as an explanatory variable which was found to lower the probability of a crisis, thereby suggesting an important role for strong domestic macroeconomic fundamentals in absorbing adverse external shocks.

V.4 Composition of External Liabilities

While reserve accumulation forms a part of central bank assets, the concomitant increase in liabilities can be seen in the country's international investment position (IIP) statistics. In view of its varying impact on crisis probability, external liabilities can be analysed by decomposing them into debt and equity. India's accumulation of external liabilities in the past two years has been largely driven by non-debt creating equity flows. For example, in 2020-21 India witnessed large net inflows of FDI and outflows of ECBs. FPI inflows in 2020-21 were mainly in the form of equity. Further, FPI inflows were from category-I

Table 4: Probit Model Results

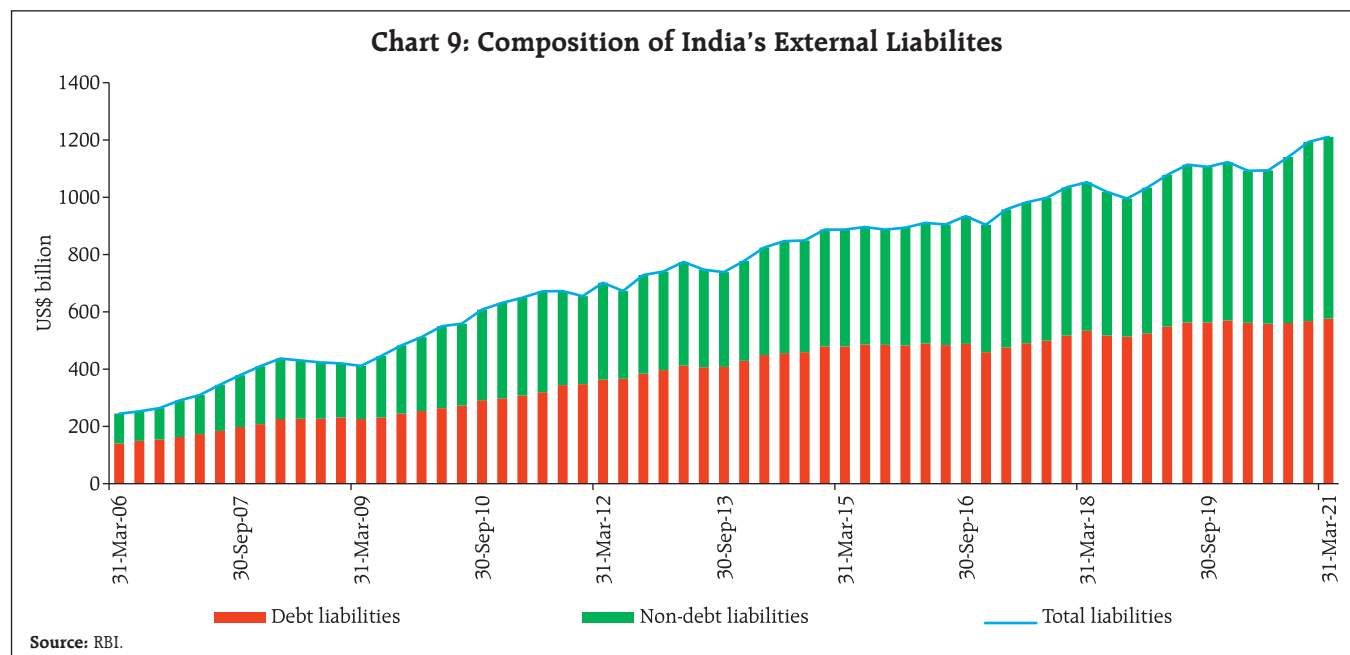
(Dependent Variable: Probability of Currency Crisis)

	1	2	3	4
Constant	-1.392*** (-11.93)	-0.830*** (-3.96)	-2.711*** (-3.97)	-2.520*** (-3.57)
NFA	-0.007** (-2.15)			
Reserve Cover		-0.078*** (-2.74)	-0.103*** (-3.20)	-0.100*** (-3.04)
External Debt		0.007** (2.03)		
Equity Liabilities		-0.011*** (-2.77)	-0.017*** (-3.51)	-0.016*** (-3.39)
External Financing			0.259*** (3.37)	0.243*** (3.05)
PCI growth				-7.758*** (-4.68)
McFadden	0.01	0.08	0.10	0.15
R-Squared				
LR Statistic	4.70	32.48	37.47	59.38

Note: 1. '***' and '**' denotes statistical significance at 1 per cent and 5 per cent probability level, respectively.
2. Figures in brackets are z-statistics.
3. Estimation in column 3 and 4 excludes Chile and Korea for which short-term debt data was not available.

¹¹ For the remaining years, *i.e.*, 2016-20, NFA computed by adding net current account position as the change in NFA equals current account balance and valuation changes.

¹² $NFA_t - NFA_{t-1} = CA_t + K_t + EO_t$ where CA= current account balance K= valuation changes and EO= error and omissions.



(i.e., central banks, sovereign wealth funds and multilateral agencies) i.e., relatively stable FPI. This has reflected in the lower share of debt liabilities in external liabilities, which declined gradually from 51.5 per cent at end March-2020 to 47.6 per cent at end-March 2021 (Chart 9). Consequently, the reserve cover of debt liabilities increased in recent years to reach 100.1 per cent at end-March 2021 from below 70 per cent during 2013-14, though it is much lower than the highest level of 138 per cent recorded during end-June 2008.

VI. Conclusion

This article analyses the trend of reserve accumulation in major EMEs with a focus on key drivers and motives or objectives. It is observed that EMEs accumulated reserves during the COVID-19 period benefitting from abundant global liquidity propelled by ultra-accommodative monetary policies pursued in major advanced economies. Several EMEs witnessed increase in reserves to GDP ratios and reserve adequacy levels. India's reserve accumulation in recent period has been broadly in

line with the trend witnessed across EMEs and an outcome of both capital flows and modest level of current account deficits.

Empirical analysis shows that in the long-run reserve accumulation of EMEs is determined by the precautionary motive rather than any mercantilist motive. On the benefits, reserves are found to be helping EMEs in curbing volatility of exchange rates, as evident from the negative relationship between exchange rate volatility and reserve cover of imports. Estimation of a Probit model revealed that an increase in reserves reduces the probability of a currency crisis, thereby implying positive externality of holding reserves. For India, higher reserve cover of imports is found to be associated with lower cost of foreign currency borrowings, viz., forward premia and the interest rate on ECBs. Further, the decomposition of India's external liabilities reveals lower vulnerability due to rising share of non-debt liabilities in total liabilities and an increased reserve cover of debt liabilities.

References:

- Aizenman J. and Lee J. (2005) 'International Reserves: Precautionary vs. Mercantilist Views, Theory and Evidence' *IMF Working Paper No 198*.
- Arslan, Y. and Cantú, C. (2019), 'The size of foreign exchange reserves' *BIS Papers*, No. 104
- Berganza, J. and Carmen Broto C. (2012), 'Flexible inflation targets, forex interventions and exchange rate volatility in emerging countries', *Journal of International Money and Finance*, Vol. 31 Issue 2, pp. 428–444.
- Catao L. A.V. and Milesi-Ferretti G. M. (2014) 'External Liabilities and Crises' *Journal of International Economics Volume 94, Issue 1*, pp. 18-32
- Choi W. J. and Taylor A.M. (2017) 'Precaution Versus Mercantilism: Reserve Accumulation, Capital Controls and the Real Exchange Rates' *NBER Working Paper Series*.
- Dooley, M. P., Folkerts-Landau D. and Garber P. (2004), 'The Revived Bretton Woods System' *International Journal of Finance and Economics* 9(4): 307–313.
- Esquivel G. and Larrain (1998) 'Explaining Currency Crises', John F. Kennedy Faculty Research Working Paper No-07.
- Fratzscher, M. Gloede, O., Menkhoff, L., Sarno, L. and Stöhr T. (2019) 'When is Foreign Exchange Intervention Effective? Evidence from 33 Countries' *American Economic Journal: Macroeconomics*, Vol 11 No 1, pp.132-56.
- Ghosh, A. R., Ostry J. D., and Tsangarides C. G. (2016), 'Shifting Motives: Explaining the Buildup in Official Reserves in Emerging Markets Since the 1980s' *IMF Economic Review* 64: 1–57.
- Glick, G. and Hutchison, M. (2001) 'Banking and Currency Crises: How Common Are Twins?' *UCSC Dept. of Economics Working Paper No. 488*.
- Glick, G. and Hutchison, M. (2011) 'Currency Crises' *FEDERAL RESERVE BANK OF SAN FRANCISCO Working Paper*.
- Goyal R. (2012) 'Sustainable Level of India's Current Account Deficit' *RBI Working Paper*, No. 16.
- IIMA (2021): 'Can Central Bank Gold Reserves Reduce Sovereign Credit Risk?' Available at www.iima.ac.in
- IMF (2020), '2020 External Sector Report: Global Imbalances and the COVID-19 Crisis'.
- IMF (2021), '2021 External Sector Report: Divergent Recoveries and Global Imbalances'.
- Jeanne, O. and Rancière, R. (2011), 'The Optimal Level of International Reserves for Emerging Market Countries: A New Formula and Some Applications' *The Economic Journal*, Volume 121, Issue 555.
- Kohlscheen E. (2020), Limiting risk premia in EMEs: The role of FX reserves, *Economics Letters*, Volume 196.
- Korinek, A. and Servén L. (2016), 'Undervaluation through Foreign Reserve Accumulation: Static Losses, Dynamic Gains' *Journal of International Money and Finance* 64: 104–136.
- Lane P. R. & Milesi-Ferretti G. M. (2017). International financial integration in the aftermath of the global financial crisis. *IMF Working Paper No.115*
- Mohan, R. (2008) 'Capital Flows to India' Paper presented at the annual meeting of Deputy Governors held at the Bank for International Settlements, Basel.
- Patnaik, I., Felman J., and Shah A (2017), 'An exchange market pressure measure for cross country analysis' *Journal of International Money and Finance*, 73: 62-77.
- Patel, N. and Cavallino, P. (2019), 'FX intervention: goals, strategies and tactics' *BIS papers*, No. 104b.
- RBI (2010), Annual Report 2009-10, Reserve Bank of India.
- RBI (2021), Monetary Policy Report-October 2021, Reserve Bank of India.

- Reddy, Y. V. (2002), 'India's foreign exchange reserves - policy, status and issues', Special Lecture, at the National Council of Applied Economic Research, New Delhi.
- Reddy, Y.V. (2006), Foreign Exchange Reserves: New Realities and Options, Address at the 2006 Program of Seminars in Singapore.
- Rodrik, Di. (2008), 'The Real Exchange Rate and Economic Growth'. Brookings Papers on Economic Activity 39(2): 769–797.
- Sooriyan, S. (2017), 'The Determinants of Foreign Exchange Reserves in India During 1983-2014' *International Journal of Pure and Applied Mathematics*, Volume 113, No. 6, pp.251-260.
- Wijnholds, O. B. and Kapteyn, A. (2001), 'Reserve Adequacy in Emerging Market Economies' IMF Working Paper No. 143.
- Yeyati, E. L. (2008), 'The cost of reserves' *Economics letters*, Volume 100.

Annex 1: Panel Unit Root Test Results

	LLC Test (Null: Unit root)	IPS test (Null: Unit root)
LRESERVES	2.36 (0.01)	2.03 (0.98)
LTOT	-1.63 (-0.05)	-1.15 (-0.12)
LEXPV	-6.95 (0.00)	-1.69 (0.05)
LIMPV	-3.55 (0.00)	0.81 (0.79)
ERVOL	-8.91 (0.00)	-8.68 (0.00)
LAVGEXPO	-7.00 (0.00)	-2.67 (0.00)
EXRATE	-1.19 (0.12)	-1.17 (0.12)

Note: 1. Figures in brackets are p-values.

2. LLC test assumes common unit root process while IPS test assumes individual unit root process.

*Digitisation in Urban Cooperative Banks: Depth and Differentiation**

Efficient customer services and financial inclusion have been the key motives behind digitisation in urban cooperative banks (UCBs). Using survey-based data, this article brings out the consistent progress made by UCBs in digitisation in recent years. The progress evinced by UCBs has been most significant in the adoption of retail payment channels followed by application-based channels, such as mobile banking. However, even in 2021, the digital index score of UCBs stood at only 41 against a maximum of 100, indicating the distance still to be travelled by these banks. Moreover, UCBs exhibit stark differentiation in digitisation by (a) type (scheduled versus non-scheduled), (b) deposit base and (c) region.

Introduction

Urban Cooperative Banks (UCBs) are a critical part of the banking ecosystem in India. As on March 31, 2021, there were 1,534 UCBs (53 scheduled and 1,481 non-scheduled) with an aggregate asset size of ₹6,57,851 crore. UCBs constituted 3.4 per cent of the asset size of scheduled commercial banks. Even though they may be small in terms of asset size, given their local feel and familiarity coupled with last-mile credit delivery focused on relatively small-sized borrowers, UCBs have emerged as a key stakeholder in the process of financial inclusion.

In the last three decades, technological and digital advances have redefined banking in India. Digitally aware customers, notably millennials, are seeking greater convenience and better customer services through digital modes. The COVID-19 pandemic has only accelerated the pace of digitisation given what

scientists have called as "anthropause", a major pause in modern human mobility (Rutz *et al.*, 2020). Importantly, technological and digital platforms have also become a critical component of financial inclusion to ensure last-mile, quick and cost-effective delivery of financial services to the under-served sections.

Even though digitisation has touched every segment of the banking system, including commercial and cooperative banks, there are certain qualitative differences in the way each of these segments have adopted technological changes. Unlike commercial banks, digitisation in UCBs has been largely spearheaded by the regulator *i.e.*, the Reserve Bank of India (RBI). Ensuring efficient customer services and furthering financial inclusion have been the key motives behind the regulatory nudge to UCBs to adopt digital banking.

In light of the various recent initiatives towards digitisation, it may be useful to assess the overall progress in digitisation among UCBs, as attempted in this article. The article addresses the following research questions:

- (a) What is the present extent of digital footprint of the UCB sector, and how differentiated is the sector with regard to digitisation?
- (b) What is the nature of digitisation in UCBs? What kind of digital banking channels are included in their operations?
- (c) Is there any association between digitisation and customer behaviour, which may manifest itself in the retention, or alternatively, attrition of UCB customers?

This article delves into these questions using data collected directly from UCBs through a customised questionnaire. The article is divided into five sections. Section 2 discusses RBI's steps towards digitisation in UCBs. Section 3 discusses the data sources used for the article. Section 4 discusses the empirical methodology used for the article along with its major findings. Section 5 provides the concluding observations.

* Article prepared by Abhishek Singh and Pallavi Chavan from the Department of Supervision (DoS). Guidance received from T. K. Rajan, CGM, DoS is gratefully acknowledged. The views expressed are those of the authors and not of the organisation to which they belong.

2. RBI's Approach to Digital Transformation in UCBs

IT support has been an integral feature of the regulatory and supervisory reforms introduced by the RBI for the UCB sector. Following the Vision document in 2005, the RBI entered into a Memorandum of Understanding (MoU) with the Central and the respective State governments for establishing a consultative approach to supervision and regulation of UCBs. As part of the MoU, the RBI agreed to provide IT support to UCBs. In the later years, a number of working groups/committees set up by the RBI deliberated upon various regulatory, supervisory and operational aspects relating to UCBs and the matter of IT support was a key point for many of these working groups/committees. To illustrate, in 2007, a working group (Chair: R. Gandhi) examined various areas where IT support could be provided by the RBI. In 2016, the RBI prescribed standards and benchmarks for Core Banking Solutions (CBS) in UCBs and introduced a scheme to provide financial assistance to UCBs for implementation of CBS.

While the RBI extended IT support to UCBs, it also endeavoured to protect the UCBs and their customers against cyber threats. In 2018, it prescribed a set of baseline cyber security controls for UCBs. In 2019, it introduced a comprehensive cyber security framework for UCBs. Baseline cyber security controls and resilience requirements were prescribed in a graded manner based on the digital depth of UCBs. Furthermore, in 2020, the RBI released the "Technology Vision for Cyber Security for Urban Co-operative Banks – 2020-2023" aimed at enhancing the cyber security posture of UCBs.

3. Data Sources

Data for this article were collected through a survey of UCBs using a customised questionnaire.¹

¹ UCBs, being RBI-regulated entities, were a natural choice as respondents for this survey and not UCB customers. This is because the data points in this survey were technical in nature involving information on the adoption of various types of digital banking channels, which could have been directly collected only from the UCBs.

Table 1: Asset-wise Distribution of Sampled UCBs

No.	Asset category (₹ crore)	Number of UCBs
1	Asset ≤ 50	29
2	50 < Asset ≤ 100	32
3	100 < Asset ≤ 250	46
4	250 < Asset ≤ 500	33
5	500 < Asset ≤ 1000	19
6	1000 < Asset ≤ 3000	16
7	Asset > 3000	13
	Total	188

Source: Survey data and DBIE database.

A total of 188 UCBs were selected for the survey including 23 scheduled and 165 non-scheduled UCBs.² In terms of asset size, the selected UCBs covered about 32 per cent of total assets of the UCB sector. In choosing the sample, a conscious attempt was made to have a representative sample from all asset size categories instead of just focusing on the large-sized systemically important UCBs (Table 1).

While an attempt was also made to select UCBs from all geographical zones, UCBs from the western zone, being home to most UCBs, dominated in number. In all, 84 UCBs were from the western zone, 40 were from the northern zone, 56 from the southern and eight were from the eastern zone.³

The information sought included details on CBS, Internet banking, mobile banking, debit cards, credit cards, ATM switch, SWIFT, payment gateways, etc. Zone-wise information was collected from banks from 2016 to 2021. The year 2016 was purposively selected as the base year for the survey, keeping in view the demonetisation exercise that was expected to provide a fillip to digital payments.⁴ The survey-

² The sample comprised about 43 per cent of the total number of scheduled UCBs and about 11 per cent of the total non-scheduled UCBs.

³ Each zone's share in the total number of sampled UCBs closely corresponded with its share in the total number of UCBs at the all-India level.

⁴ There has been a shift towards digital payments in recent years. See RBI (2020), "Assessment of the progress of digitisation from cash to electronic", February, <https://m.rbi.org.in/Scripts/PublicationsView.aspx?id=19417>

based data were supplemented by data on balance sheet and other financial parameters from the RBI supervisory returns.

4. Research Questions and Findings

4.1 What is the overall progress on digitisation and the present digital footprint of UCBs?

To address this question, a Digital Index (DI) has been constructed using the survey data. The DI is designed to display a continuous score ranging from 0 to 100. The score represents the digital landscape of the given bank. It includes the digital banking channels used by the bank in its operations, digital products and services offered to its customers, and sophistication of the digital infrastructure. A score of 100 represents the extent of digital development possible through *all* basic modes of digital banking available to UCBs and canvassed in the survey. A score of 0 represents no digital footprint of the bank.

4.1.1 Constituent parameters of DI

The DI uses 12 parameters, including features of CBS, Internet banking, mobile banking, centralised payment system, cheque truncation system, different retail payment channels, debit cards and ATMs. The list of parameters used for constructing DI is given in Annexure 1.

The parameters have been chosen keeping in mind the basic mandate of financial inclusion for UCBs. Apart from this, customer's expectations of convenience and ease of access to digital banking channels from these banks have also been considered.

Each parameter contains several sub-parameters which represent the depth or sophistication under that parameter. To illustrate, the parameter of Internet banking has two sub-parameters: (i) "view only" type Internet banking services (ii) "transactions facility" type Internet banking services.

4.1.2 Construction of DI

To construct the DI, each parameter has been assigned a maximum "parameter score". These maximum scores are externally assigned based on supervisory judgement about the relative importance attached to a given parameter in strengthening the basic IT infrastructure of a bank, which can be leveraged to provide better quality and more advanced digital services to its customers. The clientele base of UCBs generally comprises small-sized, relatively under-served, and technologically less-savvy customers. Not surprisingly, features of CBS, the most fundamental aspect of the IT infrastructure in a bank, have been assigned the maximum score of 20. ATMs being the second-most important part of the IT infrastructure carry the maximum score of 10 along with retail payment channels, which also carry the maximum score of 10. Internet banking is regarded next in line and has been assigned a score of eight.

The sub-parameters within each parameter too are assigned a score. These sub-parameter scores are designed such that they increase with the increasing depth of a given digital service. For example, the two sub-parameters of Internet banking are scored in the following manner: the "view only" Internet banking is given a basic score of five, while Internet banking with "transaction facility" is assigned the score of eight, which is the maximum score under the Internet banking parameter.

The DI score for a bank 'I' in the sample is calculated as under:

$$DI_I = \sum_{k=1}^{12} P_{kl}$$

P_{kl} represents the score for k^{th} parameter for I^{th} bank with 'k' taking values from 1 to 12, representing the total number of parameters.

P_{kl} is calculated as:

$$P_{kl} = \max (SP_{kjl}) \text{ for } j = 1 \text{ to } m$$

Where, SP_{kjl} represents the score for j^{th} sub-parameter under parameter P_k , and m are the total number of sub-parameters within the parameter P_k .

4.1.3 Results

The yearly DI score using the methodology as explained above is calculated from 2016 to 2021 for each bank. The increase in the DI score is expected to reflect the progress achieved in IT and digital infrastructure by a given bank. The following are the major findings from this exercise:

A steady progress but current scores remain low

The trends in the DI score indicated consistent progress by UCBs on the digitisation front from the base year 2016. However, in 2021, the average DI score for all UCBs was only about 41 as against a maximum score of 100, indicating a considerable distance still to be covered by these banks (Chart 1).

A wide differential between scheduled and non-scheduled UCBs

The overall DI score was pulled down by non-scheduled UCBs; there remained a stark difference between the progress achieved by scheduled and

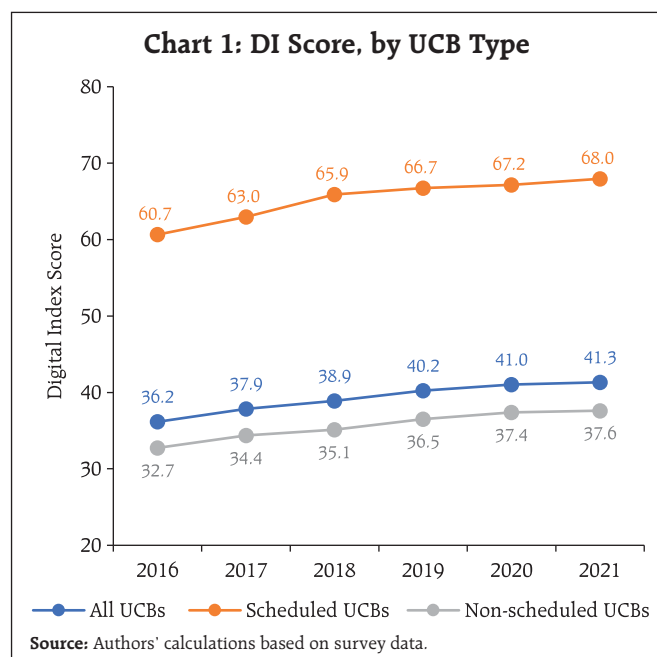


Table 2: Basic Descriptive Statistics relating to DI Scores, by UCB Type

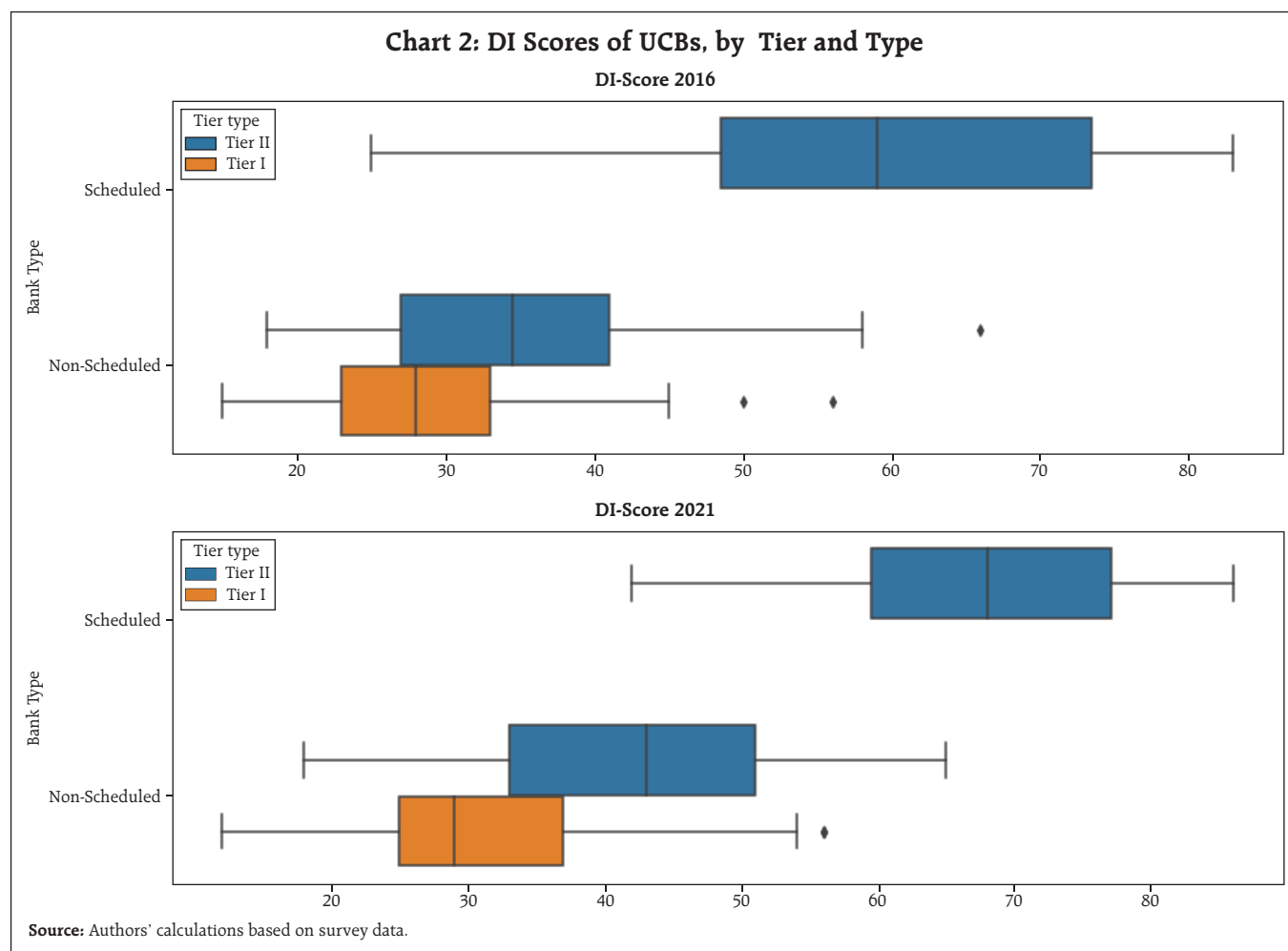
Statistical parameter	Scheduled UCBs		Non-scheduled UCBs	
	2016	2021	2016	2021
Mean	60.7	68.0	32.7	37.6
Median	59.0	68.0	31.0	37.0
First quartile	48.0	59.0	25.0	27.0
Third quartile	75.0	78.0	40.0	47.0

Source: Authors' calculations based on survey data.

non-scheduled UCBs with regard to digitisation. A comparison of the basic descriptive statistics relating to DI scores for 2016 for scheduled and non-scheduled UCBs indicated that digitisation in non-scheduled banks was at a much weaker footing than scheduled banks to begin with (Table 2). Furthermore, the gains for the non-scheduled banks were tardy during the survey period as compared to scheduled banks. The first quartile score for non-scheduled banks even in 2021 was only 27 indicating that the current state of digitisation for these banks continued to be quite poor, and that these banks possibly suffered from inertia.

Tier II UCBs faring better than Tier I UCBs

Tier II UCBs (large UCBs having wider geographic presence and with deposits of ₹100 crore and above) fared better than Tier I UCBs (having deposits of less than ₹100 crore). Incidentally, all *scheduled* banks covered in the sample were Tier II banks. The tier-wise box-plot of the digital scores for the scheduled and non-scheduled UCBs indicated (a) a distinct shift in the DI scores for scheduled/Tier II banks in the upward direction, suggesting that most banks in this category made significant progress in digitisation during the study period; (b) an increase also for non-scheduled Tier II banks in the DI scores; and (c) a limited progress for non-scheduled Tier I UCBs with the DI scores of some banks from this category being stuck at low levels (Chart 2). In fact, the non-scheduled Tier I UCBs in the first quartile showed an extremely



tardy change from 23 to 25 between 2016 and 2021 in their DI scores (Table 3).

UCBs from western zone leading in digitisation

UCBs from the western zone have been leading in terms of DI scores. Incidentally, all scheduled UCBs in the sample were from the western zone. This can hardly be deemed as a selection bias, as scheduled UCBs from the western zone account for about 98 per

cent of the total assets of all scheduled UCBs in India. Clearly, the overall digital progress of scheduled UCBs is responsible for the western zone scoring above other zones.

The non-scheduled UCBs are spread across all four zones *viz.*, north, south, east and west. Notably, even the non-scheduled UCBs from the western zone have posted considerable progress in digitisation between 2016 and 2021 over non-scheduled UCBs from the other three zones (Chart 3). While there were clear signs of improvement in the DI score in the other three zones as well, there were differentials in the extent of improvement. To illustrate, the DI score of the UCBs from the eastern zone belonging to the first quartile showed a scant increase from 21.3 in 2016 to 22.8 in 2021 (Table 4).

Table 3: Basic Descriptive Statistics of DI Scores of Non-scheduled UCBs, by Tiers

Statistical parameter	2016		2021	
	Tier I	Tier II	Tier I	Tier II
Mean	29.4	34.9	31.1	41.9
Median	28.0	34.5	29.0	43.0
First quartile	23.0	27.0	25.0	33.0
Third quartile	33.0	41.0	37.0	51.0

Source: Authors' calculations based on survey data.

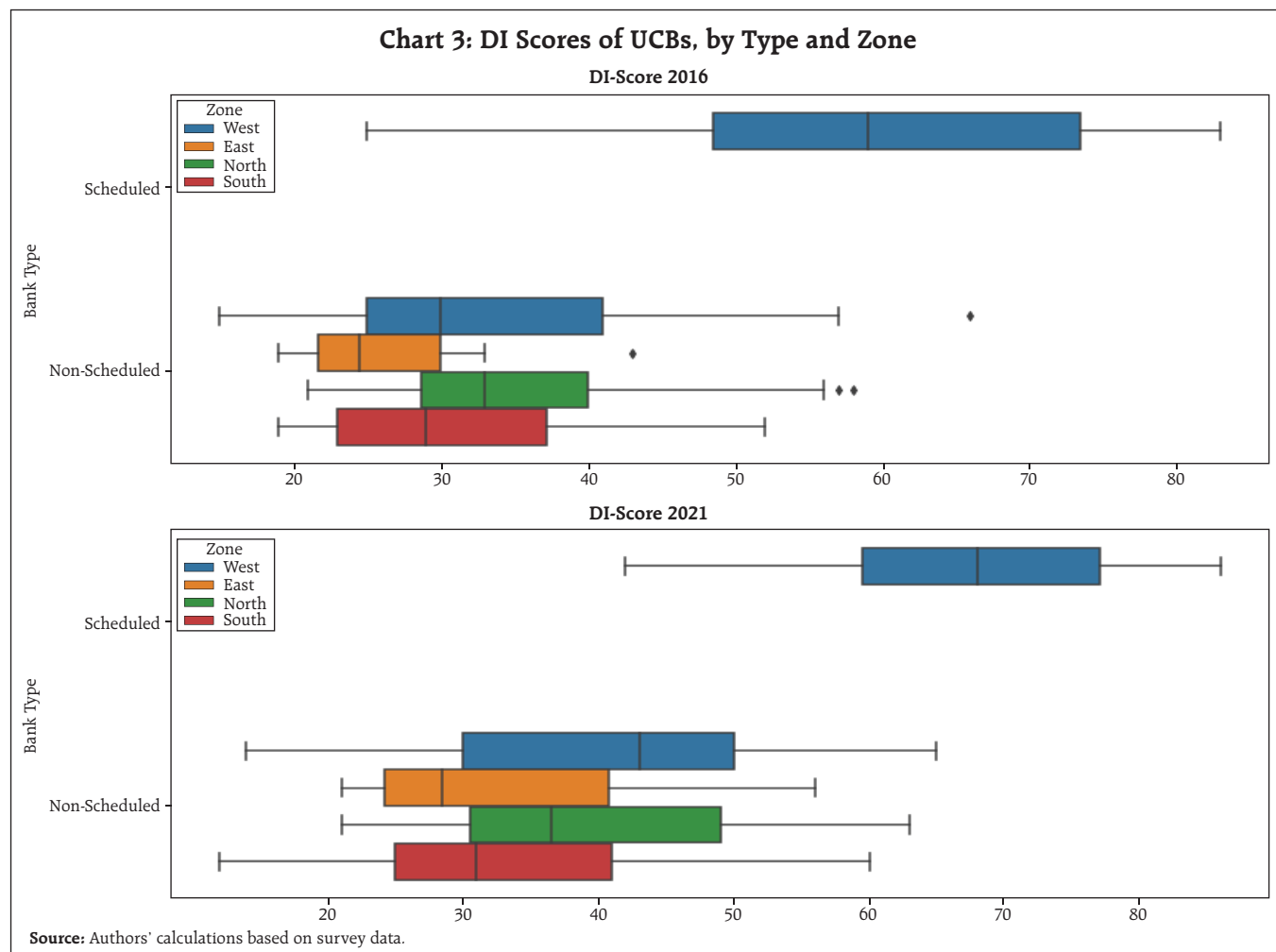


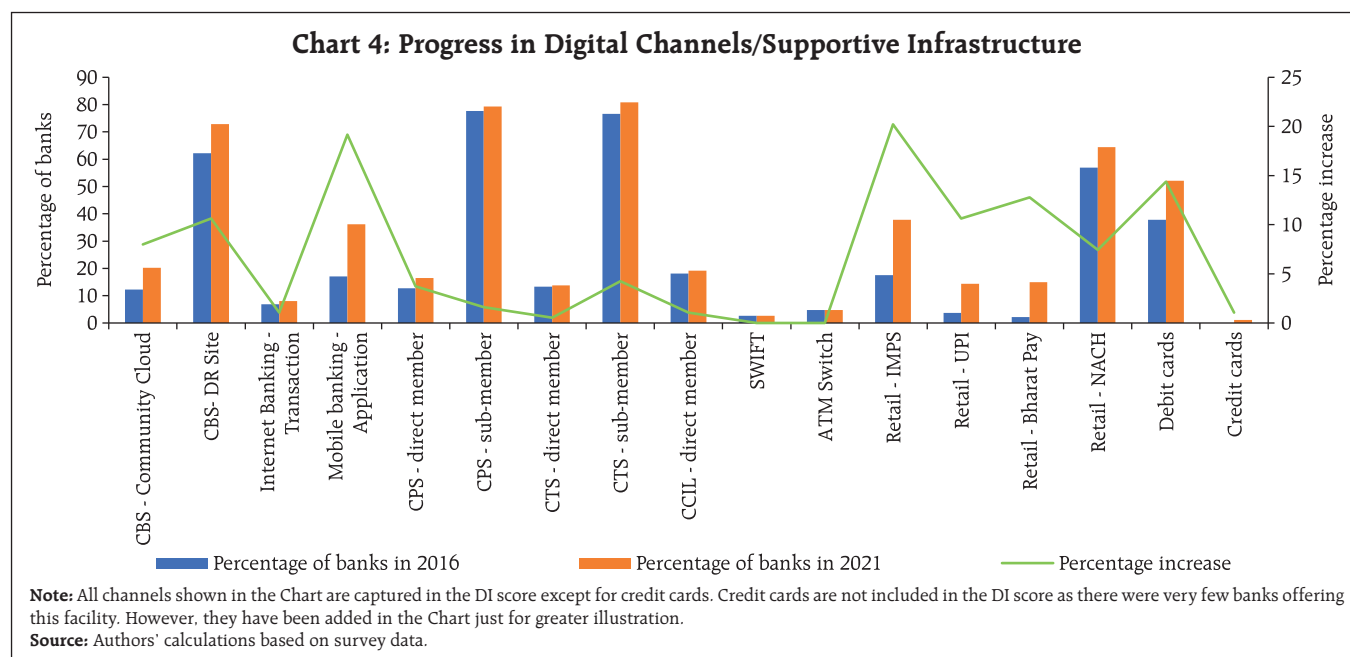
Table 4: Descriptive Statistics of DI Scores of Non-scheduled UCBs, by Zone

Parameters	2016			
	East	West	North	South
Mean	27.0	33.7	35.4	30.7
Median	24.5	30.0	33.0	29.0
First quartile	21.3	25.0	28.3	23.0
Third quartile	32.0	41.5	40.0	37.8
Parameters	2021			
	East	West	North	South
Mean	33.0	41.2	39.1	33.3
Median	28.5	43.0	36.5	31.0
First quartile	22.8	29.5	29.5	25.0
Third quartile	42.3	51.0	49.0	41.0

Source: Authors' calculations based on survey data.

4.2 What is the nature of digitisation in UCBs? What kind of digital banking channels are included in their operations?

During the survey period, UCBs showed maximum progress in three channels of digital banking viz., IMPS as a retail payment channel (18 per cent of the surveyed UCBs had adopted this channel in 2016, which increased to 38 per cent in 2021), mobile banking (17 per cent of the banks to 36 per cent), and debit cards (38 per cent to 52 per cent) (Chart 4). There was a positive change in each of the digital channels between 2016 and 2021 except ATM switch and SWIFT.



The trends for UCBs broadly support the recent trends in digital transformation in the banking sector. The digital transformation in the banking sector is indeed spearheaded by retail payments channels and application-based channels, such as mobile banking, owing to the growing popularity of smart phones and easy availability of mobile data.

4.3 Is there any association between digitisation and customer behaviour, which may manifest itself in the retention, or alternatively, attrition of UCB customers?

As the existing customers of UCBs become more technologically aware, they are expected to demand better digital services from their banks. Digital banking can also lead to an intense competition within UCBs, and between UCBs and commercial banks, leading to a movement of customers across banks. To address this research question, the relationship between deposit behaviour of UCB customers and the digital depth of these banks is modelled using the fixed effects panel regression comprising the surveyed UCBs.

From the supervisory experience, it has been observed that customers may not generally close their accounts with a bank but may reduce their usage or

draw down the balance in these accounts. However, there is also a possibility that customers may indeed choose to close these accounts. Hence, to model the association between digital depth and customer behaviour, we use both the amount and number of deposit accounts. The regression equation can be specified as follows:

$$\begin{aligned} \text{Log(Deposit variable)}_{it} &= \alpha_1 \text{DI score}_{it} + \alpha_2 \text{Size}_{it} \\ &+ \alpha_3 \text{Operating Efficiency}_{it} \\ &+ \alpha_4 \text{Bank type}_i + \alpha_5 Y_t + \varepsilon_{it} \end{aligned}$$

Where, "Deposit variable" refers to a. total amount of current and savings deposits, and b. total number of current and savings deposit accounts.

The main variable of interest is the DI score. To control for the overall systemic dominance of a bank and its operating efficiency, we introduce log of asset size, and the ratio of operating expenses to operating income, respectively. This is because typically banks with larger market shares and stronger brand name, and better operating efficiency may draw in more deposits/depositors. We also include the bank type fixed effects to account for the differences in

Table 5: Relationship between Depositor Behaviour and Digitisation in UCBs

Independent variable	Model 1: Using amount in CASA as the dependent variable	Model 2: Using number of CASA as the dependent variable
DI score	0.0095*** (0.001)	0.0105*** (0.002)
Size	0.9076*** (0.015)	0.6213*** (0.020)
Operating Efficiency	0.0365 (0.031)	0.1103** (0.044)
Bank type FE	Y	Y
Year FE	Y	Y
R ²	0.92	0.77
Number of observations	1008	1008

Note: Sample period is from 2016 to 2021. Standard errors clustered around bank are reported in brackets. ** $p \leq 0.05$, * $p \leq 0.10$, *** $p \leq 0.01$. Size is represented by $\log(\text{total assets})$ and Operating efficiency refers to Total operating expenses/Total operating income

Source: Authors' calculations based on survey data and Supervisory returns.

scheduled and non-scheduled UCBs, and time fixed effects to account for time-varying factors that may influence all UCBs uniformly.

The results from the regression indicate a statistically significant and positive association of DI score with customer deposit behaviour (Table 5). Although the sign and significance of the coefficient are satisfactory, its strength is weak suggesting that digital depth in UCBs affects depositor behaviour moderately.

5. Conclusion

Using survey-based data on scheduled and non-scheduled UCBs covering a period from 2016 to 2021, this article attempted to analyse (a) the overall digital development in the UCB sector, and differentiation in digital depth within the sector; (b) the various channels of digital banking rolled out by UCBs for their customers; and (c) the association between digitisation and depositor behaviour.

The major findings suggest that despite the scale limitation, the UCBs have made considerable progress on the digitisation front from 2016 onwards. However, the present score of digital development

(DI score) still remains at a low of 41, when marked on a scale of 0 to 100. Moreover, the digital development is marked by a stark differentiation across UCBs with the non-scheduled banks lagging significantly behind the scheduled banks. The relatively large-sized UCBs evince greater digital depth possibly owing to a larger customer base and associated economies of scale.

Among the various digital channels, UCBs have shown maximum progress in the retail payment channels, such as IMPS. Furthermore, the adoption of application-based digital channels, such as mobile banking also show a striking increase during the study period.

Digitisation shares a positive, albeit weak, correlation with the amount and number of current and savings deposits of UCBs. Simply put, digitisation may be a necessary but not a sufficient condition in influencing deposit retention among UCBs.

During the survey, an attempt was also made to understand the reasons for the low levels of digitisation in UCBs. Cost involved in developing the IT infrastructure was cited as the major reason by most UCBs for low levels of digitisation. The lack of skilled technical workforce required for the operationalisation and maintenance of digital channels too came out as another reason. It was also noted that banks were often constrained in recouping the costs incurred on digital infrastructure development due to minimal/no service charge. Furthermore, the relatively small customer base prevented banks from reaping the economies of scale from digital infrastructure development. Notwithstanding these constraints, UCBs were optimistic about the digital infrastructure development in their banks, and were, in fact, in the process of rolling out more digital channels for their customers at the time of the survey.

References:

Rutz, C., M.C. Loretto and A. E. Bates and others (2020), "COVID-19 lockdown allows researchers to quantify the effects of human activity on wildlife", *Nature*, June 22.

Annexure 1: Parameters used for Constructing the Digital Index Score

S. No.	Parameters	Maximum parameter scores	Sub-parameter scores															
1	Features of CBS	20	10															
	If the bank has CBS																	
	Additional features: 1) Bank has in-house CBS from bank's data centre 2) Bank uses CBS of community cloud 3) Maker checker arrangement for CBS 4) DR Site for the CBS application 5) CBS meets all the requirements of the bank		<table><tr><th>No. of additional features</th><th>Scores</th></tr><tr><td>1</td><td>12</td></tr><tr><td>2</td><td>14</td></tr><tr><td>3</td><td>16</td></tr><tr><td>4</td><td>18</td></tr><tr><td>5</td><td>20</td></tr></table>	No. of additional features	Scores	1	12	2	14	3	16	4	18	5	20			
No. of additional features	Scores																	
1	12																	
2	14																	
3	16																	
4	18																	
5	20																	
2	Number of ATMs	10	<table><tr><th>No. of ATMs (X)</th><th>Scores</th></tr><tr><td>X < 5</td><td>2</td></tr><tr><td>5 ≤ X < 10</td><td>4</td></tr><tr><td>10 ≤ X < 20</td><td>5</td></tr><tr><td>20 ≤ X < 30</td><td>6</td></tr><tr><td>30 ≤ X < 50</td><td>8</td></tr><tr><td>X ≥ 50</td><td>10</td></tr></table>		No. of ATMs (X)	Scores	X < 5	2	5 ≤ X < 10	4	10 ≤ X < 20	5	20 ≤ X < 30	6	30 ≤ X < 50	8	X ≥ 50	10
			No. of ATMs (X)	Scores														
X < 5	2																	
5 ≤ X < 10	4																	
10 ≤ X < 20	5																	
20 ≤ X < 30	6																	
30 ≤ X < 50	8																	
X ≥ 50	10																	
3	Retail Payment Channels (RPCs) – IMPS, UPI, Bharat bill pay, Bharat QR, AEPS, NACH	10	<table><tr><th>No. of RPC</th><th>Scores</th></tr><tr><td>1</td><td>4</td></tr><tr><td>2</td><td>6</td></tr><tr><td>3</td><td>7</td></tr><tr><td>4</td><td>8</td></tr><tr><td>5</td><td>9</td></tr><tr><td>6</td><td>10</td></tr></table>		No. of RPC	Scores	1	4	2	6	3	7	4	8	5	9	6	10
			No. of RPC	Scores														
1	4																	
2	6																	
3	7																	
4	8																	
5	9																	
6	10																	
4	Internet Banking a) View only b) Transaction facility	8	5 8															
5	Mobile Banking a) Through SMS b) Through application	8	5 8															
6	Centralised Payment System (CPS)	8	4															
	a) Bank is only a sub-member b) Bank is Direct member of CPS		6															
	c) Bank provides sub-membership to other banks for CPS		8															
7	Cheque Truncation System	8	5															
	a) Bank is a sub-member of CTS b) Bank is a direct member of CTS		8															
8	Debit Cards	8	–															
9	Clearing Corporation of India Ltd.	5	3															
	a) Bank is a direct member of CCIL b) Bank provides sub-membership to other banks for CCIL		5															
10	Payment Gateway	5	3															
	a) Bank is using a third-party payment gateway b) Bank has its own payment gateway		5															
11	SWIFT	5	–															
12	ATM Switch	5	–															
Total		100	–															

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

No.	Title	Page
1	Select Economic Indicators	251
	Reserve Bank of India	
2	RBI – Liabilities and Assets	252
3	Liquidity Operations by RBI	253
4	Sale/ Purchase of U.S. Dollar by the RBI	254
4A	Maturity Breakdown (by Residual Maturity) of Outstanding Forwards of RBI (US\$ Million)	255
5	RBI's Standing Facilities	255
	Money and Banking	
6	Money Stock Measures	256
7	Sources of Money Stock (M ₃)	257
8	Monetary Survey	258
9	Liquidity Aggregates	258
10	Reserve Bank of India Survey	259
11	Reserve Money – Components and Sources	259
12	Commercial Bank Survey	260
13	Scheduled Commercial Banks' Investments	260
14	Business in India – All Scheduled Banks and All Scheduled Commercial Banks	261
15	Deployment of Gross Bank Credit by Major Sectors	262
16	Industry-wise Deployment of Gross Bank Credit	263
17	State Co-operative Banks Maintaining Accounts with the Reserve Bank of India	264
	Prices and Production	
18	Consumer Price Index (Base: 2012=100)	265
19	Other Consumer Price Indices	265
20	Monthly Average Price of Gold and Silver in Mumbai	265
21	Wholesale Price Index	266
22	Index of Industrial Production (Base: 2011-12=100)	270
	Government Accounts and Treasury Bills	
23	Union Government Accounts at a Glance	270
24	Treasury Bills – Ownership Pattern	271
25	Auctions of Treasury Bills	271
	Financial Markets	
26	Daily Call Money Rates	272
27	Certificates of Deposit	273
28	Commercial Paper	273
29	Average Daily Turnover in Select Financial Markets	273
30	New Capital Issues by Non-Government Public Limited Companies	274

No.	Title	Page
	External Sector	
31	Foreign Trade	275
32	Foreign Exchange Reserves	275
33	Non-Resident Deposits	275
34	Foreign Investment Inflows	276
35	Outward Remittances under the Liberalised Remittance Scheme (LRS) for Resident Individuals	276
36	Indices of Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) of the Indian Rupee	277
37	External Commercial Borrowings (ECBs) – Registrations	278
38	India's Overall Balance of Payments (US \$ Million)	279
39	India's Overall Balance of Payments (₹ Crore)	280
40	Standard Presentation of BoP in India as per BPM6 (US \$ Million)	281
41	Standard Presentation of BoP in India as per BPM6 (₹ Crore)	282
42	International Investment Position	283
	Payment and Settlement Systems	
43	Payment System Indicators	284
	Occasional Series	
44	Small Savings	286
45	Ownership Pattern of Central and State Governments Securities	287
46	Combined Receipts and Disbursements of the Central and State Governments	288
47	Financial Accommodation Availed by State Governments under various Facilities	289
48	Investments by State Governments	290
49	Market Borrowings of State Governments	291
50 (a)	Flow of Financial Assets and Liabilities of Households - Instrument-wise	292
50 (b)	Stocks of Financial Assets and Liabilities of Households- Select Indicators	295

Notes: .. = Not available.

– = Nil/Negligible.

P = Preliminary/Provisional. PR = Partially Revised.

No. 1: Select Economic Indicators

Item	2020-21	2020-21		2021-22	
		Q2	Q3	Q2	Q3
	1	2	3	4	5
1 Real Sector (% Change)					
1.1 GVA at Basic Prices	-4.8	-5.9	2.1	8.4	4.7
1.1.1 Agriculture	3.3	3.2	4.1	3.7	2.6
1.1.2 Industry	-1.8	3.0	6.2	6.6	1.4
1.1.3 Services	-7.8	-10.4	0.04	10.0	6.7
1.1a Final Consumption Expenditure	-4.5	-10.8	0.4	10.1	6.5
1.1b Gross Fixed Capital Formation	-10.4	-4.5	-0.6	14.6	2.0
	2020-21	2021		2022	
		Jan.	Feb.	Jan.	Feb.
	1	2	3	4	5
1.2 Index of Industrial Production	-8.4	-0.6	-3.2	1.5	1.7
2 Money and Banking (% Change)					
2.1 Scheduled Commercial Banks					
2.1.1 Deposits	11.4	11.1	12.1	8.3	8.6
2.1.2 Credit #	5.6	5.9	6.6	8.2	9.1
2.1.2.1 Non-food Credit #	5.5	5.9	6.6	8.3	9.2
2.1.3 Investment in Govt. Securities	19.3	18.8	18.3	3.3	4.7
2.2 Money Stock Measures					
2.2.1 Reserve Money (M0)	18.8	14.5	13.6	13.5	13.9
2.2.2 Broad Money (M3)	12.2	12.1	12.8	8.4	8.7
3 Ratios (%)					
3.1 Cash Reserve Ratio	3.50	3.00	3.00	4.00	4.00
3.2 Statutory Liquidity Ratio	18.00	18.00	18.00	18.00	18.00
3.3 Cash-Deposit Ratio	4.2	3.8	3.7	4.8	4.6
3.4 Credit-Deposit Ratio	72.4	72.3	72.2	71.5	71.8
3.5 Incremental Credit-Deposit Ratio #	37.4	26.9	29.6	67.6	72.1
3.6 Investment-Deposit Ratio	29.5	29.9	29.9	28.6	28.8
3.7 Incremental Investment-Deposit Ratio	46.8	56.2	52.8	12.8	18.8
4 Interest Rates (%)					
4.1 Policy Repo Rate	4.00	4.00	4.00	4.00	4.00
4.2 Reverse Repo Rate	3.35	3.35	3.35	3.35	3.35
4.3 Marginal Standing Facility (MSF) Rate	4.25	4.25	4.25	4.25	4.25
4.4 Bank Rate	4.25	4.25	4.25	4.25	4.25
4.5 Base Rate	7.40/8.80	7.30/8.80	7.30/8.80	7.25/8.80	7.25/8.80
4.6 MCLR (Overnight)	6.55/7.05	6.55/7.05	6.55/7.05	6.45/7.00	6.45/7.00
4.7 Term Deposit Rate >1 Year	4.90/5.50	4.90/5.50	4.90/5.50	5.00/5.60	5.00/5.60
4.8 Savings Deposit Rate	2.70/3.00	2.70/3.00	2.70/3.00	2.70/3.00	2.70/3.00
4.9 Call Money Rate (Weighted Average)	3.25	3.23	3.25	3.72	3.30
4.10 91-Day Treasury Bill (Primary) Yield	3.32	3.35	3.17	3.71	3.70
4.11 182-Day Treasury Bill (Primary) Yield	3.47	3.56	3.48	4.18	4.19
4.12 364-Day Treasury Bill (Primary) Yield	3.83	3.68	3.70	4.51	4.52
4.13 10-Year G-Sec Par Yield (FBIL)	6.34	5.96	6.34	6.69	6.78
5 Reference Rate and Forward Premia					
5.1 INR-US\$ Spot Rate (Rs. Per Foreign Currency)	72.40	72.95	73.04	74.95	75.28
5.2 INR-Euro Spot Rate (Rs. Per Foreign Currency)	85.31	88.30	88.80	83.60	84.38
5.3 Forward Premia of US\$ 1-month (%)	6.80	4.19	5.59	3.84	4.30
3-month (%)	5.64	5.48	5.59	4.88	4.41
6-month (%)	5.47	5.13	5.19	4.66	4.20
6 Inflation (%)					
6.1 All India Consumer Price Index	6.18	4.1	5.0	6.0	6.1
6.2 Consumer Price Index for Industrial Workers	5.03	3.2	4.5	5.8	5.0
6.3 Wholesale Price Index	1.29	2.5	4.8	13.0	13.1
6.3.1 Primary Articles	1.71	-1.6	3.0	13.9	13.4
6.3.2 Fuel and Power	-7.99	-3.8	2.0	32.3	31.5
6.3.3 Manufactured Products	2.75	5.5	6.1	9.4	9.8
7 Foreign Trade (% Change)					
7.1 Imports	-16.91	2.1	7.5	26.2	36.1
7.2 Exports	-6.88	6.5	-0.4	27.6	25.1

Note : 1. 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.

2. #: 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).

Reserve Bank of India

No. 2: RBI - Liabilities and Assets *

(₹ Crore)

Item	As on the Last Friday/ Friday						
	2021-22	2021	2022				
		Mar.	Feb. 25	Mar. 4	Mar. 11	Mar. 18	Mar. 25
	1	2	3	4	5	6	7
1 Issue Department							
1.1 Liabilities							
1.1.1 Notes in Circulation	3107637	2831727	3052620	3064946	3087949	3097443	3107637
1.1.2 Notes held in Banking Department	15	11	14	18	18	14	15
1.1/1.2 Total Liabilities (Total Notes Issued) or Assets	3107652	2831738	3052634	3064963	3087966	3097457	3107652
1.2 Assets							
1.2.1 Gold	128208	106555	123775	124737	130184	123539	128208
1.2.2 Foreign Securities	2978927	2724437	2928450	2939835	2957421	2973573	2978927
1.2.3 Rupee Coin	518	746	409	391	362	345	518
1.2.4 Government of India Rupee Securities	—	—	—	—	—	—	—
2 Banking Department							
2.1 Liabilities							
2.1.1 Deposits	1794574	1504697	1911791	1903898	1823960	1822366	1794574
2.1.1.1 Central Government	101	100	100	101	101	101	101
2.1.1.2 Market Stabilisation Scheme							
2.1.1.3 State Governments	42	42	43	42	42	43	42
2.1.1.4 Scheduled Commercial Banks	683437	542693	664473	710853	669083	712361	683437
2.1.1.5 Scheduled State Co-operative Banks	7123	6529	6900	7270	6802	7199	7123
2.1.1.6 Non-Scheduled State Co-operative Banks	4121	3204	3916	4002	3905	4053	4121
2.1.1.7 Other Banks	37589	31820	36947	37400	37542	37688	37589
2.1.1.8 Others	988819	895440	1119484	1070362	1032856	986624	988819
2.1.1.9 Financial Institution Outside India	73343	24868	79928	73868	73629	74298	73343
2.1.2 Other Liabilities	1359254	1343670	1333412	1385172	1397879	1334904	1359254
2.1/2.2 Total Liabilities or Assets	3153828	2848367	3245202	3289070	3221839	3157270	3153828
2.2 Assets							
2.2.1 Notes and Coins	15	11	14	18	18	14	15
2.2.2 Balances held Abroad	1243853	1204135	1350827	1392438	1313744	1252424	1243853
2.2.3 Loans and Advances							
2.2.3.1 Central Government	—	—	—	—	—	—	—
2.2.3.2 State Governments	670	1674	186	3209	6209	3343	670
2.2.3.3 Scheduled Commercial Banks	94299	90275	96123	95531	95185	97167	94299
2.2.3.4 Scheduled State Co-op.Banks	—	—	—	—	—	—	—
2.2.3.5 Industrial Dev. Bank of India	—	—	—	—	—	—	—
2.2.3.6 NABARD	24927	26422	24853	24927	24927	24927	24927
2.2.3.7 EXIM Bank	—	—	—	—	—	—	—
2.2.3.8 Others	8077	6678	77	77	77	2877	8077
2.2.3.9 Financial Institution Outside India	72741	24858	64052	69503	72971	73915	72741
2.2.4 Bills Purchased and Discounted							
2.2.4.1 Internal	—	—	—	—	—	—	—
2.2.4.2 Government Treasury Bills	—	—	—	—	—	—	—
2.2.5 Investments	1491042	1331671	1499600	1492044	1488829	1492881	1491042
2.2.6 Other Assets	218203	162643	209471	211322	219878	209722	218203
2.2.6.1 Gold	201354	146572	196025	197547	205538	195047	201354

* Data are provisional

No. 3: Liquidity Operations by RBI

(₹ Crore)

Date	Liquidity Adjustment Facility				MSF	Standing Liquidity Facilities	Market Stabilisation Scheme	OMO (Outright)		Long Term Repo Operations &	Targeted Long Term Repo Operations #	Special Long-Term Repo Operations for Small Finance Banks	Special Reverse Repo ₹	Net Injection (+)/ Absorption (-) (1+3+5+6+9+10+11+12-2-4-7-8-13)
	Repo	Reverse Repo	Variable Rate Repo	Variable Rate Reverse Repo				Sale	Purchase					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Feb. 1, 2022	-	198460	-	198467	93	-504	-	-	-	-	-	-	-	-397338
Feb. 2, 2022	-	127546	-	121212	92	-	-	-	-	-	-	-	-	-248666
Feb. 3, 2022	-	123421	-	-	3	-	-	-	-	-	-	-	-	-123418
Feb. 4, 2022	-	130516	-	252033	528	-	-	-	-	-	-	-	-	-382021
Feb. 5, 2022	-	35377	-	-	1013	-	-	-	-	-	-	-	-	-34364
Feb. 6, 2022	-	1083	-	-	151	-	-	-	-	-	-	-	-	-932
Feb. 7, 2022	-	10860	-	-	8505	-	-	-	-	-	-	-	-	-2355
Feb. 8, 2022	-	83428	-	-	310	-	-	-	-	-	-	-	-	-83118
Feb. 9, 2022	-	70179	-	67499	305	-	-	-	-	-	-	-	-	-137373
Feb. 10, 2022	-	99518	-	-	441	-	-	-	-	-	-	-	-	-99077
Feb. 11, 2022	-	233827	-	491278	894	-	-	-	-	-	-	-	-	-724211
Feb. 12, 2022	-	9483	-	-	200	-	-	-	-	-	-	-	-	-9283
Feb. 13, 2022	-	3908	-	-	58	-	-	-	-	-	-	-	-	-3850
Feb. 14, 2022	-	95013	-	140395	1063	-	-	-	-	-	-	-	-	-234345
Feb. 15, 2022	-	130020	-	-	1341	-	-	-	-	-	-	-	-	-128679
Feb. 16, 2022	-	163961	-	-	980	-	-	-	-	-	-	-	-	-162981
Feb. 17, 2022	-	169962	-	-	855	-	-	-	-	-	-	-	-	-169107
Feb. 18, 2022	-	71409	-	167479	750	-	-	-	-	-	-	-	-	-238138
Feb. 19, 2022	-	29075	-	-	696	-	-	-	-	-	-	-	-	-28379
Feb. 20, 2022	-	3027	-	-	2	-	-	-	-	-	-	-	-	-3025
Feb. 21, 2022	-	90533	-	-	766	-	-	-	-	-	-	-	-	-89767
Feb. 22, 2022	-	108463	-	45060	1532	-	-	-	-	-	-	-	-	-151991
Feb. 23, 2022	-	106808	-	-	1137	-	-	-	-	-	-	-	-	-105671
Feb. 24, 2022	-	120278	-	-	1007	-	-	-	-	-	-	-	-	-119271
Feb. 25, 2022	-	287236	-	497700	1858	-	-	-	-	-	-	-	-	-783078
Feb. 26, 2022	-	16298	-	-	161	-	-	-	-	-	-	-	-	-16137
Feb. 27, 2022	-	3170	-	-	88	-	-	-	-	-	-	-	-	-3082
Feb. 28, 2022	-	157919	-	148465	1176	-	-	-	-	-	-	-	-	-305208

Notes: #Includes Targeted Long Term Repo Operations (TLTRO), Targeted Long Term Repo Operations 2.0 (TLTRO 2.0) and On Tap Targeted Long Term Repo Operations. Negative (-) sign indicates repayments done by Banks.

& Negative (-) sign indicates repayments done by Banks.

₹ As per Press Release No. 2021-2022/177 dated May 07, 2021. From June 18, 2021, the data also includes the amount absorbed as per the Press Release No. 2021-2022/323 dated June 04, 2021.

Item	2020-21	2021	2022	
		Feb.	Jan.	Feb.
	1	2	3	4
1 Net Purchase/ Sale of Foreign Currency (US \$ Million) (1.1–1.2)	68315	-1219	-771	771
1.1 Purchase (+)	162479	23352	6548	5946
1.2 Sale (–)	94164	24571	7319	5175
2 ₹ equivalent at contract rate (₹ Crores)	510516	-8475	-4816	6459
3 Cumulative (over end-March) (US \$ Million)	68315	74014	36642	37413
(₹ Crores)	510516	551639	281180	287639
4 Outstanding Net Forward Sales (–)/ Purchase (+) at the end of month (US \$ Million)	72751	73201	49877	49106

Item	2020-21	2021	2022	
		Feb.	Jan.	Feb.
	1	2	3	4
1 Net Purchase/ Sale of Foreign Currency (US \$ Million) (1.1-1.2)	0	0	0	0
1.1 Purchase (+)	12118	4841	0	0
1.2 Sale (-)	12118	4841	0	0
2 Outstanding Net Currency Futures Sales (-)/ Purchase (+) at the end of month (US \$ Million)	690	0	0	0

**No. 4 A : Maturity Breakdown (by Residual Maturity) of Outstanding
Forwards of RBI (US \$ Million)**

Item	As on February 28, 2022		
	Long (+)	Short (-)	Net (1-2)
	1	2	3
1. Upto 1 month	3065	8490	-5425
2. More than 1 month and upto 3 months	18233	5000	13233
3. More than 3 months and upto 1 year	41298	0	41298
4. More than 1 year	0	0	0
Total (1+2+3+4)	62596	13490	49106

No. 5: RBI's Standing Facilities

(₹ Crore)

Item	As on the Last Reporting Friday							
	2021-22	2021				2022		
		Mar. 26	Oct. 22	Nov. 19	Dec. 31	Jan. 28	Feb. 25	Mar. 25
	1	2	3	4	5	6	7	8
1 MSF	11	182	461	7201	8176	38	1858	11
2 Export Credit Refinance for Scheduled Banks								
	-	0	-	-	-	-	-	-
	-	0	-	-	-	-	-	-
3 Liquidity Facility for PDs								
3.1 Limit	4900	4900	4900	4900	4900	4900	4900	4900
3.2 Outstanding	-	0	0	0	0	734	0	0
4 Others								
4.1 Limit	76000	75000	76000	76000	76000	76000	76000	76000
4.2 Outstanding	32401	32387	21696	24196	24401	24401	24401	32401
5 Total Outstanding (1+2.2+3.2+4.2)	32412	32569	22157	31397	32577	25173	26259	32412

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

Item	(₹ Crore)				
	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2020-21	2021	2022		
		Feb. 26	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
1 Currency with the Public (1.1 + 1.2 + 1.3 – 1.4)	2751828	2735085	2930965	2975708	2980565
1.1 Notes in Circulation	2826851	2809858	3004604	3046152	3052620
1.2 Circulation of Rupee Coin	26170	26076	27021	27021	27139
1.3 Circulation of Small Coins	743	743	743	743	743
1.4 Cash on Hand with Banks	101935	101592	101403	98208	99937
2 Deposit Money of the Public	2042471	1869210	2103135	2085034	2157809
2.1 Demand Deposits with Banks	1995120	1824436	2050497	2032450	2103056
2.2 'Other' Deposits with Reserve Bank	47351	44774	52638	52585	54752
3 M₁ (1 + 2)	4794299	4604295	5034100	5060742	5138374
4 Post Office Saving Bank Deposits	170853	165897	170853	170853	170853
5 M₂ (3 + 4)	4965152	4770192	5204953	5231595	5309227
6 Time Deposits with Banks	14050278	13959469	14912628	15025262	15045154
7 M₃ (3 + 6)	18844578	18563764	19946728	20086004	20183528
8 Total Post Office Deposits	510435	500174	510435	510435	510435
9 M₄ (7 + 8)	19355013	19063938	20457163	20596439	20693963

No. 7: Sources of Money Stock (M₃)

(₹ Crore)

Sources	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2020-21	2021	2022		
		Feb. 26	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
1 Net Bank Credit to Government	5850374	5770646	5934151	6157986	6232004
1.1 RBI's net credit to Government (1.1.1–1.1.2)	1099686	1064827	1058706	1192118	1267912
1.1.1 Claims on Government	1337300	1324907	1496295	1510479	1498132
1.1.1.1 Central Government	1333917	1320970	1495578	1501606	1497945
1.1.1.2 State Governments	3383	3938	716	8872	186
1.1.2 Government deposits with RBI	237615	260080	437589	318361	230220
1.1.2.1 Central Government	237572	260038	437546	318318	230177
1.1.2.2 State Governments	42	42	42	42	43
1.2 Other Banks' Credit to Government	4750689	4705818	4875445	4965868	4964092
2 Bank Credit to Commercial Sector	11668466	11433720	12174904	12253244	12350302
2.1 RBI's credit to commercial sector	8709	8625	2874	1957	1853
2.2 Other banks' credit to commercial sector	11659757	11425094	12172030	12251287	12348448
2.2.1 Bank credit by commercial banks	10949509	10774742	11468977	11544960	11643717
2.2.2 Bank credit by co-operative banks	694758	640793	685155	688486	686893
2.2.3 Investments by commercial and co-operative banks in other securities	15490	9559	17898	17841	17838
3 Net Foreign Exchange Assets of Banking Sector (3.1 + 3.2)	4578846	4616641	4841390	4874119	4881815
3.1 RBI's net foreign exchange assets (3.1.1–3.1.2)	4199400	4286707	4542534	4575263	4582959
3.1.1 Gross foreign assets	4199637	4286948	4542779	4575503	4583200
3.1.2 Foreign liabilities	237	241	245	241	241
3.2 Other banks' net foreign exchange assets	379446	329934	298856	298856	298856
4 Government's Currency Liabilities to the Public	26913	26819	27764	27764	27882
5 Banking Sector's Net Non-monetary Liabilities	3280021	3284061	3031481	3227108	3308475
5.1 Net non-monetary liabilities of RBI	1356660	1410269	1291916	1325045	1324383
5.2 Net non-monetary liabilities of other banks (residual)	1923362	1873792	1739565	1902064	1984092
M₃ (1+2+3+4–5)	18844578	18563764	19946728	20086004	20183528

No. 8: Monetary Survey

(₹ Crore)

Item	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2020-21	2021	2022		
		Feb. 26	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
Monetary Aggregates					
NM ₁ (1.1 + 1.2.1+1.3)	4794299	4604295	5034100	5060742	5138374
NM ₂ (NM ₁ + 1.2.2.1)	11048276	10811822	11681954	11760686	11848308
NM ₃ (NM ₂ + 1.2.2.2 + 1.4 = 2.1 + 2.2 + 2.3 – 2.4 – 2.5)	18936051	18643535	20078698	20216587	20326078
1 Components					
1.1 Currency with the Public	2751828	2735085	2930965	2975708	2980565
1.2 Aggregate Deposits of Residents	15892847	15618939	16823507	16921212	17014022
1.2.1 Demand Deposits	1995120	1824436	2050497	2032450	2103056
1.2.2 Time Deposits of Residents	13897727	13794503	14773010	14888763	14910965
1.2.2.1 Short-term Time Deposits	6253977	6207526	6647855	6699943	6709934
1.2.2.1.1 Certificates of Deposit (CDs)	78702	55560	100092	113357	128295
1.2.2.2 Long-term Time Deposits	7643750	7586977	8125156	8188820	8201031
1.3 'Other' Deposits with RBI	47351	44774	52638	52585	54752
1.4 Call/Term Funding from Financial Institutions	244025	244737	271587	267082	276739
2 Sources					
2.1 Domestic Credit	18518949	18166567	19107911	19398808	19568630
2.1.1 Net Bank Credit to the Government	5850374	5770646	5934151	6157986	6232004
2.1.1.1 Net RBI credit to the Government	1099686	1064827	1058706	1192118	1267912
2.1.1.2 Credit to the Government by the Banking System	4750689	4705818	4875445	4965868	4964092
2.1.2 Bank Credit to the Commercial Sector	12668575	12395922	13173759	13240822	13336626
2.1.2.1 RBI Credit to the Commercial Sector	34134	35473	27644	26810	26706
2.1.2.2 Credit to the Commercial Sector by the Banking System	12634441	12360449	13146115	13214012	13309920
2.1.2.2.1 Other Investments (Non-SLR Securities)	951313	920260	964488	953739	952639
2.2 Government's Currency Liabilities to the Public	26913	26819	27764	27764	27882
2.3 Net Foreign Exchange Assets of the Banking Sector	4438202	4506195	4771073	4756062	4763868
2.3.1 Net Foreign Exchange Assets of the RBI	4199400	4286707	4542534	4575263	4582959
2.3.2 Net Foreign Currency Assets of the Banking System	238802	219488	228539	180799	180908
2.4 Capital Account	2775245	2868954	3005732	3053165	3053964
2.5 Other items (net)	1272767	1187092	822319	912882	980337

No. 9: Liquidity Aggregates

(₹ Crore)

Aggregates	2020-21	2021		2022	
		Feb.	Dec.	Jan.	Feb.
	1	2	3	4	5
1 NM₃	18936051	18643536	20245247	20078698	20326078
2 Postal Deposits	510435	500174	510435	510435	510435
3 L₁ (1 + 2)	19446486	19143710	20755682	20589133	20836513
4 Liabilities of Financial Institutions	33179	34795	24644	27058	44627
4.1 Term Money Borrowings	2645	2645	1984	2138	2082
4.2 Certificates of Deposit	25550	28865	15360	17560	34185
4.3 Term Deposits	4984	3285	7299	7360	8360
5 L₂ (3 + 4)	19479665	19178505	20780326	20616191	20881140
6 Public Deposits with Non-Banking Financial Companies	62262	..	66542
7 L₃ (5 + 6)	19541927	..	20846868

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				
	2020-21	2021	2022		
		Feb. 26	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
1 Components					
1.1 Currency in Circulation	2853763	2836677	3032368	3073916	3080502
1.2 Bankers' Deposits with the RBI	698867	497226	729343	694366	712237
1.2.1 Scheduled Commercial Banks	651748	462156	681336	645967	664473
1.3 'Other' Deposits with the RBI	47351	44774	52638	52585	54752
Reserve Money (1.1 + 1.2 + 1.3 = 2.1 + 2.2 + 2.3 – 2.4 – 2.5)	3599981	3378677	3814348	3820867	3847491
2 Sources					
2.1 RBI's Domestic Credit	730328	475420	535966	542885	561032
2.1.1 Net RBI credit to the Government	1099686	1064827	1058706	1192118	1267912
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)	1096345	1060932	1058032	1183288	1267768
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	1333174	1320154	1495081	1501153	1497537
2.1.1.1.3.1 Central Government Securities	1333174	1320154	1495081	1501153	1497537
2.1.1.1.4 Rupee Coins	743	816	498	453	409
2.1.1.1.5 Deposits of the Central Government	237572	260038	437546	318318	230177
2.1.1.2 Net RBI credit to State Governments	3340	3895	674	8830	144
2.1.2 RBI's Claims on Banks	-403492	-624880	-550384	-676043	-733586
2.1.2.1 Loans and Advances to Scheduled Commercial Banks	-378066	-598033	-525614	-651190	-708733
2.1.3 RBI's Credit to Commercial Sector	34134	35473	27644	26810	26706
2.1.3.1 Loans and Advances to Primary Dealers	—	—	734	—	—
2.1.3.2 Loans and Advances to NABARD	25426	26848	24770	24853	24853
2.2 Government's Currency Liabilities to the Public	26913	26819	27764	27764	27882
2.3 Net Foreign Exchange Assets of the RBI	4199400	4286707	4542534	4575263	4582959
2.3.1 Gold	247723	260239	296461	303427	319800
2.3.2 Foreign Currency Assets	3951694	4026486	4246090	4271853	4263177
2.4 Capital Account	1173033	1273838	1244373	1291695	1290045
2.5 Other Items (net)	183626	136431	47542	33350	34338

No. 11: Reserve Money - Components and Sources

(₹ Crore)

Item	2020-21	Outstanding as on March 31/ last Fridays of the month/ Fridays					
		2021	2022				
		Feb. 26	Jan. 28	Feb. 4	Feb. 11	Feb. 18	Feb. 25
	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)	3599981	3378677	3814348	3843856	3820867	3883786	3847491
1 Components							
1.1 Currency in Circulation	2853763	2836677	3032368	3053482	3073916	3077138	3080502
1.2 Bankers' Deposits with RBI	698867	497226	729343	737438	694366	751821	712237
1.3 'Other' Deposits with RBI	47351	44774	52638	52936	52585	54827	54752
2 Sources							
2.1 Net Reserve Bank Credit to Government	1099686	1064827	1058706	1186131	1192118	1259583	1267912
2.2 Reserve Bank Credit to Banks	-378066	-598033	-525614	-637085	-651190	-656578	-708733
2.3 Reserve Bank Credit to Commercial Sector	8709	8625	2874	2140	1957	2140	1853
2.4 Net Foreign Exchange Assets of RBI	4199400	4286707	4542534	4544463	4575263	4550867	4582959
2.5 Government's Currency Liabilities to the Public	26913	26819	27764	27764	27764	27764	27882
2.6 Net Non- Monetary Liabilities of RBI	1356660	1410269	1291916	1279557	1325045	1299990	1324383

No. 12: Commercial Bank Survey

(₹ Crore)

Item	Outstanding as on last reporting Fridays of the month/ reporting Fridays of the month				
	2020-21	2021	2022		
		Feb. 26	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
1 Components					
1.1 Aggregate Deposits of Residents	14960961	14768615	15892908	15991634	16083340
1.1.1 Demand Deposits	1861193	1703095	1912237	1894175	1963976
1.1.2 Time Deposits of Residents	13099768	13065520	13980671	14097459	14119364
1.1.2.1 Short-term Time Deposits	5894896	5879484	6291302	6343857	6353714
1.1.2.1.1 Certificates of Deposits (CDs)	78702	55560	100092	113357	128295
1.1.2.2 Long-term Time Deposits	7204873	7186036	7689369	7753602	7765650
1.2 Call/Term Funding from Financial Institutions	244025	244737	271587	267082	276739
2 Sources					
2.1 Domestic Credit	16378019	16162721	17015040	17169898	17266721
2.1.1 Credit to the Government	4461632	4460126	4579446	4669687	4669023
2.1.2 Credit to the Commercial Sector	11916387	11702595	12435594	12500211	12597698
2.1.2.1 Bank Credit	10949509	10774742	11468977	11544960	11643717
2.1.2.1.1 Non-food Credit	10888255	10699536	11386587	11466980	11575493
2.1.2.2 Net Credit to Primary Dealers	23633	15357	9861	9250	9095
2.1.2.3 Investments in Other Approved Securities	894	1197	1231	1224	1209
2.1.2.4 Other Investments (in non-SLR Securities)	942351	911298	955525	944777	943677
2.2 Net Foreign Currency Assets of Commercial Banks (2.2.1–2.2.2–2.2.3)	238802	219488	228539	180799	180908
2.2.1 Foreign Currency Assets	454866	437539	443146	385658	384970
2.2.2 Non-resident Foreign Currency Repatriable Fixed Deposits	152552	164966	139618	136499	134189
2.2.3 Overseas Foreign Currency Borrowings	63512	53085	74988	68360	69873
2.3 Net Bank Reserves (2.3.1+2.3.2–2.3.3)	1010202	1151725	1296725	1383996	1461464
2.3.1 Balances with the RBI	542693	462156	681336	645967	664473
2.3.2 Cash in Hand	90748	91537	89774	86839	88258
2.3.3 Loans and Advances from the RBI	-376761	-598033	-525614	-651190	-708733
2.4 Capital Account	1578041	1570946	1737188	1737300	1739748
2.5 Other items (net) (2.1+2.2+2.3–2.4–1.1–1.2)	843995	949637	638621	738676	809267
2.5.1 Other Demand and Time Liabilities (net of 2.2.3)	593095	571216	530821	553348	568393
2.5.2 Net Inter-Bank Liabilities (other than to PDs)	80681	73916	35577	30014	28229

No. 13: Scheduled Commercial Banks' Investments

(₹ Crore)

Item	As on March 26, 2021	2021	2022		
		Feb. 26	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
1 SLR Securities	4462526	4461323	4580677	4670911	4670231
2 Commercial Paper	82584	81193	51659	50895	49120
3 Shares issued by					
3.1 PSUs	9840	11366	8411	8417	8384
3.2 Private Corporate Sector	64035	65650	73112	73420	73319
3.3 Others	5210	5254	5020	5017	5014
4 Bonds/Debentures issued by					
4.1 PSUs	121008	121080	113382	113145	117941
4.2 Private Corporate Sector	308904	299693	338728	337548	336956
4.3 Others	149325	143843	147862	143583	142778
5 Instruments issued by					
5.1 Mutual funds	31142	30584	49961	47432	43286
5.2 Financial institutions	167130	152649	167402	165319	166879

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			
	2020-21	2021	2022		2020-21	2021	2022	
		Feb.	Jan.	Feb.		Feb.	Jan.	Feb.
	1	2	3	4	5	6	7	8
Number of Reporting Banks	209	209	211	212	133	133	136	136
1 Liabilities to the Banking System	259530	254778	270636	255874	254589	249780	266584	251956
1.1 Demand and Time Deposits from Banks	200585	197528	189586	185500	195866	192925	186194	182114
1.2 Borrowings from Banks	40886	39370	56311	44491	40880	39194	56015	44343
1.3 Other Demand and Time Liabilities	18059	17881	24738	25883	17843	17661	24375	25499
2 Liabilities to Others	16457782	16236929	17345575	17569185	16014145	15802618	16909923	17132533
2.1 Aggregate Deposits	15540152	15351268	16452976	16637912	15113512	14933580	16032526	16217528
2.1.1 Demand	1899343	1739178	1954716	2006852	1861193	1703095	1912237	1963976
2.1.2 Time	13640809	13612089	14498260	14631060	13252320	13230486	14120289	14253553
2.2 Borrowings	248271	249469	275943	281772	244025	244737	271588	276739
2.3 Other Demand and Time Liabilities	669359	636193	616656	649501	656607	624301	605809	638266
3 Borrowings from Reserve Bank	90275	84686	94286	96123	90275	84651	94286	96123
3.1 Against Usance Bills /Promissory Notes	–	–	–	–	–	–	–	–
3.2 Others	90275	84686	94286	96123	90275	84651	94286	96123
4 Cash in Hand and Balances with Reserve Bank	650745	568446	789710	771412	633440	553693	770154	752731
4.1 Cash in Hand	92793	93583	91151	90640	90748	91537	88818	88258
4.2 Balances with Reserve Bank	557951	474863	698559	680772	542693	462156	681336	664473
5 Assets with the Banking System	265729	255137	304523	296152	197541	191221	240868	232823
5.1 Balances with Other Banks	179430	176131	205822	196513	143294	141680	169574	161886
5.1.1 In Current Account	16796	17429	33438	23585	14226	15043	30638	21250
5.1.2 In Other Accounts	162634	158702	172384	172928	129068	126637	138936	140636
5.2 Money at Call and Short Notice	36716	30989	30424	27730	10654	7758	8759	6053
5.3 Advances to Banks	19908	20937	33965	36348	16764	17828	31166	32138
5.4 Other Assets	29675	27080	34312	35561	26829	23955	31369	32746
6 Investment	4598924	4595331	4722004	4810533	4462526	4461323	4580677	4670231
6.1 Government Securities	4591896	4587708	4714808	4803396	4461632	4460126	4579446	4669023
6.2 Other Approved Securities	7029	7624	7196	7136	894	1197	1231	1209
7 Bank Credit	11297014	11123028	11822445	12002460	10949509	10774742	11468977	11643717
7a Food Credit	91653	105605	118207	104041	61254	75206	82390	68224
7.1 Loans, Cash-credits and Overdrafts	11081668	10933135	11600090	11773686	10736491	10586842	11248917	11417404
7.2 Inland Bills-Purchased	30896	26578	34140	34151	30531	26275	34127	34138
7.3 Inland Bills-Discounted	128831	113084	137848	146599	127883	112204	136504	145123
7.4 Foreign Bills-Purchased	20762	18907	19331	19676	20394	18675	18954	19269
7.5 Foreign Bills-Discounted	34857	31324	31036	28348	34210	30746	30476	27783

No. 15: Deployment of Gross Bank Credit by Major Sectors

(₹ Crore)

Sector	Outstanding as on				Growth (%)	
	Mar.26, 2021	2021	2022		Financial year so far	Y-o-Y
			Feb.26	Jan.28		
	1	2	3	4	%	%
I. Gross Bank Credit (II+III)	10949509	10774742	11582442	11627008	6.2	7.9
II. Food Credit	61254	75206	82390	68224	11.4	-9.3
III. Non-food Credit	10888255	10699536	11500052	11558783	6.2	8.0
1. Agriculture & Allied Activities	1343216	1312285	1432743	1448928	7.9	10.4
2. Industry (Micro and Small, Medium and Large)	3032782	2945152	3046833	3135271	3.4	6.5
2.1 Micro and Small ¹	412655	404155	464420	484465	17.4	19.9
2.2 Medium	143193	137116	223376	235050	64.1	71.4
2.3 Large	2476933	2403881	2359037	2415757	-2.5	0.5
3. Services	2818709	2808122	2904619	2966593	5.2	5.6
3.1 Transport Operators	143305	141683	155422	149178	4.1	5.3
3.2 Computer Software	19773	17698	20344	20134	1.8	13.8
3.3 Tourism, Hotels & Restaurants	59739	57440	54461	64607	8.1	12.5
3.4 Shipping	7753	8418	6871	7480	-3.5	-11.1
3.5 Aviation	26119	26652	23407	23221	-11.1	-12.9
3.6 Professional Services	107722	106349	111576	113204	5.1	6.4
3.7 Trade	632495	600840	672389	687305	8.7	14.4
3.7.1 Wholesale Trade	320677	297113	333226	336982	5.1	13.4
3.7.2 Retail Trade	311818	303727	339163	350322	12.3	15.3
3.8 Commercial Real Estate	289439	288760	275661	288221	-0.4	-0.2
3.9 Non-Banking Financial Companies (NBFCs) ² of which,	958812	895996	1014179	1027183	7.1	14.6
3.9.1 Housing Finance Companies (HFCs)	218924	191432	232739	235080	7.4	22.8
3.9.2 Public Financial Institutions (PFIs)	78987	80092	122375	118244	49.7	47.6
3.10 Other Services ³	573552	664286	570309	586058	2.2	-11.8
4. Personal Loans	2994721	2944789	3180477	3306650	10.4	12.3
4.1 Consumer Durables	17327	17055	25744	26587	53.4	55.9
4.2 Housing	1501141	1478790	1552989	1578125	5.1	6.7
4.3 Advances against Fixed Deposits	68955	60741	70009	76579	11.1	26.1
4.4 Advances to Individuals against share & bonds	5236	4957	5017	5968	14.0	20.4
4.5 Credit Card Outstanding	131193	131068	141254	144004	9.8	9.9
4.6 Education	64063	64554	63057	63130	-1.5	-2.2
4.7 Vehicle Loans	301876	298874	281518	329636	9.2	10.3
4.8 Loan against gold jewellery	60835	56596	69521	71408	17.4	26.2
4.9 Other Personal Loans	844095	832154	971366	1011213	19.8	21.5
5. Priority Sector (Memo)						
5.1 Agriculture & Allied Activities ⁴	1280970	1263614	1354691	1375748	7.4	8.9
5.2 Micro & Small Enterprises ⁵	1190612	1211174	1244132	1312435	10.2	8.4
5.3 Medium Enterprises ⁶	222912	207995	275363	298107	33.7	43.3
5.4 Housing	491507	496751	480738	487611	-0.8	-1.8
5.5 Education Loans	48262	48610	46303	45643	-5.4	-6.1
5.6 Renewable Energy	1244	1495	1965	2573	106.9	72.1
5.7 Social Infrastructure	2666	2439	2447	2480	-7.0	1.7
5.8 Export Credit	31910	27983	24418	29721	-6.9	6.2
5.9 Others	15684	17366	39788	40603	158.9	133.8
5.10 Weaker Sections including net PSLC- SF/MF	870366	837992	875210	933147	7.2	11.4

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 94 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.

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. 26, 2021	2021	2022		Financial year so far	Y-o-Y
		Feb. 26	Jan.28	Feb. 25	2021-22	2022
	1	2	3	4	%	%
2 Industries (2.1 to 2.19)	3032782	2945152	3046833	3135271	3.4	6.5
2.1 Mining & Quarrying (incl. Coal)	47410	45222	47827	49824	5.1	10.2
2.2 Food Processing	159724	156162	165796	169669	6.2	8.6
2.2.1 Sugar	26569	26465	21895	23848	-10.2	-9.9
2.2.2 Edible Oils & Vanaspati	19276	18891	18320	18678	-3.1	-1.1
2.2.3 Tea	5252	5406	5108	5709	8.7	5.6
2.2.4 Others	108628	105399	120473	121434	11.8	15.2
2.3 Beverage & Tobacco	17685	17978	16646	17948	1.5	-0.2
2.4 Textiles	209111	210358	218010	225098	7.6	7.0
2.4.1 Cotton Textiles	91970	93111	93860	96904	5.4	4.1
2.4.2 Jute Textiles	2839	2765	3026	3558	25.3	28.7
2.4.3 Man-Made Textiles	38894	37816	42145	42153	8.4	11.5
2.4.4 Other Textiles	75409	76665	78979	82482	9.4	7.6
2.5 Leather & Leather Products	10846	10889	11159	11449	5.6	5.1
2.6 Wood & Wood Products	14127	14112	14737	15102	6.9	7.0
2.7 Paper & Paper Products	36796	36664	38468	39242	6.6	7.0
2.8 Petroleum, Coal Products & Nuclear Fuels	69032	58439	75420	83255	20.6	42.5
2.9 Chemicals & Chemical Products	199047	189423	195326	200420	0.7	5.8
2.9.1 Fertiliser	32547	32887	27348	28907	-11.2	-12.1
2.9.2 Drugs & Pharmaceuticals	55098	53870	56452	59181	7.4	9.9
2.9.3 Petro Chemicals	45797	40919	37394	36667	-19.9	-10.4
2.9.4 Others	65606	61747	74132	75665	15.3	22.5
2.10 Rubber, Plastic & their Products	56655	55506	68172	70840	25.0	27.6
2.11 Glass & Glassware	6744	7160	5957	5967	-11.5	-16.7
2.12 Cement & Cement Products	56470	61457	47090	48886	-13.4	-20.5
2.13 Basic Metal & Metal Product	338959	340874	288814	295886	-12.7	-13.2
2.13.1 Iron & Steel	239709	247940	187808	195855	-18.3	-21.0
2.13.2 Other Metal & Metal Product	99249	92934	101007	100031	0.8	7.6
2.14 All Engineering	155989	153030	160233	161443	3.5	5.5
2.14.1 Electronics	36473	36146	38310	38789	6.3	7.3
2.14.2 Others	119516	116884	121924	122654	2.6	4.9
2.15 Vehicles, Vehicle Parts & Transport Equipment	89039	87941	88936	90744	1.9	3.2
2.16 Gems & Jewellery	74899	73676	74261	77923	4.0	5.8
2.17 Construction	104002	106758	97176	104617	0.6	-2.0
2.18 Infrastructure	1121908	1067443	1168376	1194553	6.5	11.9
2.18.1 Power	578841	567062	595469	605572	4.6	6.8
2.18.2 Telecommunications	117654	102053	127432	134285	14.1	31.6
2.18.3 Roads	237744	219977	262531	264088	11.1	20.1
2.18.4 Airports	8630	6944	6459	6638	-23.1	-4.4
2.18.5 Ports	10187	10048	7112	8828	-13.3	-12.1
2.18.6 Railways	12471	11954	10151	13954	11.9	16.7
2.18.7 Other Infrastructure	156382	149405	159223	161188	3.1	7.9
2.19 Other Industries	264337	252062	264428	272405	3.1	8.1

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								
		2021						2022	
		Jan, 29	Nov, 19	Nov, 26	Dec, 03	Dec, 17	Dec, 31	Jan, 14	Jan, 28
		1	2	3	4	5	6	7	8
Number of Reporting Banks		32	33	33	33	33	33	33	33
1 Aggregate Deposits (2.1.1.2+2.2.1.2)	-	126732.3	126843.4	126631.3	126775.8	126250.1	125717.1	127755.5	127431.3
2 Demand and Time Liabilities									
2.1 Demand Liabilities	-	21955.8	24421.0	23568.9	24362.4	24175.7	25194.1	24360.8	24041.4
2.1.1 Deposits									
2.1.1.1 Inter-Bank	-	3939.0	5879.7	5294.8	5644.8	5476.8	4992.8	5599.7	5534.4
2.1.1.2 Others	-	13869.6	13527.1	13473.5	13711.9	13239.2	13529.3	13388.7	13490.3
2.1.2 Borrowings from Banks	-	342.5	174.9	150.0	0.0	0.0	30.0	0.0	0.0
2.1.3 Other Demand Liabilities	-	3804.7	4839.4	4650.6	5005.7	5459.6	6642.1	5372.5	5016.7
2.2 Time Liabilities	-	175205.9	174852.8	175629.1	174844.3	176049.4	175645.6	177700.6	178141.3
2.2.1 Deposits									
2.2.1.1 Inter-Bank	-	59535.3	58455.0	59386.8	58648.8	59937.1	60369.4	60244.0	61099.8
2.2.1.2 Others	-	112862.8	113316.3	113157.7	113063.8	113010.9	112187.8	114366.9	113941.1
2.2.2 Borrowings from Banks	-	629.9	910.1	910.1	910.1	900.5	879.7	877.6	876.9
2.2.3 Other Time Liabilities	-	2177.8	2171.4	2174.4	2221.5	2200.8	2208.6	2212.1	2223.6
3 Borrowing from Reserve Bank	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Borrowings from a notified bank / Government	-	57881.3	60487.7	62398.8	62643.7	62867.4	65323.6	64801.9	64328.2
4.1 Demand	-	13137.7	12210.4	12380.4	12696.3	13148.7	12617.5	12576.2	12684.0
4.2 Time	-	44743.5	48277.2	50018.4	49947.4	49718.6	52706.1	52225.7	51644.2
5 Cash in Hand and Balances with Reserve Bank	-	8310.8	9268.7	9075.7	9590.4	9918.8	9710.1	9513.9	9868.9
5.1 Cash in Hand	-	591.6	722.6	691.6	636.1	673.2	706.3	681.3	705.8
5.2 Balance with Reserve Bank	-	7719.2	8546.1	8384.1	8954.3	9245.6	9003.8	8832.7	9163.0
6 Balances with Other Banks in Current Account	-	871.6	1280.3	1215.4	1245.1	1141.8	1419.1	1186.3	1275.4
7 Investments in Government Securities	-	60775.8	71886.2	73814.2	73860.5	72595.8	71870.3	72279.7	71991.8
8 Money at Call and Short Notice	-	25277.1	22786.2	21853.7	21465.8	23039.9	24601.8	24189.3	25584.6
9 Bank Credit (10.1+11)	-	112134.6	107529.9	107879.4	108518.7	109958.7	109318.7	110344.5	110029.1
10 Advances									
10.1 Loans, Cash-Credits and Overdrafts	-	112115.1	107509.4	107858.5	108497.9	109938.2	109298.1	110323.9	110008.5
10.2 Due from Banks	-	88670.2	97554.3	99264.9	99615.8	100260.1	103321.6	102808.2	103697.0
11 Bills Purchased and Discounted	-	19.5	20.5	20.8	20.9	20.5	20.6	20.6	20.6

Prices and Production

No. 18: Consumer Price Index (Base: 2012=100)

Group/Sub group	2020-21			Rural			Urban			Combined		
	Rural	Urban	Combined	Feb. 21	Jan. 22	Feb 22(P)	Feb. 21	Jan. 22	Feb 22(P)	Feb. 21	Jan. 22	Feb 22(P)
	1	2	3	4	5	6	7	8	9	10	11	12
1 Food and beverages	156.7	161.1	158.3	154.7	164.1	163.9	160.8	170.3	170.1	156.9	166.4	166.2
1.1 Cereals and products	145.4	149.9	146.8	142.8	148.3	148.8	147.6	152.2	152.5	144.3	149.5	150.0
1.2 Meat and fish	185.2	192.4	187.7	184.2	196.9	198.1	191.3	202.1	205.1	186.7	198.7	200.6
1.3 Egg	160.3	164.8	162.0	168.0	178.0	175.5	170.1	180.1	176.4	168.8	178.8	175.8
1.4 Milk and products	154.1	154.4	154.2	154.5	160.5	160.7	155.1	160.4	160.5	154.7	160.5	160.6
1.5 Oils and fats	148.2	139.9	145.2	163.1	192.6	192.6	151.5	171.0	171.5	158.8	184.7	184.9
1.6 Fruits	146.9	153.4	149.9	147.2	151.2	151.4	153.9	156.5	156.4	150.3	153.7	153.7
1.7 Vegetables	174.2	196.2	181.7	149.7	159.2	155.3	180.0	203.6	198.0	160.0	174.3	169.8
1.8 Pulses and products	154.4	156.0	154.9	158.4	164.0	163.9	159.8	163.8	163.2	158.9	163.9	163.7
1.9 Sugar and confectionery	114.4	117.0	115.3	111.8	119.3	118.1	114.8	121.3	120.6	112.8	120.0	118.9
1.10 Spices	161.9	160.4	161.4	165.0	173.3	175.3	162.6	169.8	172.1	164.2	172.1	174.2
1.11 Non-alcoholic beverages	149.8	141.3	146.3	160.1	169.8	170.5	149.3	156.6	156.7	155.6	164.3	164.7
1.12 Prepared meals, snacks, sweets	163.2	165.5	164.3	165.8	175.8	176.3	169.4	179.0	180.0	167.5	177.3	178.0
2 Pan, tobacco and intoxicants	181.8	188.7	183.6	186.5	190.7	191.5	193.3	196.4	196.5	188.3	192.2	192.8
3 Clothing and footwear	155.6	149.7	153.3	158.4	172.7	173.7	151.8	162.2	163.4	155.8	168.5	169.6
3.1 Clothing	156.4	152.0	154.7	159.2	173.2	174.2	154.3	164.7	165.7	157.3	169.9	170.9
3.2 Footwear	151.1	137.2	145.3	154.0	169.3	171.0	138.3	148.5	150.4	147.5	160.7	162.4
4 Housing	-	157.2	157.2	-	-	-	159.8	164.5	165.5	159.8	164.5	165.5
5 Fuel and light	149.1	140.9	146.0	154.4	165.8	167.3	149.2	161.6	163.0	152.4	164.2	165.7
6 Miscellaneous	153.9	146.1	150.2	157.2	166.6	167.2	149.3	158.6	159.4	153.4	162.7	163.4
6.1 Household goods and services	152.9	145.2	149.3	154.8	164.9	165.7	146.5	156.8	157.4	150.9	161.1	161.8
6.2 Health	160.3	151.3	156.9	164.3	174.7	175.3	156.2	166.1	167.2	161.2	171.4	172.2
6.3 Transport and communication	144.9	135.0	139.7	150.2	160.8	161.1	140.5	152.7	153.1	145.1	156.5	156.9
6.4 Recreation and amusement	154.0	144.3	148.5	157.2	164.9	165.5	147.3	158.4	159.4	151.6	161.2	162.1
6.5 Education	162.5	156.2	158.9	163.7	169.9	170.3	156.7	161.0	162.0	159.6	164.7	165.4
6.6 Personal care and effects	153.7	155.8	154.5	155.2	163.2	164.5	156.8	162.8	164.1	155.9	163.0	164.3
General Index (All Groups)	156.1	154.4	155.3	156.7	166.4	166.7	156.5	165.0	165.5	156.6	165.7	166.1

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	2020-21	2021	2022	
				Feb.	Jan.	Feb.
	1	2	3	4	5	6
1 Consumer Price Index for Industrial Workers	2016	2.88	-	119	125.1	125
2 Consumer Price Index for Agricultural Labourers	1986-87	5.89	1034	1037	1095	1095
3 Consumer Price Index for Rural Labourers	1986-87	-	1040	1044	1105	1106

Source: Labour Bureau, Ministry of Labour and Employment, Government of India.

No. 20: Monthly Average Price of Gold and Silver in Mumbai

Item	2020-21	2021	2022	
		Feb.	Jan.	Feb.
	1	2	3	4
1 Standard Gold (₹ per 10 grams)	48723	47107	47960	49254
2 Silver (₹ per kilogram)	59283	69065	62038	63175

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	2020-21	2021		2022	
			Feb.	Dec.	Jan. (P)	Feb. (P)
	1	2	3	4	5	6
1 ALL COMMODITIES	100.000	123.4	128.1	143.3	142.9	144.9
1.1 PRIMARY ARTICLES	22.618	145.7	147.1	168.4	165.0	166.8
1.1.1 FOOD ARTICLES	15.256	160.7	157.5	176.7	171.9	170.4
1.1.1.1 Food Grains (Cereals+Pulses)	3.462	159.3	157.4	165.1	165.5	165.9
1.1.1.2 Fruits & Vegetables	3.475	179.2	160.5	226.9	202.0	192.1
1.1.1.3 Milk	4.440	153.4	154.9	157.3	157.4	157.8
1.1.1.4 Eggs, Meat & Fish	2.402	151.2	154.7	161.5	165.1	167.3
1.1.1.5 Condiments & Spices	0.529	149.5	151.5	165.9	168.6	170.2
1.1.1.6 Other Food Articles	0.948	162.0	169.3	170.3	171.9	173.5
1.1.2 NON-FOOD ARTICLES	4.119	130.5	137.0	164.6	164.8	170.2
1.1.2.1 Fibres	0.839	119.8	130.6	164.6	172.2	190.3
1.1.2.2 Oil Seeds	1.115	161.7	175.3	210.1	210.8	215.4
1.1.2.3 Other non-food Articles	1.960	109.0	113.9	123.8	122.2	123.3
1.1.2.4 Floriculture	0.204	210.0	176.7	309.8	292.2	290.2
1.1.3 MINERALS	0.833	164.9	184.3	204.7	198.5	204.8
1.1.3.1 Metallic Minerals	0.648	159.8	183.7	200.9	194.7	200.9
1.1.3.2 Other Minerals	0.185	183.1	186.2	218.2	211.9	218.6
1.1.4 CRUDE PETROLEUM & NATURAL GAS	2.410	70.4	85.6	109.3	109.5	125.1
1.2 FUEL & POWER	13.152	94.0	105.7	133.8	133.2	139.0
1.2.1 COAL	2.138	126.6	126.9	130.9	130.9	130.9
1.2.1.1 Coking Coal	0.647	141.8	141.9	143.4	143.4	143.4
1.2.1.2 Non-Coking Coal	1.401	119.3	119.8	119.8	119.8	119.8
1.2.1.3 Lignite	0.090	130.9	129.9	212.6	212.6	212.6
1.2.2 MINERAL OILS	7.950	79.2	95.3	134.0	133.0	142.6
1.2.3 ELECTRICITY	3.064	109.6	117.6	135.3	135.3	135.3
1.3 MANUFACTURED PRODUCTS	64.231	121.5	126.0	136.5	137.1	138.4
1.3.1 MANUFACTURE OF FOOD PRODUCTS	9.122	141.4	146.6	156.6	157.0	159.8
1.3.1.1 Processing and Preserving of meat	0.134	137.2	137.8	143.7	142.7	140.9
1.3.1.2 Processing and Preserving of fish, Crustaceans, Molluscs and products thereof	0.204	139.0	144.5	149.1	148.3	149.1
1.3.1.3 Processing and Preserving of fruit and Vegetables	0.138	120.2	121.7	120.9	122.4	123.1
1.3.1.4 Vegetable and Animal oils and Fats	2.643	143.5	164.4	180.1	180.9	188.9
1.3.1.5 Dairy products	1.165	146.9	146.4	148.3	148.7	151.2
1.3.1.6 Grain mill products	2.010	143.5	141.8	146.5	147.0	147.1
1.3.1.7 Starches and Starch products	0.110	115.9	118.0	138.3	141.7	146.2
1.3.1.8 Bakery products	0.215	138.1	139.3	150.0	150.6	150.8
1.3.1.9 Sugar, Molasses & honey	1.163	118.4	116.7	125.1	124.7	124.8
1.3.1.10 Cocoa, Chocolate and Sugar confectionery	0.175	128.0	127.6	132.0	132.8	132.9
1.3.1.11 Macaroni, Noodles, Couscous and Similar farinaceous products	0.026	132.3	132.2	131.4	142.3	139.7
1.3.1.12 Tea & Coffee products	0.371	166.5	152.1	175.4	171.3	165.5
1.3.1.13 Processed condiments & salt	0.163	147.0	150.5	157.4	162.4	163.7
1.3.1.14 Processed ready to eat food	0.024	132.2	134.8	136.3	137.0	137.4
1.3.1.15 Health supplements	0.225	142.9	139.3	153.1	153.0	161.6
1.3.1.16 Prepared animal feeds	0.356	170.5	175.4	199.5	199.8	203.8
1.3.2 MANUFACTURE OF BEVERAGES	0.909	124.5	124.6	127.2	127.2	128.4
1.3.2.1 Wines & spirits	0.408	120.2	120.1	124.1	123.9	124.9
1.3.2.2 Malt liquors and Malt	0.225	126.5	125.8	131.1	131.5	132.9
1.3.2.3 Soft drinks; Production of mineral waters and Other bottled waters	0.275	129.4	130.4	128.5	128.4	130.1
1.3.3 MANUFACTURE OF TOBACCO PRODUCTS	0.514	157.2	159.0	161.9	161.0	160.7
1.3.3.1 Tobacco products	0.514	157.2	159.0	161.9	161.0	160.7

No. 21: Wholesale Price Index (Contd.)

(Base: 2011-12 = 100)

Commodities	Weight	2020-21	2021		2022	
			Feb.	Dec.	Jan. (P)	Feb. (P)
1.3.4 MANUFACTURE OF TEXTILES	4.881	117.6	124.9	139.2	140.0	142.4
1.3.4.1 Preparation and Spinning of textile fibres	2.582	106.6	117.0	133.4	134.8	138.1
1.3.4.2 Weaving & Finishing of textiles	1.509	131.7	136.2	149.7	149.5	151.6
1.3.4.3 Knitted and Crocheted fabrics	0.193	115.2	116.4	127.5	128.6	130.1
1.3.4.4 Made-up textile articles, Except apparel	0.299	132.3	132.9	141.1	142.2	142.0
1.3.4.5 Cordage, Rope, Twine and Netting	0.098	155.6	165.1	167.1	167.8	166.1
1.3.4.6 Other textiles	0.201	116.3	117.6	129.3	128.8	130.3
1.3.5 MANUFACTURE OF WEARING APPAREL	0.814	138.6	139.6	144.7	144.6	145.2
1.3.5.1 Manufacture of Wearing Apparel (woven), Except fur Apparel	0.593	138.1	138.5	143.2	143.2	144.0
1.3.5.2 Knitted and Crocheted apparel	0.221	139.8	142.8	148.7	148.2	148.4
1.3.6 MANUFACTURE OF LEATHER AND RELATED PRODUCTS	0.535	117.9	116.7	119.8	121.1	121.3
1.3.6.1 Tanning and Dressing of leather; Dressing and Dyeing of fur	0.142	101.1	94.6	104.3	102.4	107.4
1.3.6.2 Luggage, HandbAgs, Saddlery and Harness	0.075	138.6	139.3	142.6	143.7	144.4
1.3.6.3 Footwear	0.318	120.6	121.2	121.4	124.2	122.1
1.3.7 MANUFACTURE OF WOOD AND PRODUCTS OF WOOD AND CORK	0.772	134.6	136.2	142.5	142.3	142.4
1.3.7.1 Saw milling and Planing of wood	0.124	120.7	121.3	131.2	131.4	131.1
1.3.7.2 Veneer sheets; Manufacture of plywood, Laminboard, Particle board and Other panels and Boards	0.493	136.6	138.1	143.1	142.9	143.1
1.3.7.3 Builder's carpentry and Joinery	0.036	185.8	190.4	194.5	194.6	195.2
1.3.7.4 Wooden containers	0.119	125.7	127.8	135.9	135.2	135.8
1.3.8 MANUFACTURE OF PAPER AND PAPER PRODUCTS	1.113	121.7	125.7	141.2	141.6	142.4
1.3.8.1 Pulp, Paper and Paperboard	0.493	124.1	128.8	145.3	144.5	146.1
1.3.8.2 Corrugated paper and Paperboard and Containers of paper and Paperboard	0.314	122.2	128.9	139.3	140.6	141.2
1.3.8.3 Other articles of paper and Paperboard	0.306	117.4	117.5	136.5	137.8	137.5
1.3.9 PRINTING AND REPRODUCTION OF RECORDED MEDIA	0.676	153.8	155.1	162.6	163.4	162.4
1.3.9.1 Printing	0.676	153.8	155.1	162.6	163.4	162.4
1.3.10 MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS	6.465	118.2	123.1	136.8	137.4	139.3
1.3.10.1 Basic chemicals	1.433	118.6	127.2	149.3	149.6	152.6
1.3.10.2 Fertilizers and Nitrogen compounds	1.485	123.6	124.0	131.1	133.2	134.4
1.3.10.3 Plastic and Synthetic rubber in primary form	1.001	116.7	128.7	142.6	141.1	143.2
1.3.10.4 Pesticides and Other agrochemical products	0.454	124.4	125.2	133.2	135.8	138.5
1.3.10.5 Paints, Varnishes and Similar coatings, Printing ink and Mastics	0.491	114.9	118.0	137.0	137.0	137.6
1.3.10.6 Soap and Detergents, Cleaning and Polishing preparations, Perfumes and Toilet preparations	0.612	120.6	122.4	130.9	131.1	132.1
1.3.10.7 Other chemical products	0.692	115.1	118.1	134.1	135.3	137.0
1.3.10.8 Man-made fibres	0.296	93.7	99.1	109.2	108.8	109.9
1.3.11 MANUFACTURE OF PHARMACEUTICALS, MEDICINAL CHEMICAL AND BOTANICAL PRODUCTS	1.993	130.9	132.8	136.6	137.2	138.2
1.3.11.1 Pharmaceuticals, Medicinal chemical and Botanical products	1.993	130.9	132.8	136.6	137.2	138.2
1.3.12 MANUFACTURE OF RUBBER AND PLASTICS PRODUCTS	2.299	111.3	116.3	127.1	127.1	127.1
1.3.12.1 Rubber Tyres and Tubes; Retreading and Rebuilding of Rubber Tyres	0.609	98.3	98.9	106.5	105.9	106.3
1.3.12.2 Other Rubber Products	0.272	93.3	95.4	104.6	104.1	105.0
1.3.12.3 Plastics products	1.418	120.3	127.8	140.3	140.6	140.3
1.3.13 MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS	3.202	117.6	117.9	125.1	125.7	126.3
1.3.13.1 Glass and Glass products	0.295	127.2	129.6	143.9	145.2	142.6
1.3.13.2 Refractory products	0.223	109.5	111.1	119.0	119.0	120.0
1.3.13.3 Clay Building Materials	0.121	109.3	111.2	120.9	131.3	134.1
1.3.13.4 Other Porcelain and Ceramic Products	0.222	109.5	111.3	114.3	116.2	116.1
1.3.13.5 Cement, Lime and Plaster	1.645	120.9	119.8	127.1	126.6	127.9

No. 21: Wholesale Price Index (Contd.)

(Base: 2011-12 = 100)

Commodities	Weight	2020-21	2021		2022	
			Feb.	Dec.	Jan. (P)	Feb. (P)
1.3.13.6 Articles of Concrete, Cement and Plaster	0.292	125.3	126.7	129.8	129.6	130.8
1.3.13.7 Cutting, Shaping and Finishing of Stone	0.234	121.1	123.2	120.2	121.4	121.5
1.3.13.8 Other Non-Metallic Mineral Products	0.169	78.9	79.9	96.6	99.0	97.9
1.3.14 MANUFACTURE OF BASIC METALS	9.646	111.4	121.1	141.9	142.8	145.1
1.3.14.1 Inputs into steel making	1.411	109.2	121.2	153.6	155.8	157.0
1.3.14.2 Metallic Iron	0.653	113.3	124.6	145.2	149.2	150.6
1.3.14.3 Mild Steel - Semi Finished Steel	1.274	99.8	105.6	118.2	119.9	121.4
1.3.14.4 Mild Steel -Long Products	1.081	112.0	124.7	139.0	139.3	143.6
1.3.14.5 Mild Steel - Flat products	1.144	117.2	134.4	160.6	156.1	158.2
1.3.14.6 Alloy steel other than Stainless Steel- Shapes	0.067	108.3	119.1	130.7	136.2	142.5
1.3.14.7 Stainless Steel - Semi Finished	0.924	108.7	118.0	142.8	144.8	147.5
1.3.14.8 Pipes & tubes	0.205	127.9	137.5	161.8	163.9	165.9
1.3.14.9 Non-ferrous metals incl. precious metals	1.693	112.3	120.8	143.8	145.3	148.5
1.3.14.10 Castings	0.925	109.1	111.8	120.7	120.7	121.7
1.3.14.11 Forgings of steel	0.271	145.7	146.1	160.6	165.1	165.8
1.3.15 MANUFACTURE OF FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	3.155	115.9	120.7	133.1	133.7	133.0
1.3.15.1 Structural Metal Products	1.031	114.1	118.6	124.8	124.6	124.3
1.3.15.2 Tanks, Reservoirs and Containers of Metal	0.660	127.8	138.8	162.1	160.9	159.8
1.3.15.3 Steam generators, Except Central Heating Hot Water Boilers	0.145	98.9	97.2	94.8	98.0	93.8
1.3.15.4 Forging, Pressing, Stamping and Roll-Forming of Metal; Powder Metallurgy	0.383	96.7	97.5	122.6	125.0	125.1
1.3.15.5 Cutlery, Hand Tools and General Hardware	0.208	102.9	104.2	109.6	109.9	109.4
1.3.15.6 Other Fabricated Metal Products	0.728	125.0	128.8	138.3	140.6	139.8
1.3.16 MANUFACTURE OF COMPUTER, ELECTRONIC AND OPTICAL PRODUCTS	2.009	109.8	111.1	113.5	114.3	114.7
1.3.16.1 Electronic Components	0.402	99.1	100.5	107.5	108.3	109.0
1.3.16.2 Computers and Peripheral Equipment	0.336	134.8	134.4	134.9	134.8	134.7
1.3.16.3 Communication Equipment	0.310	114.9	115.0	120.5	121.3	121.3
1.3.16.4 Consumer Electronics	0.641	98.5	102.4	100.8	102.3	103.2
1.3.16.5 Measuring, Testing, Navigating and Control equipment	0.181	107.7	106.1	108.5	109.2	109.5
1.3.16.6 Watches and Clocks	0.076	141.8	141.6	145.6	145.7	147.2
1.3.16.7 Irradiation, Electromedical and Electrotherapeutic equipment	0.055	102.8	102.7	109.2	107.1	106.3
1.3.16.8 Optical instruments and Photographic equipment	0.008	102.7	94.9	98.4	99.5	99.6
1.3.17 MANUFACTURE OF ELECTRICAL EQUIPMENT	2.930	113.6	116.9	123.6	124.4	124.8
1.3.17.1 Electric motors, Generators, Transformers and Electricity distribution and Control apparatus	1.298	113.2	116.6	120.8	120.8	121.5
1.3.17.2 Batteries and Accumulators	0.236	117.1	117.3	123.8	125.6	125.0
1.3.17.3 Fibre optic cables for data transmission or live transmission of images	0.133	98.1	99.9	100.4	104.1	106.1
1.3.17.4 Other electronic and Electric wires and Cables	0.428	115.9	124.4	143.1	144.6	145.6
1.3.17.5 Wiring devices, Electric lighting & display equipment	0.263	111.1	111.8	115.6	115.7	115.3
1.3.17.6 Domestic appliances	0.366	119.7	122.9	130.8	131.3	131.2
1.3.17.7 Other electrical equipment	0.206	109.5	109.5	113.9	115.8	115.3
1.3.18 MANUFACTURE OF MACHINERY AND EQUIPMENT	4.789	114.0	115.4	121.1	121.6	122.0
1.3.18.1 Engines and Turbines, Except aircraft, Vehicle and Two wheeler engines	0.638	106.3	110.2	121.4	121.0	121.7
1.3.18.2 Fluid power equipment	0.162	119.4	119.5	123.1	123.2	123.1
1.3.18.3 Other pumps, Compressors, Taps and Valves	0.552	111.6	112.2	116.4	116.6	115.1
1.3.18.4 Bearings, Gears, Gearing and Driving elements	0.340	111.8	112.9	119.5	119.1	120.9
1.3.18.5 Ovens, Furnaces and Furnace burners	0.008	80.2	71.4	73.0	72.7	76.0
1.3.18.6 Lifting and Handling equipment	0.285	113.4	115.2	122.7	124.4	122.7

No. 21: Wholesale Price Index (Concl.)

(Base: 2011-12 = 100)

Commodities	Weight	2020-21	2021		2022	
			Feb.	Dec.	Jan. (P)	Feb. (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	128.7	128.1	130.6	133.7	135.1
1.3.18.9 Agricultural and Forestry machinery	0.833	121.6	122.4	130.5	131.0	132.0
1.3.18.10 Metal-forming machinery and Machine tools	0.224	108.4	107.3	114.6	115.8	115.4
1.3.18.11 Machinery for mining, Quarrying and Construction	0.371	75.7	76.6	78.5	78.7	79.2
1.3.18.12 Machinery for food, Beverage and Tobacco processing	0.228	128.0	128.2	131.0	130.7	131.1
1.3.18.13 Machinery for textile, Apparel and Leather production	0.192	121.9	125.9	125.8	128.0	128.1
1.3.18.14 Other special-purpose machinery	0.468	128.7	131.5	136.2	136.0	136.2
1.3.18.15 Renewable electricity generating equipment	0.046	65.2	66.2	66.8	66.9	67.2
1.3.19 MANUFACTURE OF MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS	4.969	117.8	119.6	124.1	124.7	125.8
1.3.19.1 Motor vehicles	2.600	119.4	121.5	123.5	124.3	125.9
1.3.19.2 Parts and Accessories for motor vehicles	2.368	116.1	117.4	124.7	125.2	125.6
1.3.20 MANUFACTURE OF OTHER TRANSPORT EQUIPMENT	1.648	126.2	128.8	133.1	133.6	133.9
1.3.20.1 Building of ships and Floating structures	0.117	158.8	158.9	158.9	158.9	158.9
1.3.20.2 Railway locomotives and Rolling stock	0.110	105.0	104.6	103.8	105.6	103.3
1.3.20.3 Motor cycles	1.302	124.7	127.7	132.8	133.2	133.8
1.3.20.4 Bicycles and Invalid carriages	0.117	130.3	134.5	138.0	138.2	138.2
1.3.20.5 Other transport equipment	0.002	128.5	131.2	137.4	138.6	139.3
1.3.21 MANUFACTURE OF FURNITURE	0.727	133.2	138.1	154.3	154.6	154.9
1.3.21.1 Furniture	0.727	133.2	138.1	154.3	154.6	154.9
1.3.22 OTHER MANUFACTURING	1.064	132.4	137.4	136.7	138.3	139.2
1.3.22.1 Jewellery and Related articles	0.996	130.5	135.8	134.8	136.5	137.6
1.3.22.2 Musical instruments	0.001	173.7	189.7	195.7	195.0	185.1
1.3.22.3 Sports goods	0.012	132.0	134.2	142.5	144.0	144.3
1.3.22.4 Games and Toys	0.005	142.4	144.1	151.1	149.4	148.7
1.3.22.5 Medical and Dental instruments and Supplies	0.049	167.4	168.8	171.1	170.8	169.6
2 FOOD INDEX	24.378	153.4	153.4	169.2	166.3	166.4

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	2019-20	2020-21	April-January		January	
				2020-21	2021-22	2021	2022
	1	2	3	4	5	6	7
General Index	100.00	129.0	118.1	114.2	129.8	136.6	138.4
1 Sectoral Classification							
1.1 Mining	14.37	109.6	101.0	95.5	109.1	121.3	124.7
1.2 Manufacturing	77.63	129.6	117.2	113.3	129.5	136.6	138.1
1.3 Electricity	7.99	158.4	157.6	155.7	169.0	164.2	165.6
2 Use-Based Classification							
2.1 Primary Goods	34.05	127.0	118.1	114.8	127.0	134.4	136.5
2.2 Capital Goods	8.22	93.3	75.9	70.8	85.5	93.2	91.9
2.3 Intermediate Goods	17.22	137.7	124.7	120.4	142.4	149.7	151.1
2.4 Infrastructure/ Construction Goods	12.34	136.6	124.7	119.8	145.7	150.1	158.2
2.5 Consumer Durables	12.84	119.0	101.2	95.7	112.4	123.9	119.8
2.6 Consumer Non-Durables	15.33	145.3	142.1	140.1	147.2	149.8	152.9

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

(₹ Crore)

Item	Financial Year	April - February			
	2021-22 (Revised Estimates)	2021-22 (Actuals)	2020-21 (Actuals)	Percentage to Revised Estimates	
				2021-22	2020-21
	1	2	3	4	5
1 Revenue Receipts	2078936	1791017	1370272	86.2	88.1
1.1 Tax Revenue (Net)	1765145	1480886	1216086	83.9	90.4
1.2 Non-Tax Revenue	313791	310131	154186	98.8	73.2
2 Non-Debt Capital Receipt	99975	36263	42824	36.3	92.1
2.1 Recovery of Loans	21975	22749	17156	103.5	118.3
2.2 Other Receipts	78000	13514	25668	17.3	80.2
3 Total Receipts (excluding borrowings) (1+2)	2178911	1827280	1413096	83.9	88.2
4 Revenue Expenditure	3167289	2658694	2413375	83.9	80.1
4.1 Interest Payments	813791	670501	559483	82.4	80.7
5 Capital Expenditure	602711	485181	405268	80.5	92.3
6 Total Expenditure (4+5)	3770000	3143875	2818643	83.4	81.7
7 Revenue Deficit (4-1)	1088352	867677	1043103	79.7	71.6
8 Fiscal Deficit (6-3)	1591089	1316595	1405547	82.7	76.0
9 Gross Primary Deficit (8-4.1)	777298	646094	846064	83.1	73.2

Source: Controller General of Accounts (CGA), Ministry of Finance, Government of India and Union Budget 2022-23.

No. 24: Treasury Bills – Ownership Pattern

(₹ Crore)

Item	2021-22	2021	2022					
	1	Feb. 26	Jan. 21	Jan. 28	Feb. 4	Feb. 11	Feb. 18	Feb. 25
		2	3	4	5	6	7	8
1 91-day								
1.1 Banks	5310	2438	6179	4606	4383	5189	5396	4923
1.2 Primary Dealers	16705	20266	20650	23278	20417	20705	15444	15781
1.3 State Governments	31320	49738	92809	89751	84441	72538	76538	58638
1.4 Others	72109	73109	97846	92332	91521	84935	85652	80823
2 182-day								
2.1 Banks	70130	47294	53310	53165	56830	55072	58097	58219
2.2 Primary Dealers	63669	31476	43400	46518	45832	49862	46019	49488
2.3 State Governments	15763	786	5524	4026	4026	3026	4826	8826
2.4 Others	69259	66900	30924	32920	36852	41074	46142	49752
3 364-day								
3.1 Banks	112386	120536	118211	112628	119674	117434	115928	116951
3.2 Primary Dealers	160461	146544	119860	127319	124744	126510	121756	125294
3.3 State Governments	22836	18360	21981	23136	23136	23056	23056	20551
3.4 Others	118392	175183	105238	106626	105200	108720	118826	117697
4 14-day Intermediate								
4.1 Banks								
4.2 Primary Dealers								
4.3 State Governments	287975	188361	210638	224416	170948	137654	210094	367557
4.4 Others	960	91	1263	724	1660	778	813	976
Total Treasury Bills (Excluding 14 day Intermediate T Bills) #	758339	752630	715931	716307	717056	708122	717682	706943

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			
91-day Treasury Bills										
2021-22										
Jan. 25	5000	82	20841	6313	28	4997	6313	11310	99.08	3.7080
Feb. 2	5000	61	16627	3901	26	4999	3901	8900	99.04	3.8838
Feb. 9	5000	102	28646	801	29	4999	801	5800	99.04	3.8887
Feb. 16	5000	86	25026	8281	17	4969	8281	13250	99.09	3.6770
Feb. 23	5000	96	19097	3075	33	4995	3075	8070	99.09	3.6954
182-day Treasury Bills										
2021-22										
Jan. 25	10000	99	21073	700	68	10000	700	10700	97.96	4.1789
Feb. 2	10000	63	18808	1	37	9999	1	10000	97.86	4.3961
Feb. 9	10000	125	30642	0	37	10000	0	10000	97.85	4.4030
Feb. 16	10000	165	41637	1800	24	10000	1800	11800	97.97	4.1599
Feb. 23	10000	140	31349	4005	59	9995	4005	14000	97.95	4.1900
364-day Treasury Bills										
2021-22										
Jan. 25	11000	126	27590	1136	55	10964	1136	12100	95.70	4.5053
Feb. 2	11000	100	24300	27	42	10973	27	11000	95.56	4.6600
Feb. 9	11000	149	33623	30	28	10970	30	11000	95.55	4.6711
Feb. 16	11000	162	30709	1	66	10999	1	11000	95.71	4.4900
Feb. 23	11000	168	37108	0	53	11000	0	11000	95.69	4.5200

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
February	1, 2022	2.20-3.60	3.25
February	2, 2022	2.20-3.80	3.30
February	3, 2022	2.20-3.50	3.22
February	4, 2022	2.20-3.60	3.27
February	5, 2022	2.70-3.25	2.92
February	8, 2022	2.20-3.50	3.26
February	9, 2022	2.20-3.60	3.28
February	10, 2022	2.00-3.60	3.27
February	11, 2022	2.20-3.55	3.28
February	14, 2022	2.20-3.60	3.27
February	15, 2022	2.00-3.45	3.26
February	16, 2022	2.20-3.45	3.25
February	17, 2022	2.20-3.45	3.21
February	18, 2022	2.00-3.55	3.29
February	21, 2022	2.00-3.80	3.32
February	22, 2022	2.20-3.65	3.31
February	23, 2022	2.20-3.55	3.29
February	24, 2022	2.00-3.50	3.27
February	25, 2022	2.20-3.50	3.28
February	28, 2022	2.20-3.60	3.29
March	2, 2022	2.20-3.45	3.27
March	3, 2022	2.20-3.55	3.28
March	4, 2022	2.00-3.50	3.28
March	5, 2022	2.40-3.50	3.22
March	7, 2022	2.00-3.65	3.29
March	8, 2022	2.00-3.65	3.28
March	9, 2022	2.00-3.65	3.32
March	10, 2022	2.00-4.00	3.45
March	11, 2022	2.00-3.50	3.29
March	14, 2022	2.20-3.45	3.24
March	15, 2022	2.20-3.45	3.25

Note: Includes Notice Money.

No. 27: Certificates of Deposit

Item	2021	2022			
	Feb. 26	Jan. 14	Jan. 28	Feb. 11	Feb. 25
	1	2	3	4	5
1 Amount Outstanding (₹ Crore)	54917.99	101151.87	99706.14	112564.73	127618.40
1.1 Issued during the fortnight (₹ Crore)	4415.32	17328.85	2343.76	17451.50	19096.55
2 Rate of Interest (per cent)	3.34-5.12	3.57-4.98	3.78-5.09	4.01-5.44	3.86-5.62

No. 28: Commercial Paper

Item	2021	2022			
	Feb. 28	Jan. 15	Jan. 31	Feb. 15	Feb. 28
	1	2	3	4	5
1 Amount Outstanding (₹ Crore)	390852.95	386159.90	395881.00	389950.70	364645.30
1.1 Reported during the fortnight (₹ Crore)	69500.35	64665.30	71201.95	64232.70	44435.25
2 Rate of Interest (per cent)	3.10-12.60	3.39-13.45	3.47-12.32	3.67-12.29	3.64-11.51

No. 29: Average Daily Turnover in Select Financial Markets

(₹ Crore)

Item	2020-21	2021	2022					
		Feb. 26	Jan. 21	Jan. 28	Feb. 4	Feb. 11	Feb. 18	Feb. 25
	1	2	3	4	5	6	7	8
1 Call Money	17461	16616	15138	13113	10754	11940	15742	16146
2 Notice Money	2604	424	368	4614	2829	430	643	383
3 Term Money	757	568	334	376	427	269	535	334
4 Triparty Repo	421118	560631	612806	800727	697835	698852	845803	823707
5 Market Repo	337341	341540	380765	420810	321290	344725	450982	492832
6 Repo in Corporate Bond	2990	740	371	389	209	53	112	358
7 Forex (US \$ million)	67793	100046	63714	87352	75197	70481	75825	87562
8 Govt. of India Dated Securities	62490	38987	43016	34980	66829	70639	53123	39524
9 State Govt. Securities	5080	7647	5883	6719	6670	5187	6462	3982
10 Treasury Bills								
10.1 91-Day	4970	3166	2689	1941	3658	5569	4253	2800
10.2 182-Day	4870	2190	2833	1733	1843	5094	2504	3479
10.3 364-Day	4010	8736	2656	3642	1667	2496	6098	1353
10.4 Cash Management Bills	1490							
11 Total Govt. Securities (8+9+10)	82910	60726	57077	49015	80667	88985	72441	51137
11.1 RBI	—	4322	201	155	1132	115	1038	615

No. 30: New Capital Issues By Non-Government Public Limited Companies

(Amount in ₹ Crore)

Security & Type of Issue	2020-21		2020-21 (Apr.-Feb.)		2021-22 (Apr.-Feb.) *		Feb. 2021		Feb. 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	74	102062	55	95609	148	137842	6	5837	13	6944
1A Premium	73	97648	55	91432	139	135911	6	5351	12	6894
1.1 Public	53	38004	37	31622	111	112416	5	2839	9	6831
1.1.1 Premium	53	34848	37	28685	109	111195	5	2813	8	6800
1.2 Rights	21	64059	18	63987	37	25424	1	2999	4	113
1.2.1 Premium	20	62800	18	62747	30	24716	1	2537	4	94
2 Preference Shares	—	—	—	—	—	—	—	—	—	—
2.1 Public	—	—	—	—	—	—	—	—	—	—
2.2 Rights	—	—	—	—	—	—	—	—	—	—
3 Bonds & Debentures	16	5806	14	4906	27	11411	1	216	1	104
3.1 Convertible	—	—	—	—	—	—	—	—	—	—
3.1.1 Public	—	—	—	—	—	—	—	—	—	—
3.1.2 Rights	—	—	—	—	—	—	—	—	—	—
3.2 Non-Convertible	16	5806	14	4906	27	11411	1	216	1	104
3.2.1 Public	16	5806	14	4906	27	11411	1	216	1	104
3.2.2 Rights	—	—	—	—	—	—	—	—	—	—
4 Total(1+2+3)	90	107868	69	100515	175	149253	7	6054	14	7048
4.1 Public	69	43809	51	36528	138	123829	6	3055	10	6936
4.2 Rights	21	64059	18	63987	37	25424	1	2999	4	113

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	2020-21	2021				2022	
			Feb.	Oct.	Nov.	Dec.	Jan.	Feb.
		1	2	3	4	5	6	7
1 Exports	₹ Crore	2159043	201050	267628	236917	296263	261659	259270
	US \$ Million	291808	27633	35724	31802	39307	35150	34568
1.1 Oil	₹ Crore	190896	17979	40177	41141	51225	34045	34871
	US \$ Million	25804	2471	5363	5523	6796	4573	4649
1.2 Non-oil	₹ Crore	1968147	183071	227451	195776	245038	227615	224399
	US \$ Million	266004	25162	30361	26280	32510	30576	29919
2 Imports	₹ Crore	2915958	296473	403677	397795	454553	394934	415859
	US \$ Million	394436	40749	53884	53398	60308	53053	55446
2.1 Oil	₹ Crore	611353	65710	93949	109325	124323	97831	114610
	US \$ Million	82684	9031	12541	14675	16494	13142	15281
2.2 Non-oil	₹ Crore	2304605	230763	309729	288470	330230	297103	301249
	US \$ Million	311752	31717	41344	38723	43813	39911	40165
3 Trade Balance	₹ Crore	-756914	-95423	-136050	-160878	-158289	-133275	-156589
	US \$ Million	-102627	-13115	-18160	-21595	-21001	-17903	-20878
3.1 Oil	₹ Crore	-420457	-47730	-53772	-68184	-73098	-63786	-79738
	US \$ Million	-56880	-6560	-7178	-9153	-9698	-8569	-10631
3.2 Non-oil	₹ Crore	-336458	-47693	-82278	-92694	-85192	-69489	-76851
	US \$ Million	-45748	-6555	-10983	-12443	-11303	-9335	-10246

Source: DGCI&S and Ministry of Commerce & Industry.

No. 32: Foreign Exchange Reserves

Item	Unit	2021	2022					
		Mar. 26	Feb. 18	Feb. 25	Mar. 4	Mar. 11	Mar. 18	Mar. 25
		1	2	3	4	5	6	7
1 Total Reserves	₹ Crore	4200668	4725881	4755726	4812292	4765009	4699321	4707396
	US \$ Million	579285	632952	631527	631920	622275	619678	617648
1.1 Foreign Currency Assets	₹ Crore	3901003	4233784	4253494	4306235	4245013	4198615	4195294
	US \$ Million	537953	567060	564832	565466	554359	553656	550454
1.2 Gold	₹ Crore	253128	309914	319800	322284	335721	318586	329562
	US \$ Million	34907	41509	42467	42320	43842	42011	43241
	Volume (Metric Tonnes)	694.38	757.62	757.96	757.96	758.86	758.86	760.42
1.3 SDRs	SDRs Million	1049	13657	13657	13657	13657	13657	13657
	₹ Crore	10808	143069	143381	144544	144938	143063	143446
	US \$ Million	1490	19162	19040	18981	18928	18865	18821
1.4 Reserve Tranche Position in IMF	₹ Crore	35729	39114	39051	39229	39336	39057	39094
	US \$ Million	4935	5221	5187	5153	5146	5146	5132

* Difference, if any, is due to rounding off.

No. 33: Non-Resident Deposits

(US\$ Million)

Scheme	Outstanding				Flows	
	2020-21	2021	2022		2020-21	2021-22
		Feb.	Jan.	Feb.	Apr.-Feb.	Apr.-Feb.
	1	2	3	4	5	6
1 NRI Deposits	141895	142354	140485	139585	8881	2363
1.1 FCNR(B)	20473	22093	18089	17293	-2151	-3180
1.2 NR(E)RA	102579	101797	101543	101116	8957	2462
1.3 NRO	18842	18464	20852	21176	2075	3081

No. 34: Foreign Investment Inflows

(US\$ Million)

Item	2020-21	2020-21	2021-22	2021	2022	
		Apr.-Feb.	Apr.-Feb.	Feb.	Jan.	Feb.
	1	2	3	4	5	6
1.1 Net Foreign Direct Investment (1.1.1–1.1.2)	43955	43200	36599	442	5816	4275
1.1.1 Direct Investment to India (1.1.1.1–1.1.2)	54927	52861	50673	1782	6831	4884
1.1.1.1 Gross Inflows/Gross Investments	81973	77264	76897	4425	8913	6448
1.1.1.1.1 Equity	61088	58087	55103	2716	6517	4747
1.1.1.1.1.1 Government (SIA/FIPB)	948	942	1638	36	45	18
1.1.1.1.1.2 RBI	51597	49345	38706	1917	4694	3366
1.1.1.1.1.3 Acquisition of shares	7091	6477	13836	633	1649	1234
1.1.1.1.1.4 Equity capital of unincorporated bodies	1452	1323	923	129	129	129
1.1.1.1.2 Reinvested earnings	16935	15429	17140	1506	1506	1506
1.1.1.1.3 Other capital	3950	3748	4654	202	890	195
1.1.1.2 Repatriation/Disinvestment	27046	24403	26224	2643	2082	1564
1.1.1.2.1 Equity	26983	24352	25079	2631	1586	1480
1.1.1.2.2 Other capital	63	51	1145	11	496	84
1.1.2 Foreign Direct Investment by India (1.1.2.1+1.1.2.2+1.1.2.3–1.1.2.4)	10972	9661	14073	1340	1015	609
1.1.2.1 Equity capital	5583	5013	7795	359	763	216
1.1.2.2 Reinvested Earnings	3013	2762	2492	251	251	251
1.1.2.3 Other Capital	6688	5627	6361	1302	151	283
1.1.2.4 Repatriation/Disinvestment	4313	3741	2575	571	150	141
1.2 Net Portfolio Investment (1.2.1+1.2.2+1.2.3–1.2.4)	36137	36928	-11973	1853	-4919	-5492
1.2.1 GDRs/ADRs	–	–	–	–	–	–
1.2.2 FIIs	38725	39214	-9340	2156	-4186	-5372
1.2.3 Offshore funds and others	–	–	–	–	–	–
1.2.4 Portfolio investment by India	2589	2285	2633	303	733	121
1 Foreign Investment Inflows	80092	80128	24626	2295	897	-1218

No. 35: Outward Remittances under the Liberalised Remittance Scheme (LRS) for Resident Individuals

(US\$ Million)

Item	2020-21	2021		2022	
		Feb.	Dec.	Jan.	Feb.
	1	2	3	4	5
1 Outward Remittances under the LRS	12684.40	1155.61	1773.56	2018.31	1823.35
1.1 Deposit	680.37	39.73	56.64	66.27	54.20
1.2 Purchase of immovable property	62.75	4.56	10.77	8.58	8.07
1.3 Investment in equity/debt	471.80	41.19	54.30	73.53	60.39
1.4 Gift	1586.24	143.25	214.59	200.23	201.36
1.5 Donations	12.59	2.06	2.69	1.53	3.28
1.6 Travel	3239.67	316.81	884.10	989.05	980.45
1.7 Maintenance of close relatives	2680.10	215.18	281.46	315.61	282.61
1.8 Medical Treatment	29.75	2.40	3.33	3.77	3.69
1.9 Studies Abroad	3836.12	383.27	253.69	345.76	216.07
1.10 Others	85.03	7.18	11.99	13.98	13.23

**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	
			March	February	March
	1	2	3	4	5
40-Currency Basket (Base: 2015-16=100)					
1 Trade-weighted					
1.1 NEER	93.92	93.71	95.01	93.74	93.31
1.2 REER	103.46	104.23	103.94	103.57	103.08
2 Export-weighted					
2.1 NEER	93.59	93.53	94.52	93.90	93.74
2.2 REER	102.96	103.59	103.37	103.06	102.66
6-Currency Basket (Trade-weighted)					
1 Base: 2015-16 = 100					
1.1 NEER	88.46	87.03	88.56	86.91	86.44
1.2 REER	101.86	102.34	101.71	101.66	101.42
2 Base: 2019-20 = 100					
2.1 NEER	93.24	91.73	93.34	91.61	91.11
2.2 REER	98.36	98.82	98.21	98.16	97.93

No. 37: External Commercial Borrowings (ECBs) – Registrations

(Amount in US\$ Million)

Item	2020-21	2021	2022	
		Feb	Jan	Feb
	1	2	3	4
1 Automatic Route				
1.1 Number	1063	78	81	71
1.2 Amount	26799	2077	3879	805
2 Approval Route				
2.1 Number	13	1	4	2
2.2 Amount	8456	500	4100	1523
3 Total (1+2)				
3.1 Number	1076	79	85	73
3.2 Amount	35255	2577	7979	2328
4 Weighted Average Maturity (in years)	6.03	8.74	15.18	6.30
5 Interest Rate (per cent)				
5.1 Weighted Average Margin over 6-month LIBOR or reference rate for Floating Rate Loans	1.93	2.61	1.81	1.40
5.2 Interest rate range for Fixed Rate Loans	0.00-13.00	0.00-10.25	0.00-11.20	0.00-12.00
Borrower Category				
I. Corporate Manufacturing	12827	592	5783	491
II. Corporate-Infrastructure	9985	332	843	1324
a.) Transport	636	0	0	1308
b.) Energy	2713	31	708	7
c.) Water and Sanitation	151	0	5	0
d.) Communication	757	0	0	0
e.) Social and Commercial Infrastructure	1761	0	0	0
f.) Exploration, Mining and Refinery	1346	300	130	0
g.) Other Sub-Sectors	2622	1	0	9
III. Corporate Service-Sector	1894	192	34	129
IV. Other Entities	1026	0	0	0
a.) units in SEZ	26	0	0	0
b.) SIDBI	0			
c.) Exim Bank	1000	0	0	0
V. Banks	0	0	0	0
VI. Financial Institution (Other than NBFC)	2110	0	0	0
VII. NBFCs	6934	1461	1315	372
a). NBFC- IFC/AFC	6024	1250	1225	273
b). NBFC-MFI	84	1	0	0
c). NBFC-Others	827	210	90	99
VIII. Non-Government Organization (NGO)	0	0	0	0
IX. Micro Finance Institution (MFI)	8	0	0	0
X. Others	470	1	4	12

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 merchandising	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			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	
		Feb.	Jan.	Feb.		Feb.	Jan.	Feb.
	1	2	3	4	5	6	7	8
A. Settlement Systems								
Financial Market Infrastructures (FMIs)								
1 CCIL Operated Systems (1.1 to 1.3)	27.97	2.44	2.54	2.92	161943141	15872384	17839802	17994586
1.1 Govt. Securities Clearing (1.1.1 to 1.1.3)	11.55	0.95	0.93	1.10	110634315	10901991	12892869	12914111
1.1.1 Outright	6.28	0.47	0.40	0.58	10032187	681845	569722	721038
1.1.2 Repo	2.84	0.24	0.26	0.25	43751173	3678988	4348558	4221392
1.1.3 Tri-party Repo	2.43	0.24	0.28	0.27	56850956	6541158	7974589	7971681
1.2 Forex Clearing	16.04	1.44	1.52	1.73	48903961	4629628	4470518	4540145
1.3 Rupee Derivatives @	0.38	0.05	0.09	0.10	2404865	340765	476415	540330
B. Payment Systems								
I Financial Market Infrastructures (FMIs)	—	—	—	—	—	—	—	—
1 Credit Transfers - RTGS (1.1 to 1.2)	1591.92	157.70	181.29	180.29	105599849	9050425	10449109	10324618
1.1 Customer Transactions	1573.47	156.20	180.08	179.15	91008367	7645510	9285159	9277356
1.2 Interbank Transactions	18.45	1.50	1.21	1.13	14591482	1404916	1163950	1047262
II Retail								
2 Credit Transfers - Retail (2.1 to 2.6)	317867.74	30607.09	57362.63	55283.72	33504226	2919321	3803991	3806375
2.1 AePS (Fund Transfers) @	11.31	0.92	0.55	0.51	623	54	29	28
2.2 APBS \$	14372.99	835.54	1106.32	629.87	111001	4766	18048	13043
2.3 IMPS	32783.47	3189.73	4401.73	4209.31	2941500	275230	387007	384404
2.4 NACH Cr \$	16465.44	830.89	2053.44	1536.56	1216535	61364	124228	104998
2.5 NEFT	30927.89	2821.07	3629.03	3632.58	25130910	2152844	2442686	2477059
2.6 UPI @	223306.64	22928.94	46171.56	45274.89	4103658	425063	831993	826843
2.6.1 of which USSD @	10.45	0.82	0.81	0.68	172	13	11	10
3 Debit Transfers and Direct Debits (3.1 to 3.3)	10456.54	861.94	1059.01	1089.30	865520	68323	91554	90746
3.1 BHIM Aadhaar Pay @	160.84	9.33	24.47	15.23	2580	223	728	506
3.2 NACH Dr \$	9645.75	781.43	934.07	948.20	862027	68011	90703	90056
3.3 NETC (linked to bank account) @	649.96	71.18	100.47	125.87	913	88	123	184
4 Card Payments (4.1 to 4.2)	57786.60	5059.24	5151.05	4840.43	1291799	119331	147794	143106
4.1 Credit Cards (4.1.1 to 4.1.2)	17641.06	1613.77	1958.05	1884.24	630414	60105	87769	86041
4.1.1 PoS based \$	8688.81	863.91	960.63	963.40	280769	27754	32735	32500
4.1.2 Others \$	8952.25	749.87	997.43	920.84	349645	32350	55034	53541
4.2 Debit Cards (4.2.1 to 4.2.1)	40145.54	3445.46	3193.00	2956.19	661385	59227	60025	57065
4.2.1 PoS based \$	20773.50	2008.87	1924.51	1845.45	377630	37414	37274	36376
4.2.2 Others \$	19372.04	1436.60	1268.48	1110.75	283755	21813	22752	20689
5 Prepaid Payment Instruments (5.1 to 5.2)	49742.55	4560.42	5865.60	5626.89	197696	18274	26105	24649
5.1 Wallets	39987.01	3652.79	4613.76	4386.09	152065	12742	19789	17259
5.2 Cards (5.2.1 to 5.2.2)	9755.54	907.63	1251.85	1240.79	45631	5532	6316	7390
5.2.1 PoS based \$	607.15	58.80	114.11	126.61	10591	1117	2307	3360
5.2.2 Others \$	9148.39	848.83	1137.73	1114.18	35040	4415	4009	4030
6 Paper-based Instruments (6.1 to 6.2)	6703.70	636.07	596.99	581.98	5627190	547109	557721	615321
6.1 CTS (NPCI Managed)	6702.54	636.07	596.99	581.98	5625941	547109	557721	615321
6.2 Others	1.17	—	—	—	1249	—	—	—
Total - Retail Payments (2+3+4+5+6)	442557.14	41724.77	70035.28	67422.32	41486430	3672358	4627165	4680197
Total Payments (1+2+3+4+5+6)	444149.06	41882.46	70216.58	67602.60	147086278	12722783	15076275	15004815
Total Digital Payments (1+2+3+4+5)	437445.36	41246.39	69619.59	67020.62	141459089	12175674	14518553	14389494

PART II - Payment Modes and Channels

System	Volume (Lakh)				Value (₹ Crore)			
	FY 2020-21	2021	2022		FY 2020-21	2021	2022	
		Feb.	Jan.	Feb.		Feb.	Jan.	Feb.
	1	2	3	4	5	6	7	8
A. Other Payment Channels								
1 Mobile Payments (mobile app based) (1.1 to 1.2)	258033.70	24372.08	50122.61	48507.66	9201212	933736	1422872	1395093
1.1 Intra-bank \$	25220.71	2345.81	3879.91	3626.98	1871390	186602	250455	246931
1.2 Inter-bank \$	232812.99	22026.27	46242.71	44880.68	7329822	747134	1172417	1148163
2 Internet Payments (Netbanking / Internet Browser Based) @ (2.1 to 2.2)	32493.63	2900.22	3091.31	2697.65	41581497	3999196	4008361	3824220
2.1 Intra-bank @	6886.15	580.98	598.61	552.69	20601554	2076458	1723484	1635618
2.2 Inter-bank @	25607.48	2319.24	2492.69	2144.96	20979943	1922739	2284877	2188602
B. ATMs								
3 Cash Withdrawal at ATMs \$ (3.1 to 3.3)	60905.81	5534.33	5558.75	5300.30	2889826	259249	262384	256463
3.1 Using Credit Cards \$	51.41	4.98	5.49	5.29	2560	253	269	264
3.2 Using Debit Cards \$	60602.23	5506.07	5523.91	5266.81	2878025	258100	261124	255218
3.3 Using Pre-paid Cards \$	252.17	23.28	29.36	28.20	9240	895	990	981
4 Cash Withdrawal at PoS \$ (4.1 to 4.2)	394.77	21.79	2.36	2.46	1533	117	35	39
4.1 Using Debit Cards \$	353.50	19.81	2.08	2.15	1484	114	20	20
4.2 Using Pre-paid Cards \$	41.27	1.98	0.28	0.32	49	3	16	19
5 Cash Withdrawal at Micro ATMs @	9460.43	656.57	1125.54	928.46	225420	18381	28582	24975
5.1 AePS @	9460.43	656.57	1125.54	928.46	225420	18381	28582	24975

PART III - Payment Infrastructures (Lakh)

System	As on March 2021	2021	2022	
		Feb.	Jan.	Feb.
	1	2	3	4
Payment System Infrastructures				
1 Number of Cards (1.1 to 1.2)	9602.51	9556.49	10111.81	10067.74
1.1 Credit Cards	620.49	616.47	702.52	717.08
1.2 Debit Cards	8982.02	8940.02	9409.29	9350.66
2 Number of PPIs @ (2.1 to 2.2)	21952.60	21556.23	26898.31	27320.10
2.1 Wallets @	20052.10	19733.68	24231.94	24605.03
2.2 Cards @	1900.51	1822.56	2666.37	2715.07
3 Number of ATMs (3.1 to 3.2)	2.39	2.35	2.51	2.54
3.1 Bank owned ATMs \$	2.14	2.10	2.21	2.23
3.2 White Label ATMs \$	0.25	0.25	0.30	0.31
4 Number of Micro ATMs @	4.04	3.73	6.43	7.16
5 Number of PoS Terminals	47.20	47.15	56.20	58.34
6 Bharat QR @	35.70	34.92	46.97	48.27
7 UPI QR *	925.22	875.86	1521.05	1600.19

@: 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		
			Mar.	Jan.	Feb.	Mar.
		1	2	3	4	5
1 Small Savings	Receipts	181237	32210	14261	14405	34767
	Outstanding	1259585	1078535	1210379	1224772	1259585
1.1 Total Deposits	Receipts	132687	18444	9820	10143	20375
	Outstanding	867494	734807	836976	847119	867494
1.1.1 Post Office Saving Bank Deposits	Receipts	39748	9882	2049	2252	11150
	Outstanding	205888	166140	192486	194738	205888
1.1.2 MGNREG	Receipts					
	Outstanding					
1.1.3 National Saving Scheme, 1987	Receipts	276	204	-26	-23	382
	Outstanding	3419	3143	3060	3037	3419
1.1.4 National Saving Scheme, 1992	Receipts	166	32	0	57	135
	Outstanding	175	9	-17	40	175
1.1.5 Monthly Income Scheme	Receipts	12211	2109	1162	1135	1102
	Outstanding	221379	209168	219142	220277	221379
1.1.6 Senior Citizen Scheme 2004	Receipts	21009	2314	1886	1950	2301
	Outstanding	97051	76042	92800	94750	97051
1.1.7 Post Office Time Deposits	Receipts	41470	4972	3952	3798	3960
	Outstanding	207557	166087	199799	203597	207557
1.1.7.1 1 year Time Deposits	Outstanding	108205	92618	105928	107099	108205
1.1.7.2 2 year Time Deposits	Outstanding	7473	7097	7375	7418	7473
1.1.7.3 3 year Time Deposits	Outstanding	7227	7536	7285	7267	7227
1.1.7.4 5 year Time Deposits	Outstanding	84652	58836	79211	81813	84652
1.1.8 Post Office Recurring Deposits	Receipts	17807	-1069	797	974	1346
	Outstanding	132029	114222	129709	130683	132029
1.1.9 Post Office Cumulative Time Deposits	Receipts	0	0	0	0	-1
	Outstanding	-25	-25	-24	-24	-25
1.1.10 Other Deposits	Receipts	0	0	0	0	0
	Outstanding	21	21	21	21	21
1.2 Saving Certificates	Receipts	34860	4609	3909	3647	4334
	Outstanding	286863	252190	278848	282483	286863
1.2.1 National Savings Certificate VIII issue	Receipts	17361	2860	1903	1843	2332
	Outstanding	135348	117987	131173	133016	135348
1.2.2 Indira Vikas Patras	Receipts	-3	450	-1	0	2
	Outstanding	159	162	157	157	159
1.2.3 Kisan Vikas Patras	Receipts	-7911	-2814	-603	-470	-582
	Outstanding	-6776	1135	-5724	-6194	-6776
1.2.4 Kisan Vikas Patras - 2014	Receipts	25340	4095	2610	2274	2520
	Outstanding	147942	122602	143148	145422	147942
1.2.5 National Saving Certificate VI issue	Receipts	41	25	0	0	33
	Outstanding	-114	-155	-147	-147	-114
1.2.6 National Saving Certificate VII issue	Receipts	32	-7	0	0	29
	Outstanding	-74	-106	-103	-103	-74
1.2.7 Other Certificates	Outstanding	10378	10565	10344	10332	10378
1.3 Public Provident Fund	Receipts	13690	9157	532	615	10058
	Outstanding	105228	91538	94555	95170	105228

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	2020	2021			
	Dec.	Mar.	Jun.	Sep.	Dec.
	1	2	3	4	5
(A) Total (in ₹. Crore)	7357111	7635902	7882533	8235318	8439811
1 Commercial Banks	37.81	37.77	35.99	37.82	35.40
2 Non-Bank PDs	0.25	0.27	0.34	0.35	0.27
3 Insurance Companies	25.64	25.30	25.83	24.18	25.74
4 Mutual Funds	2.62	2.94	2.82	2.91	3.08
5 Co-operative Banks	1.83	1.82	1.82	1.50	1.82
6 Financial Institutions	1.00	1.00	1.43	1.17	1.69
7 Corporates	1.05	1.06	1.39	0.72	1.37
8 Foreign Portfolio Investors	2.10	1.87	1.79	1.81	1.66
9 Provident Funds	4.61	4.44	4.04	3.77	4.33
10 RBI	15.71	16.20	17.11	16.98	16.92
11. Others	7.37	7.33	7.43	8.79	7.73
11.1 State Governments	1.76	1.69	1.67	1.67	1.69

State Governments Securities					
Category	2020	2021			
	Dec.	Mar.	Jun.	Sep.	Dec.
	1	2	3	4	5
(B) Total (in ₹. Crore)	3721573	3879982	4028849	4153508	4257578
1 Commercial Banks	34.19	33.69	33.75	35.94	34.41
2 Non-Bank PDs	0.36	0.48	0.39	0.44	0.40
3 Insurance Companies	30.25	30.04	29.67	27.50	28.85
4 Mutual Funds	1.92	1.82	1.74	1.97	1.91
5 Co-operative Banks	4.11	4.05	4.12	3.60	4.07
6 Financial Institutions	1.88	1.86	1.79	1.72	1.73
7 Corporates	0.45	0.49	1.45	1.32	1.70
8 Foreign Portfolio Investors	0.02	0.02	0.02	0.03	0.02
9 Provident Funds	21.20	22.00	21.09	18.27	20.66
10 RBI	0.81	0.77	0.88	0.85	0.83
11. Others	4.82	4.77	5.10	8.38	5.40
11.1 State Governments	0.18	0.18	0.18	0.18	0.19

Treasury Bills					
Category	2020	2021			
	Dec.	Mar.	Jun.	Sep.	Dec.
	1	2	3	4	5
(C) Total (in ₹. Crore)	839729	690646	901327	763582	692869
1 Commercial Banks	54.75	55.54	52.25	50.22	47.01
2 Non-Bank PDs	1.65	2.82	1.82	1.33	1.53
3 Insurance Companies	4.50	5.61	4.75	4.12	6.29
4 Mutual Funds	18.98	17.80	19.93	17.72	13.72
5 Co-operative Banks	1.61	2.43	1.60	1.32	1.49
6 Financial Institutions	1.11	1.24	2.56	2.12	2.36
7 Corporates	2.01	3.16	3.00	2.40	3.13
8 Foreign Portfolio Investors	0.00	0.00	0.00	0.15	0.72
9 Provident Funds	0.09	0.22	0.10	0.37	0.85
10 RBI	0.68	0.49	2.58	2.63	0.00
11. Others	14.63	10.70	11.42	17.62	22.89
11.1 State Governments	13.27	5.98	7.97	12.64	18.92

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
<i>4 Total Disbursements as per cent of GDP</i>	<i>27.7</i>	<i>26.4</i>	<i>26.7</i>	<i>26.6</i>	<i>33.0</i>	<i>32.1</i>
<i>5 Total Receipts as per cent of GDP</i>	<i>27.9</i>	<i>26.5</i>	<i>26.6</i>	<i>28.2</i>	<i>32.9</i>	<i>31.6</i>
<i>6 Revenue Receipts as per cent of GDP</i>	<i>20.3</i>	<i>19.8</i>	<i>20.1</i>	<i>18.9</i>	<i>19.4</i>	<i>21.0</i>
<i>7 Tax Receipts as per cent of GDP</i>	<i>17.0</i>	<i>17.4</i>	<i>17.4</i>	<i>15.9</i>	<i>16.1</i>	<i>17.2</i>
<i>8 Gross Fiscal Deficit as per cent of GDP</i>	<i>6.9</i>	<i>5.8</i>	<i>5.8</i>	<i>7.1</i>	<i>13.3</i>	<i>10.2</i>

...: 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 February-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	374	15	2000	15	1189	9
2	Arunachal Pradesh	-	-	-	-	-	-
3	Assam	-	-	-	-	-	-
4	Bihar	-	-	-	-	-	-
5	Chhattisgarh	-	-	-	-	-	-
6	Goa	66	3	-	-	-	-
7	Gujarat	-	-	-	-	-	-
8	Haryana	-	-	-	-	-	-
9	Himachal Pradesh	-	-	-	-	-	-
10	Jammu & Kashmir UT	-	-	1206	25	989	20
11	Jharkhand	-	-	-	-	-	-
12	Karnataka	-	-	-	-	-	-
13	Kerala	79	7	499	7	-	-
14	Madhya Pradesh	-	-	-	-	-	-
15	Maharashtra	-	-	-	-	-	-
16	Manipur	-	-	281	24	142	18
17	Meghalaya	-	-	-	-	-	-
18	Mizoram	-	-	-	-	-	-
19	Nagaland	53	8	40	6	-	-
20	Odisha	-	-	-	-	-	-
21	Puducherry	-	-	-	-	-	-
22	Punjab	-	-	-	-	-	-
23	Rajasthan	773	9	-	-	-	-
24	Tamil Nadu	-	-	-	-	-	-
25	Telangana	476	24	1113	23	587	10
26	Tripura	-	-	-	-	-	-
27	Uttar Pradesh	-	-	-	-	-	-
28	Uttarakhand	-	-	-	-	-	-
29	West Bengal	-	-	-	-	-	-

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. 48: Investments by State Governments

(₹ Crore)

Sr. No	State/Union Territory	As on end of February 2022			
		Consolidated Sinking Fund (CSF)	Guarantee Redemption Fund (GRF)	Government Securities	Auction Treasury Bills (ATBs)
	1	2	3	4	5
1	Andhra Pradesh	9253	913	--	-
2	Arunachal Pradesh	2001	3	--	-
3	Assam	2783	61	--	-
4	Bihar	6237	--	--	-
5	Chhattisgarh	5514	--	1	4300
6	Goa	682	346	--	-
7	Gujarat	6979	534	--	2000
8	Haryana	866	1350	--	-
9	Himachal Pradesh	--	--	--	-
10	Jammu & Kashmir UT	--	--	--	-
11	Jharkhand	503	--	--	-
12	Karnataka	7448	--	--	8000
13	Kerala	2392	--	--	-
14	Madhya Pradesh	--	1024	--	-
15	Maharashtra	52036	918	--	23000
16	Manipur	171	112	--	-
17	Meghalaya	810	46	9	-
18	Mizoram	410	53	--	-
19	Nagaland	1838	37	--	-
20	Odisha	14524	1629	94	23773
21	Puducherry	342	--	--	1378
22	Punjab	3006	--	8	-
23	Rajasthan	--	--	129	7100
24	Tamil Nadu	7414	--	40	17165
25	Telangana	6328	1385	--	-
26	Tripura	578	15	--	1300
27	Uttar Pradesh	1770	--	180	-
28	Uttarakhand	3835	152	--	-
29	West Bengal	10030	698	214	-
	Total	147751	9274	674	88015

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.

No. 49: Market Borrowings of State Governments

(₹ Crore)

Sr. No.	State	2019-20		2020-21		2021-22						Total amount raised, so far in 2021-22	
						December		January		February			
		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	42415	33444	50896	41915	3250	3250	2500	1920	4000	3420	42500	33329
2	Arunachal Pradesh	1366	1287	767	767	-	-	163	163	-	-	563	563
3	Assam	12906	10996	15030	14230	2800	1800	653	153	2200	2200	12153	10153
4	Bihar	25601	22601	27285	24685	3000	2281	2000	719	2000	2000	27000	24000
5	Chhattisgarh	11680	10980	13000	10500	-	-	-	-	-	-	4000	2500
6	Goa	2600	2000	3354	3054	400	300	100	100	-	-	1800	1300
7	Gujarat	38900	28600	44780	33280	-	-1500	4500	4500	4000	2500	26054	13054
8	Haryana	24677	20677	30000	25550	-	-	1500	750	2500	2055	20500	15005
9	Himachal Pradesh	6580	4460	6000	3755	1000	800	-	-250	-	-660	4000	2585
10	Jammu & Kashmir UT	7869	6760	9328	6020	1800	1100	-	-	600	600	7000	5425
11	Jharkhand	7500	5656	9400	8900	-	-	-	-	-	-	1500	500
12	Karnataka	48500	42500	69000	61900	12000	9500	20000	17500	17000	15000	59000	50500
13	Kerala	18073	12617	28566	23066	1000	-1000	-	-1380	-	-1400	20000	12220
14	Madhya Pradesh	22371	16550	45573	38773	-	-	4000	1500	-	-	18000	12500
15	Maharashtra	48498	32998	69000	50022	3000	1000	5500	-500	4500	-2960	64750	39290
16	Manipur	1757	1254	1302	1044	90	90	59	59	60	60	1296	1146
17	Meghalaya	1344	1070	1777	1587	328	328	200	100	-	-	1528	1218
18	Mizoram	900	745	944	677	-	-	150	150	73	73	657	407
19	Nagaland	1000	423	1721	1366	298	148	-	-	-	-	1287	1037
20	Odisha	7500	6500	3000	500	-	-473	-	-	-	-1000	-	-4973
21	Puducherry	970	470	1390	790	250	250	390	390	185	-215	1074	674
22	Punjab	27355	18470	32995	23467	1500	1150	4532	3932	1000	317	19314	7931
23	Rajasthan	39092	24686	57359	44273	3669	2669	4500	3883	3500	3326	43769	35513
24	Sikkim	809	481	1292	1292	177	137	201	201	-	-	1129	1089
25	Tamil Nadu	62425	49826	87977	76796	5000	5000	2900	-300	7500	4500	62400	49200
26	Telangana	37109	30697	43784	37365	5500	5500	6187	5767	3000	2580	42687	36058
27	Tripura	2928	2578	1916	1631	-	-	-	-50	-	-	300	100
28	Uttar Pradesh	69703	52744	75500	59185	5000	2922	12500	11500	-	-1000	57500	40213
29	Uttarakhand	5100	4500	6200	5208	500	350	500	400	-	-	2200	1100
30	West Bengal	56992	40882	59680	50180	9500	6950	6500	4700	-	-1000	54000	32477
	Grand Total	634521	487454	798816	651777	60062	42552	79535	55907	52118	30396	597961	426115

- : 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	2018-19				
	Q1	Q2	Q3	Q4	Annual
Net Financial Assets (I-II)	274259.3	321740.3	253754.5	642691.2	1492445.3
<i>Per cent of GDP</i>	6.0	6.9	5.2	13.4	7.9
I. Financial Assets	358515.3	576730.6	391939.2	936505.3	2263690.4
<i>Per cent of GDP</i>	7.9	12.4	8.1	19.5	12.0
of which:					
1. Total Deposits (a+b)	-53701.5	302123.2	22607.1	539383.9	810412.8
(a) Bank Deposits	-63806.9	292541.5	13060.8	535297.3	777092.6
i. Commercial Banks	-62127.0	289468.1	10634.6	490680.6	728656.4
ii. Co-operative Banks	-1679.9	3073.4	2426.2	44616.6	48436.3
(b) Non-Bank Deposits	10105.5	9581.7	9546.4	4086.6	33320.2
2. Life Insurance Funds	91771.1	98477.3	89395.1	112489.6	392133.2
3. Provident and Pension Funds (including PPF)	98655.9	98158.9	99709.9	103561.9	400086.7
4. Currency	111196.6	-32134.4	102656.5	96153.4	277872.1
5. Investments	58281.3	57793.7	25258.8	32604.6	173938.4
of which:					
(a) Mutual Funds	49798.2	49798.2	23816.6	28146.8	151559.9
(b) Equity	2001.2	3054.4	471.0	855.8	6382.4
6. Small Savings (excluding PPF)	51259.6	51259.6	51259.6	51259.6	205038.3
II. Financial Liabilities	84255.9	254990.3	138184.7	293814.1	771245.0
<i>Per cent of GDP</i>	1.8	5.5	2.8	6.1	4.1
Loans (Borrowings) from					
1. Financial Corporations (a+b)	84085.7	254820.0	138014.4	293643.8	770563.9
(a) Banking Sector	42852.5	171884.2	141026.9	248612.6	604376.2
of which:					
Commercial Banks	39005.8	170252.0	141845.9	227069.5	578173.3
(b) Other Financial Institutions	41233.1	82935.8	-3012.4	45031.2	166187.7
i. Non-Banking Financial Companies	15057.0	52605.2	-3755.8	28952.6	92859.0
ii. Housing Finance Companies	23560.2	28328.8	-786.8	14118.7	65220.9
iii. Insurance Companies	2615.9	2001.9	1530.1	1959.9	8107.8
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8	33.8	33.8	135.1
3. General Government	136.5	136.5	136.5	136.5	546.0

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise (Contd.)

(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
<i>Per cent of GDP</i>	5.1	10.6	7.8	8.7	8.0
I. Financial Assets	413192.2	604322.7	538186.1	843385.9	2399086.9
<i>Per cent of GDP</i>	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
<i>Per cent of GDP</i>	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 (Concl'd.)

(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
<i>Per cent of GDP</i>	16.1	12.5	9.3	10.1	11.6
I. Financial Assets	828447.4	630907.1	676131.6	973510.9	3108997.0
<i>Per cent of GDP</i>	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
<i>Per cent of GDP</i>	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

Notes: 1. Data as ratios to GDP have been calculated based on the Second Advance Estimates of National Income 2021-22 released on February 28, 2022.

2. 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-2018	Sep-2018	Dec-2018	Mar-2019
Financial Assets (a+b+c+d)	14490526.2	14891219.6	15112941.4	15957967.7
<i>Per cent of GDP</i>	<i>82.1</i>	<i>82.1</i>	<i>80.9</i>	<i>84.5</i>
(a) Bank Deposits (i+ii)	8000655.6	8293197.1	8306257.8	8841555.1
i. Commercial Banks	7354053.7	7643521.8	7654156.4	8144837.0
ii. Co-operative Banks	646601.9	649675.3	652101.4	696718.1
(b) Life Insurance Funds	3483557.7	3585786.7	3646756.6	3785298.5
(c) Currency	1782923.3	1750788.9	1853445.4	1949598.8
(d) Mutual funds	1223389.6	1261446.9	1306481.6	1381515.3
Financial Liabilities (a+b)	5643303.3	5898123.3	6036137.8	6329781.5
<i>Per cent of GDP</i>	<i>32.0</i>	<i>32.5</i>	<i>32.3</i>	<i>33.5</i>
Loans (Borrowings) from				
(a) Banking Sector	4565448.5	4737332.7	4878359.6	5126972.2
of which:				
i. Commercial Banks	3993574.8	4163826.9	4305672.8	4532742.3
ii. Co-operative Banks	474552.2	475903.1	475218.4	487445.3
(b) Other Financial Institutions	1077854.8	1160790.6	1157778.2	1202809.3
of which:				
i. Non-Banking Financial Companies	374640.0	427245.2	423489.4	452442.0
ii. Housing Finance Companies	614618.4	642947.2	642160.4	656279.2

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators (Contd.)

(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
<i>Per cent of GDP</i>	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
<i>Per cent of GDP</i>	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 (Concl'd.)

(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
<i>Per cent of GDP</i>	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
<i>Per cent of GDP</i>	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

- 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

NM₂ and NM₃ 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.

L₁ and L₂ are compiled monthly and L₃ 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 & 1.1.1.1.4: 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 2019-20 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**.

Recent Publications of the Reserve Bank of India

Name of Publication	Price	
	India	Abroad
1. Reserve Bank of India Bulletin 2022	₹350 per copy (over the counter) ₹400 per copy (inclusive of postage) ₹4,800 (one year subscription - inclusive of postage) ₹3,600 (one year concessional rate*) ₹3,840 (one year subscription - inclusive of postage [@]) ₹2,880 (one year concessional rate [@])	US\$ 15 per copy (inclusive of postage) US\$ 180 (one-year subscription) (inclusive of air mail courier charges)
2. Handbook of Statistics on the Indian States 2020-21	₹550 (Normal) ₹600 (inclusive of postage)	US\$ 24 (inclusive of air mail courier charges)
3. Handbook of Statistics on the Indian Economy 2020-21	₹600 (Normal) ₹650 (inclusive of postage) ₹450 (concessional) ₹500 (concessional with postage)	US\$ 50 (inclusive of air mail courier charges)
4. State Finances - A Study of Budgets of 2021-22	₹600 per copy (over the counter) ₹650 per copy (inclusive of postal charges)	US\$ 24 per copy (inclusive of air mail courier charges)
5. Report of the committee on Fuller Capital account Convertibility (Tarapore Committee Report II)	₹140 per copy (over the counter) ₹170 per copy (inclusive of postal charges)	US\$ 25 per copy (inclusive of air mail courier charges)
6. Banking Glossary (2012)	₹80 per copy (over the counter) ₹120 per copy (inclusive of postal charges)	
7. Anuvad Ke Vividh Aayam (Hindi)	₹165 per copy (over the counter) ₹205 per copy (inclusive of postal charges)	
8. Bank Me Rajbhasha Niti Ka Karyanvayan: Dasha Aur Disha (Hindi)	₹150 per copy (over the counter) ₹200 per copy (inclusive of postal charges)	
9. Reserve Bank of India Occasional Papers Vol. 41, No. 1, 2020	₹200 per copy (over the counter) ₹250 per copy (inclusive of postal charges)	US\$ 18 per copy (inclusive of air mail courier charges)
10. Reserve Bank of India Occasional Papers Vol. 41, No. 2, 2020	₹200 per copy (over the counter) ₹250 per copy (inclusive of postal charges)	US\$ 18 per copy (inclusive of air mail courier charges)
11. 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

- Many of the above publications are available at the RBI website (www.rbi.org.in).
 - Time Series data are available at the Database on Indian Economy (<http://dbie.rbi.org.in>).
 - 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.
- * Discount of 25% is available for students, teachers/lecturers, academic/education institutions, public libraries and Booksellers in India provided the proof of eligibility is submitted from institution.
- @ In order to promote electronic payments it has been decided to offer 20% discount to domestic subscribers who are willing to pay through NEFT.

General Instructions

1. Publications once sold will not be taken back.
2. Publications will not be supplied on a consignment VPP basis.
3. Wherever concessional price is not indicated, a discount of 25 per cent is available for students, teachers/lecturers, academic/education institutions, public libraries and book sellers in India provided the proof of eligibility is submitted from the concerned institution. Back issues of the publication are generally not available.
4. The publications are available for sale (Monday to Friday), at Sales Section, Division of Reports and knowledge dissemination, Department of Economic and Policy Research, Reserve Bank of India, Amar Building, Ground Floor, Sir P. M. Road, Fort, P. B. No.1036, Mumbai - 400 001. The contact number of Sales Section is 022-2260 3000 Extn.: 4002, Email: spsdepr@rbi.org.in.
5. Subscription should be made preferably by NEFT & forwarding letter enclosing NEFT details should be addressed to the Director, Division of Reports and knowledge dissemination, Department of Economic and Policy Research, Reserve Bank of India, Amar Building, Ground Floor, Sir P. M. Road, Fort, P. B. No.1036, Mumbai - 400 001.

Following information is required to be filled in NEFT form by you:

Beneficiary Name	Department of Economic and Policy Research, RBI
Name of the Bank	Reserve Bank of India
Branch and address	Fort, Mumbai
IFSC of Bank Branch	RBISOMBPA04
Type of Account	Current Account
Account Number	41-8024129-19
Sender to receiver information	Name of Subscriber..... Subscriber No.

6. Every endeavour will be made to despatch publications expeditiously. In case of rush of orders, dispatch will be executed on a first-come first-served basis. It may take a minimum of a month's time to complete formalities and then to dispatch the available publications. Complaints regarding 'non-receipt of publication' may be sent **within a period of 2 months**.
7. **Kindly send your subscription number, name, address, and email id to spsdepr@rbi.org.in enabling us to communicate with you in an efficient manner.**

