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*Globalisation of Inflation and Conduct of Monetary Policy**

Shaktikanta Das

I am delighted to participate in the inaugural Kautilya Economic Conclave. I look forward to this forum emerging as a leading platform for thoughtful discussions on contemporary economic and policy issues. The conference is being attended by a host of dignitaries from India and abroad, and I am sure their insights on a vast canvas of topics will enhance our understanding of current and future issues. In my address today, I propose to focus on a matter that is now in everyone's mind, ranging from the general public to policymakers in India and across the world, *i.e.*, inflation.

The global economy is going through an extremely uncertain period amidst the simultaneous interplay of various headwinds – a lingering war and enduring COVID; the sharp rise in energy and other commodity prices; strains in global supply chains; and worsening food security. In several economies, inflation is ruling at levels not seen by the recent generations. Parallels are being drawn with the inflation era of the 1970s. Inflation is running well above targets for a prolonged period and threatening to unhinge inflation expectations. Central banks have begun delivering bigger and quicker policy rate hikes to restore price stability, even as the global economy is struggling to recover fully from the scars inflicted by the COVID-19 pandemic. The sharply tightening financial conditions due to the ongoing monetary policy normalisation on the one hand and the persisting geopolitical tensions on the other pose significant downside risks to near-term global economic prospects. They are also sparking stagflation concerns worldwide, with even talk of recession in some parts of the world.

Globalisation and Inflation

Over the years, globalisation of trade and capital flows had facilitated increased productivity and lower cost of tradeable goods and services. With access to information, communication and transportation technology and the advent of multinational companies, production hubs proliferated at multiple locations, leading to the emergence of global value chains. Globalisation also fostered competition, efficiency and innovation. Increased flow of trade, know-how, people and ideas bridged the technology gap, improved institutional capacity and accelerated the accumulation of physical and human capital in emerging markets. The result was higher growth and lifting of millions out of poverty.

More importantly, globalisation-led productivity gains contributed to a trend decline of inflation across countries. More and more countries, including emerging market economies (EMEs), strengthened their monetary policy frameworks with a number of them adopting inflation targeting. There was growing talk of globalisation leading to sustained disinflationary forces, technology diffusion and competition. We witnessed low and stable inflation in advanced economies (AEs) and several EMEs beginning the 1990s and through the second decade of the new millennium.

With greater trade and financial integration, the domestic economies get more exposed to global shocks including volatile short-term capital flows. For instance, global shocks to food, energy and commodity prices affect inflation in every country. During the COVID-19 pandemic and now due to the war in Europe, there are clear signs of transmission of global shocks to generalised and synchronised inflation across the world.

* Speech by Shri Shaktikanta Das, Governor, Reserve Bank of India - July 9, 2022 - Delivered at the Kautilya Economic Conclave, organised by Institute of Economic Growth in New Delhi.

The recent upsurge in inflation due to the black swan event, *i.e.*, the war in Europe, on top of another such event, *i.e.*, the Covid-19 pandemic offers a classic example of the globalised nature of current inflation. Around 77 per cent of countries reported acceleration in inflation in 2021 and this proportion is expected to rise further to 90 per cent in 2022, according to the IMF's latest projections. Moreover, for advanced economies, against an inflation target of 2 per cent, and emerging market economies, against an average target of about 3-5 per cent, two-thirds are witnessing inflation above 7 per cent[1]. While global factors have always been an important driver of domestic inflation, what we have witnessed over the past three years is the more protracted and sizeable role of global factors in proportions not witnessed in decades. These factors have an even more conspicuous effect on net commodity importing countries like India.

With the origins of this inflation being essentially in the supply side, energy and food prices account for more than 50 per cent of the rise in prices. There are also increasing signs of sectoral price spillovers, given that the rise in global energy and commodity prices quickly translate into higher input price pressures. While in some advanced economies, pricing power of firms has increased significantly due to strong domestic demand since 2021, other advanced economies and emerging market economies have just started experiencing such pressures beginning 2022. Household inflation expectations have started firming up, though they are not severely unanchored at this stage. Overall, we are now living in an era of globalisation of inflation amidst growing deglobalisation of world trade.

The persistence of inflation at elevated levels has also raised the debate as to whether the much required monetary actions to contain inflation will end in hard landing (a global recession) or will the monetary authorities be able to manage soft landing (a moderation in inflation closer to targets with only a moderate slowdown in output growth). Analysts point to the track record of the US economy. Ever since the data on the Federal Funds rate are available from Q3:1954, there have been ten occasions in which monetary tightening has caused a recession in the US. On the other hand, not all episodes of tightening have ended in recession. In the present context, let us look at the evidence available so far. First, revisions in GDP projections by major central banks and multilateral agencies in June 2022 continue to indicate a loss of pace rather than a loss of level. Second, with front-loaded monetary policy actions underway, central banks may not face the need for prolonged actions that lead to recessions, by historical experience. Third, with the labour participation rate still lower than pre-pandemic levels in US and UK, wage pressures are rising but not yet overheated. Finally, food and fuel price pressures are essentially transitory and may ease sooner or later, taking out a large contributor to currently elevated inflation. The evolving trends need close monitoring.

Historical Perspective

The current synchronised rise in inflation across economies is not a maiden occurrence in modern economic history. Let us step back in time and recount what had happened during the inflation era of the 1970s. Amidst repeated supply shocks from oil prices in 1973 and 1979-80 and weather-related food shocks, countries were mired in stagflation with double digit inflation accompanying a rise in unemployment.

The experience of the 1970s significantly changed the course of macroeconomic thinking. Policymakers understood that there is no permanent trade-off between inflation and output – any attempt to increase output at the cost of tolerating higher inflation will inevitably lead to high and rising inflation and unhinging of inflation expectations without any durable output gains. This realisation led to a growing focus on keeping inflation expectations well-anchored

[1] Based on current inflation data from Bloomberg.

and strengthening of monetary policy frameworks, including adoption of flexible inflation targeting. During the subsequent period, inflation and inflation volatility declined remarkably, inflation expectations gradually aligned with the target across economies, and the global economy expanded on a steady path, leading to an era described as the Great Moderation (Bernanke, 2004)[2]. Inflation spikes also became short-lived, given well anchored inflation expectations. While improved monetary policy frameworks did play an important role, the concomitant rise of rule-based fiscal policies backed by fiscal responsibility legislations, gains in productivity and technology, deepening of financial systems and globalisation also helped in moderating inflation.

Inflation and the Conduct of Monetary Policy in India

The history of inflation in India since independence (1947) reveals that incidents of high and volatile inflation mainly emanated from droughts; wars; trends in minimum support prices (MSPs); global crude oil price shocks; large fiscal deficits and their monetisation; and sharp exchange rate movements. Overall, while there were sporadic occurrences of high inflation, the Indian economy did not encounter episodes of hyperinflation.

The Gulf War of 1991 – which resulted in a spike in international crude prices and consequent increase in domestic administered prices – was a major episode of imported inflation. In addition, the balance of payments (BoP) crisis of 1991 led to sharp exchange rate devaluation, which translated into increased cost-push pressures on import sensitive products. Beginning the second half of the 1990s, the improvement in fiscal-monetary interface and reforms in the Government securities market provided monetary policy the operational flexibility to deliver on its price stability and growth objectives.

The next major inflation shock was in the post-GFC period when monsoon failure, high increase in MSPs, and escalating global commodity prices triggered inflationary pressures, which were reinforced by demand pull from a quick rebound in domestic growth from monetary and fiscal stimulus measures. Monetary policy normalisation at that time was gradual, given the considerations of economic recovery. With signs of inflationary pressures getting entrenched, monetary policy moved to an aggressive tightening mode in 2011. By 2013, macro-imbalances began to build up and got reflected in high and persistent inflation, growth slowdown and a deteriorating external sector. In this scenario, the taper tantrum of 2013 plunged the economy into severe external sector stress and macro-financial vulnerabilities. These developments set in motion the process towards the formal adoption of a flexible inflation targeting (FIT) framework for monetary policy in June 2016.

What followed was a period of low and stable inflation till the COVID shock. The average CPI inflation between September 2016 and February 2020 was 3.9 per cent and was closely aligned with the inflation target of 4 per cent.

Recent Phase

The onset of the pandemic in early 2020 saw global commodity prices crash as restrictions and stringent lockdowns were expected to lead to a collapse of aggregate demand. There were, however, two occasions during the calendar years 2020 and 2021 when inflation hovered above 6.0 per cent. First, from June till November 2020 when the surge in inflation was trigged by a series of adverse transitory supply side shocks ranging from increase in retail margins in food items; supply chain and logistics bottlenecks; unseasonal rains and resultant

[2] Ben S. Bernanke (2004), "The Great Moderation", Remarks at the meetings of the Eastern Economic Association, Washington, DC February 20.

crop damage; and the domestic spillovers from the sharp rise in international prices of edible oils. In the following period, that is from December 2020 to April 2021, inflation moved closer to the target rate of 4 per cent as much of the transitory price shocks waned. The easing of inflationary pressures, however, was short-lived as India experienced a devastating second wave of COVID-19 during April-June 2021 which triggered localised lockdowns, renewed supply chain disruptions and rising retail margins. This pushed inflation above 6.0 per cent during May-June 2021. The inflation pressures were reinforced by adverse spillovers from rising global commodity prices.

The inflationary pressures occurred even as there was unprecedented damage inflicted by the pandemic on economic activity – real GDP contracted by a humungous 23.8 per cent in the first quarter of 2020-21 and by as much as 6.6 per cent in the full financial year 2020-21. Against this backdrop, the monetary policy committee (MPC) of the RBI maintained status quo on rates during the pandemic despite inflation intermittently breaching the upper tolerance band. The MPC decided to look through the higher inflation print to allow the nascent recovery to get entrenched – both by retaining the accommodative stance of policy and by refraining from hiking the policy rate. Since the inflationary episode lacked any significant demand-pull component, any policy tightening at that juncture would have been detrimental to growth and extracted heavy social costs without being effective in containing inflation pressures. This was in consonance with the flexibility embedded in our flexible inflation targeting framework, according to which the primary objective of the monetary policy is to maintain price stability while keeping in mind the objective of growth.

In early 2022, inflation was expected to moderate significantly to the target rate of 4 per cent by Q3:2022-23, with a projected average inflation rate of 4.5 per cent for 2022-23. This assessment was based on an anticipated normalisation of supply chains, the gradual ebbing of COVID-19 infections and a normal monsoon. The median inflation projection from the Survey of Professional Forecasters at 5.0 per cent for 2022-23 was also quite benign. This narrative was, however, completely overtaken by the war in Europe since end-February, which led to a sharp spike in global crude oil and other commodity prices. Global food prices reached a historical high in March and their effects were felt in edible oil, feed cost and domestic wheat prices. The loss of Rabi wheat production due to an unprecedented heat wave put further pressures on wheat prices. Cost-push pressures were also aggravated by supply chain and logistics bottlenecks due to the war and sanctions.

Taking stock of the evolving developments and with inflation pressures getting generalised, the MPC in its April and June meetings revised the projection of inflation for 2022-23 in two stages to 6.7 per cent. About three-fourths of the revision in June was on account of geopolitical spillovers to food prices. The MPC also decided to increase the policy repo rate by 40 bps and 50 bps in May and June, respectively. This was on top of the 40 bps effective rate hike through the introduction of the Standing Deposit Facility (SDF) at 3.75 per cent, which resulted in a concomitant increase in the weighted average call rate (WACR), compared to the liquidity absorption rate under the fixed rate reverse repo regime. The WACR, as you would be aware, is the operating target of monetary policy. During this period, *i.e.*, April to June 2022, the MPC also changed its stance to withdrawal of accommodation.

Overall, at this point of time, with the supply outlook appearing favourable and several high frequency indicators pointing to resilience of the recovery in the first quarter (April-June) of 2022-23, our current assessment is that inflation may ease gradually in the second half of 2022-23, precluding the chances of a hard landing in India.

Approach to Monetary Policy in Crisis Times

A closer look at our journey through the two black swan events of COVID-19 and the geopolitical crisis in Europe would bring out certain distinct contours of our approach in these turbulent times. Our overarching objective was to safeguard the economy and preserve financial stability. Our endeavour has been to ensure a soft landing. These objectives continue to guide our actions even today and it will continue to be so in future. I would now like to touch upon a few aspects of our approach.

Communication in Turbulent Times

For monetary policy to be effective in such turbulent and uncertain times, communication of monetary policy objectives, actions and stance with prescience and clarity assumes even greater importance. Monetary policy is ultimately about managing expectations of various economic agents – from households to financial markets. In this context, over the past three years, we backed our actions with clear forward guidance and tweaked it as necessary with reference to the evolving circumstances. For instance, our forward guidance was initially state-based. But, in the second half of 2020-21, there were undue market concerns that the accommodative monetary policy stance might have to be reversed in the face of elevated inflation. To quell such disruptive forces and their possible negative effects on our accommodative stance, we supplemented our state-based guidance with time-contingent guidance by stating our intent to continue "with the accommodative stance of monetary policy as long as necessary – at least during the current financial year and into the next year …". Inflation eased in the second half of 2020-21 itself in line with our assessment as supply side pressures abated. The time-based element of the guidance did help to anchor market expectations and moderate undue expectations building up at that time of a possible reversal of the monetary policy stance.

We have actively engaged in two-way communications – we consult actively with various stakeholders in the run up to the bi-monthly MPC meetings; we hold wide ranging press conferences after the bi-monthly meetings to put forward our viewpoints clearly and clarify the issues raised by the media and analysts. We back up this with speeches and media interviews. The release of the minutes after 14 days of the MPC meeting and individual statements of the members, including my statement, have further strengthened our communication. A range of statutory and staff publications on key analytical aspects of monetary economics are an additional avenue of our forward-looking communication.

My regular statements to announce the MPC decision and its rationale have become an integral element of the institutional edifice of the RBI's crisis time response. These statements provide forward guidance to financial markets on the RBI's liquidity stance and have ensured orderly conditions in the financial markets, even amidst the pandemic and war related stress. In August 6, 2021 statement, I emphasised that the RBI remains in "whatever it takes" mode, with a readiness to deploy all its policy levers - monetary, prudential or regulatory. These words engendered calm and confidence in the markets.

Prudence as the Cornerstone of our Approach

During this entire period, we had gone beyond the rule book and we had explicitly said so. But we remained prudent at all times. For example, when we announced the government securities acquisition programme (G-SAP) in April 2021, we were going beyond the RBI's lexicon; but we discontinued it after six months when liquidity was assessed to be amply surplus. By doing so, we were well ahead of the major central banks in ceasing fresh asset purchases. Similarly, we refrained throughout the pandemic period from primary financing or direct monetisation of the government's fiscal deficit, notwithstanding the

clamour from various expert opinions at that time. Prudence also underlined our approach when we refrained from diluting the quality of the RBI's balance sheet by strictly confining our liquidity injection measures to government securities as collateral. Further, the Resolution Frameworks for COVID-19 related stressed assets were not open ended, but were subject to certain financial and operational parameters to be achieved as part of the resolution process.

Conventional, Unconventional and Innovative Measures

As I said a little while ago, we have often gone beyond the rule-book over the past 2-3 years, combining conventional, unconventional and innovative measures. For instance, we made active use of the Liquidity Adjustment Facility (LAF) corridor as an instrument of policy, first through large reductions in the reverse repo rate in March and April 2020. Consequently, the money market rates went even below the policy rate. Another such example was in April 2022 with the institution of the Standing Deposit Facility (SDF) at 40 basis points above the fixed rate reverse repo to begin the process of withdrawal of the accommodative stance. There are other such examples of being nimble-footed like the advancement of MPC meetings, the off-cycle MPC meetings, etc.

Navigating the Liquidity 'Chakravyuh'[3]

Our liquidity injection measures involved a prudent and calibrated expansion of the RBI's balance sheet. Our measures were targeted as per requirement and reflected a hands-on approach. These would include the targeted long term repo operations (TLTROs); special liquidity windows to support contact-intensive sectors severely hit by the pandemic; reduction in the Cash Reserve Ratio (CRR) for a limited and pre-specified period; and a few other measures. We had explicit sunset clauses for most of our liquidity injection measures during the pandemic which allowed us to unwind liquidity in a predictable manner and anchor market expectations. By building in the exit strategy at the time of injection, we were able to pull out significant part of the liquidity when it was no longer required.

We started rebalancing of liquidity as early as January 2021 through the reintroduction of variable rate reverse repos (VRRR) to shift liquidity from the overnight fixed rate window towards longer tenors at variable rates. This helped in pushing market rates upwards in a gradual and orderly manner. This is an example of what I would call a silent action, preparing and guiding the markets in advance.

Concluding Observations

The benefits of globalisation come with certain risks and challenges. Shocks to prices of food, energy, commodities and critical inputs are transmitted across the world through complex supply chains. This was evident during the pandemic, and more so after the conflict in Europe erupted, with global shocks playing a dominant role in domestic inflation dynamics. These global factors present difficult policy trade-offs between price stability and stabilising economic activity, especially when the economy is recuperating from repeated shocks. They add to the macroeconomic and financial stability challenges from volatile capital flows in a financially globalised world. In fact, recent developments call for greater recognition of global factors in domestic inflation dynamics and macroeconomic developments which underscore the need for enhanced policy coordination and dialogue among countries to achieve better outcomes.

The insurance against such inevitable global shocks ultimately is built on sound economic fundamentals, strong institutions and smart policies. Price stability is key to maintaining macroeconomic

[3] Chakravyuh : a military formation used to surround enemies, depicted in the Indian epic Mahabharata. It resembles a labyrinth of multiple defensive walls, from which coming out is very difficult and known only to a handful of very skilled warriors.

and financial stability. In a broader sense, inflation is a measure of the trust and confidence that the public repose in the economic institutions of a country. While factors beyond our control may affect inflation in the short run, its trajectory over the medium-term is determined by monetary policy. Therefore, monetary policy must take timely actions to anchor inflation and inflation expectations so as to place the economy on a strong and sustainable growth pedestal. We will continue to calibrate our policies with the overarching goal of preserving and fostering macroeconomic stability. In this endeavour, we will remain flexible in our approach while being cogent and transparent in our communication. If history is any guide, I am optimistic that our actions will usher in a new era of prosperity in the years ahead.

Thank you.

*Inaugural address at the Annual Statistics Day Conference**

Shaktikanta Das

It is a privilege to inaugurate the annual 'Statistics Day Conference' of the Reserve Bank. This annual event is taking place today in the physical mode after a gap of two years. On this day, the nation commemorates the contributions of Professor Prasanta Chandra Mahalanobis, one of the pioneers in the discipline of statistics and a true visionary. Professor C. R. Rao, a great statistician and a student of Professor Mahalanobis described him as "a physicist by training, a statistician by instinct and an economist by conviction"[1].

Professor Mahalanobis is regarded as the father of modern statistics in India. He established the Indian Statistical Institute (ISI) in 1931 and was also responsible for the establishment of the official statistical system in our country, including the large-scale nationwide sample surveys. He displayed keen interest in development of innovative statistical techniques for studying questions pertaining to welfare of the people. As such, his work highlighted the universal applicability of statistical methods in major scientific and social disciplines – agriculture, meteorology, statistical quality control, economics, anthropology and demography, to name a few.

Professor Mahalanobis was appointed Honorary National Statistical Adviser to the Union Cabinet in 1949 and was the Chairman of the first National Income Committee formed in 1950. The second Five-year plan was based on his model of economic development. He received India's second highest civilian award, the Padma Vibhushan, in 1968.

As I pay tribute to Professor Mahalanobis, I propose to touch upon the unique challenges faced by the discipline of statistics in these uncertain times, and the evolving expectations from the discipline and practicing statisticians. The importance of statistics in public policy is well understood. In the face of high uncertainty brought on by the COVID-19 pandemic, the discipline of statistics found itself in greater spotlight. This unprecedented global phenomenon has tested human endeavour in multiple facets and magnitude. The lockdowns in various countries, including our own, posed severe challenges to the compilation and availability of data relating to the spread of the pandemic and its impact on various economies. The world urgently needed solutions to a problem it had never seen before.

Public authorities, healthcare personnel, scientists and above all, the people eagerly looked for hard data from various sources such as hospitals, municipal authorities, etc. on the spread of the pandemic. Very soon, data from these sources got updated on a near-real time basis in an accessible manner. Statisticians collaborated with healthcare authorities to monitor the age-specific, spatial and temporal dimensions of the pandemic. This enabled the authorities to better respond to the healthcare requirements of those affected.

As statisticians provided new techniques and insights for modelling without precedence, the importance of the discipline was reaffirmed. Official statistics became a cornerstone of the responses to the short- and long-term consequences of the pandemic. The pressing need for hard data during the crisis accelerated innovation and sharing of experiences, especially in production, dissemination and use of statistics, shift towards the use of new data sources, adoption of new statistical methods and deployment of experimental statistics and dashboards.[2]

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* Inaugural Address by Governor, Shri Shaktikanta Das at the Statistics Day Conference on June 29, 2022.

1 Rao, C. Radhakrishna (1993). "Statistics Must Have a Purpose - the Mahalanobis Dictum." Sankhyā: The Indian Journal of Statistics, Series A (1961-2002), vol. 55, no. 3, pp. 331–49.

2 Baldacci, Emanuele et al. 'Innovation During the COVID-19 Crisis: Why It Was More Critical for Official Statistics Than Ever'. Statistical Journal of the IAOS, 1 Jan. 2022: 1 – 14.

During this period of unprecedented uncertainty, closer monitoring of economic activity demanded immediate attention as the massive shock reverberated across the global economy. The compilation of aggregates from electronic systems were least affected; but some channels used in compiling macroeconomic and micro-level data were hampered by social distancing norms and lockdowns. Across the world, the authorities responsible for collection and dissemination of real sector statistics started exploring collection of data through alternate modes. For example, in many socio-economic and business surveys, traditional face-to-face interviews were replaced by telephonic interviews and on-line surveys. According to a survey conducted by the United Nations Statistics Division (UNSD) and the World Bank, over 95 per cent of National Statistical Offices (NSOs) had partially or fully stopped face-to-face data collection in May 2020[3]. This has, of course, been gradually restored as economies opened up. India was not immune to this impact. The Ministry of Statistics and Programme Implementation was compelled to publish imputed figures for consumer price index (CPI) for two consecutive months during the first wave of the pandemic in 2020 due to immense difficulty in collection of prices for many items.

The statistical innovations arising out of the COVID-19 disruption will have long-lasting benefits. At the same time, the upheaval also posed challenges to statistical agencies to build more public trust in the resulting statistics. While new data sources open up opportunities for official statistics, it also raises issues for the discipline. Development of proper data quality framework and ensuring data privacy and data security has assumed top priority. Not surprisingly, this was a central theme for the recently held International Association for Official Statistics Conference in April 2022[4].

Central banks on their part are both producers and users of statistics for policy actions as well as for assessing the outcomes of their actions. They also need to establish stronger communication of their policies and actions in such turbulent times. Thus, central banks too had to cope with all these challenges by focussing on alternative indicators and data sources for monitoring the effects of the pandemic in all its dimensions. The Reserve Bank of India refocussed its statistical endeavours during the pandemic to ensure the continuity of its mission. The RBI's past efforts in streamlining of data flow, investment in technology and continuous engagement with regulated entities paid dividends. In addition to some shift in modes of survey data collection, more consistency checks were put in place and sample follow-up revisits were introduced to ensure sanctity of data. Innovative solutions were found in terms of channels of data collection, validations and dissemination for policy inputs as well as for meeting various international reporting commitments.

Statistical modelling and forecasting fundamentally depend on deriving information from precedents but the pandemic compelled statisticians to forecast in the absence of precedence. Even short-term forecasting has become a challenge for central banks in the aftermath of the pandemic. Large shifts in economic conditions, as during the pandemic, introduce structural breaks in statistical models. At the same time, the assumptions underlying these models also keep changing during uncertain times. Different solutions have been proposed by researchers and recent trends highlight a few strands of adjustments in standard forecasting models to deal with COVID-19

[3] United Nations (2020). 'Planning and Implementing Household Surveys under COVID-19'. Technical Guidance Note by the Inter-Secretariat Working Group, December.

[4] The 18th International Association for Official Statistics (IAOS) Conference, held in Poland during 26th – 28th April, 2022

disruptions. One must use all these available options to check the forecast accuracy before zeroing in on any particular technique. Further, the forecasting models will require timely updates to factor in the latest developments in the economy.

The experience of the last two years has made us mindful of the data gaps that remain, though ensuring standardisation of methodologies in the compilation of various national aggregates have stood us in good stead. Our endeavour has been to follow global standards and best practices, some of which are still evolving. In parallel to these developments, more indices, sub-indices and other statistics have also come to the forefront as countries strive to achieve higher standard of living, and attempt to monitor their progress across multiple dimensions. Various forms of Human Development Indices, Happiness Indices and Inequality indices have been proposed in the literature and are now compiled by various national and international agencies.

Given its vastness and geographical diversity, India requires regional dimensions of national indicators. We should aim at enhanced granularity, regularity and better validation. In the Reserve Bank, we treat information as a 'public good'. We envision to keep calibrating our information management systems to the needs and expectations of various stakeholders. As I have already stated, we should also tap alternate data sources, and consider ways and means of fitting them in the existing analytical frameworks.

The world has responded to the devastating impact of the COVID-19 pandemic through remarkable determination, strong human spirit and scientific efforts. This response is taking place in a period when we are also facing long term challenges of climate change, with its unusually complex dynamics. It poses new challenges to central banks, regulators and supervisors. The risk assessment methods and models for analysing climate-related risks are, at present, limited by lack of usable data. Work is on for identifying and bridging these data gaps[5]. The new phase[6] of G-20 Data Gaps Initiative (DGI) proposes climate change as a major focus area to address data gaps that have been identified as crucial for macroeconomic policy making and micro-financial stability.

The proliferation of internet has led to an explosion in the availability and demand for data. Businesses are making large investments to predict the behaviour of consumers by exploiting the advances made in the field of data analytics. Amidst this inundation of data and inferences, it is important that peculiarities and nonconformities are subjected to robust statistical analysis and peer review before deriving conclusions.

In other words, statistics should focus on laying down the pathway towards proper interpretation in the present world of data abundance. This would facilitate more informed decision making, clarity in communication from decision makers and formation of rational expectations from market participants.

In most countries today including our own, there are greater demands from the profession of statistics for policy inputs and decision making. Such rising demands on the profession necessitate robust quality of statistics and statistical methods. I would encourage the statisticians in the Reserve Bank of India, as well as those outside the Bank, to make full use of the opportunities available by way of advances in statistical methods. We are living in an era where computing power practically has no boundaries. This is an opportunity as well as a challenge for statisticians across the world.

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5 Network for Greening the Financial System (2021). 'Progress report on bridging data gaps'. May.

6 The previous two phases of G20-DGI were focussed on data gaps for (a) monitoring risks in the financial sector; (b) cross-border financial linkages; (c) vulnerabilities to shocks, interconnections and spillover; and (d) communication of official statistics. The latest phase aims to address data gaps related to (i) climate change; (ii) household distributional information; (iii) fintech and financial inclusion; and (iv) scaling up access to private and administrative data and improve data sharing.

I earnestly hope that today's deliberations will inspire our officers, especially the younger officers, to ask pertinent questions and rise to the challenges of the post-pandemic world. Their endeavour should be to innovate solutions keeping in mind the Mahalanobis Dictum[7] : "Statistics must have a clearly defined purpose, one aspect of which is scientific advance and the other, human welfare and national development."

My best wishes for productive deliberations in today's conference.

Thank you.

[7] Rao, C. Radhakrishna (1993). "Statistics Must Have a Purpose: the Mahalanobis Dictum." Sankhyā: The Indian Journal of Statistics, Series A (1961-2002), vol. 55, no. 3, pp. 331–49.

*Disruptions & Opportunities in the Financial Sector**

Shaktikanta Das

It is my pleasure to be here amongst such a distinguished gathering to deliver the inaugural address at the Financial Express Modern BFSI Summit. The theme of my address "Disruptions & Opportunities in the Financial Sector' will resonate in the current context of technological innovations and fast evolving business models in the financial sector.

The impact of Covid-19 pandemic, the recent geopolitical crisis and the all-pervasive technological innovations sweeping across economies are challenging the traditional financial intermediation processes. In my address today, I would like to focus more on the banking and the financial services space. I propose to share my thoughts on possible implications of technology on the financial services industry.

The Changing Paradigm of Banking

The edifice of growth and development in modern economies is built on the foundation of a vibrant, resilient and well-functioning financial sector. The core functions of the financial sector in an economy, *viz.* intermediation, asset price discovery, risk transfer and payments are globally undergoing a process of transformation. This is primarily driven by technological advancements. The Indian financial sector has also been a part of this churning and is adopting and propelling these transformations.

Over the past few years, the business of banking has witnessed a shift from traditional branch banking to digital banking. This paradigm shift has been possible due to innovations in information technology (IT), growth in mobile and internet connectivity, market-based financial intermediation, and the advent of Fintech. Financial service providers are now devising new products and services and are adopting new business models for reaching out to the target customers.

Improvements in technology have also enhanced the cause of financial inclusion and tech-enabled public goods delivery. Direct Benefit Transfer (DBT) through the digital mode is among the best examples of tech-enabled public goods delivery. Digital-mobile-anywhere-anytime banking is becoming the order of the day. The indigenously developed Unified Payments Interface (UPI) and Aadhaar Enabled Payment Service (AePS) have become the backbone of our retail payments system.

Alongside these advancements, the Reserve Bank's regulatory approach has been realigned to support and foster such innovations. The regulatory guidelines for account aggregators and peer-to-peer lending operators are indicative of a proactive regulatory approach. An enabling framework for Regulatory Sandbox has been in place for last three years. The Reserve Bank Innovation Hub (RBIH) has also been set up by the RBI to catalyse innovations in the Fintech sector. We are now moving towards the introduction of a central bank digital currency (CBDC).

Technology as a Disruptor – Opportunities and challenges

With the advent of new technologies, we are witnessing a new era of disruption. Given the growing role of technology, data and network effects, there is a feeling among the banks that having an ethos of a technology company, while offering banking services, is the need of the hour. This is an area of opportunity for the banks; but there are associated challenges which need to be mitigated. Greater attention needs to be given to building customers' trust by (i) offering products and services appropriate and fit for

* Address by Shri Shaktikanta Das, Governor, Reserve Bank of India - June 17, 2022 - Delivered at the Financial Express Modern BFSI Summit in Mumbai.

customer's needs and circumstances; (ii) ensuring robust security controls, reliable and efficient delivery of services, transparency of terms and conditions to customers; and (iii) by handling customer grievances satisfactorily and building necessary awareness among customers. All of these aspects need to be factored in when financial institutions introduce or enhance technology driven products and services.

Talking about opportunities, it would be relevant to note that what we have seen until now could be just the tip of the iceberg. The use of artificial intelligence (AI) and machine learning (ML) to determine the creditworthiness of clients for small ticket loans by analyzing data from a wide range of traditional and non-traditional data sources, has the potential to enhance access to credit for marginalised customers. Here also it would be necessary to understand the associated risks and mitigate them suitably through various safeguards and precautions. Risks relating to cyber security, software development, limitations in transaction capacity, privacy of customer data, and data security need to be factored in. The methodology of algorithms underpinning digital financial services has to be clear, transparent, explainable and free from exclusionary biases. The credit scoring models using innovative techniques can be useful but they should be subject to a robust model governance framework. Comprehensive assessment of risks has also to be undertaken while planning to move to cloud with customer sensitive data.

In all these digital initiatives, the plan should also factor in those sets of customers who may not be digitally savvy and who may want to engage physically with the bank. It is, therefore, crucial that while driving various tech-enabled initiatives, the existing systems and processes do not see frequent disruptions and non-availability. We have already seen instances of the damage that disruptions in technology systems can bring and the reputation risk they carry for financial entities. A casual approach to handling technology issues even as basic as wrongful deletion of a single system file or inadequate care in patch updating often lead to financial and operational losses.

The IT systems and platforms are also exposed to obsolescence and require frequent upgradation. This calls for adequate investment in IT infrastructure by all financial sector entities. This is one of the important focus areas of RBI's supervision of its regulated entities, especially the Banks and the NBFCs.

It has also to be recognised that human resource can turn out to be the weakest link in technology enabled financial services. There is thus a vital need for ongoing training and skill building programmes.

At end of the day, the bottomline is how technology improves the financial system in terms of efficiency, effectiveness, resolving bottlenecks in economic functions and provide value addition to the customers.

Collaboration between Finance and Technology Firms

Large technology companies (BigTech) which have entered into provision of financial services could potentially be another source of disruption to the financial system. As you would be aware, such companies, whether from e-commerce, social media and search engine platforms, ride hailing and similar businesses have started to offer financial services in a big way on their own or on behalf of others. These companies have an enormous amount of customer data which has helped them to offer tailored financial services to entities and individuals lacking credit history or collateral. Even the banks and other lenders are sometimes utilising platforms provided by fintech companies in their internal processes for credit risk assessment. Such large scale use of new methodologies in credit risk assessment can create systemic concerns like over-leverage, inadequate credit assessment, etc. Authorities and regulators have to strike a fine balance between enabling innovation and preventing systemic risks.

The big techs also pose concerns related to competition, data protection, data sharing and operational resilience of critical services in situations where Banks and NBFCs utilise the services of big tech companies. These concerns can also materialise in sectors other than financial services. The provision of financial services through the digital channel, including lending through online platforms and mobile apps, have brought in issues relating to unfair practices, data privacy, documentation, transparency, conduct, breach of licensing conditions, etc. The Reserve Bank will soon issue suitable guidelines and measures to make the digital lending ecosystem safe and sound while enhancing customer protection and encouraging innovation.

What kind of Regulation and Supervision?

The need for FinTech regulation emanates from the challenges they pose to the financial system and the new risks they carry. These risks have a bearing on overall financial stability and market integrity.

The approach to regulation of FinTech could be by way of Activity Based Regulation wherein similar activities are treated similarly, regardless of the legal status or nature of the entity undertaking the activity. It could also be Entity Based Regulation which requires that regulations are applied to licensed entities or groups that engage in similar and specified activities, such as deposit taking, payment facilitation, lending, and securities underwriting, etc. The approach could also be an Outcome Based Regulation by setting out some basic, common and technology or business model-neutral outcomes that entities must ensure.

India has traditionally followed a hybrid form of regulation that combines Activity and Entity Based regulation. As a principle, the RBI has been applying comprehensive regulatory, supervisory and oversight requirements to various segments of financial sector in its domain to create an enabling ecosystem for such activities to grow in an orderly fashion. The underlying theme has always been to maintain financial stability. Going forward, the RBI will continue to finetune its regulatory and supervisory measures keeping in mind the evolving dynamics of the financial sector.

Does Regulation require collaboration with different Regulators?

When it comes to technology, it may transcend regulatory or national boundaries. The most relevant example in this case would be the blockchain technology. Different blockchain platforms cannot be limited to a regulator or a nation. Another example can be the case of De-centralised Finance (DeFi) in which financial applications are processed on a blockchain with limited or no involvement of centralised intermediaries. DeFi poses unique challenges to regulators as its anonymity, lack of a centralised governance body, and legal uncertainties can make the traditional approach to regulation ineffective. There is, therefore, a case for a globally coordinated regulatory approach and inter-regulatory co-ordination to enable comprehensive assessment of such activities and mitigation of their risks.

Some recent initiatives of the RBI

I would now like to focus on certain supervisory steps taken by the RBI recently to deal with the emerging challenges from fintech. In the specific area of cyber security, the RBI has recently conducted Phishing Simulation exercises for select Supervised Entities (SEs) to assess their email security standards and cyber security preparedness. We have also initiated the process of conducting Cyber Reconnaissance exercises this year. This will provide pre-emptive information on the cybersecurity risk vectors of SEs. Besides, Cyber Drills which are conducted periodically are being further enhanced in terms of coverage and periodicity.

The increasing use of technology and digital services has led to more incidents of digital frauds and customer dissatisfaction. The recommendations

of the RBI Working Group on digital lending in this area are under examination for issuance of guidelines.

In the context of customer service, another area which is engaging the attention of the RBI is the harsh recovery methods used by certain lenders, without having adequate checks and controls over their recovery agents. We have received complaints of customers being contacted by recovery agents at odd hours, even past midnight. There are also complaints of recovery agents using foul language. Such kind of actions by recovery agents are unacceptable and pose reputational risk for the financial entities themselves. We have taken serious note of such instances and will not hesitate to take stringent action in cases where regulated entities are involved. Such complaints against unregulated entities will have to be taken up with appropriate law enforcement agencies.

We have recently set up of a Committee for Review of Customer Service Standards in the RBI Regulated Entities (REs) which would inter alia review the emerging and evolving needs of the customer service landscape, especially in the context of evolving digital financial products and their distribution, and suggest measures for strengthening the overall consumer protection framework.

Governance and Risk Management

I have often spoken about the importance of good corporate governance in banks and financial institutions. A good governance structure will have to be supported by effective risk management and compliance functions. The cost of compliance to rules and regulations should be perceived as an investment, as inadequacy in this regard can prove to be highly costly. Compliance culture should ensure adherence to not only laws, rules and regulations, but also integrity, ethics and codes of conduct.

The Global Financial Crisis was preceded by a wave of financial innovations related to securitisation and other innovative financial instruments. These allowed the financial system to grow at a pace that was beyond its capacity to manage, especially from the point of view of the connected risks. Given such past experience, prudence demands that introduction of innovations in the financial system should be done responsibly and in a calibrated manner, taking into account the capacity of financial entities to manage potential risks. It goes without saying that innovations which provide opportunities through high risk taking need to be managed by sound corporate governance and risk management practices within the financial institutions. The senior management and internal control mechanisms in financial institutions should also ensure that their IT systems are robust and transparent, and not open to manipulation that may camouflage the true state of affairs in the organisation.

Conclusion

Let me conclude by saying that we are in the midst of a technological revolution in the sphere of financial services. Technology and Innovation per se are neither destructive nor constructive. It is the use cases that present the responsible or irresponsible sides of any particular innovation or technology. Reserve Bank shall continue with its approach where innovations which provide benefits to society are encouraged without compromising the stability of the financial system.

The trend of technology driven changes in the financial services sector will continue in the future. Participants and players in this sector will have to strive hard to remain relevant in the ever changing economic environment by continuously improving the quality of their governance; reworking their business strategies and business models; designing products and services with the customer in mind; ensuring operational resilience and risk management; and focussing on more efficient products and services by leveraging on technology. The possibilities are immense only if we are ready to embrace them while meeting the challenges!

Thank you.

*The State of the Economy in Questions**

Michael Debabrata Patra

Governor, Professor Ashima Goyal, Dr. O.P Mall, Executive Director, Dr. Ajit Joshi, Principal Adviser, Department of Statistics and Information Management or DSIM, distinguished professional forecasters, colleagues from DSIM and other departments of the RBI,

I am deeply honoured to be invited to interact with our professional forecaster today. We meet after two year and seven months and much has transpired between these two meetings. We have a first in this meeting - Governor, interacting with professional forecasters. Never happened before, and I should know, with my long history in the RBI! It underlines the importance we attach to the inputs given by our panel of professional forecasters to policy-making.

"We live in a world of high uncertainty" is fast becoming the understatement of the year. Everything is up in the air. To give you a flavour of the roller coaster unknowns: as the world's most powerful grouping – the G7 – met in Germany and was reaffirming its "unwavering commit to support the government and people of Ukraine", missiles slammed into Kiev, Ukraine's capital.

The war will go on and so will geopolitical spillovers.

In response to a global inflation crisis, the most synchronised monetary policy tightening the world has seen in decades is underway. Will inflation come down is, however, hugely conditional upon how long the war lasts. More certainty seems to be crystallising around the likelihood of a recession. The BIS warns that it may take more than one recession to conquer the price surge but if it is not vanquished, an inflation psychology will spread and get entrenched.

Can India weather the geopolitical storm, break the back of inflation and achieve escape velocity from this global trap? Is the worst of inflation behind us, or is there more pain ahead? The balance of payments looks sustainable, but will it look as good if crude rules above US$ 120-130 per barrel? Monetary policy has been activated, but is the public's ask too much – inflation should fall to target without hurting growth? The RBI is asked to clearly communicate its future moves in the quest of this impossible dilemma, but is communication as good an instrument on the way up as it is on the way down?

It is said that economists seek to study uncertainty, and statisticians seek to measure it. Accordingly, I thought I would take advantage of this august company, our internal teams included, to delve into some of our recent research and place before you some existential questions about the state of the economy.

II. HARD OR SOFT LANDING?

Will the global economy undergo a hard landing – the BIS terms a hard landing as a recession occurring after the policy rate is raised for at least three successive quarters[1] – or a soft landing? Citigroup's economic surprise index (CESI) compiled by Bloomberg, which measures the degree to which macroeconomic data announcements beat or miss forecasts, has fallen into

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[1] BIS Annual Report, 2021/22, https://www.bis.org/about/areport/areport2022.pdf

[2] 'The Global Economy is falling short of expectations', The Economist, June 27, 2022; https://www.economist.com/graphic-detail/2022/06/27/the-global-economy-is-falling-below-expectations

negative territory[2]. Economists surveyed by The Wall Street Journal have dramatically raised the probability of recession in the next 12 months, putting it at 44 per cent in June 2022 – a level usually seen only on the brink of or during actual recessions. It is up from 28 per cent in April 2022 and 18 per cent in January 2022.

Much will depend on the fortunes of the US. There have been ten recessions during the period for which data on the effective Federal Funds rate are available (from Q3 1954)[3]. All of them, including the ones associated with the global financial crisis (GFC) and the COVID-19 pandemic, have been preceded by a period of monetary tightening (Chart 1). Not all episodes of monetary tightening were followed by a recession [such as during Q3:1961 to Q3:1963; Q4:1965 to Q3:1966 (recession did not occur in the next 3 years *i.e*, up to Q3:1969, but the US economy did enter a recession in Q4:1969); Q1:1984 to Q3:1984; and Q1:1993 to Q3:1993]

The global economy is projected to decelerate significantly during 2022 by all multilateral agencies; however, none of them foresee a contraction on an annual basis, including in alternative stress scenarios (Table 1).

Based on a nowcast of global GDP growth that uses data for 35 countries which account for 61 per cent of global GDP, it is observed that the momentum of global GDP growth has lost steam during Q1:2022, entering the contractionary zone sequentially (-1 per cent from 1.4 per cent in the previous quarter) (Chart 2). Even on a year-on-year basis, there is a substantial loss of pace (from 4.7 per cent in Q4:2021 to 2.8 per cent in Q1:2022)[4]. In an autoregressive integrated moving average (ARIMA) framework with exogeneous regressors, global GDP growth is likely to contract in Q2: 2022 by (-) 0.4 per cent sequentially and by (-) 4.1 per cent on a year-on-year basis.

III. IS THE INDIAN ECONOMY WEATHERING GEOPOLITCAL SPILLOVERS?

The June (MPC) meeting was held in the shadow of geopolitical spillovers. The MPC noted that domestic economic activity is gaining traction. Rural consumption should benefit from the likely normal south-west monsoon and the expected improvement in agricultural prospects. A rebound in contact-intensive services is likely to bolster urban consumption, going forward. Investment activity is expected to be supported by improving capacity utilisation, the government's capex push, and strengthening bank credit. Growth of merchandise and services exports is set to sustain the recent buoyancy. On the other hand, spillovers from prolonged geopolitical tensions, elevated commodity prices, continued supply bottlenecks and tightening global financial conditions weigh on the outlook. Taking all these factors into consideration, the real GDP growth projection for 2022-23:Q1 was placed at 16.2 per cent; Q2 at 6.2 per cent.

Table 1: World Bank Global Growth Forecast: Alternate Scenarios

	2021	2022	2023
Baseline	5.7	2.9	3.0
Alternate Scenario I: Baseline + Fed tightening	-	2.6	2.4
Alternate Scenario II: I + Energy price spike	-	2.2	1.6
Alternate Scenario III: II + China COVID-19	-	2.1	1.5

[3] FRED Economic Data, St. Louis Fed; https://fred.stlouisfed.org/series/FEDFUNDS

[4] These are the results of a recent Bulletin paper titled "Nowcasting Global GDP". **Alternate Scenario I: Baseline (+)** widespread financial stress caused by faster U.S. monetary tightening – Fed policy rates rise to 4 per cent by the first quarter of 2023, rapid tightening of global financial conditions, financial stress across EMDEs and large-scale capital outflows and soaring bond spreads, ultimately forcing authorities to accelerate fiscal consolidation efforts. **Alternate Scenario II: Alternate Scenario I (+)** Russia respond to escalating EU sanctions by announcing immediate ban on all energy exports to EU by Q3:2022, further sanctions targeting shipping companies or third parties purchasing Russian oil. **Alternate Scenario III: Alternate Scenario II (+)** China experience COVID-19 resurgences of steadily decreasing severity through the second half of 2022 and into 2023.

The high frequency indicators for Q1: 2022-23 are mixed; however, amidst a sea of red and yellow, greens are making their appearance, mainly reflecting the revival of contact-intensive sectors. (Chart 3). On the basis of these indicators, our nowcasts for Q1:2022-23 range between 15.5-16.7 per cent while the Survey of Professional Forecasters' (SPF) median forecast is 14 per cent[5]. Our nowcasts find a marginal improvement in momentum, with the 15.5 per cent nowcast having no momentum. Is it the case that professional forecasters see negative momentum in Q1: 2022-23 (Chart 4)? In Q2, we see an improvement in momentum (5.4 per cent) but weighed down by base effects.

IV. WHAT IS THE YIELD CURVE TELLING US ABOUT THE ECONOMY?

In the recent period, frequent inversions of the US yield curve have been cited as pointing to the probability of a recession. In India, the yield curve, which was relatively flat prior to the pandemic in Q2 of 2019, steepened in Q2:2020 after the announcement of the RBI's pandemic related measures, which included a 115 basis points decline in the policy rate. The introduction of G-SAP in April 2021 further lowered the belly (mid-segment) of the curve by Q2: 2021. With policy tightening commencing from since April 2022, there has been an almost parallel shift of the yield curve by Q2:2022, indicating hardening of yields across the term structure.

Information from the yield curve is encapsulated in its latent factors – the yield or level; its first derivative (or dy/dx) is the slope and its second derivative or d^2y/dx^2 is its curvature. These factors help to extract information from the entire yield curve: dimensionality reduction without losing information. In India, the pandemic-induced policy accommodation led to a decline in the level but an increase in both slope and curvature (the hump shape of the curve), which basically indicates dissimilar adjustments of yields across mid-segment maturities because of market segmentation. The recent monetary policy normalisation measures have resulted in an upward shift of the level while the curvature and slope have declined on account of higher increase in short-term rates *vis-à-vis* medium and long term rates (Chart 5).

A comparison of the recent sharp increase in level and curvature relative to the pre-pandemic period reaffirms expectations of economic recovery and hardening of *ex ante* inflation expectations by market participants. In sum, the yield curve is indicating an improvement in long-term growth prospects, an upshift in *ex ante* inflation expectations and tighter monetary policy in the period ahead.

V. ARE PEAKING SUPPLY CHAIN PRESSURES INDICATING EASING OF INFLATION?

The global inflation crisis has its roots in supply chain pressures and elevated commodity prices. As it gains generalisation and persistence, the monetary policy response shapes up to align demand with existing levels of supply. 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 May 2022, is found to track supply pressures on the Indian economy efficiently (Chart 6). While it contemporaneously correlates with input prices, it displays lead indicator properties in respect of goods price inflation. A moderation in the index would indicate an easing of inflation pressure in coming months and *vice versa.*

There is some evidence now that supply chain pressures are peaking globally and in India, so that a major source of upward inflation pressures may be ebbing. Will this reinforce the conduct of monetary policy so that less aggressive actions will suffice?

[5] Survey of Professional Forecasters on Macroeconomic Indicators – Results of the 76th Round, June 8, 2022; https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=21065

VI. HOW INTENSE IS IMPORTED INFLATION?

The transmission of exchange rate changes to domestic inflation is an important parameter for the setting of monetary policy. This is unobservable and has to be estimated for each country: the change in inflation due to a unit change in the exchange rate is known as exchange rate pass-through (ERPT). Updated estimates of time-varying ERPT suggest an increase in pass-through of exchange rate changes to domestic inflation in India in the recent period (0.11 in the pre-pandemic period to 0.18) (Chart 7). Rising levels and volatility of inflation, exchange rate volatility and higher crude oil prices have led to higher ERPT.

This focuses attention on increased monetary policy vigilance on the growing role of imported inflation, especially if external shocks become stronger. On the other hand, this strengthens the exchange rate channel of monetary policy transmission, implying that lower orders of rate hikes can bring down inflation faster, conditional upon the higher ERPT.

VII. ARE HOUSEHOLDS RESPONDING TO SUPPLY SIDE MEASURES?

The May 2022 round of the Inflation Expectation Survey of Households (IESH) of the RBI was conducted during May 2 to 11, 2022 in 19 major cities on 6,062 urban households. The survey showed that households' median inflation perceptions increased from 9.7 per cent in March 2022 to 10.1 per cent in the current round. Median inflation expectations for three months ahead rose by 10 bps to 10.8 per cent, while for one year ahead, they rose by 30 bps to 11.1 per cent (Chart 8).

In view of the reduction in the prices of petrol and diesel following the cut in central excise duties on May 21, 2022 a limited follow-up survey (or an 'extension survey') was conducted during May 24-28, 2022, which covered 3,036 households across 19 centres. In the extension survey, the three months ahead and one year ahead expectations eased by 190 bps and 90 bps, respectively, when compared with the regular round – a significant drop from the March 2022 IESH survey readings. Further reduction of State VATs on petrol and diesel across the country can certainly contribute to softening of inflationary pressures as well as expectations.

VIII. WHAT IS THE COST OF FIGHTING INFLATION?

Monetary policy has been activated with the belief that there is an inverse correlation between unemployment and wage growth – the essence of the Philip Curve (PC). Output can be increased only at the cost of higher inflation or conversely, inflation can be lowered only at the cost of lower output. From the late 1990s up to the pandemic, global economic activity expanded continuously without any parallel acceleration in inflation – the Great Moderation. This led many to believe that the PC has flattened, that it has either disappeared or is hibernating, implying that monetary policy may not work or may be too costly. A consensus exists, though, that the answer is empirical and country-specific.

Hence, we estimated a time-varying Phillips curve for India, incorporating the pandemic experience. The first challenge was to estimate the output gap. In view of the pandemic and its toll, output was posited as comprising potential output (unobservable), the output gap and a disturbance in the form of the Oxford stringency index[6]. Since we had two unobservables – potential output and the output gap – we require two measurement equations – the Phillips curve or the aggregate supply curve and the Taylor rule or the monetary policy reaction function – two observables *i.e.*, inflation and the interest rate, and a connecting equation – the IS or aggregate demand curve. From

[6] The Oxford Stringency Index track and compare government responses to the coronavirus outbreak over time. The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). The Oxford Stringency Index is a measure of the strictness of government COVID-19 response policies and is not an indicator of its effectiveness.

this set-up, we filter out the unobservables. This is the standard Kalman filter. The innovation is the introduction of the stringency index (Chart 9).

Our estimates show that the output gap, which was -1 per cent of potential output in 2019, widened to – 5.4 per cent in 2020 Q2 but is likely to have narrowed to -3.5 per cent in Q1: 2022-23. Thus, the output gap in India is closing gradually. With this valuable input, we estimated a time-varying non-linear Phillips curve for India. Our results show that the inflation process in India has become increasingly sensitive to forward-looking expectations (Chart 10). The slope of the Phillips curve has been declining with the anchoring of inflation expectations since the institution of inflation targeting and even before, *i.e.,* since the establishment of its pre-conditions from 2015. This has also led to an increase in the sacrifice ratio, implying that for every unit of disinflation, more and more output would be lost. From 2020, however, the Phillips curve has been steepening with the narrowing of the output gap and rising inflation. Alongside, there is a decline in the sacrifice ratio, suggesting that this is the best time to put anti-inflationary monetary policy to work while minimising output losses.

The Phillips curve is alive and well in India, but it is recovering from a period of flattening lasting more than six years, *i.e.*, from 2014.

IX. WHAT IS THE STANCE OF MONETARY POLICY?

The natural rate of interest is that rate at which monetary policy is neither expansionary nor contractionary and consistent with the economy being in a state of equilibrium or steady state – when inflation is at target and output is close to or at its potential level. As it is unobserved in real life, the natural or neutral rate of interest has to be empirically estimated. Caution is necessary as these estimates are time varying and highly sensitive to the choice of data, sample period, variables and methodology, with large confidence bands.

After the pandemic, several determinants of the natural rate have exhibited distinct shifts, with persisting uncertainty about whether and over what time frame they may normalise. Employing a Kalman filter with Bayesian methods, the natural rate for India is estimated to lie in the range of 0.8 per cent to 1.0 per cent for Q3 of 2021-22, which is lower by about 80 basis points than the earlier comparable estimate of 1.6 -1.8 per cent for Q4:2014-15 (Chart 10).

The main factor that can be attributed to the decline in the natural rate is the deceleration in the growth of potential output. The confidence band around the estimates has widened, reflecting heightened uncertainty about the evolution of key determinants of the natural rate during the post-pandemic period. The current estimate of the natural rate, read in conjunction of the inflation remaining above target and the output gap negative but closing, suggest that monetary policy is still accommodative.

X. WILL INDIA'S EXTERNAL SECTOR WITHSTAND GEOPOLITICAL HEADWINDS?

The elevation in international commodity prices delivered a strong terms of trade shock to India's balance of payments. In association with portfolio outflows in the wake of the war in Ukraine, financing pressures are building up, although they are modest at this time. More recently, commodity prices appear to be peaking, impacted by loss of demand as a global risk aversion has set in with fears of imminent recession.

With crude prices at $105 per barrel as assumed by the MPC, the net terms of trade index will worsen from 100.6 in 2021-22 to 98.5 in 2022-23. This will cause the CAD to widen from 1.2 per cent of GDP in 2021-22 to 2.3 in 2022-23, *ceteris paribus.* With crude at US $ 120, the terms of trade index falls further to 97.4 and the CAD expands to 2.8 per cent of GDP but it remains within the sustainable limit of 3 per cent. External debt remains modest as a proportion to GDP and has actually declined between March 2021 and March 2022 (Chart 11).

XI. ARE FISCAL RISKS MOVING SUB-NATIONAL?

Before the pandemic, the combined gross fiscal deficit (GFC) of the state governments remained modest at 2.5 per cent of GDP (during 2011-12 to 2019-20), lower than the Fiscal Responsibility Legislation (FRL) ceiling of 3 per cent. With the onset of the pandemic, States' fiscal position deteriorated in 2020-21. With a decline in revenue and increase in spending, the fiscal deficit widened to 3.5 per cent of GDP in the revised estimates for 2021-22. States' outstanding debt at end-March 2022 stands at 31.2 per cent of GDP, which is the highest in the past 15 years. The most indebted states are expected to remain stressed, with their debt-GSDP ratios likely to exceed 35 per cent by 2026-27 (Chart 12).

Risks to state government finances arise from macroeconomic uncertainty; declining own tax revenue; relaunch of the old pension scheme by some states; rising expenditure on non-merit freebies; expanding contingent liabilities; and the ballooning overdue of DISCOMs - warranting strategic corrective measures. Financial restructuring or bailout of ailing DISCOMs will have the most severe impact on debt-GSDP ratios.

XI. WILL THE OUTPUT LOST TO COVID 19 BE RECOVERED?

The pre-COVID trend growth rate works out to 6.6 per cent (CAGR for 2012-13 to 2019-20). The Report on Currency and Finance, 2021-22 took the actual growth rate of (-) 6.6 per cent for 2020-21, 8.7 per cent for 2021-22, the projection of 7.2 per cent for 2022-23, and 7.5 per cent beyond that. It found that India is expected to catch up with pre-pandemic trend growth only by 2034-35 (Chart 13). The output losses for individual years have been worked out to 19.1 lakh crore, 17.1 lakh crore and 16.4 lakh crore for 2020-21, 2021-22 and 2022-23, respectively. The key question is: Will these output losses ever be reclaimed?

XII. CONCLUSION

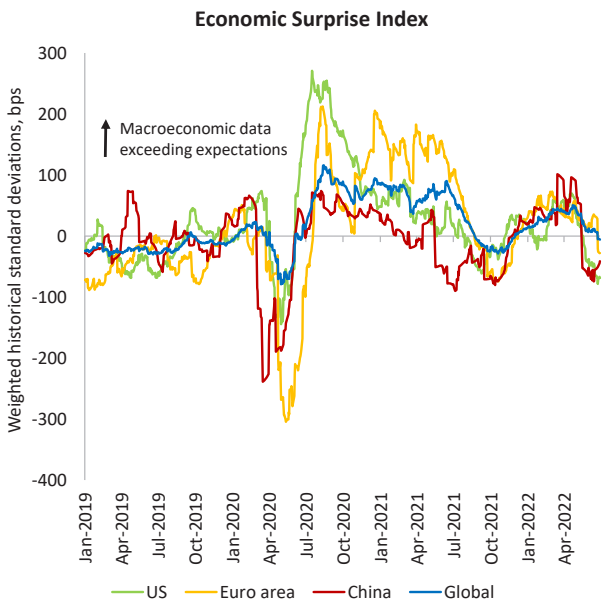
We live in an age of anxiety, when the present seems unstable and the future uncertain. Apprehensions of recession grow, consumer confidence wanes, businesses become risk averse and markets are overshooting. Geopolitical spillovers refuse to abate. Reshoring of supply chains has begun. There is a strengthening of centrifugal forces and a weakening of the centripetal in the world around us. What is looking like fragmentation may actually be changes in the fundamental shape of globalisation. Or the end of it. We do not know enough. It is possible to envisage a soft landing – the war ceases; supply bottlenecks ease; inflation falls away; and further monetary policy tightening is put on hold. On the other hand, the worse-case scenario can also play out – inflation gets entrenched, prompting a stronger tightening, and causing a stagflationary hard landing. If this dilemma is global, India cannot be immune. There are some aspects of the situation we face today that are unique but there are also others which we have seen before. History does not repeat itself, but it often rhymes[7]. We have to navigate these stormy seas. And we have to do it our way. I leave you with these pensive thoughts.

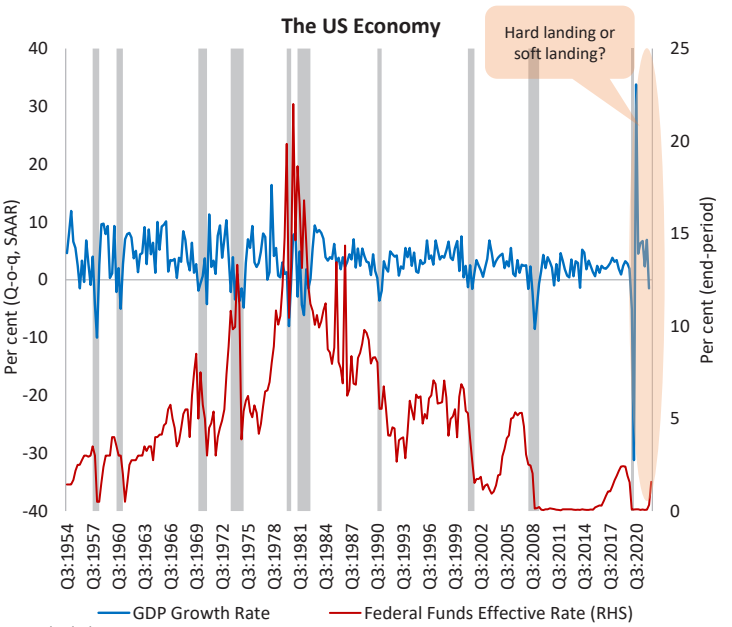
Thank you.

[7] Attributed to Mark Twain.

Annex

Chart 1: Global Economy – Hard or Soft Landing

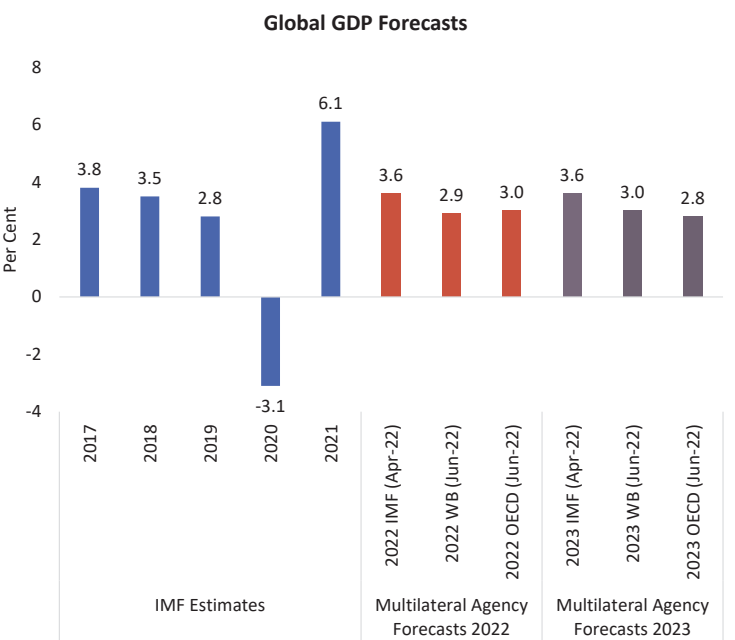




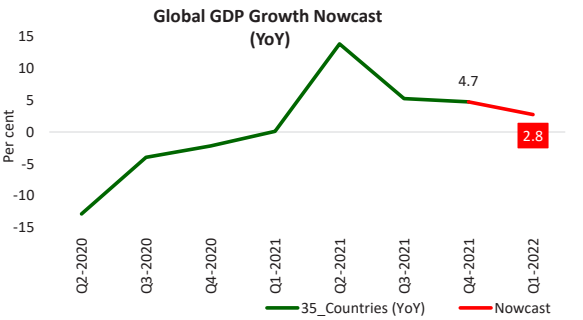
Grey shaded areas represent recessions

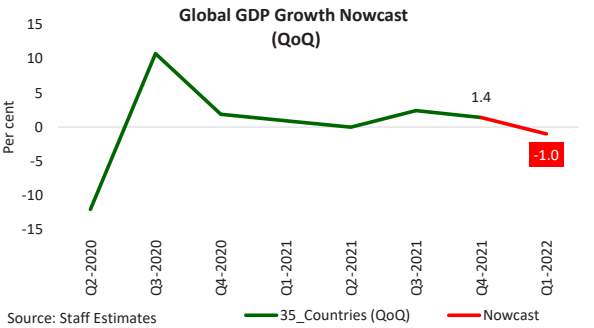
Sources: Bureau of Economic Analysis; St. Louis Fed database; https://www.nber.org/research/business-cycle-dating; Refinitiv Datastream.

Chart 2: What do nowcasts say?



Source: IMF, WB, OECD





Source: Staff Estimates

Chart 3: High Frequency Indicators – Greener or Redder?

High Frequency Indicators - Growth (y-o-y per cent)									Growth over pre pandemic		
Sectors	Indicators	Q1:2021-22	Q2:2021-22	Q3:21	Q4:21	Mar-22	Apr-22	May-22	Mar 22/Mar 19	Apr 22/Apr 19	May 22/May 19
Urban Demand	Passenger Vehicles Sales	317.7	3.7	-20.1	-6.1	-3.9	-3.8	185.1	-4.2	1.6	10.6
Rural Demand	Two Wheelers Sales	85.9	-12.3	-24.8	-23.0	-20.9	15.4	253.2	-17.8	-29.9	-27.4
	Three Wheelers Sales	91.0	53.1	14.5	-2.8	-0.7	51.1	2161.6	-51.6	-54.7	-44.7
	Tractor Sales	38.9	-9.5	-13.5	-25.7	-14.3	40.6	47.4	17.0	55.5	41.1
Trade, hotels, transport, communication	Commercial Vehicles Sales	234.4	24.5	0.9	18.8	18.8			-12.1		
	Railway Freight Traffic	40.5	13.0	7.2	7.0	6.7	9.4	14.6	16.3	20.9	25.5
	Port Cargo Traffic	27.2	6.2	1.6	-0.7	0.6	5.5	10.2	7.7	8.1	11.4
	Domestic Air Cargo Traffic	201.9	27.2	2.5	-4.3	-1.0	7.9	54.7	-4.4	2.7	1.9
	International Air Cargo Traffic	118.6	24.8	15.4	1.9	1.1	-0.9	-4.6	-10.7	-5.2	-13.6
	Domestic Air Passenger Traffic	366.8	116.6	61.6	6.9	37.7	87.9	474.7	-5.3	-1.5	-2
	International Air Passenger Traffic	328.0	110.4	138.5	80.8	105.7	155.6	722.8	-43.8	-36.6	-28
	GST E-way Bills (Total)	97.9	27.5	10.8	9.2	9.7	28.0	84.1	42.4	43.3	35.6
	Tourist Arrivals	639.1	322.9	263.1	155.9	177.9	399.2		-65.0	-49.3	
Construction	Steel Consumption	100.9	-0.5	-6.0	-1.7	0.7	1.8	19.0	2.7	18.6	5.6
	Cement Production	54.5	22.9	8.6	9.3	8.8	8.0		8.1	8.9	
PMI Index	Manufacturing	51.5	53.8	56.3	54.3	54.0	54.7	54.6			
	Services	47.2	52.4	57.3	52.3	53.6	57.9	58.9			
Scheduled Commercial Banks- Aggregates	Deposits	10.1	9.5	10.3	8.6	8.9	10.0	8.6	30.9	34.4	31.4
	Credit Outstanding	6.0	6.5	7.8	7.9	8.6	9.6	11.2	21.7	24.8	24.3
Electricity Generation	Conventional	18.8	7.6	2.4	2.2	4.3	10.1	20.4	15.6	16.4	6.8
	Renewable	12.9	28.6	6.0	19.2	22.5	29.7		58.8	52.9	

Chart 4: Is India Weathering the Geopolitical Storm?

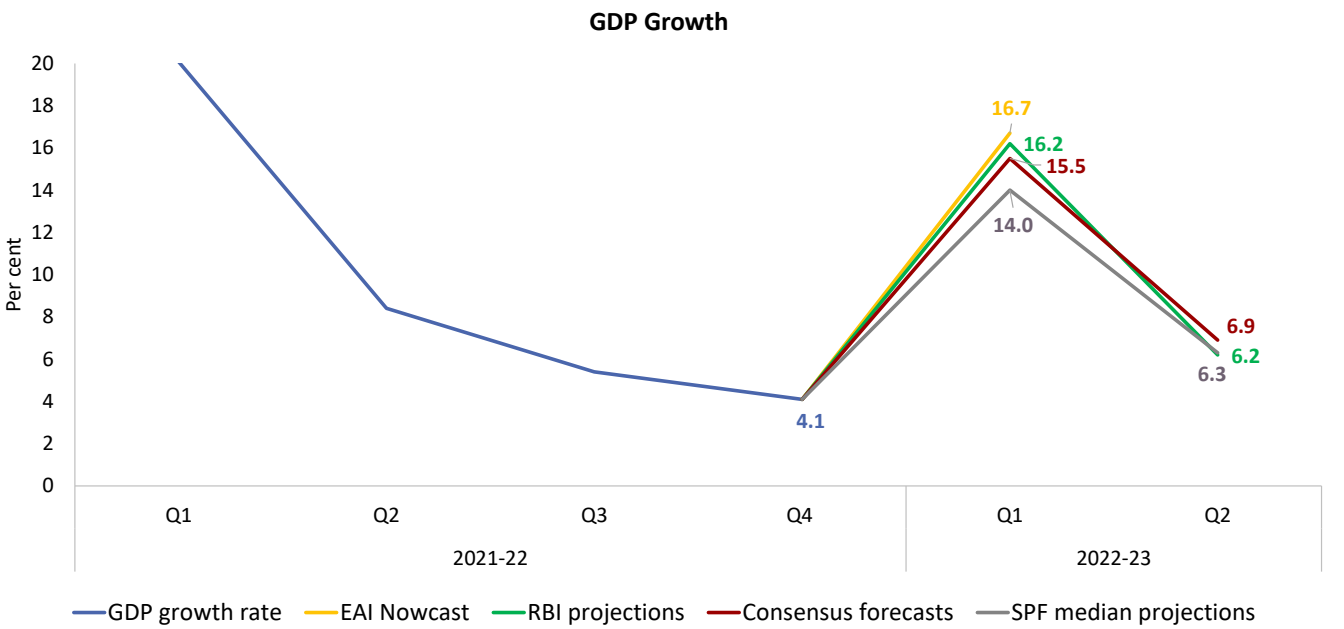
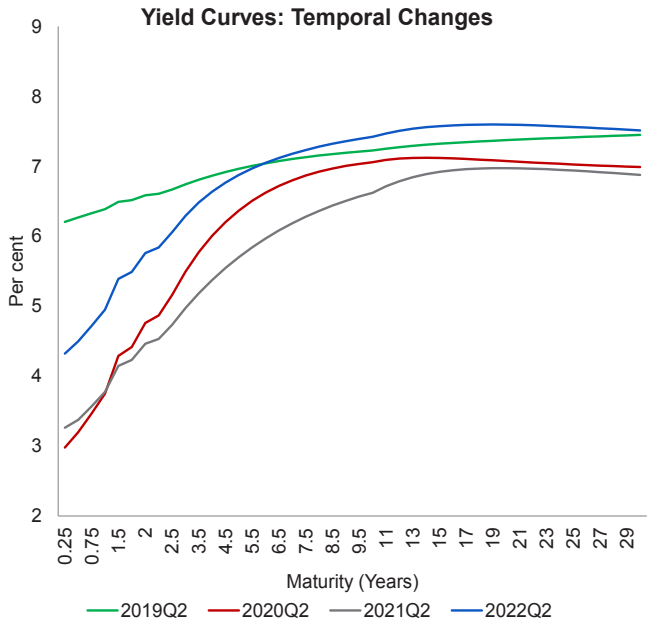


Chart 5: What is the Yield Curve Telling us About the Economy?



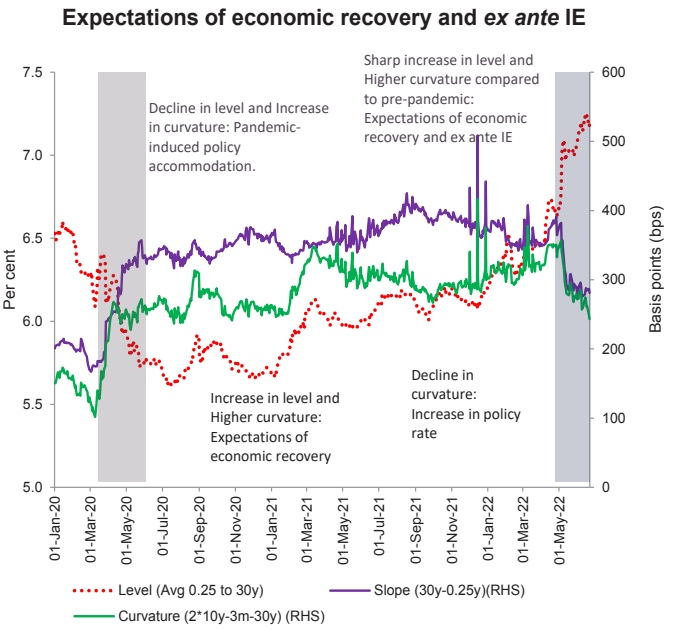
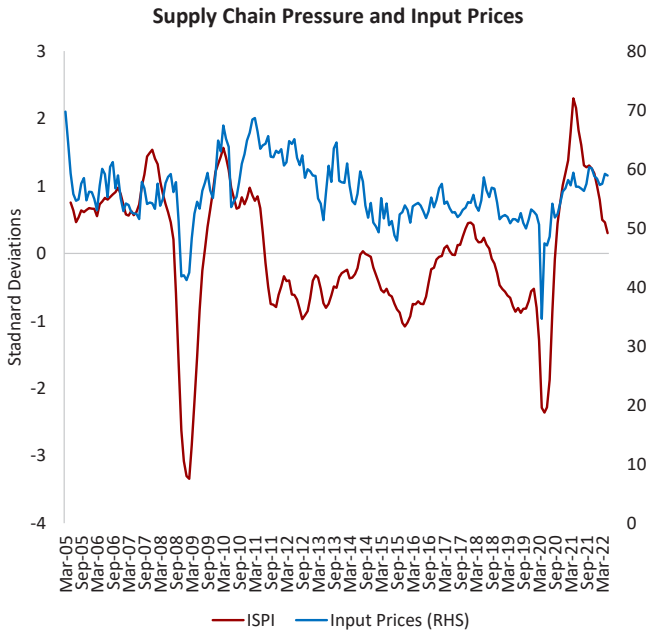


Chart 6: Will Peaking Supply Chain Pressures Reinforce Monetary Policy?



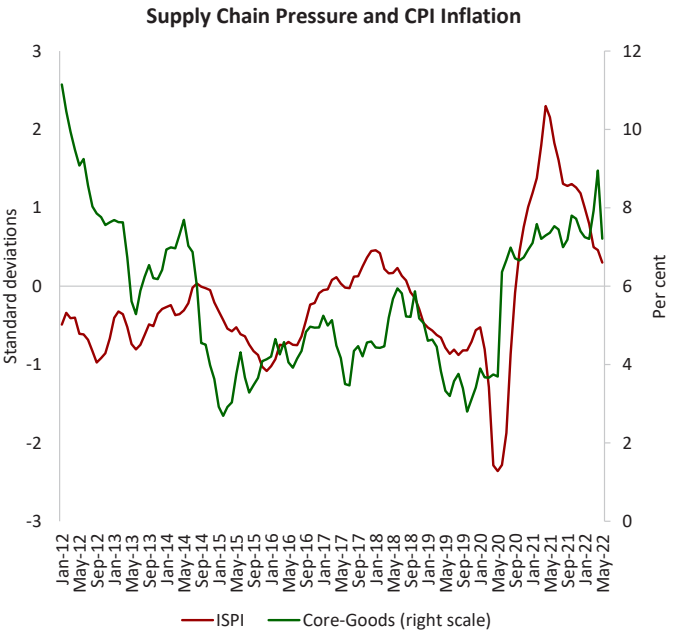


Chart 7: What is ERPT telling us?

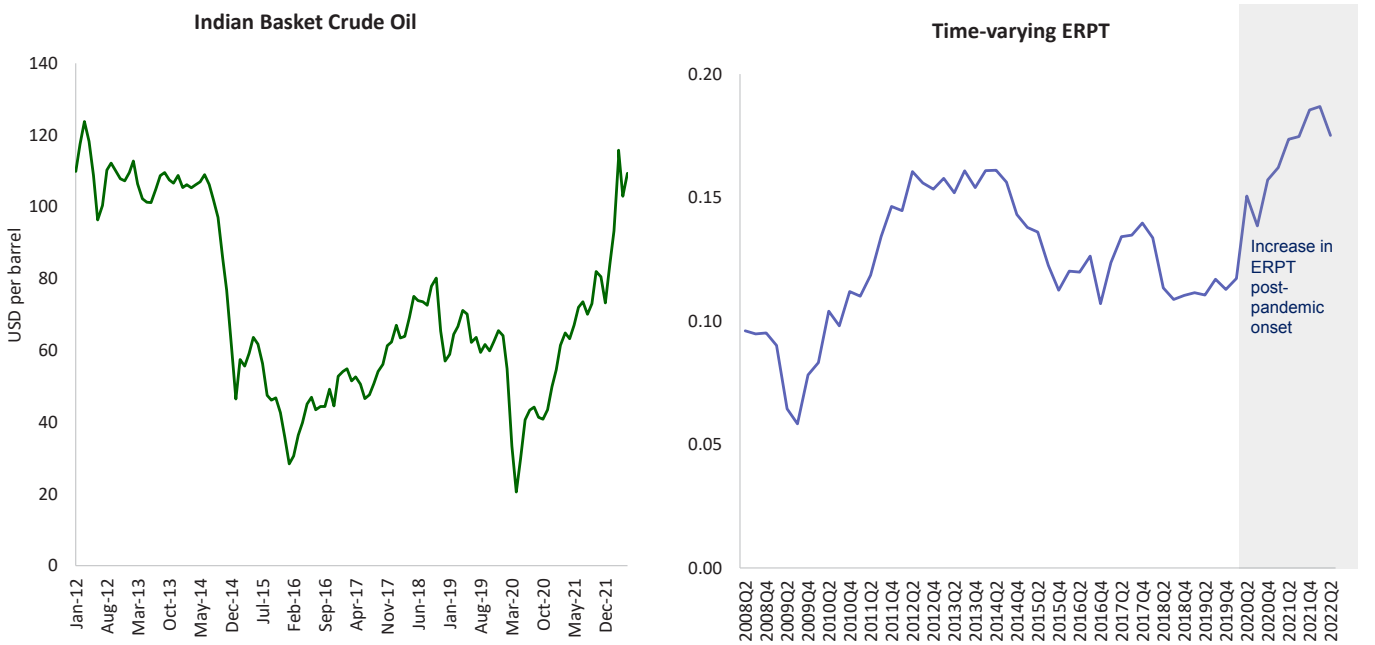


Chart 8: Can Supply-side Measures Anchor Inflation Expectations?

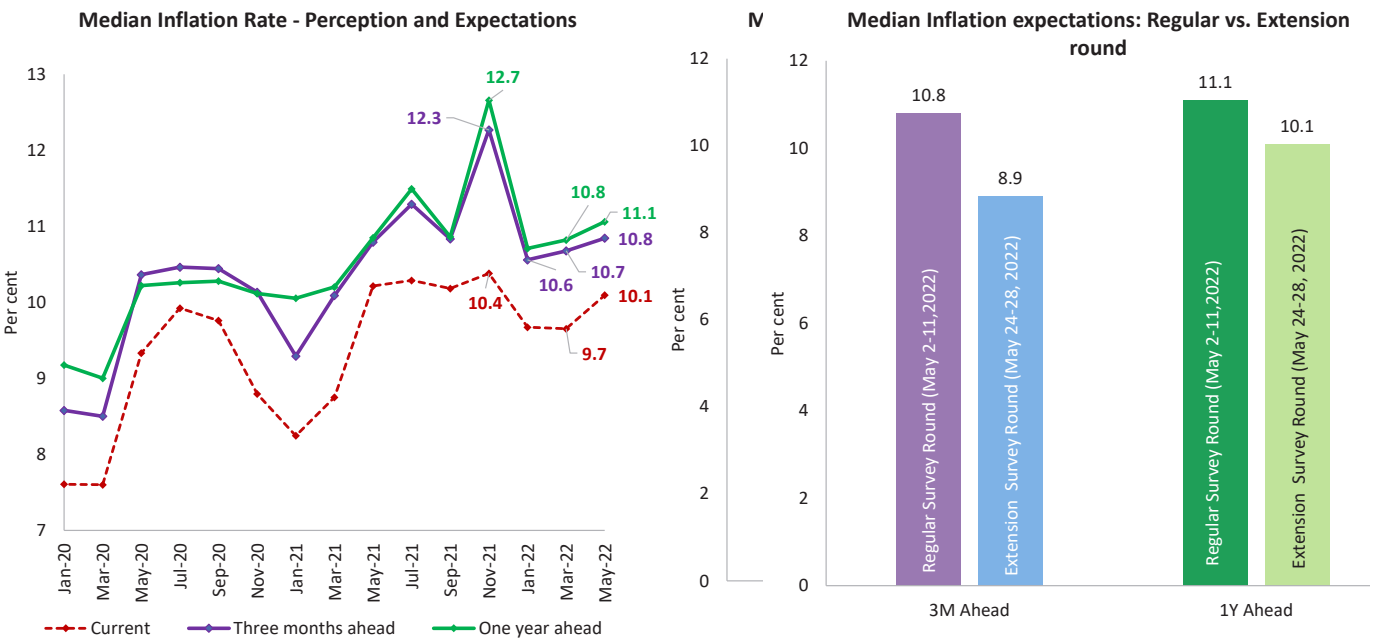
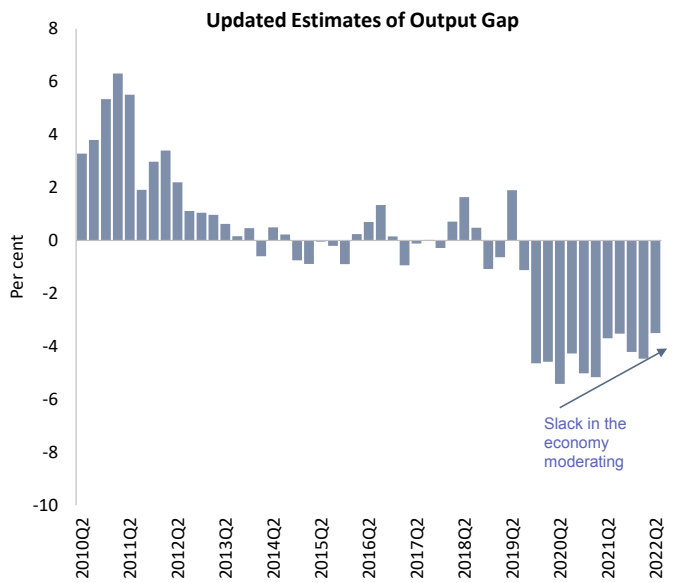


Chart 9: Is the Phillips Curve in India dead, Inert and Stirring Life or Alive and Well?



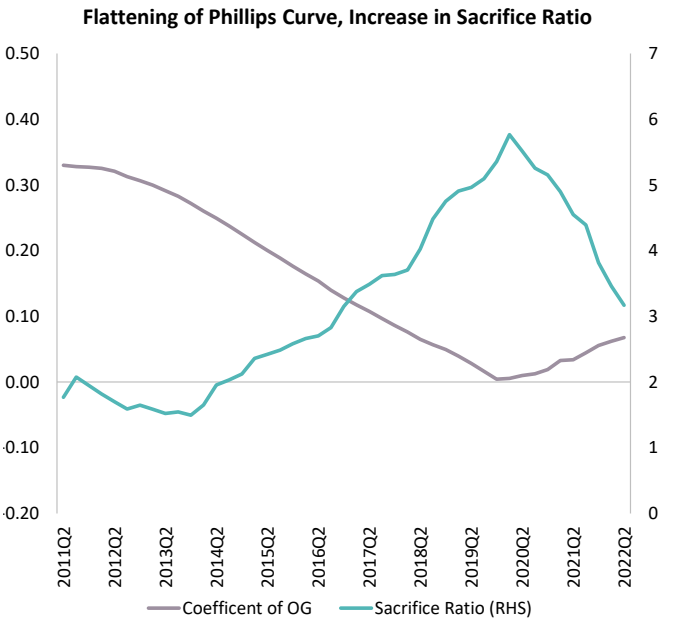
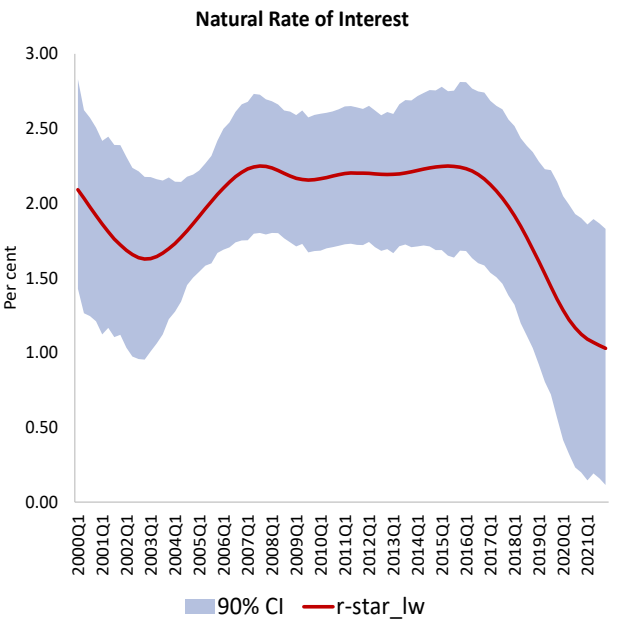


Chart 10: Natural Rate of Interest – What are New Estimates Telling Us?



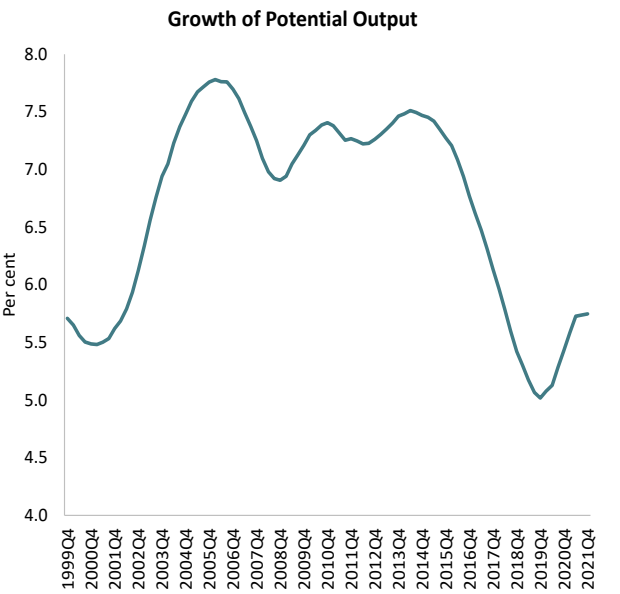


Chart 11: BoP Sustainability: Threshold Effects?

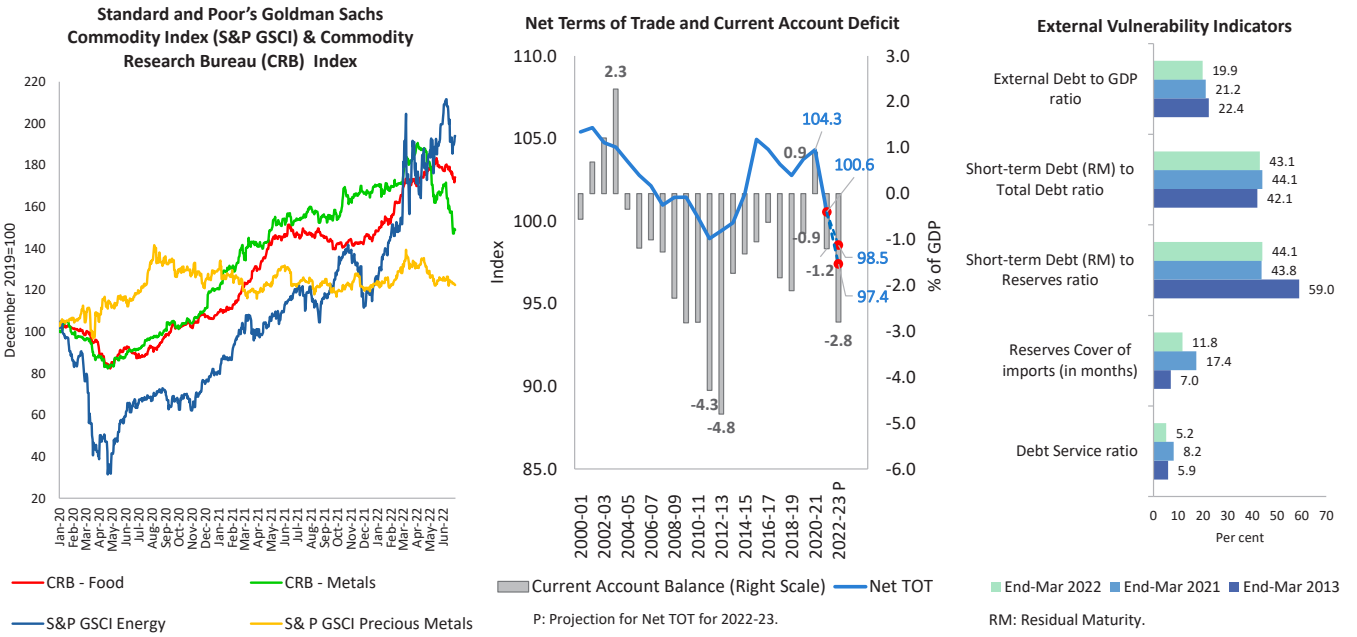


Chart 12: Fiscal Risks: Moving Sub-national?

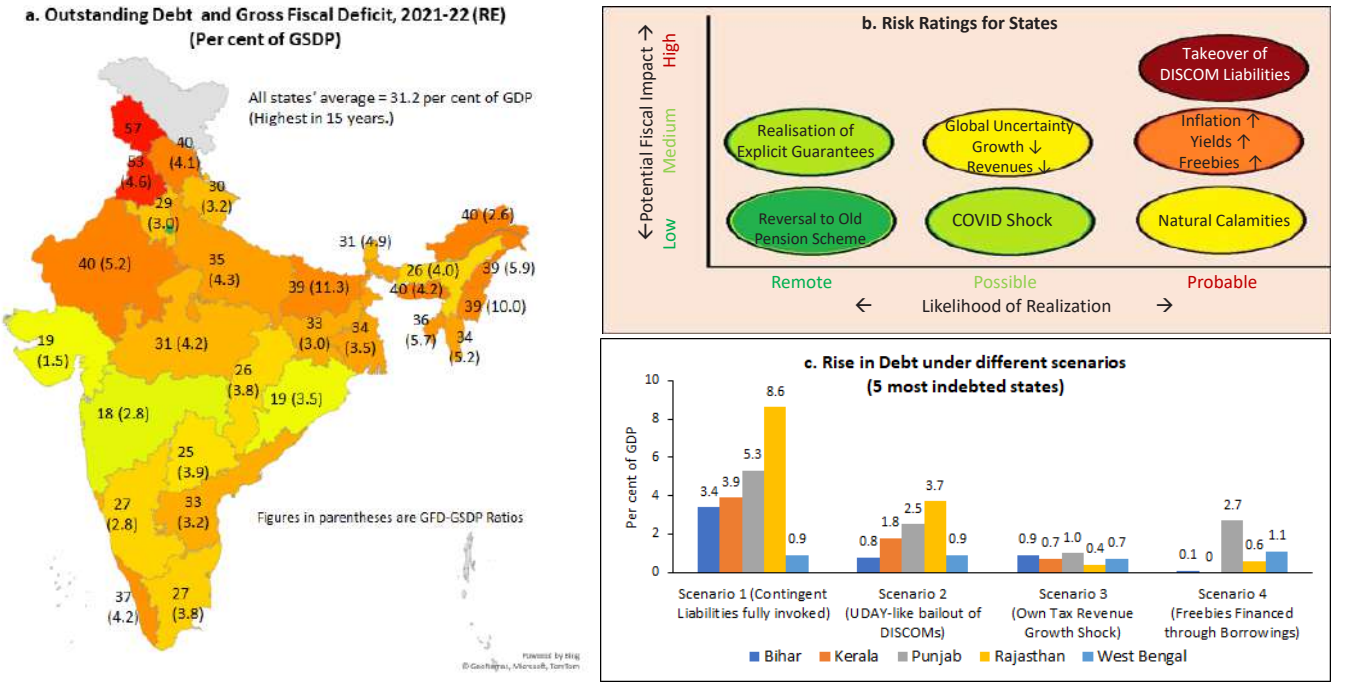
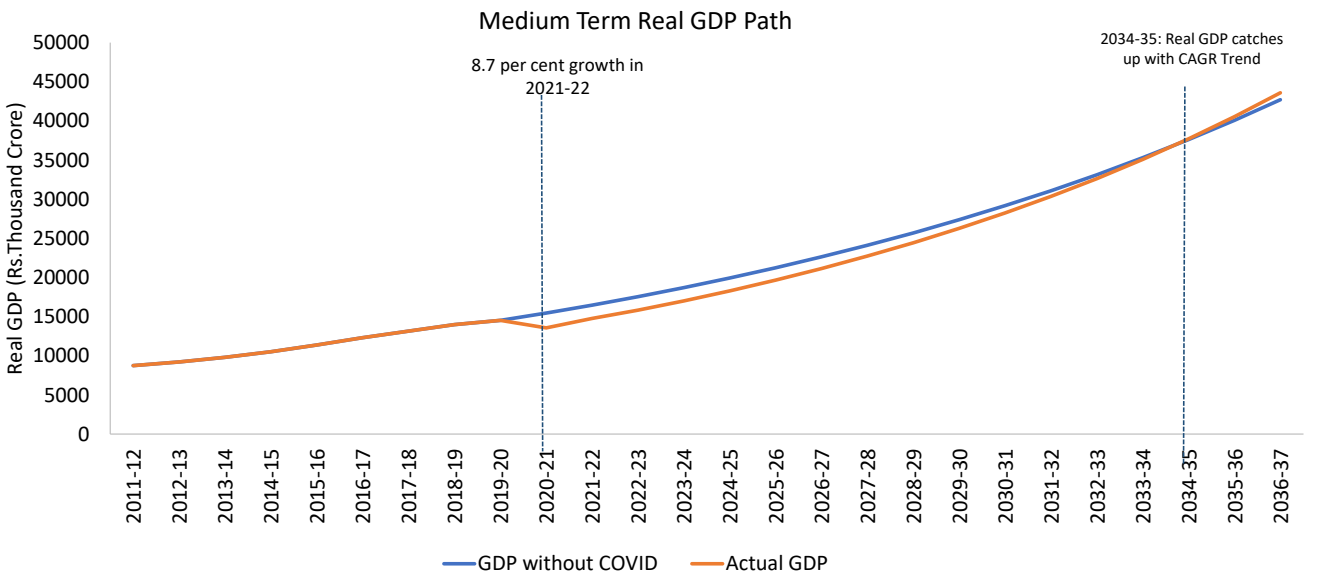


Chart 13: Recovering Output Loss to the Pandemic



India needs to redesign development strategies to recover lost output

*Geopolitical Spillovers and the Indian Economy**

Michael Debabrata Patra

Shri Pradeep Multani, President, Shri Saket Dalmia, Senior Vice-President, Shri Sanjeev Agarwal, Vice President, Shri Saurabh Sanyal, Secretary General, Dr. S P Sharma, Chief Economist, esteemed members of the PhD Chamber of Commerce and Industry, eminent dignitaries and friends.

I am honoured to be invited to address and interact with you today. I am inspired by the Chamber's glorious history of 117 years as an apex chamber of national eminence catalysing Indian businesses towards rapid economic development and nation building, including by building partnerships with government.

A special mention is warranted of the PhD Research Bureau that was established in 2010. By providing regular updates on the economic situation, the Bureau has been sensitising the nation to socio-economic and business developments of contemporaneous relevance. Dr. Satya Prakash Sharma, with whom I go back a little way, and his team in the Research Bureau are also part of the RBI's survey of professional forecasters and their work figures in our fan charts describing the balance of risks around our forecasts.

The Context

The world has been overwhelmed by the fallout of geopolitical conflict, which threatens to snuff out a recovery that was hesitantly and haltingly making its way through multiple waves of the pandemic and multiple mutations of the virus. India's economic prospects are also challenged by these ongoing developments, and the outlook is darkened and highly uncertain. I thought I would take this opportunity to share with you how the RBI is navigating this tsunami in its endeavour to shield the Indian economy and secure its tryst with a brighter future.

On February 10, 2022 as Governor Shri Shaktikanta Das made his statement on the occasion of the sixth and final meeting of the monetary policy committee (MPC) for the year 2021-22, the mood was one of cautious optimism. In spite of the Omicron-driven third wave, India was decoupling from the rest of the world and fashioning a gradual but strengthening course of recovery. Projections made by the International Monetary Fund (IMF) just a month ago showed India poised to grow at the fastest pace year-on-year among major economies. In that meeting, the RBI projected real GDP growth at 7.8 per cent for 2022-23. CPI inflation was projected to average 4.5 per cent, benefiting from the softening of food prices at that time on improving prospects for foodgrains production, the imminent arrival of the winter crop and strong supply side interventions. In the words of Governor, "Our monetary policy would continue to be guided by its primary mandate of price stability over the medium term, while also ensuring a strong and sustained economic recovery… We, in the Reserve Bank, have remained steadfast in our commitment to safeguard trust and confidence in the domestic financial system as we rebuild the foundations of strong and sustainable growth with macroeconomic stability. This has been our anchor in the ocean of uncertainty."

In a fortnight from then, the world changed. The escalation of geopolitical tensions into war from late February 2022 delivered a brutal blow to the global economy, battered as it had been through 2021 by the pandemic, supply chain and logistics disruptions, elevated inflation and bouts of

* Keynote Address delivered by Michael Debabrata Patra, Deputy Governor, Reserve Bank of India, Standalone session on 'Geopolitical Spillovers and the Indian Economy' organised by the PhD Chamber of Commerce and Industry, New Delhi, on June 24, 2022. Valuable comments from Sitikantha Pattanaik, G V Nadhanael and editorial help from Vineet Kumar Srivastava are gratefully acknowledged.

financial market turbulence triggered by diverging paths of monetary policy normalisation. Since then, the global macroeconomic outlook has become suddenly overcast with the economic costs of the war and retaliatory sanctions. Emerging market and developing economies (EMDEs) are bearing the brunt of these geopolitical spillovers as I speak, despite being bystanders. Capital outflows and currency depreciations have tightened external funding conditions, and along with elevated debt levels, put their hesitant and incomplete recoveries in danger. Heightened volatility in financial markets and surges in prices of commodities - especially of energy, metals, grain futures and fertilisers – have accentuated risks to growth, inflation and financial stability.

Like other emerging market economies (EMEs), India too faces major risks, the immediate ones being soaring crude prices and tightening financial conditions. Spillovers in the form of large and sudden swings in financial markets, portfolio capital outflows and supply chain disruptions resulting in shortages of key intermediates, are clouding the outlook. While the external sector is reasonably well-buffered with high level of reserves and a modest current account deficit, it is prudent to be watchful about the rising intensity and scale of headwinds from the geopolitical conflict which could be overwhelming for all EMEs, including India.

In the next meeting of the MPC in April 2022, Governor's statement was sombre. He termed the war in Europe and its fallout as 'tectonic shifts', little realising that these words would be forerunners to descriptions of the global outlook in terms of extreme weather conditions[1]. In his words, "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…. the conflict in Europe has the potential to derail the global economy." In a span of two months, the projection of real GDP growth was revised downwards by 60 basis points to 7.2 per cent for 2022-23 while the CPI inflation projection for the year was raised by 120 basis points to 5.7 per cent. These adjustments to the projections can be regarded as the first authentic assessment of the toll that geopolitical spillovers are expected to take on the Indian economy. By the June 2022 meeting of the MPC, it was clear that risks were materialising faster than anticipated in inflation prints, with three-fourth of the consumer price index (CPI) under siege. In that meeting, therefore, the inflation projection for 2022-23 was raised by another 100 basis points to 6.7 per cent.

The State of the Economy

The State of the Economy article published in the RBI's monthly Bulletin has established its credentials as a reliable and comprehensive source of information and analysis on the Indian economy. In its latest edition, it pointed out that domestic economic activity has been gaining traction in spite of the formidable geopolitical headwinds. Gauged from high frequency indicators, the Indian economy is consolidating its path of recovery. It is heartening that contact-intensive sectors which were hit hard by the pandemic, are regaining traction. E-way bills generation and toll collections indicate a sustained momentum in trade and transport activity. The aviation sector is fast reaching normal levels. Even the automobile industry has recorded recovery across all segments. The labour market is strengthening, but mostly in manufacturing.

Although India's merchandise exports have stayed above US$ 30 billion over the past 15 months, there has been a moderation in pace in May 2022, reflecting the renewed supply chain disruptions in the wake of the war. Yet, bucking the global decline, India

[1] "Earthquake" (IMF); "hurricane"; "storm clouds" (Jamie Dimon, CEO, JP Morgan Chase); "the perfect storm of crises" (UN Secretary-General António Guterres); "economic typhoon" (Bank of Korea).

registered robust growth in manufacturing export orders. Import growth is broad-based, taking the trade deficit to its highest monthly level in May 2022, but this is an indication that the recovery in domestic economic activity is gathering strength. Seen in the broader context of balance of payments – which is a summary record of all of India's external transactions – the decline in India's current account deficit (CAD) to 1.5 per cent of GDP in the fourth quarter from 2.6 per cent in the third quarter of 2021-22 augurs well for India's external viability as it is backed by strong merchandise export performance, rising net earnings from computer and business services and a rejuvenation of remittances by overseas Indians from pandemic lows. On an annual basis, therefore, the CAD turned out to be a modest 1.2 per cent of GDP in 2021-22, with the intrinsic strength of India's foreign exchange earnings mitigating the terms of trade shocks imposed by geopolitical spillovers and the surge in import demand.

With foodgrains production touching a record level for the sixth consecutive year in 2021-22, food security has been bolstered amidst widespread global shortages. As of May 31, 2022 the stock of rice and wheat stood at 3.7 and 4.2 times the quarterly buffer norms. Minimum support prices (MSP) for 14 major kharif crops for the marketing season of 2022-23 have been announced, but upward revisions have been modest, averaging 6.1 per cent, which is a positive for the inflation outlook.

In the industrial sector, the headline manufacturing purchasing managers' index (PMI) maintained its improvement in May 2022, turning out to be among the highest in the world. While the expansion was led by an increase in factory orders and sales, the increase in input cost pressures remains a point of concern. The PMI services accelerated in May 2022, marking a solid recovery. The business expectations index (BEI) for services expanded for the tenth successive month, but it was also accompanied by large increases in input prices.

Headline CPI inflation moderated to 7.0 per cent in May 2022 from 7.8 per cent in April, with the easing observed across the board. Core inflation fell sharply to 5.9 per cent in May from 7.1 per cent in April. For June so far, cereals prices have increased but pulses and edible oil prices have registered a decline. With inflationary pressures from global commodity prices, a number of steps have been taken on the supply side to ease domestic prices. The latest round of the inflation expectations survey (IES) of the Reserve Bank incorporated an extension survey of urban households undertaken after the excise duty cuts on petrol and diesel and the results show a significant moderation in their inflation expectations post the excise duty cut.

The Role of Monetary Policy

It will be remiss of me not to speak about the role of monetary policy in the context of geopolitical spillovers. As a backdrop, it is perhaps useful to summarise the monetary policy actions and stance adopted in 2022-23 so far. Starting in April and up to June, monetary policy has effectively tightened by 130 basis points, which is fully reflected in the movement of the overnight weighted average call money rate, the operating target of monetary policy. The stance of monetary policy has shifted from being 'accommodative 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' to 'withdrawal of accommodation to ensure that inflation remains within the target going forward, while supporting growth.'

With headline inflation having moved up by 80 bps in April but reverting by almost the same magnitude in May, the RBI has surged ahead of the curve. In fact, the question that the now blind-sided are asking is: with prices of food and fuel driving up inflation

everywhere and in India as well, how will increases in the policy rate help? This issue has been addressed in some detail in the State of the Economy article, but I will draw out the essence of its argumentation.

The initial shock from food and fuel prices to inflation lies outside the domain of the RBI. Be that as it may, the policy challenge is that food and fuel prices constitute 55 per cent of the CPI and the food shock emanates from external sources, in this case, the war in Europe. The sequence from this 'ground zero' is that households look at recent food and fuel prices which are salient items in the average consumption basket and they form their opinions about what inflation would be in the future, say three months or a year from now. If households expect future inflation to go up and stay up, they will adjust their behaviour to deal with that situation. As more and more households and firms increasingly share this view, they will build it into price mark-ups, wage negotiations, rents on houses, transportation costs and the prices of services more generally such as personal services like housekeeping, medical and education fees, entertainment and bus, train and auto fares. With households accounting for close to 60 per cent of India's GDP in the form of private consumption expenditure, this will mean that inflation will become entrenched in the Indian psyche.

As inflation becomes more persistent and generalised as a result, businesses will stop investing because they will worry that demand for their products may get postponed at these elevated levels of prices. Wages and costs will go up, export competitiveness will be damaged and savings in banks will be pulled out and put into gold - that age old repository of value - which actually means capital flight from India since 86 per cent of gold demand is met from abroad for which foreign exchange has to be paid.

If the RBI does nothing, it will be seen as accommodating the inflation shock, reinforcing the public's view that inflation may persist, broaden and rise further. On the other hand, if the RBI increases interest rates and tightens monetary and liquidity conditions to make money dearer, it will (a) demonstrate that the RBI cares about people's expectations and is determined that they should remain hinged – by anchoring people's faith in the RBI's commitment to price stability, the foundations of growth will be strengthened; (b) prevent the second-round effects of food and fuel prices, which I just described, from spreading; and (c) deter discretionary spending so that even if people's spending on food and fuel goes up because of the price shock, they will adjust their expenditure on other items so as not to exceed the family budget. In effect, the RBI's actions will cause inflation other than that related to food and fuel, or what is called core inflation, to ease and this will bring down headline inflation.

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

The monetary policy action is not without consequences. It will take its toll on spending and demand. That is the price of stability. What the RBI is trying to do is to stabilise the price situation when the economy is able to bear it because in the longer run, price stability is beneficial for growth. The RBI kept interest rates and liquidity conditions low and easy through all of 2020-21 and 2021-22. As a result, the Indian economy recovered from an unprecedented contraction of 6.6 per cent in 2020-21 to a growth rate of 8.7 per cent in 2021-22, including an expansion by 4.1 per cent in the quarter January to March 2022 when several advanced and emerging economies

either shrank or slowed. In the first quarter of 2022-23, available indicators of economic activity have improved. Unlike the rest of the world, India is recovering and getting resilient and stronger. This is the best time to put the stabilising effects of monetary policy into action so that the costs to the economy are minimised.

Will these monetary policy actions exorcise inflation? The outlook on inflation is tethered to the war in Ukraine. But will we sit on our hands and do nothing in a fatalistic acquiescence? What can monetary policy do? The fact that inflation remains elevated and is broadening indicates that there is some demand that is able to afford these high prices, perhaps due to revenge spending in a pandemic stressed response. In fact, the most sluggish part of the index – CPI excluding food, fuel, petrol, diesel, gold and silver (44 per cent versus 47 per cent of the CPI in the standard core) – and the weighted median CPI, a statistical measure of core inflation, are both showing generalisation and momentum. This warrants monetary policy action to ensure demand does not exceed the available supply, even though both are not at full strength.

Another question that has vexed public opinion relates to the RBI's accountability on monetary policy. The issue has drawn attention in the context of CPI headline inflation having averaged 6.3 per cent in the fourth quarter of 2021-22 and projected to average 7.5 per cent in the first quarter of 2022-23 and 7.4 per cent in the second quarter. Inflation is, however, forecast to edge down to 6.2 per cent in the third quarter and to 5.8 per cent in the fourth quarter.

The RBI Act mandates that in the case of the inflation target not being met for three consecutive quarters, the RBI shall set out in a report to the Central Government (a) the reasons for failure to achieve the inflation target; (b) remedial actions proposed to be taken; and (c) an estimate of the time-period within which the inflation target shall be achieved pursuant to timely implementation of proposed remedial actions. What constitutes failure has been notified by the Central Government in the Official Gazette of India as (a) average inflation being more than the upper tolerance level of the inflation target for any three consecutive quarters; or (b) average inflation being less than the lower tolerance level of the inflation target for any three consecutive quarters.

Let me speak to these issues squarely. Monetary policy is essentially a contract between the sovereign - through its delegated authority, the central bank – and the people. It is an assurance by the sovereign that it will give to the people a money they can trust, a money that does not lose value or purchasing power, and in fact, stores value into the future. Therefore, it is indeed appropriate that monetary policy is accountable, without any escape clauses. In India, this accountability is provided for with sufficient flexibility in the form of an inflation target defined in averages rather than as a point; achievement of the target over a period of time rather than continuously; a reasonably wide tolerance band around the target to accommodate measurement issues, forecast errors and supply shocks; and failure being defined as three consecutive quarters of deviation of inflation from the tolerance band, rather than every deviation from the target.

Let me now turn to the specific aspects of the accountability conditions. Research within the RBI, published in the Report on Currency and Finance 2020-21, and outside it clearly demonstrates that growth is unambiguously impaired when inflation crosses 6 per cent. Hence, breaching of the appropriate upper tolerance limit of 6 per cent for India's inflation target should trigger accountability if monetary policy has to remain credible.

Currently, we live in extraordinary times. With inflation at multi-decadal highs across advanced and emerging and developing economies, the inflation crisis is global. Actually, it is just the face of one of the

most severe food and energy crises in recent history that now threatens the most vulnerable across the globe. In response, the most widespread monetary policy tightening in decades is underway. It is the most coordinated tightening cycle in many years, and the actions are appearing synchronised because imported inflation pressures are being exacerbated by country-specific factors acting at the same time.

India is being impacted by the global inflation crisis, reflecting the materialising of geopolitical risks. Although it is largely driven by food and fuel supply disruptions and bottlenecks, mending supply always takes time. Several steps have been taken, demonstrating that price stability is a shared responsibility between the government and the central bank, but these measures will inevitably have gestations: they will show results only over a period. To gain time for supply to respond, monetary policy has to be deployed, but it is not likely to be painless.

As I stated in my minutes in the June 2022 MPC meeting, the accountability mechanism enhances credibility in the monetary policy framework, especially in its commitment to re-align inflation with its target in the event of prolonged divergences and that is of paramount importance. The wide public sensitivity to accountability works in the same direction as monetary policy in the pursuit of ensuring price stability. It shows that inflation expectations are anchored around the conviction that monetary policy will not tolerate persistent deviations from the target because it is enjoined by legislation (not) to do so.

One final question on accountability engages public attention: what is the role of the MPC here? After all, the Act enjoins the RBI – not the MPC - to write the letter on causes, remedial actions and time to return to target. Will the commitments made by the RBI in the letter render the MPC on auto pilot? Once again, the MPC regulations are unambiguous on this issue. The Secretary to the MPC shall schedule a separate meeting as part of the normal policy process to discuss and draft the report to be sent to the Central Government under the provisions of the Act.

Conclusion

Monetary policy is usually unsung. Whenever risks surround the Indian economy, the RBI rises up with everything at its command in defence of the Indian economy. When the danger recedes, the RBI reposes back to anonymity, ready to rise again when the going gets tough.

It may be a premature prognosis, but there are indications that inflation may be peaking. As monetary policy works through into the economy and inflation falls back into the tolerance band by the fourth quarter of 2022-23, it will be the playing out of the baseline scenario. In an alternative simulation which incorporates the policy actions undertaken so far, the easing of inflation could be even sooner and faster. The key is the direction of change in inflation – not its level – in these extraordinary times.

Against this backdrop, it is our hope that required monetary policy actions in India will be more moderate than elsewhere in the world and that we will be able bring inflation back to target within a two-year time span. If the monsoon brings with it a more benign outlook on food prices, India would have tamed the inflation crisis even earlier. Without a doubt, the impact of geopolitical risks will cause a very grudging decline in inflation and a possible breach of the accountability criteria, but India would succeed in bending down the future trajectory of inflation, winning the war in spite of losing the battle. If real GDP growth averages between 6-7 percent of GDP in 2022-23 and 2023-24, the recovery that is increasingly solidifying gets a fair chance of traction. The RBI will have fulfilled its mandate of prioritising price stability while being mindful of growth.

Thank you.

*Statistics and Information Management in the RBI – Where We Are; Where We Want to Be**

Michael Debabrata Patra

Dr. O. P. Mall, Executive Director, Dr. Ajit Joshi, Principal Adviser, all my colleagues from the Department of Statistics and Information Management or DSIM, colleagues from other departments and Guwahati office, I thank Mall for inviting me on behalf of all of you to this pre-Conference dinner conversation – in an Anglo-Saxon setting, this could have been possibly called a fireside chat, but in India, we can do much better. So I will call it our Brahmaputraside Bartalap[1]. It has been three years since we met. What I propose to do today is to hold up a mirror to you. I have a set of slides with which I propose to engage you, just to show you what you look like to the outside world. You have the right to respond, differ, reject and modify wherever you think appropriate and politically correct. You can also agree, acquiesce and yield. My speech and presentation are structured like a voyage of discovery or re-discovery, if you like, with two parts: (i) where we are; and (ii) where we want to be.

II. Where We Are

In terms of the department's vision and mission, you are indeed the source of high quality statistics and policy oriented research with a hallowed history; but you also add cutting edge to the Bank's functioning with statistical and information management support. You are the repository of its databases. Your footprint has expanded to virtually every part of the institution. Hence, I worry that your vision and mission somehow circumscribe you, understate you. They do not seem to reflect the spirit, the soul of DSIM. My sense is that you are much more. This is my first question: can we review and restate our vision and mission to reflect the true DSIM? Can you be Prometheus[2] unbound?

II.1 *Banking*

Let me start with the banking unit. Several notable milestones were crossed during the year gone by but probably the proudest ones are (i) the refinements you have brought into the department's workhorse – the Banking Statistical Returns – in terms of timeliness, data quality and reporting requirement synchronisation; and (ii) the onboarding of payment system operators on to the Central Information System for Banking Infrastructure (CISBI)[3] (Chart 1). Reductions in time lags have been a major achievement for it makes information relevant and useful, but care is warranted in ensuring that it does not become an obsession with a means to an end, missing the end itself.

II.2 Corporate Sector

Turning to the corporate unit, an important transition that the unit has been engaged in is the

* Speech delivered by Michael Debabrata Patra, Deputy Governor, in the Annual Statistics Conference of the Department of Statistics and Information Management on June 9, 2022 at Guwahati. Gratitude and appreciation are owed to Pratik Mitra, Pankaj Kumar and Tanima Das for their invaluable help in creating the presentation that anchors this interaction. I am also thankful to Richa Rawat, Gaurav Sangwan, Shradha Singh, Rajendra Chavan, Aditya Mishra, Haridwar Yadav, M N Limbkar, Arjya Misra, Prabha Jadav, Sanjib Bordoloi, Srilikhita Patel, Sweta Kumari, Amarnath Yadav, Geeta Giddi, Tushar Das, Sasanka Sekhar Maiti, N Unnikrishnan and Anshuman Hait; more than their contribution to slides, it was their participation which enriched the quality of interaction. Gratitude is also due to Asish Thomas George for carrying out aesthetic refinements, and to Vineet Kumar Srivastava and Samir Ranjan Behera for editorial assistance.

[1] pronounced the Ahomiya way.

[2] In Greek mythology, Prometheus defied the gods by stealing fire from them and giving it to humanity. As a punishment, he was chained to a rock and an eagle was sent to eat his liver eternally.

[3] Central Information System for Banking Infrastructure (CISBI) is an on-line portal for allotment and maintenance of Basic Statistical Return (BSR) codes along with locational details of banks, payment system operators (PSOs) and other all India financial institutions (AIFIs) and their banking channels.

move from Indian Generally Accepted Accounting Principles or IGAAP to Indian Accounting Standards (IND-AS) which is a step towards convergence with International Financial Reporting Standards (IFRS). Systems and procedures are ready to place in the public domain the accounts of 10,000 companies in the IND-AS format. The emphasis is on consistency checks, reorganisation of financial statements and getting the taxonomy right before public dissemination. Another important achievement is the work on the life cycle of a project, which is critical to understanding the dynamics of private corporate investment[4] (Chart 2). As corporate results are generally one quarter older than T-zero, I wonder if it is possible to develop higher frequency indicators, not necessarily based on the latest audited results, to gauge corporate activity and in particular, the life cycle of projects, contemporaneously.

II.3 Surveys

Let us turn to surveys. The unit conducted a once in a lifetime survey on the informal sector. Perhaps, if you develop it further and endeavor to bring it into the mainstream of your work, light shall seek it out. It is said that nobody can put down a survey whose time has come. Another noteworthy achievement was the publication of the surveys on services and infrastructure outlook and the Bank Lending Survey (Chart 3). While on surveys, I am going to move to the Ecommerce and New Age Surveys Division on the use of Artificial Intelligence (AI) and Machine Learning (ML) in banks and NBFCs during the pandemic as gathered from the pilot survey in November-December 2020 and the follow-up survey in March-May 2022 (Chart 4).

II. 4. External Sector

Moving on to the external unit, the Foreign Exchange Transactions Electronic Reporting System (FETERS) Card captures cross border transactions using cards. This enables the segregation of e-commerce transactions from travel transactions (Chart 5). FETERS Card has a lot of these interesting findings. One of them is that Indians use a lot of cash while travelling abroad, in contrast to foreigners who prefer cards.

Another noteworthy development is the work on the currency composition of India's International Investment Position, which is a recommendation of the G 20 Data Gaps Initiative (Chart 6). This comes in handy as India is about to assume the G20 Presidency from December this year and it will look remiss of the President to be a data gap defaulter.

II.5. Research

The Statistical Measurement and Modelling Unit carried out important work on supply chain pressures, both domestic and global (Chart 7). I am excited about it because I have a paper on the subject[5]. *Supply chain disruptions have forced their way into policymakers' radars in the wake of the pandemic. My co-authors and I developed an index of supply chain pressures for India (ISPI) by extracting common factors latent in 19 domestic and global variables for the period March 2005 through March 2022. We found that it contemporaneously predicts industrial production, gross domestic product (GDP) and input costs and displays lead indicator properties in respect of export volumes and inflation.* 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.

Another achievement of this unit is improvement in the publication lag with regard to house prices (Chart 7). In this effort, the contribution of regional offices is worthy of praise. Yet another frontier-pushing work

[4] Private Corporate Investment: Growth in 20-21 and Outlook for 2021-22; RBI Bulletin, September 2021; https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=20500

[5] Measuring Supply Chain Pressures on India; RBI Bulletin, April 2022 https://www.rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=20938

of the unit is the use of remote sensing information in the field of agriculture, the subject matter of many empirical studies internationally and in India (Chart 8). In this context, the availability of spatio-temporal data on near real time basis makes this work exciting.

Last but by no means the least in the section on 'where we are', I turn to the work by the Information Management and technology unit on offsite surveillance of NBFCs, a big step towards scale-based regulation (Chart 9). In recent years, the NBFC sector has gained significance as well as complexity and interconnectedness, with implications for financial stability. It is in this context an integrated scale based regulatory framework was issued on October 22, 2021

III. Where We Want to Be

As I embark on the way forward, I propose to become department-wide rather than unit-based. If over the year 2022-23, you can achieve six big milestones, it will be a source of satisfaction, and the just reward for all of you who put your shoulders to the wheel and push every day.

Upgrading India's international banking statistics in accordance with revised Bank for International Settlements (BIS) norms will be a major initiative for this year (Chart 10). This will help to understand risks facing India's banking sector from its international presence as well as risks from the operations of foreign banks in India.

Investing in environmental, social, and corporate governance (ESG) is gathering growing interest across the world. It seeks to evaluate the extent to which a corporation works on behalf of social goals that go beyond the role of maximising profits for shareholders. The goals from an ESG perspective include working to protect and preserve the environment, supporting certain social movements, and whether the corporation is governed in a way that is consistent with the goals of the diversity, equity, and inclusion (Chart 11).

A major gap in the bouquet of surveys conducted by the department is that rural and semi-urban households are not covered. This gap is sought to be bridged during 2022-23 by taking up a survey to assess consumer sentiments in rural areas on employment, income, expenditure and the price situation (Chart 12).

Currently, reporting of external commercial borrowing transactions and trade credits occurs through physical paper forms. With the implementation of SPECTRA or the Software Platform for External Commercial Borrowings and Trade Credit Reporting and Approval, online submission of returns will be enabled (Chart 13). This will improve timeliness and accuracy.

Another goal for 2022-23 is to develop big data and machine learning solutions for various functions of the Bank (Chart 14). Within this initiative, efforts are also planned to explore new data sets for forecasting, surveillance and early warning systems.

Centralised Information and Management System (CIMS), our new data warehouse which has been in the works for two-three years, should become operational in 2022-23 (Chart 15). It is a mammoth project which will cater to central office departments, host all RBI publications and databases. It will also facilitate launching of surveys for monetary policy purposes. It will also provide an analytics platform that will include big data analytics and make a big leap towards element-based reporting and data storage.

IV. Conclusion

In conclusion, I will take you back to the question that I posed at the beginning. How do we develop a vision and a mission that better capture the rapidly changing profile of the department and its evolving aspirations that embody where we want to be? New entrants arrive with stars in their eyes at the prospect

of a career in the RBI. Within a year, they are dismayed at the huge burden of data collection and management which does not allow time for exploring the data, innovating, finding new solutions and thereby contributing to the welfare of the nation. How do we set the department's vision and mission to make the dreams of new generations of our statisticians, information managers and data scientists come alive? In this, I call on our seniors to lead us into the journey into the future.

Thank you.

Annex

Chart 1: Central Information System for Banking Infrastructure

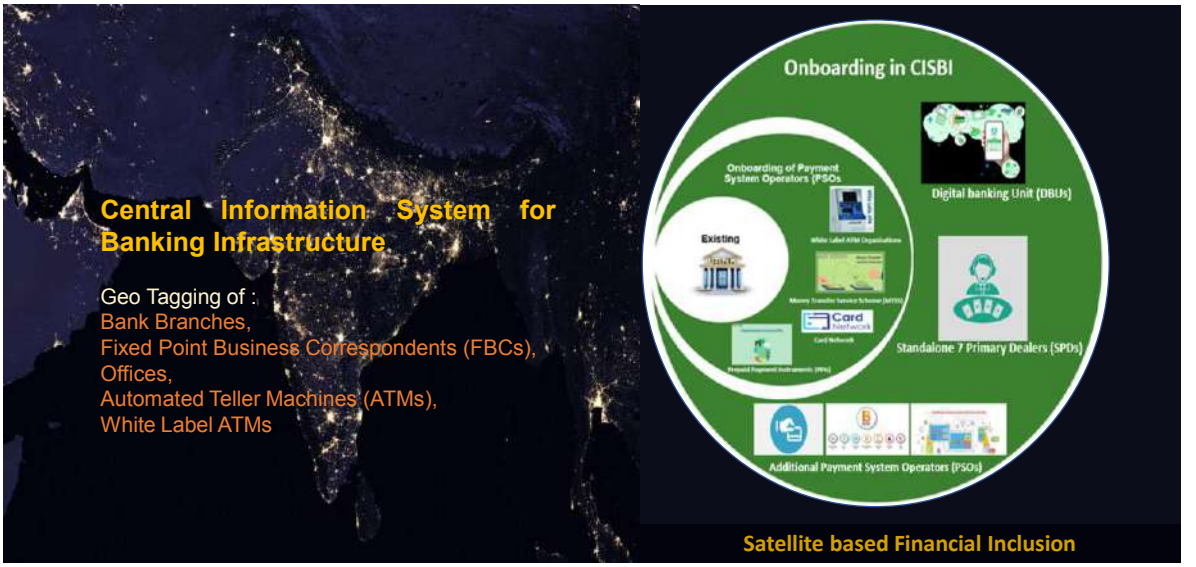
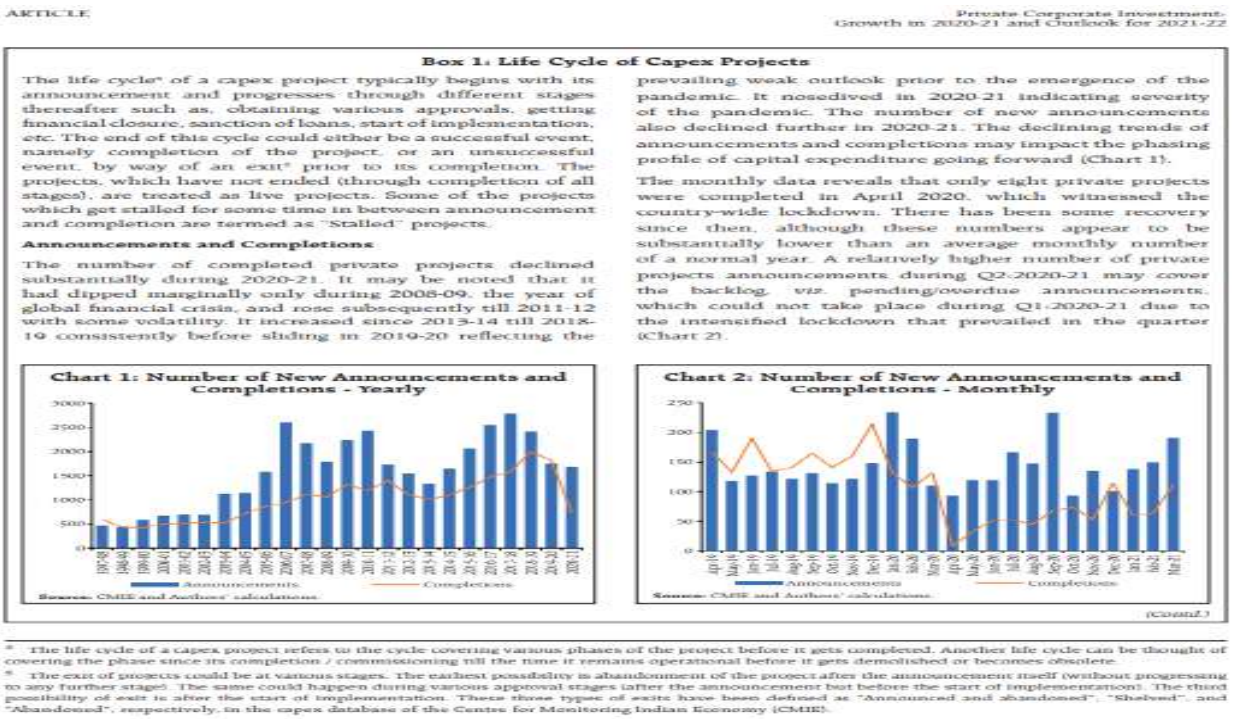


Chart 2: Life Cycle of Capex Projects – RBI Bulletin September 2021



ARTICLE

Private Corporate Investment: Growth in 2020-21 and Outlook for 2021-22

Box 1: Life Cycle of Capex Projects

The life cycle* of a capex project typically begins with its announcement and progresses through different stages thereafter such as, obtaining various approvals, getting financial closure, sanction of loans, start of implementation, etc. The end of this cycle could either be a successful event, namely completion of the project, or an unsuccessful event, by way of an exit* prior to its completion. The projects, which have not ended (through completion of all stages), are treated as live projects. Some of the projects which get stalled for some time in between announcement and completion are termed as "Stalled" projects.

Announcements and Completions

The number of completed private projects declined substantially during 2020-21. It may be noted that it had dipped marginally only during 2008-09, the year of global financial crisis, and rose subsequently till 2011-12 with some volatility. It increased since 2013-14 till 2018-19 consistently before sliding in 2019-20 reflecting the prevailing weak outlook prior to the emergence of the pandemic. It nosedived in 2020-21 indicating severity of the pandemic. The number of new announcements also declined further in 2020-21. The declining trends of announcements and completions may impact the phasing profile of capital expenditure going forward (Chart 1).

The monthly data reveals that only eight private projects were completed in April 2020, which witnessed the country-wide lockdown. There has been some recovery since then, although these numbers appear to be substantially lower than an average monthly number of a normal year. A relatively higher number of private projects announcements during Q2:2020-21 may cover the backlog, *viz.* pending/overdue announcements, which could not take place during Q1:2020-21 due to the intensified lockdown that prevailed in the quarter (Chart 2).

(Contd.)

* The life cycle of a capex project refers to the cycle covering various phases of the project before it gets completed. Another life cycle can be thought of covering the phase since its completion / commissioning till the time it remains operational before it gets demolished or becomes obsolete.

* The exit of projects could be at various stages. The earliest possibility is abandonment of the project after the announcement itself (without progressing to any further stage). The same could happen during various approval stages (after the announcement but before the start of implementation). The third possibility of exit is after the start of implementation. These three types of exits have been defined as "Announced and abandoned", "Shelved", and "Abandoned", respectively, in the capex database of the Centre for Monitoring Indian Economy (CMIE).

Chart 3: Bank Lending Surveys-Recent Trends – RBI Bulletin, December 2020

ARTICLE

*Bank Lending Survey- Recent Trends**

Initiated in 2017 by the Reserve Bank, the Bank Lending Survey in India provides perceptions of banks on loan demand and loan terms and their outlook in near term across major sectors. The details of the survey and its summary results since the first round (Q2:2017-18) are presented in this article. A broad corroboration is observed in the borrowers' perceptions and lenders' sentiments on the manufacturing sector. Bankers' sentiments on lending conditions have consistently improved after the adverse situation witnessed during April-June 2020 due to the COVID-19 pandemic.

Introduction

In a bank dominated economy like India, credit is an essential lubricant to the engine of economic growth and its prognosis may be a useful input in policy formulation. Information on credit is often supplemented with the bankers' perceptions about its demand and financing conditions, which are collected through the dedicated Bank Lending Survey (BLS), also known internationally as senior loan officers' survey or credit condition survey.

Lending choices of banks depend on various factors like macroeconomic outlook, liquidity conditions, borrowers' creditworthiness, uncertainty associated with the concerned sector, expected return including risk premium, portfolio mix and risk management abilities, among others. In this context, BLS provides lender's qualitative perspective on credit market conditions, especially the impact

Following the recommendations of the Internal Working Group on Surveys (2009), the Reserve Bank launched the Credit Conditions Survey (CrCS) in 2010. Its questionnaire underwent few revisions based on users' requirements as well as feedback from technical experts and responding banks, before it was rechristened as Bank Lending Survey (BLS) in 2017. The present article lays out broad contours of its methodology, trends in its results and compares it with official statistics and other surveys.

The remainder of the article is structured in six sections. Section II presents the cross-country practices on BLS. Section III gives an overview of the methodology of quarterly BLS conducted by the Reserve Bank; Section IV highlights the results of survey and Section V discusses its relationship with other select economic series. Section VI concludes.

II. Cross-Country Practices

Bank lending surveys are conducted regularly by central banks in major developed economies (e.g., the USA, the UK, Japan, Canada, New Zealand and the euro area countries) and some other developing and emerging market economies such as Jamaica, Nigeria and Thailand, which generally release their aggregate results in public domain. The European Investment Bank (EIB) manages the half-yearly BLS to monitor banking sector trends and challenges in the Central, Eastern and South-Eastern Europe (CESEE) region.

BLS is conducted among banks and often also covers other lending institutions and respondents are given time upto a month to provide their feedback. Its respondents are usually senior loan officers / heads of credit department and other senior officers in comparable positions, who give their qualitative

Chart 4: Artificial Intelligence – Machine Learning in Banks and NBFCs

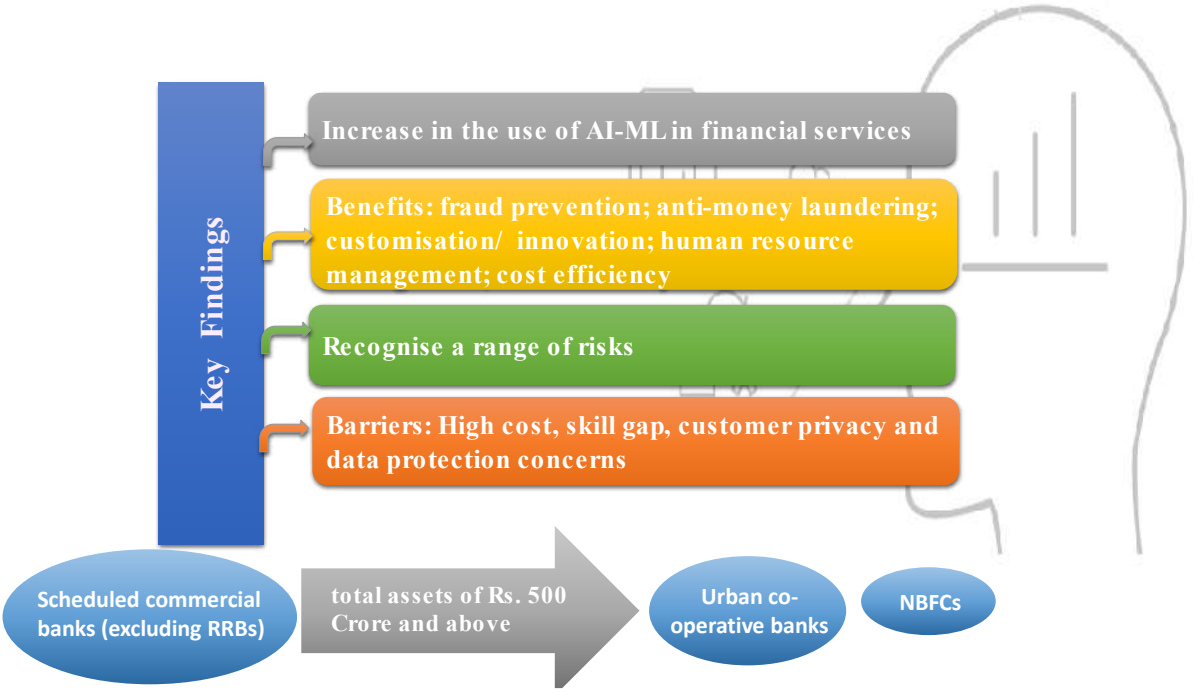


Chart 5: FETERS-Cards

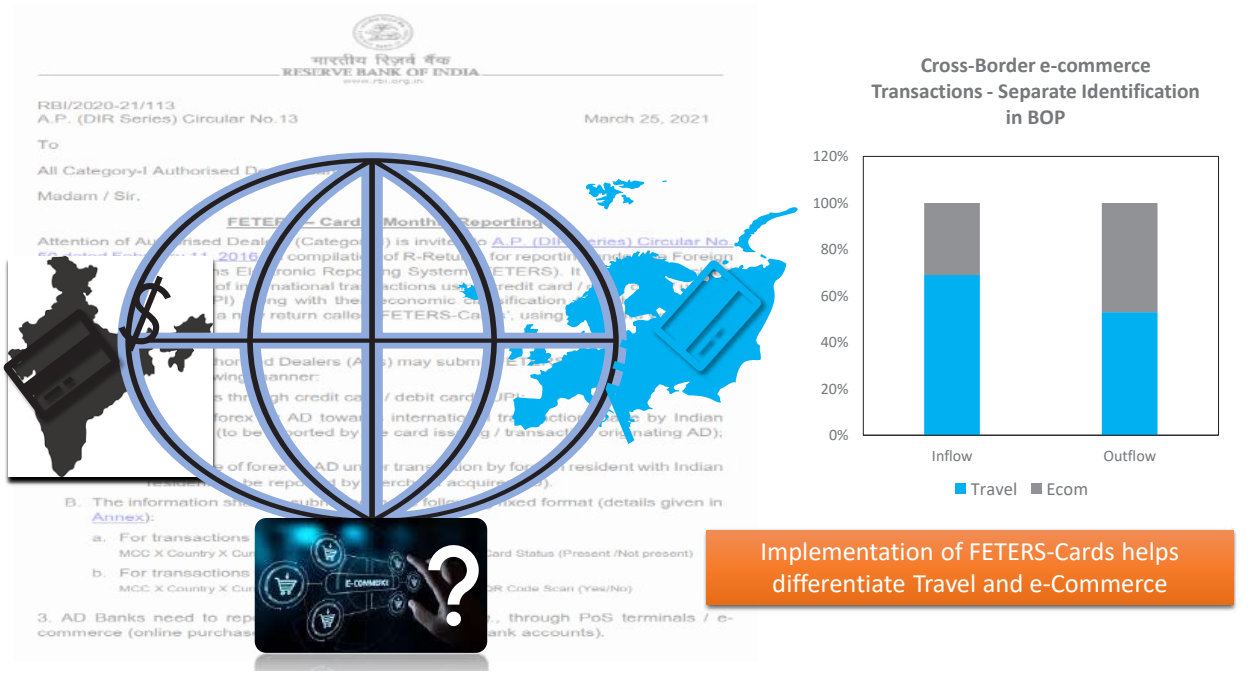
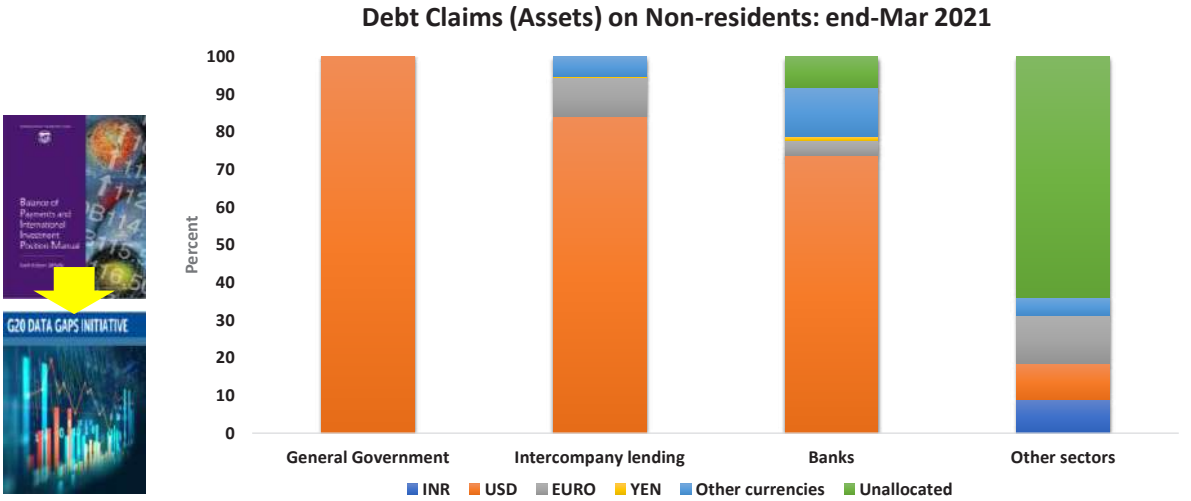
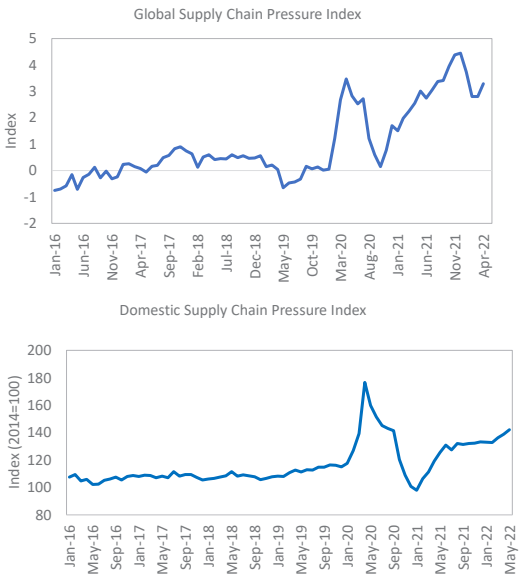


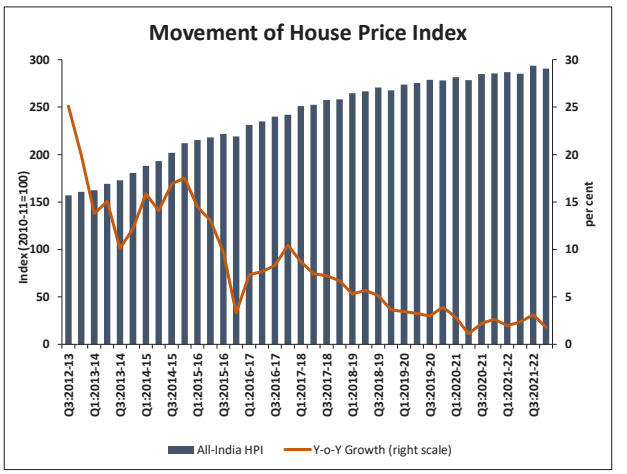
Chart 6: International Investment Position (InIP) : Currency Composition



Meeting Global best Practices

Chart 7: Measuring Pandemic Disruptions; Managing Operational Challenges





New Frontiers; Timeliness in House Prices

Chart 8: Remote Sensing based Crop Vegetation Indicator

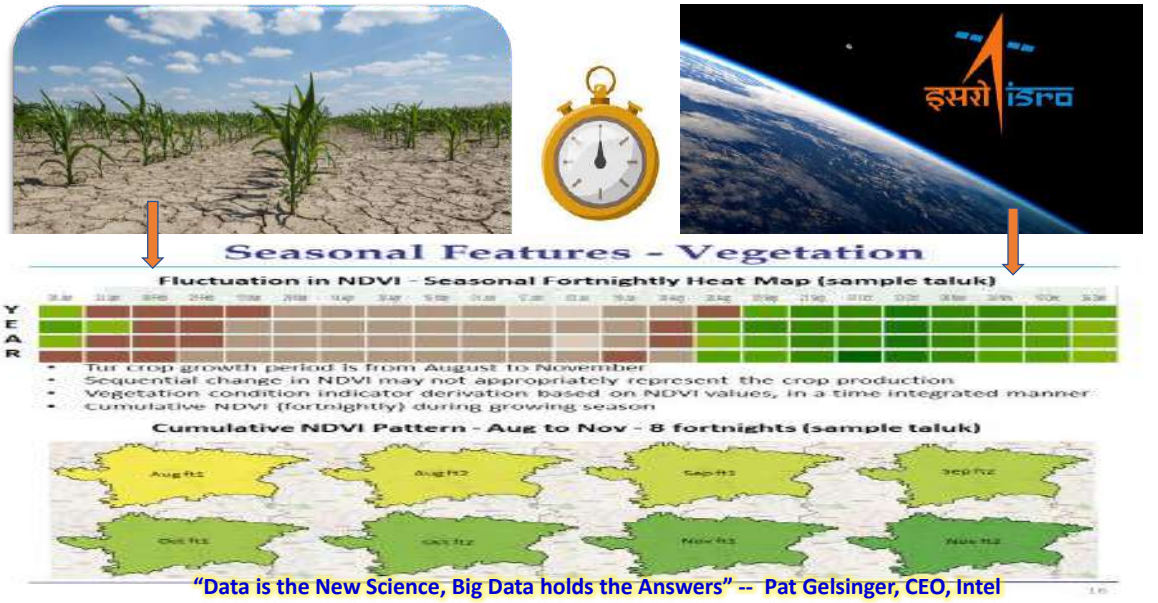


Chart 9: Offsite Surveillance of NMFCs

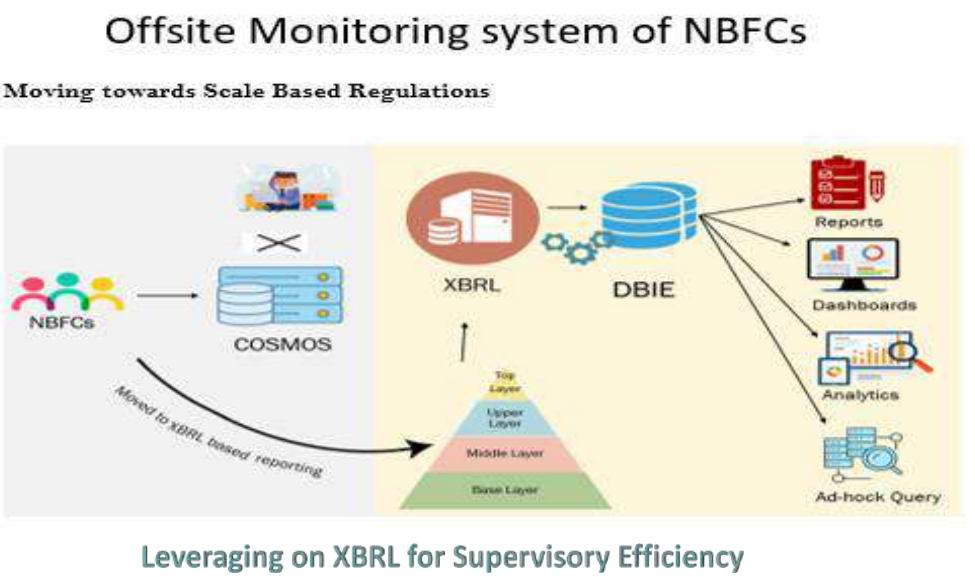


Chart 10: Upgrading India's International Banking Statistics

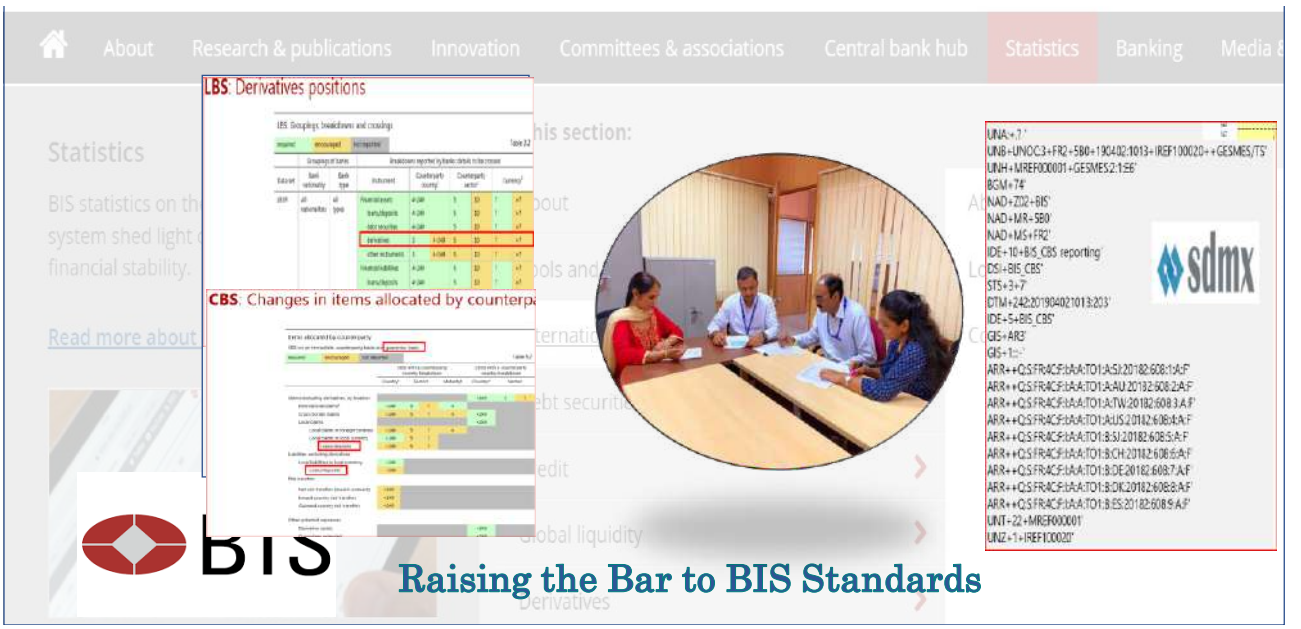


Chart 11: Environment Social Governance Framework with Score

Chart 12: Launching of Rural Sentiment Survey

Chart 13: ECB Online Submission

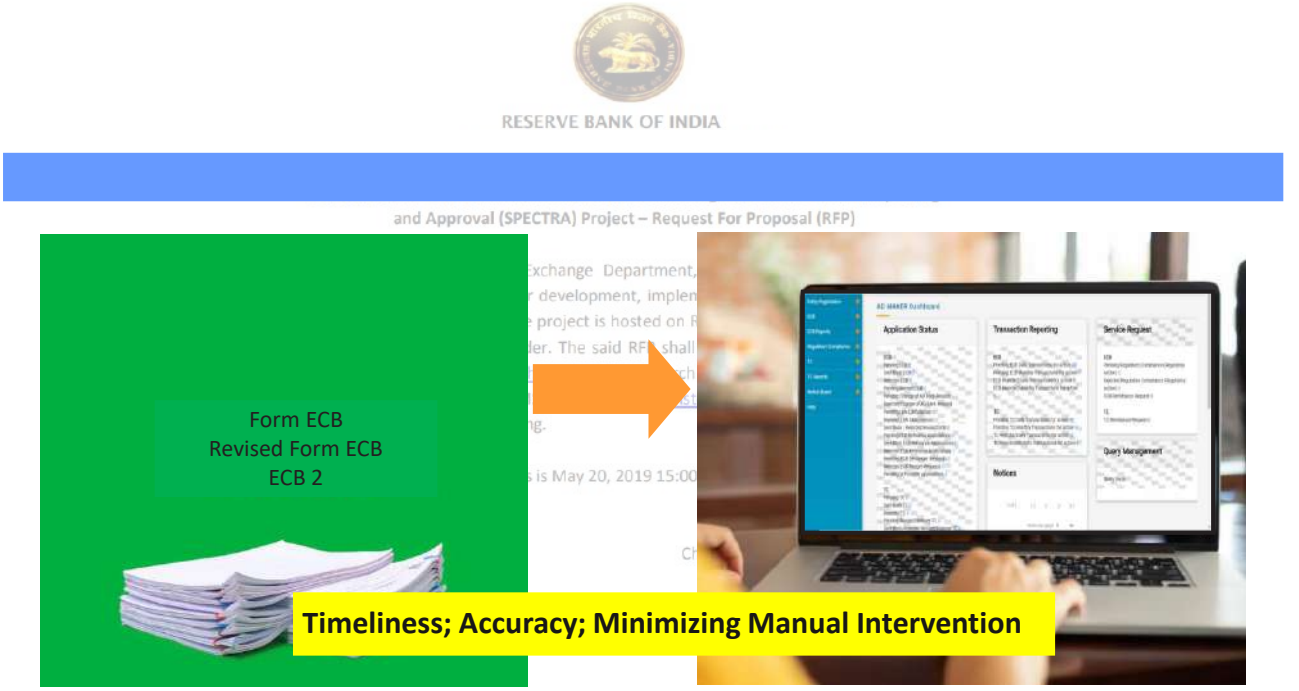
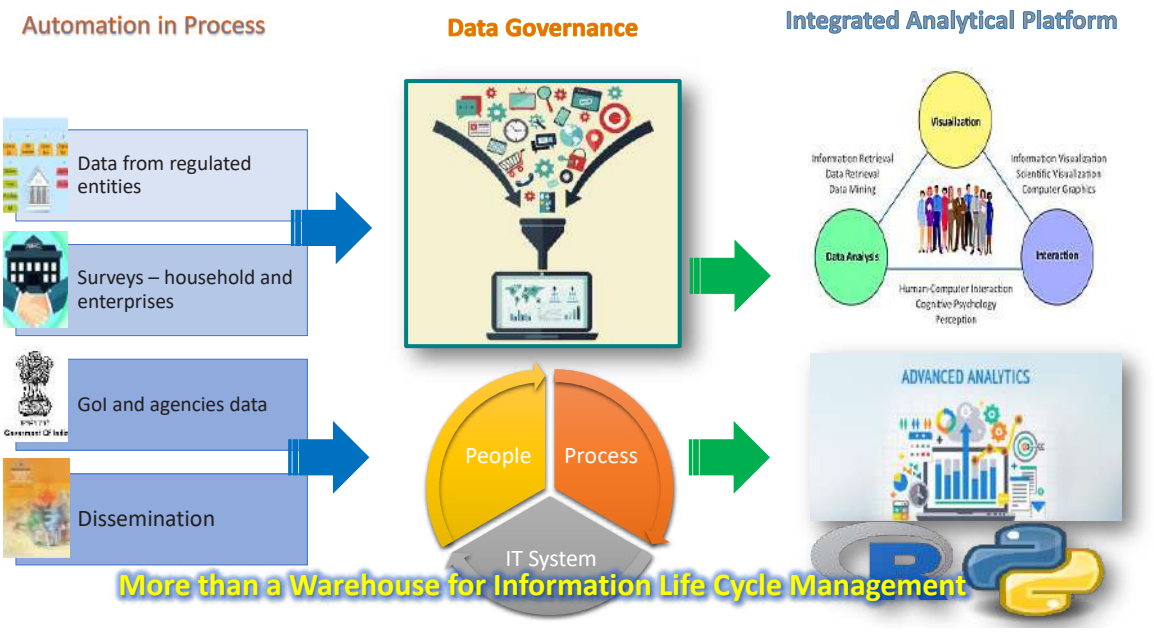


Chart 14: Machine Learning and Artificial Intelligence Goals

Chart 15: Centralised Information Management System



*Building a Future-ready Banking System**

M. Rajeshwar Rao

Good morning, everyone!

Thank you for inviting me to deliver this inaugural address this morning. This conference has been appropriately timed and quite aptly themed as we strive to come out of the debilitating impact of the pandemic. While some parts of the country are witnessing a rise in infections, the vaccines seem to have reduced its impact and infections are not as severe as they were previously. Hopefully, going forward we would be able to go on with our lives even as a new normal has dawned.

Building a resilient financial system is a matter of collective effort and this has been a critical learning from the pandemic and other crises. All of us are stakeholders in building a robust and resilient financial system and our collective and coherent response will make this endeavour less arduous. Against this backdrop, let me reflect on the strengths and challenges for the financial sector as we keep up our efforts to recalibrate a sustainable growth path.

The outbreak of COVID saw Governments across the globe impose unprecedented lockdowns because it was considered necessary to contain the spread of the virus. The consequential economic impact led to widespread downward revisions in GDP projections with some countries, including ours, experiencing GDP contraction, last heard of during the fallout of 2008 Global Financial Crisis (GFC). COVID-19 pandemic also happened to be the first real test of resilience of the global financial system since implementation of G20 reforms following the GFC. Now, as the world slowly and steadily steps into the post pandemic period, the collective focus should be on building stronger and resilient economies that will deliver inclusive growth in a sustainable manner and be adept at navigating future shocks. Evolving conditions in the Russia-Ukraine conflict, increase in the prices of crude oil, food grains and other commodities, along with rising inflation have just compounded these challenges.

Policy Response to COVID in India

Historically, every crisis has forced us to rethink and has almost always brought out the best in us. In the context of our economy, we can safely say that the Government and the Reserve Bank were closely monitoring the developments both globally and in India and have calibrated the fiscal, monetary, and regulatory responses depending upon the nature and intensity of the impact. While we all are aware about the monetary policy measures and liquidity support to the banking system along with targeted operations aimed towards supporting NBFCs, MSMEs, MFIs, among others, let me focus a bit on the levers of the prudential regulations which became enablers for extending relief to a large spectrum of individuals, small business, and industries.

Calibrated Prudential Response

The prudential interventions had to be rolled out cautiously and in a phased manner. During the initial phase of the pandemic, the focus was more on enabling the borrowers and individuals to weather the immediate financial stress through the loan moratoriums. Subsequently, even as the liquidity infusion mitigated the initial impact of the pandemic on the markets, the financial stress began to manifest as the borrowers started feeling the impact of business losses on their balance sheets. It was at this juncture, that the Reserve Bank decided to rollout targeted resolution frameworks.

* Remarks delivered by Shri M. Rajeshwar Rao, Deputy Governor, Reserve Bank of India – on June 16, 2022 - at IMC's 12th Annual Banking & Finance Conference held in Mumbai. The inputs provided by Shri Pradeep Kumar, Shri Peshimam Khabeer Ahmed and Shri Arun Kumar Pachamal are gratefully acknowledged.

While framing these measures there was a sense of déjà vu, as the experience of similar dispensations extended during the earlier crisis periods were not very encouraging. It is now argued, albeit with the benefit of hindsight, that some of the regulatory dispensations on asset classification during the post-GFC period, contributed in part to the build-up of NPAs in the subsequent years. But again, the key lesson which was drawn from the experiences of that period was that the problem assets need to be 'recognised' and 'provided for' at the earliest through realistic assessments and also by building in sunset clauses for the regulatory schemes to the extent possible.

Of course, the absence of credible insolvency regime at that point in time was also one of the key factors responsible for the problems cropping up later. Just compare that situation with the current one, when there is a formal Insolvency and Bankruptcy Code in place since 2016. With the legal issues around the IBC having been largely settled in a relatively short period, it has become a preferred channel for resolution specially for large value accounts.

In this context, the resolution frameworks announced by the RBI in the wake of Covid19 assimilated the learnings from the past, maintaining a fine balance between prudence and financial stability on one hand while enabling a flexible system for helping the COVID stressed borrowers on the other. The resolution plans implemented under the frameworks included rescheduling of payments, conversion of any interest accrued, or to be accrued, into another credit facility and granting of moratorium based on an assessment of income streams of the borrower for up to two years. The intent was that reliefs for each borrower was to be tailored by banks to meet the specific problem being faced by the borrower depending on need rather than have a broad- brush approach in dealing with the issue. One other distinct feature this time around was a special Committee constituted with banking experts to arrive at the sector specific benchmark ranges for the identified financial parameters to be factored into each resolution plan implemented by the lending institutions.

As things moved on, there came the resurgence of the pandemic during the second wave. The Reserve Bank came up with the Resolution Frameworks 2.0, this time primarily targeted for individuals, small businesses and MSMEs as the lockdown measures were more localised in nature and the impact was much limited.

Challenges

In implementing these resolution frameworks, banks encountered several challenges. While establishing the viability of the borrower itself was a challenge under the circumstances, managing the expectations was equally tough. The expectations were multifarious given the widespread economic pain caused by the pandemic. Some of the representations made at that time were to:

- Extend the moratorium beyond August 31, 2020;
- Waive off interest/ interest on interest during the moratorium period;
- Permit moratorium for all accounts, instead of being at the discretion of the lenders;
- Restructure all impacted accounts unconditionally;
- Include all Standard accounts for resolution under the frameworks besides NPA accounts and not just the accounts overdue for less than 30 days;
- Customise the framework to address sector-specific issues such as real estate, hospitality, other contact intensive sectors, etc;
- Modify Kamath Committee recommendations relating to financial parameters as they were perceived to be onerous and impractical to achieve.

From a regulatory perspective, the response was dovetailed to address the specific challenges unique to the economic fallout of the pandemic. Permitting such accommodations as sought for, would have entailed significant economic costs which could not have been absorbed by the banks and other lending institutions without seriously denting their financials, which in turn would have had negative implications for the depositors and other stakeholders besides impacting financial stability.

It also needs to be appreciated that the RBI guidelines on moratorium and Resolution Frameworks were discretionary and not mandatory for the lenders as well as the borrowers. The lending institutions were permitted to extend the moratorium to any borrower/ class of borrower in a transparent manner based on their Board approved policies. Similarly, even the borrowers had the discretion to decide whether or not to avail the moratorium, after weighing the pros and cons. Giving a regulatory fiat under the circumstances was not considered feasible on account of two reasons- first, we needed to differentiate between the COVID induced stress and structural viability issues; and, second - the lending institutions were expected to assess the viability of each borrower because they had the pulse of borrowers' cash flows and both- risks and reward were theirs to reap.

There were also demands to design sector specific schemes. As regards the sector specific demands, it is one of the stiffest challenges for a regulator since it gives rise to moral hazard issues. The approach thus was to help lending institutions design their schemes in a suitable manner to build in such flexibility in the Resolution Frameworks. The underpinning logic is that resolution plans are ultimately commercial decisions of the lending institutions, and the regulator should only specify the boundaries of the game through overarching steady-state frameworks. The regulatory flexibility cannot and must not be used to solve the structural issues affecting a particular sector and as such regulatory dispensations can at best only provide a temporary relief. Overall, every regulatory forbearance has its trade-off in terms of adverse incentives and unintended consequences.

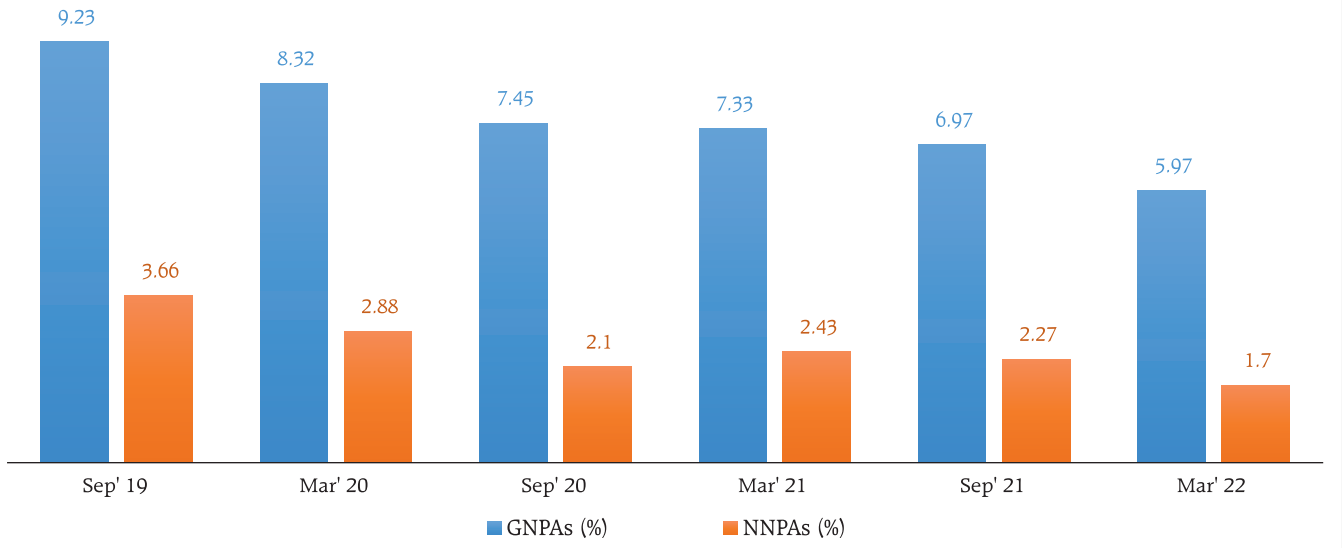
Outcomes

As a result of the co-ordinated efforts of the Reserve Bank and Government, in 2021-22, the year on year (y-o-y) growth in SCBs' credit gathered steam. The success of regulatory interventions, provision of ample banking system liquidity, coupled with the government's efforts to boost credit demand conditions in the economy was reflected by credit offtake in various sectors. The momentum in SCBs' credit offtake has been mostly positive since end-August 2021 and it increased by 9.6 per cent on a year-on-year basis for 2021-22 as compared with 5.6 per cent the previous year. According to data on the sectoral deployment of bank credit, credit to agriculture and allied activities grew by 9.9 per cent in March 2022 *vis-à-vis* 10.5 per cent in March 2021. Bank credit growth remained robust for a buoyant agriculture sector even during the COVID-19 pandemic period with continued support of the government's interest subvention scheme. Industrial credit growth improved steadily after Q1:2021-22 and accelerated to 7.1 per cent in March 2022. Credit to micro and small industries also posted a faster growth of 21.5 per cent in March 2022 from 3.9 per cent during the previous year. Credit growth to large industry, which was mainly in contraction zone till December 2021, turned positive in January 2022 and stood at 0.9 per cent in March 2022[1].

The preliminary assessment of health of the banking sector is encouraging. The restructured portfolio of banks as a percentage of total advances had expanded significantly post September' 2020 owing to restructuring of accounts undertaken in view of the Resolution Frameworks announced by RBI. However, the situation seems to be gradually stabilising.

[1] Source: RBI Annual Report, 2021-22

Chart 1: Asset Quality has been consistently improving

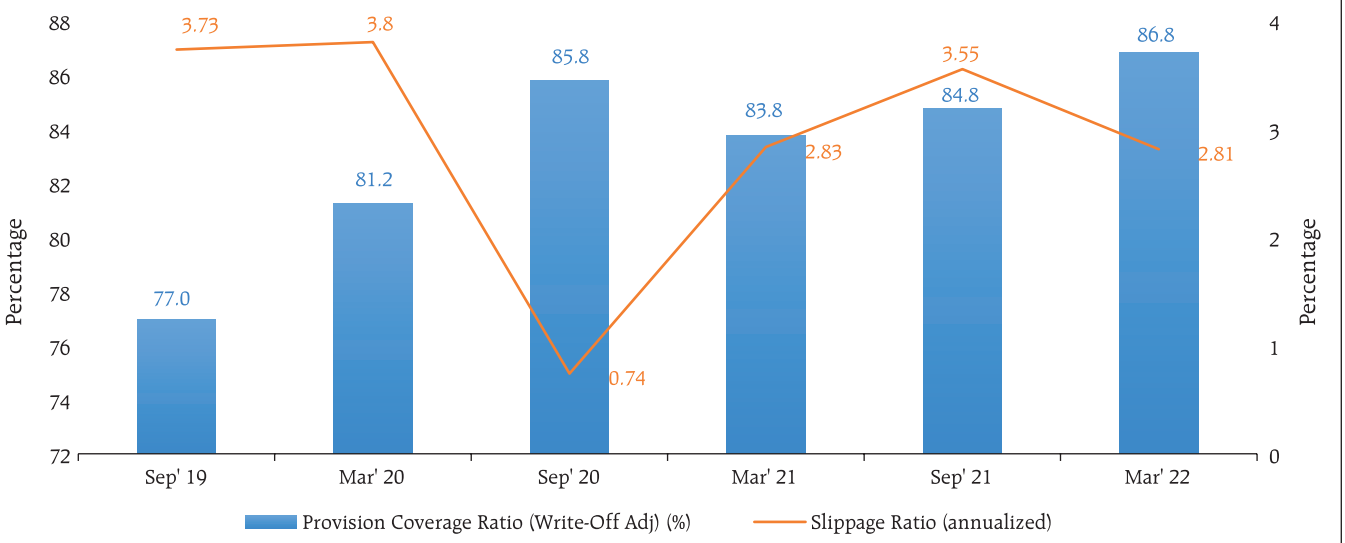


Source: RBI Supervisory Returns; Data for Mar-22 is provisional.

The asset quality of the banks has improved and the GNPA and NNPA levels of the banks have improved from the pre-pandemic levels. The fresh slippages have broadly been brought under control. Banks have also enhanced their provisions for impaired portfolios including provisions towards the restructured accounts as envisaged under the Resolution Frameworks (Chart-1 & 2).

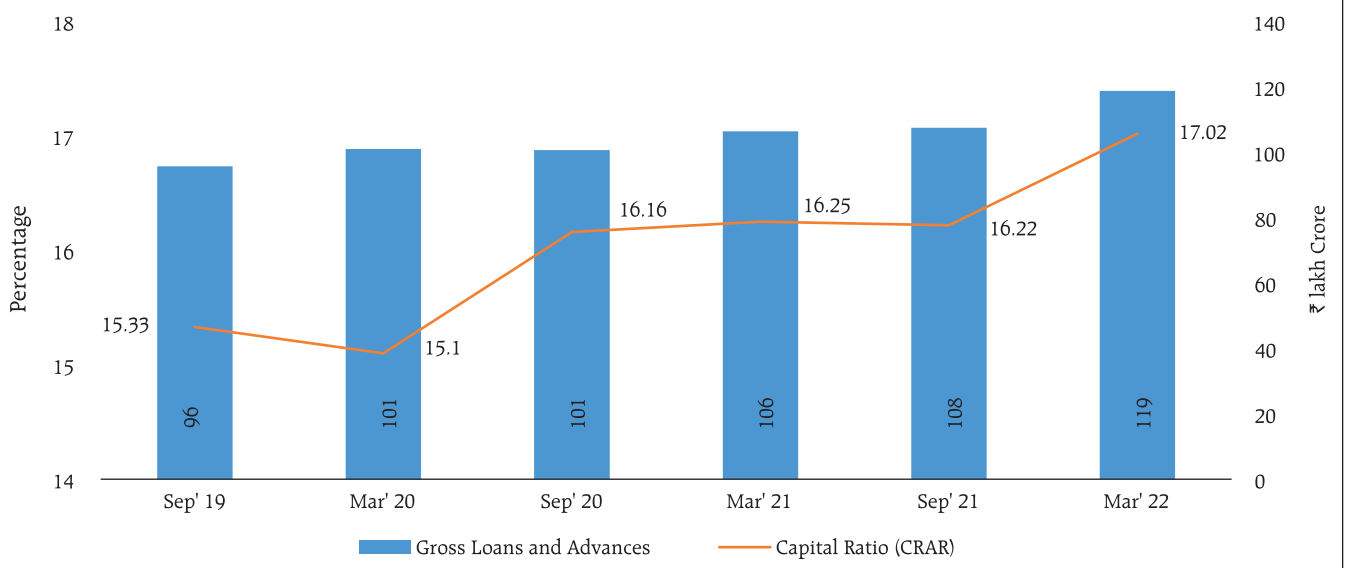
The banks have also facilitated timely credit offtake to catalyse the economic recovery. Needless to mention the ECLGS scheme rolled out by the Government too effectively dovetailed with the overall efforts in mitigating the risk aversion amongst the lending institutions.

Chart 2: Provision Coverage has improved while slippages show early signs of moderation



Source: RBI Supervisory Returns; Data for Mar-22 is provisional.

Chart 3: Capital position has improved along with growth in advances



Source: RBI Supervisory Returns; Data for Mar-22 is provisional.

These efforts have also found favour amongst the investors and the markets too have supported banks in their capital augmentation measures. Today, most of the banks have a comfortable capital position which should position them well to support economic recovery (Chart-3). These data points do give us a degree of comfort at this juncture. However, we may also have to wait a bit longer to see how the impact completely plays out. While we have attempted to combat the effects of pandemic on the financial system, the task is only half done, we have to ensure that the financial system escapes unscathed as we exit from the pandemic driven regulatory forbearances.

The pandemic also saw financial sector enjoying a favourable momentum with increase in liquidity, flow of credit and government spending on relief programs. It is increasingly getting debated in global forums as to whether the pandemic induced measures have led to build up of leverage and debt over-hang in non-financial sectors. Prudence, therefore, has to be exhibited by banks to ascertain whether the current levels of asset quality being exhibited is on account of improvement in fundamentals of business on account of deleveraging and efficiency gains or on account of support extended by the authorities through the measures elucidated above. We expect banks and other financial institutions to pro-actively undertake stress testing of their loan books subjecting them to various levels of stress including extreme scenarios to estimate the loss absorption limits available at disposal and take measures to augment the same wherever necessary.

The way forward

As a regulator, we still have miles to go before we sleep and therefore, continue to contemplate and roll out measures to improve the resilience of financial sector through planned and calibrated regulatory interventions. The Scale-Based Regulatory Framework for NBFCs, activity-based regulation for microfinance sector and guidelines to improve governance in private banks are few examples of our approach. As we continue to roll out regulatory measures, let me mention a few of them which are in the pipeline which would help make the banking sector more resilient to withstand economic shocks in times to come.

One of the key lessons which we can draw from our Covid experience is that the effectiveness of any policy response in crisis situations is critically dependent on the strength of the financial sector balance sheet. The report put out by the Basel Committee on early lessons from the Covid-19 pandemic finds that the increased quality and higher levels of capital and liquidity held by banks have helped them absorb the impact of the Covid-19 pandemic. It would therefore be imperative to work towards putting in place appropriate prudential and accounting frameworks that enhance institutional resilience.

To achieve this, we have come out with a Discussion Paper in January this year seeking comments from the stakeholders for a comprehensive review of the prudential norms for classification, valuation, and operation of the investment portfolio. The guidelines for valuation of investments were last revised in the year 2000. Since then, the domestic financial markets had grown in leaps and bounds in terms of volumes, liquidity, and underlying technology. Illustratively, in the Government Securities market we have seen the operationalisation of an anonymous electronic order matching system viz. NDS-OM, DVP-III, establishment of Clearing Corporation of India Limited (CCIL) as a central counterparty and introduction of Liquidity Adjustment Facility (LAF) and a whole suit of trading and hedging products such as market repo, Triparty Repo, Interest rate futures and options, etc. At the international level too, there have been several changes in the regulatory norms and accounting practices. While RBI has been tweaking the guidelines in response to situations as they emerged, there was a widening gap between our norms and the global standards and practices. A comprehensive review was therefore overdue and called for.

The Discussion Paper (DP) proposes radical changes which are designed to give greater flexibility to banks in the management of their investment portfolio while addressing concerns through enhanced disclosure. The idea is to align the prudential framework with global standards, while retaining elements which are germane to the domestic context. Some of the proposals in the Discussion Paper are symmetric recognition of fair value gains and losses, removal of various restrictions on investment portfolio such as the ceilings on investments in held to maturity (HTM), allowing non-SLR securities to be included under Held to Maturity (HTM) book, etc. The proposals in the DP, especially those on disclosures, would promote transparency and market discipline while giving the increased degree of freedom to banks. We are in advanced stages of finalising the revised norms based on feedback received and hope to issue guidelines on the new framework soon.

Another issue that is engaging our attention is the framework for provisioning on loan exposures. Currently, banks operating in India are required to make loan loss provisions on incurred loss model, wherein provisions are made after occurrence of default. However, loan default itself is a lagging indicator of stress, or more to say an outcome of build-up of stress over a period in the loan account. Thus, incurred loss approach is inefficient since it may prove pro-cyclical during economic downturns which can severely impact the health of banks as well as the financial system.

This also meant that recognition and crystallisation of credit risk usually lags the actual increase in credit risk for the banks. Such delays in recognising expected losses under an "incurred loss" approach were found to exacerbate the downswing during the financial crisis of 2007-09. Faced with a systemic increase in defaults, the delay in recognising loan losses resulted in banks having to make higher provisions which eroded the capital maintained precisely at a time when banks needed to shore up their capital, thereby affecting their resilience and exacerbating the systemic risks. Further, the delay in recognizing loan losses and

consequent higher dividend pay-outs reduced internal accruals to the capital.

This experience prompted the G-20 and the Basel Committee on Banking Supervision (BCBS) to recommend to accounting standard setters to modify the provisioning practices to incorporate a more forward-looking approach rather than to require the losses to happen before they are recognised. This encouraged the move towards adoption of provisioning standards that require the use of expected credit loss (ECL) models rather than incurred loss models. In principle, the approach requires a credit institution to estimate expected credit losses based on forward-looking estimations rather than wait for credit losses to be incurred before making corresponding loss provisions.

However, banks in India follow the "incurred loss" approach for loan loss provisioning, while the bigger non-banking financial companies (NBFCs) are following the more forward looking "expected credit loss" approach for estimating credit losses. Therefore, to achieve global convergence in regulations, we propose to issue a Discussion Paper on introduction of a framework on Expected Credit Loss (ECL) for banks. The idea is to formulate principle-based guidelines, supplemented by regulatory backstops wherever necessary. The Discussion Paper would seek to solicit comments from all the stakeholders, including the business community, on the proposed approach and the final contours of the transition will take into account the feedback received.

Concluding Remarks

The last two years have been tough on everyone but as individuals and a nation we have exhibited resilience and fought our way back. As we slowly step into the post pandemic world, we must strive to be ahead of the curve in designing and nurturing a financial system that is resilient and sustainable. As a closing thought I would like to leave you with a quote by Nelson Mandela:

"The Greatest Glory in living lies not in never falling, but in rising every time we fall"

And indeed, we shall rise strong. Wishing you all the very best! Thank you.

*Deposit Insurance in India - Journey; Milestones; Challenges**

Michael Debabrata Patra

Shri Saurav Sinha, Dr. Deepak Kumar, Executive Directors, Reserve Bank of India, Shri Kamal Pattnaik, Regional Director, Jammu and Kashmir, Shri Anup Kumar Chief General Manager, DICGC, Team DICGC and colleagues from the Srinagar/Jammu office of the Reserve Bank of India.

At the outset, I thank you for inviting me to deliver the keynote address for this year's Annual Conference, which is being held after a gap of two years (last at Madurai in November 2019). I am particularly happy that you have chosen Srinagar as its venue, which Amir Khusrau called paradise on earth. I do not propose to stand between you and Srinagar with a boring speech. Instead, I hope to engage you with a short interactive presentation.

The DICGC has come a long way in the quest of its vision and mission. Today, it is widely recognised that deposit insurance is an important pillar of trust in the banking system. Global benchmarks have been established to assess the quality of deposit insurance – I refer to the Core Principles for Effective Deposit Insurance Systems of the International Association of Deposit Insurers (IADI). The Core principles are also used by the IMF and the World Bank in their assessments of financial stability in member jurisdictions under the Financial Sector Assessment Programs (FSAPs). By protecting the depositor's interests in accordance with best practices, institutions such as the DICGC maintain depositor confidence and preserve financial stability. The year 2021-22 just gone by has been a particularly eventful one, characterised by landmark events and challenges. You as a team have risen up admirably to these challenges, actually converting them into opportunities. The theme of my address today is the DICGC's journey from where you are to where you want to be and how you would actualise our vision and mission.

Let me start with where we are. In the interest of time, I am going to focus on some key achievements, but this does not in any manner diminish the importance of various other milestones that you passed in your journey. I have to say that Director Shri M. Ramaiah and Assistant Adviser Shri Avijit Joarder have painstakingly briefed me on each accomplishment and I found all of them very valuable. I will refer to them as I speak.

Although I do not present it here, the hike in deposit insurance cover to ₹5 lakh with effect from February 4, 2020 from the earlier level of ₹1 lakh after a gap of 27 years is a major achievement. As a result, about half the total assessable deposits[1] of the banking system are insured, up from only 29 per cent when the insurance cover was ₹ 1 lakh. 98 per cent of all accounts in the banking system are fully protected with deposit insurance. These ratios far exceed the global norms of 20-30 per cent of assessable deposits and 80 per cent of accounts.

In a landmark legislation in pursuance of the announcement made in the Union Budget 2021-22, the Deposit Insurance and Credit Guarantee Corporation (DICGC) Act 1961 was amended on August 13, 2021. The amendments - which came into force on September 1, 2021 - empower the DICGC to pay deposit insurance to depositors of banks that

* Keynote Address delivered by Michael Debabrata Patra, Deputy Governor, Reserve Bank of India in the Annual Conference of Deposit Insurance and Credit Guarantee Corporation on May 22, 2022 at Srinagar. Valuable briefing and comments from M Ramaiah and Avijit Joarder and editorial assistance from Vineet Kumar Srivastava are gratefully acknowledged.

[1] Exclude inter-bank deposits, Central/State government deposits, deposits by foreign governments , deposits received outside India and deposits specifically exempted by the Corporation with the prior approval of the Reserve Bank.

are under all inclusive directions or AID of the RBI within 90 days from the date of the imposition of such directions. Such up-front payment to depositors with clear processing timelines is not observed in the cross-country experience. As of March 31, 2022 the DICGC sanctioned claims amounting to ₹3,455 crore to 2,64,142 depositors in respect of 22 urban co-operative banks placed under AID by the RBI. In order to commemorate this defining milestone in institutional reforms to secure depositor protection, enhance confidence and trust in our banking system, the Hon'ble Prime Minister, Hon'ble Union Finance Minister and Hon'ble Governor, RBI had addressed the depositors of select banks and handed over cheques to depositors across the nation in an event held on December 12, 2021 in New Delhi.

Among the core principles which I referred to earlier, jurisdictions are encouraged to levy insurance premiums on member banks so as to reflect their underlying risk profiles. This is expected to disincentivise excessive risk taking while rewarding well-managed ones, thereby eschewing moral hazard. The DICGC had set up a committee to recommend underlying principles. Based on its recommendations made in April 2020, a framework for risk-based insurance has been established. Drawing broadly on the CAMELS methodology, the framework is simple, operationally implementable and intuitively appealing. There is a dedicated panel discussion on the subject which I commend you to participate in. The risk profile of banks is regularly updated. In this area at least, the DICGC is aligned with the curve as only 50 percent of the IADI's membership has implemented risk-based insurance so far.

Let me now turn to another important milestone. The total collection of premium from insured banks was ₹19,490 crore during the year 2021-22 with no default. For operational convenience, the DICGC categorizes banks under four groups, that is, functioning banks, those under AID, merged entities and liquidated banks. Functioning banks and those under AID pay premiums regularly, while for merged banks, it is acquirer bank that maintains payment discipline. Premium payments start within 30 days of intimation of registration and reporting requirements follow a bi-annual cycle. In the case of non-payment of premium, penal interest at the rate of Bank Rate plus 8 per cent becomes applicable from the start date of premium payment (i.e 1st April and October) till the date of actual payment. The DICGC Act provides for cancellation of membership in case of non-payment of premium for three consecutive semesters. All in all, the premium collection process is a robust one, with punitive provisions for slips in compliance. Hence, the DICGC can rightfully boast of zero tolerance and full compliance.

During the year 2021-22, the DICGC has achieved remarkable progress in the settlement of claims for deposit insurance. With the amendment to the Act coming into force from September 01, 2021 claims amounting to ₹3,457 crore have been settled between December 2021 and March 2022 in the case of 22 UCBs under AID. As I mentioned earlier, this feat was commemorated by the Hon'ble Prime Minister in the Udyog Bhavan in Delhi. In the case of liquidated banks, claims settled amounted to ₹1,268 crore. Turning to mergers, a major achievement of the Corporation was the financial assistance of ₹3,791 crore it provided to Unity Small Finance Bank for making payments to depositors of the much-sensationalised Punjab and Maharashtra Cooperative Bank Ltd or PMC Bank. Overall, the claims settled under these three channels amounted to ₹8,517 crore, which is a commendable achievement when seen in comparison with the total of claims of ₹5,763 crore settled since the establishment of the DICGC up to 2020-21.

These notable achievements are reflected in the key parameters of the DICGC's operational performance. A steady rise in premium income as well as investment income has enabled the build-up of a robust deposit insurance fund, despite record levels of claim settlement and regular income tax payments. Besides, rigorous follow-up facilitated long pending income tax refunds amounting to ₹77.4 crore during the year as well as refund of ₹27 crore of service tax. Even in the case of the bread and butter of the DICGC's architecture which usually goes unnoticed and unsung, there has been noteworthy progress. Recoveries of ₹348.9 crore have been made during the year, by both legal processes and moral suasion. Banks under AID for which claims have been settled are required to make repayment in five equal instalments beginning March 31, 2022.

The DICGC has also leveraged on digital technology to secure efficiency gains in terms of payment of claims to the depositors using the Aadhar Enabled Payment system of the National Payment Corporation of India (NPCI) wherein the first such payment was made in 2021-22 to the depositors of Shri Anand Cooperative Bank Lts., Pune. Futhermore, spreading of awareness among depositors on receipt of claims and settlement of claims was achieved through bulk SMSes.

Last but by no means the least, the DICGC's treasury operations have been prudent and competent. There has been a steady expansion of the investment portfolio in terms of both book value and market value in spite of an all-time high claims outflow of over ₹8,500 crore during 2021-22. In order to ensure efficient liquidity management and simultaneously manage interest rate risk while not compromising on returns, the modified duration of the portfolio has been brought down from 7.96 years to 6.97 years by investing in the most liquid securities and parking funds in collateralised money market instruments.

Issues and Challenges: Future Agenda

Clearly, the DICGC has traversed considerable ground in pursuit of its goals. With the dynamic actions of the year gone by, it has established strong credentials as a depositor protector and an anchor of financial stability. Going forward, it must reap the benefits of this reputational bonus and cement its future agenda in the credibility it has earned.

First, the DICGC needs to be completely aligned with the IADI's 16 core principles that define global standards today. This may require some substantive legislative changes while others can be achieved through Board approvals. Currently, there are gaps in this desired alignment which your own internal assessment has revealed. I do hope that the panel discussions will shed light on the way forward in this endeavour.

Second, a large number of deposit insurance agencies around the world target the reserve ratio through enabling legislation or through Board resolutions in order to maintain adequate level of funds commensurate with their payment obligations. I understand that a few years ago when the insurance cover was ₹1 lakh, the Board of the DICGC set an internal target ratio of 4.0 per cent to be attained by 2034-35. At present the ratio stood at 1.81 per cent. There is a need to raise the reserve ratio from its current level, based on clear, consistent and transparent criteria (Core Principle 9 of IADI). With insurance cover of ₹5 lakh and the observed patterns of premium, investment and recovery income net of claims and income tax, it is feasible to increase the reserve ratio to at least 2.5 per cent by 2027-28 with a 95 per cent confidence interval. Progress towards this objective needs to be periodically reviewed so that you stay the course steadfastly.

Third, the IADI has prescribed an indicative period of settlement of claims within 7 working days between liquidation and settlement. It is highly commendable that the DICGC reduced this time interval to only 3 days between receipt of claims from the liquidator and claim settlement during 2021-22. It should not, however, rest on its laurels. You must now train your energies on reducing the time interval between deregistration of a bank and payment of claims, which was as high as 184 days in 2021-22. Although this represents a significant improvement over 2020-21 when it was 500 days, you have miles to go before you sleep. This may even require legislative changes for powers of liquidation in consultation with the RBI.

Fourth, as monetary policy authorities across the world engage in front-loaded normalisation of policy rates and quantitative tightening, interest rates are expected to head northwards and financial conditions more generally will tighten. This will prove to be a challenging environment for the Corporation's treasury as it strives to balance interest rate and liquidity risks. This will require nimble-footedness and a proactive approach in reading market signals into the future, including an effective strategy for the Corporation's investment portfolio that is marked to market.

Fifth, information security requirements have become paramount in ensuring the integrity and resilience of the operations of the Corporation. In this direction, this needs upgrade to the IT infrastructure to safeguard stored data, return flows and the entire gamut of operations. Migration from physical servers in data centres to clouds appears to be a minimum or a starting point. Upgradation of IT existing solutions and improving the overall infrastructure on par with or better than other leading deposit insurers, is the way to go.

In closing, it is important to closely monitor the impact of financial innovations like e-money and digital products on the scope and coverage of deposits and constantly recalibrate definitions and parameters of deposit insurance cover. Public awareness about the actions of the DICGC need to be given sufficient coverage in the public domain through different channels of regular communication. I have always wondered why an institution like the DICGC with strong fund positions still resides in RBI premises and does not have an office of its own. I am sure such an independent office will boost morale and pride in the institution to which you belong. Furthermore, why does the DICGC with so many achievements under its belt need to be staffed almost exclusively by the RBI? I would look for a healthy mix that includes lateral hires of domain experts. There is also a pressing need to regularly upgrade knowledge and skill exposures through deputations to leading deposit insurers around the world, secondment programmes and technical agreements for knowledge sharing. Upgradation of IT infrastructure on a continuous basis for integrated solutions is a minimum in today's fast changing technological environment.

Thank you.

I wish the Conference every success.

ARTICLES

*State of the Economy**

In a global landscape marred by fears of recession and war, the Indian economy shows resilience. The recent revival of the monsoon, the pick-up in manufacturing and services, stabilisation of inflation pressures and strong buffers in the form of adequate international reserves, sufficient foodgrain stocks and a well-capitalised financial system together brighten the outlook and strengthen the conditions for a sustainable high growth trajectory in the medium-term.

Introduction

India's inflation is on the backfoot. For the second month in a row in June, headline CPI inflation eased in India, according to the July 12, 2022 data release of the National Statistics Office (NSO), on the back of receding food inflation. Very grudgingly, as we foretold, but diverging from the global central tendency. Fingers are crossed, but time may prove our other oracle true – that the worst of inflation may be behind us. Several global developments are pointing in that direction. First, central banks across the world are engaged in the most aggressive monetary policy tightening in decades so much so that financial markets wilt in the fear of imminent recession. Second, commodity prices are easing across the board, with even announcements of a big stimulus failing to halt their meltdown. Third, supply chain pressures are edging down globally and in India. Prices of goods, which were caught up in supply chain tangles are approaching a tipping point. Fourth, retailers that had built inventories are cutting prices to shift stock. Fifth, both input and output in the global manufacturing purchasing managers' index (PMI) moderated in June. In India too, such positive developments may gradually appear. Formation of falling international commodity prices into a trend may encourage food manufacturing companies to stop 'shrinkflating' and start reducing prices. Manufacturing and services input and output prices moderated in June, the former down to a 3-month low. Furthermore, suppliers' delivery time turned positive for the first time since February 2021 reflecting the easing of supply chain constraints facing India. Most importantly, monetary policy has gone on to the front foot against inflation and as Governor Shri Shaktikanta Das pointed out: "…..our current assessment is that inflation may ease gradually in the second half of 2022-23, precluding the chances of a hard landing in India"[1].

Amidst growing apprehensions of recession, the global manufacturing PMI fell in June 2022 to a 22-month low as new orders moderated and international flows declined. Reflecting ongoing improvement in demand, however, the global services PMI accelerated to its highest level since April 2011 and saved the blushes. Meanwhile, reshoring of supply chain has begun. Businesses are shifting to dual sourcing, long term contracts, and vertical integration of production processes to gain strategic control. Foreign direct investment (FDI) is transforming, with more of reinvestment from local subsidiaries and less of capital invested by parents from across borders. More than 100 countries accounting for 90 per cent of global GDP are pursuing 'make at home' policies which include strategic control over technologies and key inputs.

One global development that almost flew underneath the radar is that the annual rate of world population growth fell below one per cent for the first

* This article has been prepared by GV Nadhanael, Madhuresh Kumar, Kunal Priyadarshi, Rajeev Jain, Harshita Keshan, Rigzen Yangdol, Palak Godara, Jobin Sebastian, Rohan Bansal, Priyanka Sachdeva, Avnish Kumar, Vijaya Agarwal, Akshara Awasthi, Deepika Rawat, Rajas Saroy, Ramesh Kumar Gupta, Ipsita Padhi, Aayushi Khandelwal, Sudhanshu Goyal, Harendra Behera, Pankaj Kumar, Kaustubh, Vineet Kumar Srivastava, Samir Ranjan Behera, Deba Prasad Rath and Michael Debabrata Patra. Views expressed in this article are those of the authors and do not necessarily represent the views of the Reserve Bank of India.

[1] Globalisation of Inflation and Conduct of Monetary Policy: speech delivered by Shri Shaktikanta Das, Governor, RBI on July 9, 2022. https://www.rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1317

time since 1950. It is projected to slow even further through this century. Low fertility rates are combining with improvements in healthcare to accelerate the aging of the human species, which in turn will impact global growth adversely. Although the global population will reach 8 billion this year – 1 billion in 1804; 4 billion in 1974; and 7 billion in 2011 – the populations of 61 countries are projected to decline between 2022 and 2050. Eventually, the world's population is expected to peak at 10.4 billion in the 2080s and then begin to fall. Global life expectancy, which was 72.8 years in 2011, fell to 71 years in 2021 under the impact of the COVID-19 pandemic.

India is set to become the most populous country in the world by 2023. According to the fifth round of the National Family Health Survey, 2019-21, released by the Ministry of Health and Family Welfare (MOHFW) in May 2022, however, India's fertility rate – the number of children a woman bears in her child bearing life time – has fallen below 2.1, the rate at which the population can replace itself.

Back to the here and now. COVID-19 infections have been rising in India with new mutations of the virus. High frequency indicators of economic activity are mixed. Green shoots of revival in contact-intensive services are breaking through.

The Indian economy is showing resilience and dynamism in spite of the geopolitical situation and high risk aversion in financial markets that is stampeding portfolio investors and taking down all currencies against the unrelenting strength of the US dollar. Apparently, markets are differentiating between currencies on the basis of the size and speed of monetary policy tightening relative to the US Fed. In comparison with peers, the depreciation of the INR has been modest at 5.1 per cent on a financial year basis and 7.0 per cent on a calendar year basis to date.

In its assessment of financial sector soundness and resilience, the June 2022 issue of the RBI's Financial Stability Report released on June 30, 2022 points out that capital in the banking system is high at 16.7 per cent of risk weighted assets at the end of March 2022, with tier 1 capital of 13.6 per cent. For urban cooperative banks, the capital to risk weighted asset ratio (CRAR) rose to 15.8 per cent and for non-banking financial companies (NBFCs) to 26.9 per cent for the same reference date. For banks, profitability has improved and gross non-performing assets have fallen to a six year low as a ratio of total assets, with the net non-performing assets ratio at 1.7 per cent. Banks stand up well to stress testing, with all banks able to comply with minimum capital requirements under a severe stress scenario. Network analysis shows that bilateral exposures are lower than pre-pandemic levels, reducing contagion risks. Global spillovers and financial markets are assigned high risk, with global uncertainty, commodity prices, geopolitical conditions and monetary policy normalisation as main drivers.

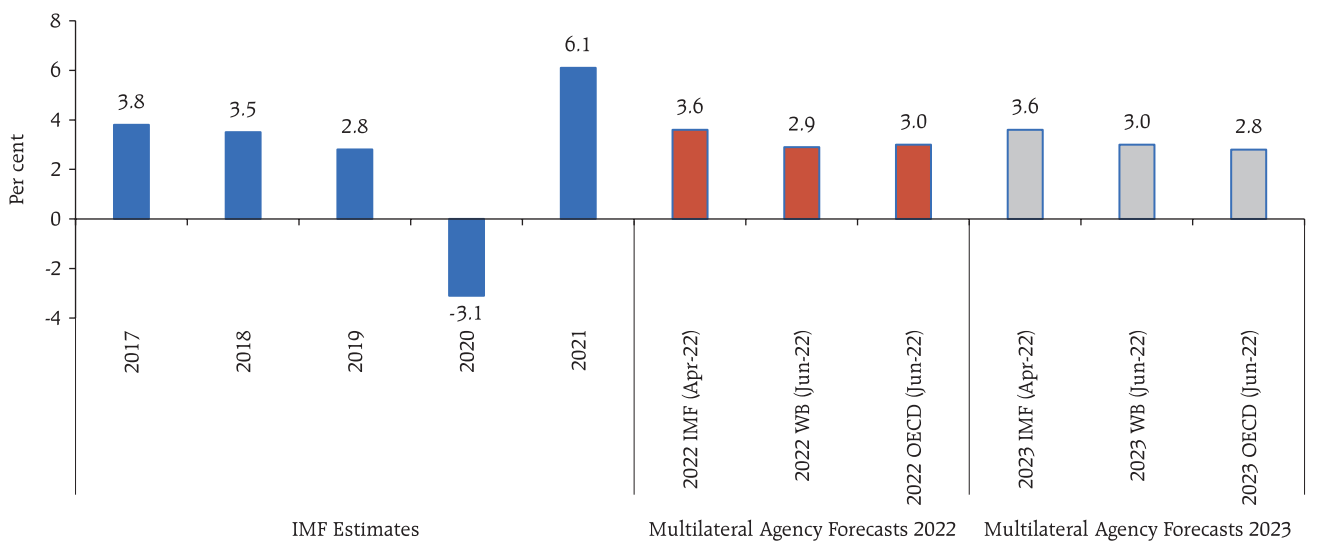
Set against this backdrop, the remainder of the article is structured into four sections. Section II captures the rapidly evolving developments in the global economy. An assessment of domestic macroeconomic conditions is presented in Section III. Section IV reviews financial conditions in India. The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

II. Global Setting

Aggressive monetary tightening and the protracted war in Europe continue to weigh down global growth prospects during 2022 and 2023 (Chart 1). Model-based nowcast of quarter on quarter (Q-o-Q) growth of global GDP shows that it is in contraction in Q1 and Q2 of 2022 (Chart 2). [2]

[2] For a detailed discussion on methodology of nowcast of global GDP, see Ramesh Kumar *et al.*, "Nowcasting Global GDP", RBI Bulletin, June 2022.

Chart 1: Global GDP Forecasts

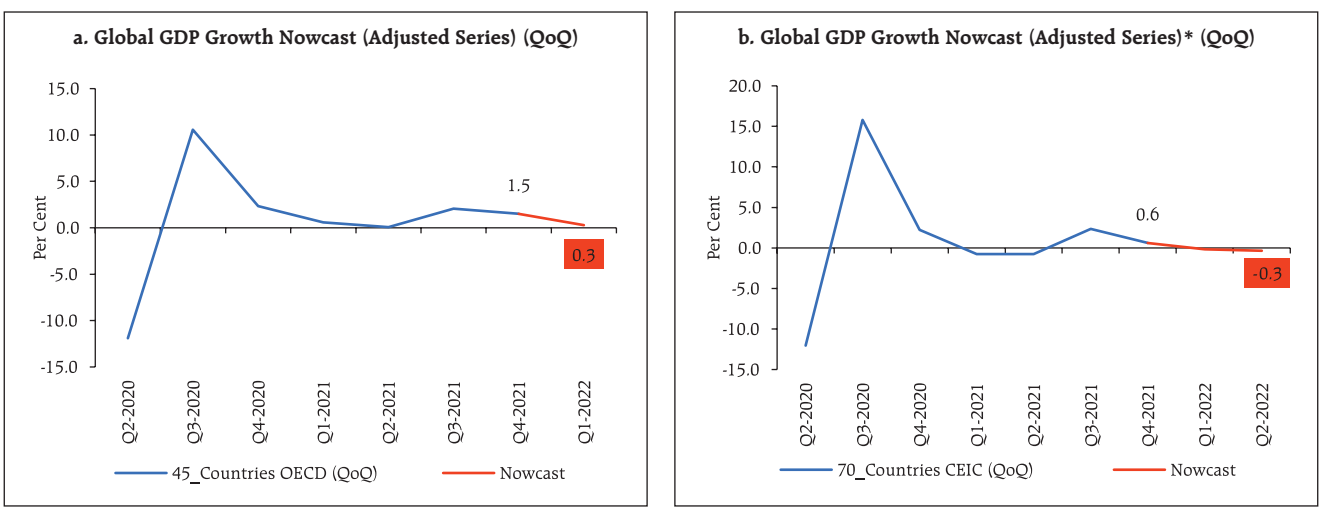


Sources: IMF; WB; and OECD.

Among high frequency indicators, the global composite PMI picked up in June 2022 to 53.5 from 51.3 a month ago (Chart 3). While the manufacturing PMI declined marginally to 52.2 – its lowest level since August 2020 – the services PMI accelerated to 53.9 from 51.9 a month ago. A silver lining is that input costs rose at the slowest rate in four months, reflecting easing of supply constraints and lower inventory build-up. Output prices also moderated, indicating that faltering demand appears to be stalling the momentum of global inflation.

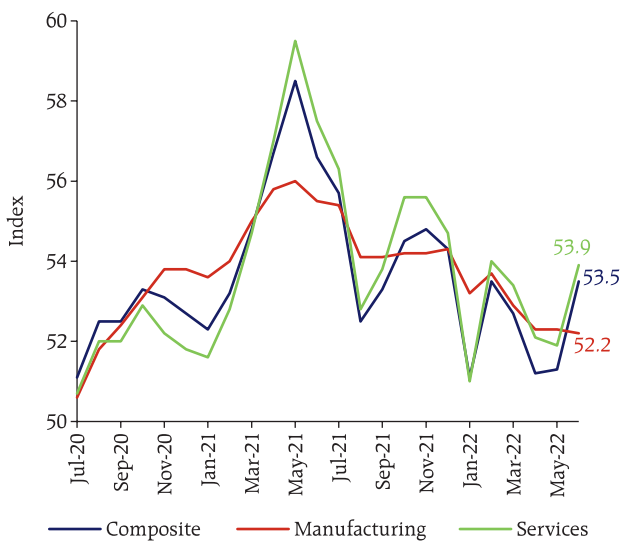
Global merchandise trade volume growth accelerated to 3.1 per cent (y-o-y) in April from 2.0 per cent in March on positive monthly momentum as

Chart 2: Global GDP Nowcast



*: Model/Assumptions: SARIMAX model augmented with global IIP (YoY%). Global IIP (YoY%) in May and June 2022 is assumed to be equal to average monthly growth over the last six months, *i.e.*, November 2021 to April 2022.
Sources: OECD; CEIC; and RBI staff estimate.

Chart 3: Global PMIs



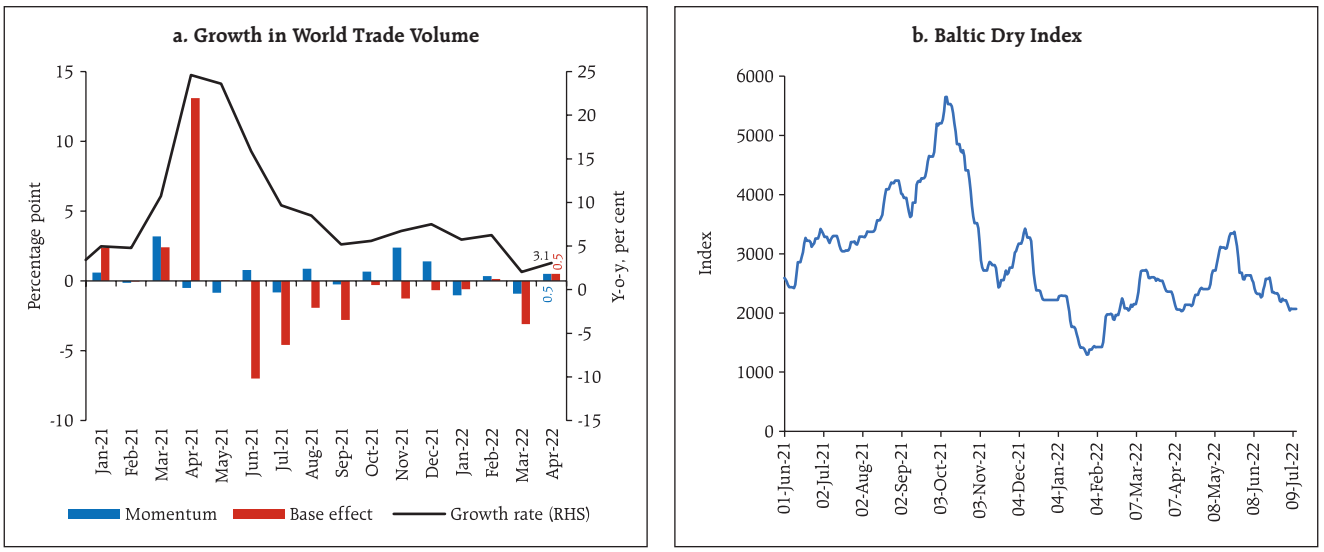
Sources: IHS Markit.

well as a favourable base effect (Chart 4a). The Baltic Dry Index, a measure of shipping charges for dry bulk commodities, spiked in May before shedding 14.8 per cent in June (Chart 4b).

The World Investment Report (2022) released in June reveals that global foreign direct investment (FDI) which grew 64 per cent in 2021 from an exceptionally low level in 2020 is unlikely to be sustained. Data for Q1:2022 show greenfield projects and international project finance deals down by 21 per cent and 4 per cent, respectively.

The Bloomberg commodity price index witnessed a correction in the second half of June, averaging 7 per cent below the first half's average (Chart 5a). Crude oil prices exhibited heightened volatility and changing momentum owing to exceptionally stringent supply conditions. The renewed pledge by the G7 of further sanctions against Russia while also considering a price cap for Russian oil sent mixed signals to the oil markets. Overall, crude oil prices have recorded a 36.7 per cent gain year to date (up to July 15, 2022) despite a moderation in June 2022 (Chart 5b). Oil prices have been exhibiting a softening bias in July – on July 6, oil prices fell below US$100 for the first time since April 25 on the back of recession fears and the strong US dollar. Nonetheless, risks remain as the International Energy Agency's (IEA) oil market report for June 2022 projected that world oil demand would reach 101.6 million barrels per day in 2023. On the supply side,

Chart 4: World Trade and Shipping Costs



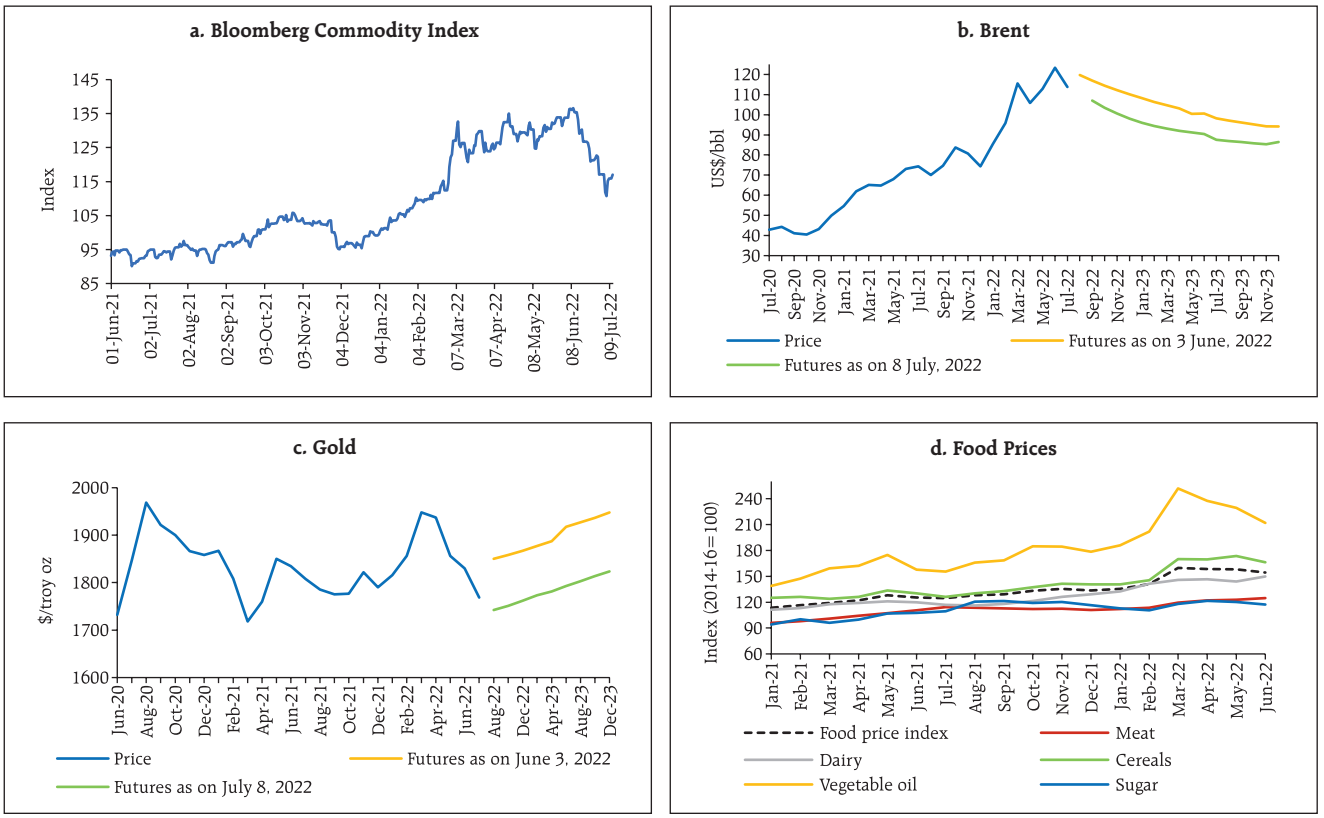
Sources: CPB Netherlands; and Bloomberg.

non-OPEC economies are set to account for nearly 80 per cent of growth next year; non-OPEC+[3] is set to add 1.9 million barrels per day in 2022 and 1.8 million of barrels per day in 2023. As on July 8, 2022 Brent futures averaged around US$102 per barrel for 2022 and US$90 per barrel for 2023.

Gold prices have continued to tumble for the third consecutive month with futures data also showing a lower trajectory of prices than a month ago (Chart 5c). The FAO food price index retreated for the third successive month to 154.2 in May from the all-time high registered in March due to moderation in prices of vegetable oil, cereal and sugar while meat and dairy prices continued to increase (Chart 5d). The war has severely affected the supply of foodgrains as Russia and Ukraine account for a quarter of global exports of wheat, a fifth of barley and maize exports, and more than half of sunflower oil exports. They also provide about an eighth of all calories traded in the world[4].

Two-thirds of the world is suffering inflation above 7 per cent, though there are signs that the pace of acceleration in inflation is slowing down in some countries. The US headline CPI inflation (y-o-y) soared to 40-year high of 9.1 per cent in June 2022 from 8.6 per cent a month ago, the highest since November 1981. The monthly momentum of 1.3 per cent in June was the largest in 17 years, with energy prices increasing 7.5 per cent (m-o-m) and contributing nearly half of the overall momentum in CPI. Core inflation, however, moderated to 5.9 per cent in June from 6.0

Chart 5: Commodity and Food Prices

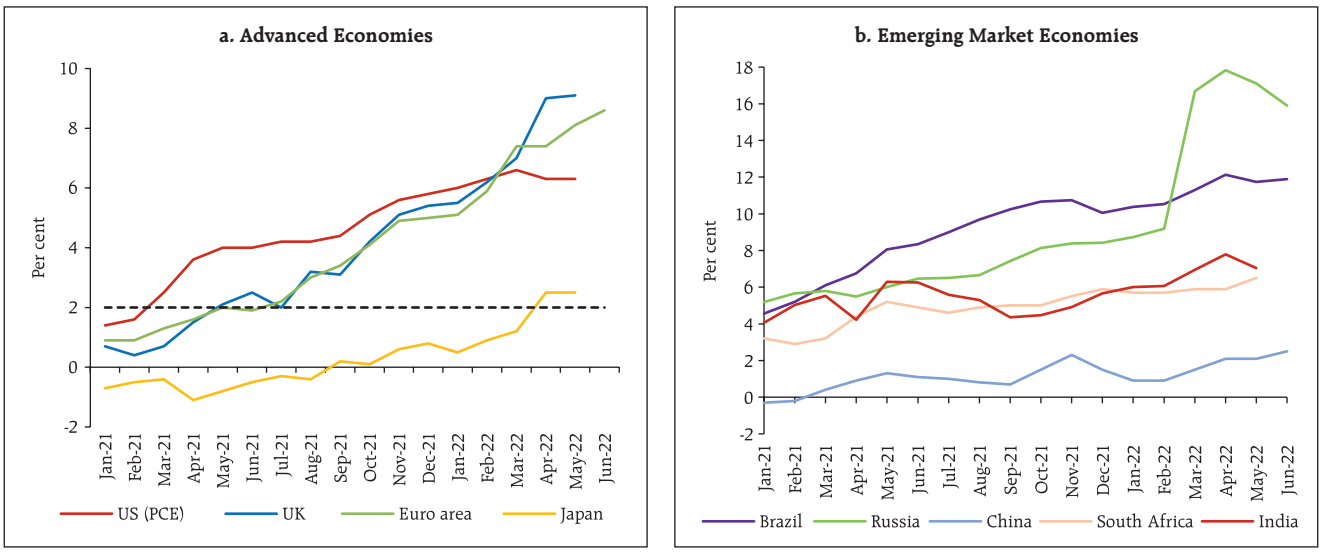


Sources: Bloomberg; World Bank Pink Sheet; and FAO.

[3] Non-OPEC+ includes the US, Canada, China, Brazil, Norway and Guyana.

[4] International Monetary Fund (2022), Finance and Development, June.

Chart 6: Inflation



Sources: Bloomberg.

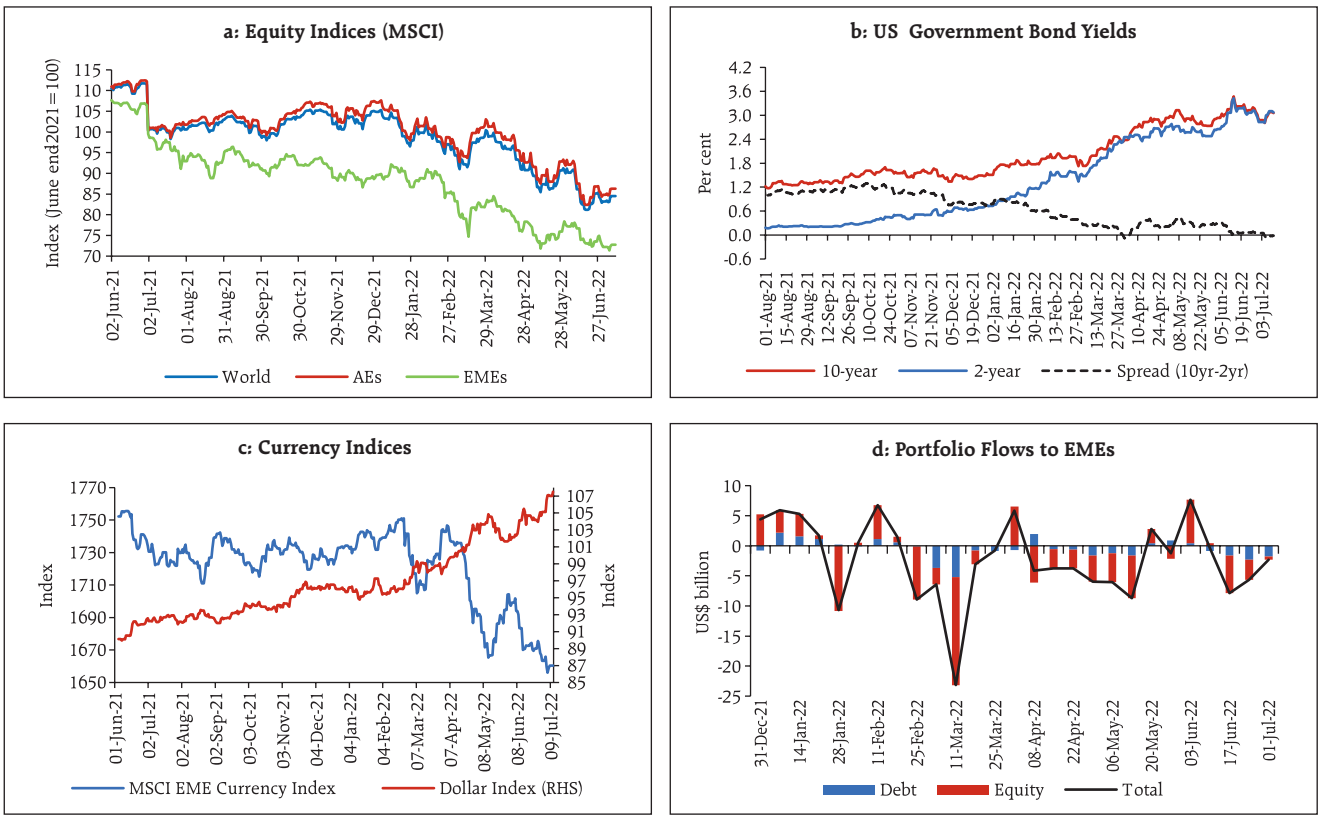
per cent in May due to favourable base effects. Euro area annual inflation soared to a new record of 8.6 per cent in June, primarily driven by energy and followed by food, alcohol and tobacco. CPI inflation in the UK also accelerated to a fresh peak of 9.1 per cent (y-o-y) in May 2022, with food and non-alcoholic beverages contributing the highest to the monthly momentum (Chart 6a). Among BRICS economies, inflation in Brazil at 11.9 per cent in June remained in double digits for the tenth consecutive month, while in China, it rose to a twenty-two month high of 2.5 per cent (Chart 6b). In Russia, the annual inflation rate fell to 15.9 per cent in June of 2022 from 17.8 percent in the previous month, the lowest inflation rate since it entered double-digit territory in March.

After a sell-off in early June, global financial markets recovered marginally towards the end of June. The MSCI World Equity Index shed 22 per cent year to date (up to July 15, 2022) as AE equity index declined by 22 per cent while EME equity index declined by 21.6 per cent (Chart 7a). In the bond markets, the US Treasury yield spread (10 year minus 2 year) narrowed markedly, averaging 7 bps in the second half of June *vis-a-vis* 19 bps for the first half. Policy rate sensitive short-term yields spiked while longer-term yields softened due to the dampening medium term growth outlook (Chart 7b). In fact, a yield curve inversion — one of the most widely used indicators of an impending recession – took place in the early days of July, suggesting that the US economy might be heading towards a hard landing. The dollar index picked up momentum considerably after weakening in the first half of the month (Chart 7c). Most EME currencies underwent downward corrections with net portfolio outflows (Chart 7d).

Monetary tightening continued synchronously across the globe in June 2022 with many central banks increasing the pace of tightening to tackle historically high levels of inflation. Sixty increases in key interest rates were effected by major central banks during March-May 2022.[5] In its June meeting, the US Federal Reserve raised the target range of the Federal Funds rate by 75 basis points (bps) to 1.5 - 1.75 per cent, the first 75 bps hike in 28 years, resulting

[5] *https://www.ft.com/content/addbf3ca-9859-47cb-bb8f-56a34aa13930.*

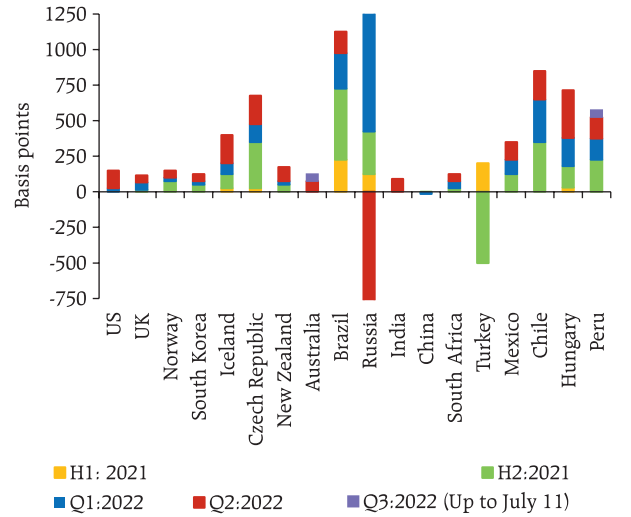
Chart 7: Financial Markets



Sources: Bloomberg; and IIF.

in a cumulative hike of 150 bps since March 2022. Chairman Powell also signaled a 50-75 bps hike for the next meeting. The ECB Governing Council met for an *ad hoc* meeting on June 15, 2022 to calm jittery markets and reassure that it would apply flexibility in reinvesting redemptions falling due in the Pandemic Emergency Purchase Programme (PEPP) portfolio. In its June meeting, the Bank of England (BoE) raised its policy rate by 25 bps, taking it to 1.25 per cent. The Bank of Japan reiterated its accommodative stance with yield curve control, thereby remaining in direct contrast to its peers. Most EME central banks have continued with policy tightening, including Hungary, Mexico and Brazil which hiked their benchmark rates by 185 bps, 75 bps and 50 bps respectively in their latest meetings (Chart 8). On the other hand, the People's Bank of China maintained *status quo* on its policy rates after reducing the 5-year loan prime rate (LPR), mortgage reference rate by 15 bps to 4.45 per cent in its May policy announcement.

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



Source: Central bank websites.

Chart 9: Change in High Frequency Indicators

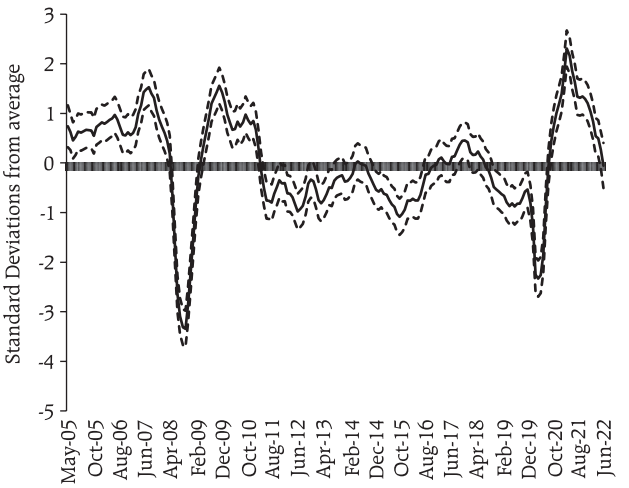
Indicator	Change between Feb-20 to Latest (%)	Change between Q4 2021-22 (Avg.) to Latest (%)
Foreign Tourist***	-58.40	61.98
Air Passengers***	-2.03	46.58
Rail Passengers****	-26.00	20.82
Air Cargo***	7.60	15.38
IIP Electricity**	26.55	12.78
Govt Receipts***	25.61	10.53
Auto Sales*	-4.73	4.31
IIP Core***	10.55	0.95
NONG Imports***	56.61	0.69
Exports****	36.76	-2.59
Rail Freight****	17.85	-2.95
IIP Manufacturing**	-1.27	-4.19
IIP Consumer Goods***	-7.99	-6.66
BSE****	31.48	-7.63
IIP Cement***	2.35	-8.52

****June, ***May, **April, *March
Sources: RBI; and Authors' own calculations.

III. Domestic Developments

Several indicators suggest that the Indian economy is making resilient progress in Q1:2022-23 inspite of the drag from global spillovers, elevated inflation and some slackening of external demand as geopolitical developments take their toll on world trade. Domestically, the number of new Covid-19 cases increased[6] and an intense heatwave in major regions limited economic activity, despite which most of the high frequency indicators showed improvement especially in services sector activity (Chart 9). There were also significant improvements in domestic supply delivery time, backlogs and decline in truck freights which was reflected in the fall of index of supply chain pressures for India (ISPI)[7] (Chart 10). Our 27 factor nowcasting model (Kumar, 2020) places real GDP growth in Q1:2022-23 at 16.2 per cent, in line with the RBI's projection, but above the median forecast of professional forecasters at 14.0 per cent. Although this largely reflects base effects of the steep contraction in the corresponding quarter a year ago, the nowcast finds quarter-on-quarter positive momentum of 0.9 per cent *versus* 0.7 per cent in the previous quarter (Chart 11).

Chart 10: India's Supply Chain Pressure Index (ISPI)

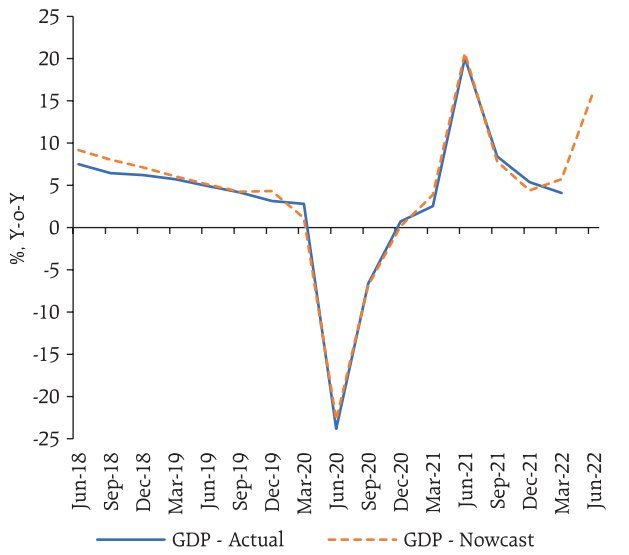


Note: Dotted line represents +/- 2 standard error of the estimates.
Sources: RBI; and Authors' own calculations.

[6] The 7-day average of new cases increased from 2574 on May 30, 2022 to 16,674 as on July 7, 2022, while the number of deaths showed a l pick-up from 20 to 29 during the same period.

[7] Constructed by extracting common factors latent in 19 domestic and global variables. For methodology, see Patra M. D, H. Behera and D. Gajbhiye (2022). "Measuring Supply Chain Pressures on India", *RBI Bulletin*, April 2022.

Chart 11: GDP - Actual and Nowcast



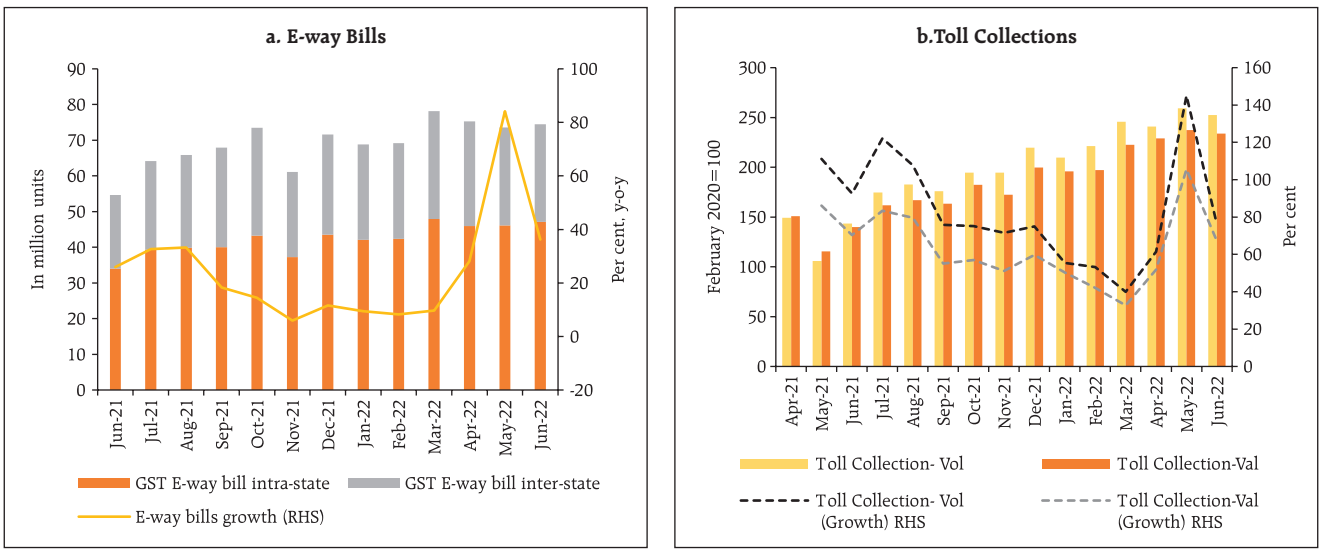
Sources: RBI; and Authors' own calculations.

Aggregate Demand

Mixed signals characterise the evolution of aggregate demand in June and July. Sequential stagnation in e-way bills, on account of moderation in inter-state e-way bills points to an ebbing of inter-state trading activity in June, even as intra-state trading remained robust (Chart 12a). Toll collections plateaued in terms of both value and volume (Chart 12b). Fuel consumption increased in June, aided by increased off-take in high speed diesel, even as petrol and aviation turbine fuel (ATF) consumption recorded a marginal dip (Chart 13a). Furthermore, the entry level passenger vehicle (PV) segment (in the range of under 3600 mm) dipped further in June, its share falling to 15.2 per cent of total PV sales, from 16.1 per cent in June 2021 (Chart 13b). Retail sales of automobiles were dampened in June by a fall in registration of non-transport vehicles, primarily two-wheelers which constitute 80 per cent of total non-transport vehicle registrations (Chart 13c). The fast moving consumer goods (FMCG) sales ebbed in June 2022, with urban FMCG demand recording a steeper decline – especially in tier 2 cities – reflecting the impact of high inflation.[8]

On the other hand, automobile sales surpassed pre-pandemic levels led by continuing improvement in passenger vehicle sales. Within automobiles, rural demand reflected buoyancy,

Chart 12: E-way Bills and Toll Collections



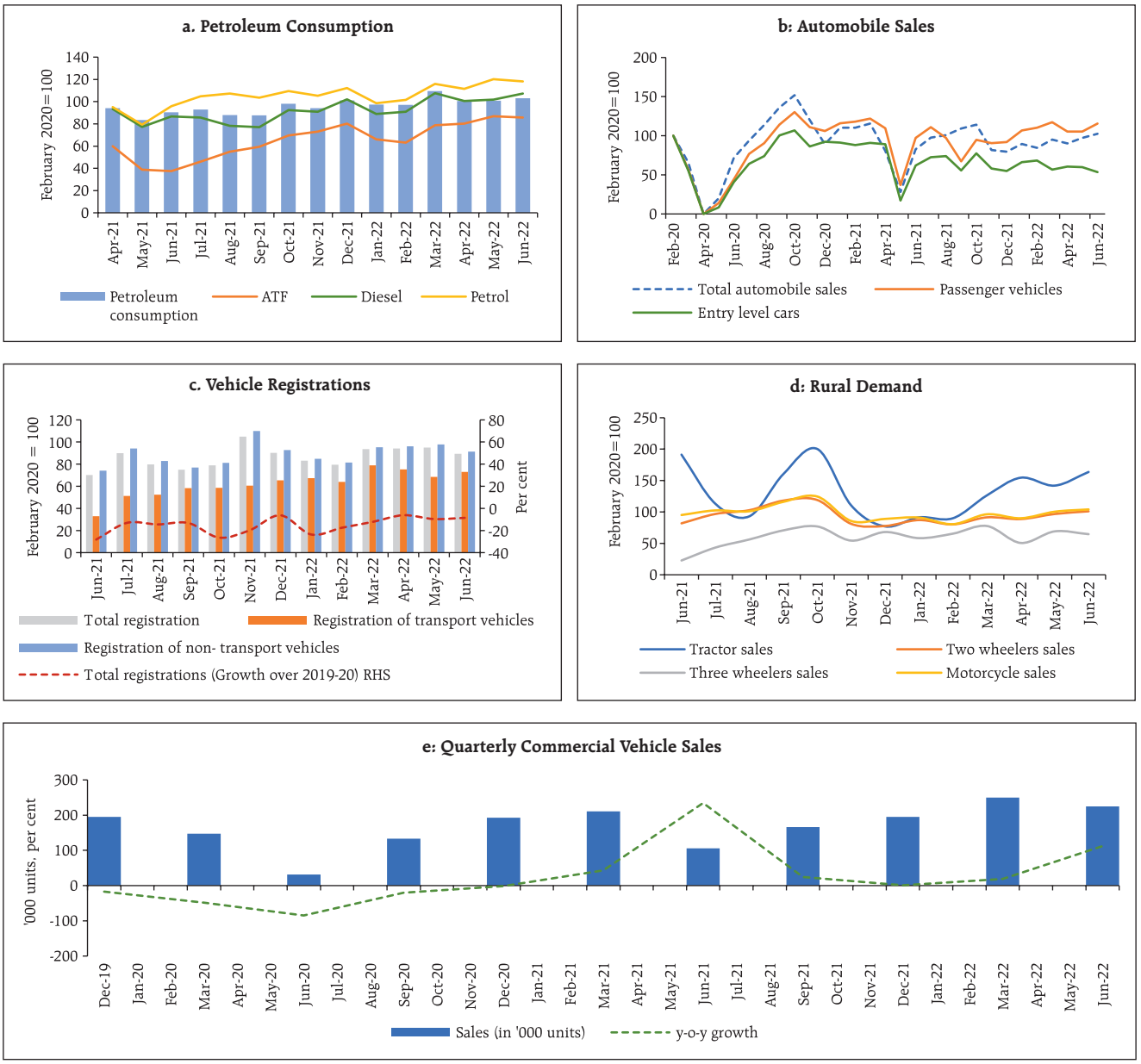
Sources: GSTN; Reserve Bank of India; and Authors' own calculations.

[8] According to retail intelligence platform Bizom, FMCG segment saw sales dropping by 0.9 per cent (m-o-m) in June following a decline of 16 per cent in April and 32 per cent in May.

with tractor sales remaining robust on the back of good returns on *Rabi* crop and government's approval of an increase in MSP for all *Kharif* crops. Domestic sales of two wheelers and motorcycle sales crossed pre-pandemic levels, although the three-wheeler segment continued to lag (Chart 13d).

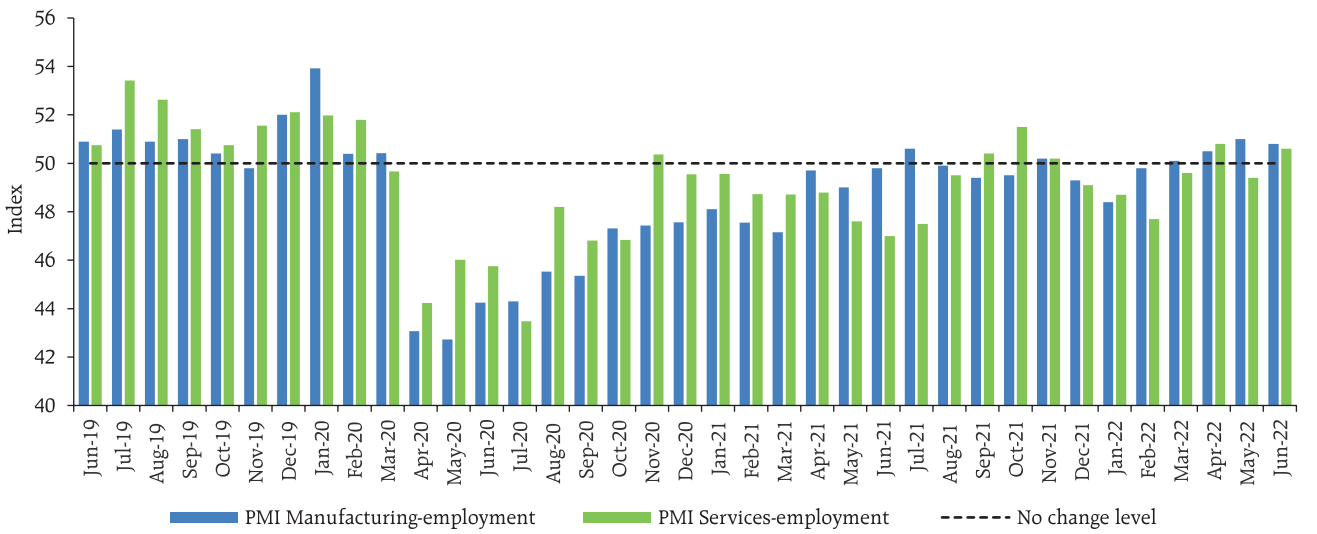
With the advancement of Southwest monsoon, the farm sector outlook remains positive. Transport sector indicator of commercial vehicle sales in Q1:2022-23, recorded growth year-on-year, as well as over corresponding pre-pandemic quarter (Apr-Jun 2019), even as it moderated sequentially (Chart 13e).

Chart 13: Automobile Sector Indicators



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

Chart 14: PMI Employment Indices



Source: S&P Global.

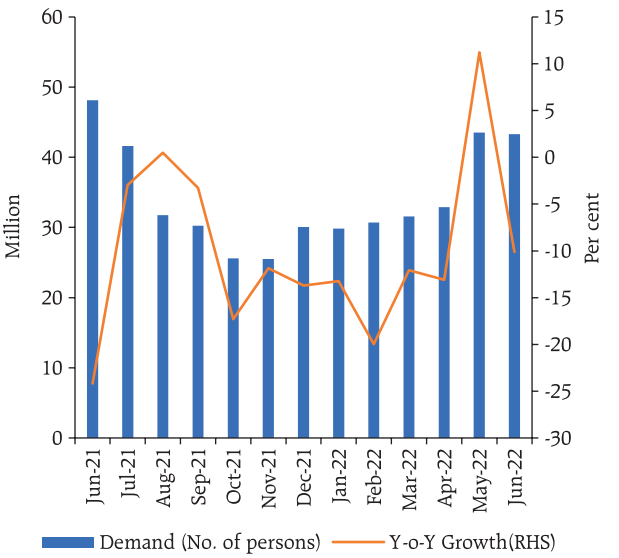
The purchasing managers' index (PMI), which is a survey-based indicator of organised sector employment, indicated sustained improvement in employment conditions in June 2022. Although manufacturing sector employment eased marginally on a sequential basis, it remained in expansionary mode. Services sector employment turned expansionary in June 2022 after contracting in the previous month (Chart 14). Organised sector employment proxied by the Naukri Jobspeak index recorded a growth of 12 per cent year-on-year in April-June 2022, with the hospitality sector showing strong growth, followed by retail, real estate, insurance and banking.

Demand for work under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) eased on a y-o-y basis in June 2022, reflecting the beginning of *Kharif* crop sowing in rural parts of the country and the consequent increase in demand for farm labour (Chart 15).

As per the household survey of the Centre for Monitoring Indian Economy (CMIE), the labour participation rate fell to 38.8 per cent in June 2022 from 39.9 per cent last month. The employment rate also moderated from 37.1 per cent in May to 35.8 per cent in June. This led to an increase in the unemployment rate from 7.1 per cent last month to 7.8 per cent in June (Chart 16). In July so far, employment conditions, however, improved as reflected in a fall in 30 day moving average unemployment numbers to 7.3 per cent as on July 15.

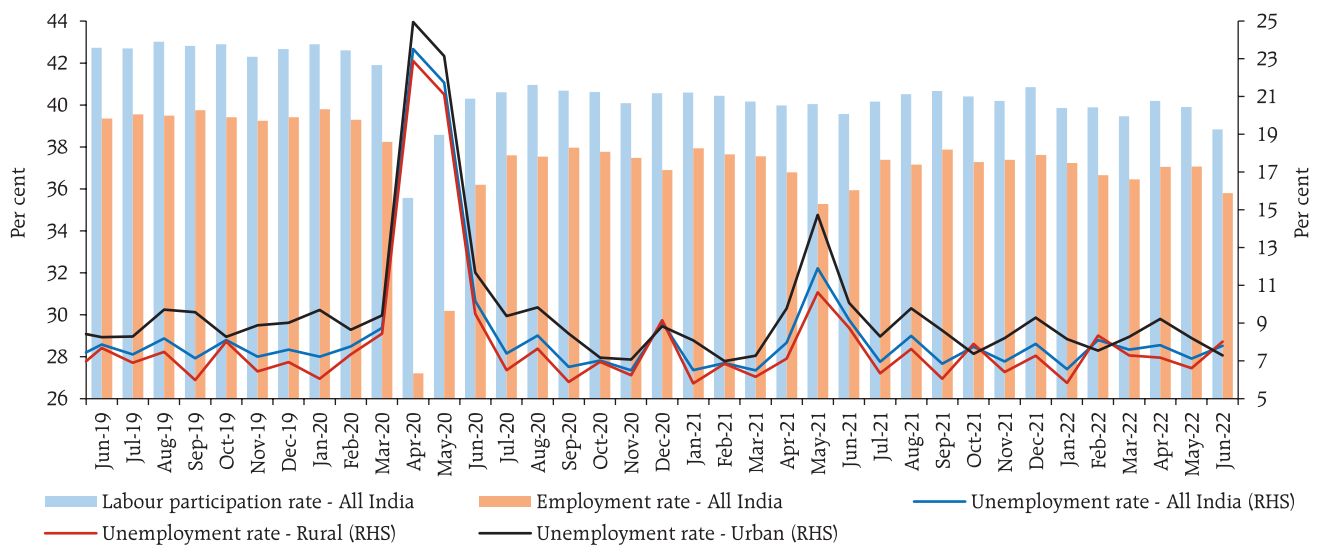
As per the preliminary data released by the Ministry of Commerce and Industry on July 4, India's merchandise exports at US$ 37.9 billion in June 2022 registered a robust growth of 16.8 per cent on a y-o-y

Chart 15: Demand for work under the MGNREGA



Source: Ministry of Rural Development.

Chart 16: Employment, Unemployment and Labour Participation Rates



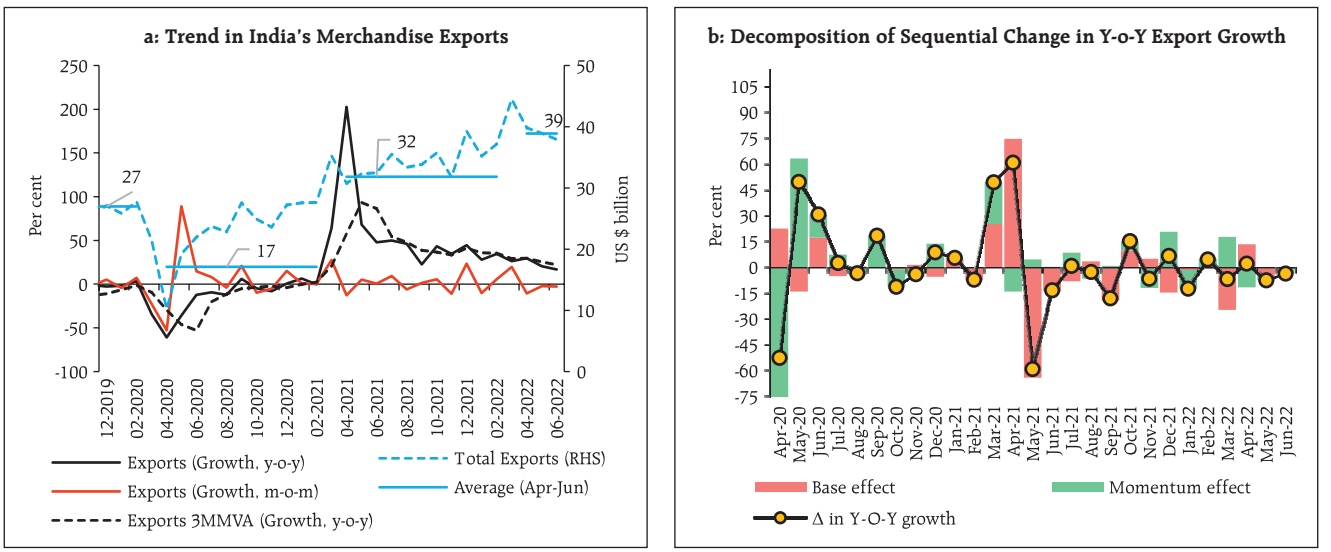
Source: CMIE.

basis (Chart 17). At US$ 116.7 billion, merchandise exports recorded the highest ever quarterly level during Q1:2022-23.

Six out of ten major commodity groups accounting for 47.6 per cent of total exports grew on a y-o-y basis in June 2022 (Chart 18).

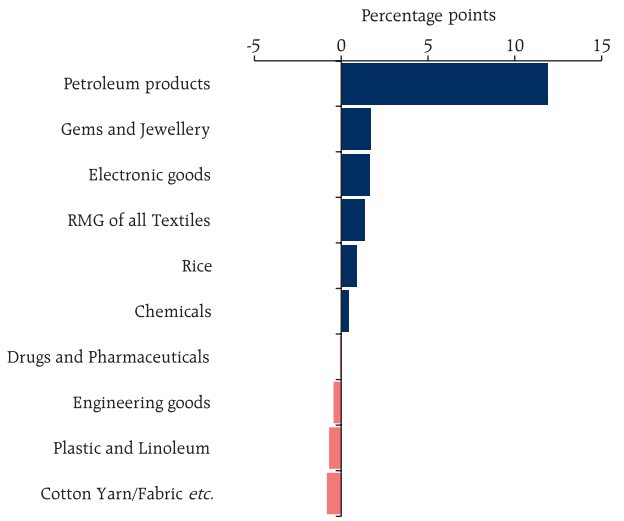
Petroleum products alone contributed 71 per cent of export growth. Exports of petroleum products to the Netherlands and Sri Lanka have increased four times during March to May 2022 over the corresponding period of the previous year (Chart 19). The Netherlands is a gateway for Indian exports to EU countries. To

Chart 17: India's Merchandise Exports – June 2022



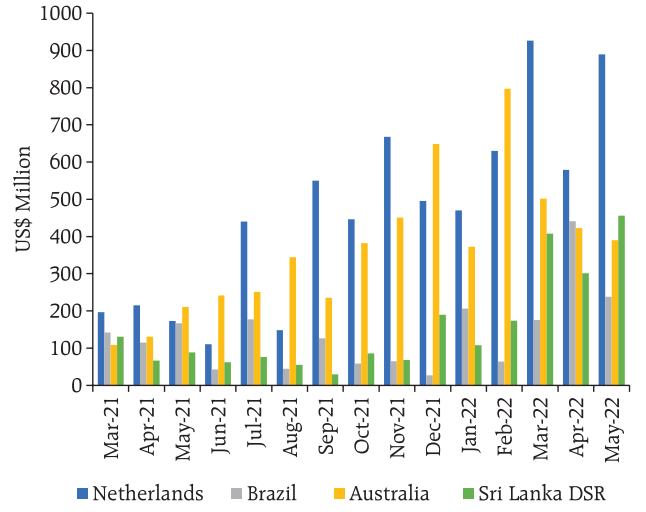
Note: Analysis based on Preliminary data.
Sources: PIB; DGCI&S; and Authors' own calculations.

Chart 18: Relative Contribution to Export Growth (June 2022 over June 2021)



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

Chart 19: Petroleum Products Exports by Destination



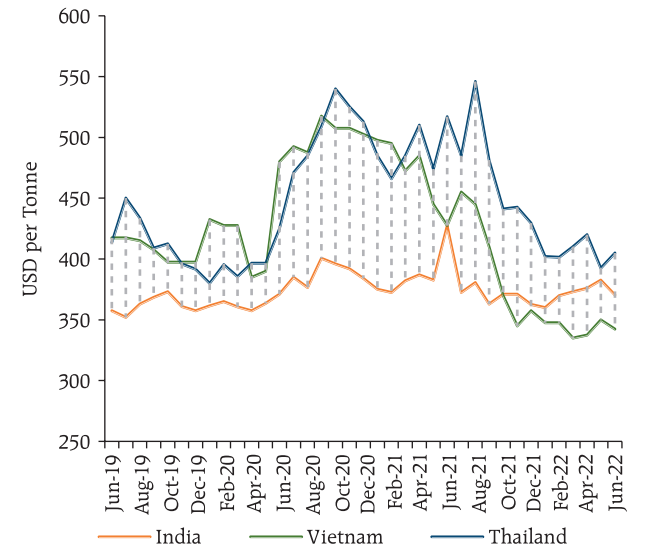
Source: DGCI&S.

ensure sufficient domestic supplies of petroleum products, the Government of India imposed cesses of ₹6 per litre and ₹13 per litre on exports of petrol and diesel, respectively[9].

With a share of 37.5 per cent in global rice exports, India's exports rose to US$ 1.03 billion in June 2022. Indian rice exports benefited from a price advantage over rice varieties sold by Vietnam and Thailand, the other major exporters (Chart 20). External demand for Indian rice was also buoyed by the appetite for wheat alternatives and an import duty cut in Bangladesh[10]. India's increasing defence cooperation with ASEAN countries like Vietnam, Malaysia and Philippines highlights the domestic defence export potential (Chart 21).

India and the EU - our second largest trading partner after the US - have recently concluded the first round of negotiations for the India-EU Trade and Investment Agreements[11], which were re-launched after a 9-year pause. India runs a trade surplus with

Chart 20: International Prices of Rice by Origin



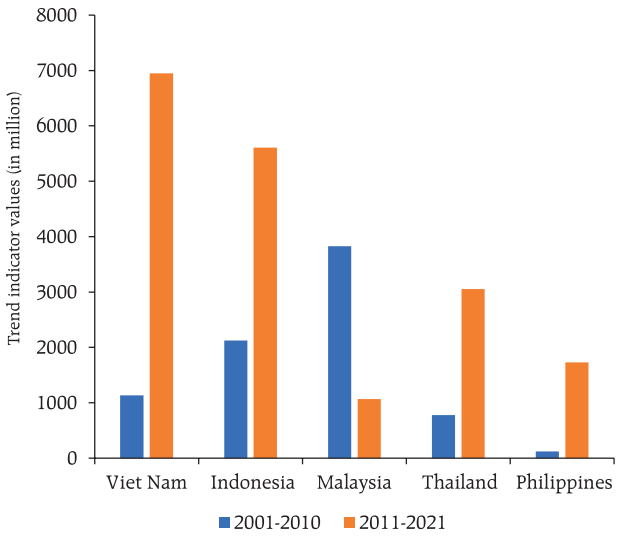
Source: Refinitve Eikon.

[9] Also, a special additional excise duty (SAED) of ₹23,250 per tonne has been imposed on domestically produced crude (with certain exemptions) and a SAED of ₹6 per litre has been imposed on exports of Aviation Turbine Fuel. See: *https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1838455*

[10] Bangladesh has cut the import duty on rice to 25 per cent from 62.5 per cent in June 2022. See: *https://www.dhakatribune.com/bangladesh/2022/06/24/duty-on-rice-imports-reduced-by-375*

[11] *https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1838839*

Chart 21: Arms Imports of ASEAN Countries



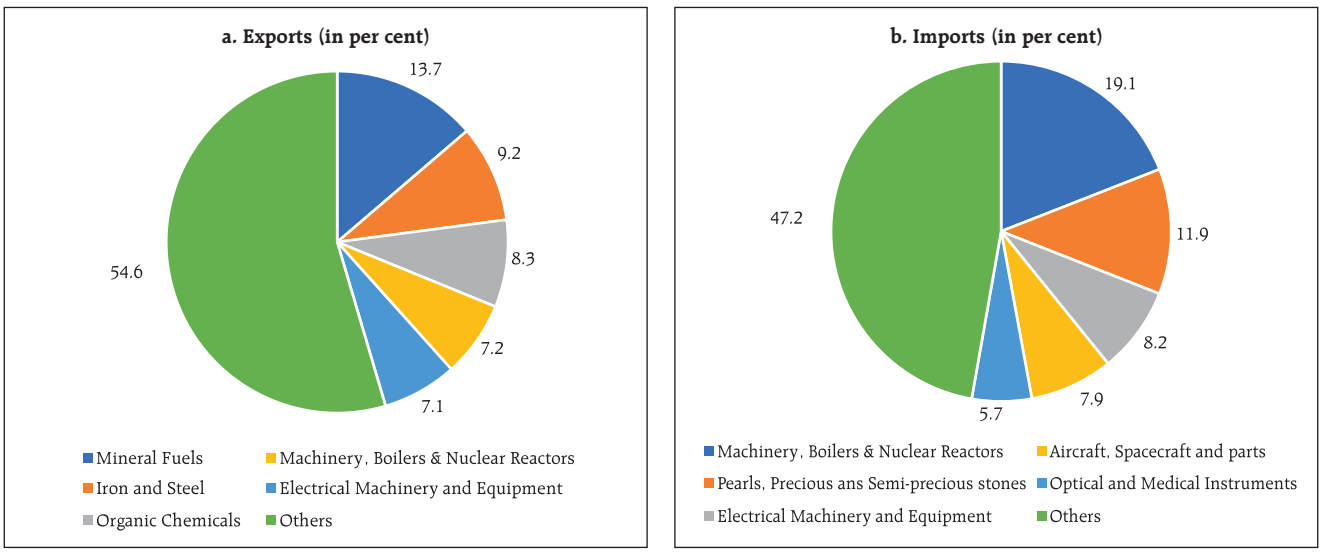
Source: SIPRI arms transfers database.

the EU, with exports at US$ 65 billion and imports at US$ 54 billion during 2021-22. India primarily exports mineral fuels, iron and steel, organic chemicals and machinery to the EU and imports machinery, pearls and precious stones, electrical equipment, aircrafts and spacecrafts and parts from the EU (Chart 22).

India's merchandise imports at US$ 63.6 billion surged to their highest monthly level in June 2022, growing by 51.0 per cent on a y-o-y basis (Chart 23). Non-oil non-gold imports at US$ 40.2 billion registered robust growth in June 2022. Petroleum products and coal, coke and briquettes, accounting for 42.7 per cent of total imports, contributed 68 per cent of total import growth (Chart 24).

Imports of petroleum and its products rose by 94.2 per cent in value and 20.5 per cent in volume terms in June 2022 (Chart 25). Excise duty exemption for biofuels has been expanded to encourage the blending of higher proportions of ethanol and vegetable oil with gasoline and diesel.[12] A *Green Hydrogen Policy* has been announced to achieve the target of net-zero carbon emission by 2070. India plans to introduce a

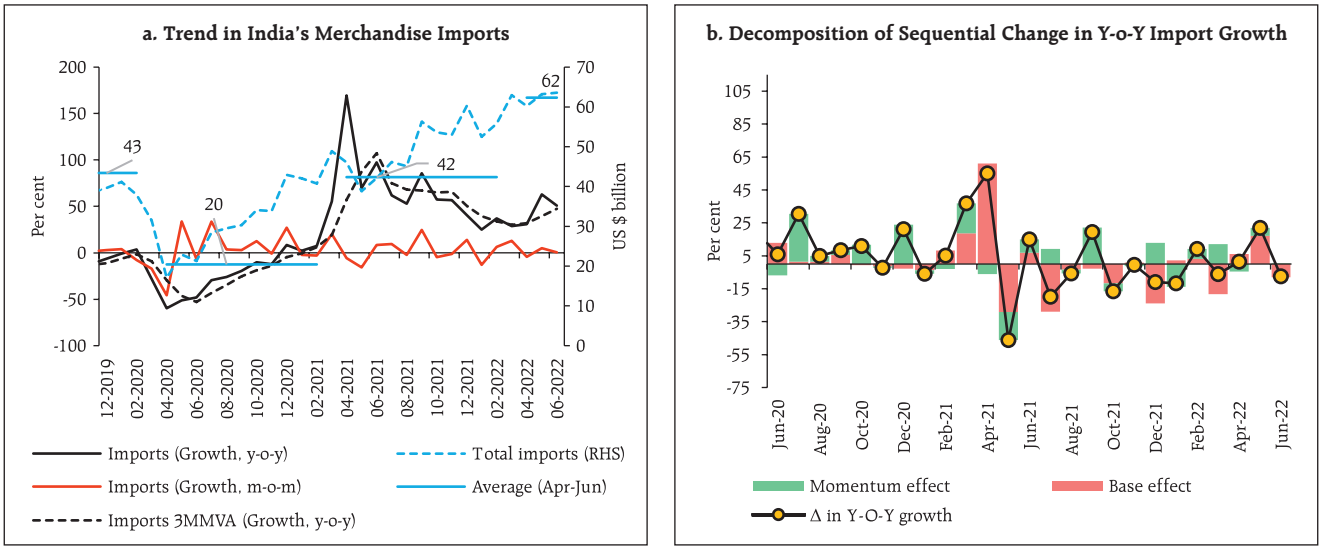
Chart 22: India's Trade Profile with the EU (2021-22)



Source: DGCI&S.

[12] The tax exemption will be applicable to an ethanol portion of 12-15 per cent blended with gasoline, up from 10per cent previously. For diesel, the exemption will apply to a 20per cent portion of alkyl esters of long chain fatty acids obtained from vegetable oils, as per the government release (*https://www.business-standard.com/article/economy-policy/india-expands-biofuel-tax-benefits-for-ethanol-and-vegetable-oils-122070500458_1.html*).

Chart 23: India's Merchandise Imports – June 2022

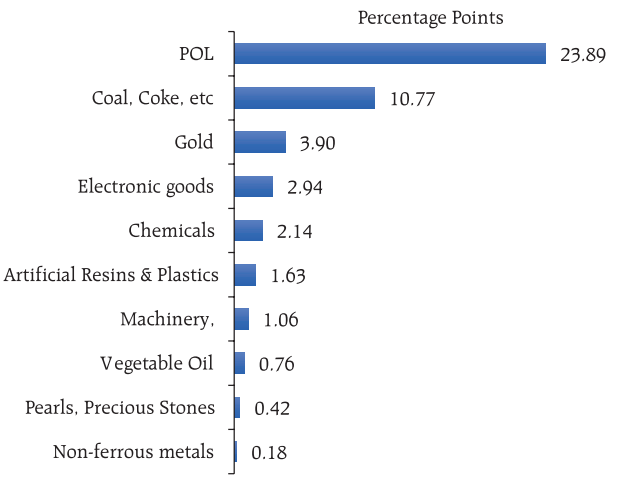


Note: Analysis based on Preliminary data.
Sources: PIB; DGCI&S; and Authors' own calculations.

production-linked incentive (PLI) scheme to encourage manufacturing of electrolysers to extract hydrogen from water.[13]

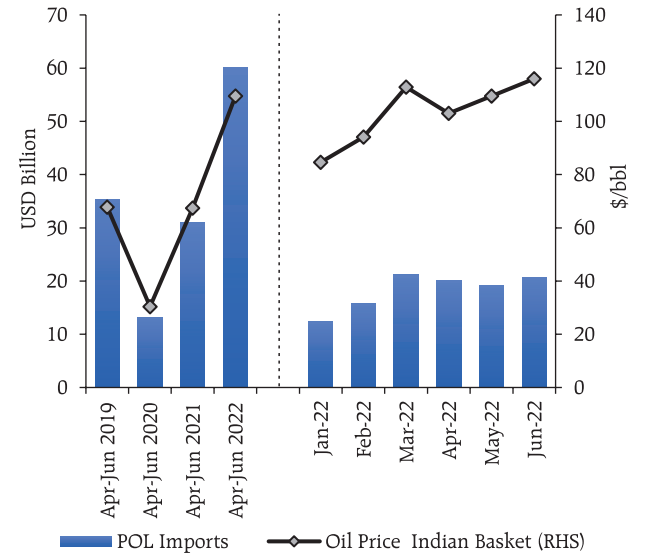
Gold imports at US$ 2.6 billion in June 2022 were almost half the level of US$ 6.0 billion in May 2022, even though they grew by 169.4 per cent on a y-o-y basis. As international gold prices remained stable in June, the entire increase was on account of an increase in volume. According to the World Gold Council, the fall in gold demand in June marks the end of the wedding season. The Government of India has recently increased the customs duty on gold from

Chart 24: Relative Contribution to Import Growth (June 2022 *vis-à-vis* June 2021)



Source: PIB and DGCI&S.

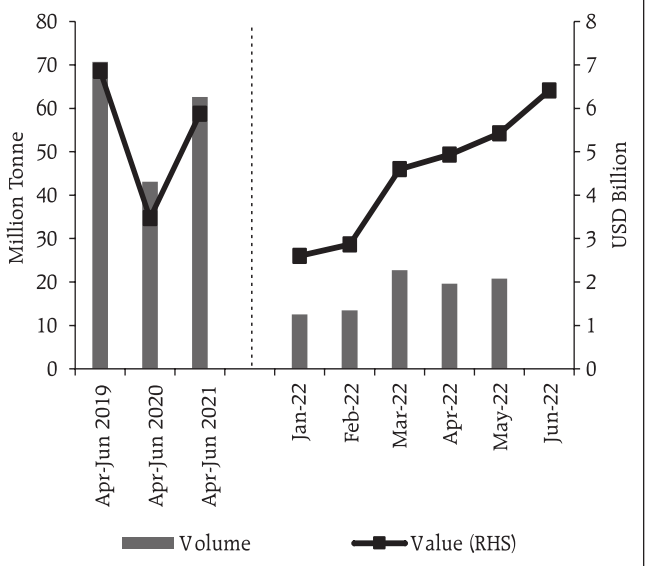
Chart 25: Petroleum Imports of India



Source: PPAC.

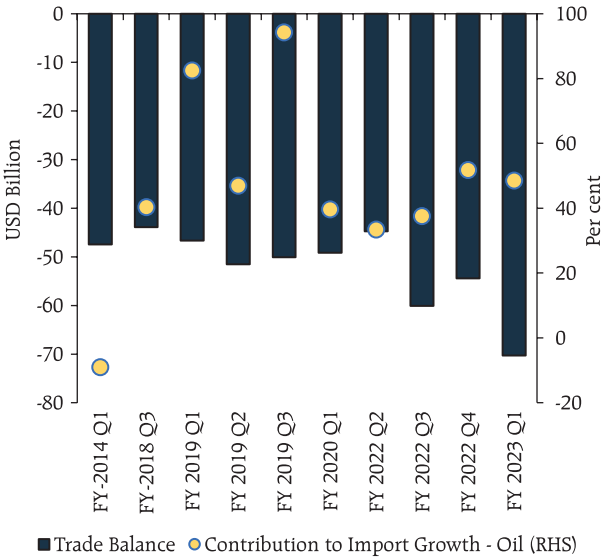
[13] *https://www.businessinsider.in/policy/news/green-hydrogen-and-indias-new-policy-around-it/articleshow/91251724.cms*

Chart 26: India's Coal Imports



Source: PIB and DGCI&S.

Chart 27: India's Trade Balance



Source: CEIC.

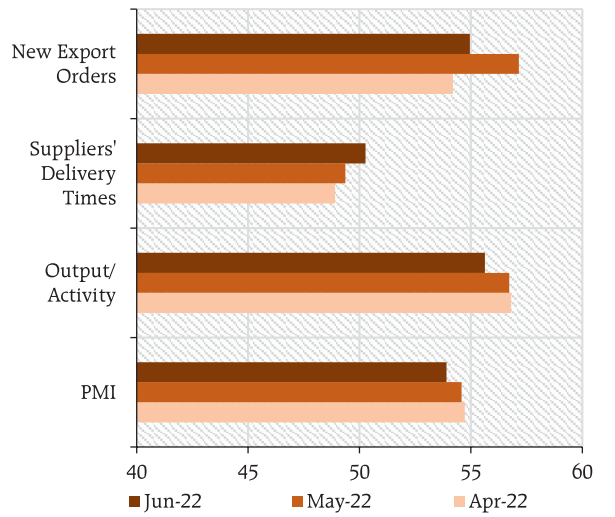
10.75 per cent to 15 per cent to curb the surge in gold imports.[14]

Imports of coal jumped by 241.8 per cent on a y-o-y basis in June 2022, rising for the fifth consecutive month (Chart 26). With the rapidly increasing demand for electricity and a shortage of domestic coal supply, the government has decided to put its import substitution plan for coal on hold till domestic production of the fuel touches the 1 billion tonne mark.[15]

India's merchandise trade deficit widened to its highest monthly level of US$ 25.6 billion in June 2022 as against a deficit of US$ 9.6 billion a year ago and US$ 24.3 billion in May 2022. On a quarterly basis too, Q1:2022-23 recorded the highest ever trade deficit of US$ 70.3 billion (Chart 27).

Going forward, India's export performance is expected to improve as new export orders with Indian manufacturers recorded a third consecutive monthly increase and suppliers' delivery times improved for the first time in 15 months[16] (Chart 28). Supply disruptions are expected to ease further with vendor performance improving in China after lengthening

Chart 28: Forward Looking Indicators of Export Performance - India



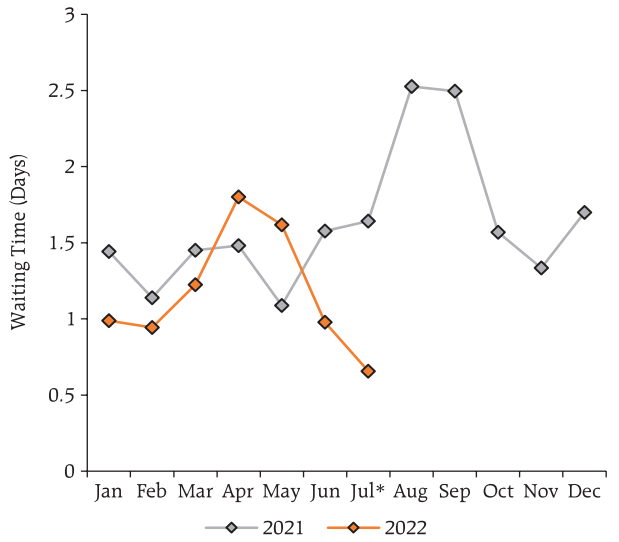
Source: IHS markit.

[14] https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1838455

[15] *https://www.financialexpress.com/economy/no-coal-import-curbs-for-now/2581266/*

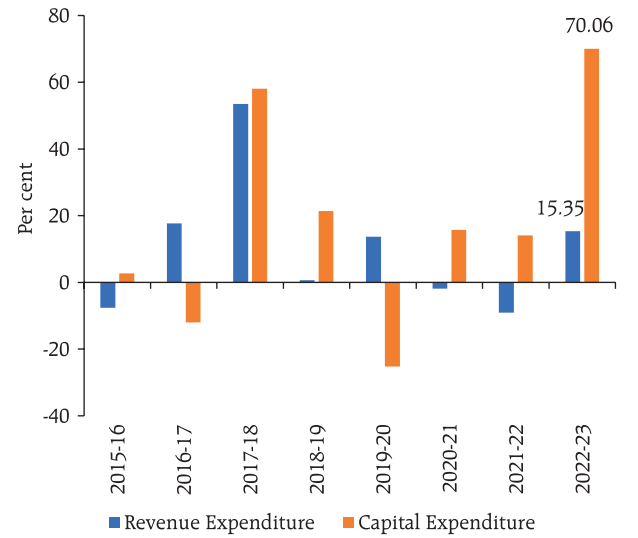
[16] *https://connect.ihsmarkit.com/document/show/phoenix/4476114?connectPath=Search&searchSessionId=32c8281b-2624-4bc5-9229-6bd32c130750.*

Chart 29: Container Waiting Time – Shanghai



* Data till July 10, 2022
Source: Refinitive eikon.

Chart 30: Expenditure Growth during April-May



Source: Controller General of Accounts (CGA).

delivery time for 24 straight months since June 2020[17]. The easing of logistics pressures was also reflected in improved port operations and reduced container waiting time in Shanghai (Chart 29).

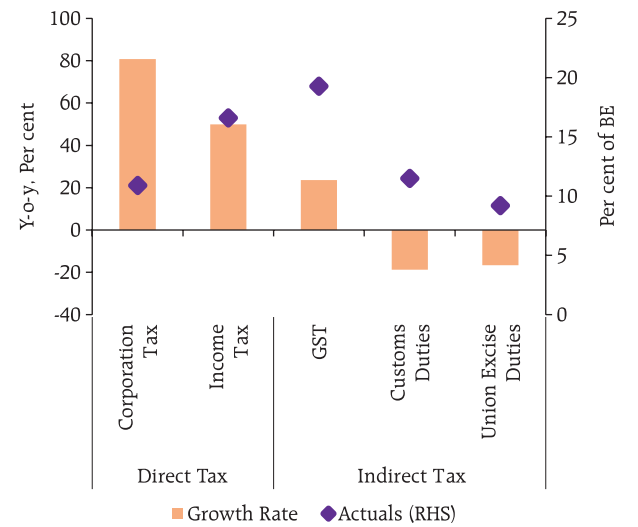
During April-May 2022, the Union government frontloaded capex, with the y-o-y growth in capital spending of 70.1 per cent turning out to be the highest in several years (Chart 30). Consequently, the fiscal deficit widened to 12.3 per cent of budget estimates (BE) during the period, as compared with 8.2 per cent of BE a year ago.

On the receipts front, tax collections remained buoyant, driven by a growth of 60.2 per cent in direct tax revenue. Indirect tax collections reported a more modest increase of 9.0 per cent – double digit growth in goods and services tax (GST) was offset by a contraction in customs and excise duty collections (Chart 31).

GST collections (Centre *plus* states) stood at ₹1.45 lakh crore in June 2022, the second highest since the inception of GST. This also marks the fourth consecutive month in which GST collections have surpassed ₹1.4 lakh crore (Chart 32). In Q1:2022-23, the pick-up in the year-on-year growth in GST revenues was driven by a positive momentum and a favourable base effect.

Revenue collections of the States rose by 22.2 per cent in April 2022 due to increase in tax

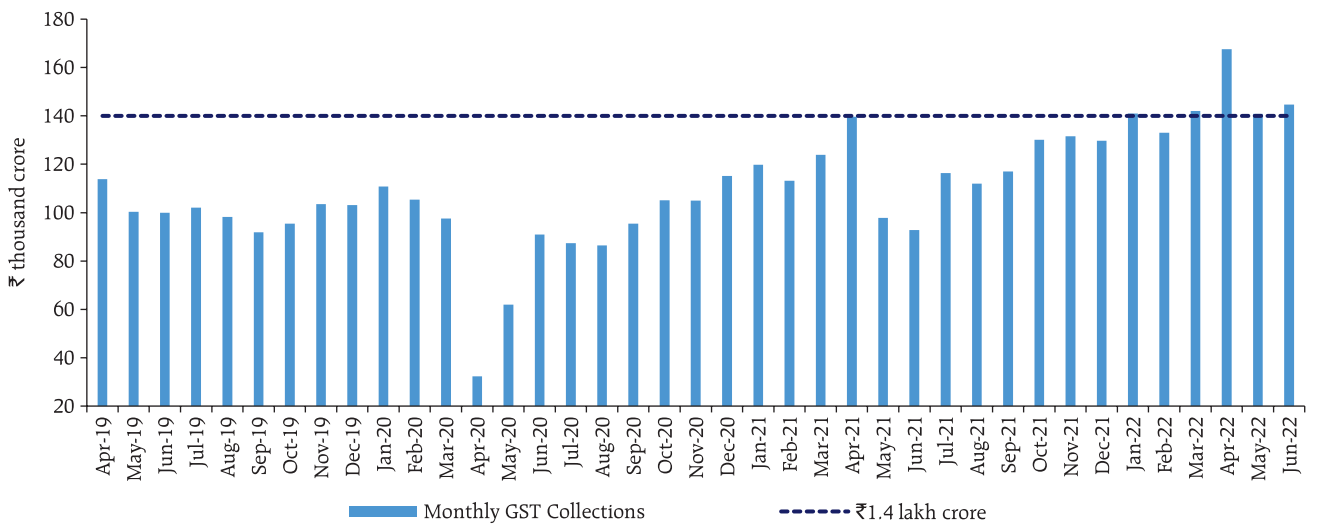
Chart 31: Tax Revenue during April-May 2022-23



Sources: Union Budget Documents; and CGA.

[17] *https://connect.ihsmarkit.com/master-viewer/show/phoenix/4476057?connectPath=Search&searchSessionId=7b2dfc89-da75-4919-b22e-417dbb87939b*

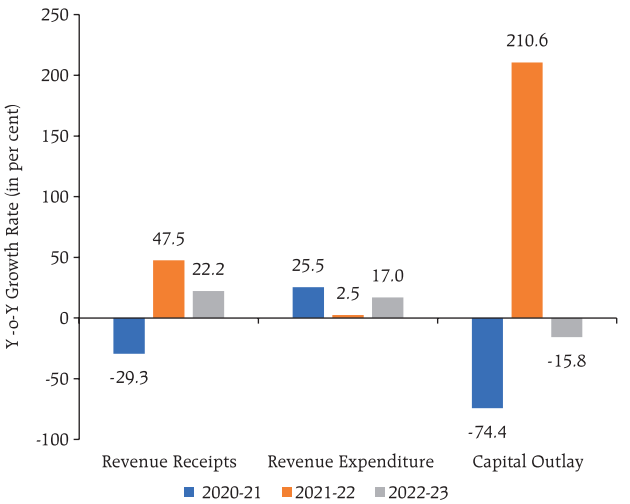
Chart 32: Monthly GST Revenue



Sources: PIB Press Release.

revenues across all sub-components and higher non-tax revenues (Chart 33). While revenue expenditure increased sharply, capital outlay declined. The GST Council extended the period for the levy of the GST compensation cess up to March 31, 2026 for repaying back-to-back loans taken during the pandemic to meet the shortfall in compensation cess collection. In its 47th meeting held on June 29, 2022, the GST Council made recommendations relating to changes in GST rates and laws and procedures[18] that will be made effective from July 18, 2022.

Chart 33: States' Revenue and Expenditure Growth during April



Note: The data pertain to 24 States.
Source: Comptroller and Auditor General of India.

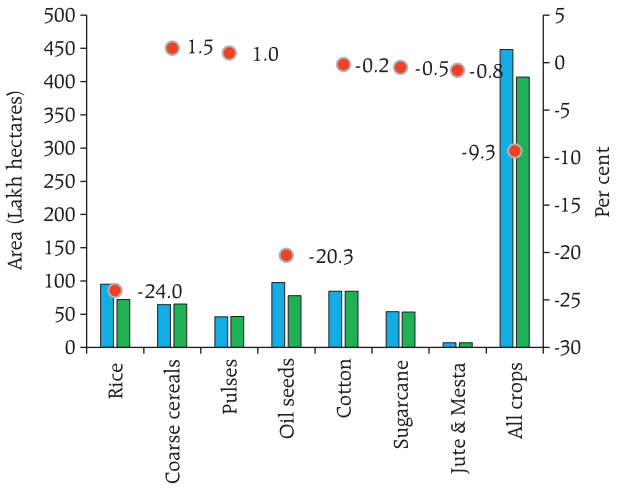
Aggregate Supply

Crop sowing in the ongoing *Kharif* season has slowed due to the uneven distribution of the south-west monsoon across the country. As on July 8, 2022, the total sown area touched 407 lakh hectares - 9.3 per cent lower in comparison with the previous year's level. Among major crops, all crops except coarse cereals and pulses registered negative year-on-year growth (Chart 34).

The progress of the south-west monsoon has been slow and uneven during the month of June with an 8 per cent reduction in cumulative rainfall from the normal (1970-2020) as of end-June. Furthermore, June rainfall is 8 per cent lower than the historic median level (1901-2021) [Chart 35]. Adequate precipitation and an even spatial spread during July and August would be critical for crop prospects. The pickup in rainfall activity in July augurs well for the outlook. The monsoon covered the entire country as

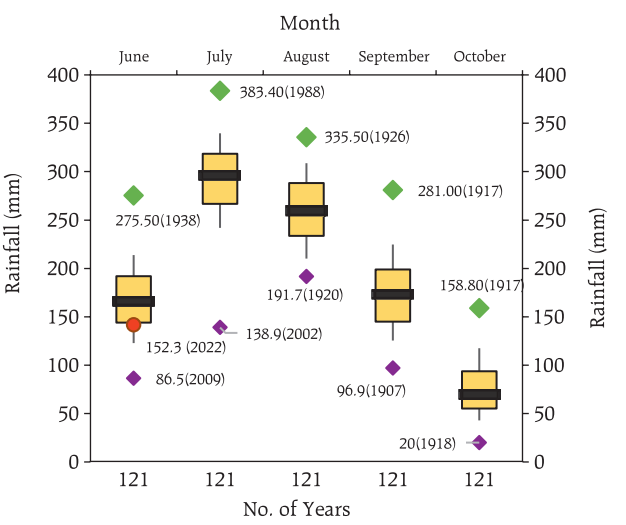
[18] For details, see https://pib.gov.in/Pressreleaseshare.aspx?PRID=1838020

Chart 34: Progress of Kharif Sowing (as on July 8, 2022)



Source: Ministry of Agriculture and Farmers' Welfare.

Chart 35: Monthly South-West Monsoon Rainfall: All-India (1901-2022)

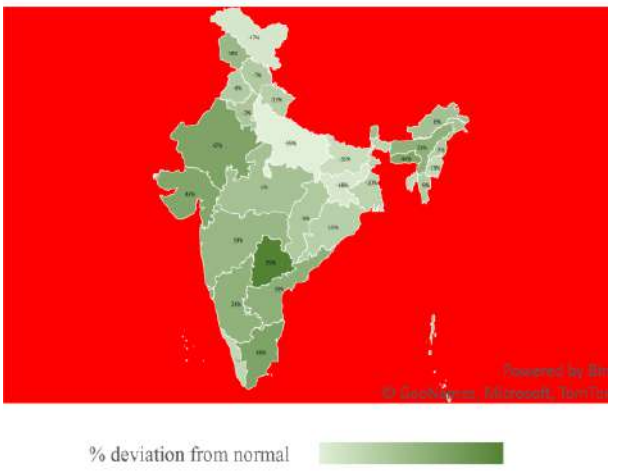


Source: IMD.

on July 2, 2022. By July 11, the cumulative seasonal rainfall reached 7 per cent above the period average (LPA). While south peninsula and central India recorded positive deviation from normal rainfall,it was negative for north west India as well as east and north east India. (Chart 36 a).

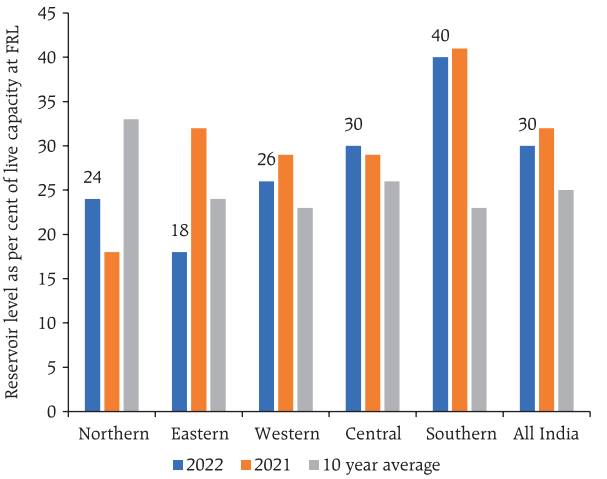
According to the Indian Meteorological Department's (IMD) latest forecast, monthly rainfall in July is expected to be normal [94 to 106 per cent of the LPA which is 280.4 mm]. The spatial distribution is predicted to be normal and above normal for most parts of north India, central India and southern Peninsula. However, normal to below normal rainfall is forecast for east and north-east India, adjacent

Chart 36 a: State-wise Variation of Southwest Monsoon (as on July 11, 2022)



Source: IMD.

Chart 36 b: Reservoir Levels (as on July 07, 2022)



Source: Central Water Commission (CWC).

areas to east and central India and some parts of the southern peninsula.

The total live storage in 143 major reservoirs as on July 07, 2022 at 30 per cent of the full reservoir level (FRL) was lower than 32 per cent during the previous year, but higher than the decadal average of 25 per cent (Chart 36 b).

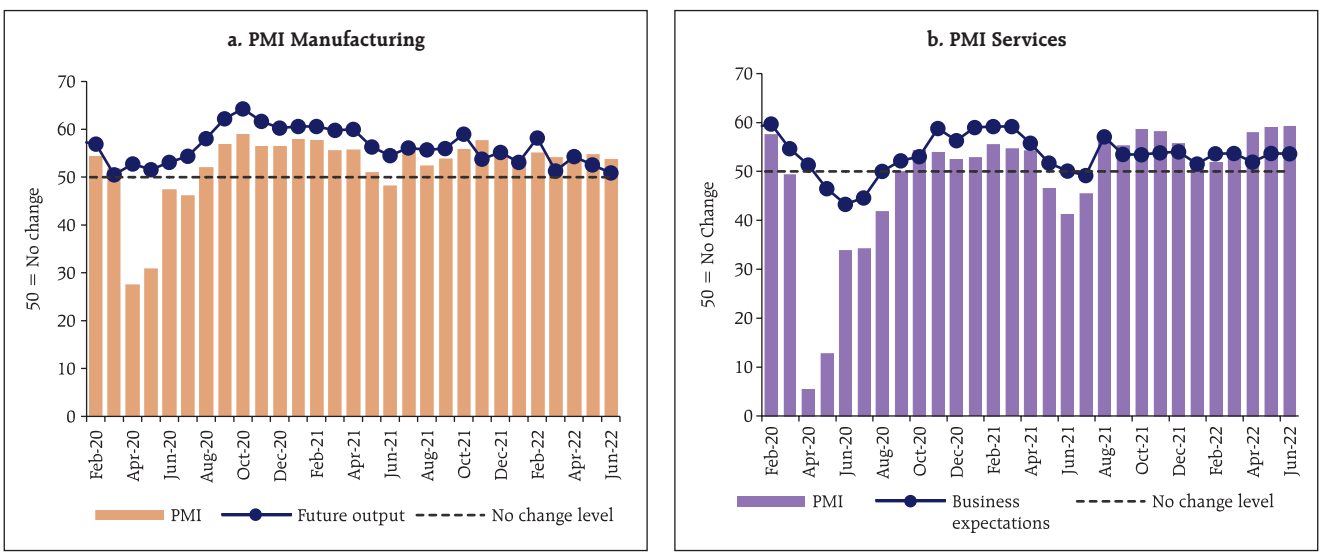
Procurement of 187.9 lakh tonnes of wheat has been achieved so far in the *Rabi* marketing season 2022-23, which is 57.7 per cent of the initial target (444 lakh tonnes) and 5.1 per cent lower than the revised target (195 lakh tonnes). As on July 11, the cumulative procurement of rice at 582 lakh tonnes (*Kharif* marketing season 2021-22) is the same as that in the previous year. The stocks to norm ratio of rice is 3.5 times higher than the quarterly buffer norm for July-September while in the case of wheat, the stock levels are marginally higher (1.03 times).

In the industrial sector, the headline manufacturing PMI remained in expansionary mode at 53.9 in June 2022 *albeit* moderating from 54.6 recorded a month ago. Pressures on input costs continued to dent future output, which declined to a 27-month low. PMI services, on the other hand, accelerated to 59.2 in June from 58.9 in May 2022, expanding at the fastest pace in more than 11 years. The expansion in services activity was driven by an improvement in demand (Chart 37).

In the services sector, transport indicators recorded robust growth, with railways freight traffic recording growth over both pre-pandemic levels and over a year ago (11.3 per cent y-o-y) in June 2022 (Chart 38a). An increase in freight movement was recorded in respect of coal and cement, even as iron ore and pig iron declined on a high base a year ago. Cargo at major ports recorded expansion by 13.6 per cent (y-o-y) in June, attributed to increase in coking coal and thermal coal freight, and other miscellaneous cargo which together accounts for about 39 per cent of total cargo (Chart 38b).

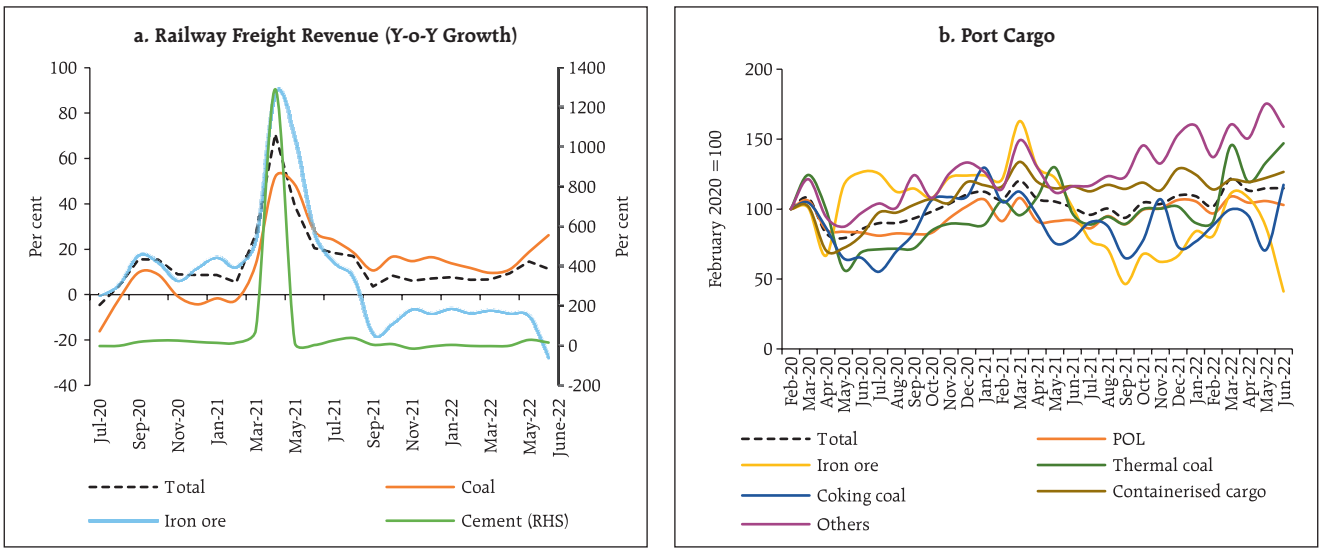
Construction sector activity continued on an uptrend in May-June 2022, with cement production and steel consumption recording sustained growth over pre-pandemic levels (Chart 39). The impact of

Chart 37: Purchasing Managers' Index



Source: S&P Global.

Chart 38: Railway and Cargo Traffic

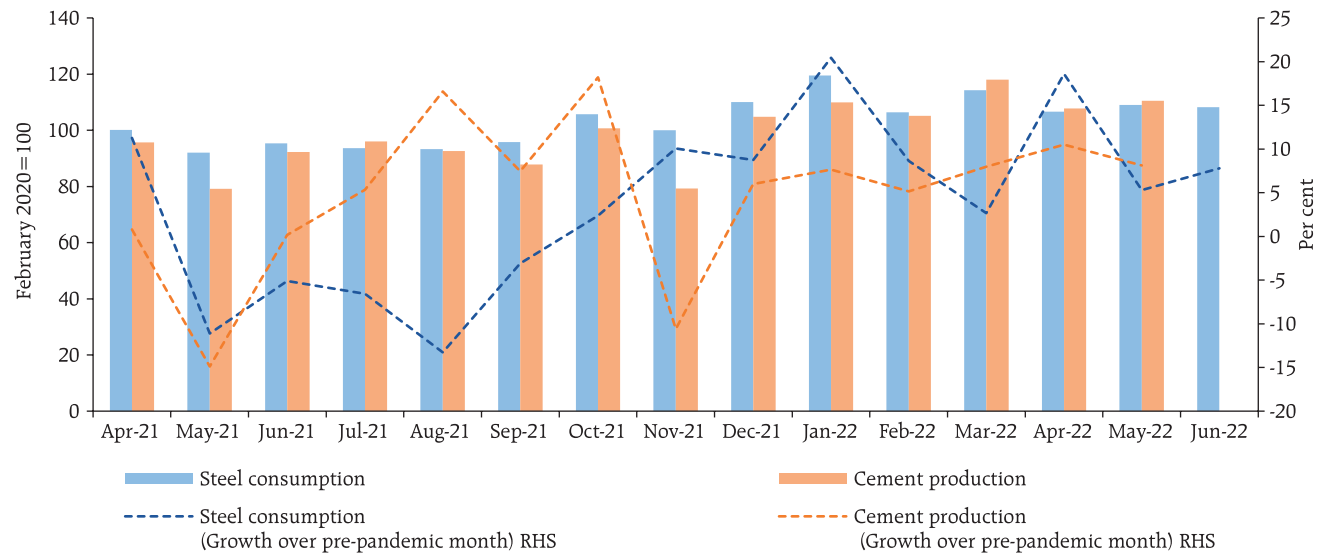


Source: Indian Ports Association.

rising input costs was muted as demand outstripped supply, reflected in capacity utilisation increasing to about 70.0 per cent for the cement industry in June 2022[19].

Activity in the aviation sector moderated in June 2022, with the domestic passenger segment contracting in relation to the previous month, even as international passenger traffic recorded double digit growth which has been maintained in July so far. The

Chart 39: Steel Consumption and Cement Production



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

[19] Indian Express, June 20, 2022.

Table 1: High Frequency Indicators- Services

Sector	Indicator	High Frequency Indicators- Services Growth (y-o-y, per cent)				Growth over 2019		
		Mar-22	Apr-22	May-22	Jun-22	Apr-22/ Apr-19	May-22/ May-19	Jun-22/ Jun 19
Urban Demand	Passenger Vehicles Sales	-3.9	-3.8	185.1	19.1	1.6	10.6	31.6
Rural Demand	Two Wheelers Sales	-20.9	15.4	253.2	23.4	-29.9	-27.4	-20.7
	Three Wheelers Sales	0.5	51.1	2161.6	183.9	-54.7	-44.7	-48.5
	Tractor Sales	-14.3	40.6	47.4	-14.4	55.5	41.1	24.5
Trade, hotels, transport, communication	Commercial Vehicles Sales	18.8	112.2			7.8		
	Railway Freight Traffic	6.7	9.4	14.6	11.3	20.9	25.5	23.7
	Port Cargo Traffic	0.7	5.6	10.2	12.4	8.1	11.4	14.7
	Domestic Air Cargo Traffic	-1.0	7.9	54.7		2.7	1.9	
	International Air Cargo Traffic	1.1	-0.9	-4.6		-5.2	-13.6	
	Domestic Air Passenger Traffic	37.7	87.8	474.7		-1.5	-2.0	
	International Air Passenger Traffic	105.7	155.6	722.8		-36.6	-28.0	
	GST E-way Bills (Total)	9.7	28.0	84.1	36.2	43.3	35.6	49.7
	GST E-way Bills (Intra State)	11.8	28.4	83.3	38.6	50.8	45.5	58.7
	GST E-way Bills (Inter State)	6.6	27.4	85.5	32.2	32.9	21.8	36.4
	Tourist Arrivals	177.9	465.8			-49.3		
Construction	Steel Consumption	0.7	1.8	18.6	13.3	18.6	5.3	7.8
	Cement Production	9.0	7.4	26.3		8.3	10.9	
PMI Index	Manufacturing	54.0	54.7	54.6	53.9			
	Services	53.6	57.9	58.9	59.2			

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

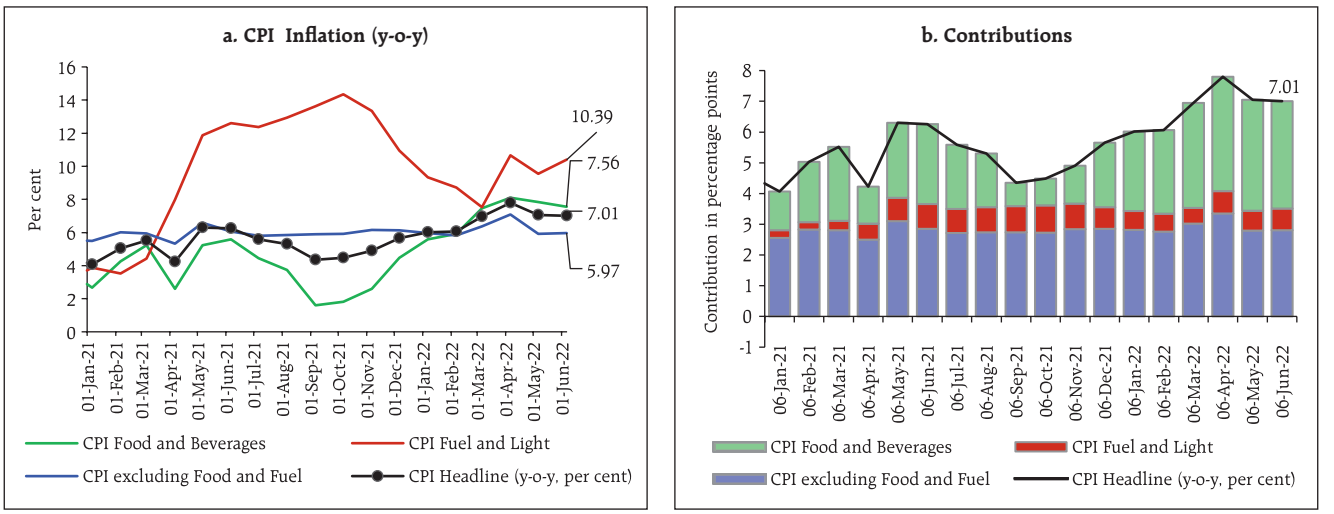
cargo segment fared better, recording growth over May for both domestic and international segments. In July (up to 11), activity in the domestic passenger and cargo segment contracted m-o-m reflecting the impact of the monsoon which put on hold travel plans for work and leisure (Table 1).

Inflation

The provisional data released by the National Statistical Office (NSO) on July 12, 2022 showed that inflation, measured by year on year (y-o-y) changes in the all-India consumer price index (CPI), eased marginally in June (7.01 per cent) relative to its reading a month ago (Chart 40a). Over the previous month, the index increased by 52 bps but it was offset by a favourable base effect (month-on-month change in prices a year ago) of 56 bps, leading to the decline in headline inflation by 3 bps between May and June.

The month-over-month (m-o-m) increase in prices of food and beverages group was of the order of 0.9 per cent, 1.0 per cent for the fuel group and only 0.1 per cent for the 'core' category. At the sub-group level, m-o-m price increases were significant in the case of vegetables and eggs whereas prices declined in the case of oils and fats, fruits, pulses, and transport and communication within the miscellaneous group (Chart 41).

Chart 40: Trends and Drivers of CPI Inflation

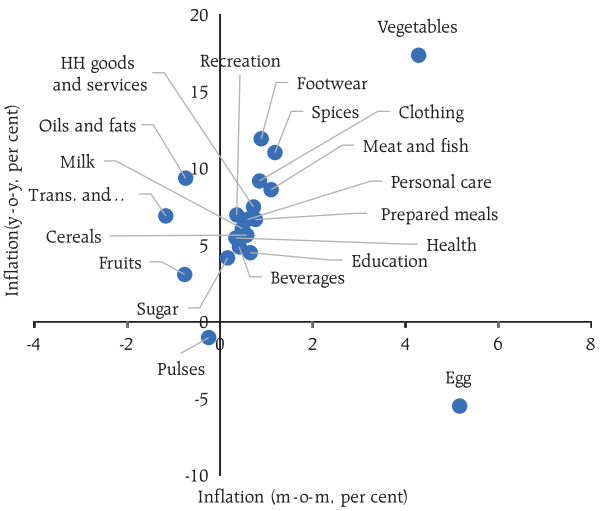


Note: CPI inflation for April-May 2021 was computed based on imputed CPI indices for April-May 2020.
Sources: National Statistical Office (NSO); and RBI staff estimates.

In June, there was a marginal decline in the contribution of the food group to overall CPI inflation (Chart 40b), stemming from softer price changes (y-o-y) in respect of edible oils, eggs, vegetables, pulses, sugar and prepared meals. On the other hand, inflation edged up for cereals, meat, fish, milk, fruits and spices (Chart 42).

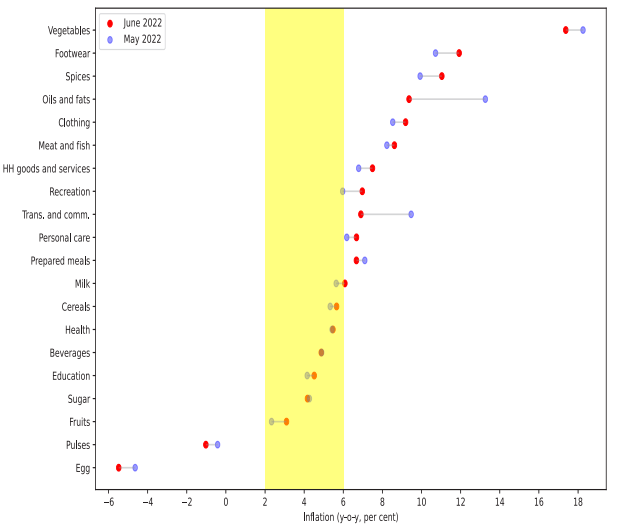
The fuel group (weight of 6.84 per cent in the CPI basket) contributed 10.0 per cent of headline inflation in June, with inflation in the category edging up from 9.5 per cent in May to 10.4 per cent in June. There was a sharp increase in kerosene and LPG prices. Electricity prices remained in deflation.

Chart 41: Inflation Across Sub-groups: m-o-m *versus* y-o-y



Sources: MOSPI; and RBI staff estimates.

Chart 42: Inflation (y-o-y) in June and May 2022

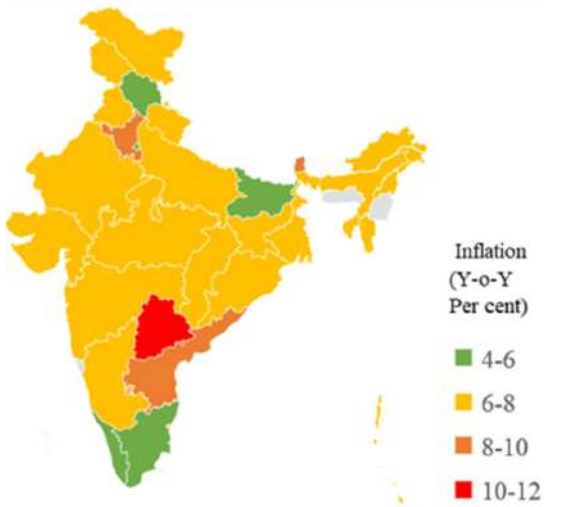


Sources: MOSPI; and RBI staff estimates.

Core inflation increased marginally to 6.0 per cent in June from 5.9 per cent in May, primarily under sub-groups such as pan, tobacco and intoxicants, clothing and footwear, recreation, amusement, household goods and services, education, and personal care and effects. On the other hand, inflation in respect of transport and communication recorded a sharp moderation due to a fall in petrol and diesel prices on account of the full direct impact of the cut in excise duties in May.

In terms of spatial distribution, Telangana, Haryana, Sikkim and Andhra Pradesh experienced high inflation in excess of 8 per cent whereas Bihar, Tamil Nadu, Kerala and Himachal Pradesh recorded inflation in the range of 4-6 per cent (Chart 43).

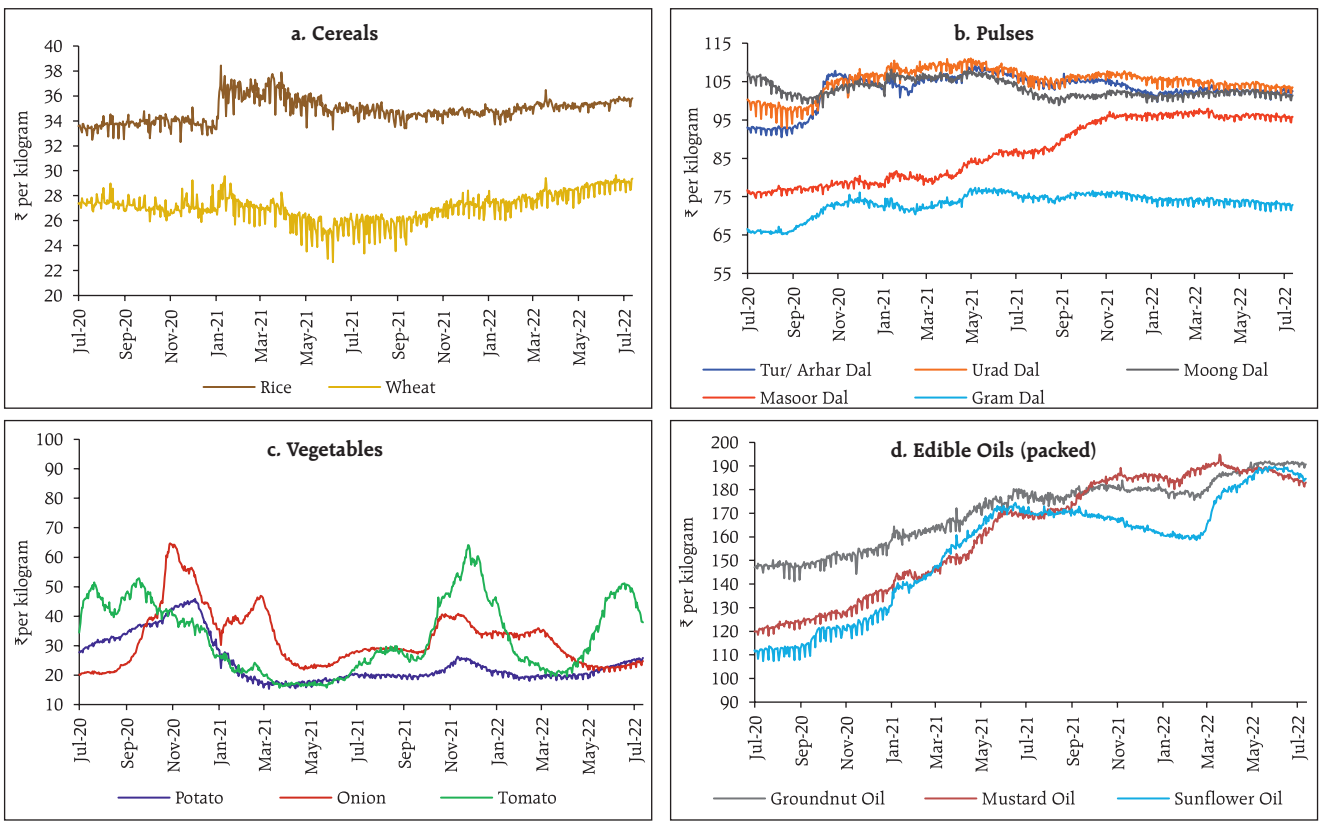
Chart 43: Spatial Distribution of Inflation (CPI-Combined, y-o-y)



Sources: MOSPI; and RBI staff estimates.

High frequency food prices data from the Ministry of Consumer Affairs, Food and Public Distribution (Department of Consumer Affairs) for July so far (July 1-12, 2022) indicate an increase in cereals prices, primarily driven by rice. Pulses prices, other than *tur*, declined marginally. Edible oil prices registered a

Chart 44: DCA Essential Commodity Prices



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

broad-based decline in line with falling international prices. Among key vegetables, onion and potato prices have edged up, while tomato prices have plunged (Chart 44).

Retail selling prices of petrol and diesel in the four major metros remained steady in July so far (until July 12). Kerosene prices increased sharply while LPG prices edged up (Table 2).

Table 2: Petroleum Products Prices

Item	Unit	Domestic Prices			Month-over-month (per cent)	
		July-21	June-22	July-22^	June-22	July-22
Petrol	₹/litre	102.81	104.18	104.18	-5.4	0.0
Diesel	₹/litre	93.51	93.48	93.48	-4.9	0.0
Kerosene (subsidised)	₹/litre	33.34	61.99	71.44	5.4	15.2
LPG (non-subsidised)	₹/cylinder	845.13	1013.25	1042.42	1.1	2.9

^ : For the period July 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.

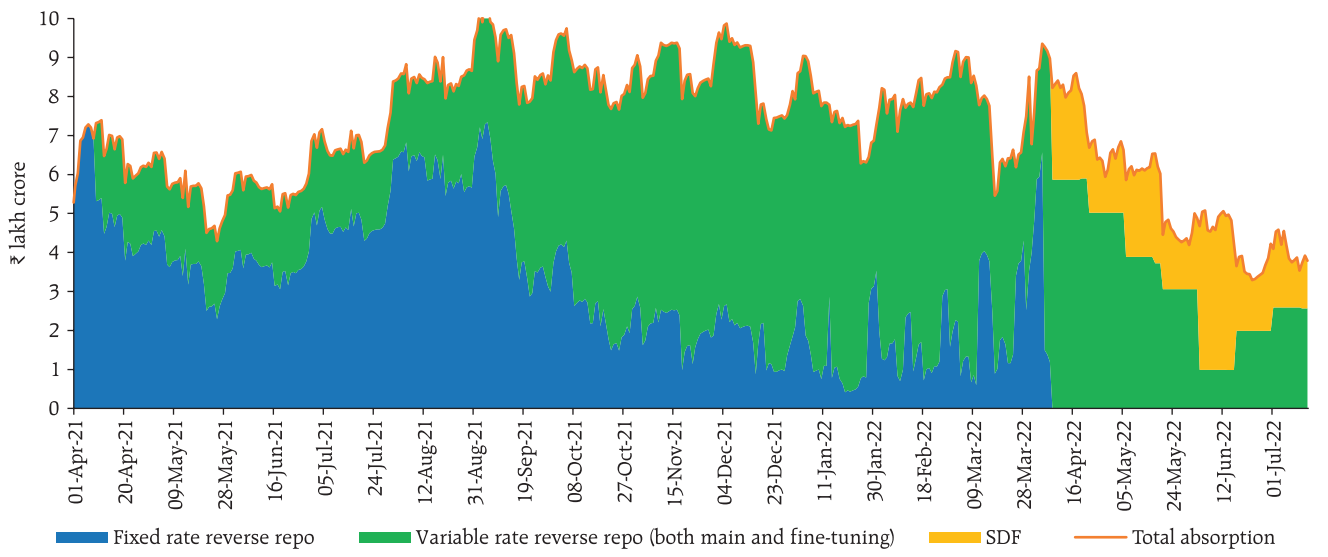
Sources: IOCL; Petroleum Planning and Analysis Cell (PPAC); and RBI staff estimates.

Input cost pressures increased at a slower pace in June 2022 across manufacturing and services as reflected in the PMIs. Selling prices edged up across manufacturing and services, with the manufacturing sector registering price increases higher than the long-run average and those of services hitting a five-year high.

IV. Financial Conditions

Daily absorption under the liquidity adjustment facility (LAF) moderated, averaging ₹4.1 lakh crore during June 8 through July 14, 2022 from ₹5.3 lakh crore during May 5 to June 7, 2022 (Chart 45). Of the total surplus liquidity, nearly ₹2.1 lakh crore was absorbed under the standing deposit facility (SDF) while the remaining was mopped up through variable rate reverse repo (VRRR) auctions (both main and fine-tuning) at an effective absorption rate of 4.74 per cent. Reflecting these liquidity conditions, overnight money market rates firmed up above the SDF rate towards the end of June, although on an average basis, the weighted average call rate (WACR) traded 2 bps below the SDF rate during the month and in

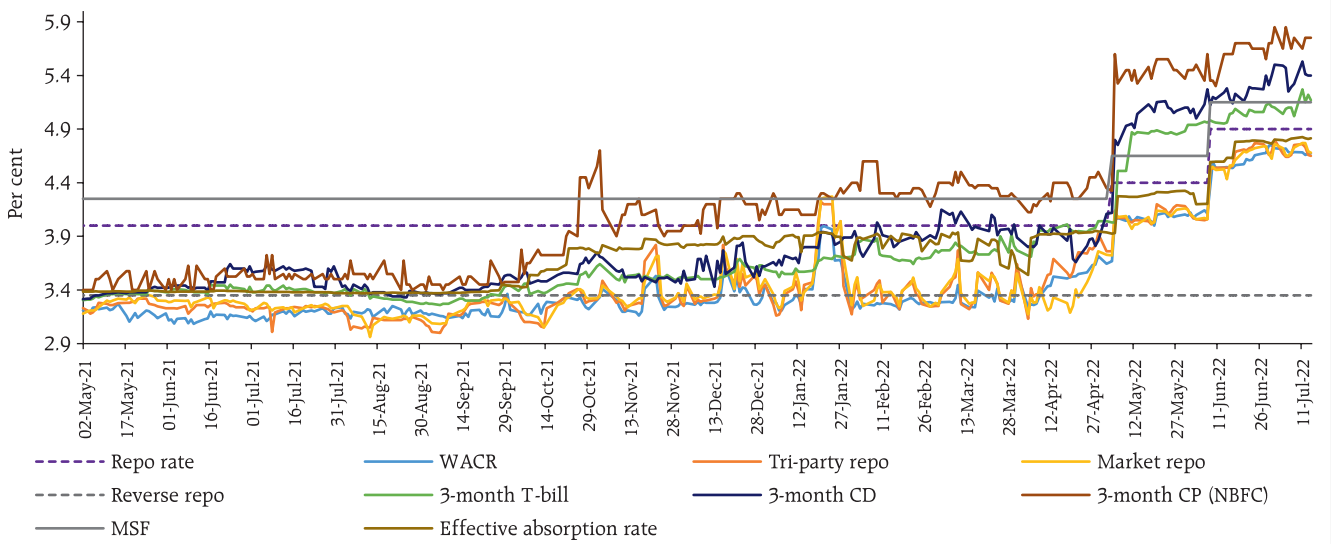
Chart 45: Surplus Liquidity Conditions



Source: RBI.

[20] The effective reverse repo rate is renamed as the effective absorption rate and is the weighted average of the SDF rate and the VRRR auctions of varying maturity with the weights being the amounts absorbed under the SDF and VRRR windows.

Chart 46: Policy Corridor and Money Market Rates



Source: RBI; Bloomberg; and Authors' own calculations.

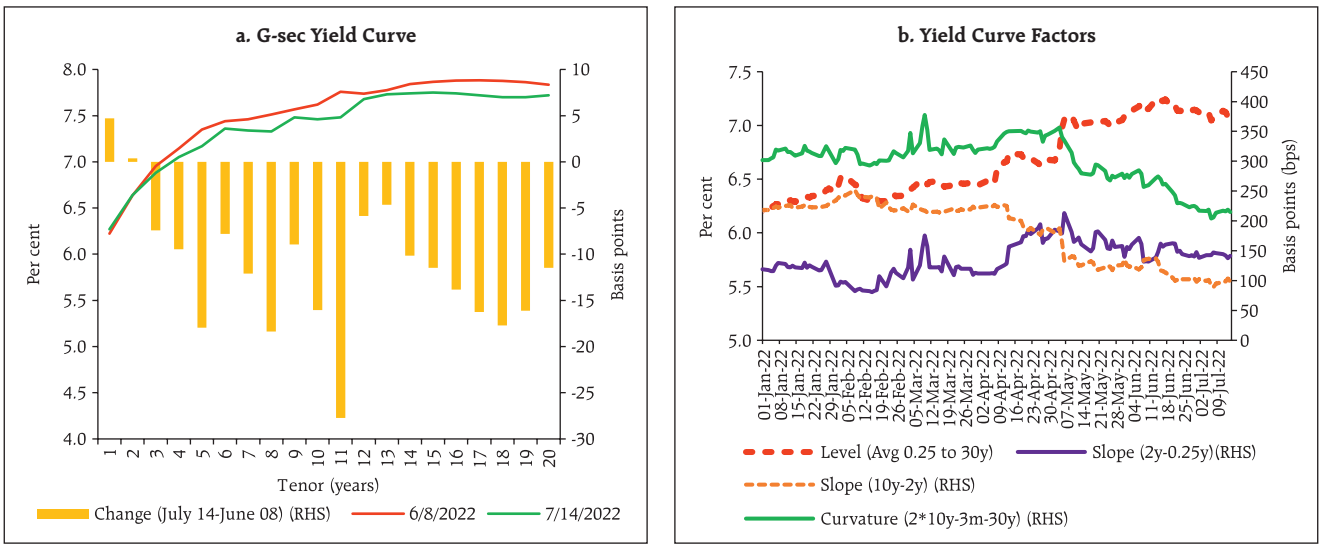
the collateralised segment, the tri-party rate and the market repo rate generally traded above the SDF rate since the second half of June.

In the term money market segment, yields on 3-month certificates of deposit (CDs) and 3-month commercial paper (CPs) increased, with their spreads above the marginal standing facility (MSF) rate averaging 15 bps and 50 bps, respectively, during June 8 through July 14, 2022 (Chart 26). At the same time, the yield on 3-month T-bill firmed up by end-June to reach closer to the ceiling of the LAF corridor. Narrowing liquidity surplus amidst strong credit growth prompted banks to raise funds through CD issuances from the primary market. Outstanding CD issuances amounted to ₹2.2 lakh crore as on July 1, 2022 compared with ₹0.7 lakh crore a year ago.

In the fixed income market, bond yields largely softened during June 8 through July 14, 2022 with the yield on the 10-year G-sec easing from its peak of 7.62 per cent to close at 7.38 per cent on July 14. The rise in US treasury yields and inflation apprehensions ahead of the release of the CPI inflation print kept market sentiments on edge in early June. Recession concerns in the US amidst aggressive US Fed tightening, however, pushed down US treasury yields with a concomitant impact on domestic yields in India. While declining crude oil prices and benign CPI inflation print on domestic front aided softening of yields, some of the gains were wiped after US CPI inflation came in higher than market expections. Across the yield curve, the decline at the long end was more pronounced than in the mid segment and the short end of the curve (Chart 47a). The spread between 2-year G-sec and 3-month T-bill yields moderated, reflecting the impact of monetary tightening, resulting in a decline in curvature[21] (the yield curve becoming less hump-shaped) (Chart 47b). While the upward shift in the level of the yield curve is consistent with a declining slope (as measured by the 10-year and 2-year spread) since April, a perceptible decline in curvature is evident since the May policy meeting,

[21] The curvature of the yield curve describes the relationship between yields at short, medium and longer maturities. Higher curvature means higher concavity of the curve, *i.e.*, the yield curve is steep in the short to medium tenure compared to medium to long-end yields, and therefore, shows a hump in the yield curve. The curvature is calculated as 2 times the 10-year yield minus the sum of 30-year and 3-month yields.

Chart 47: Developments in G-sec Market



Sources: Bloomberg; CCIL; and Authors' own calculations.

indicating the impact of monetary tightening across various maturity segments. Overall, the yield curve is indicating an improvement in long-term growth prospects, an upshift in *ex ante* inflation expectations and tighter monetary policy in the period ahead (Patra *et.al*, 2022).[22]

Corporate bond yields softened in tandem with the G-sec yields across tenors and the rating spectrum (Table 3). Credit risk premium as reflected in the spread of corporate bond yields over G-sec yields of equivalent maturities also declined marginally during the same period. Consequently, corporates were deterred from raising funds in the bond market, with primary market issuances during 2022-23 so far (up to May 2022) remaining tepid at ₹0.33 lakh crore.

In view of the ongoing geopolitical tensions triggering safe haven demand for the US dollar and causing persistent depreciation of the INR, the Reserve Bank announced the following measures on July 6, 2022 to enhance forex inflows while ensuring overall macroeconomic and financial stability: (i) exemptions of incremental FCNR(B) and NRE deposits accruing between July 1, 2022 till November 4, 2022 from the maintenance of cash reserve ratio (CRR) and statutory liquidity ratio (SLR) effective fortnight beginning July 30, 2022;[23] and (ii) permitting banks temporarily (up

Table 3: Financial Markets - Rates and Spread

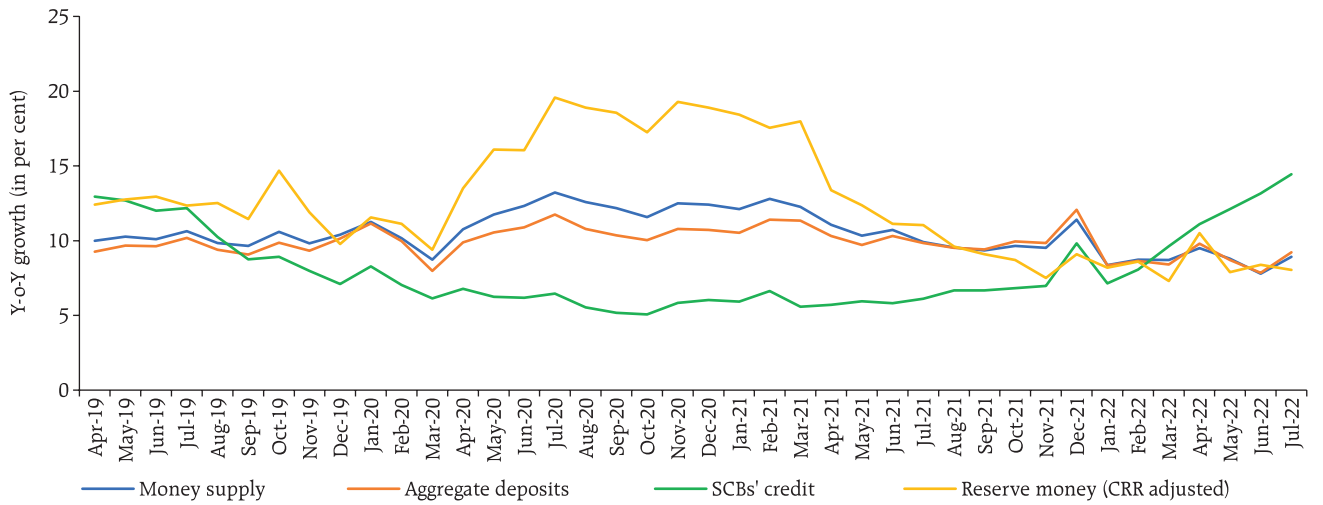
Instrument	Interest Rates (per cent)			Spread (bps) (over corresponding risk-free rate)		
	Jun-22	July 2022 (Up to July 13)	Variation (in bps)	Jun-22	July 2022 (Up to July 13)	Variation (in bps)
1	2	3	(4 = 3-2)	5	6	(7 = 6-5)
Corporate Bonds						
(i) AAA (1-yr)	6.67	6.41	-26	35	35	0
(ii) AAA (3-yr)	7.55	7.41	-14	45	40	-5
(iii) AAA (5-yr)	7.64	7.42	-22	22	14	-8
(iv) AA (3-yr)	8.26	8.13	-13	116	112	-4
(v) BBB-minus (3-yr)	11.94	11.81	-13	484	480	-4
10-yr G-sec	7.49	7.34	-15			

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

[22] Patra, M.D., Joice, J., Kushwaha, K.M., and I. Bhattacharyya (2022). 'What is the Yield Curve telling us about the Economy?' *RBI Bulletin*, June.

[23] Transfers from Non-Resident (Ordinary) (NRO) accounts to NRE accounts are not entitled for this relaxation.

Chart 48: Monetary and Credit Aggregates



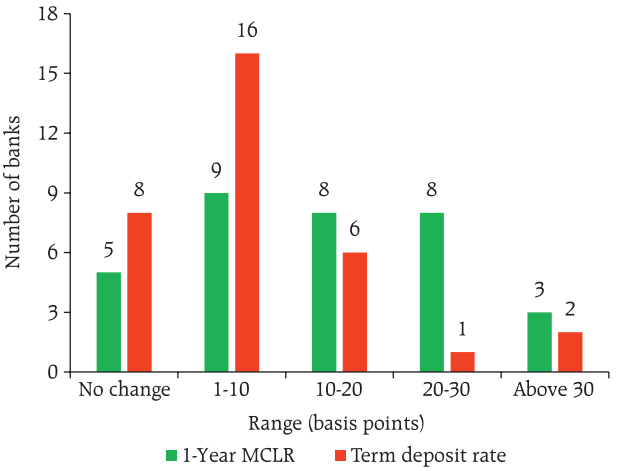
Note: 1. Data pertain to last reporting Friday of every month for money supply, aggregate deposits and bank credit; and last Friday of every month for reserve money.
2. For July, however, reserve money data are as on July 8, 2022; and money supply data are as on July 1, 2022.
Source: RBI.

to October 31, 2022) to raise fresh FCNR(B) and NRE deposits without reference to the extant regulations on interest rates effective July 7, 2022. Following the relaxations, few major banks have increased the interest rates on FCNR(B) deposits.

Reserve money (RM), excluding the first-round impact of the cash reserve ratio (CRR)[24], grew by 8.0 per cent on a y-o-y basis as on July 8, 2022 (10.8 per cent a year ago) [Chart 48]. Growth in currency in circulation (CiC), the largest component of RM, declined to 8.0 per cent from 11.5 per cent a year ago. Money supply (M_3), the liabilities of the banking sector, registered a growth of 8.9 per cent as on July 1, 2022 (10.1 per cent a year ago), primarily driven by its largest component – aggregate deposits with banks. The recent pick-up in scheduled commercial banks' (SCBs') credit gained further traction in the recent period and recorded a three-year high of 14.4 per cent y-o-y as on July 1, 2022 (6.1 per cent a year ago).

Banks increased their external benchmark lending rates (EBLRs) by 50 bps in June. Twenty-eight domestic banks (including ten public sector banks and eighteen private banks) have also increased their 1-year marginal cost of funds-based lending rates (MCLRs) in the range of 5-50 bps during June. In the case of term deposits, twenty-five out of thirty-three domestic banks increased their term deposit rates in the range of 3-38 bps (Chart 49 and Table 4). The

Chart 49: Increase in Lending and Deposit Rates in June 2022



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

[24] CRR increased by 50 bps to 4.5 per cent effective May 21, 2022.

Table 4: Transmission from the Repo Rate to Banks' Deposit and Lending Rates

Period	Repo Rate (bps)	Term Deposit Rates (bps)		Lending Rates (bps)		
		Median TDR - Fresh Deposits	WADTDR - Outstanding Deposits	1-Year Median MCLR	WALR - Outstanding Rupee Loans	WALR - Fresh Rupee Loans
Oct 2019 – March 2022	-140	-180	-180	-128	-150	-189
April 2022	0	0	0	0	-2	-12
May 2022	40	0 (0 to 60)	4	3 (0 to 35)	7	35
June 2022	50	3 (0 to 38)	-	20 (0 to 50)	-	-

Note: Figures in parentheses indicate range of bank-wise variation for 33 domestic banks.

WALR: Weighted Average Lending Rate;

WADTDR: Weighted Average Domestic Term Deposit Rate.

TDR: Term Deposit Rate; MCLR: Marginal Cost of Funds-based Lending Rate.

Sources: RBI; and Authors' own calculations.

weighted average lending rate (WALR) on fresh rupee loans and outstanding loans of SCBs increased by 35 bps and 7 bps, respectively, during May 2022. Across bank groups, the WALR (fresh loans) for public and private sector banks increased by 37 bps and 26 bps, respectively.

While banks have been quick to increase their lending rates, transmission to deposit rates has been relatively slow. Deposit rates are dependent on demand for credit as well as liquidity conditions in the banking system.[25] As the pickup in credit demand gathers momentum, banks may be forced to raise deposits at higher rates to meet this additional demand. The incremental credit to deposit ratio, which rose from 77.2 per cent in end-March to 246.8 per cent as on June 17, 2022 could incentivise banks to increase deposit rates faster in the coming months.

With the increase in G-Sec yields of various maturities in recent months, the interest rates on few small savings schemes (SSSs) fell below the formula-based rates[26] which were left unchanged following a review on June 30, 2022.

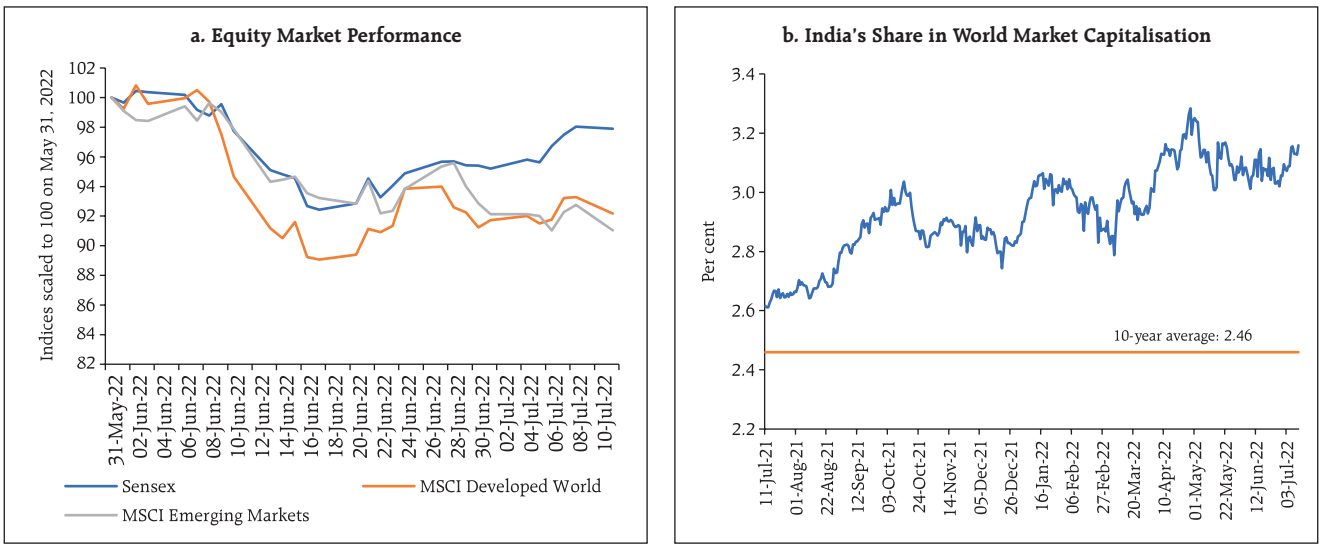
Indian equity markets weakened in the first half of June 2022 owing to growing fears of recession, which triggered sell-offs across the globe on investors' risk aversion. Furthermore, weak global cues following the announcement of a 75 bps hike in the policy rate by the US Fed also dampened market spirits. The domestic equity market rebounded, however, in the second half of June and extended the gains in July amidst softening commodity prices and positive cues emanating from gains in global equity markets. In line with global market peers, the benchmark index (Sensex) declined by 2.1 per cent from end-May 2022 to close at 54,395 on July 11, 2022 (Chart 50a). Nevertheless, Indian equities accounted for 3.2 per cent of the total world market capitalisation, substantially higher than the long-term average (July 2012 to July 2022) of 2.46 per cent (Chart 50b). At this level, India is the fifth largest contributor to world market capitalisation following the US, China, Japan and Hong Kong.

Amidst the correction, equity market valuations declined in June to their lowest level since May 2020. The Sensex is trading at a trailing price/earnings ratio (P/E) of 22.0 (as on July 11, 2022), down from 23.7 at end-March 2022, and the ten-year average P/E multiple of 22.5 (Chart 51a). While the index has become inexpensive compared with its valuation in

[25] Monetary Transmission to Banks' Interest Rates: Implications of External Benchmark Regime, RBI Bulletin, April 2022. https://rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=20939

[26] Administered interest rates on small savings instruments – which compete with bank deposits and have a sizeable bearing on monetary transmission – are linked to market yields on G-secs with a lag and are fixed on a quarterly basis at a spread of 0-100 bps over and above G-sec yields of comparable maturities (MPR, April 2021: https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=20350#42).

Chart 50: Equity Market Trends

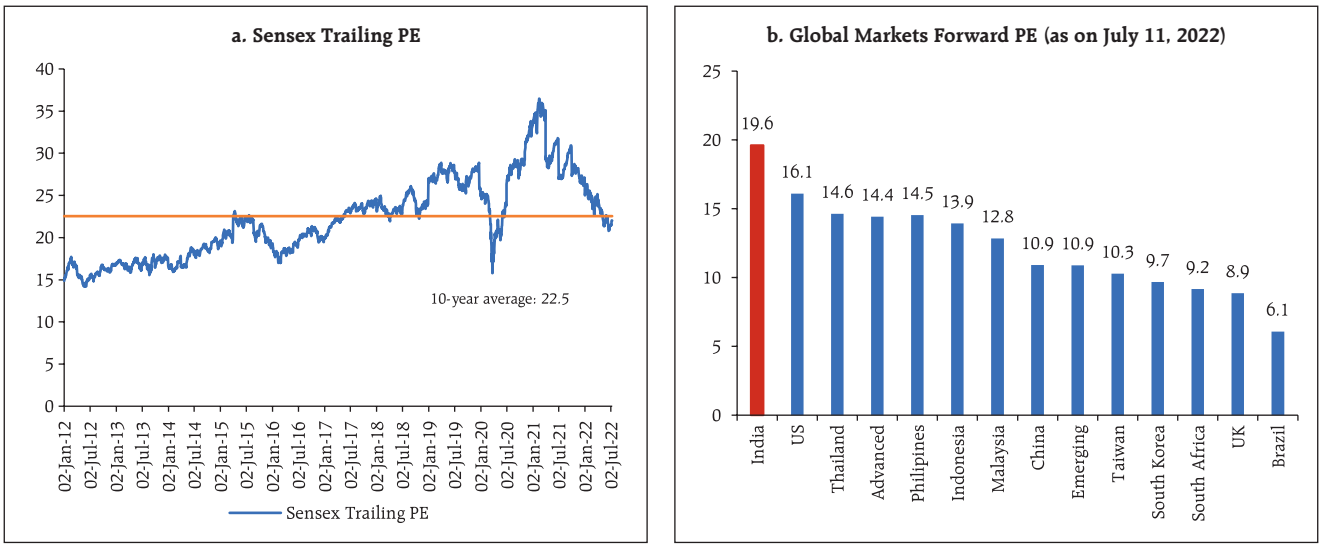


Sources: Bloomberg; and Authors' own calculations.

recent years, it remains expensive when compared with emerging market peers (Chart 51b).

Amidst monetary tightening, global investors are shunning emerging market assets as captured by the Bloomberg emerging market capital flow proxy index.[27] The index stood at 139.8 on July 08, 2022, which is below its 10-year average of 145.7 (Chart 52a). In consonance, foreign portfolio investors

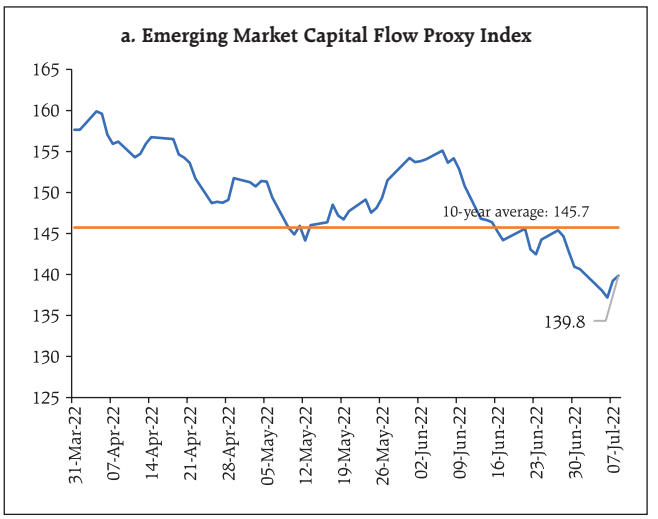
Chart 51: Equity Market Valuation

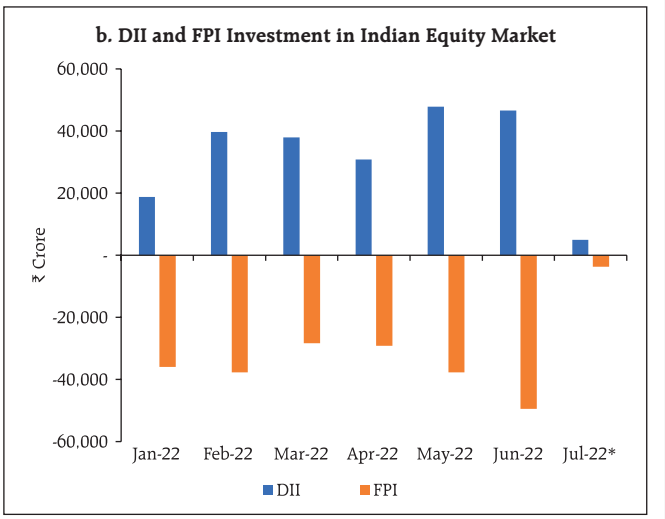


Sources: Bloomberg; and Authors' own calculations.

[27] The index is constructed using Goldman Sachs Commodity Index, MSCI EM Equity index, EM Bond Index spreads and EM FX carry trade index. This is a daily composite index of the performance of four asset classes that appears to mimic the flow of money in and out of EMs (where growing values are indicative of inflow and shrinking values are indicative of outflow).

Chart 52: FPI and DII Investments





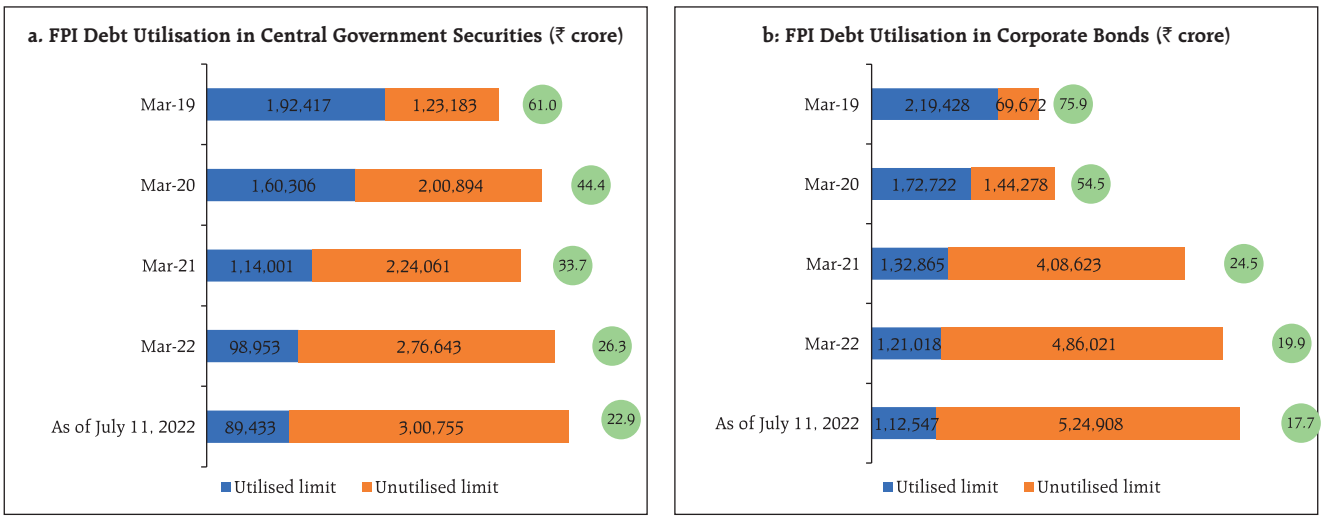
Note: * Data for July 2022 is up to July 8 for FPI and July 11 for DII.
Sources: Bloomberg; NSDL; and Capitaline.

(FPIs) were net sellers in the Indian equity market for the ninth consecutive month in June, with an outflow of ₹49,469 crore (highest monthly outflow since March 2020) and the sell-off continued in July (up to July 8, 2022) to the tune of ₹3,716 crore. Overall, FPIs have withdrawn ₹1.2 lakh crore from the Indian equity market in 2022-23 so far, but the sell-off has been absorbed by domestic institutional investors (DIIs) (Chart 52b). DIIs have invested in equity markets for the 16th consecutive month in June 2022, with a net inflow of ₹1.3 lakh crore in 2022-23 so far (up to July 11, 2022) as against ₹21,024 crore in the corresponding period last year. Mutual fund equity/ growth-oriented schemes have recorded net monthly inflows since March 2021, highlighting the positive sentiment among domestic investors. Equity schemes attracted net inflows of ₹48,797 crore in 2022-23 so far (up to June 2022) as against ₹15,627 crore in the corresponding period last year. Furthermore, systematic investment plans (SIPs) recorded an inflow of ₹12,276 crore in June marking the 10th consecutive month of SIP inflows being greater than ₹10,000 crore.

FPIs have also reduced their presence in the Indian debt market over time. As on July 11, 2022, FPIs had utilised only 22.9 per cent of their investment limit in the central government securities, as against 61 per cent at end-March 2019 (Chart 53a). Furthermore, utilisation of FPIs' limit in the corporate bond segment also declined to 17.7 per cent as on July 11, 2022 as compared with 75.9 per cent at the end-March 2019 (Chart 53b).

To encourage foreign portfolio investment in the debt segment, the Reserve Bank announced relaxation on FPI investment norms on July 06, 2022. They included: (i) expanding the investable space for non-resident investors under the fully automatic route (FAR) route to new issuances of G-Secs of 7-year and 14-year tenors; (ii) exemption on the short-term limit on investments by FPIs in government securities and corporate debt till October 31, 2022; (iii) providing a window till October 31, 2022 for FPIs to invest in corporate money market, *viz.*, commercial paper (CP) and non-convertible debentures (NCDs) with an

Chart 53: FPI in Debt Market



Note: Numbers in green bubble represent percentage of limits utilised by FPIs.
Sources: CCIL; and NSDL.

original maturity of up to one year. These measures are expected to enhance foreign currency inflows while ensuring overall macroeconomic and financial stability.

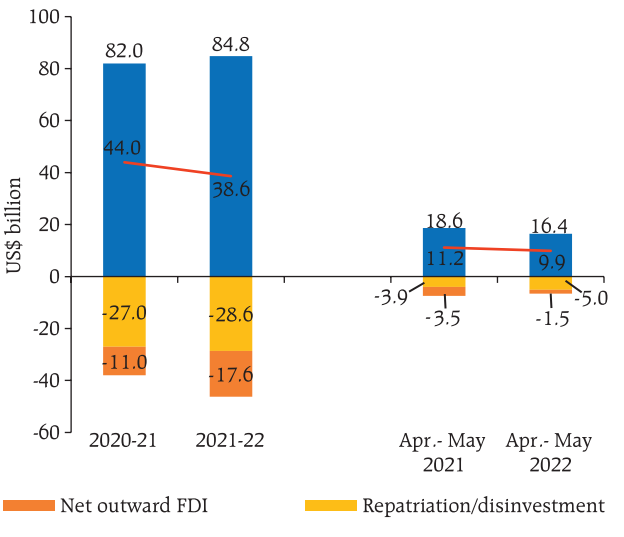
During April-May 2022, gross inward foreign direct investment (FDI) marginally decreased to US$ 16.4 billion and repatriation of FDI increased to US$ 5.0 billion from their levels a year ago (Chart 54). Manufacturing, retail and wholesale trade, computer services, communication services and financial services received most of the investment and accounted for 76.7 per cent of the fresh equity flows.

Gross disbursements of external commercial borrowings (ECBs) to India were to the tune of US$ 2.4 billion during April-May 2022 as compared with US$ 3.0 billion a year ago, while on a net basis (*i.e.*, excluding repayments and inter-company borrowings), ECBs recorded net outflows of US$ 1.6 billion as against net disbursement of US$ 0.1 billion a year ago. In May 2022, a considerable amount of borrowing was routed to new projects, on-lending/sub-lending, and working capital.

The foreign exchange reserves at US$ 580.3 billion on July 8, 2022 were equivalent to 9.5 months of imports projected for 2022-23 (Chart 55).

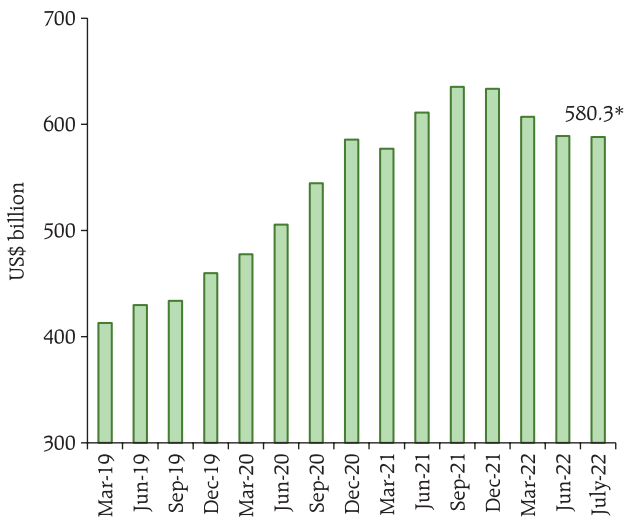
In the foreign exchange market, the Indian rupee (INR) depreciated by 1.0 per cent *vis-à-vis* the US dollar

Chart 54: Foreign Direct Investment



Source: RBI.

Chart 55: Foreign Exchange Reserves



*: Up to July 8, 2022.
Source: RBI.

Table 5: Balance of Payments Indicators

(As per cent of GDP, unless indicated otherwise)

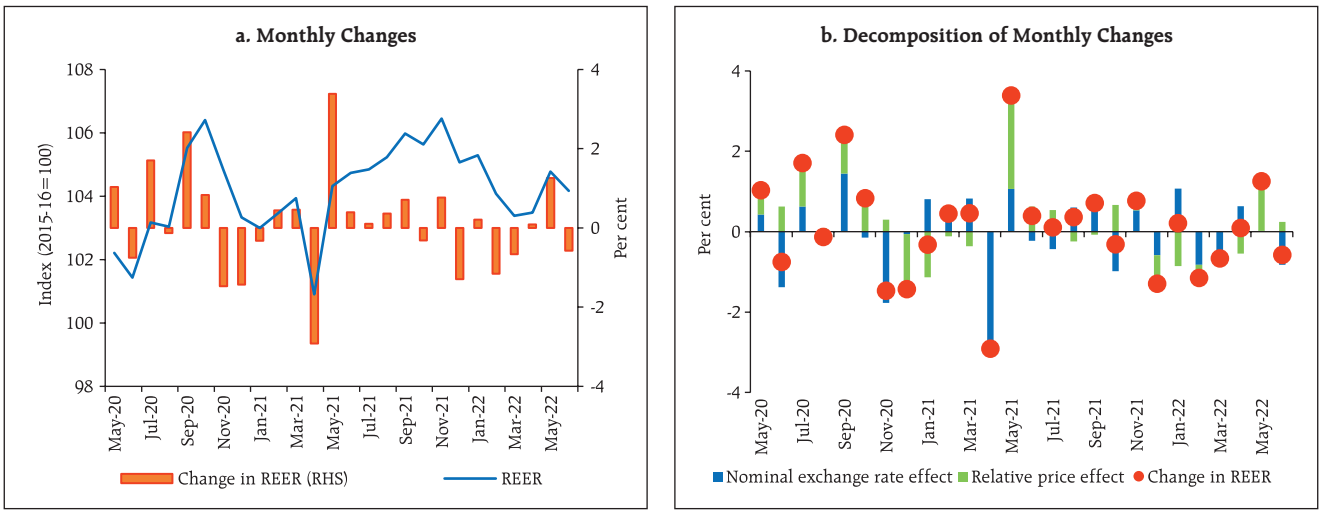
Indicator		Q4: 2020-21	Q4: 2021-22	2020-21	2021-22
(i)	**Current Account Balance (+Surplus/- Deficit)**	**-1.0**	**-1.5**	**0.9**	**-1.2**
(ii)	Exports	11.6	13.4	11.1	13.5
(iii)	Imports	16.8	19.6	14.9	19.5
(iv)	Trade Balance	-5.3	-6.2	-3.8	-6.0
(v)	Remittances Receipts (US$ billion)	20.9	23.7	80.2	89.1
(vi)	Remittances Receipts	2.6	2.7	3.0	2.8
(vi)	Net Terms of Trade (Index)#	102.3	99.3	104.3	100.6
(vii)	**Net Capital Flows**	**1.6**	**-0.2**	**2.4**	**2.7**
	of which:				
	FDI	0.3	1.6	1.6	1.2
	FPI	0.9	-1.7	1.4	-0.5
	Other Investments	0.3	0.0	-0.6	2.0
(viii)	**Reserve change, (-) increase/ (+) decrease**	**-0.4**	**1.8**	**-3.3**	**-1.5**

Note: # An increase in net terms of trade index implies favourable export prices relative to imports.
Sources: RBI and IMF.

(m-o-m) in June 2022 on the back of FPI equity outflows and strong US dollar. This was also mirrored in the movement of the 40-currency real effective exchange rate (REER) which depreciated by 0.6 per cent in June 2022 over its level a month ago (Chart 56).

The current account deficit (CAD) narrowed to 1.5 per cent of GDP in Q4:2021-22 from 2.6 per cent in the previous quarter, mainly on account of a decrease in the trade deficit and net investment income outgoes (Table 5). Resilient services exports and remittances receipts eased merchandise import pressures on the current account in Q4:2021-22. Notwithstanding

Chart 56: Monthly Movements in 40-Currency Real Effective Exchange Rate (REER)
(Base:2015-16 = 100)



Source: RBI.

Table 6: Key External Vulnerability Indicators (end-March)

(Per cent, unless indicated otherwise)

Indicator	2021	2022
1. External Debt (US$ billion)	573.7	620.7
2. External Debt to GDP Ratio (%)	21.2	19.9
3. Short-term Debt (RM) to Total Debt Ratio	44.1	43.1
4. Reserves to Total Debt Ratio (%)	100.6	97.8
5. Short-term Debt (RM) Ratio to Reserves (%)	17.5	20.0
6. Reserve Cover of Imports (in months) ^	17.4	11.8
7. Net International Investment Position (US$ billion) #	-355.2	-359.8
8. Net IIP to GDP ratio (%) #	-13.3	-11.3

RM: Residual maturity; **IIP:** International investment position;
#: Negative sign indicates non-residents' net claims on India; and
^: Based on actual imports (BOP basis).
Source: RBI.

strong FDI inflows in Q4:2021-22, there was net portfolio capital outflows by FPIs. Overall, these factors led to a drawdown of reserves in the quarter.

India's net international investment position (IIP) worsened by US$ 4.7 billion during 2021-22 (*i.e.*, increase in non-residents' claims on India), but the net IIP to GDP ratio improved to 11.3 per cent in the year (Table 6). On a similar note, external debt as on end-March 2022 remained modest, recording a decline as a ratio of GDP *vis-à-vis* end-March 2021.

Payment Systems

In June 2022 and July 2022 (up to July 10), there was sustained momentum (y-o-y) in the volume and value of payments through all digital platforms (Table 7). The disbursal of *Pradhan Mantri Kisan Samman Nidhi* (PM-KISAN) payments[28] spurred acceleration in transaction value through the National Automated Clearing House (NACH) and the Aadhaar enabled Payment System (AePS). The World Bank's Global Findex 2021 survey[29] provides evidence that government payments were pivotal in opening of new accounts. In India, 38 per cent of adults opened their first ever accounts with financial institutions to receive government payments, while the corresponding figure for developing countries stood at 18 per cent. Furthermore, more than 80 million adults in India made their first digital merchant payment during the pandemic.

The cumulative number of digital (QR-code based) payment acceptance devices deployed under the Payments Infrastructure Development Fund (PIDF)[30] scheme more than doubled by end-April 2022 from end-September 2021 (Table 8), while the corpus increased by 32 per cent to ₹811.4 crore.

Table 7: Growth Rates in Select Payment Systems

Payment System	Transaction Volume Growth (Y-o-Y, per cent)				Transaction Value Growth (Y-o-Y, per cent)			
	May-2021	May-2022	June-2021	June-2022	May-2021	May-2022	June-2021	June-2022
RTGS	37.0	58.7	28.8	26.1	18.8	33.7	17.9	21.2
NEFT	33.0	48.6	28.6	37.6	22.8	40.0	10.0	29.5
UPI	104.9	135.1	110.0	108.8	124.0	112.7	109.1	85.3
IMPS	67.9	73.2	52.8	50.0	57.2	69.9	37.3	56.2
NACH	45.8	24.9	0.8	6.7	1.8	14.9	-4.1	19.5
NETC	111.1	145.0	92.7	76.1	86.0	105.6	70.4	67.0
BBPS	137.1	109.3	157.7	80.6	187.8	120.5	167.2	91.0

Source: RBI.

[28] https://www.cnbctv18.com/agriculture/pm-kisan-schemes-11th-installment-to-be-released-today-heres-how-to-check-status-online-13669122.htm

[29] https://www.worldbank.org/en/publication/globalfindex

[30] The PIDF Scheme, operationalised by the Reserve Bank from January 01, 2021, subsidises deployment of PoS infrastructure (both physical and digital/ QR-code based modes) in tier-3 to tier-6 centres, north eastern states and for beneficiaries of PM Street Vendor's *Atma Nirbhar Nidhi Scheme* in tier-1 and tier-2 centres.

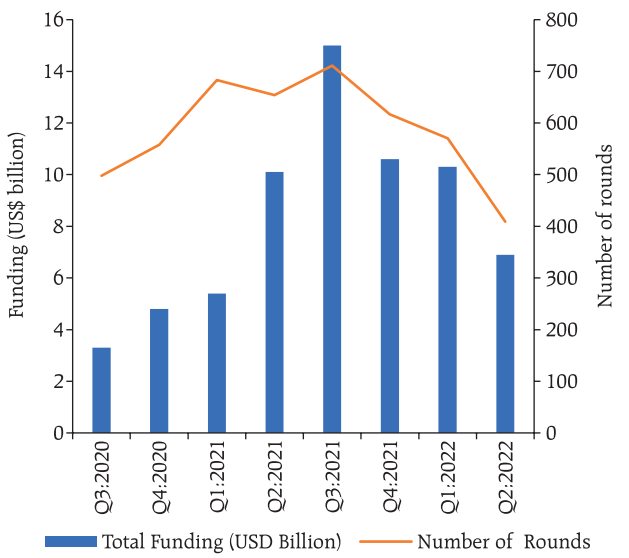
Table 8: Progress under the PIDF Scheme

Location	end-September 2021		end-April 2022	
	Physical Devices*	Digital Devices**	Physical Devices*	Digital Devices**
Tier 3 and 4 Centres	98,504	20,46,075	1,65,356	42,93,988
Tier 5 and 6 Centres	84,968	30,47,750	1,40,421	61,01,464
North Eastern States	18,449	2,42,145	30,994	4,96,271
Tier 1 and 2 Centres	44,021	2,00,708	74,721	5,13,393
Total	**2,45,942**	**55,36,678**	**4,11,492**	**1,14,05,116**

*Physical devices include point of sale (PoS), mobile PoS (mPoS), General Packet Radio Service (GPRS), Public Switched Telephone Network (PSTN), *etc.*
**Digital devices include inter-operable quick response (QR) code-based payments such as UPI QR, Bharat QR, *etc.*
Source: RBI.

On the start-up front, there is early evidence of moderation in investor enthusiasm after a bumper 2021-22 in terms of fundraising (Chart 57). The Reserve Bank recently released the Payments Vision 2025[31], with "E-payments for Everyone, Everywhere, Everytime" as its core theme. Targeting secure growth of digital finance, the Reserve Bank will soon issue suitable guidelines and measures to make the digital lending ecosystem safe and sound while enhancing customer protection and encouraging innovation.[32] The Reserve Bank has also set up a Committee for Review of Customer Service Standards pertaining to Regulated Entities (REs) to *inter alia* review the evolving needs of the customer service landscape, especially in the context of evolving digital financial products and their distribution, and to suggest measures for strengthening the overall consumer protection framework.

Chart 57: Start-up Fundraising Activity in India



Source: Tracxn Geo Quarterly Report: India Tech - Q2 2022.

V. Conclusion

Short-term global economic prospects are transfixed in the cross hairs of synchronized monetary tightening and the war in Europe. The outlook is shrouded in high uncertainty. A sliver of hope has become visible in the recent moderation in global commodity prices, and especially food prices. This suggests that unjust inflation may be peaking, providing a breather for beleaguered nations across the world but is it presaging inexpedient recession? In 1923, John Maynard Keynes wrote: "Of the two, perhaps deflation is the worse; because it is worse to provoke unemployment than to disappoint the rentier"[33].

The Indian economy remains resilient in the face of formidable global headwinds. Knock-on effects of geopolitical spillovers are visible in several sectors, tapering the pace of recovery. In spite of this overwhelming shock, there are sparks in the wind that ignite the innate strength of the economy and set it on course to becoming the fastest growing economy in the world, though besieged it might

[31] https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/PAYMENTSVISION2025844D11300C884DC4ACB8E56B7348F4D4.PDF.

[32] Das, Shaktikanta (2022), "Disruptions & Opportunities in the Financial Sector', Address on June 17, 2022 at Financial Express Modern BFSI Summit in Mumbai

[33] John Maynard Keynes (1923): "A Tract on Monetary Reform".

be by fears of recession. The recent revival of the southwest monsoon and rejuvenation of sowing activity has raised hopes of another bountiful year for agricultural activity, raising expectations that rural demand will soon catch up with urban spending and consolidate the recovery. The biggest source of relief is from inflation coming off its recent peak, *albeit* at an elevated level still. Nonetheless, the signs of its generalization and the potential unhinging of inflation expectations have elicited a pre-emptive and frontloaded monetary policy response. Amidst all these developments, India's financial sector remains sound and stable.

If the commodity price moderation witnessed in recent weeks endures alongside the easing of supply chain pressures, the worst of the recent surge in inflation will be left behind, enabling the Indian economy to escape the global inflation trap and enjoy the fruits of the ebullient supply response that is taking place. The international environment is hostile and hence, close and continuous monitoring of the widening trade deficit and portfolio outflows is warranted, notwithstanding strong reserve buffers, moderating external debt and a fairly valued exchange rate that has wilted less in the face the monotonic strengthening of the US dollar than many peers.

Monetary Policy: Confronting Supply-driven Inflation *

Monetary policy's response to supply shocks in pursuit of its goal of price stability has been brought into sharp focus by the ongoing global inflation crisis. Using crude oil price as an exemplar of supply shocks, simulations from the RBI's Quarterly Projection Model (QPM) show that when the shock is transitory, inflation returns to equilibrium without the need for any monetary policy action. On the other hand, repeated supply shocks trigger second round effects through cost-push, expectations, exchange rate and demand channels, warranting pre-emptive monetary policy action. Credibility can reduce the monetary policy response; even so, by frontloading monetary policy actions, credibility is demonstrated by showing commitment to the inflation target. The required monetary policy response is lower when there is a fiscal policy response to supply-side shocks, but the latter entails macroeconomic costs, including potentially a slowing down of medium-term growth.

Introduction

The current inflation crisis is global. According to the World Bank, global median inflation is at its highest level since 2008. For advanced economies (AEs), it is at its highest level since 1982. Inflation is above target in the majority of AEs and emerging markets and developing economies (EMDEs) that have adopted inflation targeting (World Bank, 2022)[1].

This inflation surge draws its origins from a series of supply shocks – pandemic lockdowns; supply chain disruptions; elevated commodity prices and the war in Ukraine – exacerbated more recently by firming demand and shifts from services to goods and back. Reflecting these pressures, the energy component of global consumer price inflation is at its highest level since early 1980s. For over 40 per cent of EMDEs and most low-income countries, consumer price index (CPI) food inflation is expected to remain in double digits through 2022 (World Bank, *ibid*). Consequently, the global inflation crisis is just the face of one of the most severe food and energy crises in recent history that now threatens the most vulnerable across the globe (Patra, 2022). Food shortages are adding to the pain of soaring prices and even among the rich nations, food security is endangered.

In response, the most widespread monetary policy tightening is underway across the world. National actions are appearing synchronised because imported inflation pressures are being exacerbated by country specific shocks acting at the same time. As central banks aggressively frontload rate increases and liquidity withdrawals, apprehensions of eminent recession are rising[2] and loss of momentum is already being reflected in the recent purchasing managers indices (PMI) as well as in the pervasive risk aversion in financial markets.

EMDEs are at the receiving end and their macroeconomic and financial conditions are worsened by currency depreciation, capital outflows and reserves losses. India has not been immune to this risk-off sentiment gripping global investors and financial markets, in addition to inflation having remained above target and at or outside the tolerance threshold for 6 months. Assessing the initial impact of the geo-political spillovers, GDP projections have been revised downwards by 60 basis points (bps) for 2022-23, while inflation projections have been raised by as much as 220 bps. The policy rate has been

* This article is prepared by Joice John, Deepak Kumar and Michael Debabrata Patra of the 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 Global Economic Prospects, June 2022.

2 In a survey of economists conducted by Wall Street Journal, the probability of recession in the United States in the next 12 months has risen to 44 per cent from 28 per cent in April and 18 per cent in January.

effectively raised by 130 bps and liquidity withdrawal is underway (RBI, 2022). In a world in which elevated inflation is globalised, it is the direction of the change that matters, not the height. In May 2022, India's CPI inflation declined by as much as 80 bps. High frequency indicators suggest that the momentum of recovery is holding up. Against this backdrop, an animated debate has swung from regarding the Reserve Bank of India (RBI) as being behind the curve (Bakshi, 2022) or acted too little, too late (Subramanian and Felman, 2022) to the other end of the bi-polarity that it has acted for the wrong reasons (Sengupta, 2022), given the supply-side nature of inflation against which monetary policy is powerless (Aiyar, 2022).

Using the RBI's Quarterly Projection Model (QPM), our article addresses this debate with the help of counterfactual scenarios of adverse crude oil price shocks as a case study. Central to the exercise is the role of credibility and anchoring of inflation expectations. The results show that India's flexible inflation targeting (FIT) framework, coordinated with supply-side policy actions, can redistribute the macroeconomic costs of shocks by taking into account the behaviour of firms in setting prices and of households in bargaining for wages.

The rest of the article is divided into three sections. Section II sets out a brief discussion on the channels of transmission of crude oil price shocks. The challenges confronting monetary policy decision making in the face of adverse supply shocks are the focus of Section III. Conclusion and policy perspectives are given in Section IV.

II. QPM: Channels of Fuel Price Transmission

The QPM belongs to the *genre* of consensus macroeconomic New Keynesian open economy structural models. Drawing on this tradition, it consists of 1) an aggregate demand equation; 2) an expectations augmented Philips curve; 3) a monetary policy rule; and 4) an external block for the determination of exchange rates. A defining feature is the focus on nominal rigidities in price/wage settings and in mark-ups, providing monetary policy the exploitable trade-off to affect goal variables like output and inflation. Trend variables like potential output are assumed to be supply-driven and therefore exogenous to the model. Inflation is a result of deviations of aggregate demand from its underlying trend.

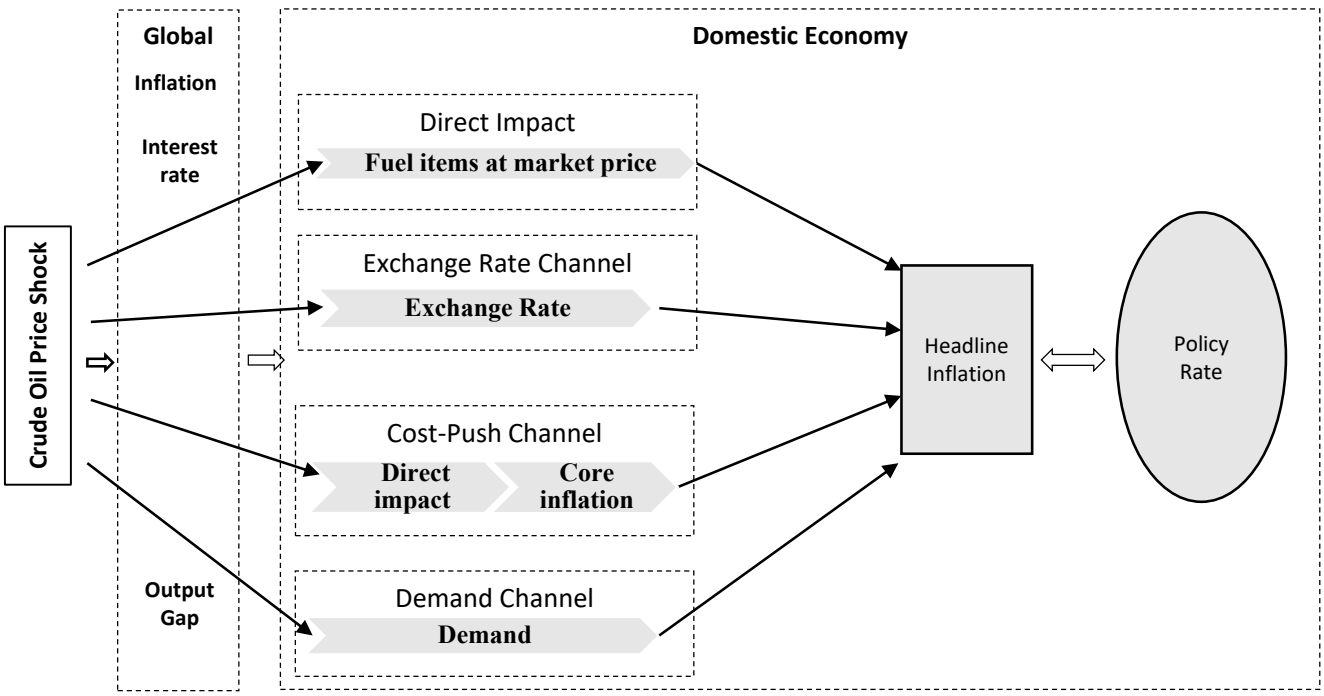
In India, the prominence of food and fuel in the consumption basket amplifies the dominance of supply-side shocks in economic activity, with spillovers to the formation of inflation. Therefore, such country-specific characteristics[3] are incorporated into the QPM, enabling gains in empirical regularity. We can now turn to the theme of the article by drilling down into the 'fuel' block in the QPM[4] and interlinkages with other blocks, since crude oil price impacts growth and inflation through multiple channels (Chart 1).

The immediate impact of changes in crude oil price is on global variables - higher crude oil price increases other international commodity prices, feed into global inflation and weaken global demand and growth, the latter being also impacted by the monetary policy response in the form of a rise in global interest rates to head off the inflation surge. In the next stage, the disturbance to global macroeconomic conditions caused by the crude price rise feeds into domestic output and inflation. The direct impact on inflation occurs due to the pass-through to domestic petroleum product prices. Second round effects occur through

[3] The QPM embeds many India-specific features like the behaviour of different inflation components and their interlinkages, sluggishness in monetary policy transmission, the predominance of the bank lending channel, endogenous credibility, monetary-fiscal linkages, fuel pricing, capital flow management and exchange rate dynamics. The schematic diagram representing interlinkages in the QPM and the key equations are presented in the Appendix. For a fuller overview, see Benes, Clinton, George, Gupta, *et al.* (2016).

[4] The fuel block has market-driven and administered components of fuel. The market-driven component is determined by crude oil price, the exchange rate and fuel taxes. The administered component is modeled as an exogenously driven process.

Chart 1: Crude Oil Price – Transmission Channels



Source: Authors' estimates.

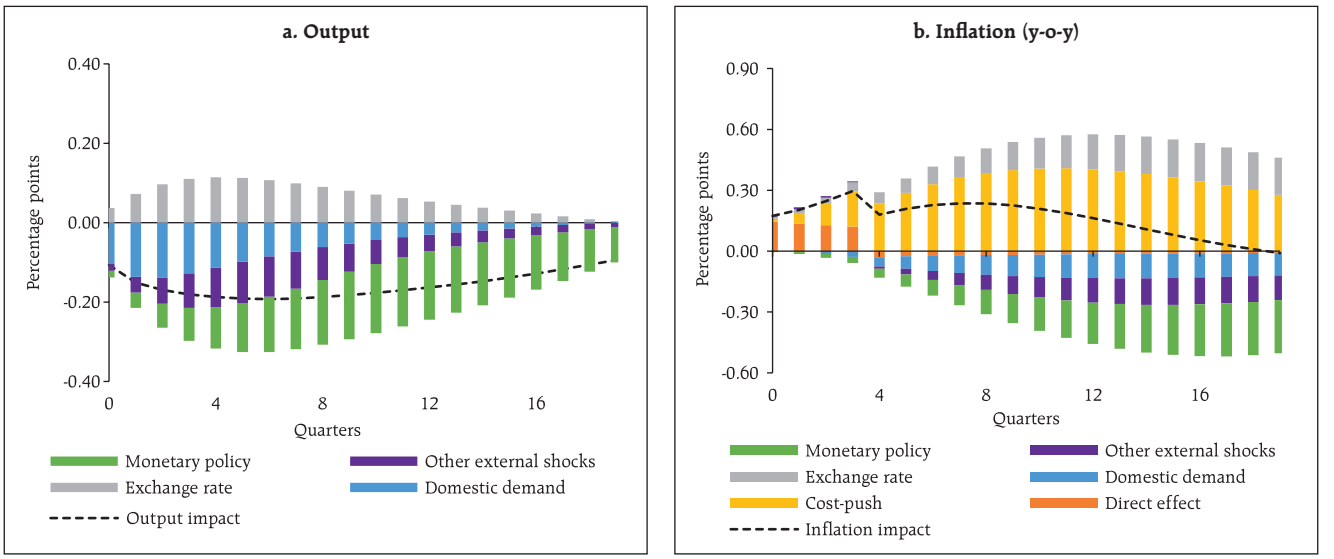
cost-push – petroleum prices increase prices of intermediate goods and services which, in turn, push up prices of final goods and services. There is also a demand channel of transmission to domestic inflation at work – higher petroleum product (PoL) prices reduce the consumption of non-PoL items of households and profit margins of firms, leading to lower cash flows and investment. As a result, domestic aggregate demand moderates, causing inflation to ease.

On balance, the cost-push increase in inflation is much more painful than output losses. If the Indian basket of crude price increases by 10 per cent, inflation could increase by around 30 bps at its peak, with GDP growth weaker by 20 bps (Chart 2). Hence, monetary policy tightening is required to push inflation back to target. The monetary policy reaction widens the output gap, compresses demand and thereby brings down inflation.

The fuel block in the QPM incorporates the dynamics of the impact of fuel taxes on petroleum products. Shocks to fuel taxes are long lasting, leading to changes in the tax structure that stay until the tax changes are exogenously reversed (Chart 3).

In the context of recent actions to reduce excise duty on petroleum products in India, the dynamics of a fuel tax cut can be traced to a reduction in headline inflation through a) the direct effects on inflation due to reduction in domestic petroleum product prices; b) second round effects through a decline in intermediate costs and eventually prices of final goods; c) the demand channel – lower PoL prices increase the consumption of non-PoL items by households and profit margins of firms; and d) an increase in the fiscal deficit due to revenue losses, which leads to higher market borrowings, higher debt, higher country risk

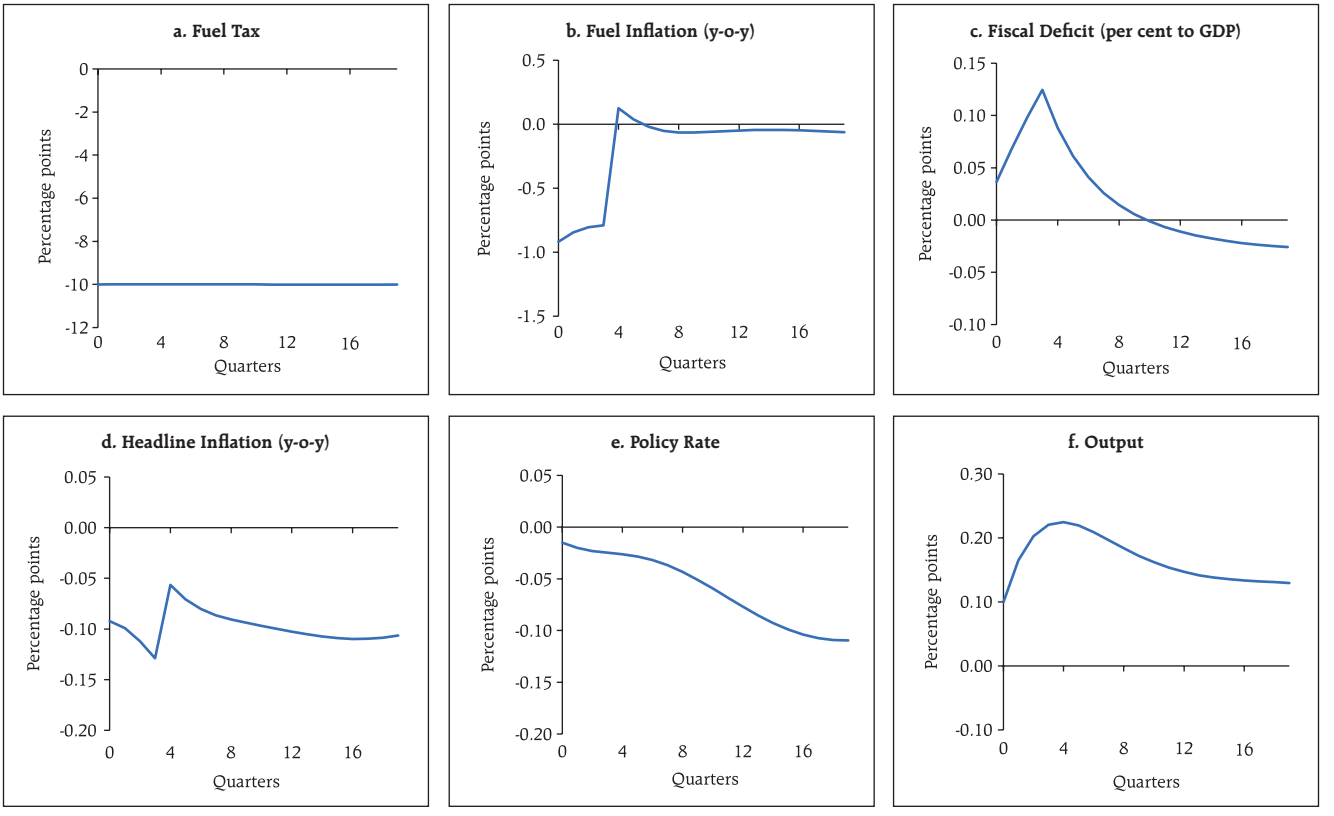
Chart 2: Impact of 10 Per cent Increase in Crude Oil Price



Note: y-o-y (year - on- year)
Source: Monetary Policy Report (MPR), April 2022, RBI

premium, exchange rate pressure and a pick-up in inflation. If fuel taxes are cut by 10 per cent, inflation could decline by around 15 bps, with GDP increasing by 20 bps.

Chart 3: Impact of 10 Per cent Cut in Fuel Tax



Source: Authors' estimates

III. Case Study of Crude Oil Price Shocks

When the economy faces supply shock/s,[5] the monetary policy response is conditioned by a) the nature of the shock; b) aggregate demand conditions; c) monetary policy credibility; and d) the reaction of other agents in the economy to the shock.

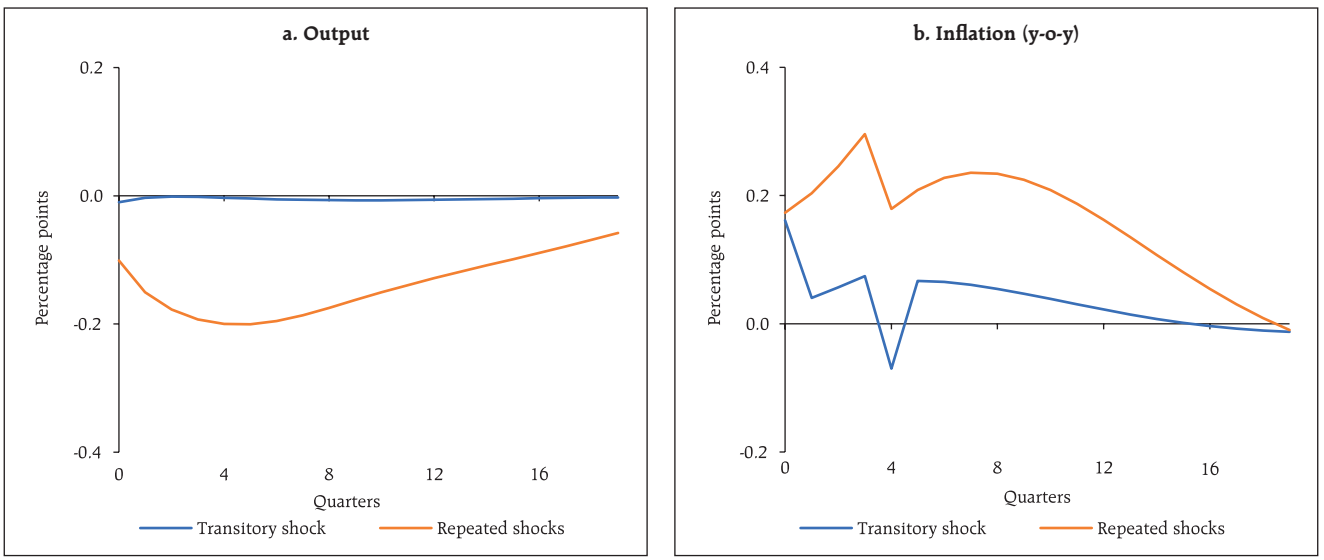
III. 1. Transitory Versus Repetitive Supply Shocks

Macroeconomic policy responses to transitory[6] and repeated[7] supply shocks may differ markedly for a 10 per cent increase in crude oil price (Chart 4). In both cases, the initial impact (direct impact) on headline inflation remains the same. In the case of a transitory or one-off shock, inflation returns to equilibrium without the need for any monetary policy action. On the other hand, repeated supply shocks presented as a persistent 10 per cent increase in crude oil price triggers second round effects through the various channels described earlier, resulting in ratcheting up of inflationary pressures. This warrants pre-emptive monetary policy action.

There are non-trivial costs associated with misjudging the nature of the shock (Chart 5). If monetary policy decides to look through the second round effects of repetitive increases in crude oil price, inflation expectations will become unanchored, leading to an upward drift in inflation away from its pre-shock level (Chart 5.i a-c). On the other hand, if monetary policy chooses to react to a transitory crude price shock by increasing the policy rate, it will impart volatility to output without any noticeable impact on inflation, which would have otherwise returned to the target (Chart 5.ii a-c).

Thus, the key takeaway is that monetary policy can ignore the initial impact of an adverse supply shock as it lies outside its realm and remit, but it is essential for it to react to second round effects to avoid the generalisation of inflation. It is important to carry out an assessment of the life of the shock for an optimal monetary policy response.

Chart 4: Response to Transitory and Repeated Increase of 10 Per cent in Crude Oil Price



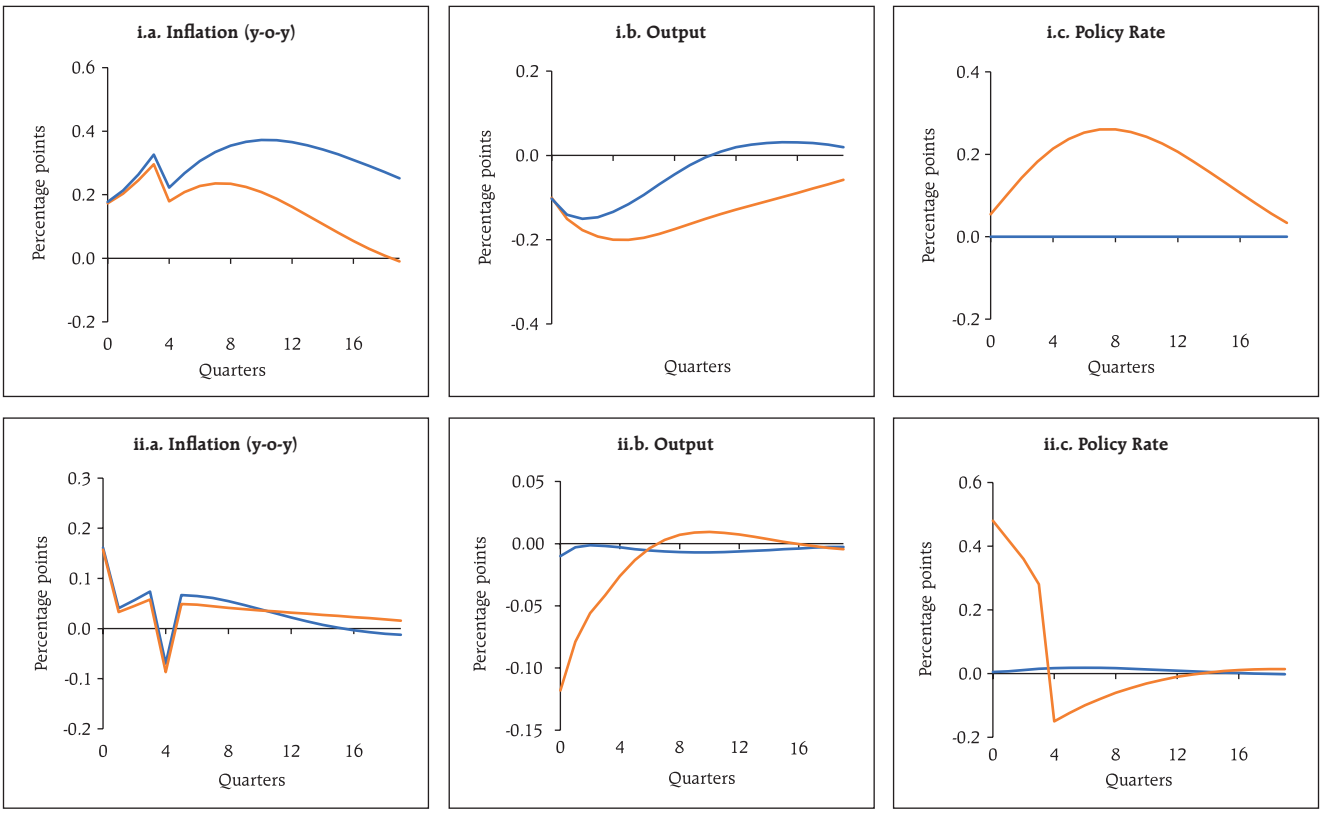
Source: MPR, April 2022, RBI

[5] If there are favorable supply shocks, monetary policy decision making is relaxed as inflation declines, growth gather momentum and monetary policy gains credibility or the "Opportunistic Approach to Disinflation" (Orphanides *et al.*, 1997). The reverse holds in the event of an unfavourable shock.

[6] Transitory shock means the crude oil price returns to the pre-shock level in next quarter.

[7] Repeated shocks mean the crude oil price returns to the pre-shock level over 5 years.

Chart 5: Monetary Policy Response to Transitory and Repeated Increase of 10 Per cent in Crude Oil Price



Note: Orange lines represent the impulse response functions (IRFs) with monetary policy action and blue lines represent the IRFs with unchanged monetary policy. The first row (charts i. a-c) represents the case of repeated crude price shock and the second row (charts ii. a-c) represents the case of a transitory crude price shock.
Source: Author's estimates

III.2. Supply Shocks and Aggregate Demand

The monetary policy response to supply shocks is also conditioned by the state of aggregate demand conditions in the economy *i.e.* whether there is slack in the economy or excess demand. In the former, the Phillips curve will be flatter, while it will be steeper in the case of the latter.

In the event of a 10 per cent adverse shock to crude oil price when the Phillips curve[8] is flatter,[9] the responsiveness of inflation to aggregate demand conditions will be lower, requiring sharper increases in the policy rate than otherwise to bring down inflation in the face of second round effects (Chart 6). This inflicts more slack on the economy. On the other hand, when the Phillips curve is steeper,[10] inflation is more responsive to aggregate demand, warranting a smaller monetary policy response and hence a lower sacrifice of growth.

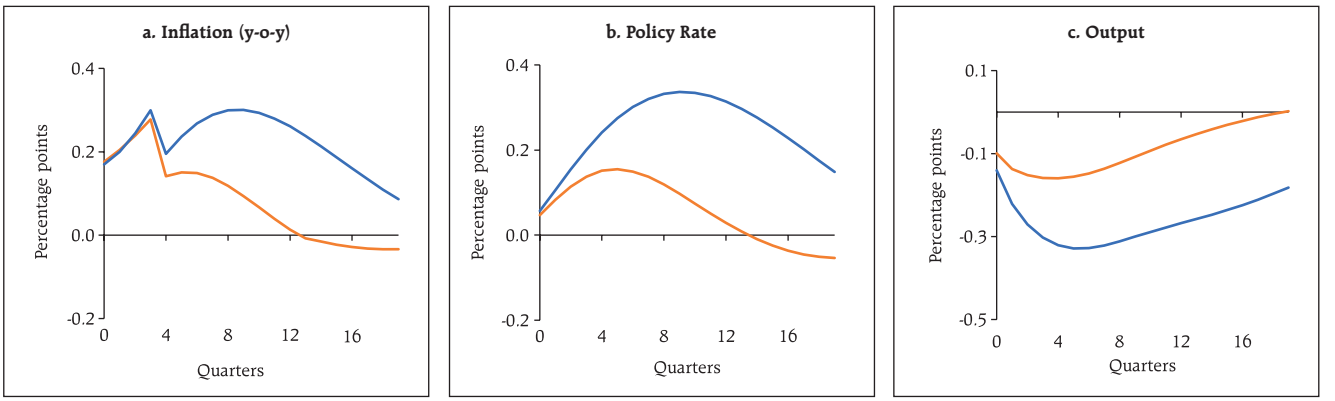
When the economy is going through a contractionary phase, a supply shock can aggravate the dilemma for monetary policy, which can ill afford to weaken demand conditions further by responding to the inflationary impact of the supply shock. Hence, the conduct of monetary policy emphasises the role

[8] When the Philips curve is flatter the elasticity of inflation to aggregate demand will be lower, implying that every unit of disinflation will require more reduction in demand than otherwise; and when it is steeper the elasticity will be higher, requiring less demand compression for every unit of reduction in inflation. For recent estimates of the Phillips curve in India, see Patra *et al.* (2021).

[9] The output gap coefficient in the Phillips curve is calibrated to 0.05.

[10] The output gap coefficient in the Phillips curve is calibrated to 0.30.

Chart 6: Response to 10 Per cent Increase in Crude Oil Price: Steep and Flat Phillips Curve



Note: Orange lines represent the IRFs when the Philips curve is steeper and blue lines represent the IRFs when Philips curve is flatter.
Source: Authors' estimates

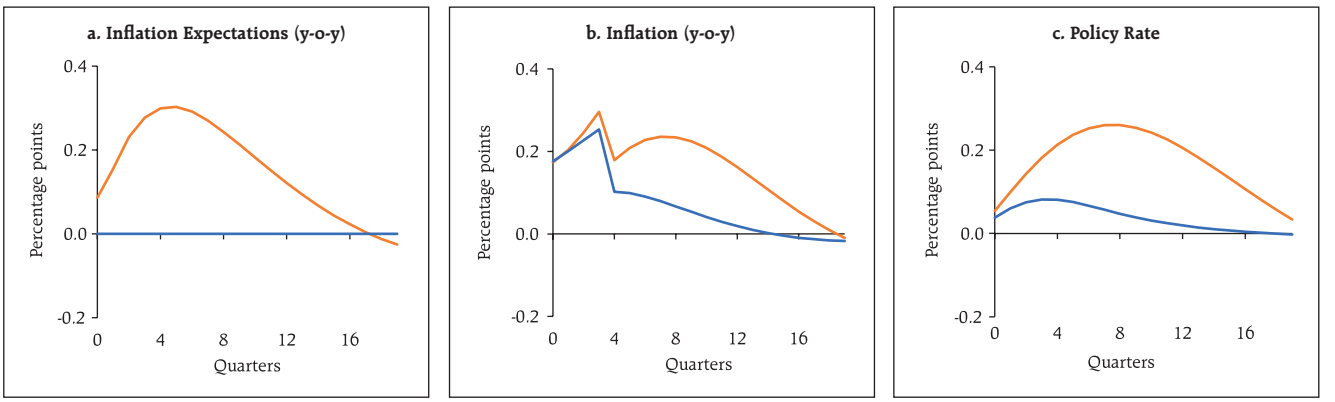
of inflation expectations. If agents in the economy believe in monetary policy's steadfast commitment to inflation within a credible FIT framework, large policy rate increases can be avoided. This leads into the issue of the credibility of monetary policy.

III.3. Supply Shocks under Perfect and Imperfect Credibility

With a 10 per cent shock to crude oil price under perfect credibility[11], inflation expectations of all agents in the economy are fully aligned with the target. Hence, monetary policy need not react even to second round effects as firms will not pass on these inflationary impulses, preferring to absorb them in their profit margins because they believe that passing on the crude price shock to consumers will lead to higher interest rates in the economy that will adversely affect their cost of borrowing (Chart 7).

Even with perfect credibility, however, monetary policy cannot look through the second round effects

Chart 7: Response to 10 Per cent Increase in Crude Oil Price : Perfect and Imperfect Credibility



Note: Orange lines represent the IRFs with imperfect credibility and blue lines represent the IRFs with perfect credibility.
Source: Authors' estimates.

[11] Credibility is defined on an index between 0 to 1. 1 means perfect credibility; for imperfect credibility, we assume the index is at 0.5. When credibility is perfect, inflation expectations are completely forward looking. (Benes, Clinton, George, John, *et al.*, 2016)

of repeated supply shocks. The inflation target may be breached for a prolonged period and this could un-anchor expectations and eventually get reflected in higher inflation. On the other hand, if credibility is not perfect, inflation expectations will be adaptive. In the case of unfavourable supply shocks, inflation expectations will increase, leading to generalised inflation and hence a higher policy rate than otherwise will be required. Thus, higher credibility can reduce – not substitute for – the monetary policy response to second round effects of repeated supply shocks.

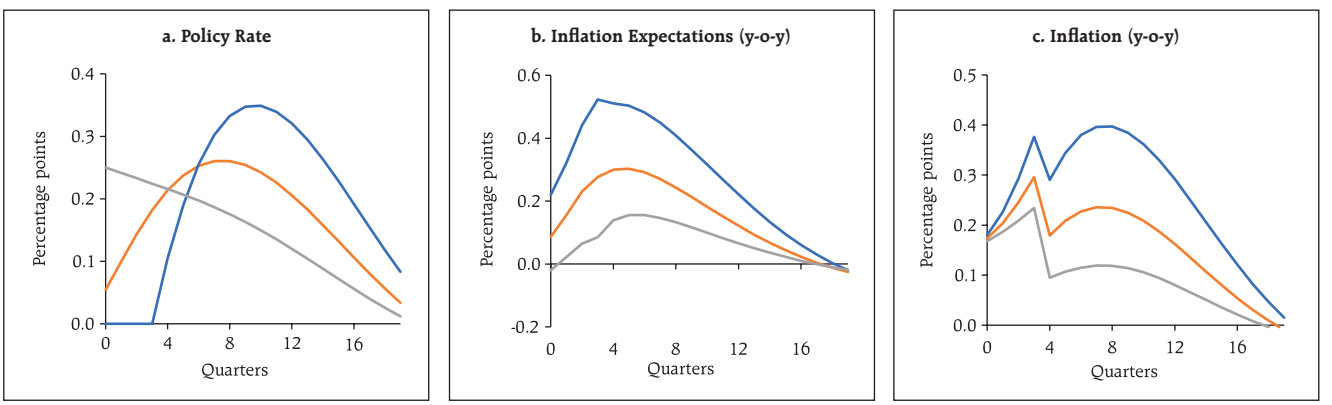
Another dimension of monetary policy credibility is the timing of its response. With imperfect credibility, a delay in the monetary policy response to repeated unfavorable supply shocks leads to a further loss of credibility, unhinging of inflation expectations and eventually, higher inflation outcomes with a higher sacrifice of growth (Chart 8). On the other hand, by frontloading monetary policy actions, credibility in the commitment to the inflation target is enhanced. This will anchor inflation expectations, necessitating less aggressive policy increases and, therefore, a lower growth sacrifice.

III.4. Role of Fiscal Policy

We assume two counterfactual scenarios under a 10 per cent increase in crude oil price *viz.*, a) a fuel tax cut that keeps retail prices unchanged, but this results in a slippage relative to budgetary projections; and b) a fuel tax cut which is offset by a commensurate reduction in capital expenditure to prevent fiscal slippage (Chart 9).

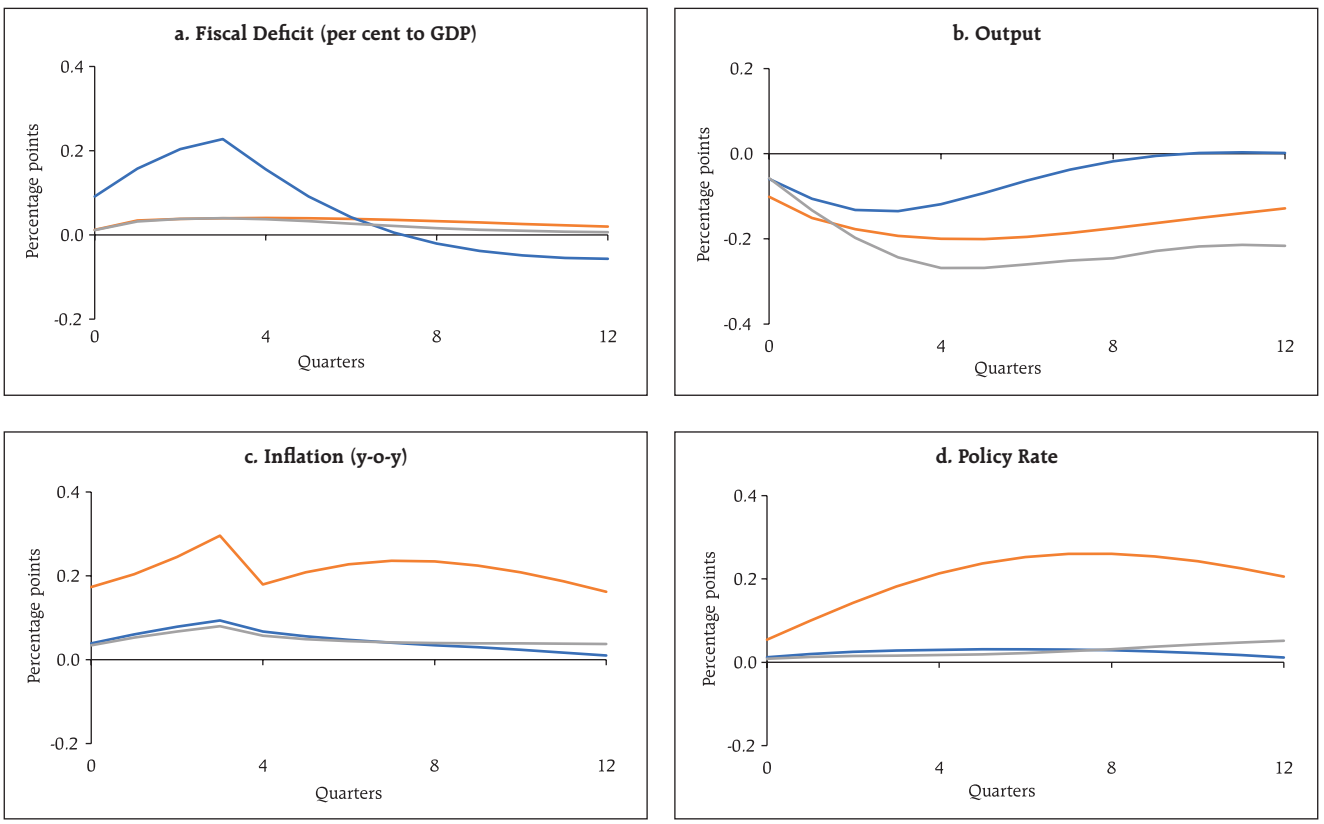
In the first scenario, there is a widening of the fiscal deficit due to revenue losses which has inflationary consequences. Furthermore, second order effects set in. The widening trade deficit due to higher outgo on imports leads to depreciation pressures on the exchange rate. The initial increase in the fiscal deficit also imposes additional pressure on the exchange rate due to higher country risk premium. Overall, although the peak impact on headline inflation could be substantially lower than in a scenario with no cut in fuel taxes, the combination of fiscal slippage and higher market borrowing by the government, exchange rate pressures and a higher country risk premium may produce large destabilising macroeconomic effects.

Chart 8: Response to 10 Per cent Increase in Crude Oil Price : Delay Versus Frontloading Monetary Policy Actions



Note: Orange lines represent the IRFs with gradualism; blue lines represent the IRFs with 4-quarter delay in response and grey lines represent the IRFs with frontloading policy action.
Source: Authors' estimates

Chart 9: Response to 10 Per cent Increase in Crude Oil Price : Under Fiscal Action



Note: Orange lines represent the IRFs with no fuel tax cut; blue lines represent the IRFs in Scenario 1 and grey lines represent the IRFs in Scenario 2.
Source: Authors' estimates

In the second scenario, taxes on petroleum products are reduced to absorb the full impact of the crude oil price increase (therefore, no increase in retail prices), but the primary deficit is kept unchanged by reducing capital expenditure equivalently. In this scenario, the peak impact on inflation is lower as the exchange rate depreciates by a relatively lower magnitude and the country risk premium is unaffected in the short run because of the unchanged primary deficit. The required interest rate tightening in this scenario is also lower. The decline in output is, however, much more in view of the lower capital expenditure, and more prolonged due to multiplier effects.

IV. Conclusion

The role of monetary policy in the context of inflation driven up by supply shocks is engaging attention in India as well as across the world. 'Team transitory' that would argue for monetary policy looking through supply shocks is losing out to 'Team permanent' which advocates fighting inflation with monetary policy irrespective of the sources of inflationary pressures. As we have argued in this article, the answer to this conundrum is conditional on several factors such as the nature of the shock, aggregate demand conditions prevailing in the economy, monetary policy credibility, and the role played by other agents in response to the supply

shocks. We have attempted to model each of these factors in discrete scenarios. In real life policy making, however, these factors come into play together with differing intensity, often interacting with each other, and have to be considered simultaneously.

In the wake of the pandemic and now the war in Ukraine, the Indian economy has faced repeated supply shocks. The flattening of the Phillips curve during the pandemic would have required a large and unaffordable growth sacrifice for disinflation. At the current juncture, however, supply shocks are larger and unrelenting, carrying the risk of unanchoring inflation expectations. They are also accompanied by a rebound in pandemic related revenge spending. With the gradual closing of the output gap underway, disinflation is less costly than before. Consequently, coordinated monetary and fiscal policy responses are set in motion on an ongoing basis. With limited policy space, frontloading of monetary policy actions can keep inflation expectations firmly anchored, re-align inflation with the target and reduce the medium-term growth sacrifice.

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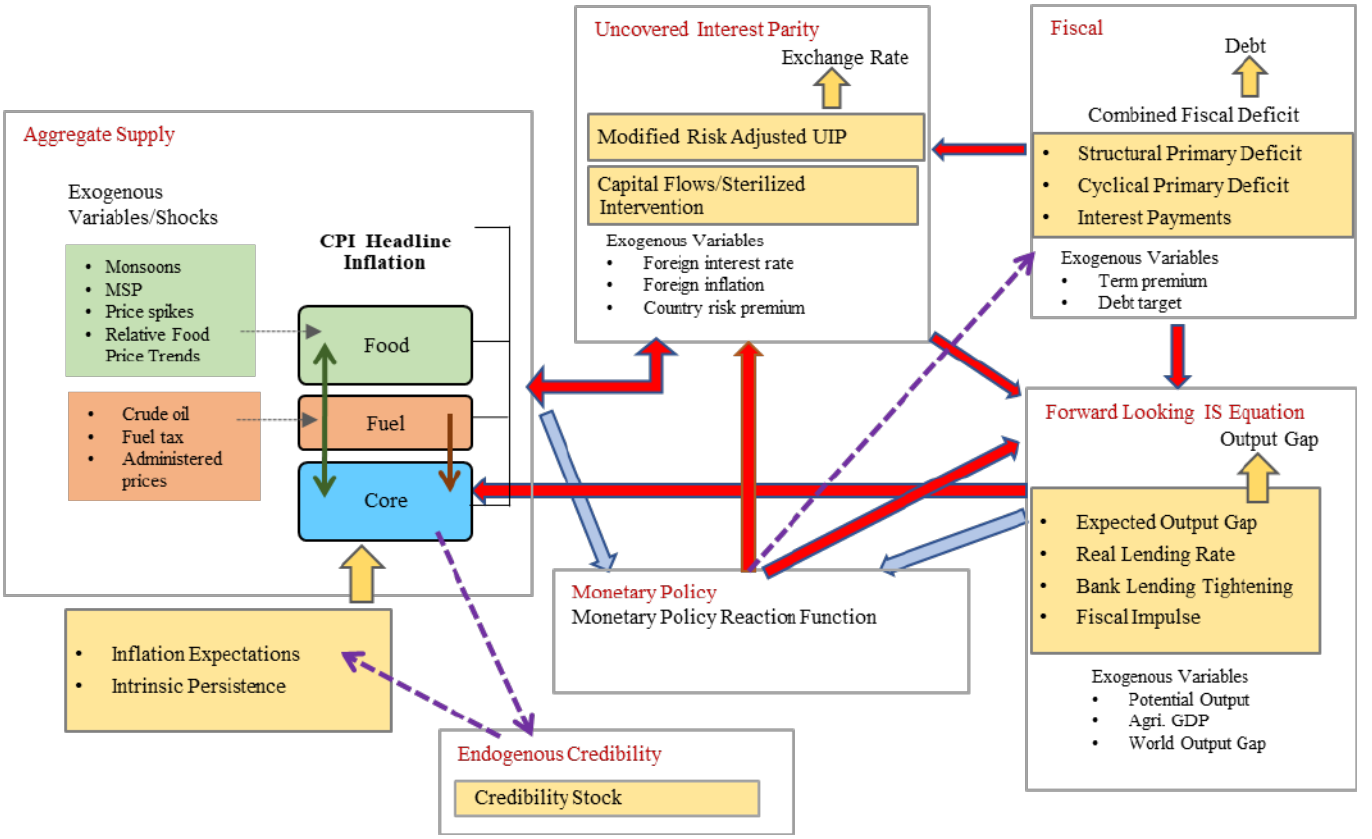
Appendix

I. Schematic Representation of Quarterly Projection Model (QPM)



Source: Modified version of Benes, Clinton, George, Gupta, *et al.* (2016).

II. Key Equations in QPM

The QPM has 154 equations, of which 57 are behavioral equations. Only key equations are presented below.

Forward-Looking IS Equation:

$$\hat{y}_t = \alpha_1 * E_t(\hat{y}_{t+1}) + \alpha_2 * \hat{y}_{t-1} - \alpha_3 * \hat{r}_t^m + \alpha_4 * \hat{y}_t^f$$

$$+\alpha_5 * \hat{z}_t - \eta_t^{BLT} + \alpha_6 * FIMP_t + \alpha_7 * \widehat{roil}_t + \varepsilon_t^{\hat{y}} \quad \ldots(1)$$

The output gap ($\hat{y}_t$) is determined by lagged values ($\hat{y}_{t-1}$), model-based rational expectation ($E_t(\hat{y}_{t+1})$), the long-term market real interest rate gap ($\hat{r}_t^m$), the foreign output gap ($\hat{y}_t^f$), the real exchange rate gap ($\hat{z}_t$), the credit conditions (η_t^{BLT}), the real domestic fuel price gap ($\widehat{roil}_t$), the fiscal impulse ($FIMP_t$) and the shocks to aggregate demand ($\varepsilon_t^{\hat{y}}$).

Aggregate Supply Block - Inflation Equations:

$$\pi_t^{food} = \pi_{t-1}^{food} + \varphi_1\left(\pi 4_t^{headline} - \pi 4_t^{food}\right) - \varphi_2\left(p_{t+4}^{food} - p_{t+4}^{core} - \overline{rp}_{t+4}^{food}\right)$$

$$+\Gamma_{monsoon}(L)\varepsilon_t^{monsoon} + \Gamma_{MSP}(L)\varepsilon_t^{MSP} + \Gamma_{vegetables}(L)\varepsilon_t^{vegetables} + \varepsilon_t^{\pi^{food}} \quad \ldots(2)$$

Food inflation (π_t^{food}) depends on past food inflation (π_{t-1}^{food}). $(\pi 4_t^{headline} - \pi 4_t^{food})$ and $(p_{t+4}^{food} - p_{t+4}^{core} - \overline{rp}_{t+4}^{food})$ ensure that food inflation converges to overall inflation in the long run. Food inflation in the short run is driven by three shocks: monsoon shocks ($\varepsilon_t^{monsoon}$), shocks to minimum support prices (ε_t^{MSP}) and shocks to vegetable prices, e.g., onions ($\varepsilon_t^{vegetables}$), with each of these shocks having different short-term effects

$$\pi_t^{core} = \beta_1 * {E_t}^h(\pi 4_{t+1}^{core}) + (1-\beta_1) * \pi_{t-1}^{core} + \beta_2 * (\hat{y}_t + \beta_3 * \hat{z}_t) + \beta_4 * \left(\pi 4_t^{headline} - \pi 4_t^{core}\right)$$
$$+\beta_5\left(p_t^{energy,mkt} - p_t^{core} - \overline{rp}_t^{energy,mkt}\right) + \beta_6\left(p_{t+4}^{food} - p_{t+4}^{core} - \overline{rp}_{t+4}^{food}\right) + \varepsilon_t^{\pi^{core}} \quad ...(3)$$

Core inflation (π_t^{core}) depends on expected inflation (${E_t}^h(\pi 4_{t+1}^{core})$), as well as its past value (π_{t-1}^{core}). Core inflation also depends on domestic output gap ($\hat{y}_t$), and the real exchange rate gap ($\hat{z}_t$). $\left(p_t^{energy,mkt} - p_t^{core} - \overline{rp}_t^{energy,mkt}\right)$ and $\left(p_{t+4}^{food} - p_{t+4}^{core} - \overline{rp}_{t+4}^{food}\right)$ represents the spillovers from food and fuel components.

$$\pi_t^{fuel} = wt_{fuel,mkt}\, \pi_t^{fuel,mkt} + \left(1 - wt_{fuel,mkt}\right) \pi_t^{fuel,adm} \quad ...(4)$$

Fuel inflation (π_t^{fuel}) is determined as weighted average of market determined fuel inflation ($\pi_t^{fuel,mkt}$) and administered fuel inflation ($\pi_t^{fuel,adm}$)

$$\pi_t^{fuel,mkt} = \beta_1^{fm}\pi_{t-1}^{fuel,mkt} + \beta_2^{fm}\pi_t^{fuel,tax} + \left(1 - \beta_1^{fm} - \beta_2^{fm}\right)4\left(\Delta S_t + \Delta p_t^{oil} - \Delta \bar{Z}_t\right) + \varepsilon_t^{\pi^{fuel,mkt}} \quad ...(5)$$

Market fuel inflation is determined by changes in Indian basket crude oil price (Δp_t^{oil}), changes in exchange rate (ΔS_t) and fuel taxes ($\pi_t^{fuel,tax}$).

$$\pi_t^{fuel,tax} = \pi_{t-1}^{fuel,tax} + \beta_1^{ft}\left(\pi_{t-1}^{core} - \pi_{t-1}^{fuel,tax}\right) + \varepsilon_t^{\pi^{fuel,tax}} - \varepsilon_{t-1}^{\pi^{fuel,tax}} \quad ...(6)$$

$$\pi_t^{fuel,adm} = \pi_{t-1}^{fuel,adm} + \beta_1^{fa}\left(\pi_{t-1}^{core} - \pi_{t-1}^{fuel,adm}\right) + \varepsilon_t^{\pi^{fuel,adm}} \quad ...(7)$$

Fuel taxes and administered fuel inflation ($\pi_t^{fuel,adm}$) are assumed to be driven by exogenous factors.

Monetary Policy Reaction Function:

$$i_t = \lambda_1 * i_{t-1} + (1-\lambda_1) * \left\{\bar{r}_t + \pi 4_t^* + \lambda_2 * [E_t(\pi 4_{t+3}^{core}) - \pi 4_t^*] + \lambda_3 * [E_t(\pi 4_{t+3}^{headline}) - \pi 4_t^*] + \lambda_4 * \hat{y}_t\right\} + \varepsilon_t^i \quad ...(8)$$

where i_t is the policy repo rate, $\bar{r}_t$ is the natural rate of interest, $\pi 4_t^*$ is the inflation target, $E_t(\pi 4_{t+3}^{core})$ is the core inflation forecast of three-quarter ahead, $E_t(\pi 4_{t+3}^{headline})$ is the headline inflation forecast and $\hat{y}_t$ is the output gap.

Modified Risk-Adjusted Uncovered Interest Parity (UIP):

$$\gamma_1 * [i_t - (i_t^f + \sigma_t + \gamma_2 * BIMP_t + \gamma_3 * FIMP_t)] + (1-\gamma_1) * [4\Delta \bar{Z}_{t-1} + (\pi 4_{t-1}^{core} - \pi 4_{t-1}^f)] +$$
$$(1 - Int) * \gamma_4 * K_t = 4 * (E_t S_{t+1} - S_t) + \varepsilon_t^S \quad ...(9)$$

where S_t is the current exchange rate, $E_t S_{t+1}$ is the expected exchange rate, i_t the nominal interest rate, i_t^f the foreign nominal interest rate, σ_t the time-varying country risk premium, $\pi 4_t^f$ is the foreign inflation, $\Delta \bar{Z}_t$ is the change in the real exchange rate trend. Exchange rate is also affected by fiscal ($FIMP_t$) and debt ($BIMP_t$) impulses and capital flows (K_t).

Fiscal Block:

The fiscal deficit (FD_t) is the sum of primary deficit (PD_t) and interest payments (IP_t).

$$FD_t = PD_t + IP_t \quad \ldots(10)$$

Primary deficit is decomposed into ${PD^s}_t$ the structural component and ${PD^c}_t$ the cyclical component.

$$PD_t = {PD^s}_t + {PD^c}_t \quad \ldots(11)$$

The cyclical primary fiscal deficit (${PD^c}_t$), which is the automatic stabiliser is modeled as the function of the economic cycle measured by output gap ($\hat{y}$).

$${PD^c}_t = -\xi_1 * \hat{y}_t + {\varepsilon^{PD^c}}_t \quad \ldots(12)$$

The structural component of fiscal deficit (${PD^s}_t$) is modeled as the weighted sum of one-quarter lagged of the structural primary deficit and the primary deficit target ($\overline{PD}_t^s$).

$$PD_t^s = \rho^{PD^s} * {PD^s}_{t-1} + \left(1 - \rho^{PD^s}\right) * \overline{PD}_t^s + {\varepsilon^{PD^s}}_t \quad \ldots(13)$$

The debt accumulation dynamics is modeled based on Domar's canonical form

$$B_t = FD_t + B_{t-1} * \left(\frac{1}{\left(1+\frac{(\pi^{SS}+G^{SS})}{100}\right)}\right) \quad \ldots(14)$$

The changes in the structural primary deficit causes fiscal impulses ($FIMP_t$).

$$FIMP_t = PD_t^s - \overline{PD}_t^s \quad \ldots(15)$$

The changes in the debt produces debt impulses ($BIMP_t$)

$$BIMP_t = B_t - B_{t-1} \quad \ldots(16)$$

*Remote Sensing Applications for Policy: An Assessment of Agricultural Commodity Arrivals**

Timely and reliable information on crop production is a key element for gauging future inflationary trends. The study explores the utility of remote sensing data for policy analysis with a focus on pulses. Using satellite imagery-based Normalised Difference Vegetation Index (NDVI), vegetation growth is derived by suitable seasonal filtering and temporal aggregation. The results suggest that vegetation growth has significant ability to provide reasonably good assessment of commodity arrivals in mandis, well in advance. Further, geospatial modelling using location coordinates indicates the presence of spatial heterogeneity.

Introduction

Food Inflation has long been a focal point of policy debates in India. The Food and Beverages group, owing to its high weightage in the composition of Consumer Price Index (CPI) in India, exerts a high degree of price pressure on headline retail inflation. The effects may be persistent, with spillovers to other components as well as to inflation expectations, and therefore, warranting policy interventions.

Food inflation is influenced by a host of factors broadly categorised into demand-pull, supply-side, global and policy factors. These factors share a complex intrinsic structure, and their inter-dynamics shapes the inflation trajectory (Anand *et al.*, 2016; Bhattacharya and Gupta, 2015; Sonna *et. al.*, 2014). As food availability in the country is intrinsically shaped by domestic food production, with supply-side factors predominantly determining food availability, timely and reliable information on crop production becomes a key element in gauging future inflationary trends.

In India, Directorate of Economics and Statistics (DES) in the Ministry of Agriculture and Farmers' Welfare (MoA&FW), Government of India (GoI) provides advance estimates of major food grains at the country level. Final country-level estimates are released after the crops are harvested[1]. Moreover, the state and district-level crop production estimates are released with even a longer lag (one-two years) (DES, 2020).

Publication delays in official data has led to the exploration of alternative sources, such as high frequency remote sensing data. Availability of spatio-temporal remote sensing data at high-frequency and near real-time basis provides an extra edge over traditional datasets and is being explored extensively. With modern big data tools, machine learning and image processing capabilities, the usage of remote sensing data has become even more appealing. The related literature suggests that satellite imagery-based vegetation indicators have the potential to capture change patterns on earth which can be valuable for monitoring of agricultural crop production and estimating crop yields.

The wholesale and retail prices are influenced by commodity prices recorded in agricultural markets (mandis), which typically represent an initial touch point for transaction by farmers and traders, and thus, prices at the first level of transaction. *Mandi* prices primarily depend on arrival quantity, though there

* This article is prepared by Shweta Kumari and Sandhya Kuruganti of Big Data Analytics Division, Department of Statistics and Information Management, Reserve Bank of India. The authors express their gratitude to Ajit Ratnakar Joshi for his encouragement and valuable guidance. Views expressed in the article are those of the authors and do not represent the views of the organisation they belong to.

[1] Under the FASAL scheme (*Forecasting Agricultural Output using Space, Agro-meteorology and Land based observations*), pre-harvest forecasts of acreage and production are generated for selected ago-commodities using multiple data sources. The scheme is operated by Mahalanobis National Crop Forecast Centre (MNCFC), MoA&FW, in collaboration with Indian Space Research Organisation, India Meteorological Department, State Agriculture Departments, Institute of Economic Growth and Agricultural Universities. (DES, 2020; Ray, 2016).

could be additional factors such as procurement policy, export/import decisions and minimum support prices influencing the *mandi* prices. A timely assessment of arrivals is crucial as lower arrivals may build price pressures. *Mandi* arrivals and prices are also analysed while making nowcast for retail inflation (Raj *et al.*, 2019).

Against this backdrop, the article explores the utility of remote sensing data for policy analysis with focus on pulses, especially *Tur*. The choice of *Tur* is motivated by two factors: (i) India is one of the largest producers and consumers of pulses globally, (ii) retail inflation is seen to be sensitive to *Tur*, as the latter carries the highest weight (33 per cent) in pulses sub-group. The overall analytical approach and modelling framework is kept simple in order to (i) be able to deploy it in an operational environment, (ii) to keep the scope of scalability (to cover more geographical regions and additional indicators) and replicability (to cover other commodities) open.

Using the satellite imagery-based Normalised Difference Vegetation Index (NDVI), vegetation growth is derived by suitable seasonal filtering and temporal aggregation. Vegetation growth, an indicator of crop production, provides an assessment of commodity arrivals in mandis in advance. Rainfall data is also used as additional variable for robustness check and efficiency gain.

The article makes a useful contribution to the literature. First, a direct study of the inter-linkages between vegetation indicators and *mandi* arrivals is a departure from the existing studies that look at crop yield estimation. Moreover, this approach brings us one step closer to inflation assessment. Second, experimenting with geospatial models for understanding spatial heterogeneity is relatively limited in extant studies.

Our results suggest that vegetation growth has significant ability to provide reasonably good assessment of commodity arrival growth in mandis, well in advance. Vegetation growth influences the growth in *mandi* arrivals positively and strengthens as the season progresses. The effect of vegetation indicator is found to be stronger than rainfall for our period of study. Geospatial modelling using location coordinates indicates the presence of spatial heterogeneity.

The rest of the article is structured as follows. Section II presents a brief review of relevant literature. The representative area and datasets used in the article have been discussed in Section III. In Section IV, we present stylised facts and discuss first stage results which set the basis for the next section. Section V sets out the modelling framework. Empirical results are presented and discussed in Section VI. Section VII concludes with future proposals.

II. Review of Literature

An enhanced access of earth observation data has created opportunities for downstream applications and innovations in various domains. Satellite data offers multi-faceted applications and are being used for several purposes, including but not limited to, agriculture, environmental dynamics, security and defense activities, demographic characteristics, urbanisation, public policies, disaster management and monitoring the progress of sustainable development goals (Donaldson and Storeygard, 2016; Goldblatt *et al.*, 2019; OECD, 2020; World Bank, 2017).

Globally, agriculture has been a core application area of remote sensing. In India, agriculture has been a major driver for the Indian Space Programme, starting with the Coconut Wilt Experiment in 1969 to the cutting-edge experiments and multi-faceted applications of today. Satellite imagery has been used

successfully in precision agriculture, crop production/ yield assessment, land cover estimation, climate change impact, drought and horticulture (Ray, 2016; Navalgund and Ray, 2019).

Agricultural ecosystems are complex and crop conditions are influenced by a host of factors, both climatic (precipitation, temperature, soil moisture) and agronomic practices (sowing timing, seed quality, cropping pattern, fertilizer, pesticide, farming practices). Vegetation indices represent the crop conditions in near real time accounting for various factors and are significant inputs in yield / production forecasting models (Johnson *et al.*, 2016)[2].

The selection of representative regions is based on the varieties of crops produced in a country. Accordingly, studies focus on specific crops and consider the representative regions producing these crops, though they may vary in their approach and model designs (Dubey *et al.*, 2018; Johnson *et al.*, 2016; Rembold *et al.*, 2013; Manjunath *et. al.*, 2002). In the literature, it is a general practice to derive a measure of vegetation condition by suitable transformation or aggregation of NDVI values, for assessing changes in vegetation patterns. Due attention is also paid to capture the phenological stages of the crop while doing so (Balaghi *et. al.*, 2008; Johnson, 2014; Gumma *et al.*, 2021; Wall *et al.*, 2008; Mkhabela *et al.*, 2011; Panek and Gozdowski, 2020).

Linear regression using ordinary least squares (OLS) is a common method adopted in most studies. A relatively new dimension in this area aims at examining presence of spatial variability using Geographically Weighted Regression (GWR) framework. GWR has found applications in agricultural domain, though the references are rather limited (Haghighattalab *et al.*, 2017).

Most studies focus on target crop yield estimation and anomaly detection. Very few empirical studies have directly examined the inter-linkages between vegetation indicators and *mandi* arrivals/prices, as we have attempted in this article.[3]

III. Representative Region and Data

III.1 Representative Region

India is a geographically vast country with diverse topography, multiple crops, varying climatic conditions and multiple seasons. Considering these features, a simple aggregation of regions may dilute the rich micro-information from disaggregated data. Therefore, the selection of representative regions, which are significant for the target crop of *Tur*, assumes significance.

Tur production in India is regionalised. Three states - Karnataka, Madhya Pradesh and Maharashtra – have contributed about 60-70 per cent in the all-India *Tur* production in the recent period (2015-16 to 2019-20), commanding a similar share in area coverage. Top 15 districts from these three states having 40-45 per cent share in all-India production are selected for the current study (Chart 1).

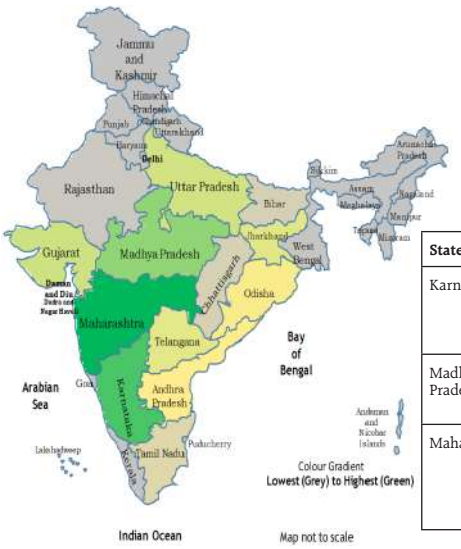
III.2 Data

A range of datasets are used in this study covering *mandi* arrivals, remote sensing vegetation and rainfall data; the period is from 2012 to 2021. Temporal signatures depend on the crop being analysed. Due to seasonality, the selection of appropriate time windows for modelling assumes importance. As vegetation data are available at fortnightly frequency, *mandi* arrival and rainfall data are aggregated on a fortnightly basis.

[2] In satellite crop monitoring, there are a host of indicators for measurement of vegetation vigor, using different combination of spectral bands, such as Normalised Difference Vegetation Index (NDVI), Ratio Vegetation Index (RVI), Leaf Area Index (LAI), Soil Adjusted Vegetation Index (SAVI), Difference Vegetation Index (DVI) and Enhanced Vegetation Index (EVI). Though these vegetation indices may be useful for specific applications, NDVI has been a common choice in empirical studies and for operational applications (Xue and Su, 2017; Sawasawa, 2003).

[3] A related paper in this regard is by Prasad *et al.* (2018) that predicts arrivals using NDVI data of neighborhood locations for select regions of Karnataka.

Chart 1: Representative Region - Tur Production



State	Districts
Karnataka	Bidar, Bijapur, Kalaburgi (Gulbarga), Raichur, Yadgir
Madhya Pradesh	Damoh, Narsinghpur, Raisen, Satna
Maharashtra	Akola, Amarawati, Latur, Wardha, Washim, Yeotmal

Note: Figures pertaining to Jammu & Kashmir also includes Ladakh
Source: DES, MoA&FW and Authors' calculations.

III.2.1 *Mandi* Arrival Data

Commodity arrivals at agricultural markets (mandis) influence *mandi* prices, which represent the first stage in the price setting mechanism, and impact wholesale price and retail prices in subsequent periods. Daily data on *mandi* prices and arrival quantity are published on the Government portal Agricultural Marketing Information Network[4].

In line with the objective of this study, daily data of *Tur* for all the mandis of select three states were collected. Though the data are available at daily frequency, there are instances of missing values, which vary across mandis. Therefore, a filtering mechanism was adopted to exclude mandis having missing data more than a threshold value. For remaining mandis, missing data, if any, were imputed using the Kalman Filter method.

Mandi prices depend on commodity arrivals not only in the same time period, but also on arrivals during the first few months following the crop harvesting period. Accordingly, cumulative arrivals are derived for each fortnight in year-to-date manner and arrival growth is computed (for the same fortnight a year ago).

III.2.2 Remote Sensing Vegetation Data

The multispectral remote sensing captures image data within specific wavelengths across the electromagnetic spectrum. A color composite is obtained by the combination of different bands, highlighting the presence of vegetation and distinguish it from other features (water, soil, manmade features). Vegetation appears differently at visible red (RED) and near-infrared (NIR) wavelengths and this insight of varying reflectance is used to construct the vegetation index.

The Normalised Difference Vegetation Index (NDVI), derived from the satellite imagery of crops, is the most widely used vegetation indicator in agriculture remote sensing literature; it is illustrated below. NDVI is range bound and a higher value indicates healthier vegetation. Temporal changes in NDVI value indicate changes in crop vigor and used for monitoring crop growth in progressive manner.

$$NDVI = \frac{NIR - RED}{NIR + RED}$$

Generally, crop production data are available at a particular administrative level (e.g., district in India), and hence to develop a model, NDVI is aggregated in a manner such that it represents the vegetation of the administrative region (Dubey *et al.*, 2018; Balaghi *et al.*, 2008; Panek and Gozdowski, 2020). As there could be one or more mandis located in one district, using NDVI at district level may not be appropriate as it may dilute the results. Accordingly, NDVI at sub-district level (Taluk or Tehsil), is considered. This one-step drill-down offers advantage in terms of maintaining the inherent information contained in granular data and offers a way to map the production area to mandis

[4] See www.agmarknet.gov.in

at the same time[5]. In the present study, MODIS NDVI 16-Day L3 Global "MOD13A1" dataset is used, sourced from Indian Space Research Organisation (ISRO) VEDAS web-portal (Visualization of Earth Observation Data and Archival System). This data is available at fortnightly frequency.

For modelling of arrival growth, NDVI also needs suitable transformation in order to represent the year-on-year growth in vegetation. Further, it is not known *a priori* which fortnight during the growing season would be optimal for a fair representation of the production, as the timing may vary from one location to another and / or from one year to another (depending on the sowing timing or climatic factors). Therefore, a suitable temporal aggregation of NDVI during the growing season is desirable representing the cumulative effect in line with literature, which would also be in sync with cumulative arrivals being used in the study.

Tur is mainly cultivated in semi-arid regions and can tolerate drought to a certain extent. It needs water at the time of sowing, but unusual heavy rains at later growth stages can be destructive for the crop. *Tur* being a Kharif crop, the season starts with sowing at onset of monsoon (June and July), growing period of 3-4 months (August, September, October, November) and harvesting begins in late November or early December, which may vary slightly from region to region (Tiwari and Shivhare, 2017; GoI, 2020).

Accordingly, the NDVI values for successive fortnights are aggregated and cumulative NDVI (CNDVI) is derived for each fortnight during the growing months. Vegetation growth is represented as annual growth in CNDVI (same fortnight a year ago)[6].

III.2.3 Rainfall Data

In addition to remote sensing information, land-based measurements, particularly rainfall data are also analysed. In India, rainfall is primarily recorded during the South-West Monsoon (SWM). It acts as a precursor to the sowing activity and is a key determinant of Kharif crop production (RBI, 2015). We include it for robustness check and for possible improvement in the explanatory value of the model.

Daily data on rainfall, current and historical normal rainfall, captured by Indian Meteorological Department (IMD), sourced from India Water Resources Information System (WRIS), is used for the analysis. Rainfall deviation has been derived as departure of actual rainfall from historical normal rainfall for each fortnight. These data are not available at Taluk level, and therefore, district-level data have been considered.

IV. Stylised Facts

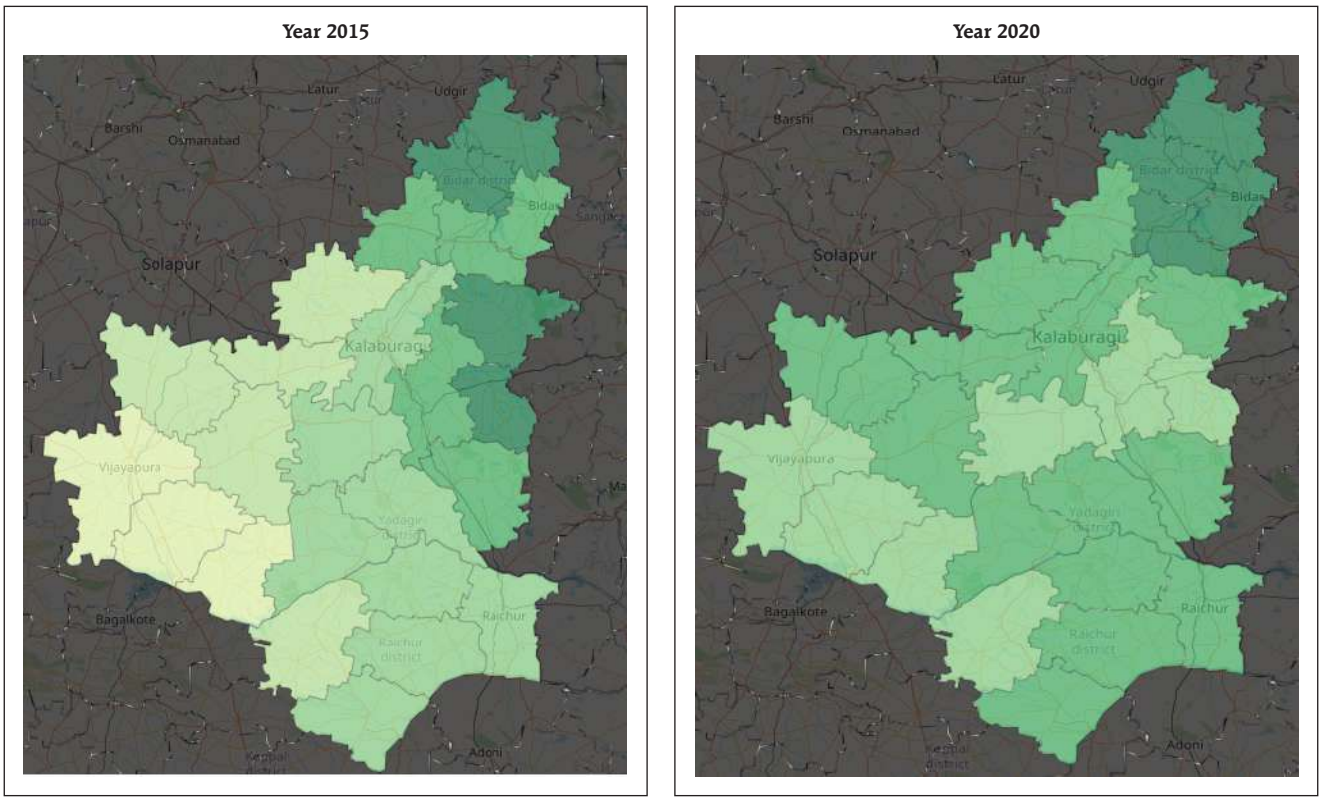
Salient features of data are presented in this section, which help in understanding the seasonal dynamics as a prelude to the modelling exercise. Chart 2 presents cumulative NDVI of different Taluks in Karnataka state in the second fortnight of October for two sample years, which clearly depicts variation in vegetation conditions across Taluks and also between years.

Post harvesting, the commodity starts slowly arriving at the mandis in December, picks up in

[5] In order to link production to arrival, each taluk is mapped to its nearest *mandi* within the same district. Spherical distance between a taluk and *mandi* is measured by using Havershine method based on latitude-longitude co-ordinates.

[6] NDVI values and other transformation of NDVI, such as vegetation condition index (min-max normalisation) and standardised z-score based on historical values were also analysed. However, their correlations with arrival growth were low and insignificant and hence have not been included here.

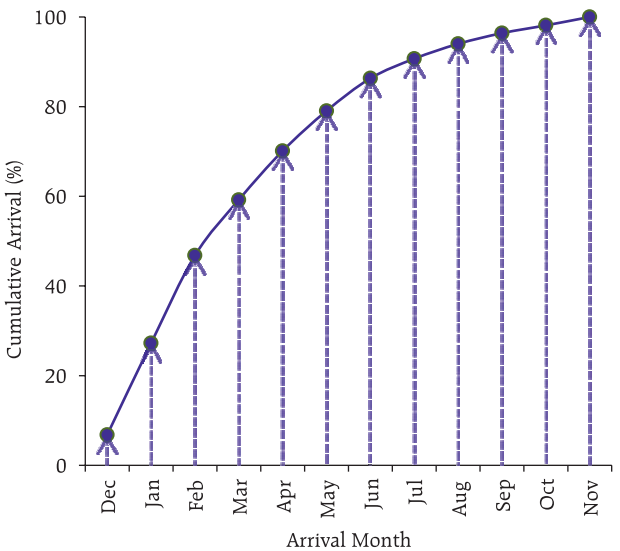
Chart 2: Crop Conditions in Karnataka (CNDVI)



Source: ISRO and Authors' calculations

January and February and tapers slowly afterwards. A large part of the arrivals happens in a few months, approximately 40-50 per cent during the first three months (December to February) and 70-80 per cent during first 6 months (December to May) (Chart 3).

Chart 3: Cumulative Arrival Pattern

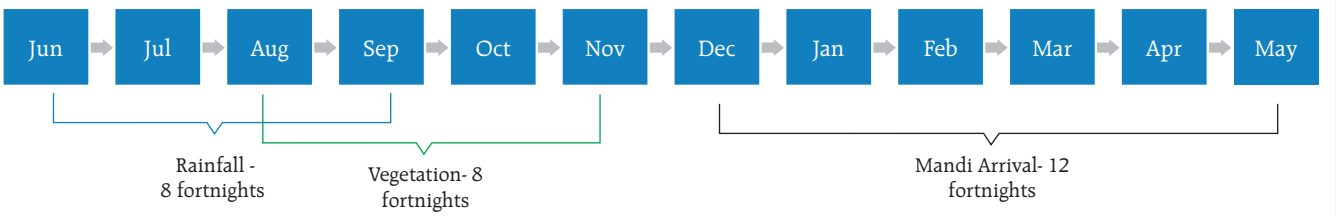


Source: www.agmarknet.gov.in and Authors' calculations.

Taking cognisance of the strong seasonal influence, data pertaining to the peak of season has been considered for analysis, as indicated in Chart 4. It is logical considering that a crop can be produced only during a particular season, but its influence on arrivals may be measured over a period of time.

The changes in production should ideally be reflected in subsequent arrivals, and it is expected that a higher (lower) growth in vegetation gives an indication of higher (lower) arrivals in mandis. Chart 5 presents trend in cumulative NDVI growth (October second fortnight) and cumulative arrival growth (May-end) during the period under study.

Chart 4: Crop Year Definition - June to May



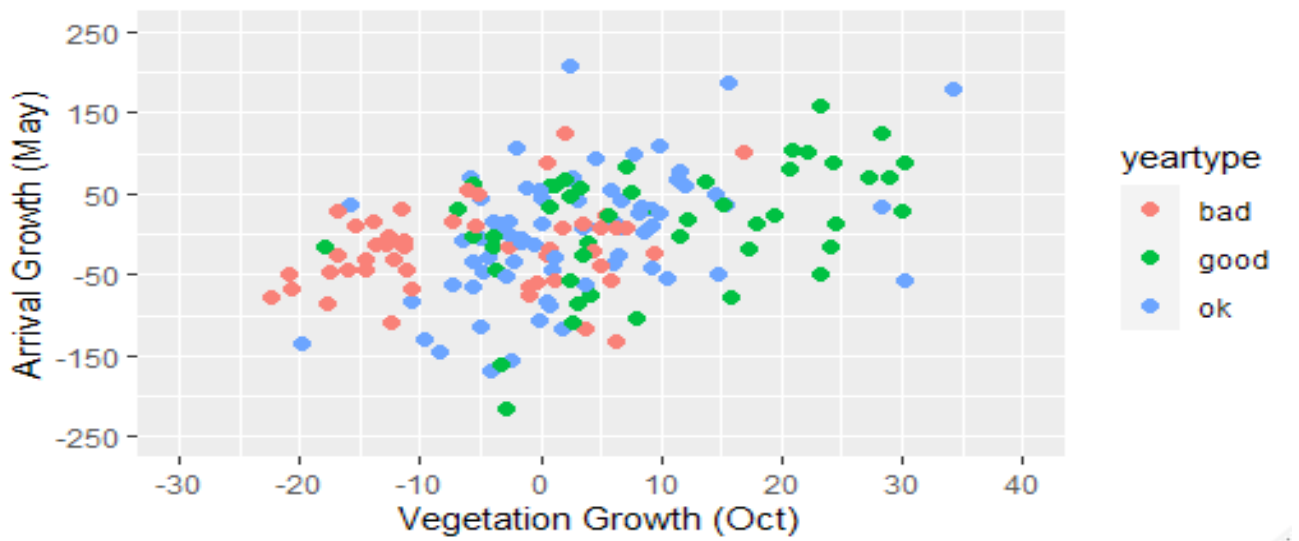
Source: Authors' calculations.

The scatter plot shows a positive linear relationship, *i.e.*, when vegetation growth becomes higher, so does the arrival growth. Similarly, poor growth in vegetation coincides with lower growth in arrivals. It is also able to capture the bad and good years reasonably well (bad and good years defined as per production data sourced from DES).

Though the crop sowing area may remain broadly the same, vegetation vigor and growth may change quickly during the growing season. Correlation between rainfall deviation, vegetation growth and arrival growth are derived at various fortnights and presented in Chart 6.

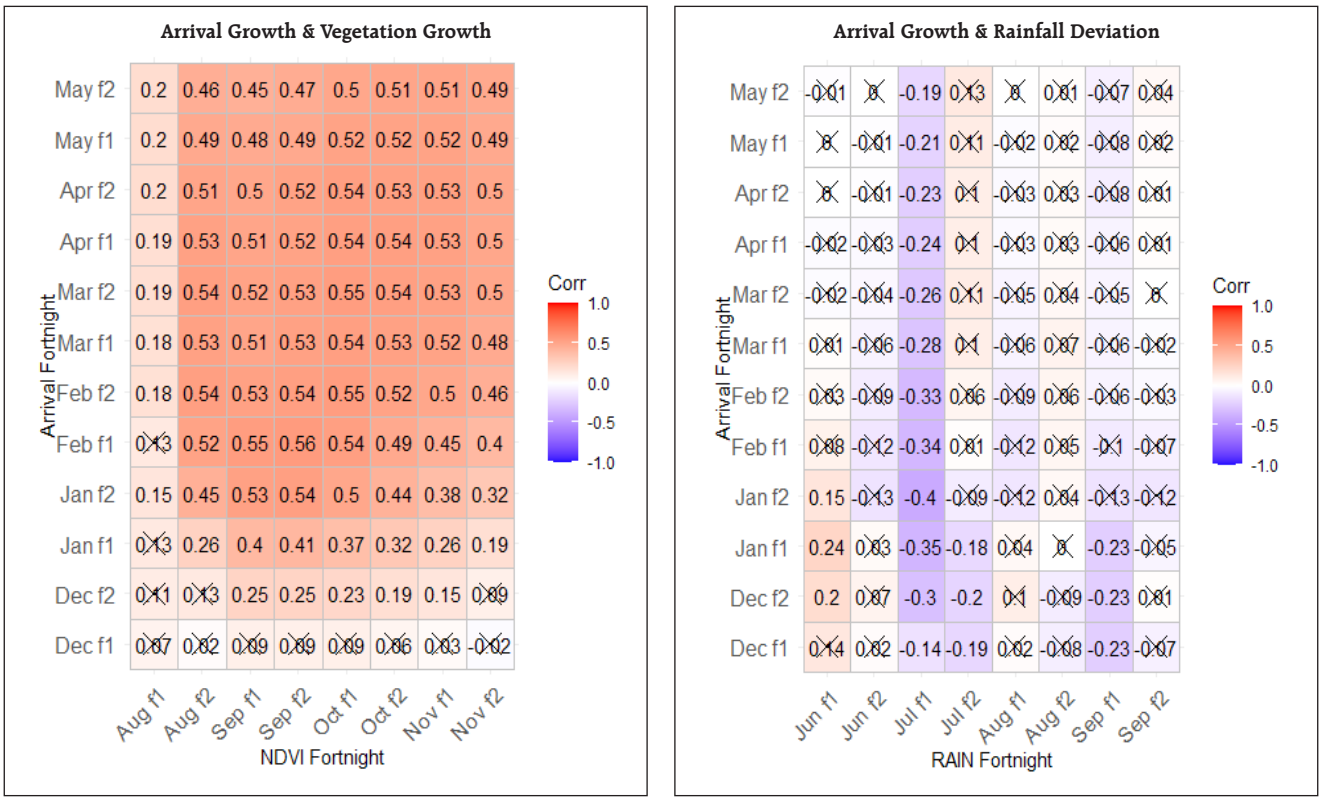
The correlation signs are as expected. Vegetation growth influences arrival growth positively, while rainfall deviation impacts crop production negatively, and hence, the subsequent arrivals. Correlation of arrival growth with vegetation growth is strong and consistent throughout the season, while correlation with rainfall deviation is much smaller in magnitude and significant only for one fortnight *viz.*, the first fortnight of July, while other patterns are inconsistent. This is not surprising given the fact that the sowing season of *Tur* is in June and July when the rains can affect production, whereas vegetation across the entire growing season can influence the arrivals in near future.

Chart 5: Vegetation growth and Arrival growth



Source: Authors' calculations.

Chart 6: Correlation



Note: Figure in cell indicates correlation coefficient, while significance (at 5 per cent) is indicated by absence of cross sign. f1 and f2 indicate first and second fortnight of a month respectively.
Source: Authors' calculations.

V. Modelling Framework - Arrival Growth

Preliminary results in Section IV provide encouragement for the development of arrival growth model based on vegetation growth. Along with single indicator models, hybrid model using both vegetation and rainfall information are also developed, for robustness check and any incremental value that they may provide. As crop conditions may change during the growing cycle, the influence is estimated dynamically at different time points in the growing season. Model specifications are presented below:

$$RAIN\ model: \quad ARG_f = \alpha_{f,r} + \gamma_{f,r} RFD_r + \varepsilon \quad \ldots (1)$$

$$NDVI\ model: \quad ARG_f = \alpha_{f,k} + \beta_{f,k} VEG_k + \varepsilon \quad \ldots (2)$$

$$Hybrid\ model: \quad ARG_f = \alpha_{f,r,k} + \gamma_{f,r} RFD_r + \beta_{f,k} VEG_k + \varepsilon \quad \ldots (3)$$

where, ARG_f is arrival growth for fortnight f, RFD_r is rainfall deviation for fortnight r and VEG_k is vegetation growth for fortnight k, as defined earlier in Section III, and fortnights are indicated as below:

f = arrival fortnight = 1 to 12 = December first fortnight to May second fortnight,

r = rainfall fortnight = 3 = July first fortnight,

k = NDVI fortnight = 1 to 8 = August first fortnight to November second fortnight

Keeping the structure same, the models are trained separately for different fortnights of arrivals and NDVI[7]. It enables us to understand how the coefficient evolves during the season and how

[7] Data of 25 mandis for various years during the study period is used in the analysis and OLS models were developed with pooled data. Separate models may be developed for individual mandis, though it would need sufficient data for robust parameter estimates and as the sample size is limited, this was not attempted.

incremental gains are made in terms of explanatory power in a progressive manner.

The vegetation coefficient β is expected to be positive, and rainfall deviation coefficient γ is expected to be negative. Further, the value of coefficient β, at different k, may be viewed as the changing influence of vegetation growth on arrival growth (of a specific arrival fortnight). It is expected that, as the season progresses, β strengthens in magnitude. A significant positive coefficient early in the season would be an added advantage, as arrival growth could be assessed even before harvest.

Another dimension to examine is how the vegetation coefficient β changes from NDVI model (eq. 2) to Hybrid model (eq. 3), when rainfall deviation is added. If the estimated values of β are similar in both models, it implies that rainfall does not add much value in explaining arrival growth. A similar interpretation is possible for rainfall coefficient γ as well. In addition to coefficients, one may look at the changes in model R-square or information criteria for a comparative perspective.

V.1 Geospatial Modelling

In the OLS regression models, the intercept (α) and slope coefficient (β) are constant for all locations in the study area. However, in reality, the inter-linkages between the explanatory variables (rainfall deviation and vegetation growth) and dependent variable (arrival growth) may vary from one location to another (depending on climatic factors and geographical features), and therefore a uniform relationship as measured by OLS may not be appropriate. Deciphering the presence of spatial variability may lead to interesting geographical patterns and relationships, which otherwise might be known to domain experts but not available empirically.

While undertaking spatial analysis, it is essential to understand and incorporate the geographical features. Tobler's First Law of Geography states "Everything is related to everything else but near things are more related than distant things" (Miller, 2004). This concept provides an intuitive basis for analysing geographical similarity or variation. As conventional statistical models may not be able to capture geographical heterogeneity, Geographically Weighted Regression (GWR) models are developed and used (Brunsdon *et al.*, 1996; Fotheringham *et al.*, 2002). Spatial analysis is performed using GWR model, technical details on which have been provided in Annex.

VI. Empirical Results

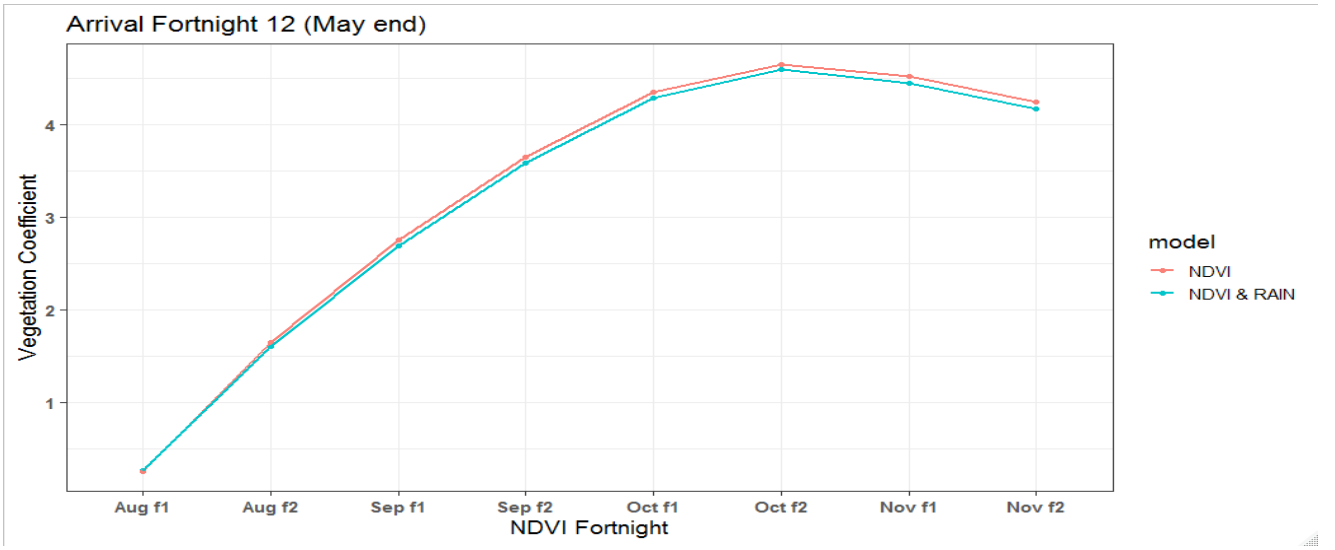
We train various models as outlined in Section V. For a particular fortnight (f) of arrival, there are eight vegetation coefficients (β) pertaining to the eight fortnights (k) of NDVI (August first fortnight to November second fortnight). Similarly, there would be one coefficient (γ) of rainfall deviation corresponding to the 3rd fortnight (July first fortnight). Data upto May 2020 is used for training the models, while remaining data are kept aside for evaluation.

VI.1 OLS model results

Several interesting results are obtained, key results are highlighted and discussed in subsequent paragraphs for select arrival fortnights.

i. **Impact of vegetation on arrivals is strong and robust -** The vegetation growth influences arrival growth positively and its influence consistently strengthens as the season progresses. Its impact peaks by the end of October and stabilises thereafter. Vegetation coefficients are robust, as addition of rainfall does not seem to alter its value (Chart 7). The upward pattern remains broadly same for various arrival fortnights.

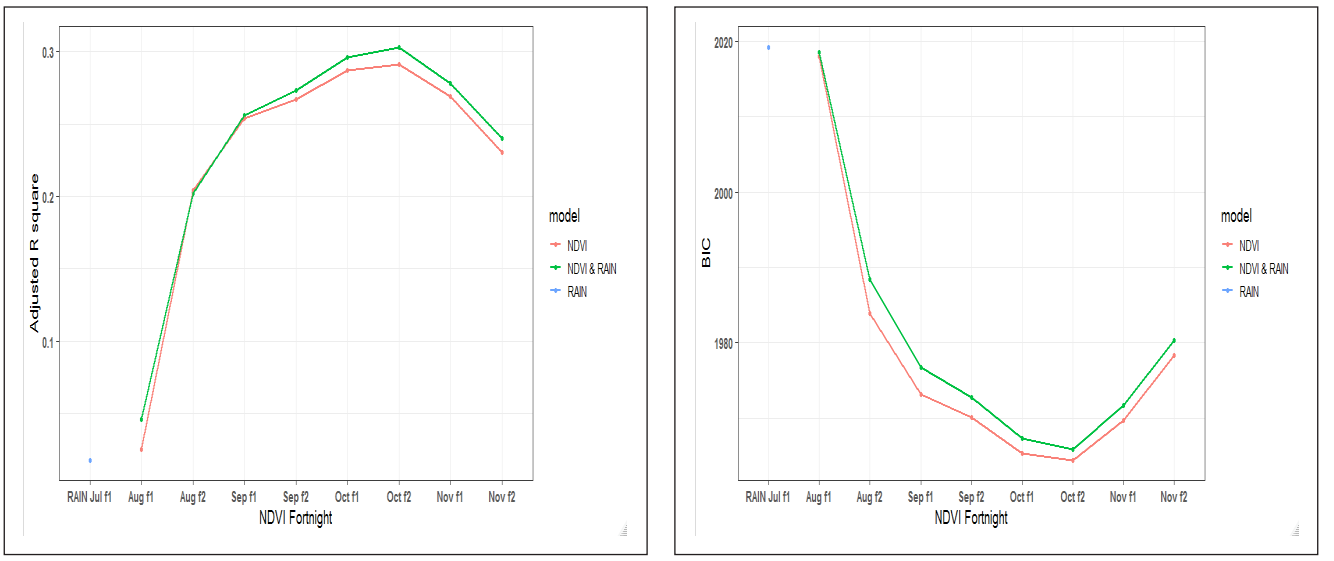
Chart 7: Vegetation Coefficient



Source: Authors' calculations.

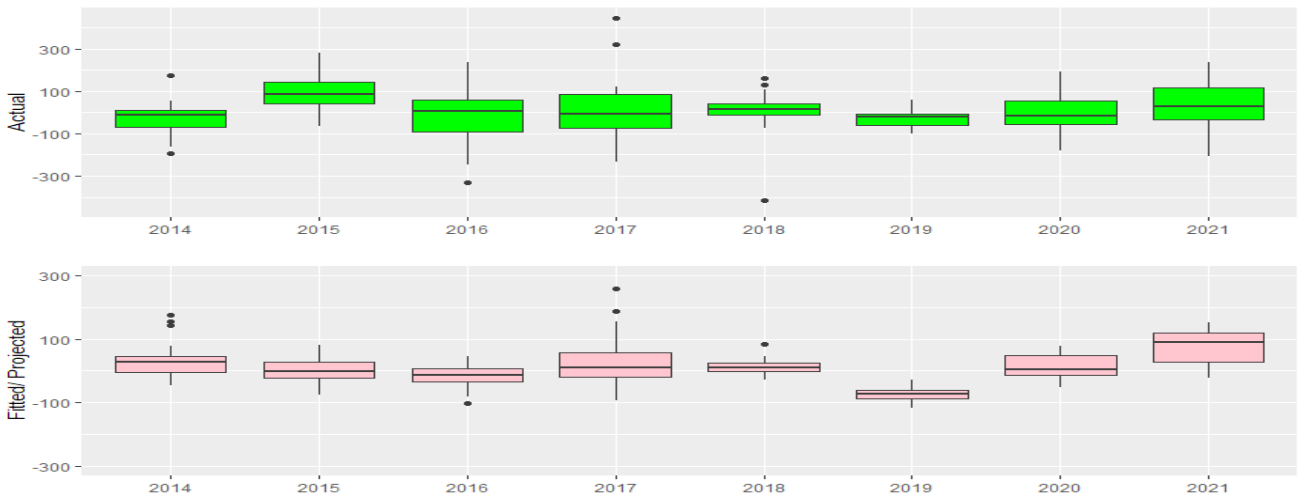
ii. **Vegetation indicator provides a fair assessment of arrivals, while rainfall impact is negligible** - A comparative assessment of individual and combined models, in terms of Adjusted R-square and Bayesian Information Criterion (BIC), reveals interesting facts. While the variability in arrival growth is explained reasonably well by vegetation growth, depicting progressive improvement and stable relationship, standalone rainfall model fails to explain any variation. Further, the individual NDVI and NDVI with RAIN models are very close, indicating that addition of rainfall does not provide any material gain, beyond the variation explained by vegetation during the period under study (Chart 8).

Chart 8: Explanatory Power of Models



Source: Authors' calculations.

Chart 9: Arrival Growth – Actual *v/s* Projected



Note: Projected values of arrival growth are derived using vegetation growth pertaining to October end fortnight, which has emerged as optimal NDVI fortnight. Arrivals pertain to February end.
Source: Authors' calculations.

iii. **Early-on contribution of vegetation is significant** - During the entire growing season, from August to November, sequential improvement in the inter-linkage between vegetation growth and arrival growth is seen (Chart 8). The significance of coefficients of vegetation growth in early fortnights, as early as September first fortnight, which sees a significant jump from August first fortnight and is closer to the maximum influence as seen in October second fortnight, is a key result (Chart 7).

iv. **Model projections provide early information for identification of a good or bad year** - NDVI model-based arrival growth projections are in line with actual patterns, lower in bad years and higher in good years, re-confirming the utility of remote sensing data for assessment arrival growth well in advance (Chart 9).

VI.2 GWR model results

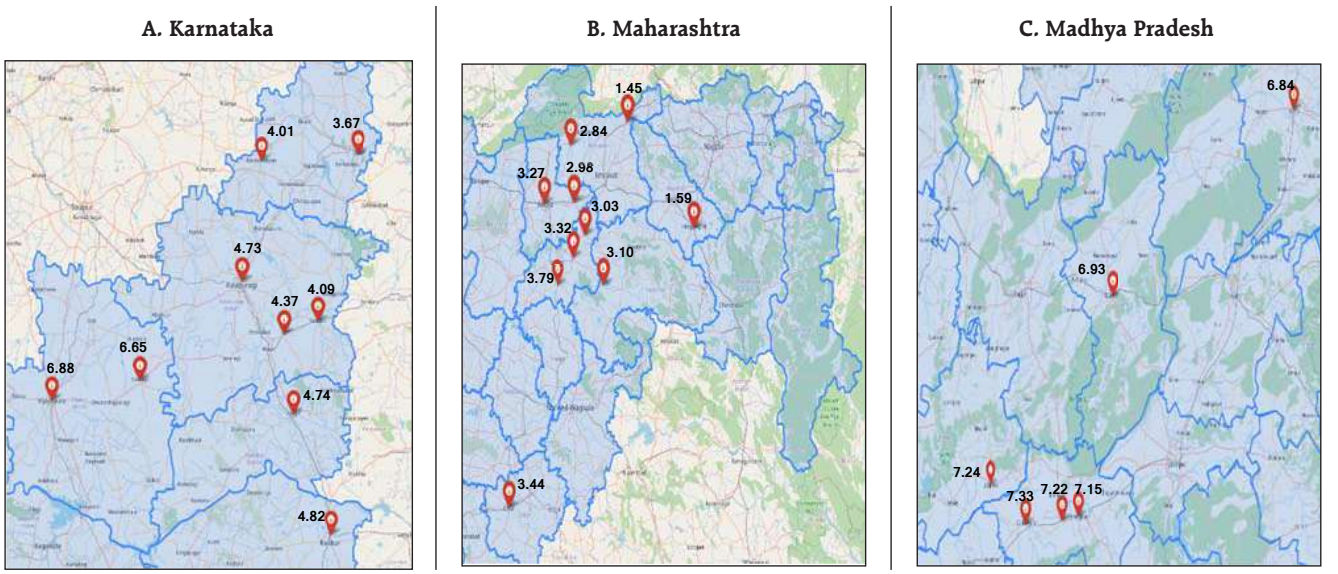
GWR models are developed for NDVI model only, as rainfall effect is found to be negligible, as seen in Section VI.1. Spatial dimension of elements in the space (mandis) is represented by their corresponding latitude and longitude coordinates, based on which the proximity between elements is derived. For brevity, we present results pertaining to the second fortnight of February, which accounts for approximately 50 per cent of total arrivals in a year. It is based on vegetation growth corresponding to October second fortnight, which has maximum explanatory power in the estimated OLS model.

Localised parameter estimates for vegetation growth are presented in Chart 10 (A to C) for visual clarity and distinction. It is observed that relationship between vegetation growth and arrival growth is stronger for mandis in Karnataka and Madhya Pradesh than in Maharashtra.

The local parameter estimates of GWR model are compared with the global estimate (equivalent to OLS estimate). The results are presented in Table 1, which indicate variation in coefficient values.

Though the heterogeneity in location-wise estimates can be seen in Chart 10 and Table 1, we need to test if the spatial variation in estimates across the

Chart 10: Mandi Level Vegetation Coefficient



Source: Authors' calculations

study area is statistically significant. Following Leung *et al.* (2000), the null hypothesis of parameter equality *i.e.*, all local coefficients are equal is tested, against the alternative hypothesis of not all local coefficients are equal. The null hypothesis (at one per cent level of significance) is rejected confirming the presence of heterogeneity in parameter estimates for Vegetation Growth (β) (Table 2).

Table 2: Test for Parameter Equality Leung *et al.* (2000) F(3) test

	F statistic	Numerator degree of freedom	Denominator degree of freedom	p-value
Intercept (α)	0.39	153.65	159.03	1.000
VEG (β)	1.88	51.64	159.03	0.001

Source: Authors' calculations.

In order to examine the performance of GWR and OLS, the ANOVA test suggested in Brunsdon *et al.* (1999) is used. The goodness-of-fit of OLS model is compared with GWR and the improvement obtained by the GWR model is examined. The test results are presented in Table 3. The ANOVA results suggest that the gain obtained by using GWR is significant, and the null hypothesis of adequacy of OLS model is rejected in favour of GWR model (at 10 per cent level of significance).

Table 1: Local and Global Coefficients in GWR Model

	Local coefficient (GWR)				Global coefficient (OLS)
	Min.	Max.	Median	Mean	
Intercept (α)	-15.07	13.13	-1.72	-1.01	-1.68
VEG (β)	1.45	7.33	4.09	4.62	5.15

Source: Authors' calculations.

Table 3: Comparison between OLS and GWR models Brunsdon et al. (1999)

	Sum of Squares (SS)	Degree of Freedom (DF)	Mean of Squares (MS)	F statistic	p-value
OLS Residuals	1560440	2.00			
GWR Improvement	125106	10.33	12111		
GWR Residuals	1435334	155.67	9220	1.31	0.065

Source: Authors' calculations.

VII. Conclusions and Way Forward

Crop growth is a potential source of advance information for assessing the arrivals in mandis, which in turn could influence the future trends in wholesale and retail prices. This article combines remote sensing and ground-based indicators to develop an empirical approach to predict agricultural commodity arrivals in mandis prior to the harvest. It uses a regression-based model embedded with appropriate seasonal filtration and optimised for capturing spatial heterogeneity (geographically-weighted regression).

Due emphasis has been given to select representative regions (districts) for the target crop (*Tur*), considering the production of multiple crops and diverse topography of India. Vegetation indicators pertaining to sub-district level (taluk) in the selected districts have been used to exploit granular information.

The dynamic approach using sequentially updated vegetation growth values enables us to (i) monitor crop conditions on a near real-time basis, (ii) study how the relationship between NDVI and arrivals evolves during the season and (iii) re-assess the arrival growth as and when new data become available. The crop coefficients, estimated early in the season, provide confidence for planning and policy making.

The influence of vegetation growth on arrival growth is found to be significant and robust, which strengthens as the season progresses. It is stronger than the effect of rainfall deviation and varies across locations. The results uphold the use of remote sensing data as a surveillance tool for agro-commodities and projections in near future. The utility is further enhanced by the early availability of vegetation indicators.

To sum up, the analysis in this article has considerable policy use. It can be further strengthened in many ways, going forward. First, in addition to vegetation indicators, climatic factors can be included. Secondly, factors affecting arrivals, such as crop damage during harvesting, transportation or storage, imports, pricing and demand situation, can also be considered while developing an optimal prediction model for arrivals. Thirdly, vegetation indicators can be incorporated in a forecasting framework for inflation, along with other indicators. Finally, following recent advancements by remote sensing experts, high resolution images at fine grid levels supported by ground truth data, sophisticated image analytics, and machine learning algorithms can be used to identify the exact crop and forecast production.

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Annex: Geospatial Modelling – Brief Technical Details

GWR allows the relationship (parameters estimates) to change across various locations in space and thus provides a basis for analysing spatial variability. GWR model is calibrated in a way that it produces location specific parameter estimates directly. The GWR model is expressed as an extension of OLS model form, as below -

$$GWR\ general\ form: \quad y_i = \alpha(u_i, v_i) + \beta(u_i, v_i)x_i + \varepsilon_i \qquad \ldots (4)$$

where $\alpha(u_i, v_i)$ and $\beta(u_i, v_i)$ represent the local coefficients, as a function of location coordinates (u_i, v_i) which adds spatial dimension to the regression model. Weighted least square method is used for estimation of parameters, with a diagonal weighting matrix where each diagonal element corresponds to weighting scheme for a particular observation location (Brunsdon *et al.*, 1999; Leung *et al.*, 2000).

Nearby locations are assumed to have more influence and hence assigned more weight compared to faraway locations (this is possibly based on "distance decay" concept in geography). For each observation at location i, the weight of another observation at location j depends on its distance from location i and the weighting function can take any of the following forms -

$$Gaussian: \quad w_{ij} = e^{-\frac{1}{2}\left(\frac{d_{ij}}{h}\right)^2}$$

$$Bisquare: \ w_{ij} = \begin{cases} \left(1 - \left(\frac{d_{ij}^2}{h^2}\right)\right)^2, & if \ d_{ij} \leq h \\ 0, & if \ d_{ij} > h \end{cases}$$

where d_{ij} is the spatial distance between location i and j, and h is the bandwidth which controls the degree of distance decay. The bandwidth can be fixed for all observations, or adaptive kernel, which allows the bandwidth to be larger when data is sparse and smaller when data is dense. We use bi-square weighting scheme with adaptive kernel suitable for smaller sample size and bandwidth optimisation is done using corrected Akaike Information Criterion (AIC).

Once the GWR model calibration is complete, statistical tests may be used to check whether (i) GWR performance is better than OLS and (ii) differences in parameter estimates are significant. The underlying idea is to examine whether the improvement in model fit provided by GWR over OLS is genuine and not arbitrary. Brundson *et al.*, 1999 and Leung *et al.*, 2000 provide detailed discussion and methods for GWR related hypothesis testing, addressing several theoretical issues.

*Fed Taper and Indian Financial Markets: This Time is Different**

This article compares the impact of the Federal Reserve (Fed)'s two taper announcements (May 22, 2013 and November 3, 2021) on Indian financial markets. The event study results indicate that the later taper (Taper 2) announcement has been less severe as compared to Taper Tantrum of 2013 (Taper 1) in terms of the impact on bond yields and spreads. Empirical analysis using a GARCH framework suggests a muted impact of Taper 2 announcement on financial market volatilities which could be a result of India's stronger external position in 2021 as compared to 2013.

Introduction

"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, and it will spill back to systemically important ones. It is always easier to go into accommodation than to come out. This brings back memories of 2013 and the infamous 'taper tantrum'. It also focuses the spotlight on India."[1]

The Quantitative Easing (QE) programmes by the Fed have a long history that dates back to the early 1930s. QE interventions were also utilised between 2008 and 2014 as a response to the Great Recession, in addition to the Fed's recent QE programme in response to the pandemic. While the Fed's QE operations have been successful in easing financial conditions and lowering longer-term rates *via* the portfolio rebalance channel and/or the signalling channel, the Fed's balance sheet expansion has had some unintended consequences for many emerging market economies (EMEs). Fed QE operations, in particular, have the potential to distort exchange rates; influence capital and trade flows; produce asset market bubbles; and to increase business and household borrowing (Aizenman *et al.*, 2016, Aizenman *et al.*, 2017). In light of the aforementioned negative consequences and adverse impact of the Fed taper announcement in May 2013 on the Indian equity, bond, and currency markets, this article compares the impact of the COVID-QE taper announcement (2021) with the impact of the taper announcement in May 2013 and draws future policy implications.

In response to the Global Financial Crisis, the Fed's large-scale asset acquisition programme was launched in November 2008, when it made public its plans to buy mortgage-backed securities (MBS) and debt issued by Freddie Mae and Fannie Mac. The Federal Open Market Committee (FOMC) authorised large-scale purchases of MBS and Treasury securities in March 2009 (QE1). Two more rounds of QE followed, with QE2 in November 2010 involving an open-ended announcement to buy Treasuries and MBS, and QE3 in September 2012 involving an open-ended announcement to buy Treasuries and MBS. On May 22, 2013, Fed Chairman Ben Bernanke delivered the first hint that the Fed could taper QE (Taper 1), causing a bond market meltdown that raised the 10-year yield by nearly a percentage point (Bernanke, 2020). The Fed's asset market purchases, on the other hand, did not end until October 2014. In his presidential address to the American Economic Association in January 2020, Ben Bernanke argued that the unconventional monetary policy tools had proven effective, enhancing monetary policy flexibility for the future.

The asset purchases recommenced in the wake of the dysfunction of the treasury and mortgage-backed securities (MBS) markets after the outbreak of COVID-19. The Fed announced on March 15, 2020 that it would buy at least $500 billion in treasury securities

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* This article is prepared by Vidya Kamate and Saurabh Ghosh from Strategic Research Unit, Department of Economic and Policy Research. The views expressed in this article are those of the authors and do not represent the views of the Reserve Bank of India.

[1] Dr. M. D. Patra, Deputy Governor, Reserve Bank of India, Keynote address delivered to IMC Chamber of Commerce and Industry, 'Taper 2022: Touchdown in Turbulence'.

and $200 billion in MBS. The Fed made the purchase amounts open-ended on March 23, 2020. It set its rate of purchases to at least $80 billion per month in treasuries and $40 billion per month in MBS in June 2020. In December 2020, the Fed indicated that it would slow down the pace of these purchases once the economy has made progress toward the Fed goals. On November 3, 2021, the Fed announced a taper in asset purchases to the tune of $10 billion in treasuries and $5 billion in MBS per month (Taper 2). In December 2021, the Fed announced a doubling of its tapering speed. The Fed announced that the asset purchases would end in March 2022. While such policies may be well-designed and calibrated for the US economy, what could be done to minimise their spillovers to other emerging market economies remains an open question.

With this backdrop, the rest of the article is organised as follows. Section II provides a brief overview of the literature analysing the impact of QE and its taper on financial markets. Section III presents a detailed economic and statistical analysis of the impact of Taper 1 and Taper 2 on Indian equity, bond and currency markets. It also provides an assessment of the impact of recent global events *e.g.* Russia-Ukraine conflict, the policy rate hikes by the Fed and the Reserve Bank on financial market volatilities. Section IV explores the reasons for the differential financial market response to the two taper events. Section V concludes with some key takeaways and policy suggestions.

II. Literature Review

The impact of QE announcements on prices of financial assets is well documented using event studies framework (Gagnon *et al.*, 2011, Krishnamurthy and Vissing-Jorgensen, 2011). The event study framework, however, is able to reliably capture only the short-term impact on asset prices. Considerable research has linked the dynamic relationship between bond market yields and relative supply of securities and highlighted a highly persistent impact on asset prices (Greenwood and Vayanos, 2014, Wu, 2014, Ihrig *et al.*, 2018).

Bruno and Shin (2015) find evidence of US monetary policy on cross-border capital flows through banking sector leverage channel. Hausman and Wongswan (2011) analyse the impact of FOMC announcements on international equity, bond and currency markets in 49 countries. Ghosh and Saggar (2017) analyse volatility spillovers during the taper talk and actual tapering across major emerging economies. More recently, Lin and Niu (2021) examine the spillover effects of QE in advanced economies on Chinese yield curve.

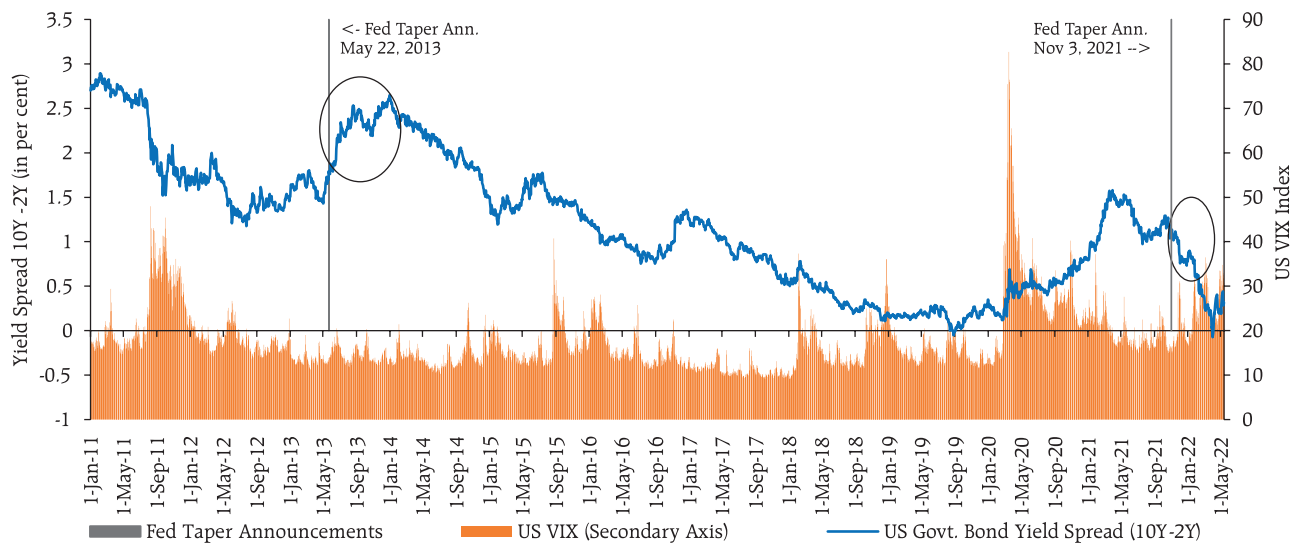
Extant literature has also analysed the role of country-specific macro-economic factors in determining the effects of US monetary policy spillovers on other economies. Bowman et al. (2015) find that a country's currency regime and vulnerability to US financial conditions had a significant role to play in a country's responsiveness to US unconventional monetary policy spillovers. Eichengreen and Gupta (2014) found that EMEs with larger and liquid financial markets that allowed greater capital inflows experienced a sizeable impact during the taper talk episode. Many studies find that strong macroeconomic fundamentals helped in dampening volatilities during the taper episode (Aizenman *et al.*, 2014, Basu *et al.*, 2015).

III. Impact of Fed Taper Announcement on Financial Markets of US and India

III.1 Impact on US and India Government Bond Yield Curve, FPI Flows and Exchange Rate

The taper announcement on May 22, 2013 led to a significant increase in 10-year government bond yields in the US and a steepening of the US yield curve as opposed to the announcement of November 3, 2021 taper that had an insignificant impact on the yield curve (Chart 1). An event study analysis of 1-day

Chart 1: Fed Taper Announcements and US Govt. Bond Yield Spread



Source: Bloomberg.

change in yield around the taper announcement dates indicates that the impact of announcement of Taper 2 on 10-year government bond yields was moderate (5.46 basis points) as compared to Taper 1 (11.32 basis points). The statistical significance is calculated on the basis of unconditional standard deviation of 1-day yield changes over a period of one year starting from one month prior to the Taper 1 announcement date. The slope of the yield curve remained unchanged during Taper 2 (Table 1). The increase in 10-year yields was on the expected lines given that the taper announcement served as a signal for a reduction in future demand for these securities leading to a decrease in price and hence, an increase in yield. During Taper 2 episode, the 10-year yield increased but not significantly, perhaps due to the anticipated nature of the announcement. In subsequent months, the US yield curve fell further and inverted stoking fears of a possible recession.

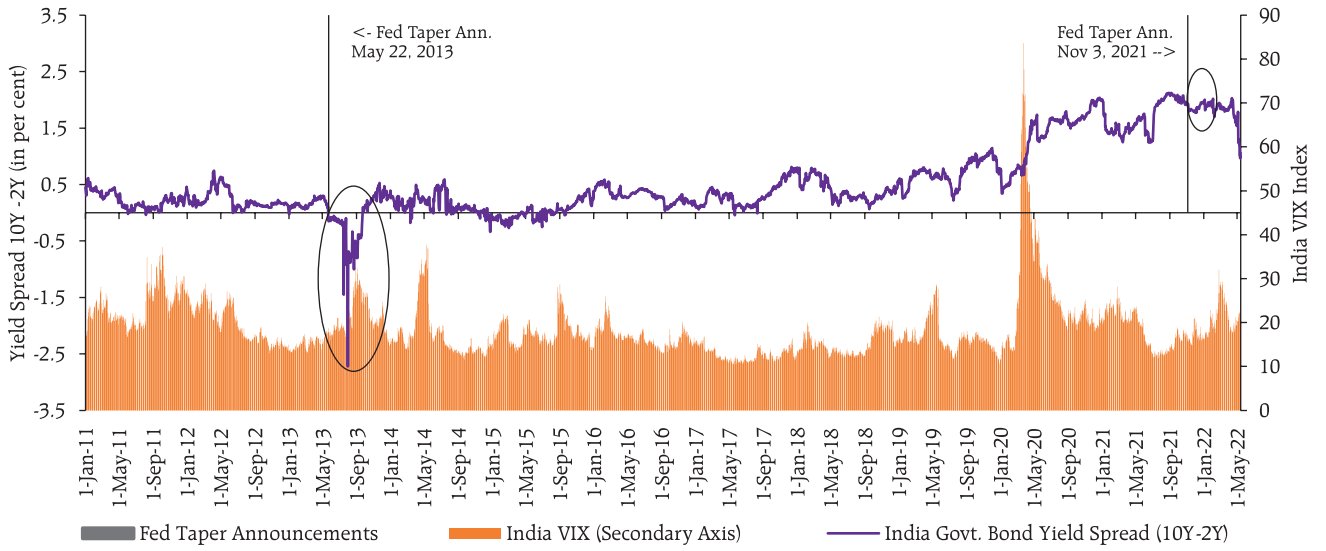
Table 1: Impact of Fed Taper Announcements on US Govt Bond Yields

1-day change (in basis points)	Taper 1 (May 22, 2013)	Taper 2 (November 3, 2021)
US 2-Year Govt. Bond Yield	1.23	1.6
US 10-Year Govt. Bond Yield	11.32***	5.46
US 10-Year minus 2-Year Bond Yield	10.09***	3.9
Unconditional Std. Dev of 1-day changes in US 2-Year Govt. Bond Yields	1.05	1.15
Unconditional Std. Dev of 1-day changes in US 10-Year Govt. Bond Yields	4.25	4.13

Note: *** $p < 0.01$

The Indian bond market reacted strongly to Taper 1 announcement with the yield curve (10-year minus 2-year) inverting in the months following the May 2013 announcement (Chart 2). The bond market reaction to the Taper 2 announcement has been tepid. Event study results of 1-day change in yield around the taper announcement dates highlight the decrease of 10-year yields and the yield curve inversion around Taper 1 with 10-year yields falling by 19 basis points and the spread (10-year minus 2-year yield) falling by 21 basis points. Extant empirical evidence also points to a similar decline in 10-year yields for India around Taper 1 announcement and indicates that the yield softening could be due to a delayed debt market reaction as inflation was edging down and monetary policy was easing in the period leading upto Taper 1 announcement (Patra *et al.*, 2016). A yield

Chart 2: Fed Taper Announcements and Indian Govt. Bond Yield Spread



Source: Bloomberg

curve inversion, is usually treated as a precursor to recession. An inverted yield curve has preceded all recessions in the US since 1973. However, proactive steps by the RBI averted any recessionary concerns in India in the period post Taper 1 announcement. In comparison, Taper 2 announcement has had an insignificant impact on Indian bond yields (Table 2).

There was a significant exodus of foreign portfolio investment (FPI) flows from India and a steep depreciation of the rupee following Taper 1 announcement (Chart 3). There was an FPI outflow of approximately ₹78,000 crore in the three months following Taper 1 announcement (June - August 2013) and most of it was in the form of debt. In contrast, the rupee experienced a mild depreciation following Taper 2 announcement that was quickly corrected in the following weeks. FPI outflows have been moderate and mostly in the form of equity in the immediate aftermath of Taper 2. However, there has been a strong exodus of FPI investors in recent months largely owing to global inflationary pressures, policy rate hikes by major central banks and heightened geo-political tensions on account of world developments such as Russia-Ukraine War.

Table 2: Impact of Fed Taper Announcements on Indian Govt Bond Yields

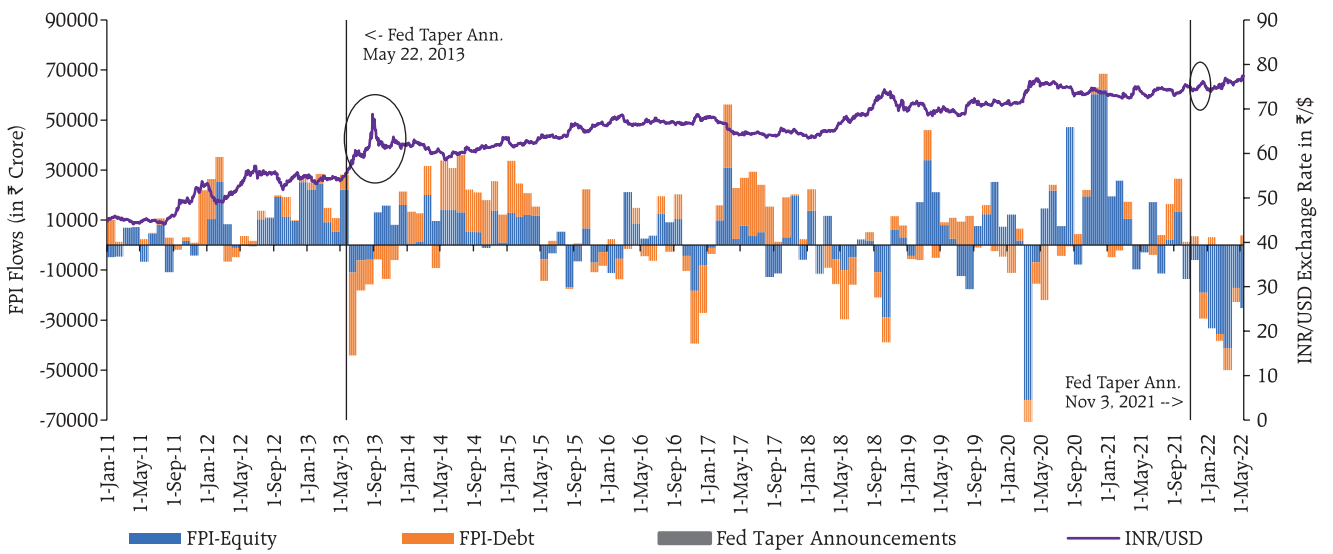
1-day change (in basis points)	Taper 1 (May 22, 2013)	Taper 2 (November 3, 2021)
India 2-Year Govt. Bond Yield	2.1	-2.4
India 10-Year Govt. Bond Yield	-18.5***	0.2
India 10-Year minus 2-Year Bond Yield	-20.6***	2.2
Unconditional Std. Dev of 1-day changes in India 2-Year Govt. Bond Yields	3.01	6.01
Unconditional Std. Dev of 1-day changes in India 10-Year Govt. Bond Yields	3.13	2.78

Note: *** $p < 0.01$

III.2 Volatility in Bond, Equity and Currency Markets

Following the seminal work of Engle and Bollerslev (1986), generalised autoregressive conditional heteroskedasticity (GARCH) models were used to quantify volatility in equity, bond and currency markets using Bloomberg daily financial equity, bond and currency data for the US and India from January 1, 2011 to May 16, 2022. Univariate estimation of GARCH with standard conditional variance formulation based on autoregressive conditional mean specification was

Chart 3: Fed Taper and FPI Flows in India



Source: Bloomberg; NSDL.

used. The GARCH(1,1) specification was found to be parsimonious with coefficients significantly different from zero and satisfying stability conditions. The regression results from GARCH estimation are reported in the Annex. The estimates of conditional GARCH volatility for equity, bond and currency markets were plotted separately for Taper 1 and Taper 2 (Chart 4). Volatility increased across bond, equity and currency

Chart 4a. Equity Market Volatility: First Fed Taper Episode

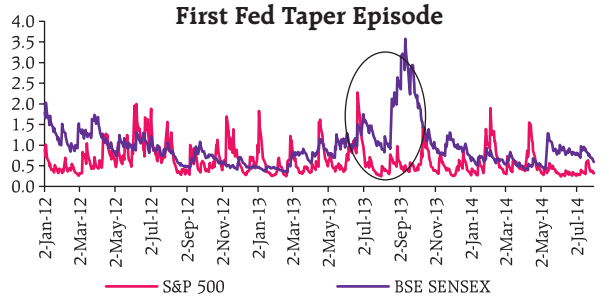


Chart 4b: Govt. Bond and FX Market Volatility: First Fed Taper Episode

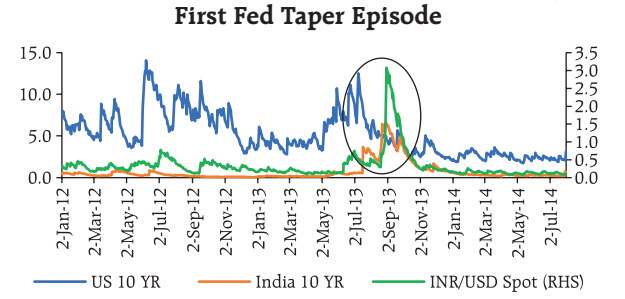


Chart 4c. Equity Market Volatility: Second Fed Taper

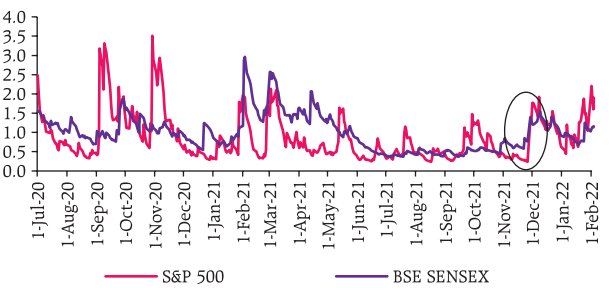
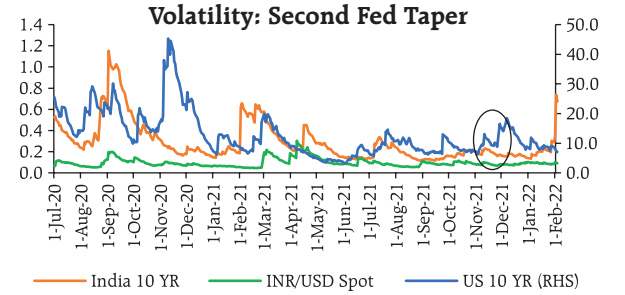
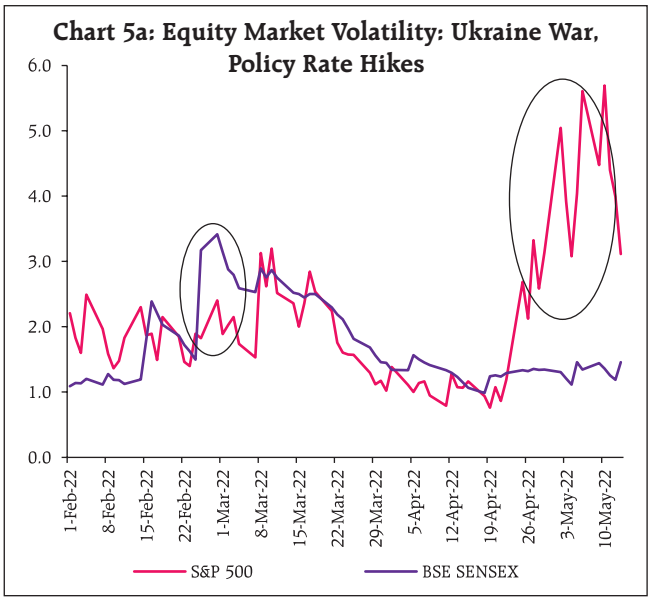
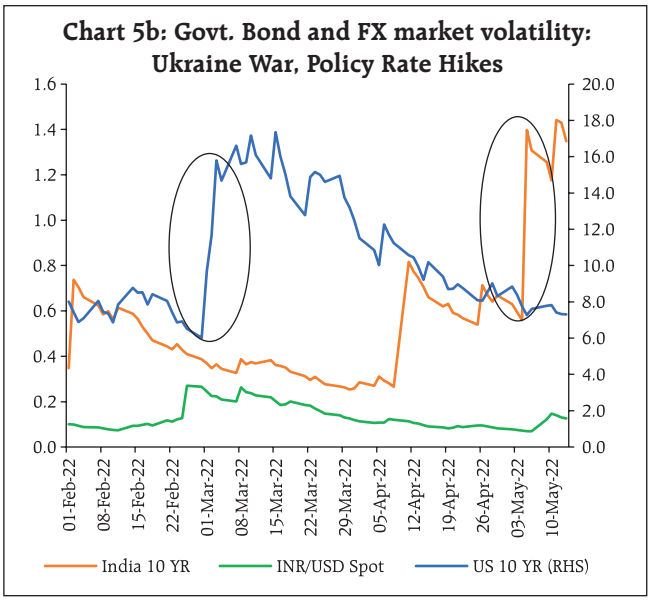


Chart 4d. Govt. Bond and FX Market Volatility: Second Fed Taper



Source: Bloomberg.





Source: Bloomberg.

markets in US and India during the first taper episode; the impact of the second taper announcement has been mild with an insignificant increase in volatility across the three markets.

Recent geo-political events, however, have contributed to a surge in volatility across global financial markets. Inflationary concerns and consequent tightening of monetary policies across the globe have also led to an increase in uncertainty in equity and bond markets in the early part of calendar year 2022 (Chart 5). The surge in volatility in the last week of February 2022 and first week of March 2022 is driven by the Russia-Ukraine war and associated financial market and supply chain disruptions. The US equity market volatility may have accelerated due to a 50 basis points policy rate hike at the beginning of May-2022. Notwithstanding these bouts of recent financial market volatilities, our two main observations are (a) the volatilities in Indian markets were muted as compared to the US counterparts; and (b) the recent movement in volatilities is due to a confluence of several confounding events and may not be attributed to the taper episode alone. The identification of each of them could be difficult and may be a topic of future research.

III.3 Volatility Spillovers from the US to Indian Financial Markets

Extant empirical research provides evidence of volatility spillovers from advanced economies to EMEs on account of many factors including central bank monetary policy actions (Ghosh and Saggar, 2017). In order to quantify the volatility spillovers from the US to Indian equity and bond markets, a multivariate GARCH (MGARCH) framework that allows for co-movement of volatilities across several markets was used. Under MGARCH framework, the following mean specification was used:

$$R_{it} = m_i + e_{it}, \qquad i = 1,2 \;\; e_t/I_{t-1} \sim N(0, S_t)$$

Where e_{it} is the conditional error and S_t is the conditional variance at time t. The variance-covariance matrix in VECH model is specified as follows:

$$VECH(S_t) = C + A \times VECH(\Xi_t \Xi_{t-1}') + B \times VECH(S_{t-1})$$

Where VECH(.) is a column stacking vector, S_t is an $N \times N$ conditional variance-covariance matrix

and Ξ_t is a $N \times 1$ innovation vector. Among the various MGARCH specifications that differ in their assumptions regarding the variance-covariance matrix, Diagonal Vector Error Conditional Heteroskedasticity (DVECH) model proposed by Bollerslev *et al.* (1988) that assumes matrices 'A' and 'B' to be diagonal was used. The DVECH specification can be written as follows:

$$s_{ijt} = c_{ij} + a_{ij}e_{i,t-1} + b_{ij}s_{ij,t-1}$$

for i,j = 1, 2.

The aforementioned system of equations can be estimated using maximum likelihood function under the assumption of conditional normality.

Each element of the DVECH model follows a GARCH(1,1) process in our analysis. The spillover of volatility from the US equity market (S&P 500 returns) to Indian equity market (BSE SENSEX returns) and US 10-year government bond market to Indian 10-year government bond market is analysed. The A(1,2) coefficients for both equity and bond market are significant indicating significant volatility contemporaneous comovement between US and Indian markets (Table 3). The significance of B(1,2) coefficients highlight clustering and high persistence of these volatilities in equity markets though the phenomenon seems muted in the Govt. bond market (Table 3). The strong comovement of volatilities and spillover in bond market may arise due to interest rate arbitrage causing lumpy debt market portfolio flows. Similarly, the strong movement of equity volatilities may be reflective of movement of global equity portfolio funds. This strong comovement highlights the tradeoff that many emerging markets face when determining their degree of openness to foreign capital inflows that can prove to be destabilising during policy reversions.

Table 3: Volatility Spillover from the US to Indian Financial Markets

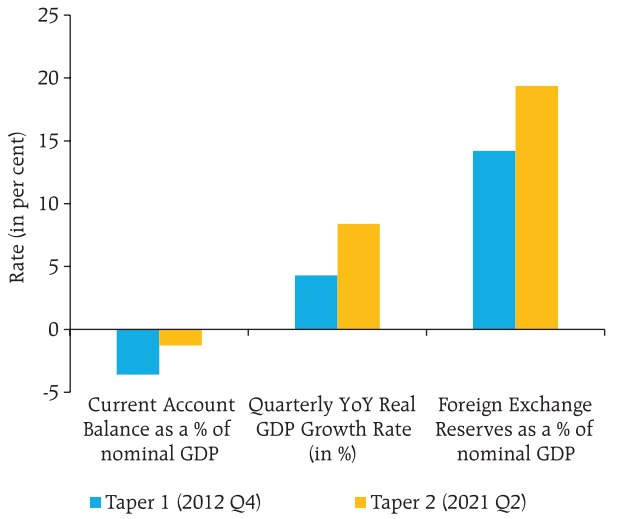
	Equity Market		*Govt. 10-Year Bond Market*	
	Coefficient	**Probability**	**Coefficient**	**Probability**
C(1)	0.08***	0.00	-0.01	0.88
C(2)	0.08***	0.00	-0.01	0.46
Variance Equation Coefficients				
M(1,1)	0.05***	0.00	0.05***	0.00
M(1,2)	0.01***	0.00	0.01	0.75
M(2,2)	0.02***	0.00	0.00***	0.00
A(1,1)	0.18***	0.00	0.08***	0.00
A(1,2)	0.02***	0.00	0.04***	0.01
A(2,2)	0.07***	0.00	0.07***	0.00
B(1,1)	0.77***	0.00	0.91***	0.00
B(1,2)	0.93***	0.00	0.01	0.98
B(2,2)	0.91***	0.00	0.93***	0.00

*** $p < 0.01$

IV. Potential Explanations for Differential Responses to Taper Announcements

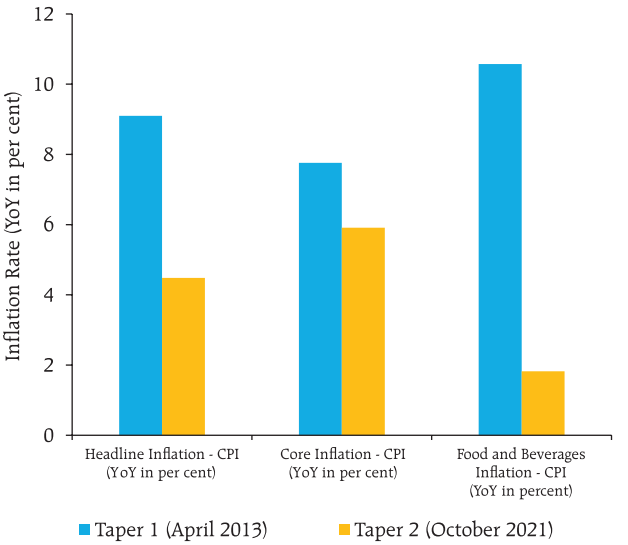
The analysis has indicated that the response of Indian financial markets to Taper 2 announcement has been moderate as compared to Taper 1 announcement which lead to a substantial increase in bond, equity and currency market volatilities and significant depreciation of the rupee *vis-à-vis* the USD. An attempt is made to understand the potential causes for this differential financial market response. One potential explanation could be that the Taper 1 announcement caught the financial markets across the world by surprise, and hence, led to a significant adverse reaction. Taper 2 announcement, on the other hand, was somewhat anticipated by the financial markets given the past experience with Taper 1 and Fed communication subtly hinting at chances of taper in the periods leading upto Taper 2 announcement. Another potential explanation for the resilience in the Indian markets post Taper 2 could be the backing of stronger economic fundamentals in India as opposed to the period before Taper 1 announcement. A lower current account deficit as a percentage of GDP, larger foreign exchange reserves and stronger economic growth in Taper 2 *vis-à-vis* Taper 1 period imply that the Indian economy is in a much better shape to withstand Fed tightening and manage any associated change in volatility in financial markets (Chart 6).

Chart 6: Current Account Balance, Foreign Exchange Reserves and GDP Growth Rate



Source: CEIC data.

Chart 7: Inflation Dynamics in India



Source: CEIC, CSO, RBI Staff Calculations.

Inflation dynamics in India were also vastly different in Taper 1 *vis-à-vis* Taper 2 announcement period. In contrast to the multiple indicator approach in 2013, monetary policy currently operates under an inflation targeting regime with a well-defined inflation target that anchors inflation expectations. Inflationary pressures were much higher in 2013 with headline consumer price index (CPI) inflation at 9.10 per cent in April 2013 as opposed to 4.48 per cent in October 2021 (Chart 7). Food inflation is a major component of headline inflation and has a tendency to spillover to core components. Food inflation was at an elevated level in 2013 as compared to 2021.

V. Conclusion

Monetary policy of systemically important advanced economies has the potential to exert a significant impact on financial markets in emerging economies through their impact on global financial conditions. Geopolitical risks have also altered the current global environment and the backdrop of operation of international monetary policy. The first episode of Fed taper announcement in 2013 led to an abrupt tightening of financial conditions, significant capital outflows and large currency depreciation in emerging economies. This article contrasted the impact of Fed taper announcement in 2013 with the recent one in 2021 and analysed the differences in the impact of the two taper announcements on Indian equity, bond and currency markets. In terms of changes in government bond yields, yield curve, and exchange rate, the impact of the Taper 2 announcement was found to be rather muted. In comparison to Taper 1 announcement, movements in Indian equities, bond, and currency market volatility were also observed to be rather muted in Taper 2 announcement period. The Indian financial markets' mild response to Taper 2 announcement can be linked to the country's strong external sector position during the Taper 2 announcement period. However, there are evidences of large volatility spillovers from the US to Indian equity and bond markets. This emphasizes the need for readiness among EMEs in terms of adequate buffers, pre-emptive and calibrated state contingent and data dependent policy responses to withstand future volatility spillovers.

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Annex

Table: Univariate GARCH Results

Method: ML ARCH - Normal distribution (BFGS / Marquardt steps) Included observations: 2922 after adjustments GARCH = C(3) + C(4)*RESID(-1) ^ 2 + C(5)*GARCH(-1)					
Dependent Variable	**S&P 500 Returns**	**Sensex Returns**	**US 10-Year G-Sec Yield**	**India 10-Year G-Sec Yield**	**INR USD Return**
Constant	0.0786	0.0629	-0.0069	-0.0070	0.0104
Lagged Value	-0.0543	0.0544	-0.0560	0.0236	0.0059
Variance Equation					
Constant	0.0430	0.0170	0.0523	0.0039	0.0037
RESID(-1) ^ 2	0.1966	0.0751	0.0792	0.0671	0.0733
GARCH(-1)	0.7651	0.9099	0.9157	0.9309	0.9033
R-squared	0.0117	-0.0027	0.0062	0.0014	-0.0003
Adjusted R-squared	0.0114	-0.0030	0.0059	0.0011	-0.0006
S.E. of regression	1.0704	1.0790	3.0797	0.6660	0.4215
Sum squared resid	3393.8900	3448.2600	28093.7800	1313.7400	526.1200

*Headwinds of COVID-19 and India's Inward Remittances**

Notwithstanding headwinds of COVID-19, India's inward remittances have proven to be a resilient source of current account receipts. In this article cross-country remittances inflows are found to be driven by altruism motive, captured by the infection rate in the destination country and the stringency of the lockdown in the source countries. The fifth round of the survey on remittances for the reference period 2020-21 finds that the share of Gulf countries has declined, reflecting slower pace of migration and presence of Indian diaspora in informal sectors which was hit the most during the pandemic period. Further, the impact of COVID-19 led stressed income conditions was discernible as small size transactions gained share in total remittances in 2020-21. The divergence was also reflected in the bank-group wise transactions as public sector banks lost market share while private banks retained their dominance in remittances business.

1. Introduction

Remittances are the second major source of external financing for low and middle-income countries after foreign direct investment. Its effect on household income and contribution to financial asset building to improve people's quality of life is well recognised in the literature (Azizi, 2021; Basnet *et al.*, 2021; Ogunniyi *et al.*, 2020). Defying adverse predictions of unprecedented global recession triggered by COVID-19, remittances have proved to be resilient during the pandemic (Kpodar *et al.*, 2021; World Bank, 2021a). According to the World Bank Report on Migration and Remittances (World Bank, 2021b), remittance flows to low and middle-income countries declined marginally to US$540 billion in 2020, only 1.6 per cent below the US$548 billion in 2019. India, being the top recipient country, was expected to be one of the worst affected (projected decline of 23 per cent) (World Bank, 2020) as its host country basket was vulnerable to the twin effect of economic slowdown and slump in oil prices. Defying the early projections, however, India remained the top recipient country, accounting for 12 per cent of total global remittances, recording a marginal decline of 0.2 per cent in 2020 and a growth of 8 per cent in 2021.

Recent research has largely focused on analysing the pattern of cross-country remittances and the impact of COVID-19 on the actual volume of remittances (Kpodar *et al.*, 2021; World Bank, 2021). However, there is limited empirical research on the resilience of remittances during the pandemic. This paper attempts to address this gap. First, it identifies the factors determining the resilience of remittance inflows using a sample of 49 countries. Second, based on the data reported under the 'Fifth round of Remittance Survey' for 2020-21, the paper validates the macro findings and insights on various aspects of remittances.

The rest of the paper is organised as follows. Section 2 models the resilience of remittances using a sample of 49 major recipient countries. Section 3 presents the survey results based on data reported by 84 Authorised Dealers (ADs) and 3 Money Transfer Operators (MTOs) regarding the characteristics and pattern of remittances received in India during 2020-21, *i.e.*, COVID-19 period. Section 4 sets out concluding observations and policy inferences.

2. Global Scenario: Resilience against COVID-19

Stylised facts

In the last decade, remittance flows to emerging market economies (EMEs) have steadily increased (Chart 1). In fact, remittances have exceeded foreign

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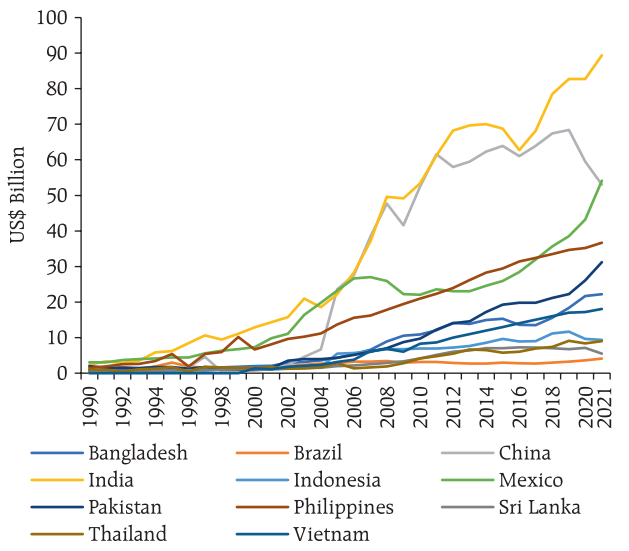
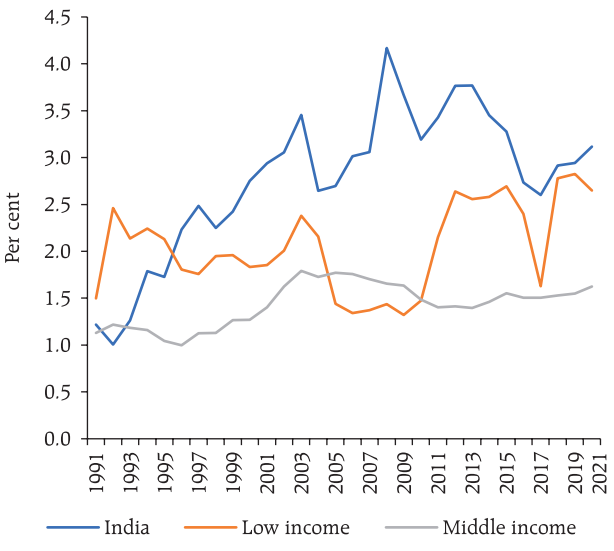
Chart 1: Inward Remittances in EMEs



Source: Authors' calculations based on World Bank data.

Chart 2: Remittances as a Share of GDP



Source: Authors' calculations based on World Bank data.

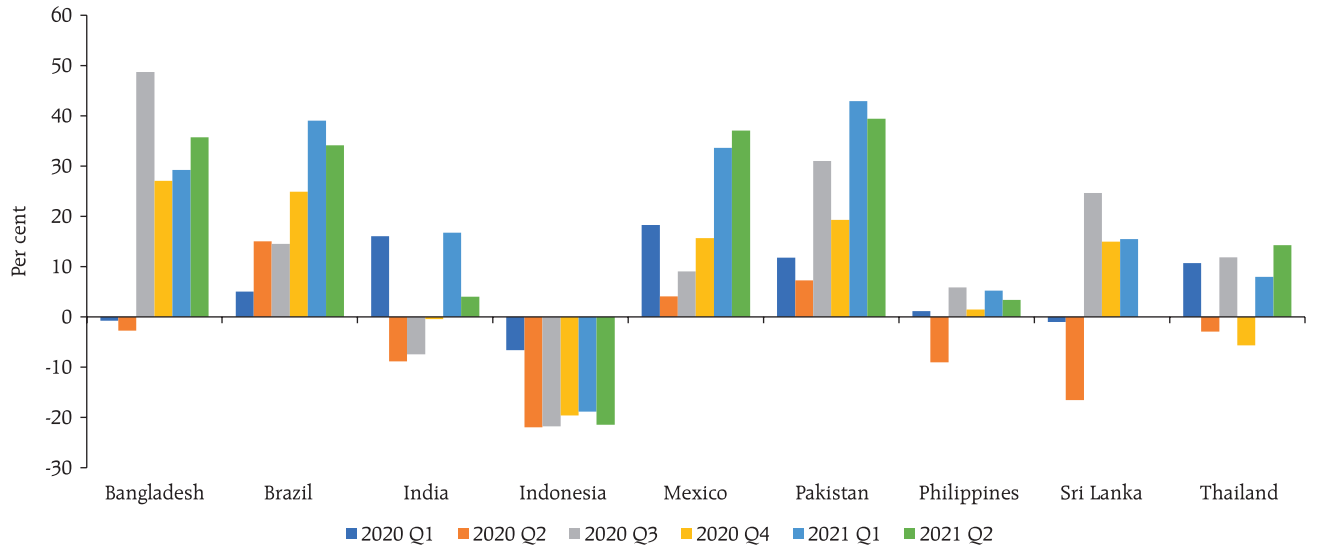
direct inflows in several countries, including India, Philippines, Pakistan and Bangladesh, accounting for about 3 per cent of GDP in low-income and 1.6 per cent of GDP in middle-income countries (Chart 2).

In several major recipient countries, the flow of remittances has remained resilient in 2020 and increased in 2021 (Chart 3). However, quarterly growth variations can be seen since the onset of COVID-19 in India and Indonesia (Chart 4). India showed a net drop in remittances between Q2:2020 to Q4:2020, with a rebound from Q1:2021. In the case of India, remittances dwindled on year-on-year (y-o-y) basis during Q2 to Q4 of 2020 but rebounded since Q1 of 2021.

Chart 3: Inbound Remittances in Major Receipt Economies

Sources: The Global Knowledge Partnership on Migration and Development (KNOMAD), World Bank.

Chart 4: Remittances Growth in Emerging Economies

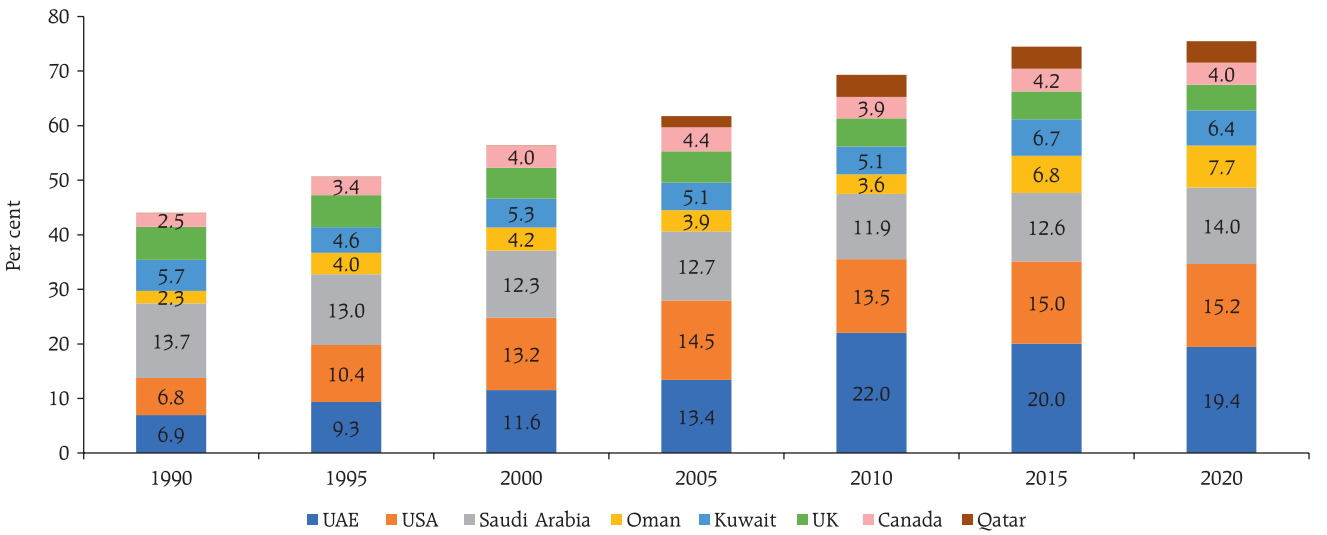


Sources: Authors' calculations based on BOP, IMF data.

The United Arab Emirates (UAE), the Unites States of America (USA) and Saudi Arabia have been the three major destinations of Indian migrants for the past two decades. Out of the total migrants from India, 48.6 per cent were in the UAE, the USA and Saudi Arabia as at end 2020 (Chart 5).

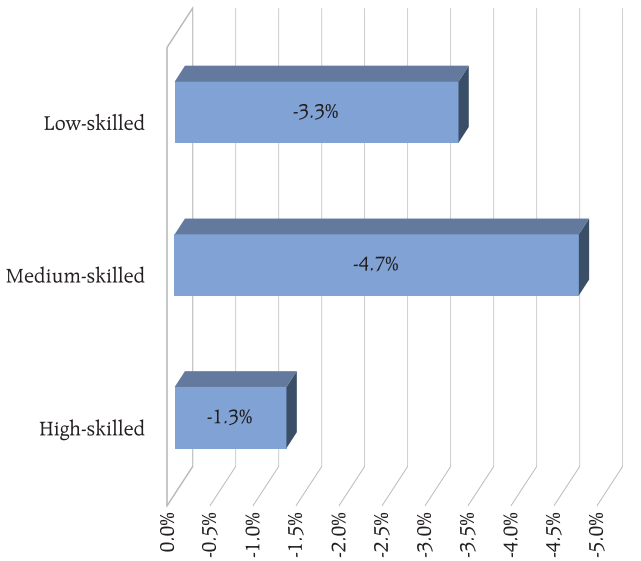
From the perspective of global remittances, however, the impact of the pandemic on migrants has varied across regions. Strict lockdown measures disproportionately impacted sectors with high reliance on migrant labour than others in certain economies. Migrants employed in low-skilled

Chart 5: Distribution of Indian Migrants Across Top Host Countries



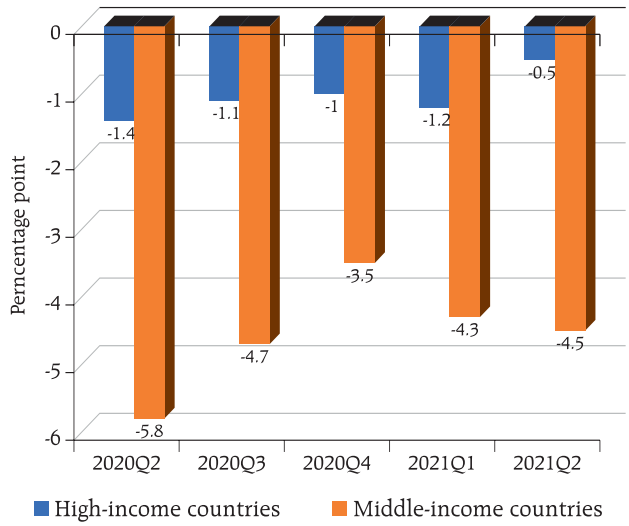
Sources: Authors' calculations based on UN DESA data.

Chart 6: Global Employment Growth in 2020



Source: ILO, 2021.

Chart 7: Change in Employment to Population Ratio, 2020-21



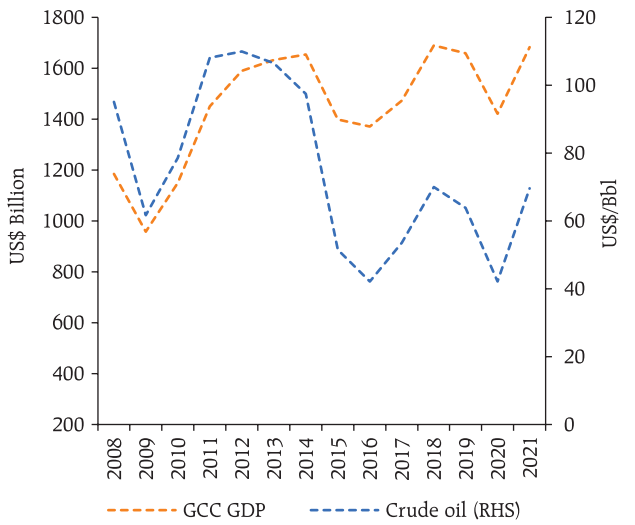
Source: ILO, 2021.

professions in countries with high level of informality were particularly vulnerable due to lower savings and limited access to social security. Further, the global employment declined more for women, youth, low-skilled and medium-skilled population with low-wage workers affected disproportionately by the pandemic in 2020 (International Labour Organisation, ILO, 2021) (Chart 6). Even after almost two years since the onset of the pandemic, the employment recovery has remained fragile and quite divergent across country groups (Chart 7). The growth across regions was primarily driven by high productivity sectors and high wage earners, indicating a compositional shift across regions.

India's geographical pattern of migration has been historically dominated by the Gulf Cooperation Council (GCC) region. While the share of migrant stock in AEs, particularly the US, the UK, Canada and South Africa has been around 30 per cent, the India-Gulf corridor remained the second highest migrant corridor with a combined share of 28 per cent. Despite the continued dominance of the GCC corridor, the migration pattern to the GCCs has changed significantly with a sharp contraction in the number of emigration clearances (ECs) issued since 2015, generally issued to unskilled or semi-skilled workers and women seeking overseas employment (Table 1). Notwithstanding that India remained the largest source of international migration in 2020, migration from India to the GCCs slowed in the last five years due to economic slowdown, sluggish oil prices, stricter labour laws, introduction of nationalisation policies, higher work permit renewal fees and taxes. These factors coupled with pandemic induced travel restrictions and changes in the region's labour market reduced the employment opportunities and dented the scope for absorption of blue-collar workers (Chart 8 and Table 1).

The compositional shift in India's migration towards AEs, notably, the US, the UK, Canada and South Africa dominated by high-skilled white-collar workers augurs well for total remittance inflows. However, the potentiality of the severe adverse impact on India's low-wage low-skilled workers from the successive waves of the pandemic and the uneven economic recovery in the low and middle-income countries may have long-term implications for remittances inflows.

Chart 8: Trend in GCC Gross Domestic Product and Crude Oil (Indian Basket) Prices



Source: World Bank and PPAC.

Factors influencing remittances during COVID-19 period

While the contractionary effect of COVID-19 was much milder than anticipated in the initial phase of COVID-19, there was wide variation across recipient economies. Kpodar *et al.* (2021) argues that a positive association between remittance inflows and COVID-19 infection rate in the home country would support the hypothesis that migrants' altruism or the insurance motive has played a role in the strong resilience of remittance inflows observed so far. This argument is consistent with the countercyclical nature of remittances, as it has been evidenced during periods of recessions, financial crises, food price shocks and natural disasters (Combes *et al.*, 2014; De *et al.*, 2019; Frankel, 2021.; Kpodar *et al.*, 2021). However, as a counter-argument, evidences suggest that the increase in remittances in Mexico from the USA, during the initial few months of COVID-19, was partially due to a shift in remittances from informal channels to formal ones and thus the role of fiscal stimulus at the host country and altruism in boosting remittance inflows to home country is ruled out (Dinarte *et al.*, 2022). In the following discussion, an empirical analysis is attempted to examine the relative importance of various factors that might have influenced remittances during the COVID-19 period.

Table 1: India's Emigration to the GCC Region (in Lakhs)

GCCs	2015	2017	2019	2020
Saudi Arabia	3.1	0.8	1.6	0.4
UAE	2.3	1.5	0.8	0.2
Kuwait	0.7	0.6	0.5	0.1
Oman	0.9	0.5	0.3	0.1
Qatar	0.6	0.2	0.3	0.1
Bahrain	0.2	0.1	0.1	0.0
Total	**7.6**	**3.7**	**3.5**	**0.9**

Source: Based on emigration clearance data, MEA, Government of India.

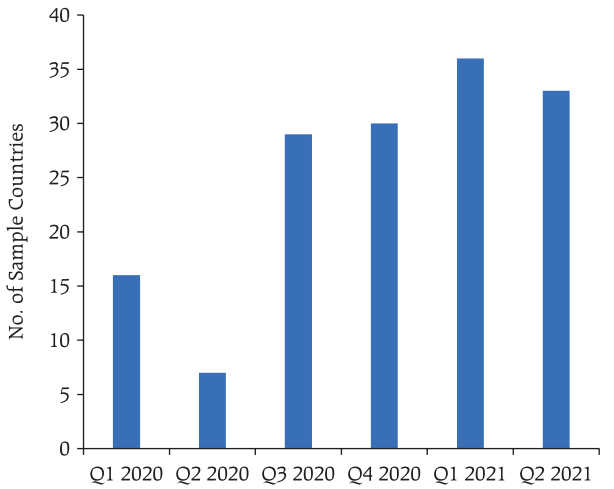
Data and Variables

Internationally comparable quarterly data on remittances is sourced from the Balance of Payments Statistics (BOP) of the International Monetary Fund (IMF). This study uses 'personal transfers' component of the BOP as an estimate of remittances inflow. An unbalanced panel dataset comprising quarterly data of 49 countries for the period Q1:2020 to Q2:2021 is used[1]. COVID-19 related impact was evident in the majority of the sample countries, albeit most of them recovered in subsequent quarters. Nevertheless, remittances in 13 sample countries were yet to recover to their pre-pandemic levels by Q1:2021 (Chart 9).

The dependent variable (DEV_REMGR) is the deviation of remittance growth (y-o-y) calculated taking 2019 as the base for quarterly flows during the study period. In other words, the dependent variable captures the remittance performance of each sample country relative to its pre-pandemic period. The independent variables include Herfindahl–Hirschman index of diversification of migrants across host

[1] Initially, a sample of 100 top remittance-receiving countries, based on the World Bank data on bilateral remittances for 2017, was selected, which was subsequently reduced to 49 countries due to missing information for certain variables. The country list is reported in Appendix Table A1.

Chart 9: Remittances Relative to Pre-Pandemic Period (No. of Countries above Pre-COVID-19 Levels)



Source: Authors' calculations based on BOP, IMF data.

countries (HHI)[2], per capita GDP of host countries (PCGDP), global oil prices (OLPRC), cost of receiving remittance equivalent to US$ 200 (REMITCOST), average stringency index in major ten host countries (STRING) and infection rate in home country (INFEC). The details of data sources and summary statistics is given in Appendix Table A2 and A3, respectively.

Empirical models

This section focuses on the pandemic period (January 2020 through June 2021) and adopts the following models to explain developments in remittances in Asia.

$$DEV\_REMGR_{it} = \propto + \beta_1 log \sum_{p=1}^{10} w_p PCGDP_{pt} + \beta_2 REMITCOST_{it} + \beta_3 INFEC_{it} + \beta_4 \sum_{p=1}^{10} w_p STRING_{pt} + \beta_5 DEV\_EXCR_{it} + \beta_6 OILPRC_{t-1} + \beta_7 HHI_i + \delta_{it} \quad ...(1)$$

Where, sample countries i= 1 to 49, time period t =1 to 6 and w is the weight (*i.e.*, share) of each of top 10 remittances sending country (p=1 to 10) in the total remittance inflows of the host country. This model (Eqn. 1) is estimated using a panel data regression model with country fixed effects. To capture the effect of diversification of diaspora, HHI is included in a random effect model that allows for the inclusion of time-invariant factors.

To verify the robustness of the results, this paper uses the positive deviation of quarterly remittances growth from its trend growth as the dependent variable and estimates the following panel logit regression (Eqn. 2).

$$y_{it} = \propto + \beta_1 log \sum_{p=1}^{10} w_p PCGDP_{pt} + \beta_2 REMITCOST_{it} + \beta_3 INFEC_{it} + \beta_4 \sum_{p=1}^{10} w_p STRING_{pt} + \beta_5 DEV\_EXCR_{it} + \beta_6 OILPRC_{t-1} + \beta_7 HHI_i + \delta_{it} \quad ...(2)$$

Where, $y_{it} = \begin{cases} 1 (y_{it}^* > 0) \\ 0 (y_{it}^* < 0) \end{cases}$

When y_{it}=1, when the country reports a higher quarterly y-o-y growth of remittances than the average annual trend growth rate for the last five years.

Results

The results show that in the country fixed effect (FE) model, the economic soundness of the host country as reflected by PCGDP is positive and significant. This also supports the anecdotal evidence that fiscal stimuli provided in various recipient countries might have improved disposable income levels of overseas workers and migrants, which aided remittances flows. However, PCGDP becomes insignificant in the random effect model.

Results also shed light on the negative effect of the stringency index on the hardship of migrant workers, implying more stringent lockdown norms in host countries impacted flows of remittances. On the other hand, the paper finds a positive and significant effect of home infection rate on the deviation of remittance growth. It implies that countries with a severer impact of COVID-19 received greater support

[2] HHI is calculated as: $HHI \sum_{i=1}^{N} S_i^2$ where S_i is the share of migrants in individual host countries; i is the number of host countries. While the HHI closer to one implies the highest concentration of migrants, a value closer to zero signifies the high diversification of migrants.

Table 2: Factors Explaining Remittance Performance-Regression Results

(1)	(2) Country Fixed Effect Model	(3) Random effect Model
	DEV_REMGR	DEV_REMGR
PCGDP	1.454**	0.0909
	(0.665)	(0.138)
REMITCOST	0.0160	-0.00322
	(0.0178)	(0.0114)
INFEC	0.0310***	0.0295***
	(0.00630)	(0.00588)
STRING	-0.00346***	-0.00335***
	(0.000926)	(0.000921)
DEV_EXCR	0.171	0.118
	(0.268)	(0.189)
OILPRC	0.000344	0.000399
	(0.00110)	(0.00108)
HHI		0.152
		(0.138)
Constant	-15.24**	-0.926
	(6.948)	(1.452)
Observations	271	271
Prob > F	0.000	0.000
Number of countries	49	49

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1.

than others for family maintenance from the overseas diaspora. This finding validates the altruism motive of remittances. Further, the country FE estimation results presented in Table 2 column 2 are broadly consistent and strengthen the results obtained by adding HHI without FE in column 3. The model does not find HHI as a significant factor influencing remittances during the COVID-19 period. The coefficient of remittance cost, oil prices, and the exchange rate movements, the standard factors determining inward remittances during normal periods, are found to be statistically insignificant in the model. The results in Table 1 are also consistent with those in Appendix Table A4.

3. India's Remittances: Insights from the Fifth Round of the Survey

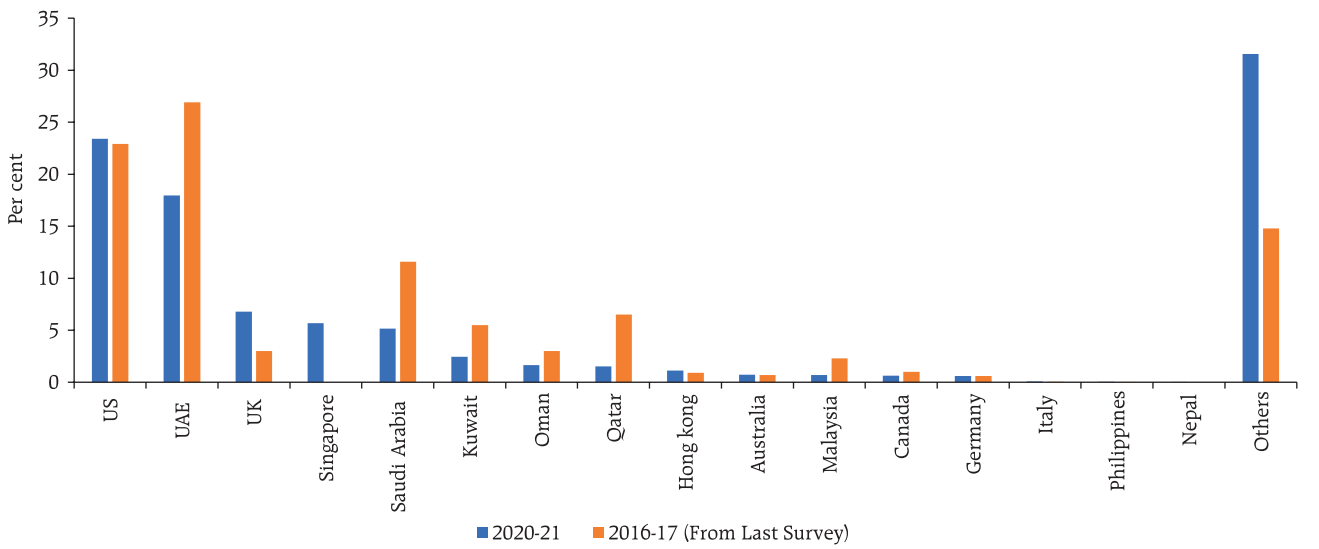
While India's inward remittances remained resilient defying the crisis at the macro level, there has been significant changes in the geographical and socio-economic composition of remittances, driven by the home and host country crisis dynamics and the severity of the impact across different working class. To analyse the factors contributing to the resilience of remittances and to understand to what extent the pandemic has changed the underlying dynamics of remittances flow, the Reserve Bank of India conducted the fifth round of the Survey on Remittances for the year 2020-21 based on a census of all AD banks and major MTOs engaged in cross border transfer of funds. This round of the survey covered 98 ADs, of which response was received from 79 ADs accounting for 99.3 per cent of total amount reported under family maintenance and 3 MTO providers. The survey findings largely corroborate with the resilient trend in aggregate remittances but highlights the changes in the sources and destination pattern in 2020-21 and the varying impacts of the pandemic across banks and MTOs.

As per the survey, the share of remittances from the GCC region in India's inward remittances is estimated to have declined from more than 50 per cent in 2016-17 (last surveyed period) to about 30 per cent in 2020-21 (Chart 10 and Appendix Table A5). Amid steady migration of skilled workers, AEs, particularly the US, the UK and Singapore emerged as an important source country of remittances, accounting for 36 per cent of total remittances in 2020-21. The US surpassed the UAE as the top source country, accounting for 23 per cent of total remittances in 2020-21. This corroborates with the World Bank report (2021)[3] citing economic recovery in the US as one of the important drivers of India's remittances growth as it accounts for almost 20 per cent of total remittances.

The share of the traditional remittance recipient states of Kerala, Tamil Nadu and Karnataka, which had strong dominance in the GCC region, have almost halved in 2020-21, accounting for only 25 percent of

[3] Migration and Development Brief 35: Recovery: COVID-19 Crisis through a Migration Lens." KNOMAD-World Bank, Washington, DC, November 2021.

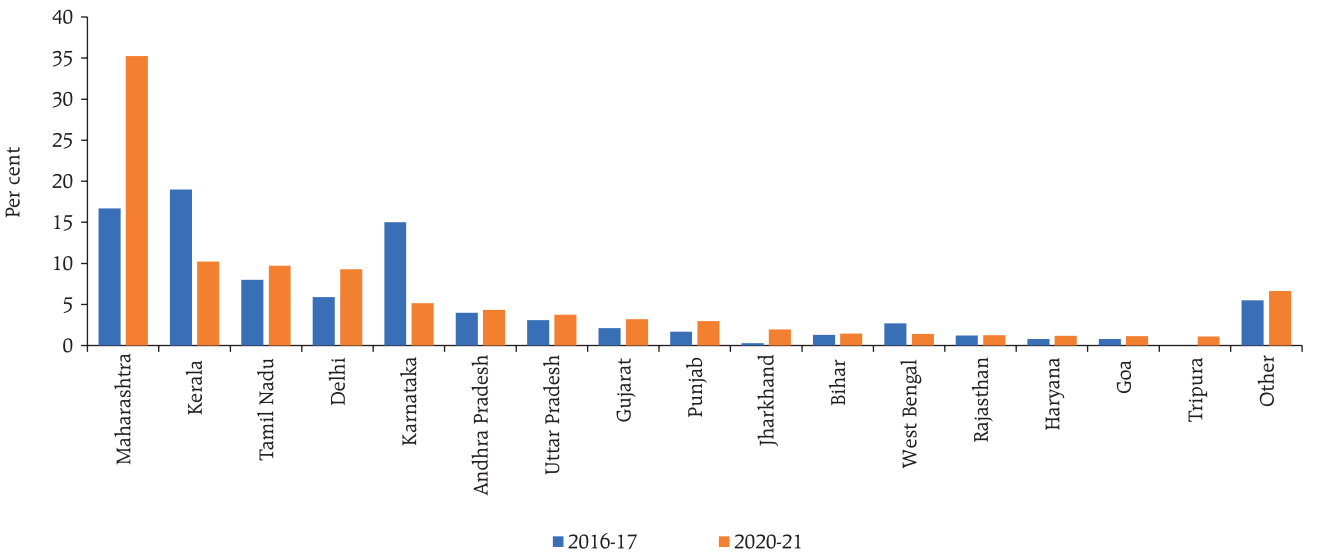
Chart 10: Country-wise Sources of Remittances



Sources: RBI Remittances Survey, 2020-21.

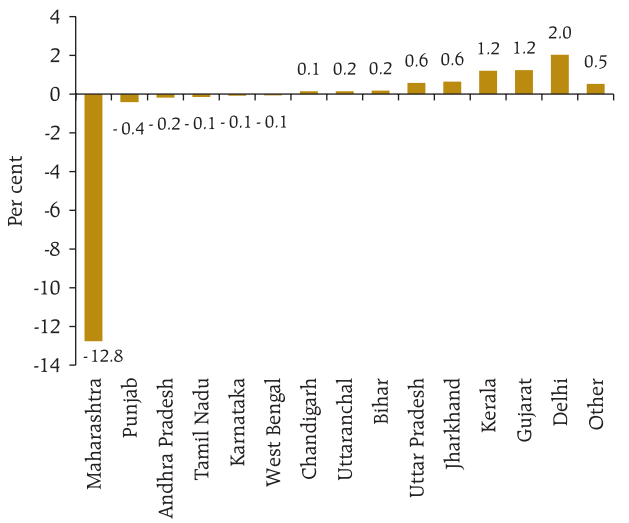
total remittances since 2016-17, while Maharashtra has emerged as the top recipient state surpassing Kerala. (Chart 11 and Appendix Table A6). Apart from the host country dynamics, reducing wage differentials, changing occupational patterns in these states with increasing white collar migrant workers to GCC region and entry of low-wage semi-skilled workers from other states and Asian countries may have led to this compositional shift. By contrast, migration from Uttar Pradesh, Bihar, Orissa and West Bengal to the Gulf countries has increased in recent years. According to the Ministry of External Affairs data, more than 50 per cent of the approved emigration clearances for GCC region in 2020 were for these states. With

Chart 11: State-wise Share of Remittances Receipts



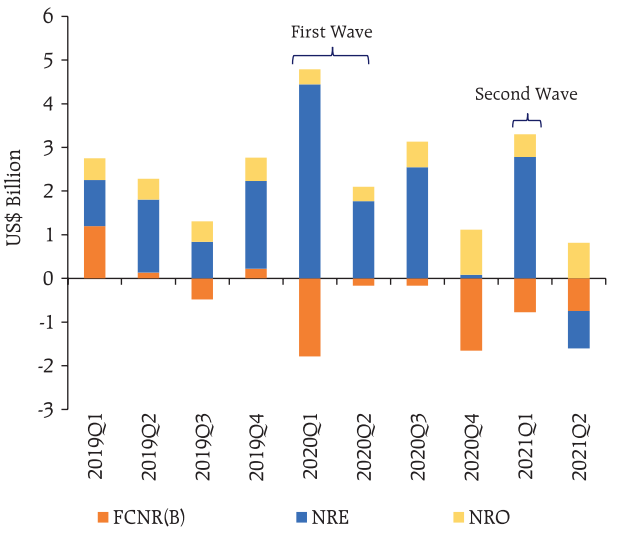
Sources: RBI Remittances Survey, 2020-21.

Chart 12: Weighted Distribution of State-wise Remittances Growth in 2020-21



Source: RBI Remittances Survey, 2020-21.

Chart 13: Trend in NRI Deposits



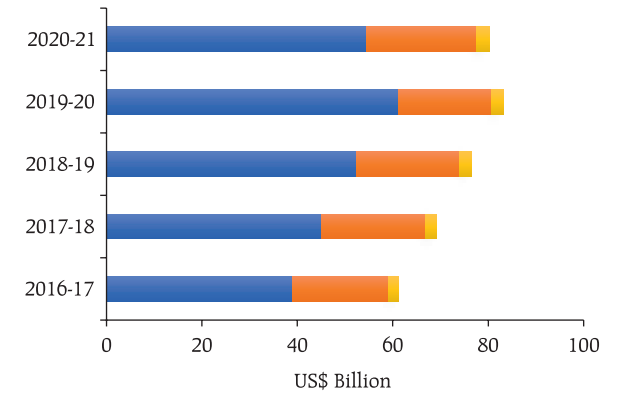
Source: RBI.

the dominance of low-wage unskilled labourers, however, their share in remittances has remained significantly low while the share of Maharashtra and Delhi has increased significantly in 2020-21. Nevertheless, Maharashtra, being one of the worst affected states with the largest number of COVID-19 affected population and prolonged lockdown phases impacting mobility of return migrants and economic and business operations, witnessed the sharpest decline in remittances in 2020-21(Chart 12).

One of the compensatory forces which is argued to have assisted in a steady flow of remittances in 2020-21 is the savings brought in due to return migration during the pandemic, reflecting a temporary frontloading of remittances by migrants which may not sustain if the pandemic related economic stress persists in the long run (Kpodar *et al.* 2021). In India, while the deposits from overseas Indians in NRI deposit schemes are treated as capital account transactions, local withdrawals/redemptions from NRI deposits (especially NRE and NRO rupee deposit schemes) are treated as forming part of private transfers (Balance of Payments Manual, RBI, 2010).[4] While NRI deposits are empirically found to be driven by exchange rate and interest differentials, trend in NRE account, which is typically used for parking income from abroad by non-resident Indians in INR, witnessed a sharp spike in the consecutives waves of the pandemic (Chart 13). Apart from favourable yields, deposits in the NRE accounts increased significantly during this period as returning overseas migrants amidst layoffs and heightened uncertainty regarding their return and future employment prospects repatriated their savings into these accounts. While overseas remittances for family maintenance, representing a major chunk of India's in-bound remittances (Appendix Table 7), moderated with loss of overseas employment opportunities; local withdrawals from non-resident rupee denominated deposit accounts increased implying the drawdown of savings to tide through the crisis (Chart 14).

[4] Balance of Payment Manual for India, Reserve Bank of India, September 2010.

Chart 14: Composition of Inward Remittances



Source: RBI.

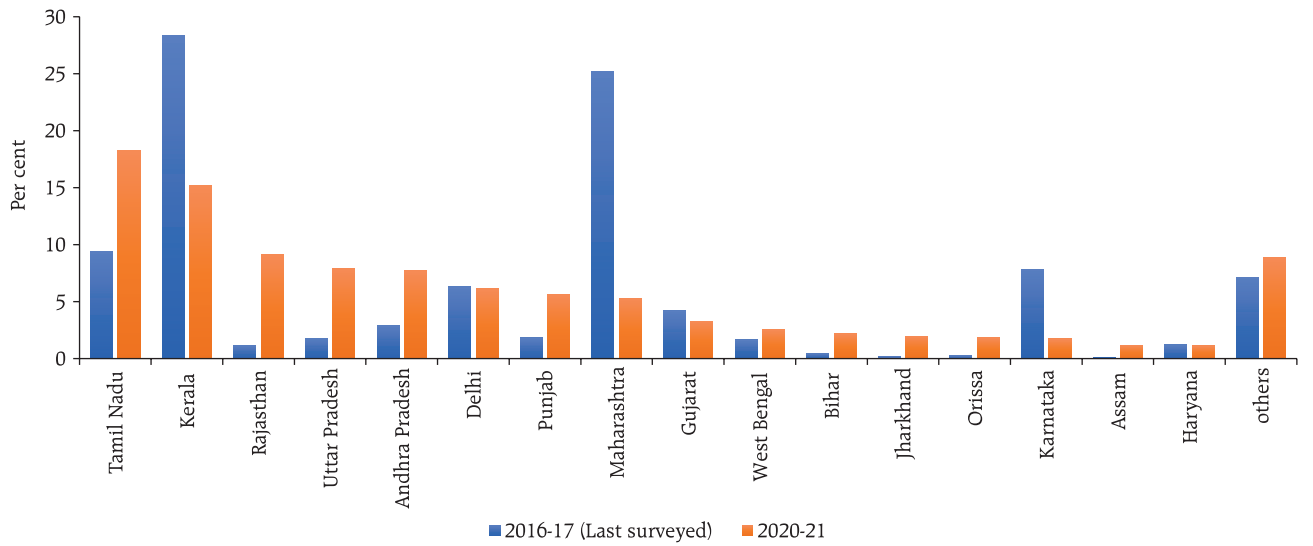
A more disaggregated state-level withdrawal also corroborates the compensatory effect of savings on the financial stress caused by moderation in remittances for family maintenance in most states (Chart 15).

Heterogeneous impact on banks' remittances transactions

The impact of slowdown in remittances has been quite diverse across banks. While public sector banks (PSBs) and cooperative banks (CoBs) suffered loss of business, reflected in lower number of transactions, private sector banks (Pvt.Bs) and foreign banks (FBs) improved their market share as private banks retained their market leadership followed by PSBs and FBs (Chart 16 and 17 and Appendix Table A8).

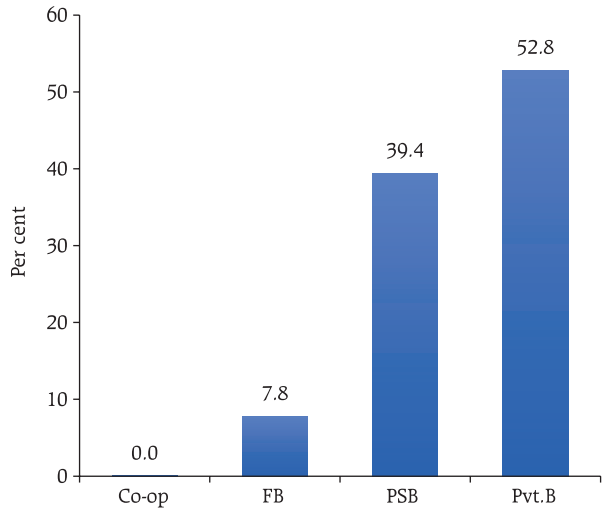
Improved market share of Pvt.Bs can be attributed to their source-country balanced portfolio as decline in remittances from Gulf countries was offset by increased flows from AEs including the US, the UK and Singapore. The share of FBs increased to 9.8 per cent in 2020-21 from 7.5 per cent in 2019-20 driven by sharp increase in remittances from Singapore which more than outweighed almost static or lower inflows from other source countries. On the other hand, the decline in remittances business of PSBs was

Chart 15: Local Withdrawal from Non-resident Deposit Accounts Across Major States



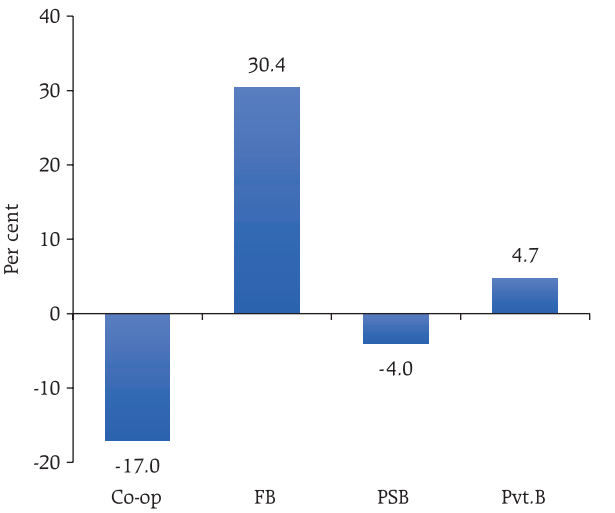
Sources: RBI Remittances Survey, 2020-21.

Chart 16: Bank Group-wise Share in Remittances Receipts, 2020-21



Source: RBI Remittances Survey, 2020-21.

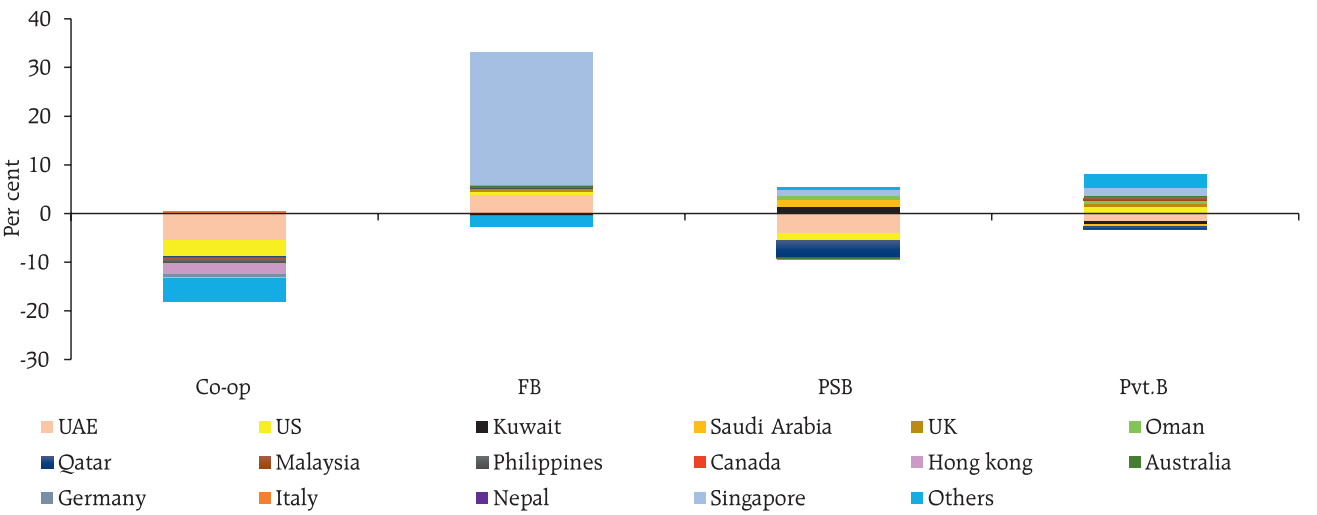
Chart 17: Bank Group-wise Growth in Number of Transactions in 2020-21



Source: RBI Remittances Survey, 2020-21.

primarily driven by lower receipts from Qatar and the UAE, which outweighed improved transactions in other countries (Chart 18). Incidentally, In September 2021, the Reserve Bank and the Monetary Authority of Singapore (MAS) have initiated integration of India's Unified Payments Interface (UPI) with PayNow, Singapore's fast payment system to facilitate faster, efficient and transparent cross-border transactions relating to trade, travel and remittances between the two countries (RBI, September 2021)[5].

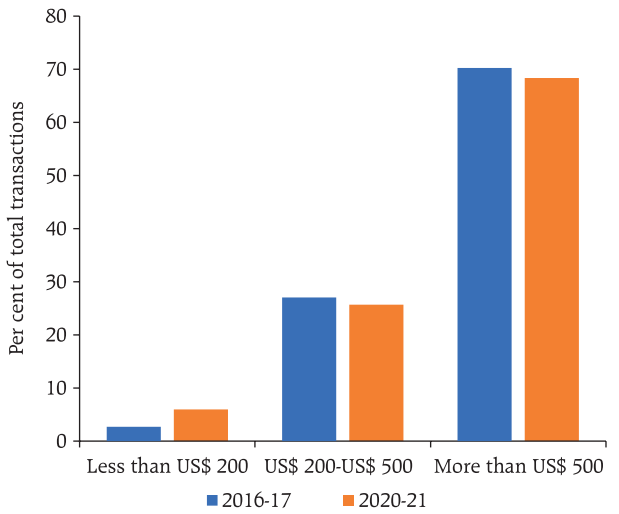
Chart 18: Relative Contribution of Source Countries in Bank-Groups' Remittance Buisness (No. of Transactions)



Sources: RBI Remittances Survey, 2020-21.

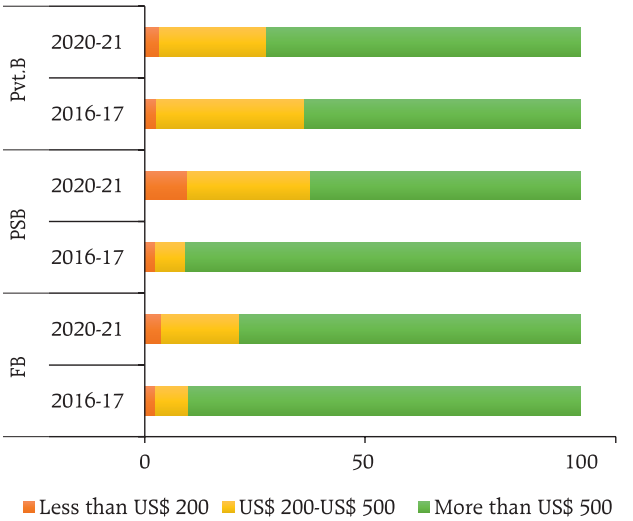
[5] India and Singapore to link their Fast Payment Systems – Unified Payments Interface and PayNow, RBI Press Release, September 2021.

Chart 19: Average Size of Remittances Transactions



Source: RBI Remittances Survey, 2020-21.

Chart 20: Bank-Group wise Variation in Average Size of Transactions



Source: RBI Remittances Survey, 2020-21.

The signs of financial distress among remitters were evident in the increase in smaller denominated transactions (*i.e.*, less than US$ 200) in 2020-21 (Chart 19 and Appendix Table A9). While the increase in small size transactions may be due to the reduced sending capacity of the overseas remitters, it might also be indicative of more frequent financial support required by their low-income beneficiaries during the pandemic period. The variation is more prominent across bank groups depending on their remitter country, income profiles and business channels (Chart 20). This has been corroborated by the heterogeneous impact on the average size profile of transactions across bank groups. In the case of PSBs, a shift from large size transactions to small and medium size is evident in 2020-21, while private sector banks have not only been able to retain their largest market share (in terms of value) but also recorded higher transactions in 2020-21 as compared with 2019-20 reflecting economic rebound mainly in advanced economies.

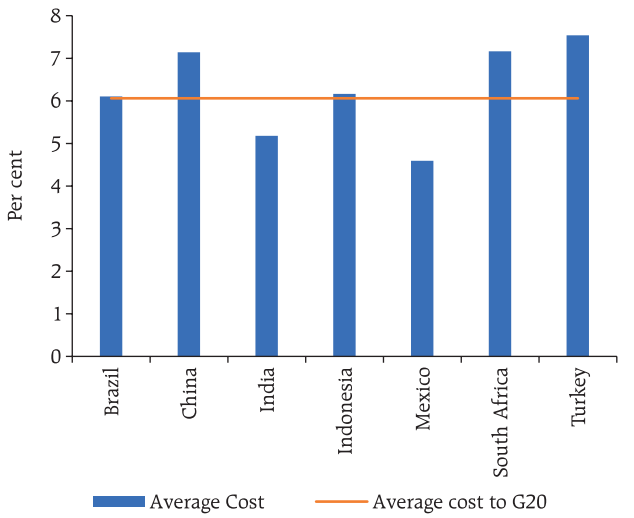
Cost of Remittances

The global average cost of remittances remains above the SDG target at 6.3 per cent and 5.0 per cent for US$ 200 and US$ 500 respectively in Q2 2021, the level, however, has come down since 2017 (World Bank, 2021)[6]. The global trend is mirrored in the G20 countries as the average cost of remitting to the G20 has remained mostly below the global average for both denominations in recent years. The cost of sending remittances to the major G20 countries, however, varies with Mexico being the cheapest corridor followed by India with a below average cost of remittances (Chart 21 and 22).

The survey, however, reveals wide divergence in the cost structures of bank groups, largely depending on the business channels and their tie-ups with overseas banks/entities. While for private banks, the cost of remittances has gone up across all sizes

[6] Remittances Prices Worldwide, World Bank Group, 2021.

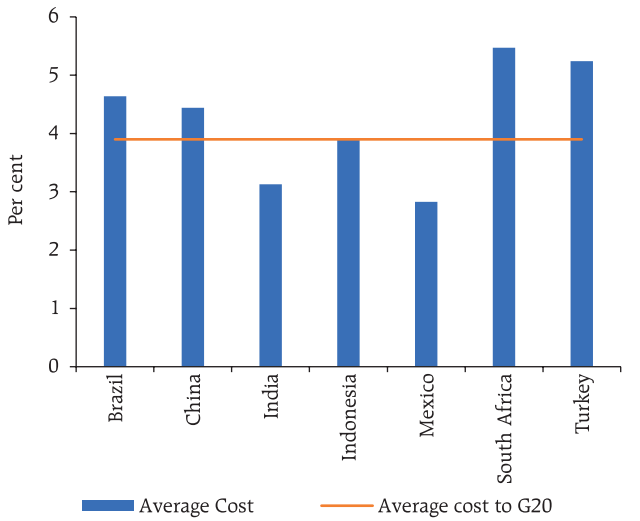
Chart 21: Cost of Sending Remittances to Major G20 Countries (US$ 200)



Source: Remittances Prices Worldwide, World Bank 2021.

of transactions and not much variation is observed within the Pvt.B group, the PSBs have reported larger variation across countries with lower charges normally accruing to the GCC region and neighbouring countries like Nepal, while higher cost charged mostly in the case of Singapore, the US and Hong Kong. Similar cost pattern was reflected in large denominations as well,

Chart 22: Cost of Sending Remittances to Major G20 Countries (US$ 500)



Source: Remittances Prices Worldwide, World Bank 2021.

Table 3: Maximum Charges by Bank Groups across Countries

(Per cent)

Amount	Year	PSB	Pvt. B	FB
US$ 200	2016-17	4.4	12.6	13.3
	2020-21	2.8-11.3	19.7	0.8-11.8
US$ 500	2016-17	2.5	5.1	6.2
	2020-21	1.1-4.5	13.3	0.3-4.7

Note: 1. The composition of banks in each group varies across years.
2. Since there is wide variation across countries, the maximum amount is taken here.
3. Cost includes GST.
4. The maximum cost range is given where the bank-wise cross-country cost variation is high.

Source: RBI Remittances Survey, 2020-21.

but the level is much lower than small size transactions (Table 3). Foreign banks, though accounting for a smaller share of India's remittances accounts, have reduced their cost structure quite significantly in 2020-21 as compared with 2016-17, *albeit* with larger cross-country variations. This has augured well for improving their share in remittances transactions in 2020-21 despite the global turmoil.

As reported by ADs, a major portion of remittances continues to be received under Rupee Drawing Arrangements (RDAs) through the Rupee Vostro Account of Exchange Houses (Appendix Table 10).

Money Transfer Operators (MTOs)

The dominance of MTOs as a non-banking entity in the remittances business has gained due to their business and cost structures which are often found to be very competitive and people friendly (Jain *et al.*, 2018)[7]. While from supply side, greater adoption of digital technologies has given MTOs the ability to respond to the increased digital demand during the current COVID-19 crisis, the societal effect of lockdown has been a great accelerator of change, driving the customer demand towards online transactions (Webber, 2020).

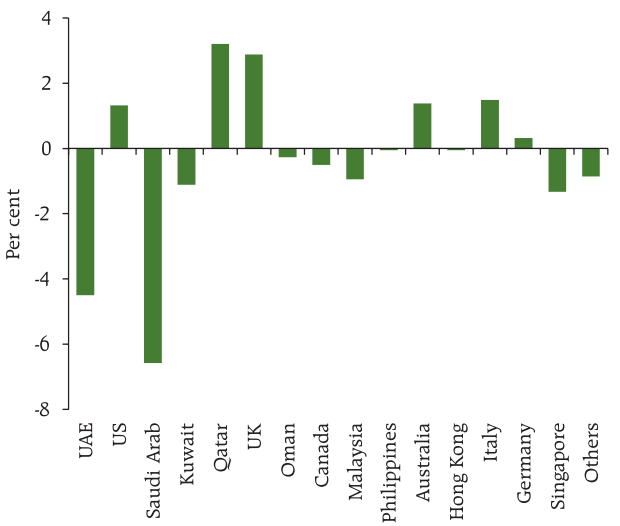
[7] "Globalising People: India's Inward Remittances", RBI Bulletin November 2018.

Recognising their growing role in the remittance transactions, the Reserve Bank has allowed MTOs to offer digital products in conjunction with banks to facilitate more seamless transactions. In November 2021, the RBI announced issuance of pre-paid instruments by banks and authorised non-bank entities, appointed as Indian agent of overseas principal, to beneficiaries of remittances under the Money Transfer Service Scheme (MTSS) (RBI, 2021).[8]

MTO transactions also mirrored global slowdown recording a decline of about 25 per cent business in 2020-21, primarily driven by top few entities. Overseas labour migration pattern and diverse host country experiences of MTOs corroborated the bank-wise pattern as the decline was primarily driven by sharp fall in remittances from the UAE and Saudi Arabia, accounting for about 10 per cent of the total fall in MTO remittances transaction in 2020-21 (Chart 23). The state-wise pattern also highlighted the losing dominance of Southern states like Kerala, Karnataka and Tamil Nadu and growing share of Punjab, Maharashtra and Uttar Pradesh as new destinations mirroring the changing labour migration pattern (Chart 24).

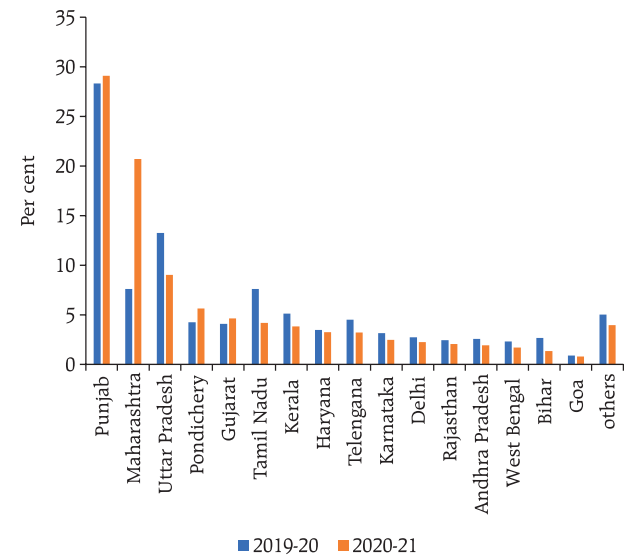
According to the World Bank report and a few other studies (Dinarte *et al.*, 2021, Kpodar *et al.*, 2021), the resilience of remittances in some countries, despite

Chart 23: Relative Contribution of Countries in Remittances of MTOs, 2020-21



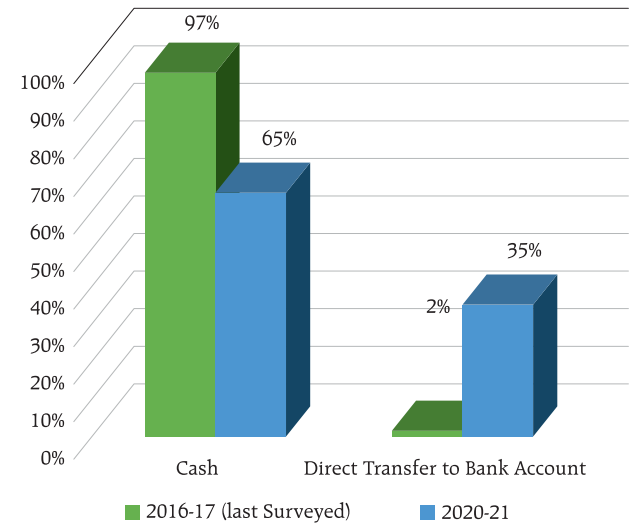
Source: RBI Remittances Survey, 2020-21.

Chart 24: State-wise Performance through MTOs



Source: RBI Remittances Survey, 2020-21.

Chart 25: Mode of Transfer through the MTOs (Share in Total)



Source: RBI Remittances Survey, 2020-21.

[8] Master Directions on Prepaid Payment Instruments (PPIs), Reserve Bank of India, November 2021.

Table 4: Cost of Sending Remittances to India through MTOs (per cent)

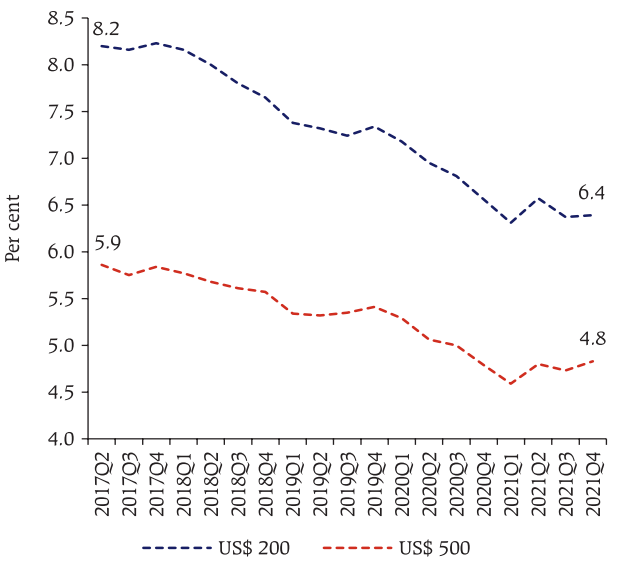
Amount Sent (US$)	Year	Avg. Cost *	Range
200	2016-17	1.9-4.0	0-11.1
	2020-21	1.7-2.0	0-12.6
500	2016-17	1.0-2.4	0-7.1
	2020-21	0.9-1.1	0-10.2

Note: 1. *Depending on the mode of transfer, upper band for cash and lower band for direct bank transfer.
2. Data based on available data from 3 major MTOs.
Source: RBI Remittances Survey, 2020-21.

a sharp decline in economic growth was more on account of a shift towards the official banking channel transactions. Remittances transactions through MTOs in India also reflected a similar pattern in 2020-21 as the dominance of cash transactions moderated with a significant shift towards direct transfers through bank accounts (Chart 25 and Appendix Table A11).

The pandemic period also witnessed a significant reduction in the average cost of remittances across the major MTOs (Table 4). Growing competition in the market with entry of new entities, slowdown in business during the lockdown and shifting to digitalised transactions are the primary reasons for such decline which augurs well for remittances. The upper limit for the average cost across various modes have almost halved for both US$200 and US$500 in 2020-21 as compared with the last surveyed year (2016-17). This is corroborated by the World Bank International MTO Index which tracks the prices of MTOs that are present in major corridors. According to the June 2021 data, there has been considerable moderation in the sending cost of both US$ 200 and US$ 500 since 2017 (Chart 26).

Chart 26: Global MTO Index



Source: Remittance Prices Worldwide - Issue 48, December 2021, World Bank.

4. Conclusion

While the COVID-19 pandemic has raised concerns regarding cross country labour mobility and prompted discussions on migrants' vulnerability in source countries, this article captures the dynamics of remittance flows to India during the pandemic period. Based on the 'Fifth Round of the Survey on Remittances' for reference period 2020-21, a few major inferences can be drawn. First, evidence on fall in the remittances from the Gulf region is in line with the global employment dynamics as Indian diaspora working in informal sectors in the Gulf region seems to have been impacted the most *inter alia* due to lockdown restrictions, and subdued crude oil prices and slower pace of migration in the recent years. Second, stressed income conditions are discernible from small size transactions gaining share in total remittances during the pandemic period. Third, notwithstanding sharp decline in remittances to Maharashtra in 2020-21, it has emerged as the top recipient state along with Delhi apart from the traditional states of Kerala and Tamil Nadu which have witnessed gradual decline in recent years. Fourth, majority of the remittances continues to be routed through private sector banks, followed by public sector banks although foreign banks have witnessed marginal increase in remittances transactions, particularly from Singapore. Fifth, the average cost of remittances charged by private sector banks increased as compared with the earlier survey, the cost structure for public and foreign banks have come down since the last surveyed period.

Notwithstanding, India is the second cheapest remittance receiving market in the G20 group after Mexico, the cost for certain remittance corridors has been consistently higher than others. The policy measures need to be undertaken that expand the scope of MTSS in high-cost corridors. Further, remittance service providers need to adapt to the changing times by investing heavily in digital technologies. Efforts towards digital payment methods and integration with mobile and digital channels would not only help drop the cost of remittances but also bode well for virtual KYC by connecting the digital wallets of senders and recipients to their SIM cards. Policy environment also needs to facilitate domestic banks in taking a prudent view to facilitate MTOs' access to correspondent banking. During the pandemic period, the World Bank (2021) has noted the phenomenon of de-risking among banks in certain jurisdictions which can potentially push-up costs of sending remittances.

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Appendix Tables

Table A1: List of selected countries

Sl.	Country	Sl.	Country
1	India	26	Ecuador
2	Philippines	27	Uzbekistan
3	Mexico	28	Brazil
4	Nigeria	29	Jamaica
5	Egypt, Arab Rep.	30	Haiti
6	Pakistan	31	Croatia
7	Bangladesh	32	Bulgaria
8	Indonesia	33	Tajikistan
9	Guatemala	34	Ghana
10	Lebanon	35	Algeria
11	Ukraine	36	Bosnia and Herzegovina
12	Morocco	37	Georgia
13	Sri Lanka	38	Armenia
14	Nepal	39	Nicaragua
15	Poland	40	Albania
16	Thailand	41	Uganda
17	Colombia	42	Belarus
18	El Salvador	43	Azerbaijan
19	Romania	44	Turkey
20	Hungary	45	Ethiopia
21	Jordan	46	Paraguay
22	Honduras	47	Myanmar
23	Czech Republic	48	Costa Rica
24	Serbia	49	Panama
25	Peru		

Table A2: Variable Definitions and Source

Variables	Definition	Source
Inward Remittances	Only personal transfers component of balance of payments.	BOP, IMF
Per capita Gross Domestic Product	GDP per capita is gross domestic product converted to international dollars using purchasing power parity rates.	World Development Indicators
Infection rate	Number of new COVID confirmed cases per lakh population	Oxford COVID-19 Government Response Tracker
Stringency Index	The stringency index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest)	Oxford COVID-19 Government Response Tracker
Remittance cost of US$ 200	The transaction cost of receiving US$ 200 in the home country	World Bank
Oil Prices	Global Crude oil prices based on Brent	US Energy Information Administration
Exchange rate (LUC per US$)	Value of US$ of one unit of local currency	International Financial Statistics, IMF
Herfindahl–Hirschman index of Migrants	Measures the diversification of migrants in remittance sending countries	Author's estimation using bilateral remittance matrix, World Bank

Table A3: Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
DEV_REMIT	271	0	0.27	-0.96	0.95
OILPRC	271	48.81	11.87	31.42	68.62
REMITCOST	271	5.84	2.27	0.98	12.18
INFEC	271	620.24	960.55	0.02	5558.81
EXCR	270	916.95	2756.88	0.71	14989.86
HHI	271	0.33	0.25	0.09	1.00
PCGDP	271	35753.35	8004.57	20163.38	56703.19
STRING	271	61.43	14.38	23.57	89.23

Table A4: Robustness check

(1)	(2) Logit Fixed effect	(3) Logit Random Effect
	POSDEV=1	**POSDEV=1**
PCGDP	1.487 (32.54)	0.400 (1.339)
REMITCOST	0.349 (0.280)	-0.0123 (0.130)
INFEC	0.377*** (0.110)	0.333*** (0.0975)
STRING	-0.0355** (0.0154)	-0.0288** (0.0147)
DEV_EXCR	-1.827 (4.279)	0.115 (2.211)
OILPRC	-0.0153 (0.0176)	-0.0219 (0.0167)
HHI		1.614 (1.312)
Constant		-3.286 (14.02)
Observations	198	271
Number of Countries	35	49

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A5: Country-wise Share in Inward Remittances, 2020-21

Source Country	Share in Total Remittances (Per cent)
United States	23.4
United Arab Emirates	18.0
United Kingdom	6.8
Singapore	5.7
Saudi Arabia	5.1
Kuwait	2.4
Oman	1.6
Qatar	1.5
Hong Kong	1.1
Australia	0.7
Malaysia	0.7
Canada	0.6
Germany	0.6
Italy	0.1
Philippines	0.0
Nepal	0.0
Others	31.6
Total	**100.0**

Source: RBI Remittances Survey, 2021.

Table A6: State-wise Share in Inward Remittances, 2020-21

Destination State	Share in total remittances (Per cent)
Maharashtra	35.2
Kerala	10.2
Tamil Nadu	9.7
Delhi	9.3
Karnataka	5.2
Andhra Pradesh	4.4
Uttar Pradesh	3.7
Gujarat	3.2
Punjab	3.0
Jharkhand	1.9
Bihar	1.4
West Bengal	1.4
Rajasthan	1.2
Haryana	1.2
Goa	1.1
Tripura	1.1
Uttaranchal	0.7
Madhya Pradesh	0.5
Orissa	0.5
Chandigarh	0.4
Jammu and Kashmir	0.3
Chhattisgarh	0.3
Pondicherry	0.2
Assam	0.2
Himachal Pradesh	0.1
Diu	0.1
Arunachal Pradesh	0.1
Others	3.3
Total	**100.0**

Note: "Others" includes states with negligible shares including Daman, Sikkim, Manipur, Dadra Nagar Haveli, Nagaland, Meghalaya, Mizoram, Andaman and Nicobar, Lakshadweep and those remittances for which banks could not identify the specific destination.

Source: RBI Remittances Survey, 2021.

Table A7: Purpose of Remittances, 2020-21

Purpose of Remittances	Share in total Remittances (Per cent)
Family maintenance (*i.e.*, consumption)	43.6
Deposits in Banks	34.6
Investments (landed property /equity shares/etc.)	10.2
Others	11.7
Total	**100.0**

Source: RBI Remittances Survey, 2021.

Table A8: Bank-wise Distribution of Inward Remittances, 2020-21

Bank Group	Share in Total Remittances (Per cent)
Private Banks	52.8
Public Sector Banks	39.4
Foreign Banks	7.8
Total	**100.0**

Source: RBI Remittances Survey, 2021.

Table A9: Size-wise Distribution of Remittances, 2020-21

Size of Remittances	Share in Total Remittances (Per cent)
Less than or equal to US$ 200	6.0
Between US$200 - US$500	25.7
Greater than or equal to US$ 500	68.4
Total	**100.0**

Source: RBI Remittances Survey, 2021.

Table A10: Mode-wise Remittances Transfer, 2020-21

Mode of Transfer	Share in Total Remittances (Per cent)
RDA/Vostro Account	56.5
SWIFT	41.2
Direct Transfer	1.9
Others (including Cheque and draft)	0.3
Total	**100.0**

Source: RBI Remittances Survey, 2021.

Table A11: Mode-wise Transfer through MTOs, 2020-21

Mode of Transfer	Share in Remittances of MTOs (Per cent)
Cash	64.9
Direct Transfer to Bank Account	35.1
Others	0.01
Total	**100.0**

Source: RBI Remittances Survey, 2021.

*Electronification of FX Markets – Trends in India**

The electronification of global foreign exchange (FX) trading with the emergence of multi-bank platforms has transformed the execution of trade and price discovery. Recent changes in electronification, particularly the emergence of single-bank platforms, have further altered the market structure, resulting in market fragmentation and internalisation of trade. Some of these changes can be seen even in the onshore Indian Rupee (INR) market, albeit in a limited way. These structural shifts have implications for transparency, pricing and central bank oversight of FX markets.

Introduction

The global foreign exchange (FX) market is the largest financial market in the world, with an average daily turnover of $6.6 trillion[1]. The market is characterised by round-the-clock trading primarily over-the-counter (OTC) or outside the centralised exchanges; only about 3 per cent of the global FX trade is conducted through exchanges in the form of futures and options. A vast majority of the trading activity occurs between institutional traders, such as dealers (mostly banks), financial intermediaries, corporations and central banks.

Traditionally, counterparties in the FX market traded with each other through phone calls ("voice") or through FX brokers. The last couple of decades have, however, witnessed the emergence of electronic trading venues operated both by banks and non-banks. Increasingly, OTC FX trades are being executed on these venues leading to increasing electronification of FX trading.

The first phase of electronification of global FX markets can be traced to the 1990s when multi-bank platforms (MBPs) with transparent central limit order books (CLOBs)[2], such as Refinitiv (formerly Reuters) and Electronic Broking Services (EBS), emerged. This phase was characterized by an increase in trading over MBPs which, thereafter, went on to emerge as primary venues i.e., venues with substantial trading volume and where prices are discovered for major currency pairs. During the last decade, the nature of FX electronification too has undergone a change with the emergence of new forms of trading venues, such as single-bank platforms (SBPs), and market-makers, including principal trading firms (PTFs).

These developments have altered the global FX market structure with growing market fragmentation *viz.*, dispersion of FX trading across a wide range of trading venues, and internalisation *viz.*, dealers increasingly offsetting client trades with each other instead of covering the risk in the interdealer market (Schrimpf and Sushko, 2019a, Moore *et al.*, 2016). Electronification has reduced FX transaction costs (Woolridge, 2019). At the same time, it has made the understanding of market liquidity rather complex, by reducing the informative value of traditional indicators like the bid-ask spread. Furthermore, these developments have made it more challenging to monitor structural changes and undertake ex-post event analysis (Rahmouni-Rousseau and Churm, 2018).

Some of these trends are also becoming evident in the onshore Indian Rupee (INR) market, concomitant with the growing integration of financial markets. However, the effects of these trends on the onshore INR market are limited as compared to the way in which they have affected the FX markets of other

* This article is prepared by Abhishek Kumar and Nitin Daukia of Financial Markets Regulation Department (FMRD), Reserve Bank of India. The assistance provided by Akshay Jha and Kaivalya Sakalgaonkar of FMRD is gratefully acknowledged. The views expressed in this article are those of the authors and do not represent the views of the Reserve Bank of India.

[1] Figure relates to April 2019, as per the *BIS Triennial Central Bank Survey* 2019.

[2] A central limit order book is an exchange-style execution method that matches all bids and offers according to price and time priority. Users can also see order book depth in real time.

countries, partly owing to the idiosyncratic features of the onshore market. Considering (a) the importance of the Indian OTC FX market (with daily turnover of about $40 billion[3]) and (b) reliance of a diverse clientele from retail to institutional clients on this market for their hedging requirements, it becomes crucial to understand the developments shaping the structure of this market and their implications. These shifts may also be crucial for Reserve Bank's market intelligence, market operations and market regulation.

Against this backdrop, the present article analyses key trends related to FX electronification and their implications for onshore trading of the INR and suggests some policy actions. The article is structured as follows. A summary of the shifts observed in the global FX markets is provided in Section II. Section III focusses on the implications of these trends for the Indian markets, while Section IV concludes.

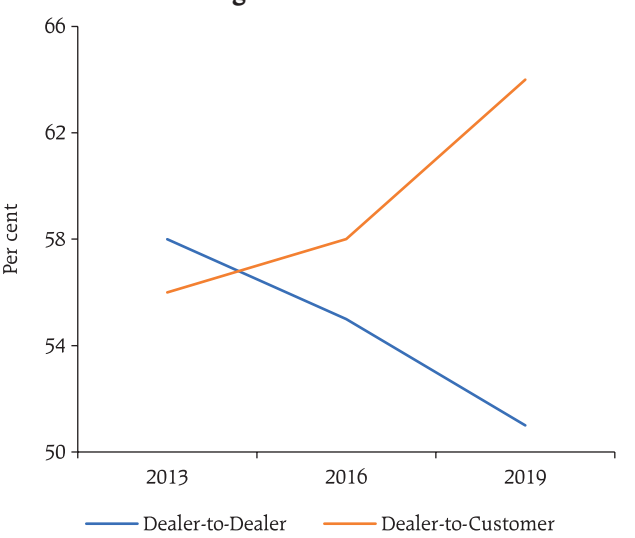
II. Electronification, Market Fragmentation and Internalisation: The Global Scenario

The electronification of the FX markets began in the 1990s with the advent of MBPs, primarily in the inter-dealer (or dealer-to-dealer) *spot* segment of FX market[4]. FX MBPs are trading venues, generally operated by non-bank institutions, which provide access to prices and liquidity from several banks and non-bank dealers. Many MBPs involve dealing through a transparent CLOB and provide pre- and post-trade transparency regarding prices, volume, and depth. Globally, these platforms have come to be classified as "lit" pools/markets (as against "dark pools" where such information is not disseminated). Venues operated by Refinitiv and EBS are examples of FX MBPs with transparent CLOBs.

As the technology has developed, innovations in the FX market have led to the emergence of a variety of trading venues, featuring a diverse set of execution protocols, such as request for quotes (RFQ)/ request for stream (RFS), beyond the traditional CLOB[5]. This has expanded the scope of FX instruments traded electronically to include derivatives, such as FX forwards and swaps.

As per data from the *BIS Triennial Central Bank Survey* 2019, about 70 per cent of the global spot trading is executed electronically, while 57 per cent and 52 per cent of FX forwards and swaps, respectively, are traded through electronic modes. Simultaneously, FX electronic dealing has also gained traction in the dealer-to-customer segment where growth in electronic dealing has outpaced electronification of the inter-dealer segment (Chart 1). As FX volumes are increasingly migrating to these venues from the MBPs,

Chart 1: Segment-Wise Global Share of Electronic Trading in Total Turnover



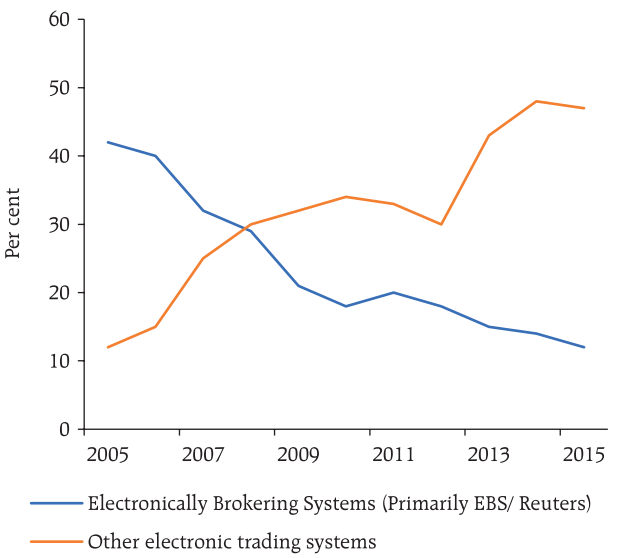
Source: Schrimpf and Sushko (2019a).

[3] Spot and derivatives combined.

[4] The standardised nature of spot contracts make it easier to transact electronically.

[5] Request for quote (RFQ) is a query issued by a trading platform member to another member to request for a price quotation. Request for stream (RFS) is a query in which market-makers provide continuous streams of quotes, on which the client receiving the quotes can click to trade.

Chart 2: Global Trading in Spot FX



Source: Rahmouni-Rousseau and Churm (2018).

market fragmentation or the dispersion of global FX liquidity across a wide range of trading platforms, is becoming evident (Chart 2).

Among the new type of trading venues which have emerged in recent years, one of the most salient are SBPs. These are electronic trading systems operated by banks for their clients. They have come up as banks have sought to leverage technology to increase the ease with which their clients transact bilaterally with them. SBPs allow banks to employ automated pricing and risk management technology to provide customised pricing and execution for different client types (Rahmouni-Rousseau and Churm, 2018).

SBPs are fundamentally different from MBPs. Unlike an MBP where the operator is typically a non-bank and cannot provide liquidity to the transacting parties, the offering bank is the sole liquidity provider on its SBP[6]. While an existing 'relationship' is an important determinant of transactions on SBPs, it is not relevant in an MBP having an anonymous CLOB dealing mode. Further, SBPs are often referred to as "dark pools" since price and trade information are not disseminated on such platforms, unlike in case of an MBP.

By offering liquidity, the SBP operator is exposed to adverse inventory positions which may lead to losses while offloading positions. Despite this, the number of SBPs have grown on account of several advantages associated with operating them. SBP operating banks are able to avoid transaction fees of dealing over MBPs[7], limit leakage of their flow-related information, have better control over choice of trading counterparties and receive opportunities for internalising flows. Moreover, SBPs provide their operators with visibility over a section of the interbank market thereby providing access to valuable market insights which could be leveraged for proprietary trading, quoting tighter prices to clients, fine-tuning the SBPs' algorithms and providing other value-added services.

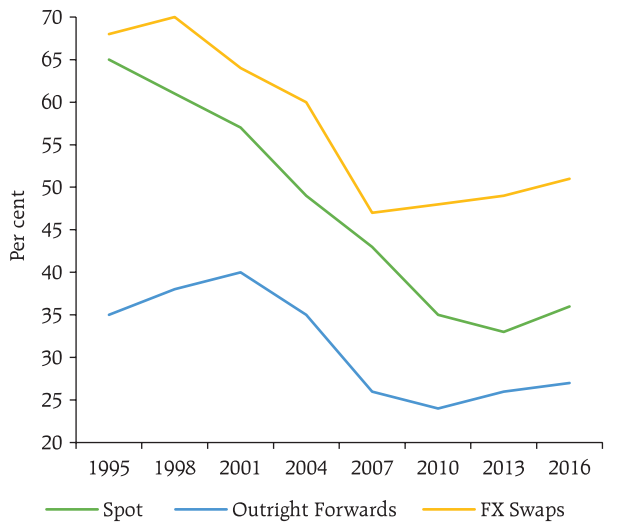
As the SBP operator is also the sole liquidity provider, the emergence of such venues has influenced the way in which liquidity is provided to customers in the FX market. Dealers in OTC financial markets provide liquidity to customers and manage the risk positions arising out of this activity through either externalising the trade by hedging it out in the interbank market or internalising it by accumulating the risk in anticipation of future offsetting customer flow. Through internalisation, dealers hope to benefit from the bid-ask spread (Butz and Oomen, 2019) as against earning only the transaction charge (effectively the bid-to-bid spread)[8].

[6] The venue-offering bank is the counterparty to all deals contracted on the platform.

[7] See "Fee fight: dealers take aim at brokerage costs", risk.net, April 7, 2020, available at https://www.risk.net/derivatives/7521416/fee-fight-dealers-take-aim-at-brokerage-costs

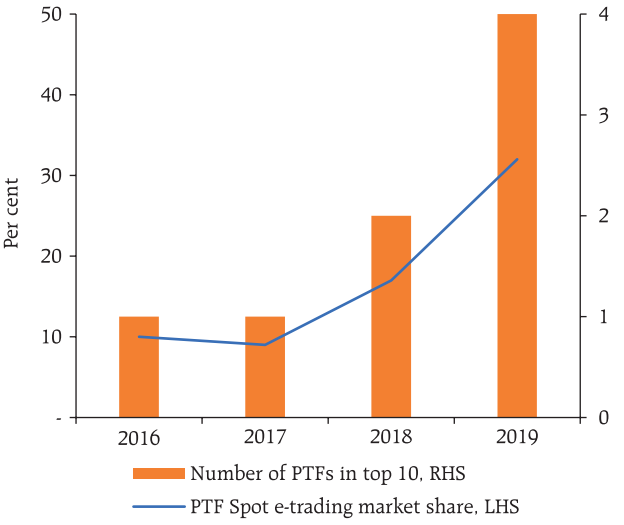
[8] If the best bid and ask quotes in the interbank market are *x-a and x+a*, respectively, then the price quoted by a dealer, willing to charge transaction cost of s from customer, will be *(x-a-s, x+a+s)*. Thus, if a customer purchases an asset at price *x+a+s* from the dealer while the other customer sells the same at x-a-s, then the profit for the dealer in case of externalisation and internalisation will be *2s and 2(s+a)*, respectively. Hence, the dealer can make additional profit of *2a*, the interbank bid-ask spread, while internalising the flow.

Chart 3: Inter Dealer Trading as Share of Total FX Turnover



Source: Moore *et al*, 2016

Chart 4: Global PTF Spot Electronic Liquidity Provision to Clients



Source: Schrimpf and Sushko (2019b).

A growing electronic client base and rising sophistication of trading systems, including of the SBPs, have increased the ability of dealers to internalise. As these large internalisers effectively become deep liquidity pools, their need to manage inventory *via* "hot potato trading"[9] has reduced, contributing to a decline in turnover in the interbank market (Moore *et al.*, 2016) (Chart 3). These developments have raised an important debate around whether interbank MBPs continue to serve as primary venues for price discovery, amidst the rising FX fragmentation and internalisation-led decline in interbank liquidity.

Finally, the *BIS Triennial Central Bank Survey* 2019 points to the increasing importance of the "non-bank electronic market-maker" community, which forms part of the broader group of principal trading firms (PTFs). PTFs in general rely on speed instead of balance sheet to trade large volumes. The *Euromoney Survey* 2019 indicates that the share of PTFs in spot e-trading rose sharply to 32 per cent, up from 10 per cent three years earlier (Chart 4). As PTFs have morphed into market-makers, alongside main FX dealing banks, they have become an integral part of FX intermediation and a key determinant of liquidity conditions, particularly in the spot market (Schrimpf and Sushko, 2019b).

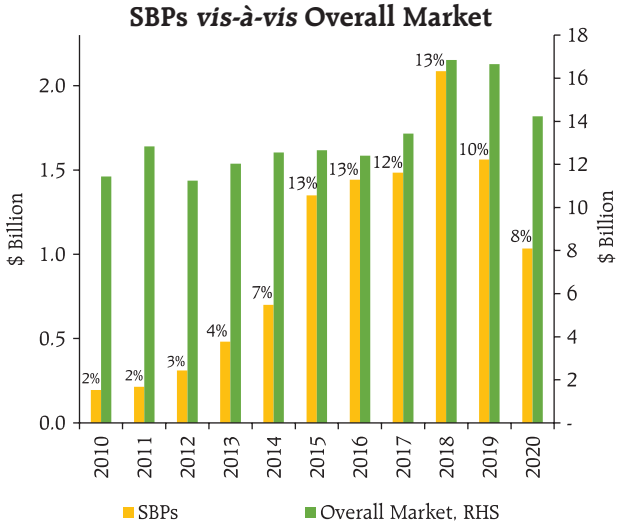
III. Electronification and the Indian FX market

India has a vibrant onshore OTC FX market with an average daily turnover of about $40 billion. Spot, including value cash and value tom, is the largest segment accounting for about half of total OTC turnover with derivatives, mainly forwards and swaps, contributing the rest. A significant portion of the INR spot market is traded electronically on MBPs, while the bulk of the derivative transactions are executed through other modes (voice/brokers). MBPs operated by Refinitiv, Clearcorp, 360T and Bloomberg are the most popular in the interdealer segment. Most of these operators have separate venues for dealer-to-client segments as well.

In recent years, SBPs are also becoming increasingly visible in the Indian FX market with trading volumes rising on such venues (Chart 5). SBPs

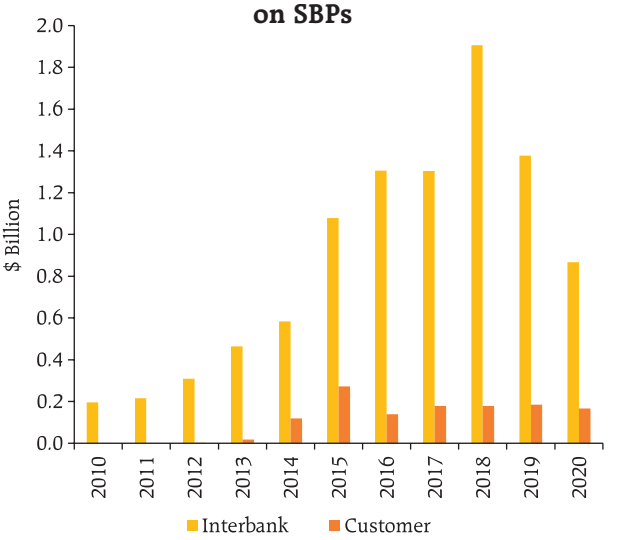
[9] Hot potato trading arises when a dealer wants to get rid of an unwanted position (*e.g.*, established through a customer trade) through trade in the interdealer market.

Chart 5: Average Daily Turnover on SBPs *vis-à-vis* Overall Market



Note: Data labels indicate share of transactions over SBPs in overall market. Data for USD/INR contracts.
Source: RBI; and authors' calculations.

Chart 7: Category-Wise Average Daily Turnover on SBPs

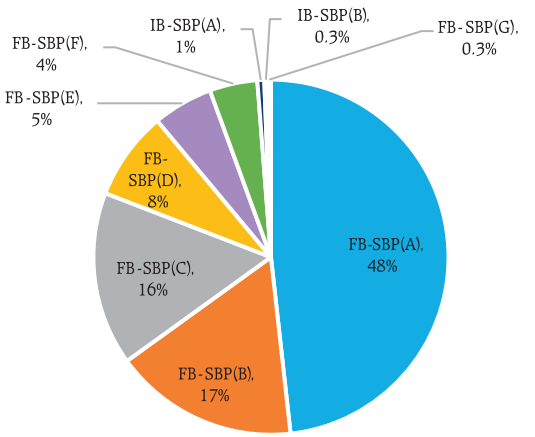


Note: Data for USD/INR spot contracts.
Source: RBI; and authors' calculations

operated by foreign banks account for almost the entire (99 per cent) volume of FX trades transacted over such platforms in the country. These banks have been able to leverage their global expertise to offer refined SBPs with sophisticated price engines to dominate this segment. A couple of Indian banks are also offering SBPs but the volume on these platforms remains insignificant (Chart 6).

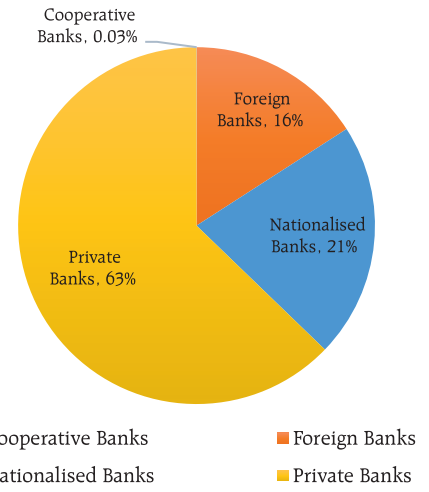
A primary reason for the growing volumes on SBPs in India has been the participation of domestic banks as clients on SBPs operated by foreign banks (Charts 7 and 8). One reason for this is possibly the competitive prices offered on these venues. Also, these venues offer the possibility of improved trade execution by enabling banks to split transactions across different SBPs or between SBPs and MBPs. Relative to trading

Chart 6: Share of Trading Over SBPs



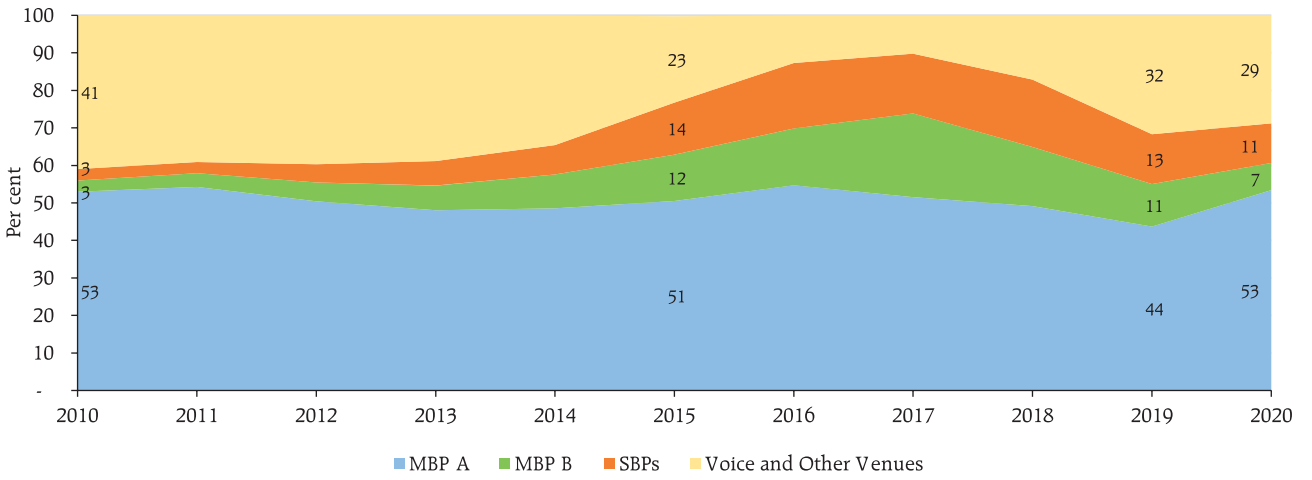
Note: Data for Jan 1, 2018 to Dec 31, 2020 interbank USD/INR spot segment. FB – SBP and IB – SBP refer to SBP offered by foreign banks and Indian banks respectively. (A), (B), (C) etc. refer to different electronic venues.
Source: RBI; and authors' calculations.

Chart 8: Category-Wise Share of Bank Clients on SBPs



Note: Data for Jan 1, 2018 to Dec 31, 2020 USD/INR spot segment.
Source: RBI; and authors' calculations

Chart 9: Share of Trading in Interbank Spot FX



Note: Data for interbank USD/INR spot transactions. Data for interbank segment include transactions with the Reserve Bank. MBP A and MBP B refer to two different MBP venues.
Source: RBI, authors' calculations.

on MBPs, such splitting of trades minimises the price impact of large trades and limits information leakage. However, client trades on these venues remain limited.

Market Fragmentation in India

As is the case globally, the emergence of SBPs has fragmented interbank liquidity in the Indian FX market (Chart 9). SBPs' share in spot FX trading has increased steadily from 3 per cent in 2011 to 13 per cent in 2019. The share of the dominant MBP, referred as "MBP A", had declined from 53 per cent in 2010 to 44 per cent in 2019. Another MBP, "MBP B", which had steadily increased its market share to 22 per cent in 2017 has witnessed a decline in trading activity, thereafter, and accounted for 11 per cent of transactions in 2019.

Nonetheless, relative to global trends, where about 50 per cent of the spot trading is on non-primary venues, the degree of market fragmentation in India remains limited. One of the reasons may be that the emergence of SBPs is a comparatively recent phenomenon for the Indian FX market.

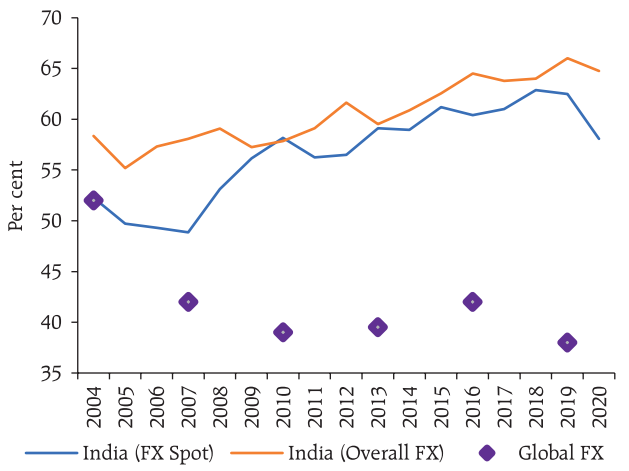
In 2020, amidst COVID-19-related disruptions, the trading on the dominant MBP rose to 53 per cent from 44 per cent a year ago. This trend is consistent with global trends wherein FX trading activity tends to revert to the primary venues during periods of market stress as these platforms provide the highest concentration of liquidity and pre-trade anonymity, as observed by Rahmouni-Rousseau and Churm, 2018. While dealers can internalise large FX flows and quote narrow spreads to their clients in normal times, their need to hedge inventory risk in the inter-dealer market rises sharply when volatility is elevated, and client flow tends to be unidirectional.

Indian FX Market: Externalised or Internalised?

Risk management approaches of dealing banks is a crucial aspect in the context of market-making. Dealers in OTC markets, including FX, manage the risk positions through either externalising or internalising customer flows[10]. Risk management approaches across

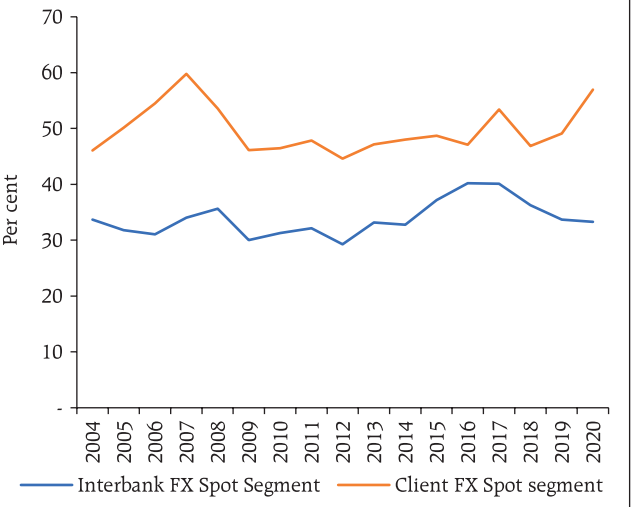
[10] Banks have certain internal as well as regulatory limits as to the proprietary positions that they may run. Further, there are capital charges for keeping open inventory positions.

Chart 10: Share of Interbank Transactions in FX Market



Note: Data for Indian market is for FCY/INR transactions. Data for Indian interbank segment include transactions with the Reserve Bank.
Source: RBI; and authors' calculations.

Chart 11: Share of Top 5 FX Dealing Banks



Note: Data for Indian market, for FCY/INR transactions. Data for interbank segment include transactions with the Reserve Bank.
Source: RBI; and authors' calculations.

banks may also diverge based on degree of technology used, degree of discretion allowed, *etc.* Globally, with rising electronification there has been a trend towards increased internalisation of customer flows. This has contributed to a decline in turnover in the global interbank FX market.

Similarly, to understand the degree of internalisation/externalisation in the Indian FX market, the trends in interbank FX volumes may be considered as a partial indicator. Chart 10 plots the interbank FX transaction as a share of total FX transaction in the Indian market. Barring 2020, the long-term trends in India have clearly diverged from global trends, with the share of interbank transactions increasing over the years in India as against a decline in global FX markets. This seems to suggest that INR trading remains largely externalised *viz.*, dealers hedge customer trades in the open market/with other banks.

It has also been argued that rising internalisation may increase market concentration by contributing to a market structure in which concentration begets more concentration. This is because dealers with large flows from a diverse set of clients find it easier to internalise and can price more competitively, letting them attract ever greater customer flows (Schrimpf and Sushko, 2019b). Therefore, an alternate measure to check for FX internalisation could be through trends related to market concentration *i.e.*, if FX activity passes through the desks of few top banks. Chart 11, which plots the share of top dealer banks in total FX trading, does not indicate that the market concentration has increased in the Indian markets substantiating that INR trading has broadly remained externalised.

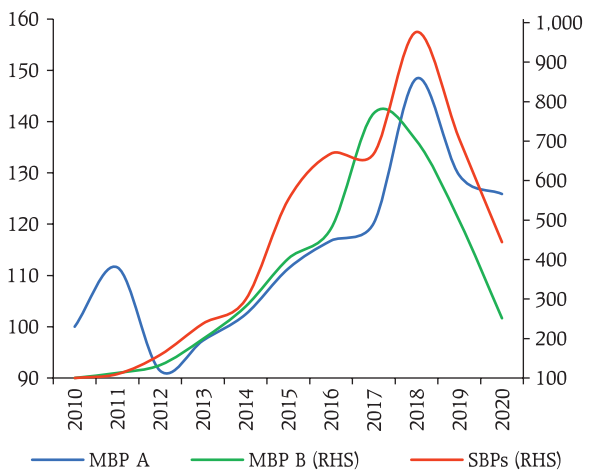
The relatively externalised nature of Indian FX trading indicates that risk management of FX dealing banks remain less automated compared to global markets. Further, internalisation is material when a dealing bank receives adequate bi-directional flows which may meaningfully offset each other. Therefore, a primary reason for Indian FX trading remaining externalised could be due to certain idiosyncratic structural factors of the Indian market. The FX client base remains largely with the Indian banks, possible on account of a larger number of branches amidst low electronification in dealer-to-client segment, while

the SBPs are being provided by the foreign banks. Notwithstanding these observations, Charts 10 and 11 still indicate a deviation from long-term trends in 2020 which could be on account of disruptions related to either COVID-19, or recent bank mergers or a shift in trend possibly alluding towards internalisation.

Are Primary Venues Still Relevant?

Even as the share of primary venues in total FX transactions has come down, volumes in absolute terms on such platforms remain significant, both onshore and in global FX markets (Chart 12). Rahmouni-Rousseau and Churm (2018) have also argued that primary venues continue to serve as an important point of price discovery on account of several reasons: (a) the tendency towards greater trade internalisation may have led to an increase in the informational content of the flow that is directed to the primary venues; (b) dealer positions in primary venues with transparent order books will almost instantaneously be reflected on other venues in which the dealer operates; and (c) primary venues provide a crucial backstop during periods of market stress with volumes on such venues increasing during periods of higher volatility (a trend also observed in INR trading in 2020 amidst COVID-19-related disruptions). With regard to growing internalisation in the global FX markets, onshore INR trading appears to be largely externalised, which further substantiate that interbank market remains crucial for price discovery and risk management.

Chart 12: Venue-Wise Absolute Trading Volume in FX Spot



Note: Absolute trading volume for each venue in 2010 have been considered as 100. Subsequent volumes have been normalised to 100.
Source: RBI; and authors' calculations.

IV. Conclusions and Policy Suggestions

The previous section discussed how electronification and associated developments in the onshore OTC FX market differ from the global FX market trends. The evolving trends for India regarding the emergence of SBPs point towards fragmentation and reduced transparency in markets, as is the case globally. The structural shifts in the FX markets have implications for both policymaking, especially with regard to transparency and pricing for clients, as well as central bank oversight on FX markets. In this regard, some policy suggestions are discussed below:

Increasing transparency

Transparency is a fundamental aspect of market regulation and design. Transparency has two aspects – pre-trade transparency, which refers to the availability of information about bid, offer and depth, and post-trade transparency, which refers to the public and timely transmission of information on past trades (price, volume, execution time, *etc.*). Greater transparency reduces the information asymmetry between banks and customers, which may enable customers to negotiate and achieve better terms-of-trade.

Transparency is one of the key factors distinguishing centralised and fragmented markets (Yamaguchi, 2001). Electronic trading platforms (ETPs), by capturing aspects related to pre- and post-trade information, generally provide better transparency as compared to traditional OTC trading. Notwithstanding, the presence of multiple ETPs has ensured that this information is not easily accessible

as ETPs, typically, disclose information about trades executed on the platform to their subscribers/ members only.

Electronification of FX markets provides a unique opportunity to enhance transparency for further development of the market. Advancements in technology may be leveraged to pool market information from various venues and make it available to all the market participants. One of the possible methods could be collection of traded prices data directly from all venues (electronic as well as voice) on real time basis by the trade repository and publicly disclosing consolidated results. This will allow easy access to price information on a near real-time basis to all market participants.

Best execution methods

Fair, transparent and efficient pricing for clients in FX markets is a key goal for the RBI. Recent initiatives in this direction include introduction of FX-Retail platform and mandatory disclosure of mid-market mark for FX derivatives for retail clients. Globally, regulatory stipulations for best execution requirements nudged banks towards electronic execution of client transactions while also encouraging clients to demand competitive pricing. For example, Markets in Financial Instruments Directive (MiFID) II requires that "all sufficient steps are taken in pursuit of best execution and the Execution Policy must explain precisely what those steps are". Going forward, best execution requirements could be considered for the Indian markets as well.

Improving market monitoring

SBPs and some other venues for OTC trading have often been referred to as "dark pools" as price and trade information are not disseminated on such platforms. There is limited literature available which shed light on the activities on these dark pools. The market monitoring of trading activity on SBPs should proportionately increase with the rising importance of these venues. One approach in this direction, considering that transaction level data on FX derivatives are already being reported to the CCIL Trade Repository (TR), could be to expand the TR reporting requirements to spot transactions (both client and interbank), along with a field to disclose the venue of execution. This would provide a holistic view of the microstructure of the FX market.

Introduction of new intermediaries

Exploiting new technology, a new set of non-bank electronic intermediaries, most notably PTFs, has gained a stronger footing in the global FX markets. The growth in PTFs has been driven by their ability to deploy technology to provide liquidity at reduced marginal cost. As they have morphed into market-makers, alongside main FX dealing banks, they have become an integral part of FX intermediation and a key determinant of liquidity conditions, particularly in the spot market. In addition to enhancing liquidity, non-bank market-makers also bring in different interests in the otherwise bank dealer-led market, increasing its efficiency and vibrancy. In view of the prominent role being played by non-bank electronic market-makers in the global FX markets, the benefits and risks of their introduction in the Indian FX market, also a bank dealer-led market, can be debated.

To sum up, electronification has fundamentally altered the way prices are discovered and liquidity is provisioned to users in financial markets. Market monitoring must commensurately and continuously evolve to effectively keep track of the structural shifts on account of these trends. At the same time, the possibilities emerging out of electronification must be leveraged to increase market transparency, reduce information asymmetry, and improve pricing for the users.

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CURRENT STATISTICS

Contents

Notes: .. = Not available.
– = Nil/Negligible.
P = Preliminary/Provisional. PR = Partially Revised.

No. 1: Select Economic Indicators

Item	2021-22	2020-21		2021-22	
		Q3	Q4	Q3	Q4
	1	2	3	4	5
1 Real Sector (% Change)					
1.1 GVA at Basic Prices	8.1	2.1	5.7	4.7	3.9
1.1.1 Agriculture	3.0	4.1	2.8	2.5	4.1
1.1.2 Industry	9.8	6.2	11.6	1.5	1.0
1.1.3 Services	8.8	0.04	4.3	6.6	5.0
1.1a Final Consumption Expenditure	7.0	0.4	9.6	6.8	2.3
1.1b Gross Fixed Capital Formation	15.8	-0.6	10.1	2.1	5.1
	2021-22	**2021**		**2022**	
		Apr.	**May**	**Apr.**	**May**
	1	2	3	4	5
1.2 Index of Industrial Production	11.4	- -	27.6	7.1	-
2 Money and Banking (% Change)					
2.1 Scheduled Commercial Banks					
2.1.1 Deposits	8.9	11.2	9.5	10.0	8.8
2.1.2 Credit #	9.6	6.2	5.9	11.0	12.5
2.1.2.1 Non-food Credit #	9.7	6.0	5.8	11.4	13.0
2.1.3 Investment in Govt. Securities	6.0	14.1	11.7	6.6	6.0
2.2 Money Stock Measures					
2.2.1 Reserve Money (M0)	13.0	18.7	18.3	13.2	10.4
2.2.2 Broad Money (M3)	8.8	11.1	10.3	9.5	8.8
3 Ratios (%)					
3.1 Cash Reserve Ratio	4.00	3.50	4.00	4.00	4.50
3.2 Statutory Liquidity Ratio	18.00	18.00	18.00	18.00	18.00
3.3 Cash-Deposit Ratio	4.7	4.4	4.8	5.0	5.2
3.4 Credit-Deposit Ratio	72.2	71.5	70.9	71.5	72.7
3.5 Incremental Credit-Deposit Ratio #	77.2	-24.4	-84.4	34.7	129.9
3.6 Investment-Deposit Ratio	28.7	29.7	29.9	28.8	29.1
3.7 Incremental Investment-Deposit Ratio	19.7	44.6	65.0	31.0	76.9
4 Interest Rates (%)					
4.1 Policy Repo Rate	4.00	4.00	4.00	4.00	4.40
4.2 Fixed Reverse Repo Rate	3.35	3.35	3.35	3.35	3.35
4.3 Standing Deposit Facility (SDF) Rate *	-	-	-	3.75	4.15
4.4 Marginal Standing Facility (MSF) Rate	4.25	4.25	4.25	4.25	4.65
4.5 Bank Rate	4.25	4.25	4.25	4.25	4.65
4.6 Base Rate	7.25/8.80	7.40/8.80	7.40/8.80	7.25/8.80	7.25/8.80
4.7 MCLR (Overnight)	6.45/7.00	6.55/7.05	6.55/7.05	6.50/7.00	6.60/7.00
4.8 Term Deposit Rate >1 Year	5.00/5.60	4.90/5.50	4.90/5.50	5.00/5.60	5.00/5.75
4.9 Savings Deposit Rate	2.70/3.00	2.70/3.00	2.70/3.00	2.70/3.00	2.70/3.00
4.10 Call Money Rate (Weighted Average)	3.34	3.21	3.18	3.63	4.09
4.11 91-Day Treasury Bill (Primary) Yield	3.84	3.32	3.40	3.98	4.89
4.12 182-Day Treasury Bill (Primary) Yield	4.27	3.45	3.60	4.40	5.43
4.13 364-Day Treasury Bill (Primary) Yield	4.58	3.72	3.73	4.81	5.91
4.14 10-Year G-Sec Par Yield (FBIL)	6.86	6.26	6.28	7.15	7.43
5 Reference Rate and Forward Premia					
5.1 INR-US$ Spot Rate (Rs. Per Foreign Currency)	76.18	74.02	72.48	76.42	77.66
5.2 INR-Euro Spot Rate (Rs. Per Foreign Currency)	84.01	89.69	88.23	80.58	83.49
5.3 Forward Premia of US$ 1-month (%)	5.67	6.00	5.46	4.08	3.55
3-month (%)	4.46	5.38	5.63	3.77	3.63
6-month (%)	4.10	5.17	5.49	3.69	3.66
6 Inflation (%)					
6.1 All India Consumer Price Index	5.51	4.2	6.3	7.8	7.0
6.2 Consumer Price Index for Industrial Workers	5.13	5.1	5.3	6.3	7.0
6.3 Wholesale Price Index	12.97	10.7	13.1	15.1	15.9
6.3.1 Primary Articles	10.25	9.9	9.4	15.4	19.7
6.3.2 Fuel and Power	32.50	21.3	36.7	38.7	40.6
6.3.3 Manufactured Products	11.10	9.4	11.3	10.9	10.1
7 Foreign Trade (% Change)					
7.1 Imports	55.31	169.5	69.9	30.7	62.8
7.2 Exports	44.58	202.6	68.3	29.4	20.6

Note : Financial Benchmark India Pvt. Ltd. (FBIL) has commenced publication of the G-Sec benchmarks with effect from March 31, 2018 as per RBI circular FMRD.DIRD.7/14.03.025/2017-18 dated March 31, 2018. FBIL has started dissemination of reference rates w.e.f. July 10, 2018.

*: As per Press Release No. 2022-2023/41 dated April 08, 2022

#: Bank credit growth and related ratios for all fortnights since December 3, 2021 are adjusted for past reporting errors by select scheduled commercial banks (SCBs).

- -: The index for month of April 2021 is not strictly comparable with April 2020.

Reserve Bank of India

No. 2: RBI - Liabilities and Assets *

(₹ Crore)

Item	As on the Last Friday/ Friday						
	2021-22	2021	2022				
		Jun.	May 27	Jun. 3	Jun. 10	Jun. 17	Jun. 24
	1	2	3	4	5	6	7
1 Issue Department							
1.1 Liabilities							
1.1.1 Notes in Circulation	3107637	2952976	3191136	3195019	3210124	3198495	3189152
1.1.2 Notes Held in Banking Department	15	18	14	14	12	16	15
1.1/1.2 Total Liabilities (Total Notes Issued) or Assets	**3107652**	**2952995**	**3191150**	**3195034**	**3210136**	**3198511**	**3189167**
1.2 Assets							
1.2.1 Gold	128208	112026	122749	122559	122969	122091	123505
1.2.2 Foreign Securities	2978927	2840318	3068097	3071991	3086716	3075994	3065265
1.2.3 Rupee Coin	518	651	304	483	451	426	396
1.2.4 Government of India Rupee Securities	–	–	–	–	–	–	–
2 Banking Department							
2.1 Liabilities							
2.1.1 Deposits	1794574	1797775	1681711	1684924	1667368	1692618	1694383
2.1.1.1 Central Government	101	100	100	100	100	100	101
2.1.1.2 Market Stabilisation Scheme							
2.1.1.3 State Governments	42	42	42	42	42	42	42
2.1.1.4 Scheduled Commercial Banks	683437	622356	761736	799046	757879	800142	776521
2.1.1.5 Scheduled State Co-operative Banks	7123	6671	8095	8511	7884	8589	8015
2.1.1.6 Non-Scheduled State Co-operative Banks	4121	3527	4559	4508	4444	4506	4487
2.1.1.7 Other Banks	37589	36285	42927	42888	42669	42846	42974
2.1.1.8 Others	988819	1071108	808897	777056	807403	776470	804425
2.1.1.9 Financial Institutions Outside India	73343	57685	55353	52773	46946	59922	57819
2.1.2 Other Liabilities	1359254	1365760	1282215	1269460	1245405	1213855	1258297
2.1/2.2 Total Liabilities or Assets	**3153828**	**3163534**	**2963926**	**2954384**	**2912772**	**2906473**	**2952681**
2.2 Assets							
2.2.1 Notes and Coins	15	18	14	14	12	16	15
2.2.2 Balances Held Abroad	1243853	1389880	1125024	1120624	1084701	1065215	1107213
2.2.3 Loans and Advances							
2.2.3.1 Central Government	–	–	–	–	–	–	–
2.2.3.2 State Governments	670	6526	10723	11372	5404	7869	8618
2.2.3.3 Scheduled Commercial Banks	94299	90829	94368	94842	94295	94302	94514
2.2.3.4 Scheduled State Co-op.Banks	–	–	–	–	–	–	–
2.2.3.5 Industrial Dev. Bank of India	–	–	–	–	–	–	–
2.2.3.6 NABARD	24927	11684	23084	23167	23167	23167	14801
2.2.3.7 EXIM Bank	–	–	–	–	–	–	–
2.2.3.8 Others	8077	4115	13211	18549	27094	27017	30517
2.2.3.9 Financial Institutions Outside India	72741	26321	55138	52584	46946	59994	58082
2.2.4 Bills Purchased and Discounted							
2.2.4.1 Internal	–	–	–	–	–	–	–
2.2.4.2 Government Treasury Bills	–	–	–	–	–	–	–
2.2.5 Investments	1491042	1473318	1441442	1433191	1430290	1428225	1435151
2.2.6 Other Assets	218203	160843	200923	200041	200864	200668	203770
2.2.6.1 Gold	201354	157317	194717	194417	195067	194831	197089

* Data are provisional.

No. 3: Liquidity Operations by RBI

(₹ Crore)

Date	Liquidity Adjustment Facility						Standing Liquidity Facilities	OMO (Outright)		Net Injection (+)/ Absorption (-) (1+3+5+7+9-2-4-6-8)
	Repo	Reverse Repo	Variable Rate Repo	Variable Rate Reverse Repo	MSF	SDF		Sale	Purchase	
	1	2	3	4	5	6	7	8	9	10
May 1, 2022	-	-	-	-	217	9331	0	-	-	-9114
May 2, 2022	-	-	-	-	0	138634	-2300	330	-	-141264
May 3, 2022	-	-	-	-	385	29461	0	-	-	-29076
May 4, 2022	-	-	-	-	39	182820	0	1345	-	-184126
May 5, 2022	-	-	-	-	0	160606	0	-	-	-160606
May 6, 2022	-	-	-	338279	65	197576	1500	-	-	-534290
May 7, 2022	-	-	-	-	1808	27713	0	-	-	-25905
May 8, 2022	-	-	-	-	71	7685	0	-	-	-7614
May 9, 2022	-	-	-	-	0	209839	0	-	-	-209839
May 10, 2022	-	-	-	-	380	223949	0	-	-	-223569
May 11, 2022	-	-	-	-	179	220982	500	-	-	-220303
May 12, 2022	-	-	-	-	820	227181	7000	-	-	-219361
May 13, 2022	-	-	-	-	248	221801	0	-	-	-221553
May 14, 2022	-	-	-	-	12	5657	0	-	-	-5645
May 15, 2022	-	-	-	-	16	3161	0	-	-	-3145
May 16, 2022	-	-	-	-	782	34454	0	-	-	-33672
May 17, 2022	-	-	-	33711	152	281767	0	-	-	-315326
May 18, 2022	-	-	-	-	171	248364	0	-	-	-248193
May 19, 2022	-	-	-	-	795	230186	0	70	-	-229461
May 20, 2022	-	-	-	272150	1009	139323	0	680	-	-411144
May 21, 2022	-	-	-	-	134	33270	0	-	-	-33136
May 22, 2022	-	-	-	-	3	5029	0	-	-	-5026
May 23, 2022	-	-	-	-	408	155767	0	605	-	-155964
May 24, 2022	-	-	-	-	396	147489	0	190	-	-147283
May 25, 2022	-	-	-	-	312	134054	0	990	-	-134732
May 26, 2022	-	-	-	-	52	126696	0	735	-	-127379
May 27, 2022	-	-	-	-	101	120712	0	310	-	-120921
May 28, 2022	-	-	-	-	94	3971	0	-	-	-3877
May 29, 2022	-	-	-	-	28	6085	0	-	-	-6057
May 30, 2022	-	-	-	-	130	112822	0	-	-	-112692
May 31, 2022	-	-	-	-	0	144101	0	195	-	-144296

SDF: Standing Deposit Facility; MSF: Marginal Standing Facility.

No. 4: Sale/ Purchase of U.S. Dollar by the RBI

i) Operations in OTC segment

Item	2021-22	2021	2022	
		May	Apr.	May
	1	2	3	4
1 Net Purchase/ Sale of Foreign Currency (US $ Million) (1.1–1.2)	17312	5842	1965	2001
1.1 Purchase (+)	113991	7142	11965	10143
1.2 Sale (–)	96679	1300	10000	8142
2 ₹ equivalent at contract rate (₹ Crore)	134629	43956	14061	14789
3 Cumulative (over end-March) (US $ Million)	17312	10054	1965	3966
(₹ Crore)	134629	75735	14061	28850
4 Outstanding Net Forward Sales (–)/ Purchase (+) at the end of month (US $ Million)	65791	59852	63826	49191

ii) Operations in currency futures segment

Item	2021-22	2021	2022	
		May.	Apr.	May.
	1	2	3	4
1 Net Purchase/ Sale of Foreign Currency (US $ Million) (1.1–1.2)	0	0	0	0
1.1 Purchase (+)	2370	0	0	2085
1.2 Sale (–)	2370	0	0	2085
2 Outstanding Net Currency Futures Sales (–)/ Purchase (+) at the end of month (US $ Million)	0	550	0	-1200

No. 4 A : Maturity Breakdown (by Residual Maturity) of Outstanding Forwards of RBI (US $ Million)

Item	As on May 31, 2022		
	Long (+)	Short (-)	Net (1-2)
	1	2	3
1. Upto 1 month	7335	7625	-290
2. More than 1 month and upto 3 months	10944	0	10944
3. More than 3 months and upto 1 year	28402	0	28402
4. More than 1 year	10135	0	10135
Total (1+2+3+4)	**56816**	**7625**	**49191**

No. 5: RBI's Standing Facilities

(₹ Crore)

Item	As on the Last Reporting Friday							
	2021-22	2021	2022					
		Jun. 18	Jan. 28	Feb. 25	Mar. 25	Apr. 22	May 20	Jun. 17
	1	2	3	4	5	6	7	8
1 MSF	11	59	38	1858	11	140	1009	7
2 Export Credit Refinance for Scheduled Banks								
2.1 Limit	-	-	-	-	-	-	-	-
2.2 Outstanding	-	-	-	-	-	-	-	-
3 Liquidity Facility for PDs								
3.1 Limit	4900	4900	4900	4900	4900	4900	4900	4900
3.2 Outstanding	–	0	734	0	0	0	0	0
4 Others								
4.1 Limit	76000	76000	76000	76000	76000	76000	76000	76000
4.2 Outstanding	32401	5578	24401	24401	32401	31021	35521	49364
5 Total Outstanding (1+2.2+3.2+4.2)	32412	5637	25173	26259	32412	31161	36530	49371

Note :1.Special refinance facility to Others, i.e. to the EXIM Bank, is reopened since May 22, 2020
2.Refinance facility to Others, i.e. to the NABARD/SIDBI/NHB U/S 17(4H) of RBI ACT,1934, since, April 17, 2020.

Money and Banking

No. 6: Money Stock Measures

(₹ Crore)

Item	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		May 21	Apr. 22	May 6	May 20
	1	2	3	4	5
1 Currency with the Public (1.1 + 1.2 + 1.3 – 1.4)	3035689	2861264	3093159	3122170	3117960
1.1 Notes in Circulation	3105703	2937217	3181381	3204195	3197840
1.2 Circulation of Rupee Coin	27270	26230	27270	27417	27417
1.3 Circulation of Small Coins	743	743	743	743	743
1.4 Cash on Hand with Banks	98028	102925	116235	110185	108039
2 Deposit Money of the Public	2271436	1879414	2193024	2214484	2180138
2.1 Demand Deposits with Banks	2212992	1830962	2135456	2158512	2126310
2.2 'Other' Deposits with Reserve Bank	58444	48451	57568	55972	53828
3 M_1 (1 + 2)	**5307125**	**4740678**	**5286184**	**5336654**	**5298098**
4 Post Office Saving Bank Deposits	187061	171030	187061	187061	187061
5 M_2 (3 + 4)	**5494186**	**4911708**	**5473245**	**5523715**	**5485159**
6 Time Deposits with Banks	15186605	14271448	15425879	15474822	15384209
7 M_3 (3 + 6)	**20493729**	**19012126**	**20712063**	**20811476**	**20682307**
8 Total Post Office Deposits	1008539	883157	1008539	1008539	1008539
9 M_4 (7 + 8)	**21502268**	**19895283**	**21720602**	**21820015**	**21690846**

No. 7: Sources of Money Stock (M_3)

(₹ Crore)

Sources	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		May 21	Apr. 22	May 6	May 20
	1	2	3	4	5
1 Net Bank Credit to Government	**6477629**	**5863293**	**6411599**	**6400871**	**6264552**
1.1 RBI's net credit to Government (1.1.1–1.1.2)	1450596	1025199	1343761	1270275	1196325
1.1.1 Claims on Government	1490991	1441680	1466235	1458072	1449291
1.1.1.1 Central Government	1489324	1439024	1463536	1437326	1440787
1.1.1.2 State Governments	1667	2656	2698	20746	8504
1.1.2 Government deposits with RBI	40394	416481	122473	187797	252966
1.1.2.1 Central Government	40352	416439	122431	187754	252924
1.1.2.2 State Governments	42	42	43	42	42
1.2 Other Banks' Credit to Government	5027033	4838094	5067838	5130596	5068228
2 Bank Credit to Commercial Sector	**12616520**	**11543147**	**12683203**	**12763371**	**12769728**
2.1 RBI's credit to commercial sector	16571	1435	10881	7775	15275
2.2 Other banks' credit to commercial sector	12599950	11541712	12672322	12755597	12754453
2.2.1 Bank credit by commercial banks	11891314	10831221	11956344	12040719	12038120
2.2.2 Bank credit by co-operative banks	690201	692995	698969	697882	699492
2.2.3 Investments by commercial and co-operative banks in other securities	18435	17496	17009	16995	16841
3 Net Foreign Exchange Assets of Banking Sector (3.1 + 3.2)	**4741335**	**4678189**	**4735562**	**4727218**	**4782289**
3.1 RBI's net foreign exchange assets (3.1.1–3.1.2)	4442479	4298743	4436706	4428363	4483433
3.1.1 Gross foreign assets	4442720	4298979	4436947	4428603	4483667
3.1.2 Foreign liabilities	241	237	241	241	234
3.2 Other banks' net foreign exchange assets	298856	379446	298856	298856	298856
4 Government's Currency Liabilities to the Public	**28013**	**26973**	**28013**	**28160**	**28160**
5 Banking Sector's Net Non-monetary Liabilities	**3369768**	**3099476**	**3146314**	**3108144**	**3162422**
5.1 Net non-monetary liabilities of RBI	1308500	1332483	1265658	1221225	1253040
5.2 Net non-monetary liabilities of other banks (residual)	2061268	1766993	1880656	1886919	1909382
M_3 (1+2+3+4–5)	**20493729**	**19012126**	**20712063**	**20811476**	**20682307**

No. 8: Monetary Survey

(₹ Crore)

Item	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		May 21	Apr. 22	May 6	May 20
	1	2	3	4	5
Monetary Aggregates					
NM_1 (1.1 + 1.2.1+1.3)	5307125	4740678	5286184	5336654	5298098
NM_2 (NM_1+ 1.2.2.1)	12081049	11095429	12168200	12242550	12162730
NM_3 (NM_2 + 1.2.2.2 + 1.4 = 2.1 + 2.2 + 2.3 – 2.4 – 2.5)	20634885	19107045	20859368	20966816	20946605
1 Components					
1.1 Currency with the Public	3035689	2861264	3093159	3122170	3117960
1.2 Aggregate Deposits of Residents	17266157	15952632	17428827	17504947	17381047
1.2.1 Demand Deposits	2212992	1830962	2135456	2158512	2126310
1.2.2 Time Deposits of Residents	15053166	14121670	15293371	15346435	15254737
1.2.2.1 Short-term Time Deposits	6773925	6354751	6882017	6905896	6864632
1.2.2.1.1 Certificates of Deposit (CDs)	176718	91409	206988	187012	187763
1.2.2.2 Long-term Time Deposits	8279241	7766918	8411354	8440540	8390105
1.3 'Other' Deposits with RBI	58444	48451	57568	55972	53828
1.4 Call/Term Funding from Financial Institutions	274594	244698	279813	283726	393770
2 Sources					
2.1 Domestic Credit	20080599	18369514	20093050	20164988	20122082
2.1.1 Net Bank Credit to the Government	6477629	5863293	6411599	6400871	6264552
2.1.1.1 Net RBI credit to the Government	1450596	1025199	1343761	1270275	1196325
2.1.1.2 Credit to the Government by the Banking System	5027033	4838094	5067838	5130596	5068228
2.1.2 Bank Credit to the Commercial Sector	13602969	12506221	13681451	13764117	13857529
2.1.2.1 RBI Credit to the Commercial Sector	39581	3113	33657	30858	38358
2.1.2.2 Credit to the Commercial Sector by the Banking System	13563389	12503107	13647793	13733259	13819171
2.1.2.2.1 Other Investments (Non-SLR Securities)	952181	949168	959581	960840	1050868
2.2 Government's Currency Liabilities to the Public	28013	26973	28013	28160	28160
2.3 Net Foreign Exchange Assets of the Banking Sector	4705191	4621233	4748952	4718362	4708895
2.3.1 Net Foreign Exchange Assets of the RBI	4442479	4298743	4436706	4428363	4483433
2.3.2 Net Foreign Currency Assets of the Banking System	262711	322491	312246	290000	225461
2.4 Capital Account	3021858	2917473	3069509	3067334	3256699
2.5 Other items (net)	1157060	993201	941138	877361	655832

No. 9: Liquidity Aggregates

(₹ Crore)

Aggregates	2021-22	2021	2022		
		May	Mar.	Apr.	May
	1	2	3	4	5
1 NM_3	**20630753**	**19107045**	**20630753**	**20859368**	**20946605**
2 Postal Deposits	594633	515899	594633	594633	594633
3 L_1 (1 + 2)	**21225386**	**19622944**	**21225386**	**21454001**	**21541238**
4 Liabilities of Financial Institutions	49578	28932	49578	41050	30285
4.1 Term Money Borrowings	1824	3563	1824	1758	2044
4.2 Certificates of Deposit	39170	20275	39170	39170	28070
4.3 Term Deposits	8584	5094	8584	122	171
5 L_2 (3 + 4)	**21274964**	**19651876**	**21274964**	**21495050**	**21571524**
6 Public Deposits with Non-Banking Financial Companies	66542	..	66542	..	..
7 L_3 (5 + 6)	**21341506**	..	**21341506**	..	..

Note : 1. Figures in the columns might not add up to the total due to rounding off of numbers.

No. 10: Reserve Bank of India Survey

(₹ Crore)

Item	Outstanding as on March 31/last reporting Fridays of the month/reporting Fridays				
	2021-22	2021	2022		
		May 21	Apr. 22	May 6	May 20
	1	2	3	4	5
1 Components					
1.1 Currency in Circulation	3133716	2964190	3209394	3232355	3226000
1.2 Bankers' Deposits with the RBI	876726	649717	735349	756571	863500
1.2.1 Scheduled Commercial Banks	823632	603344	684949	706380	810295
1.3 'Other' Deposits with the RBI	58444	48451	57568	55972	53828
Reserve Money (1.1 + 1.2 + 1.3 = 2.1 + 2.2 + 2.3 – 2.4 – 2.5)	4068887	3662358	4002311	4044898	4143328
2 Sources					
2.1 RBI's Domestic Credit	906895	669125	803251	809601	884775
2.1.1 Net RBI credit to the Government	1450596	1025199	1343761	1270275	1196325
2.1.1.1 Net RBI credit to the Central Government (2.1.1.1.1 + 2.1.1.1.2 + 2.1.1.1.3 + 2.1.1.1.4 – 2.1.1.1.5)	1448972	1022585	1341106	1249572	1187863
2.1.1.1.1 Loans and Advances to the Central Government	–	–	–	–	–
2.1.1.1.2 Investments in Treasury Bills	–	–	–	–	–
2.1.1.1.3 Investments in dated Government Securities	1488816	1438339	1463104	1436944	1440459
2.1.1.1.3.1 Central Government Securities	1488816	1438339	1463104	1436944	1440459
2.1.1.1.4 Rupee Coins	508	685	432	383	329
2.1.1.1.5 Deposits of the Central Government	40352	416439	122431	187754	252924
2.1.1.2 Net RBI credit to State Governments	1624	2614	2656	20703	8461
2.1.2 RBI's Claims on Banks	-583282	-359187	-574168	-491533	-349908
2.1.2.1 Loans and Advances to Scheduled Commercial Banks	-560272	-357508	-551158	-468449	-326824
2.1.3 RBI's Credit to Commercial Sector	39581	3113	33657	30858	38358
2.1.3.1 Loans and Advances to Primary Dealers	–	–	–	–	–
2.1.3.2 Loans and Advances to NABARD	23010	1679	23010	23084	23084
2.2 Government's Currency Liabilities to the Public	28013	26973	28013	28160	28160
2.3 Net Foreign Exchange Assets of the RBI	4442479	4298743	4436706	4428363	4483433
2.3.1 Gold	322213	275640	327120	320940	316885
2.3.2 Foreign Currency Assets	4120283	4023120	4109603	4107440	4166566
2.4 Capital Account	1254092	1233571	1244927	1215449	1365613
2.5 Other Items (net)	54408	98912	20731	5776	-112573

No. 11: Reserve Money - Components and Sources

(₹ Crore)

Item	2021-22	Outstanding as on March 31/ last Fridays of the month/ Fridays					
		2021	2022				
		May 28	Apr. 29	May 6	May 13	May 20	May 27
	1	2	3	4	5	6	7
Reserve Money (1.1 + 1.2 + 1.3 = 2.1 + 2.2 + 2.3 + 2.4 + 2.5 – 2.6)	4068887	3705431	4059241	4044898	4052157	4143328	4092142
1 Components							
1.1 Currency in Circulation	3133716	2963060	3210481	3232355	3243115	3226000	3219429
1.2 Bankers' Deposits with RBI	876726	692723	790444	756571	755478	863500	817317
1.3 'Other' Deposits with RBI	58444	49649	58316	55972	53563	53828	55395
2 Sources							
2.1 Net Reserve Bank Credit to Government	1450596	1069925	1338817	1270275	1303676	1196325	1128141
2.2 Reserve Bank Credit to Banks	-560272	-404069	-495401	-468449	-492333	-326824	-309121
2.3 Reserve Bank Credit to Commercial Sector	16571	1963	8562	7775	15117	15275	15275
2.4 Net Foreign Exchange Assets of RBI	4442479	4313624	4415731	4428363	4443213	4483433	4510138
2.5 Government's Currency Liabilities to the Public	28013	26995	28160	28160	28160	28160	28293
2.6 Net Non- Monetary Liabilities of RBI	1308500	1303006	1236627	1221225	1245676	1253040	1280583

No. 12: Commercial Bank Survey

(₹ Crore)

Item	Outstanding as on last reporting Fridays of the month/ reporting Fridays of the month				
	2021-22	2021	2022		
		May 21	Apr. 22	May 6	May 20
	1	2	3	4	5
1 Components					
1.1 Aggregate Deposits of Residents	16331874	15017406	16490982	16567484	16444802
1.1.1 Demand Deposits	2072747	1695080	1994770	2017495	1985767
1.1.2 Time Deposits of Residents	14259128	13322326	14496212	14549989	14459035
1.1.2.1 Short-term Time Deposits	6416607	5995047	6523296	6547495	6506566
1.1.2.1.1 Certificates of Deposits (CDs)	176718	91409	206988	187012	187763
1.1.2.2 Long-term Time Deposits	7842520	7327279	7972917	8002494	7952469
1.2 Call/Term Funding from Financial Institutions	274594	244698	279813	283726	393770
2 Sources					
2.1 Domestic Credit	17575002	16319407	17694881	17841606	17864954
2.1.1 Credit to the Government	4728179	4534239	4770863	4831016	4770031
2.1.2 Credit to the Commercial Sector	12846823	11785167	12924018	13010591	13094923
2.1.2.1 Bank Credit	11891314	10831221	11956344	12040719	12038120
2.1.2.1.1 Non-food Credit	11836304	10740559	11913792	11985232	11984866
2.1.2.2 Net Credit to Primary Dealers	11522	12490	16153	17086	14113
2.1.2.3 Investments in Other Approved Securities	769	1250	902	909	784
2.1.2.4 Other Investments (in non-SLR Securities)	943218	940205	950619	951877	1041906
2.2 Net Foreign Currency Assets of Commercial Banks (2.2.1–2.2.2–2.2.3)	262711	322491	312246	290000	225461
2.2.1 Foreign Currency Assets	465464	531538	518674	494351	426756
2.2.2 Non-resident Foreign Currency Repatriable Fixed Deposits	133439	149778	132509	128387	129472
2.2.3 Overseas Foreign Currency Borrowings	69314	59269	73919	75964	71822
2.3 Net Bank Reserves (2.3.1+2.3.2–2.3.3)	1268887	1052544	1339631	1273018	1232851
2.3.1 Balances with the RBI	683437	603344	684949	706380	810295
2.3.2 Cash in Hand	85926	91692	103524	98189	95732
2.3.3 Loans and Advances from the RBI	-499524	-357508	-551158	-468449	-326824
2.4 Capital Account	1743595	1659731	1800411	1827714	1866915
2.5 Other items (net) (2.1+2.2+2.3–2.4–1.1–1.2)	756537	772606	775552	725700	617779
2.5.1 Other Demand and Time Liabilities (net of 2.2.3)	571535	511476	536209	556444	565536
2.5.2 Net Inter-Bank Liabilities (other than to PDs)	26533	54669	33786	3659	7741

No. 13: Scheduled Commercial Banks' Investments

(₹ Crore)

Item	As on March 25, 2022	2021	2022		
		May. 21	Apr. 22	May. 6	May. 20
	1	2	3	4	5
1 SLR Securities	4728948	4535489	4771756	4831924	4770815
2 Commercial Paper	55315	78342	52497	55026	58764
3 Shares issued by					
3.1 PSUs	7642	9587	8061	9000	9784
3.2 Private Corporate Sector	73814	65536	73668	72634	72109
3.3 Others	5152	5136	5074	5114	5133
4 Bonds/Debentures issued by					
4.1 PSUs	117860	118763	116629	115744	98683
4.2 Private Corporate Sector	326188	305422	322067	320603	315849
4.3 Others	148753	152802	145822	145341	91127
5 Instruments issued by					
5.1 Mutual funds	34404	40436	53485	54779	59922
5.2 Financial institutions	174090	164148	173399	173636	172452

Note: Data against column Nos. (1), (2) & (3) are Final and for column Nos. (4) & (5) data are Provisional.

No. 14: Business in India - All Scheduled Banks and All Scheduled Commercial Banks

(₹ Crore)

Item	As on the Last Reporting Friday (in case of March)/ Last Friday							
	All Scheduled Banks				All Scheduled Commercial Banks			
	2021-22	2021	2022		2021-22	2021	2022	
		May	Apr.	May		May	Apr.	May
	1	2	3	4	5	6	7	8
Number of Reporting Banks	212	209	212	212	136	133	136	136
1 Liabilities to the Banking System	**262674**	**245040**	**286747**	**281473**	**258649**	**240110**	**282628**	**277568**
1.1 Demand and Time Deposits from Banks	194143	181875	210053	196517	190570	177405	206382	193068
1.2 Borrowings from Banks	38369	44689	43698	50013	38317	44471	43690	50009
1.3 Other Demand and Time Liabilities	30162	18477	32995	34943	29762	18234	32556	34491
2 Liabilities to Others	**17832517**	**16527824**	**18184870**	**18094313**	**17380755**	**16089154**	**17731648**	**17645370**
2.1 Aggregate Deposits	16899634	15682311	17216660	17028245	16465313	15261152	16781378	16597227
2.1.1 Demand	2117513	1802866	2159279	2030262	2072747	1763217	2114435	1985304
2.1.2 Time	14782121	13879446	15057380	14997983	14392567	13497935	14666943	14611923
2.2 Borrowings	278985	248315	291197	399209	274594	242718	286130	393281
2.3 Other Demand and Time Liabilities	653898	597198	677013	666859	640848	585284	664139	654863
3 Borrowings from Reserve Bank	**94299**	**90093**	**94306**	**94368**	**94299**	**90093**	**94306**	**94368**
3.1 Against Usance Bills /Promissory Notes	–	–	–	–	–	–	–	–
3.2 Others	94299	90093	94306	94368	94299	90093	94306	94368
4 Cash in Hand and Balances with Reserve Bank	788725	757622	861402	881396	769363	738455	841178	859658
4.1 Cash in Hand	88732	94785	103551	100846	85926	92728	100944	97922
4.2 Balances with Reserve Bank	699993	662837	757851	780550	683437	645726	740234	761736
5 Assets with the Banking System	**315282**	**247367**	**339178**	**341720**	**243637**	**191072**	**273145**	**278517**
5.1 Balances with Other Banks	199434	171280	220989	228476	164240	138317	186466	193977
5.1.1 In Current Account	19733	18640	21655	16142	16691	16107	18732	13681
5.1.2 In Other Accounts	179701	152640	199334	212334	147549	122209	167734	180296
5.2 Money at Call and Short Notice	36905	27532	36999	33082	6982	8874	11255	9843
5.3 Advances to Banks	39340	18069	35852	31176	35802	16028	33397	29323
5.4 Other Assets	39603	30487	45339	48986	36613	27853	42027	45374
6 Investment	**4874070**	**4695860**	**4969726**	**4973135**	**4728948**	**4558998**	**4827062**	**4830428**
6.1 Government Securities	4867102	4688752	4963370	4967000	4728179	4557647	4826084	4829622
6.2 Other Approved Securities	6968	7108	6356	6135	769	1352	979	806
7 Bank Credit	**12259048**	**11161004**	**12372846**	**12432283**	**11891314**	**10824944**	**12000930**	**12062731**
7a Food Credit	90827	125083	98423	96386	55011	89264	52702	50666
7.1 Loans, Cash-credits and Overdrafts	12016486	10958298	12131606	12194102	11651337	10624467	11762233	11827177
7.2 Inland Bills-Purchased	36070	29136	34860	34607	36055	29108	34845	34590
7.3 Inland Bills-Discounted	155796	121059	154044	155143	154212	119655	152374	153369
7.4 Foreign Bills-Purchased	19537	17904	21010	20987	19157	17642	20715	20703
7.5 Foreign Bills-Discounted	31160	34607	31327	27444	30554	34071	30763	26892

Note: Data in column Nos. (4) & (8) are Provisional.

No. 15: Deployment of Gross Bank Credit by Major Sectors

(₹ Crore)

Sector	Outstanding as on				Growth (%)	
	Mar.25, 2022	2021	2022		Financial year so far	Y-o-Y
		May.21	Apr.22	May.20	2022-23	2022
	1	2	3	4	%	%
I. Gross Bank Credit (II+III)	**11891314**	**10727269**	**11954640**	**12027305**	**1.1**	**12.1**
II. Food Credit	**55011**	**90663**	**42552**	**53254**	**-3.2**	**-41.3**
III. Non-food Credit	**11836304**	**10636606**	**11912088**	**11974051**	**1.2**	**12.6**
1. Agriculture & Allied Activities	**1461350**	**1326698**	**1478559**	**1483557**	**1.5**	**11.8**
2. Industry (Micro and Small, Medium and Large)	**3152449**	**2910571**	**3152414**	**3164938**	**0.4**	**8.7**
2.1 Micro and Small [1]	532081	414750	545070	551566	3.7	33.0
2.2 Medium	213996	146312	218112	218446	2.1	49.3
2.3 Large	2406372	2349509	2389232	2394926	-0.5	1.9
3. Services	**3017116**	**2695701**	**3018767**	**3043206**	**0.9**	**12.9**
3.1 Transport Operators	155353	141831	152498	152061	-2.1	7.2
3.2 Computer Software	20899	19270	20249	19241	-7.9	-0.1
3.3 Tourism, Hotels & Restaurants	64369	59088	64941	64358	0.0	8.9
3.4 Shipping	8437	5719	7917	7617	-9.7	33.2
3.5 Aviation	23979	27647	23067	22382	-6.7	-19.0
3.6 Professional Services	116743	109853	117355	119143	2.1	8.5
3.7 Trade	696349	629945	707317	714543	2.6	13.4
3.7.1 Wholesale Trade	351228	325833	374605	377061	7.4	15.7
3.7.2 Retail Trade	345121	304112	332712	337481	-2.2	11.0
3.8 Commercial Real Estate	291168	290337	296145	300774	3.3	3.6
3.9 Non-Banking Financial Companies (NBFCs)[2]	1078447	908834	1091216	1095777	1.6	20.6
of which,						
3.9.1 Housing Finance Companies (HFCs)	278979	255908	288085	289048	3.6	12.9
3.9.2 Public Financial Institutions (PFIs)	144121	80304	142802	142580	-1.1	77.5
3.10 Other Services [3]	561373	503176	538062	547311	-2.5	8.8
4. Personal Loans	**3385827**	**2979579**	**3442993**	**3467812**	**2.4**	**16.4**
4.1 Consumer Durables	27613	17168	28896	29593	7.2	72.4
4.2 Housing	1684424	1502877	1706286	1708911	1.5	13.7
4.3 Advances against Fixed Deposits	78734	66580	79768	77906	-1.1	17.0
4.4 Advances to Individuals against share & bonds	6161	5269	6112	6172	0.2	17.2
4.5 Credit Card Outstanding	147789	118512	153681	154137	4.3	30.1
4.6 Education	82723	77941	82600	82721	0.0	6.1
4.7 Vehicle Loans	402667	366623	413536	418350	3.9	14.1
4.8 Loan against gold jewellery	75311	75984	74281	73752	-2.1	-2.9
4.9 Other Personal Loans	880406	748626	897834	916270	4.1	22.4
5. Priority Sector *(Memo)*						
5.1 Agriculture & Allied Activities [4]	1485438	1307555	1529136	1457961	-1.8	11.5
5.2 Micro & Small Enterprises [5]	1377138	1120944	1408936	1423956	3.4	27.0
5.3 Medium Enterprises [6]	351900	216816	354749	357217	1.5	64.8
5.4 Housing	614487	586715	610187	614155	-0.1	4.7
5.5 Education Loans	58118	59105	57760	57938	-0.3	-2.0
5.6 Renewable Energy	3538	1838	3552	3994	12.9	117.3
5.7 Social Infrastructure	2483	3023	2513	2545	2.5	-15.8
5.8 Export Credit	23385	21435	21144	20801	-11.0	-3.0
5.9 Others	37159	14287	43698	46082	24.0	222.5
5.10 Weaker Sections including net PSLC- SF/MF	1180928	989205	1212594	1165808	-1.3	17.9

Note 1: Data are provisional. Gross bank credit and non-food credit data are based on Section-42 return, which covers all scheduled commercial banks (SCBs), while sectoral non-food credit data are based on sector-wise and industry-wise bank credit (SIBC) return, which covers select banks accounting for about 93 per cent of total non-food credit extended by all SCBs.
Note 2: With effect from January 2021, sectoral credit data are based on revised format due to which values and growth rates of some of the existing components published earlier have undergone some changes.
Note 3: Bank credit growth are adjusted for past reporting errors by select SCBs.

1 Micro & Small includes credit to micro & small industries in the manufacturing sector.

2 NBFCs include HFCs, PFIs, Microfinance Institutions (MFIs), NBFCs engaged in gold loan and others.

3 Other Services include Mutual Fund (MFs), Banking and Finance other than NBFCs and MFs and other services which are not indicated elsewhere under services.

4 Agriculture and Allied Activities also include priority sector lending certificates (PSLCs).

5 Micro and Small Enterprises include credit to micro and small enterprises in manufacturing and services sector and also include PSLCs.

6 Medium Enterprises include credit to medium enterprises in the manufacturing and services sector.

No. 16: Industry-wise Deployment of Gross Bank Credit

(₹ Crore)

Industry	Outstanding as on				Growth (%)	
	Mar. 25, 2022	2021	2022		Financial year so far	Y-o-Y
		May. 21	Apr.22	May 20	2022-23	2022
	1	2	3	4	%	%
2 Industries (2.1 to 2.19)	3152449	2910571	3152414	3164938	0.4	8.7
2.1 Mining & Quarrying (incl. Coal)	49038	43435	47466	46980	–4.2	8.2
2.2 Food Processing	173243	156704	175433	175068	1.1	11.7
2.2.1 Sugar	26307	25069	26528	25556	–2.9	1.9
2.2.2 Edible Oils & Vanaspati	18246	17238	17463	17749	–2.7	3.0
2.2.3 Tea	5728	5104	5948	6094	6.4	19.4
2.2.4 Others	122962	109294	125494	125669	2.2	15.0
2.3 Beverage & Tobacco	18176	17303	18020	17760	–2.3	2.6
2.4 Textiles	223508	208903	222928	219502	–1.8	5.1
2.4.1 Cotton Textiles	90189	85211	89202	87693	–2.8	2.9
2.4.2 Jute Textiles	3509	2503	3526	3568	1.7	42.6
2.4.3 Man-Made Textiles	38354	35871	38290	38396	0.1	7.0
2.4.4 Other Textiles	91456	85318	91910	89844	–1.8	5.3
2.5 Leather & Leather Products	11481	10894	11323	11438	–0.4	5.0
2.6 Wood & Wood Products	16248	15232	16293	16514	1.6	8.4
2.7 Paper & Paper Products	40073	38258	40221	40366	0.7	5.5
2.8 Petroleum, Coal Products & Nuclear Fuels	107242	84493	103596	104665	–2.4	23.9
2.9 Chemicals & Chemical Products	196179	180587	204316	208786	6.4	15.6
2.9.1 Fertiliser	33160	31809	34562	37804	14.0	18.8
2.9.2 Drugs & Pharmaceuticals	61093	53339	63353	62652	2.6	17.5
2.9.3 Petro Chemicals	19622	25604	21215	21566	9.9	–15.8
2.9.4 Others	82303	69835	85185	86764	5.4	24.2
2.10 Rubber, Plastic & their Products	71915	57364	71616	71255	–0.9	24.2
2.11 Glass & Glassware	5948	6115	5813	5784	–2.8	–5.4
2.12 Cement & Cement Products	47912	53942	46781	47812	–0.2	–11.4
2.13 Basic Metal & Metal Product	288395	298884	287221	292059	1.3	–2.3
2.13.1 Iron & Steel	187443	205164	184990	187800	0.2	–8.5
2.13.2 Other Metal & Metal Product	100952	93720	102231	104259	3.3	11.2
2.14 All Engineering	167680	154606	166455	168567	0.5	9.0
2.14.1 Electronics	38180	36711	38771	38401	0.6	4.6
2.14.2 Others	129500	117895	127683	130166	0.5	10.4
2.15 Vehicles, Vehicle Parts & Transport Equipment	89688	83744	90076	91247	1.7	9.0
2.16 Gems & Jewellery	80411	68363	77804	71997	–10.5	5.3
2.17 Construction	117625	122127	112462	114229	–2.9	–6.5
2.18 Infrastructure	1193965	1094425	1202839	1198804	0.4	9.5
2.18.1 Power	610815	563267	612805	614470	0.6	9.1
2.18.2 Telecommunications	130349	114602	130730	129377	–0.7	12.9
2.18.3 Roads	269896	234287	273756	275270	2.0	17.5
2.18.4 Airports	6646	9670	8493	6841	2.9	–29.3
2.18.5 Ports	8886	11073	9112	7938	–10.7	–28.3
2.18.6 Railways	10512	12523	11483	11381	8.3	–9.1
2.18.7 Other Infrastructure	156861	149004	156461	153527	–2.1	3.0
2.19 Other Industries	253724	215192	251752	262106	3.3	21.8

Note : With effect from January 2021, sectoral credit data are based on revised format due to which values and growth rates of some of the existing components published earlier have undergone some changes.

No. 17: State Co-operative Banks Maintaining Accounts with the Reserve Bank of India

(₹ Crore)

Item	Last Reporting Friday (in case of March)/Last Friday/ Reporting Friday								
	2020-21	2021	2022						
		Apr, 30	Feb, 11	Feb, 25	Mar, 11	Mar, 25	Apr, 08	Apr, 22	Apr, 29
	1	2	3	4	5	6	7	8	9
Number of Reporting Banks	32	32	33	33	33	33	33	33	33
1 Aggregate Deposits (2.1.1.2+2.2.1.2)	**125859.6**	**126362.8**	**126324.0**	**126531.5**	**127247.4**	**129858.2**	**131377.4**	**130646.5**	**130356.1**
2 Demand and Time Liabilities									
2.1 Demand Liabilities	**23736.9**	**24146.6**	**26573.3**	**24733.8**	**24440.4**	**26116.3**	**26854.4**	**26800.8**	**26799.3**
2.1.1 Deposits									
2.1.1.1 Inter-Bank	4896.9	5197.4	5468.9	5237.4	5305.3	5902.5	5475.6	5677.3	5097.7
2.1.1.2 Others	13,899.4	14115.6	13829.4	13918.4	14003.1	14459.2	15139.9	14945.7	14888.6
2.1.2 Borrowings from Banks	0.0	10.0	294.9	499.9	0.0	0.0	60.0	90.0	579.8
2.1.3 Other Demand Liabilities	4940.6	4823.6	6980.0	5078.1	5132.1	5754.5	6179.0	6087.8	6233.2
2.2 Time Liabilities	**179957.5**	**178951.7**	**176359.3**	**177613.0**	**179429.6**	**189731.8**	**193780.5**	**189892.4**	**188046.3**
2.2.1 Deposits									
2.2.1.1 Inter-Bank	65333.7	64191.2	60724.4	61880.2	63021.6	71236.3	74235.3	70896.1	69276.0
2.2.1.2 Others	111960.2	112247.2	112494.5	112613.1	113244.3	115399.0	116237.5	115700.8	115467.5
2.2.2 Borrowings from Banks	630.0	899.9	876.8	859.4	874.8	853.7	1000.5	1000.0	1000.0
2.2.3 Other Time Liabilities	2033.7	1613.3	2263.6	2260.3	2288.9	2242.7	2307.1	2295.6	2302.9
3 Borrowing from Reserve Bank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4 Borrowings from a notified bank / Government	63559.8	58908.7	65375.2	64466.5	64019.3	66978.0	66398.8	63840.5	63081.2
4.1 Demand	15691.8	11930.6	13311.1	12992.3	13989.3	15765.8	13904.1	13317.7	13292.8
4.2 Time	47868.0	46978.1	52064.0	51474.2	50030.0	51212.3	52494.8	50522.8	49788.3
5 Cash in Hand and Balances with Reserve Bank	**8151.1**	**8327.7**	**9040.8**	**9228.6**	**8995.9**	**9725.6**	**11612.6**	**10679.3**	**10297.1**
5.1 Cash in Hand	570.3	604.1	691.6	743.8	812.4	1014.8	1302.6	993.5	886.4
5.2 Balance with Reserve Bank	7580.8	7723.6	8349.1	8484.8	8183.4	8710.8	10310.0	9685.7	9410.7
6 Balances with Other Banks in Current Account	**1148.1**	**951.6**	**1284.4**	**1310.3**	**1404.5**	**1651.7**	**1565.8**	**1413.3**	**1398.7**
7 Investments in Government Securities	**64455.2**	**65337.4**	**71964.6**	**71262.5**	**71736.8**	**75927.5**	**72724.3**	**72956.1**	**72964.6**
8 Money at Call and Short Notice	**28835.7**	**24534.3**	**24200.2**	**24875.8**	**25352.5**	**32935.8**	**29095.0**	**29100.2**	**28772.6**
9 Bank Credit (10.1+11)	**114631.6**	**118073.6**	**112313.6**	**111718.8**	**111685.2**	**111549.1**	**121123.8**	**120219.0**	**120025.5**
10 Advances									
10.1 Loans, Cash-Credits and Overdrafts	**114612.1**	**118054.5**	**112293.0**	**111698.2**	**111659.5**	**111529.1**	**121103.2**	**120198.3**	**120004.5**
10.2 Due from Banks	89429.1	86692.3	104523.9	106973.7	108134.5	112645.5	112402.9	110021.7	108476.3
11 Bills Purchased and Discounted	19.5	19.2	20.6	20.6	25.7	20.0	20.7	20.7	21.0

Prices and Production

No. 18: Consumer Price Index (Base: 2012=100)

Group/Sub group	2021-22			Rural			Urban			Combined		
	Rural	Urban	Combined	May. 21	Apr. 22	May 22(P)	May. 21	Apr. 22	May 22(P)	May. 21	Apr. 22	May 22(P)
	1	2	3	4	5	6	7	8	9	10	11	12
1 Food and beverages	**162.8**	**168.7**	**165.0**	**158.7**	**168.6**	**170.8**	**164.2**	**174.5**	**177.5**	**160.7**	**170.8**	**173.3**
1.1 Cereals and products	146.4	150.4	147.6	145.1	151.8	152.9	148.8	155.4	156.7	146.3	152.9	154.1
1.2 Meat and fish	200.4	206.5	202.6	198.5	209.7	214.7	204.3	215.8	221.2	200.5	211.8	217.0
1.3 Egg	173.3	176.0	174.4	168.6	164.5	161.4	173.0	164.6	164.1	170.3	164.5	162.4
1.4 Milk and products	158.3	159.0	158.6	155.8	163.8	164.6	156.5	164.2	165.4	156.1	163.9	164.9
1.5 Oils and fats	192.2	172.4	184.9	184.4	207.4	209.9	168.8	186.0	189.5	178.7	199.5	202.4
1.6 Fruits	155.3	163.5	159.2	162.3	169.7	167.9	172.5	175.9	174.5	167.1	172.6	171.0
1.7 Vegetables	156.1	192.8	168.5	138.4	153.6	160.3	166.5	190.7	203.2	147.9	166.2	174.9
1.8 Pulses and products	164.1	164.4	164.2	165.1	165.1	165.0	165.9	164.0	164.1	165.4	164.7	164.7
1.9 Sugar and confectionery	117.4	119.1	118.0	114.3	118.2	118.9	115.9	120.5	121.2	114.8	119.0	119.7
1.10 Spices	171.2	167.5	170.0	169.7	182.9	186.6	165.2	178.0	181.4	168.2	181.3	184.9
1.11 Non-alcoholic beverages	167.8	154.7	162.3	164.6	172.4	173.2	152.0	157.5	158.5	159.3	166.2	167.1
1.12 Prepared meals, snacks, sweets	173.0	175.8	174.3	169.8	178.9	180.4	171.1	183.3	184.9	170.4	180.9	182.5
2 Pan, tobacco and intoxicants	**190.3**	**196.5**	**191.9**	**189.6**	**192.8**	**192.8**	**198.2**	**197.1**	**197.5**	**191.9**	**193.9**	**194.1**
3 Clothing and footwear	**168.2**	**158.4**	**164.3**	**164.5**	**177.1**	**179.0**	**154.1**	**166.3**	**167.8**	**160.4**	**172.8**	**174.6**
3.1 Clothing	168.8	160.9	165.7	165.3	177.5	179.3	156.5	168.4	170.0	161.8	173.9	175.6
3.2 Footwear	164.5	144.7	156.3	160.6	175.1	177.3	140.2	154.5	155.9	152.1	166.5	168.4
4 Housing	**--**	**163.0**	**163.0**	**--**	**--**	**--**	**161.6**	**167.0**	**167.6**	**161.6**	**167.0**	**167.6**
5 Fuel and light	**164.0**	**159.8**	**162.4**	**161.7**	**173.3**	**175.3**	**155.5**	**170.5**	**173.5**	**159.4**	**172.2**	**174.6**
6 Miscellaneous	**164.1**	**156.1**	**160.2**	**161.1**	**170.2**	**170.9**	**152.3**	**163.1**	**163.8**	**156.8**	**166.8**	**167.5**
6.1 Household goods and services	161.8	153.5	157.9	158.8	167.7	168.9	150.1	159.8	161.2	154.7	164.0	165.3
6.2 Health	172.0	163.3	168.6	169.1	177.0	177.7	160.4	169.0	170.2	165.8	174.0	174.9
6.3 Transport and communication	157.9	150.0	153.7	153.2	166.2	167.2	145.0	159.3	159.4	148.9	162.6	163.1
6.4 Recreation and amusement	162.7	154.8	158.2	160.0	167.2	167.7	152.6	162.2	163.1	155.8	164.4	165.1
6.5 Education	168.4	160.1	163.5	167.6	170.9	171.7	156.6	164.0	165.1	161.2	166.9	167.8
6.6 Personal care and effects	161.3	160.8	161.1	159.3	169.0	168.5	157.5	168.4	168.2	158.6	168.8	168.4
General Index (All Groups)	**164.5**	**163.1**	**163.8**	**161.1**	**170.8**	**172.4**	**159.5**	**169.2**	**170.8**	**160.4**	**170.1**	**171.7**

Source: National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India.
P: Provisional.

No. 19: Other Consumer Price Indices

Item	Base Year	Linking Factor	2021-22	2021	2022	
				May	Apr.	May
	1	2	3	4	5	6
1 Consumer Price Index for Industrial Workers	2016	2.88	-	120.6	127.7	129
2 Consumer Price Index for Agricultural Labourers	1986-87	5.89	1075	1049	1108	1119
3 Consumer Price Index for Rural Labourers	1986-87	–	1084	1057	1119	1131

Source: Labour Bureau, Ministry of Labour and Employment, Government of India.

No. 20: Monthly Average Price of Gold and Silver in Mumbai

Item	2021-22	2021	2022	
		May	Apr.	May
	1	2	3	4
1 Standard Gold (₹ per 10 grams)	47999	47860	52023	50879
2 Silver (₹ per kilogram)	65426	70833	66922	61572

Source: India Bullion & Jewellers Association Ltd., Mumbai for Gold and Silver prices in Mumbai.

No. 21: Wholesale Price Index

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			May	Mar.	Apr. (P)	May (P)
	1	2	3	4	5	6
1 ALL COMMODITIES	**100.000**	**139.4**	**132.9**	**148.9**	**151.9**	**154.0**
1.1 PRIMARY ARTICLES	**22.618**	**160.7**	**150.2**	**170.9**	**174.9**	**179.8**
1.1.1 FOOD ARTICLES	**15.256**	**167.3**	**159.6**	**169.6**	**175.1**	**179.3**
1.1.1.1 Food Grains (Cereals+Pulses)	3.462	163.5	162.2	169.1	170.8	171.5
1.1.1.2 Fruits & Vegetables	3.475	187.6	159.4	179.0	198.8	210.9
1.1.1.3 Milk	4.440	156.9	154.9	161.6	162.6	163.9
1.1.1.4 Eggs,Meat & Fish	2.402	164.0	163.2	169.6	169.4	175.9
1.1.1.5 Condiments & Spices	0.529	159.8	150.3	172.9	173.8	177.9
1.1.1.6 Other Food Articles	0.948	168.3	169.4	173.4	177.3	173.3
1.1.2 NON-FOOD ARTICLES	**4.119**	**158.1**	**145.0**	**175.0**	**177.3**	**180.0**
1.1.2.1 Fibres	0.839	158.4	134.6	200.1	214.8	235.1
1.1.2.2 Oil Seeds	1.115	214.4	208.9	226.6	227.2	223.7
1.1.2.3 Other non-food Articles	1.960	119.9	115.8	126.7	127.3	127.7
1.1.2.4 Floriculture	0.204	217.0	119.5	253.9	230.8	217.1
1.1.3 MINERALS	**0.833**	**197.2**	**170.9**	**228.9**	**225.0**	**228.9**
1.1.3.1 Metallic Minerals	0.648	193.3	163.2	229.9	226.9	229.9
1.1.3.2 Other Minerals	0.185	211.0	197.7	225.4	218.4	225.6
1.1.4 CRUDE PETROLEUM & NATURAL GAS	**2.410**	**110.3**	**92.2**	**151.6**	**152.5**	**165.5**
1.2 FUEL & POWER	**13.152**	**124.6**	**109.8**	**143.9**	**151.0**	**154.4**
1.2.1 COAL	**2.138**	**129.0**	**127.3**	**130.9**	**130.9**	**130.9**
1.2.1.1 Coking Coal	0.647	143.0	141.9	143.4	143.4	143.4
1.2.1.2 Non-Coking Coal	1.401	119.8	119.8	119.8	119.8	119.8
1.2.1.3 Lignite	0.090	170.5	138.1	212.6	212.6	212.6
1.2.2 MINERAL OILS	**7.950**	**126.2**	**106.9**	**155.7**	**167.5**	**173.1**
1.2.3 ELECTRICITY	**3.064**	**117.4**	**105.2**	**122.2**	**122.2**	**122.2**
1.3 MANUFACTURED PRODUCTS	**64.231**	**135.0**	**131.5**	**142.3**	**144.0**	**144.8**
1.3.1 MANUFACTURE OF FOOD PRODUCTS	**9.122**	**157.9**	**157.3**	**165.7**	**169.1**	**170.9**
1.3.1.1 Processing and Preserving of meat	0.134	142.8	143.6	142.6	143.6	145.3
1.3.1.2 Processing and Preserving of fish, Crustaceans, Molluscs and products thereof	0.204	144.1	139.8	142.8	144.8	146.2
1.3.1.3 Processing and Preserving of fruit and Vegetables	0.138	122.3	122.2	121.9	123.4	125.3
1.3.1.4 Vegetable and Animal oils and Fats	2.643	187.2	191.0	202.5	210.2	212.8
1.3.1.5 Dairy products	1.165	149.4	148.5	156.3	158.4	160.8
1.3.1.6 Grain mill products	2.010	145.6	143.4	150.1	150.9	151.5
1.3.1.7 Starches and Starch products	0.110	133.3	124.2	151.5	154.2	157.7
1.3.1.8 Bakery products	0.215	146.2	142.0	152.5	154.8	155.5
1.3.1.9 Sugar, Molasses & honey	1.163	122.9	119.4	124.6	125.2	126.2
1.3.1.10 Cocoa, Chocolate and Sugar confectionery	0.175	130.5	129.7	134.5	134.6	135.2
1.3.1.11 Macaroni, Noodles, Couscous and Similar farinaceous products	0.026	136.7	130.5	152.5	160.6	163.1
1.3.1.12 Tea & Coffee products	0.371	171.1	174.8	169.3	171.3	183.1
1.3.1.13 Processed condiments & salt	0.163	157.5	153.9	165.3	169.1	170.6
1.3.1.14 Processed ready to eat food	0.024	137.0	137.4	139.0	141.0	140.8
1.3.1.15 Health supplements	0.225	153.5	145.3	166.7	172.4	170.4
1.3.1.16 Prepared animal feeds	0.356	200.9	194.7	210.4	213.9	210.9
1.3.2 MANUFACTURE OF BEVERAGES	**0.909**	**126.8**	**125.8**	**127.0**	**127.6**	**128.1**
1.3.2.1 Wines & spirits	0.408	123.6	122.2	125.7	126.8	127.4
1.3.2.2 Malt liquors and Malt	0.225	130.5	127.7	133.2	134.3	134.3
1.3.2.3 Soft drinks; Production of mineral waters and Other bottled waters	0.275	128.6	129.6	123.9	123.3	124.1
1.3.3 MANUFACTURE OF TOBACCO PRODUCTS	**0.514**	**160.2**	**159.3**	**162.4**	**163.3**	**165.0**
1.3.3.1 Tobacco products	0.514	160.2	159.3	162.4	163.3	165.0

No. 21: Wholesale Price Index (Contd.)

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			May	Mar.	Apr. (P)	May (P)
1.3.4 MANUFACTURE OF TEXTILES	**4.881**	**135.2**	**128.5**	**143.9**	**145.4**	**147.6**
1.3.4.1 Preparation and Spinning of textile fibres	2.582	128.2	120.6	138.9	140.1	142.1
1.3.4.2 Weaving & Finishing of textiles	1.509	146.8	139.8	154.1	155.6	158.5
1.3.4.3 Knitted and Crocheted fabrics	0.193	125.5	122.7	128.7	131.9	132.8
1.3.4.4 Made-up textile articles, Except apparel	0.299	138.7	133.4	147.3	148.5	151.2
1.3.4.5 Cordage, Rope, Twine and Netting	0.098	168.5	172.4	162.5	166.2	167.6
1.3.4.6 Other textiles	0.201	126.2	122.0	132.3	133.9	135.0
1.3.5 MANUFACTURE OF WEARING APPAREL	**0.814**	**143.1**	**139.9**	**145.1**	**145.9**	**146.6**
1.3.5.1 Manufacture of Wearing Apparel (woven), Except fur Apparel	0.593	142.0	139.6	143.7	144.3	145.2
1.3.5.2 Knitted and Crocheted apparel	0.221	145.8	140.7	148.9	150.1	150.3
1.3.6 MANUFACTURE OF LEATHER AND RELATED PRODUCTS	**0.535**	**119.2**	**119.5**	**120.4**	**120.9**	**121.7**
1.3.6.1 Tanning and Dressing of leather; Dressing and Dyeing of fur	0.142	103.4	101.9	105.0	106.4	106.4
1.3.6.2 Luggage, HandbAgs, Saddlery and Harness	0.075	141.5	140.6	144.3	144.7	142.1
1.3.6.3 Footwear	0.318	121.0	122.4	121.6	121.8	123.7
1.3.7 MANUFACTURE OF WOOD AND PRODUCTS OF WOOD AND CORK	**0.772**	**141.0**	**138.3**	**144.4**	**145.0**	**147.2**
1.3.7.1 Saw milling and Planing of wood	0.124	128.8	123.0	133.5	133.8	135.6
1.3.7.2 Veneer sheets; Manufacture of plywood, Laminboard, Particle board and Other panels and Boards	0.493	141.9	140.5	145.1	145.7	149.3
1.3.7.3 Builder's carpentry and Joinery	0.036	193.9	191.3	195.2	201.5	201.5
1.3.7.4 Wooden containers	0.119	134.1	128.9	138.1	137.1	134.2
1.3.8 MANUFACTURE OF PAPER AND PAPER PRODUCTS	**1.113**	**137.5**	**132.6**	**148.5**	**151.9**	**153.8**
1.3.8.1 Pulp, Paper and Paperboard	0.493	141.4	137.3	152.1	155.2	156.5
1.3.8.2 Corrugated paper and Paperboard and Containers of paper and Paperboard	0.314	137.8	133.9	146.2	146.9	149.0
1.3.8.3 Other articles of paper and Paperboard	0.306	131.0	123.7	145.0	151.9	154.5
1.3.9 PRINTING AND REPRODUCTION OF RECORDED MEDIA	**0.676**	**157.8**	**155.2**	**162.7**	**163.5**	**167.7**
1.3.9.1 Printing	0.676	157.8	155.2	162.7	163.5	167.7
1.3.10 MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS	**6.465**	**133.5**	**128.4**	**142.3**	**143.9**	**146.3**
1.3.10.1 Basic chemicals	1.433	143.8	135.3	156.1	159.9	165.1
1.3.10.2 Fertilizers and Nitrogen compounds	1.485	129.6	127.6	135.1	136.5	137.1
1.3.10.3 Plastic and Synthetic rubber in primary form	1.001	140.3	135.8	149.8	151.6	152.4
1.3.10.4 Pesticides and Other agrochemical products	0.454	132.1	127.3	141.4	141.1	142.8
1.3.10.5 Paints, Varnishes and Similar coatings, Printing ink and Mastics	0.491	130.4	123.7	139.1	141.2	143.4
1.3.10.6 Soap and Detergents, Cleaning and Polishing preparations, Perfumes and Toilet preparations	0.612	128.1	124.8	134.5	132.0	138.1
1.3.10.7 Other chemical products	0.692	130.3	123.6	140.5	141.7	143.5
1.3.10.8 Man-made fibres	0.296	106.6	102.3	113.5	115.6	114.9
1.3.11 MANUFACTURE OF PHARMACEUTICALS, MEDICINAL CHEMICAL AND BOTANICAL PRODUCTS	**1.993**	**135.9**	**136.9**	**138.0**	**137.6**	**139.4**
1.3.11.1 Pharmaceuticals, Medicinal chemical and Botanical products	1.993	135.9	136.9	138.0	137.6	139.4
1.3.12 MANUFACTURE OF RUBBER AND PLASTICS PRODUCTS	**2.299**	**124.8**	**121.2**	**130.0**	**131.8**	**131.9**
1.3.12.1 Rubber Tyres and Tubes; Retreading and Rebuilding of Rubber Tyres	0.609	104.3	102.1	105.9	107.2	108.2
1.3.12.2 Other Rubber Products	0.272	101.9	96.7	106.5	106.6	106.0
1.3.12.3 Plastics products	1.418	138.0	134.1	144.8	147.2	147.0
1.3.13 MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS	**3.202**	**123.7**	**120.9**	**127.7**	**129.4**	**130.6**
1.3.13.1 Glass and Glass products	0.295	139.1	135.5	145.9	148.2	151.5
1.3.13.2 Refractory products	0.223	115.6	113.6	119.0	118.8	118.8
1.3.13.3 Clay Building Materials	0.121	119.3	114.8	132.0	135.5	136.0
1.3.13.4 Other Porcelain and Ceramic Products	0.222	112.9	107.7	116.6	116.2	117.4
1.3.13.5 Cement, Lime and Plaster	1.645	126.4	124.0	129.8	131.6	133.0

No. 21: Wholesale Price Index (Contd.)

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			May	Mar.	Apr. (P)	May (P)
1.3.13.6 Articles of Concrete, Cement and Plaster	0.292	129.2	128.9	131.7	132.8	133.2
1.3.13.7 Cutting, Shaping and Finishing of Stone	0.234	122.2	122.5	121.6	123.7	124.4
1.3.13.8 Other Non-Metallic Mineral Products	0.169	90.6	80.3	101.2	104.9	104.3
1.3.14 MANUFACTURE OF BASIC METALS	**9.646**	**140.1**	**133.5**	**157.5**	**160.5**	**158.7**
1.3.14.1 Inputs into steel making	1.411	150.8	138.2	177.6	181.4	174.7
1.3.14.2 Metallic Iron	0.653	147.7	141.8	172.0	178.4	174.3
1.3.14.3 Mild Steel - Semi Finished Steel	1.274	119.1	117.0	132.3	133.8	134.1
1.3.14.4 Mild Steel -Long Products	1.081	137.4	130.9	155.9	158.6	158.0
1.3.14.5 Mild Steel - Flat products	1.144	157.5	152.4	170.2	178.3	174.5
1.3.14.6 Alloy steel other than Stainless Steel- Shapes	0.067	133.7	129.2	152.5	155.2	154.8
1.3.14.7 Stainless Steel - Semi Finished	0.924	141.7	135.1	169.9	173.0	168.1
1.3.14.8 Pipes & tubes	0.205	155.9	146.4	171.9	172.7	179.1
1.3.14.9 Non-ferrous metals incl. precious metals	1.693	139.7	132.0	155.4	155.2	155.7
1.3.14.10 Castings	0.925	118.9	115.7	123.4	125.6	126.3
1.3.14.11 Forgings of steel	0.271	159.0	154.0	165.0	166.9	171.4
1.3.15 MANUFACTURE OF FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT	**3.155**	**130.5**	**126.5**	**135.3**	**137.8**	**139.7**
1.3.15.1 Structural Metal Products	1.031	123.9	122.6	127.2	130.3	131.5
1.3.15.2 Tanks, Reservoirs and Containers of Metal	0.660	156.2	149.5	163.4	166.8	170.3
1.3.15.3 Steam generators, Except Central Heating Hot Water Boilers	0.145	96.1	96.8	96.4	96.4	97.0
1.3.15.4 Forging, Pressing, Stamping and Roll-Forming of Metal; Powder Metallurgy	0.383	117.5	107.7	127.1	127.7	132.1
1.3.15.5 Cutlery, Hand Tools and General Hardware	0.208	108.2	106.9	108.5	111.7	112.2
1.3.15.6 Other Fabricated Metal Products	0.728	136.5	132.7	140.8	143.2	143.9
1.3.16 MANUFACTURE OF COMPUTER, ELECTRONIC AND OPTICAL PRODUCTS	**2.009**	**113.7**	**111.6**	**116.4**	**116.3**	**116.0**
1.3.16.1 Electronic Components	0.402	106.0	100.3	111.5	113.0	114.8
1.3.16.2 Computers and Peripheral Equipment	0.336	134.7	134.8	134.8	134.8	135.0
1.3.16.3 Communication Equipment	0.310	121.7	118.4	128.8	128.2	128.2
1.3.16.4 Consumer Electronics	0.641	102.1	101.5	102.0	101.2	98.6
1.3.16.5 Measuring, Testing, Navigating and Control equipment	0.181	108.4	107.0	112.2	111.2	112.7
1.3.16.6 Watches and Clocks	0.076	145.6	142.0	150.5	150.6	149.6
1.3.16.7 Irradiation, Electromedical and Electrotherapeutic equipment	0.055	106.1	106.0	107.4	107.9	109.6
1.3.16.8 Optical instruments and Photographic equipment	0.008	98.3	95.8	99.6	99.6	99.6
1.3.17 MANUFACTURE OF ELECTRICAL EQUIPMENT	**2.930**	**122.3**	**118.8**	**126.0**	**125.9**	**126.4**
1.3.17.1 Electric motors, Generators, Transformers and Electricity distribution and Control apparatus	1.298	119.7	116.2	122.2	121.6	121.3
1.3.17.2 Batteries and Accumulators	0.236	121.8	115.8	127.2	129.1	129.6
1.3.17.3 Fibre optic cables for data transmission or live transmission of images	0.133	103.1	101.6	109.4	102.7	108.0
1.3.17.4 Other electronic and Electric wires and Cables	0.428	140.7	134.7	150.3	151.5	151.9
1.3.17.5 Wiring devices, Electric lighting & display equipment	0.263	114.5	113.9	115.4	115.8	117.0
1.3.17.6 Domestic appliances	0.366	128.4	125.1	131.2	131.9	132.1
1.3.17.7 Other electrical equipment	0.206	113.2	111.1	113.4	113.1	114.9
1.3.18 MANUFACTURE OF MACHINERY AND EQUIPMENT	**4.789**	**120.0**	**117.3**	**122.7**	**123.7**	**124.4**
1.3.18.1 Engines and Turbines, Except aircraft, Vehicle and Two wheeler engines	0.638	119.2	114.3	123.5	125.5	125.8
1.3.18.2 Fluid power equipment	0.162	122.1	120.4	125.1	125.1	125.2
1.3.18.3 Other pumps, Compressors, Taps and Valves	0.552	115.1	115.0	115.8	116.4	117.2
1.3.18.4 Bearings, Gears, Gearing and Driving elements	0.340	118.1	113.4	119.2	120.3	120.0
1.3.18.5 Ovens, Furnaces and Furnace burners	0.008	74.2	72.3	76.5	77.3	78.1
1.3.18.6 Lifting and Handling equipment	0.285	120.0	116.5	124.4	125.3	125.4

No. 21: Wholesale Price Index (Concld.)

(Base: 2011-12 = 100)

Commodities	Weight	2021-22	2021	2022		
			May	Mar.	Apr. (P)	May (P)
1.3.18.7 Office machinery and Equipment	0.006	130.2	130.2	130.2	130.2	130.2
1.3.18.8 Other general-purpose machinery	0.437	133.4	131.6	134.3	138.9	145.3
1.3.18.9 Agricultural and Forestry machinery	0.833	128.4	124.4	132.8	133.3	133.9
1.3.18.10 Metal-forming machinery and Machine tools	0.224	114.2	109.6	118.0	117.7	118.0
1.3.18.11 Machinery for mining, Quarrying and Construction	0.371	78.2	77.0	80.0	80.5	80.4
1.3.18.12 Machinery for food, Beverage and Tobacco processing	0.228	130.1	128.4	130.7	131.0	129.7
1.3.18.13 Machinery for textile, Apparel and Leather production	0.192	125.3	126.2	129.1	127.9	128.3
1.3.18.14 Other special-purpose machinery	0.468	134.7	132.8	136.9	137.2	136.8
1.3.18.15 Renewable electricity generating equipment	0.046	66.6	66.5	67.6	67.6	68.3
1.3.19 MANUFACTURE OF MOTOR VEHICLES, TRAILERS AND SEMI-TRAILERS	**4.969**	**122.7**	**119.5**	**125.8**	**126.1**	**126.8**
1.3.19.1 Motor vehicles	2.600	122.6	119.6	125.1	125.1	125.1
1.3.19.2 Parts and Accessories for motor vehicles	2.368	122.7	119.4	126.5	127.2	128.8
1.3.20 MANUFACTURE OF OTHER TRANSPORT EQUIPMENT	**1.648**	**131.7**	**130.0**	**133.9**	**134.3**	**134.8**
1.3.20.1 Building of ships and Floating structures	0.117	158.9	158.9	159.0	159.1	159.1
1.3.20.2 Railway locomotives and Rolling stock	0.110	104.4	104.1	103.7	103.7	103.7
1.3.20.3 Motor cycles	1.302	131.0	129.0	133.7	134.2	134.8
1.3.20.4 Bicycles and Invalid carriages	0.117	137.2	135.9	139.1	139.2	139.9
1.3.20.5 Other transport equipment	0.002	135.9	133.5	142.1	143.5	146.5
1.3.21 MANUFACTURE OF FURNITURE	**0.727**	**150.1**	**146.3**	**157.3**	**158.7**	**159.4**
1.3.21.1 Furniture	0.727	150.1	146.3	157.3	158.7	159.4
1.3.22 OTHER MANUFACTURING	**1.064**	**137.9**	**139.7**	**146.6**	**147.8**	**144.3**
1.3.22.1 Jewellery and Related articles	0.996	136.0	138.1	145.0	146.4	142.5
1.3.22.2 Musical instruments	0.001	192.3	200.4	180.7	184.4	186.8
1.3.22.3 Sports goods	0.012	140.4	136.0	145.9	146.6	147.9
1.3.22.4 Games and Toys	0.005	150.9	148.5	154.8	158.1	156.1
1.3.22.5 Medical and Dental instruments and Supplies	0.049	171.8	170.7	177.8	176.4	175.7
2 FOOD INDEX	**24.378**	**163.8**	**158.8**	**168.2**	**172.9**	**176.1**

Source: Office of the Economic Adviser, Ministry of Commerce and Industry, Government of India.

No. 22: Index of Industrial Production (Base:2011-12=100)

Industry	Weight	2020-21	2021-22	April-April		April	
				2021-22	2022-23	2021	2022
	1	2	3	4	5	6	7
General Index	100.00	118.1	131.6	126.1	135.1	126.1	135.1
1 Sectoral Classification							
1.1 Mining	14.37	101.0	113.3	107.6	116.0	107.6	116.0
1.2 Manufacturing	77.63	117.2	131.0	124.6	132.5	124.6	132.5
1.3 Electricity	7.99	157.6	170.1	174.0	194.5	174.0	194.5
2 Use-Based Classification							
2.1 Primary Goods	34.05	118.1	129.5	126.5	139.3	126.5	139.3
2.2 Capital Goods	8.22	75.9	88.8	79.0	90.6	79.0	90.6
2.3 Intermediate Goods	17.22	124.7	143.9	139.6	150.2	139.6	150.2
2.4 Infrastructure/ Construction Goods	12.34	124.7	148.3	144.0	149.4	144.0	149.4
2.5 Consumer Durables	12.84	101.2	113.9	103.3	112.1	103.3	112.1
2.6 Consumer Non-Durables	15.33	142.1	146.8	140.0	140.4	140.0	140.4

Source : Central Statistics 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 - May			
	2022-23 (Budget Estimates)	2022-23 (Actuals)	2021-22 (Actuals)	Percentage to Budget Estimates	
				2022-23	2021-22
	1	2	3	4	5
1 Revenue Receipts	**2204422**	**356840**	**349977**	**16.2**	**19.6**
1.1 Tax Revenue (Net)	1934771	307589	233565	15.9	15.1
1.2 Non-Tax Revenue	269651	49251	116412	18.3	47.9
2 Non-Debt Capital Receipt	**79291**	**25013**	**4810**	**31.5**	**2.6**
2.1 Recovery of Loans	14291	966	815	6.8	6.3
2.2 Other Receipts	65000	24047	3995	37.0	2.3
3 Total Receipts (excluding borrowings) (1+2)	**2283713**	**381853**	**354787**	**16.7**	**18.0**
4 Revenue Expenditure	3194663	478700	415000	15.0	14.2
of which:					
4.1 Interest Payments	940651	105422	88573	11.2	10.9
5 Capital Expenditure	750246	107074	62961	14.3	11.4
6 Total Expenditure (4+5)	**3944909**	**585774**	**477961**	**14.8**	**13.7**
7 Revenue Deficit (4-1)	**990241**	**121860**	**65023**	**12.3**	**5.7**
8 Fiscal Deficit (6-3)	**1661196**	**203921**	**123174**	**12.3**	**8.2**
9 Gross Primary Deficit (8-4.1)	**720545**	**98499**	**34601**	**13.7**	**5.0**

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					
		May 28	Apr. 22	Apr. 29	May 6	May 13	May 20	May 27
	1	2	3	4	5	6	7	8
1 91-day								
1.1 Banks	5310	8922	5598	7549	8304	9890	9773	9431
1.2 Primary Dealers	16705	32090	18260	21356	28297	33187	38528	36013
1.3 State Governments	31320	34870	57950	53950	53200	53700	48200	53400
1.4 Others	72109	121465	89027	89280	87286	89079	91923	102756
2 182-day								
2.1 Banks	70130	116696	75966	79249	82618	83571	91859	92683
2.2 Primary Dealers	63669	48862	86252	90726	92548	97514	97841	101768
2.3 State Governments	15763	9839	19311	20311	21311	21311	22311	23811
2.4 Others	69259	71404	83245	83968	87980	90867	91222	95293
3 364-day								
3.1 Banks	112386	136542	104560	101687	105819	112201	113652	112051
3.2 Primary Dealers	160461	152729	160503	164687	164203	168821	174768	179691
3.3 State Governments	22836	18725	26164	26514	25689	26369	26369	26369
3.4 Others	118392	109770	142378	141150	139319	130152	125139	123857
4 14-day Intermediate								
4.1 Banks								
4.2 Primary Dealers								
4.3 State Governments	289362	158373	197634	183862	129526	141401	147252	141999
4.4 Others	659	657	1460	899	685	1296	1025	862
Total Treasury Bills (Excluding 14 day Intermediate T Bills) #	758339	861914	869214	880427	896575	916662	931585	957123

14D intermediate T-Bills are non-marketable unlike 91D, 182D and 364D T-Bills. These bills are 'intermediate' by nature as these are liquidated to replenish shortfall in the daily minimum cash balances of State Governments

No. 25: Auctions of Treasury Bills

(Amount in ₹ Crore)

Date of Auction	Notified Amount	Bids Received			Bids Accepted			Total Issue (6+7)	Cut-off Price	Implicit Yield at Cut-off Price (per cent)
		Number	Total Face Value		Number	Total Face Value				
			Competitive	Non-Competitive		Competitive	Non-Competitive			
	1	2	3	4	5	6	7	8	9	10
91-day Treasury Bills										
2022-23										
Apr. 27	13000	121	38007	2512	45	12998	2512	15510	99.02	3.9799
May 4	13000	87	30565	3152	46	12998	3152	16150	99.01	4.0290
May 11	13000	85	24114	1303	69	12997	1303	14300	98.78	4.9538
May 18	13000	162	42401	2997	56	12853	2997	15850	98.79	4.9127
May 25	13000	152	48263	8255	45	12995	8255	21250	98.80	4.8869
182-day Treasury Bills										
2022-23										
Apr. 27	12000	186	38808	1000	58	12000	1000	13000	97.85	4.3999
May 4	12000	131	27847	1000	64	12000	1000	13000	97.84	4.4325
May 11	12000	153	22362	2	124	11998	2	12000	97.35	5.4592
May 18	12000	161	35730	1022	40	11978	1022	13000	97.36	5.4300
May 25	12000	123	26336	2203	68	11997	2203	14200	97.36	5.4294
364-day Treasury Bills										
2022-23										
Apr. 27	8000	160	27141	350	61	8000	350	8350	95.42	4.8102
May 4	8000	141	22183	0	53	8000	0	8000	95.40	4.8351
May 11	8000	181	17932	681	120	7999	681	8680	94.42	5.9249
May 18	8000	181	22548	1	82	7999	1	8000	94.43	5.9200
May 25	8000	166	20465	2	83	7998	2	8000	94.43	5.9100

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
May 2, 2022	2.30-3.90	3.64
May 4, 2022	2.30-4.40	3.67
May 5, 2022	2.30-4.35	4.05
May 6, 2022	2.30-4.30	4.07
May 7, 2022	3.20-4.50	3.64
May 9, 2022	2.30-4.30	4.04
May 10, 2022	2.30-4.35	4.08
May 11, 2022	2.30-4.35	4.04
May 12, 2022	2.30-4.30	4.05
May 13, 2022	2.00-4.30	4.08
May 17, 2022	2.30-4.35	4.06
May 18, 2022	2.30-4.35	4.04
May 19, 2022	2.30-4.35	4.00
May 20, 2022	2.30-4.70	4.10
May 21, 2022	3.30-4.40	3.80
May 23, 2022	2.30-4.35	4.12
May 24, 2022	2.40-4.30	4.07
May 25, 2022	2.30-4.35	4.10
May 26, 2022	2.30-4.40	4.08
May 27, 2022	2.35-4.35	4.09
May 30, 2022	2.00-4.30	4.10
May 31, 2022	2.40-4.30	4.09
June 1, 2022	2.35-4.50	4.13
June 2, 2022	2.35-4.45	4.07
June 3, 2022	2.35-4.55	4.10
June 4, 2022	3.25-4.25	3.87
June 6, 2022	2.35-4.50	4.15
June 7, 2022	2.35-4.45	4.11
June 8, 2022	2.35-4.95	4.36
June 9, 2022	2.35-4.80	4.60
June 10, 2022	2.35-4.80	4.54
June 13, 2022	3.30-4.80	4.54
June 14, 2022	2.30-4.80	4.55
June 15, 2022	3.30-4.80	4.53

Note: Includes Notice Money.

No. 27: Certificates of Deposit

Item	2021	2022			
	May 21	Apr. 8	Apr. 22	May 6	May 20
	1	2	3	4	5
1 Amount Outstanding (₹ Crore)	90349.28	202431.31	201427.56	185308.10	193034.11
1.1 Issued during the fortnight (₹ Crore)	5836.60	22347.23	5160.29	5508.80	26309.36
2 Rate of Interest (per cent)	3.43-4.01	3.85-5.50	4.38-5.75	4.04-5.83	4.88-5.76

No. 28: Commercial Paper

Item	2021	2022			
	May 31	Apr. 15	Apr. 30	May 15	May 31
	1	2	3	4	5
1 Amount Outstanding (₹ Crore)	388707.25	351642.10	364999.65	384417.40	384544.00
1.1 Reported during the fortnight (₹ Crore)	61593.90	43499.30	64930.35	44342.95	72437.60
2 Rate of Interest (per cent)	3.36-12.87	3.70-12.11	3.77-13.41	3.91-10.59	4.48-12.31

No. 29: Average Daily Turnover in Select Financial Markets

(₹ Crore)

Item	2021-22	2021	2022					
		May 28	Apr. 22	Apr. 29	May 6	May 13	May 20	May 27
	1	2	3	4	5	6	7	8
1 Call Money	14515	16285	15449	16222	13403	17680	15625	17938
2 Notice Money	2122	5913	550	4541	4780	355	6143	591
3 Term Money	515	807	813	286	491	611	382	338
4 Triparty Repo	618526	526894	652229	721457	514132	562908	809662	664721
5 Market Repo	383844	458253	384865	481888	429633	445312	447105	367359
6 Repo in Corporate Bond	4373	12063	312	241	385	4003	1364	384
7 Forex (US $ million)	67793	88420	90269	112085	97320	89585	80148	76519
8 Govt. of India Dated Securities	51300	52981	86405	82491	74130	76717	57396	66154
9 State Govt. Securities	5570	4165	18742	7136	6520	5252	3119	4540
10 Treasury Bills								
10.1 91-Day	4690	8193	5249	3490	2565	3605	5268	7611
10.2 182-Day	3440	4315	6972	5341	4025	3420	3696	2874
10.3 364-Day	3530	2314	2675	3538	2535	5505	5394	2914
10.4 Cash Management Bills								
11 Total Govt. Securities (8+9+10)	68530	71968	120044	101995	89775	94499	74874	84094
11.1 RBI	–	1014	66	376	425	1704	328	810

No. 30: New Capital Issues By Non-Government Public Limited Companies

(Amount in ₹ Crore)

Security & Type of Issue	2021-22		2021-22 (Apr.-May)		2022-23 (Apr.-May) *		May 2021		May 2022 *	
	No. of Issues	Amount	No. of Issues	Amount	No. of Issues	Amount	No. of Issues	Amount	No. of Issues	Amount
	1	2	3	4	5	6	7	8	9	10
1 Equity Shares	**164**	**138894**	**12**	**3314**	**33**	**16829**	**2**	**26**	**18**	**11872**
1A Premium	154	136893	11	3227	31	16146	2	24	17	11280
1.1 Public	121	112567	8	3010	23	15759	1	1	13	10940
1.1.1 Premium	119	111314	8	2940	22	15247	1	1	12	10487
1.2 Rights	43	26327	4	305	10	1070	1	25	5	932
1.2.1 Premium	35	25580	3	287	9	898	1	24	5	793
2 Preference Shares	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
2.1 Public	–	–	–	–	–	–	–	–	–	–
2.2 Rights	–	–	–	–	–	–	–	–	–	–
3 Bonds & Debentures	**28**	**11589**	**6**	**3581**	**8**	**1682**	**–**	**–**	**2**	**339**
3.1 Convertible	–	–	–	–	–	–	–	–	–	–
3.1.1 Public	–	–	–	–	–	–	–	–	–	–
3.1.2 Rights	–	–	–	–	–	–	–	–	–	–
3.2 Non-Convertible	28	11589	6	3581	8	1682	–	–	2	339
3.2.1 Public	28	11589	6	3581	8	1682	–	–	2	339
3.2.2 Rights	–	–	–	–	–	–	–	–	–	–
4 Total(1+2+3)	**192**	**150484**	**18**	**6895**	**41**	**18511**	**2**	**26**	**20**	**12211**
4.1 Public	149	124157	14	6591	31	17442	1	1	15	11279
4.2 Rights	43	26327	4	305	10	1070	1	25	5	932

Note : 1.Since April 2020, monthly data on equity issues is compiled on the basis of their listing date.
2.Figures in the columns might not add up to the total due to rounding of numbers.

Source : Securities and Exchange Board of India.

* : Data is Provisional

External Sector

No. 31: Foreign Trade

Item	Unit	2021-22	2021	2022				
			May	Jan.	Feb.	Mar.	Apr.	May
		1	2	3	4	5	6	7
1 Exports	₹ Crore	3146186	236648	262178	278585	339207	302975	301058
	US $ Million	421894	32299	35219	37143	44489	39784	38937
1.1 Oil	₹ Crore	503820	38929	34090	51733	74744	59949	66090
	US $ Million	67468	5313	4579	6897	9803	7878	8548
1.2 Non-oil	₹ Crore	2642366	197719	228087	226852	264462	243026	234969
	US $ Million	354427	26986	30640	30246	34686	31906	30389
2 Imports	₹ Crore	4569443	284484	390724	418745	480163	458435	488833
	US $ Million	612608	38828	52487	55830	62977	60187	63223
2.1 Oil	₹ Crore	1207782	69377	91971	118171	161199	153259	148421
	US $ Million	161808	9469	12355	15755	21142	20121	19196
2.2 Non-oil	₹ Crore	3361660	215108	298754	300574	318964	305176	340412
	US $ Million	450800	29359	40133	40075	41834	40066	44027
3 Trade Balance	₹ Crore	-1423256	-47836	-128547	-140159	-140957	-155459	-187774
	US $ Million	-190713	-6529	-17268	-18687	-18487	-20403	-24286
3.1 Oil	₹ Crore	-703962	-30448	-57880	-66438	-86454	-93310	-82331
	US $ Million	-94340	-4156	-7775	-8858	-11339	-12243	-10648
3.2 Non-oil	₹ Crore	-719294	-17389	-70666	-73721	-54502	-62150	-105443
	US $ Million	-96373	-2373	-9493	-9829	-7148	-8160	-13637

Source: DGCI&S and Ministry of Commerce & Industry.

No. 32: Foreign Exchange Reserves

Item	Unit	2021	2022					
		Jun. 25	May 20	May 27	Jun. 3	Jun. 10	Jun. 17	Jun. 24
		1	2	3	4	5	6	7
1 Total Reserves	**₹ Crore**	**4519253**	**4638067**	**4665848**	**4664693**	**4644598**	**4611925**	**4647773**
	US $ Million	**608999**	**597509**	**601363**	**601057**	**596458**	**590588**	**593323**
1.1 Foreign Currency Assets	₹ Crore	4201958	4140278	4166344	4165848	4144578	4114439	4145595
	US $ Million	566240	533378	536988	536779	532244	526882	529216
1.2 Gold	₹ Crore	269344	316885	317466	316976	318036	316922	320594
	US $ Million	36296	40823	40917	40843	40842	40584	40926
	Volume (Metric Tonnes)	702.78	765.09	765.09	765.09	765.09	767.89	767.89
1.3 SDRs	SDRs Million	1049	13657	13657	13657	13657	13657	13657
	₹ Crore	11119	142099	143058	142877	143183	141773	142649
	US $ Million	1498	18306	18438	18410	18388	18155	18210
1.4 Reserve Tranche Position in IMF	₹ Crore	36832	38806	38980	38991	38801	38791	38934
	US $ Million	4965	5002	5019	5025	4985	4968	4970

* Difference,if any, is due to rounding off.

No. 33: Non-Resident Deposits

(US$ Million)

Scheme	Outstanding				Flows	
	2021-22	2021	2022		2021-22	2022-23
		May	Apr.	May	Apr.-May	Apr.-May
	1	2	3	4	5	6
1 NRI Deposits	**139,022**	**144,288**	**139,202**	**137,089**	**2,427**	**422**
1.1 FCNR(B)	16,918	19,876	16,135	15,910	–597	–1,008
1.2 NR(E)RA	100,801	105,245	101,559	99,928	2,691	1,070
1.3 NRO	21,303	19,166	21,508	21,250	333	360

No. 34: Foreign Investment Inflows

(US$ Million)

Item	2021-22	2021-22	2022-23	2021	2022	
		Apr.-May	Apr.-May	May	Apr.	May
	1	2	3	4	5	6
1.1 Net Foreign Direct Investment (1.1.1–1.1.2)	**38,587**	**11,200**	**9,881**	**8,802**	**4,962**	**4,919**
1.1.1 Direct Investment to India (1.1.1.1–1. 1.1.2)	**56,231**	**14,682**	**11,397**	**10,352**	**5,835**	**5,562**
1.1.1.1 Gross Inflows/Gross Investments	**84,835**	**18,622**	**16,445**	**12,322**	**8,375**	**8,070**
1.1.1.1.1 Equity	59,684	15,039	12,748	10,531	6,528	6,220
1.1.1.1.1.1 Government (SIA/FIPB)	1,698	72	266	69	63	203
1.1.1.1.1.2 RBI	42,932	8,521	10,120	4,318	5,839	4,281
1.1.1.1.1.3 Acquisition of shares	14,143	6,309	2,225	6,076	558	1,667
1.1.1.1.1.4 Equity capital of unincorporated bodies	910	137	137	69	69	69
1.1.1.1.2 Reinvested earnings	19,347	2,918	2,918	1,459	1,459	1,459
1.1.1.1.3 Other capital	5,805	665	778	332	388	390
1.1.1.2 Repatriation/Disinvestment	**28,605**	**3,940**	**5,048**	**1,970**	**2,540**	**2,508**
1.1.1.2.1 Equity	27,189	3,879	4,737	1,939	2,450	2,288
1.1.1.2.2 Other capital	1,416	61	310	31	91	220
1.1.2 Foreign Direct Investment by India (1.1.2.1+1.1.2.2+1.1.2.3–1.1.2.4)	**17,644**	**3,482**	**1,516**	**1,551**	**873**	**643**
1.1.2.1 Equity capital	10,061	1,866	640	1,188	336	303
1.1.2.2 Reinvested Earnings	3,379	563	563	282	282	282
1.1.2.3 Other Capital	7,604	1,415	677	261	459	217
1.1.2.4 Repatriation/Disinvestment	3,400	361	363	181	204	159
1.2 Net Portfolio Investment (1.2.1+1.2.2+1.2.3–1.2.4)	**–16,777**	**–850**	**–8,369**	**966**	**–4,160**	**–4,209**
1.2.1 GDRs/ADRs	–	–	–	–	–	–
1.2.2 FIIs	–14,071	–866	–8,529	958	–4,071	–4,458
1.2.3 Offshore funds and others	–	–	–	–	–	–
1.2.4 Portfolio investment by India	2,706	–16	–160	–8	89	–249
1 Foreign Investment Inflows	**21,809**	**10,350**	**1,512**	**9,768**	**801**	**711**

No. 35: Outward Remittances under the Liberalised Remittance Scheme (LRS) for Resident Individuals

(US$ Million)

Item	2021-22	2021	2022		
		May	Mar.	Apr.	May
	1	2	3	4	5
1 Outward Remittances under the LRS	**19610.77**	**1250.24**	**1968.77**	**2023.70**	**2039.26**
1.1 Deposit	830.05	68.20	182.61	113.90	79.46
1.2 Purchase of immovable property	112.90	7.85	16.35	14.09	11.76
1.3 Investment in equity/debt	746.57	52.19	104.51	76.24	82.47
1.4 Gift	2336.29	149.38	276.19	299.20	248.69
1.5 Donations	16.55	1.95	0.65	0.85	1.01
1.6 Travel	6909.04	294.02	776.64	880.78	994.82
1.7 Maintenance of close relatives	3302.37	237.27	391.02	385.57	336.96
1.8 Medical Treatment	37.79	2.57	4.21	4.51	4.43
1.9 Studies Abroad	5165.33	429.73	202.25	232.95	264.61
1.10 Others	153.88	7.07	14.33	15.59	15.04

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	
			June	May	June
	1	2	3	4	5
40-Currency Basket (Base: 2015-16=100)					
1 Trade-weighted					
1.1 NEER	93.92	93.13	93.03	93.35	92.58
1.2 REER	103.46	104.66	104.74	104.78	104.18
2 Export-weighted					
2.1 NEER	93.59	93.55	93.22	94.46	93.92
2.2 REER	102.96	103.48	103.52	103.44	102.93
6-Currency Basket (Trade-weighted)					
1 Base: 2015-16 = 100					
1.1 NEER	88.45	87.03	87.09	88.04	87.40
1.2 REER	101.84	102.27	102.05	104.20	103.77
2 Base: 2020-21 = 100					
2.1 NEER	100.00	98.39	98.45	99.53	98.80
2.2 REER	100.00	100.42	100.21	102.32	101.90

No. 37: External Commercial Borrowings (ECBs) – Registrations

(Amount in US$ Million)

Item	2021-22	2021	2022	
		May	Apr	May
	1	2	3	4
1 Automatic Route				
1.1 Number	1086	60	65	95
1.2 Amount	28851	738	362	1416
2 Approval Route				
2.1 Number	18	0	0	1
2.2 Amount	11035	0	0	100
3 Total (1+2)				
3.1 Number	1104	60	65	96
3.2 Amount	39886	738	362	1516
4 Weighted Average Maturity (in years)	8.00	6.41	5.30	5.80
5 Interest Rate (per cent)				
5.1 Weighted Average Margin over 6-month LIBOR or reference rate for Floating Rate Loans	1.71	1.86	1.63	2.52
5.2 Interest rate range for Fixed Rate Loans	0.00-10.50	0.00-8.80	0.00-11.80	0.00-10.50
Borrower Category				
I. Corporate Manufacturing	12244	141	174	712
II. Corporate-Infrastructure	17023	355	56	456
a.) Transport	1597	110	50	0
b.) Energy	8215	145	5	54
c.) Water and Sanitation	10	0	0	10
d.) Communication	1,258	0	0	0
e.) Social and Commercial Infrastructure	0	0	0	100
f.) Exploration,Mining and Refinery	4691	100	0	16
g.) Other Sub-Sectors	1252	0	1	276
III. Corporate Service-Sector	1570	231	113	129
IV. Other Entities	609	0	0	0
a.) units in SEZ	9	0	1	0
b.) SIDBI				
c.) Exim Bank	600	0	0	0
V. Banks	100	0	0	0
VI. Financial Institution (Other than NBFC)	4	0	0	0
VII. NBFCs	7995	0	8	210
a). NBFC- IFC/AFC	5621	0	0	100
b). NBFC-MFI	93	0	8	0
c). NBFC-Others	2282	0	0	110
VIII. Non-Government Organization (NGO)	0	0	0	0
IX. Micro Finance Institution (MFI)	0	0	0	0
X. Others	341	11	10	9

No. 38: India's Overall Balance of Payments

(US$ Million)

Item	Jan-Mar 2021			Jan-Mar 2022(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
Overall Balance of Payments(1+2+3)	**336072**	**332683**	**3389**	**384903**	**400927**	**-16024**
1 CURRENT ACCOUNT (1.1+ 1.2)	**173382**	**181543**	**-8161**	**218823**	**232247**	**-13424**
1.1 MERCHANDISE	**91281**	**133025**	**-41745**	**118020**	**172503**	**-54483**
1.2 INVISIBLES (1.2.1+1.2.2+1.2.3)	**82101**	**48518**	**33583**	**100803**	**59744**	**41059**
1.2.1 Services	56004	32520	23485	69876	41557	28319
1.2.1.1 Travel	2308	3141	-834	2757	5133	-2376
1.2.1.2 Transportation	6080	5633	446	9398	11002	-1604
1.2.1.3 Insurance	647	566	82	904	428	476
1.2.1.4 G.n.i.e.	159	241	-82	160	271	-111
1.2.1.5 Miscellaneous	46811	22938	23873	56657	24723	31934
1.2.1.5.1 Software Services	26802	3327	23475	32786	3520	29266
1.2.1.5.2 Business Services	13324	12847	478	16835	13867	2968
1.2.1.5.3 Financial Services	1258	1402	-145	1615	1504	111
1.2.1.5.4 Communication Services	696	399	297	763	269	494
1.2.2 Transfers	20927	2085	18842	23723	2591	21132
1.2.2.1 Official	18	285	-267	21	239	-218
1.2.2.2 Private	20909	1801	19108	23702	2353	21350
1.2.3 Income	5170	13913	-8743	7204	15596	-8392
1.2.3.1 Investment Income	3517	13192	-9675	5589	14792	-9202
1.2.3.2 Compensation of Employees	1653	721	932	1614	804	810
2 CAPITAL ACCOUNT (2.1+2.2+2.3+2.4+2.5)	**162690**	**150429**	**12261**	**166081**	**167787**	**-1707**
2.1 Foreign Investment (2.1.1+2.1.2)	**108195**	**98236**	**9959**	**95111**	**96550**	**-1439**
2.1.1 Foreign Direct Investment	15393	12714	2679	24396	10620	13777
2.1.1.1 In India	13679	7928	5750	23281	6028	17253
2.1.1.1.1 Equity	8553	7894	659	15845	5177	10669
2.1.1.1.2 Reinvested Earnings	4519		4519	5229		5229
2.1.1.1.3 Other Capital	607	34	573	2207	851	1356
2.1.1.2 Abroad	1714	4786	-3072	1115	4592	-3477
2.1.1.2.1 Equity	1714	1197	517	1115	2132	-1017
2.1.1.2.2 Reinvested Earnings	0	753	-753	0	845	-845
2.1.1.2.3 Other Capital	0	2835	-2835	0	1615	-1615
2.1.2 Portfolio Investment	92802	85522	7280	70715	85930	-15215
2.1.2.1 In India	92500	84310	8190	70254	84543	-14289
2.1.2.1.1 FIIs	92500	84310	8190	70254	84543	-14289
2.1.2.1.1.1 Equity	81440	73679	7761	62553	75636	-13083
2.1.2.1.1.2 Debt	11059	10631	428	7701	8907	-1206
2.1.2.1.2 ADR/GDRs	0	0	0	0		0
2.1.2.2 Abroad	303	1212	-909	461	1387	-926
2.2 Loans (2.2.1+2.2.2+2.2.3)	**26446**	**18725**	**7721**	**33737**	**20826**	**12911**
2.2.1 External Assistance	5380	1387	3993	3988	1331	2657
2.2.1.1 By India	10	21	-11	13	16	-3
2.2.1.2 To India	5370	1366	4004	3976	1315	2661
2.2.2 Commercial Borrowings	11834	5759	6075	11346	7913	3433
2.2.2.1 By India	683	745	-63	514	373	141
2.2.2.2 To India	11152	5014	6138	10832	7540	3292
2.2.3 Short Term to India	9232	11578	-2346	18403	11582	6821
2.2.3.1 Buyers' credit & Suppliers' Credit >180 days	8067	11578	-3511	14571	11582	2988
2.2.3.2 Suppliers' Credit up to 180 days	1165	0	1165	3833	0	3833
2.3 Banking Capital (2.3.1+2.3.2)	**16733**	**21158**	**-4425**	**27241**	**33202**	**-5961**
2.3.1 Commercial Banks	16518	21158	-4640	27195	32602	-5407
2.3.1.1 Assets	4141	7973	-3832	13120	17970	-4850
2.3.1.2 Liabilities	12377	13185	-808	14075	14632	-557
2.3.1.2.1 Non-Resident Deposits	11350	11889	-539	13468	13309	159
2.3.2 Others	215	0	215	46	600	-554
2.4 Rupee Debt Service		7	-7	0	12	-12
2.5 Other Capital	11315	12302	-987	9991	17196	-7205
3 Errors & Omissions		**711**	**-711**	0	**893**	**-893**
4 Monetary Movements (4.1+ 4.2)	0	**3389**	**-3389**	**16024**	0	**16024**
4.1 I.M.F.	0	0	0	0	0	0
4.2 Foreign Exchange Reserves (Increase - / Decrease +)	0	3389	-3389	16024	0	16024

Note : P : Preliminary

No. 39: India's Overall Balance of Payments

(₹ Crore)

Item	Jan-Mar 2021			Jan-Mar 2022(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
Overall Balance of Payments(1+2+3)	**2449502**	**2424800**	**24702**	**2895618**	**3016163**	**-120545**
1 CURRENT ACCOUNT (1.1+ 1.2)	**1263718**	**1323202**	**-59484**	**1646199**	**1747190**	**-100991**
1.1 MERCHANDISE	**665312**	**969572**	**-304260**	**887863**	**1297738**	**-409875**
1.2 INVISIBLES (1.2.1+1.2.2+1.2.3)	**598406**	**353629**	**244776**	**758336**	**449452**	**308883**
1.2.1 Services	408194	237025	171170	525672	312631	213042
1.2.1.1 Travel	16819	22896	-6077	20740	38617	-17877
1.2.1.2 Transportation	44312	41058	3254	70702	82770	-12068
1.2.1.3 Insurance	4719	4125	594	6801	3218	3583
1.2.1.4 G.n.i.e.	1158	1759	-601	1201	2035	-834
1.2.1.5 Miscellaneous	341186	167187	173999	426228	185990	240238
1.2.1.5.1 Software Services	195350	24250	171099	246649	26481	220167
1.2.1.5.2 Business Services	97117	93634	3484	126651	104321	22330
1.2.1.5.3 Financial Services	9166	10220	-1054	12147	11313	834
1.2.1.5.4 Communication Services	5073	2905	2168	5742	2024	3718
1.2.2 Transfers	152529	15199	137330	178471	19496	158975
1.2.2.1 Official	129	2074	-1945	158	1796	-1638
1.2.2.2 Private	152400	13125	139275	178313	17700	160613
1.2.3 Income	37682	101406	-63724	54193	117326	-63133
1.2.3.1 Investment Income	25637	96153	-70517	42047	111277	-69230
1.2.3.2 Compensation of Employees	12045	5252	6793	12145	6049	6096
2 CAPITAL ACCOUNT (2.1+2.2+2.3+2.4+2.5)	**1185784**	**1096418**	**89366**	**1249419**	**1262257**	**-12838**
2.1 Foreign Investment (2.1.1+2.1.2)	**788594**	**716008**	**72586**	**715520**	**726343**	**-10823**
2.1.1 Foreign Direct Investment	112193	92670	19523	183534	79893	103640
2.1.1.1 In India	99699	57788	41911	175144	45346	129797
2.1.1.1.1 Equity	62338	57537	4801	119205	38945	80260
2.1.1.1.2 Reinvested Earnings	32935	0	32935	39334	0	39334
2.1.1.1.3 Other Capital	4427	251	4176	16605	6401	10203
2.1.1.2 Abroad	12493	34882	-22389	8390	34547	-26157
2.1.1.2.1 Equity	12493	8726	3767	8390	16040	-7650
2.1.1.2.2 Reinvested Earnings	0	5490	-5490	0	6355	-6355
2.1.1.2.3 Other Capital	0	20666	-20666	0	12153	-12153
2.1.2 Portfolio Investment	676402	623338	53063	531986	646450	-114463
2.1.2.1 In India	674196	614505	59691	528521	636017	-107496
2.1.2.1.1 FIIs	674196	614505	59691	528521	636017	-107496
2.1.2.1.1.1 Equity	593588	537019	56569	470586	569008	-98422
2.1.2.1.1.2 Debt	80608	77487	3122	57935	67009	-9074
2.1.2.1.2 ADR/GDRs	0	0	0	0	0	0
2.1.2.2 Abroad	2206	8833	-6628	3465	10433	-6968
2.2 Loans (2.2.1+2.2.2+2.2.3)	**192758**	**136479**	**56279**	**253804**	**156675**	**97128**
2.2.1 External Assistance	39212	10111	29101	30003	10013	19989
2.2.1.1 By India	71	153	-82	95	120	-26
2.2.1.2 To India	39141	9958	29183	29908	9893	20015
2.2.2 Commercial Borrowings	86255	41978	44276	85354	59528	25826
2.2.2.1 By India	4975	5433	-459	3867	2804	1062
2.2.2.2 To India	81280	36545	44735	81487	56723	24764
2.2.3 Short Term to India	67291	84390	-17099	138447	87134	51313
2.2.3.1 Buyers' credit & Suppliers' Credit >180 days	58799	84390	-25591	109614	87134	22479
2.2.3.2 Suppliers' Credit up to 180 days	8492	0	8492	28833	0	28833
2.3 Banking Capital (2.3.1+2.3.2)	**121962**	**154215**	**-32253**	**204931**	**249778**	**-44847**
2.3.1 Commercial Banks	120397	154215	-33818	204584	245264	-40680
2.3.1.1 Assets	30186	58112	-27927	98701	135191	-36490
2.3.1.2 Liabilities	90211	96103	-5892	105884	110073	-4190
2.3.1.2.1 Non-Resident Deposits	82726	86651	-3925	101318	100121	1197
2.3.2 Others	1565	0	1565	347	4514	-4167
2.4 Rupee Debt Service	0	50	-50	0	93	-93
2.5 Other Capital	82471	89666	-7196	75165	129368	-54203
3 Errors & Omissions	0	**5180**	**-5180**	0	**6716**	**-6716**
4 Monetary Movements (4.1+ 4.2)	0	**24702**	**-24702**	**120545**	0	**120545**
4.1 I.M.F.	0	0	0	0	0	0
4.2 Foreign Exchange Reserves (Increase - / Decrease +)	0	24702	-24702	120545	0	120545

Note : P: Preliminary

No. 40: Standard Presentation of BoP in India as per BPM6

(US$ Million)

Item	Jan-Mar 2021			Jan-Mar 2022(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
1 Current Account (1.A+1.B+1.C)	**173382**	**181517**	**-8135**	**218822**	**232225**	**-13404**
1.A Goods and Services (1.A.a+1.A.b)	**147285**	**165545**	**-18260**	**187896**	**214060**	**-26164**
1.A.a Goods (1.A.a.1 to 1.A.a.3)	**91281**	**133025**	**-41745**	**118020**	**172503**	**-54483**
1.A.a.1 General merchandise on a BOP basis	89691	115206	-25515	118046	164299	-46253
1.A.a.2 Net exports of goods under merchanting	1590	0	1590	-26	0	-26
1.A.a.3 Nonmonetary gold		17819	-17819		8204	-8204
1.A.b Services (1.A.b.1 to 1.A.b.13)	**56004**	**32520**	**23485**	**69876**	**41557**	**28319**
1.A.b.1 Manufacturing services on physical inputs owned by others	102	6	96	214	24	190
1.A.b.2 Maintenance and repair services n.i.e.	54	211	-157	44	440	-397
1.A.b.3 Transport	6080	5633	446	9398	11002	-1604
1.A.b.4 Travel	2308	3141	-834	2757	5133	-2376
1.A.b.5 Construction	752	713	39	596	720	-124
1.A.b.6 Insurance and pension services	647	566	82	904	428	476
1.A.b.7 Financial services	1258	1402	-145	1615	1504	111
1.A.b.8 Charges for the use of intellectual property n.i.e.	238	2107	-1868	193	2518	-2325
1.A.b.9 Telecommunications, computer, and information services	27574	3909	23665	33629	4009	29620
1.A.b.10 Other business services	13324	12847	478	16835	13867	2968
1.A.b.11 Personal, cultural, and recreational services	727	878	-150	970	1224	-253
1.A.b.12 Government goods and services n.i.e.	159	241	-82	160	271	-111
1.A.b.13 Others n.i.e.	2781	865	1916	2560	416	2145
1.B Primary Income (1.B.1 to 1.B.3)	**5170**	**13913**	**-8743**	**7204**	**15596**	**-8392**
1.B.1 Compensation of employees	1653	721	932	1614	804	810
1.B.2 Investment income	2621	12952	-10331	4303	13417	-9113
1.B.2.1 Direct investment	1363	7837	-6474	3206	8193	-4987
1.B.2.2 Portfolio investment	28	1633	-1605	80	1591	-1511
1.B.2.3 Other investment	122	3481	-3359	96	3629	-3533
1.B.2.4 Reserve assets	1109	1	1107	922	4	918
1.B.3 Other primary income	896	240	656	1286	1375	-89
1.C Secondary Income (1.C.1+1.C.2)	**20927**	**2058**	**18868**	**23722**	**2570**	**21153**
1.C.1 Financial corporations, nonfinancial corporations, households, and NPISHs	20909	1801	19108	23702	2353	21350
1.C.1.1 Personal transfers (Current transfers between resident and/ non-resident households)	20224	1303	18920	22943	1677	21267
1.C.1.2 Other current transfers	686	497	188	759	676	83
1.C.2 General government	17	258	-240	20	217	-197
2 Capital Account (2.1+2.2)	**191**	**230**	**-38**	**244**	**173**	**71**
2.1 Gross acquisitions (DR.)/disposals (CR.) of non-produced nonfinancial assets	87	38	49	117	29	88
2.2 Capital transfers	104	191	-88	127	144	-17
3 Financial Account (3.1 to 3.5)	**162499**	**153615**	**8884**	**181861**	**167636**	**14226**
3.1 Direct Investment (3.1A+3.1B)	**15393**	**12714**	**2679**	**24396**	**10620**	**13777**
3.1.A Direct Investment in India	13679	7928	5750	23281	6028	17253
3.1.A.1 Equity and investment fund shares	13071	7894	5177	21074	5177	15897
3.1.A.1.1 Equity other than reinvestment of earnings	8553	7894	659	15845	5177	10669
3.1.A.1.2 Reinvestment of earnings	4519		4519	5229		5229
3.1.A.2 Debt instruments	607	34	573	2207	851	1356
3.1.A.2.1 Direct investor in direct investment enterprises	607	34	573	2207	851	1356
3.1.B Direct Investment by India	1714	4786	-3072	1115	4592	-3477
3.1.B.1 Equity and investment fund shares	1714	1950	-236	1115	2977	-1862
3.1.B.1.1 Equity other than reinvestment of earnings	1714	1197	517	1115	2132	-1017
3.1.B.1.2 Reinvestment of earnings		753	-753		845	-845
3.1.B.2 Debt instruments	0	2835	-2835	0	1615	-1615
3.1.B.2.1 Direct investor in direct investment enterprises		2835	-2835		1615	-1615
3.2 Portfolio Investment	**92802**	**85522**	**7280**	**70715**	**85930**	**-15215**
3.2.A Portfolio Investment in India	92500	84310	8190	70254	84543	-14289
3.2.1 Equity and investment fund shares	81440	73679	7761	62553	75636	-13083
3.2.2 Debt securities	11059	10631	428	7701	8907	-1206
3.2.B Portfolio Investment by India	303	1212	-909	461	1387	-926
3.3 Financial derivatives (other than reserves) and employee stock options	**2662**	**4929**	**-2267**	**4629**	**7403**	**-2774**
3.4 Other investment	**51642**	**47061**	**4581**	**66098**	**63683**	**2415**
3.4.1 Other equity (ADRs/GDRs)	0	0	0	0	0	0
3.4.2 Currency and deposits	11565	11889	-324	13514	13909	-395
3.4.2.1 Central bank (Rupee Debt Movements; NRG)	215	0	215	46	600	-554
3.4.2.2 Deposit-taking corporations, except the central bank (NRI Deposits)	11350	11889	-539	13468	13309	159
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)	22382	16416	5966	29061	28537	524
3.4.3.A Loans to India	21690	15650	6040	28534	28148	386
3.4.3.B Loans by India	692	766	-74	527	389	138
3.4.4 Insurance, pension, and standardized guarantee schemes	27	43	-16	40	17	22
3.4.5 Trade credit and advances	9232	11578	-2346	18403	11582	6821
3.4.6 Other accounts receivable/payable - other	8435	7134	1301	5080	9637	-4557
3.4.7 Special drawing rights			0			0
3.5 Reserve assets	0	**3389**	**-3389**	**16024**	0	**16024**
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	3389	-3389	16024	0	16024
4 Total assets/liabilities	**162499**	**153615**	**8884**	**181861**	**167636**	**14226**
4.1 Equity and investment fund shares	99217	89707	9510	89872	92596	-2725
4.2 Debt instruments	54846	53384	1462	70886	65402	5484
4.3 Other financial assets and liabilities	8435	10524	-2088	21104	9637	11466
5 Net errors and omissions		**711**	**-711**		**893**	**-893**

No. 41: Standard Presentation of BoP in India as per BPM6

(₹ Crore)

Item	Jan-Mar 2021			Jan-Mar 2022(P)		
	Credit	Debit	Net	Credit	Debit	Net
	1	2	3	4	5	6
1 Current Account (1.A+1.B+1.C)	**1263714**	**1323006**	**-59291**	**1646190**	**1747025**	**-100835**
1.A Goods and Services (1.A.a+1.A.b)	**1073506**	**1206597**	**-133090**	**1413535**	**1610368**	**-196833**
1.A.a Goods (1.A.a.1 to 1.A.a.3)	**665312**	**969572**	**-304260**	**887863**	**1297738**	**-409875**
1.A.a.1 General merchandise on a BOP basis	653724	839694	-185970	888059	1236020	-347961
1.A.a.2 Net exports of goods under merchanting	11588	0	11588	-196	0	-196
1.A.a.3 Nonmonetary gold	0	129878	-129878	0	61718	-61718
1.A.b Services (1.A.b.1 to 1.A.b.13)	**408194**	**237025**	**171170**	**525672**	**312631**	**213042**
1.A.b.1 Manufacturing services on physical inputs owned by others	741	44	697	1613	184	1429
1.A.b.2 Maintenance and repair services n.i.e.	393	1536	-1143	329	3313	-2984
1.A.b.3 Transport	44312	41058	3254	70702	82770	-12068
1.A.b.4 Travel	16819	22896	-6077	20740	38617	-17877
1.A.b.5 Construction	5482	5199	283	4482	5418	-937
1.A.b.6 Insurance and pension services	4719	4125	594	6801	3218	3583
1.A.b.7 Financial services	9166	10220	-1054	12147	11313	834
1.A.b.8 Charges for the use of intellectual property n.i.e.	1737	15356	-13619	1454	18944	-17489
1.A.b.9 Telecommunications, computer, and information services	200979	28494	172485	252989	30162	222827
1.A.b.10 Other business services	97117	93634	3484	126651	104321	22330
1.A.b.11 Personal, cultural, and recreational services	5300	6397	-1096	7300	9206	-1906
1.A.b.12 Government goods and services n.i.e.	1158	1759	-601	1201	2035	-834
1.A.b.13 Others n.i.e.	20269	6308	13962	19262	3129	16133
1.B Primary Income (1.B.1 to 1.B.3)	**37682**	**101406**	**-63724**	**54193**	**117326**	**-63133**
1.B.1 Compensation of employees	12045	5252	6793	12145	6049	6096
1.B.2 Investment income	19106	94405	-75299	32373	100933	-68559
1.B.2.1 Direct investment	9937	57123	-47186	24116	61632	-37516
1.B.2.2 Portfolio investment	203	11901	-11699	602	11973	-11371
1.B.2.3 Other investment	886	25372	-24486	721	27299	-26578
1.B.2.4 Reserve assets	8080	10	8071	6935	29	6906
1.B.3 Other primary income	6530	1748	4782	9674	10344	-670
1.C Secondary Income (1.C.1+1.C.2)	**152526**	**15003**	**137523**	**178462**	**19331**	**159131**
1.C.1 Financial corporations, nonfinancial corporations, households, and NPISHs	152400	13125	139275	178313	17700	160613
1.C.1.1 Personal transfers (Current transfers between resident and/ non-resident households)	147403	9500	137903	172602	12613	159989
1.C.1.2 Other current transfers	4997	3625	1372	5711	5086	624
1.C.2 General government	126	1878	-1752	149	1631	-1482
2 Capital Account (2.1+2.2)	**1393**	**1673**	**-280**	**1836**	**1303**	**533**
2.1 Gross acquisitions (DR.)/disposals (CR.) of non-produced nonfinancial assets	636	278	358	879	220	660
2.2 Capital transfers	757	1395	-638	957	1084	-127
3 Financial Account (3.1 to 3.5)	**1184395**	**1119643**	**64752**	**1368137**	**1261119**	**107018**
3.1 Direct Investment (3.1A+3.1B)	**112193**	**92670**	**19523**	**183534**	**79893**	**103640**
3.1.A Direct Investment in India	99699	57788	41911	175144	45346	129797
3.1.A.1 Equity and investment fund shares	95272	57537	37735	158539	38945	119594
3.1.A.1.1 Equity other than reinvestment of earnings	62338	57537	4801	119205	38945	80260
3.1.A.1.2 Reinvestment of earnings	32935	0	32935	39334	0	39334
3.1.A.2 Debt instruments	4427	251	4176	16605	6401	10203
3.1.A.2.1 Direct investor in direct investment enterprises	4427	251	4176	16605	6401	10203
3.1.B Direct Investment by India	12493	34882	-22389	8390	34547	-26157
3.1.B.1 Equity and investment fund shares	12493	14216	-1723	8390	22395	-14005
3.1.B.1.1 Equity other than reinvestment of earnings	12493	8726	3767	8390	16040	-7650
3.1.B.1.2 Reinvestment of earnings	0	5490	-5490	0	6355	-6355
3.1.B.2 Debt instruments	0	20666	-20666	0	12153	-12153
3.1.B.2.1 Direct investor in direct investment enterprises	0	20666	-20666	0	12153	-12153
3.2 Portfolio Investment	**676402**	**623338**	**53063**	**531986**	**646450**	**-114463**
3.2.A Portfolio Investment in India	674196	614505	59691	528521	636017	-107496
3.2.1 Equity and investment fund shares	593588	537019	56569	470586	569008	-98422
3.2.2 Debt securities	80608	77487	3122	57935	67009	-9074
3.2.B Portfolio Investment by India	2206	8833	-6628	3465	10433	-6968
3.3 Financial derivatives (other than reserves) and employee stock options	**19402**	**35925**	**-16523**	**34822**	**55690**	**-20868**
3.4 Other investment	**376398**	**343008**	**33391**	**497250**	**479086**	**18164**
3.4.1 Other equity (ADRs/GDRs)	0	0	0	0	0	0
3.4.2 Currency and deposits	84291	86651	-2360	101664	104634	-2970
3.4.2.1 Central bank (Rupee Debt Movements; NRG)	1565	0	1565	347	4514	-4167
3.4.2.2 Deposit-taking corporations, except the central bank (NRI Deposits)	82726	86651	-3925	101318	100121	1197
3.4.2.3 General government			0	0	0	0
3.4.2.4 Other sectors			0	0	0	0
3.4.3 Loans (External Assistance, ECBs and Banking Capital)	163138	119653	43484	218623	214684	3939
3.4.3.A Loans to India	158092	114067	44025	214662	211760	2902
3.4.3.B Loans by India	5045	5586	-540	3961	2925	1037
3.4.4 Insurance, pension, and standardized guarantee schemes	198	313	-116	300	131	169
3.4.5 Trade credit and advances	67291	84390	-17099	138447	87134	51313
3.4.6 Other accounts receivable/payable - other	61481	52000	9481	38216	72502	-34286
3.4.7 Special drawing rights	0	0	0	0	0	0
3.5 Reserve assets	**0**	**24702**	**-24702**	**120545**	**0**	**120545**
3.5.1 Monetary gold			0	0	0	
3.5.2 Special drawing rights n.a.			0	0	0	
3.5.3 Reserve position in the IMF n.a.			0	0	0	
3.5.4 Other reserve assets (Foreign Currency Assets)	0	24702	-24702	120545	0	120545
4 Total assets/liabilities	**1184395**	**1119643**	**64752**	**1368137**	**1261119**	**107018**
4.1 Equity and investment fund shares	723159	653844	69315	676102	696601	-20499
4.2 Debt instruments	399754	389097	10657	533274	492016	41258
4.3 Other financial assets and liabilities	61481	76702	-15221	158761	72502	86259
5 Net errors and omissions	**0**	**5180**	**-5180**	**0**	**6716**	**-6716**

Note : P: Preliminary

No. 42: International Investment Position

(US$ Million)

Item	As on Financial Year /Quarter End							
	2021-22		2021				2022	
			Mar.		Dec.		Mar.	
	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
	1	2	3	4	5	6	7	8
1.1 Equity and investment fund shares	132765	493987	122726	456947	130904	487895	132765	493987
1.2 Debt instruments	78807	27694	71203	25177	77192	26301	78807	27694
1 Direct investment	211573	521681	193929	482125	208096	514196	211573	521681
2.1 Equity and investment fund shares	1110	156381	2340	177278	6113	172794	1110	156381
2.2 Debt securities	9533	105994	5596	101232	3603	104286	9533	105994
2. Portfolio investment	10642	262375	7936	278510	9716	277080	10642	262375
3.1 Trade credit and advances	18603	118156	5644	100329	12891	113450	18603	118156
3.2 Loans	10474	205023	13335	197527	8856	204063	10474	205023
3.3 Currency and deposits	42081	140994	42436	143760	34796	143502	42081	140994
3.4 Other accounts receivable	19918	32203	19191	12384	19946	29833	19918	32203
3 Other investment	91075	496377	80606	454000	76489	490849	91075	496377
4 Reserve assets	607309		576984		633614		607309	
5 Total Assets / Liabilities	920599	1280433	859454	1214634	927915	1282125	920599	1280433
6 Net International Investment Position	-359834		-355180		-354210		-359834	

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	
		May	Apr.	May		May	Apr.	May
	1	2	3	4	5	6	7	8
A. Settlement Systems								
Financial Market Infrastructures (FMIs)								
1 CCIL Operated Systems (1.1 to 1.3)	33.01	2.08	3.06	3.32	206873112	14652880	18651860	19742339
1.1 Govt. Securities Clearing (1.1.1 to 1.1.3)	12.22	0.89	1.08	1.23	142072939	9966087	11915370	13110275
1.1.1 Outright	6.21	0.47	0.59	0.66	8793301	710624	870328	832089
1.1.2 Repo	3.09	0.23	0.25	0.31	51015712	4280973	4315711	4940038
1.1.3 Tri-party Repo	2.92	0.19	0.23	0.26	82263926	4974490	6729332	7338148
1.2 Forex Clearing	19.90	1.14	1.87	1.98	59775826	4424858	6124936	6039213
1.3 Rupee Derivatives @	0.88	0.05	0.11	0.11	5024347	261935	611554	592851
B. Payment Systems								
I Financial Market Infrastructures (FMIs)	–	–	–	–	–	–	–	–
1 Credit Transfers - RTGS (1.1 to 1.2)	2078.39	123.34	195.32	195.72	128657516	8366599	11097594	11183947
1.1 Customer Transactions	2063.73	122.28	194.11	194.53	113319292	7211162	9780600	9851274
1.2 Interbank Transactions	14.66	1.07	1.21	1.19	15338225	1155437	1316994	1332673
II Retail								
2 Credit Transfers - Retail (2.1 to 2.6)	577934.74	33866.21	66747.57	72187.50	42728006	2707637	4050335	4177865
2.1 AePS (Fund Transfers) @	9.76	0.95	0.55	0.58	575	59	33	36
2.2 APBS $	12573.33	1343.10	1119.53	2268.03	133345	16261	11118	41011
2.3 IMPS	46625.25	2798.61	4716.26	4848.13	4171037	266289	444670	452328
2.4 NACH Cr $	18757.82	1866.34	1329.76	1794.53	1281685	116463	112354	97341
2.5 NEFT	40407.29	2565.39	3737.59	3813.34	28725463	1819459	2498587	2546928
2.6 UPI @	459561.30	25291.82	55843.88	59462.89	8415900	489106	983573	1040221
2.6.1 of which USSD @	11.99	1.01	0.86	1.00	177	16	12	14
3 Debit Transfers and Direct Debits (3.1 to 3.3)	12189.49	936.41	1121.68	1177.32	1034444	70589	93616	95542
3.1 BHIM Aadhaar Pay @	227.73	17.29	16.76	17.81	6114	422	580	571
3.2 NACH Dr $	10754.74	857.30	996.72	1018.05	1026641	70069	92902	94752
3.3 NETC (linked to bank account) @	1207.01	61.82	108.20	141.46	1690	98	135	218
4 Card Payments (4.1 to 4.2)	61782.94	3901.33	5541.17	5698.18	1701851	95239	170521	179655
4.1 Credit Cards (4.1.1 to 4.1.2)	22398.83	1344.73	2229.30	2377.95	971638	52014	105459	113696
4.1.1 PoS based $	11124.59	509.46	1152.87	1220.24	380643	18477	39807	42266
4.1.2 Others $	11274.23	835.27	1076.43	1157.71	590994	33537	65652	71430
4.2 Debit Cards (4.2.1 to 4.2.1)	39384.11	2556.60	3311.87	3320.23	730213	43225	65062	65959
4.2.1 PoS based $	22967.10	1127.84	2131.77	2150.28	451550	22195	43530	44306
4.2.2 Others $	16417.00	1428.76	1180.10	1169.95	278663	21030	21532	21653
5 Prepaid Payment Instruments (5.1 to 5.2)	65812.39	3880.40	6551.30	6652.60	293658	21509	27664	28257
5.1 Wallets	52683.01	3180.18	5036.15	5198.06	226645	14626	19360	19616
5.2 Cards (5.2.1 to 5.2.2)	13129.38	700.22	1515.15	1454.54	67014	6883	8305	8640
5.2.1 PoS based $	1066.47	40.58	169.34	178.85	18123	1169	3183	3229
5.2.2 Others $	12062.91	659.64	1345.81	1275.69	48891	5714	5121	5411
6 Paper-based Instruments (6.1 to 6.2)	6999.12	366.69	624.01	590.44	6650332	341794	670259	594562
6.1 CTS (NPCI Managed)	6999.12	366.69	624.01	590.44	6650332	341794	670259	594562
6.2 Others	0.00	–	–	–	–	–	–	–
Total - Retail Payments (2+3+4+5+6)	724718.68	42951.04	80585.73	86306.04	52408291	3236769	5012396	5075880
Total Payments (1+2+3+4+5+6)	726797.07	43074.39	80781.06	86501.76	181065807	11603368	16109991	16259827
Total Digital Payments (1+2+3+4+5)	719797.95	42707.70	80157.05	85911.32	174415475	11261574	15439731	15665265

PART II - Payment Modes and Channels

System	Volume (Lakh)				Value (₹ Crore)			
	FY 2020-21	2021	2022		FY 2020-21	2021	2022	
		May	Apr.	May		May	Apr.	May
	1	2	3	4	5	6	7	8
A. Other Payment Channels								
1 Mobile Payments (mobile app based) (1.1 to 1.2)	507531.40	29734.31	59767.19	64186.29	14973395	898224	1683381	1753658
1.1 Intra-bank $	40805.67	2528.93	4515.86	4617.48	2726360	174307	312740	318478
1.2 Inter-bank $	466725.74	27205.39	55251.33	59568.81	12247035	723917	1370640	1435180
2 Internet Payments (Netbanking / Internet Browser Based) @ (2.1 to 2.2)	36127.50	2336.06	3639.09	3735.84	50121370	2953188	7155362	7233469
2.1 Intra-bank @	7375.30	492.39	964.04	1023.10	23505766	1290828	4288061	4344369
2.2 Inter-bank @	28752.20	1843.67	2675.04	2712.74	26615604	1662360	2867301	2889100
B. ATMs								
3 Cash Withdrawal at ATMs $ (3.1 to 3.3)	65287.28	4169.98	5834.29	5872.26	3111927	202854	286411	280266
3.1 Using Credit Cards $	62.38	3.65	6.12	6.64	3130	187	303	328
3.2 Using Debit Cards $	64898.81	4142.63	5796.88	5832.83	3097741	201978	285011	278833
3.3 Using Pre-paid Cards $	326.11	23.69	31.28	32.79	11056	690	1097	1106
4 Cash Withdrawal at PoS $ (4.1 to 4.2)	92.26	20.81	2.74	2.65	805	122	54	53
4.1 Using Debit Cards $	79.42	18.08	2.24	2.20	557	102	22	22
4.2 Using Pre-paid Cards $	12.84	2.73	0.50	0.44	248	19	32	31
5 Cash Withrawal at Micro ATMs @	11126.04	824.37	984.19	1073.66	299776	24138	27824	29828
5.1 AePS @	11126.04	824.37	984.19	1073.66	299776	24138	27824	29828

PART III - Payment Infrastructures (Lakh)

System	As on March 2021	2021	2022	
		May	Apr.	May
	1	2	3	4
Payment System Infrastructures				
1 Number of Cards (1.1 to 1.2)	9912.93	9643.64	9956.84	10002.10
1.1 Credit Cards	736.27	623.93	751.66	768.77
1.2 Debit Cards	9176.66	9019.71	9205.18	9233.33
2 Number of PPIs @ (2.1 to 2.2)	27403.54	22609.29	27405.90	27692.16
2.1 Wallets @	24645.39	20542.99	24748.38	25005.51
2.2 Cards @	2758.15	2066.30	2657.52	2686.65
3 Number of ATMs (3.1 to 3.2)	2.48	2.40	2.51	2.52
3.1 Bank owned ATMs $	2.17	2.15	2.19	2.20
3.2 White Label ATMs $	0.32	0.26	0.32	0.32
4 Number of Micro ATMs @	7.81	4.25	8.16	8.81
5 Number of PoS Terminals	60.70	45.20	61.26	61.69
6 Bharat QR @	49.72	40.22	40.90	41.38
7 UPI QR *	1727.34	990.22	1807.21	1880.15

@: 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		
			Sep.	Jul.	Aug.	Sep.
		1	2	3	4	5
1 Small Savings	**Receipts**	**181237**	**15218**	**18119**	**16867**	**18026**
	Outstanding	**1259585**	**1155063**	**1317190**	**1334049**	**1352069**
1.1 Total Deposits	**Receipts**	**132687**	**11962**	**13433**	**12495**	**13381**
	Outstanding	**867494**	**796745**	**910440**	**922936**	**936317**
1.1.1 Post Office Saving Bank Deposits	Receipts	39748	3061	2648	2034	3205
	Outstanding	205888	184681	214190	216224	219429
1.1.2 MGNREG	Receipts					
	Outstanding					
1.1.3 National Saving Scheme, 1987	Receipts	276	-23	-33	-34	-26
	Outstanding	3419	3070	3326	3293	3267
1.1.4 National Saving Scheme, 1992	Receipts	166	-3	-3	-5	-3
	Outstanding	175	0	164	159	156
1.1.5 Monthly Income Scheme	Receipts	12211	1401	1600	1445	1575
	Outstanding	221379	214935	226015	227460	229035
1.1.6 Senior Citizen Scheme 2004	Receipts	21009	2032	2412	2322	2306
	Outstanding	97051	85480	104419	106741	109048
1.1.7 Post Office Time Deposits	Receipts	41470	4278	4606	4432	4452
	Outstanding	207557	184793	221996	226428	230879
1.1.7.1 1 year Time Deposits	Outstanding	108205	100944	111691	112820	113935
1.1.7.2 2 year Time Deposits	Outstanding	7473	7269	7700	7777	7852
1.1.7.3 3 year Time Deposits	Outstanding	7227	7447	7136	7103	7098
1.1.7.4 5 year Time Deposits	Outstanding	84652	69133	95469	98728	101994
1.1.8 Post Office Recurring Deposits	Receipts	17807	1216	2203	2301	1873
	Outstanding	132029	123790	140334	142635	144508
1.1.9 Post Office Cumulative Time Deposits	Receipts	0	0	0	0	-1
	Outstanding	-25	-25	-25	-25	-26
1.1.10 Other Deposits	Receipts	0	0	0	0	0
	Outstanding	21	21	21	21	21
1.2 Saving Certificates	**Receipts**	**34860**	**3010**	**4512**	**4262**	**4509**
	Outstanding	**286863**	**265147**	**300625**	**304878**	**309381**
1.2.1 National Savings Certificate VIII issue	Receipts	17361	1361	1981	1822	1965
	Outstanding	135348	124488	141690	143512	145477
1.2.2 Indira Vikas Patras	Receipts	-3	-3	0	0	0
	Outstanding	159	159	158	158	158
1.2.3 Kisan Vikas Patras	Receipts	-7911	-821	-251	-278	-171
	Outstanding	-6776	-3288	-7565	-7842	-8013
1.2.4 Kisan Vikas Patras - 2014	Receipts	25340	2473	2782	2718	2715
	Outstanding	147942	133676	156169	158886	161601
1.2.5 National Saving Certificate VI issue	Receipts	41	0	0	0	0
	Outstanding	-114	-155	-114	-114	-114
1.2.6 National Saving Certificate VII issue	Receipts	32	0	0	0	0
	Outstanding	-74	-106	-74	-74	-74
1.2.7 Other Certificates	Outstanding	10378	10373	10361	10352	10346
1.3 Public Provident Fund	**Receipts**	**13690**	**246**	**174**	**110**	**136**
	Outstanding	**105228**	**93171**	**106125**	**106235**	**106371**

Note : Data on receipts from April 2017 are net receipts, i.e., gross receipt minus gross payment.

Source: Accountant General, Post and Telegraphs.

No. 45 : Ownership Pattern of Central and State Governments Securities

(Per cent)

Central Government Dated Securities					
Category	2021				2022
	Mar.	Jun.	Sep.	Dec.	Mar.
	1	2	3	4	5
(A) Total (in ₹. Crore)	**7635902**	**7882533**	**8235318**	**8439811**	**8529036**
1 Commercial Banks	37.77	35.99	37.82	35.40	37.75
2 Non-Bank PDs	0.27	0.34	0.35	0.27	0.29
3 Insurance Companies	25.30	25.83	24.18	25.74	25.89
4 Mutual Funds	2.94	2.82	2.91	3.08	2.91
5 Co-operative Banks	1.82	1.82	1.50	1.82	1.81
6 Financial Institutions	1.00	1.43	1.17	1.69	0.94
7 Corporates	1.06	1.39	0.72	1.37	1.47
8 Foreign Portfolio Investors	1.87	1.79	1.81	1.66	1.56
9 Provident Funds	4.44	4.04	3.77	4.33	4.60
10 RBI	16.20	17.11	16.98	16.92	16.62
11. Others	7.33	7.43	8.79	7.73	6.15
11.1 State Governments	1.69	1.67	1.67	1.69	1.82

State Governments Securities					
Category	2021				2022
	Mar.	Jun.	Sep.	Dec.	Mar.
	1	2	3	4	5
(B) Total (in ₹. Crore)	**3879982**	**4028849**	**4153508**	**4257578**	**4410250**
1 Commercial Banks	33.69	33.75	35.94	34.41	34.39
2 Non-Bank PDs	0.48	0.39	0.44	0.40	0.38
3 Insurance Companies	30.04	29.67	27.50	28.85	28.42
4 Mutual Funds	1.82	1.74	1.97	1.91	1.82
5 Co-operative Banks	4.05	4.12	3.60	4.07	4.04
6 Financial Institutions	1.86	1.79	1.72	1.73	1.72
7 Corporates	0.49	1.45	1.32	1.70	1.82
8 Foreign Portfolio Investors	0.02	0.02	0.03	0.02	0.02
9 Provident Funds	22.00	21.09	18.27	20.66	20.79
10 RBI	0.77	0.88	0.85	0.83	0.80
11. Others	4.77	5.10	8.38	5.40	5.81
11.1 State Governments	0.18	0.18	0.18	0.19	0.20

Treasury Bills					
Category	2021				2022
	Mar.	Jun.	Sep.	Dec.	Mar.
	1	2	3	4	5
(C) Total (in ₹. Crore)	**690646**	**901327**	**763582**	**692869**	**757198**
1 Commercial Banks	55.54	52.25	50.22	47.01	51.14
2 Non-Bank PDs	2.82	1.82	1.33	1.53	4.20
3 Insurance Companies	5.61	4.75	4.12	6.29	6.58
4 Mutual Funds	17.80	19.93	17.72	13.72	14.01
5 Co-operative Banks	2.43	1.60	1.32	1.49	1.79
6 Financial Institutions	1.24	2.56	2.12	2.36	3.53
7 Corporates	3.16	3.00	2.40	3.13	3.47
8 Foreign Portfolio Investors	0.00	0.00	0.15	0.72	0.49
9 Provident Funds	0.22	0.10	0.37	0.85	0.21
10 RBI	0.49	2.58	2.63	0.00	0.00
11. Others	10.70	11.42	17.62	22.89	14.59
11.1 State Governments	5.98	7.97	12.64	18.92	11.54

No. 46: Combined Receipts and Disbursements of the Central and State Governments

(₹ Crore)

Item	2016-17	2017-18	2018-19	2019-20	2020-21 RE	2021-22 BE
	1	2	3	4	5	6
1 Total Disbursements	**4265969**	**4515946**	**5040747**	**5410887**	**6523916**	**7160694**
1.1 Developmental	2537905	2635110	2882758	3074492	3906147	4254004
1.1.1 Revenue	1878417	2029044	2224367	2446605	3259401	3242247
1.1.2 Capital	501213	519356	596774	588233	636062	922982
1.1.3 Loans	158275	86710	61617	39654	10684	88775
1.2 Non-Developmental	1672646	1812455	2078276	2253027	2526514	2810847
1.2.1 Revenue	1555239	1741432	1965907	2109629	2334608	2602289
1.2.1.1 Interest Payments	724448	814757	894520	955801	1082302	1244457
1.2.2 Capital	115775	69370	111029	141457	189487	177328
1.2.3 Loans	1632	1654	1340	1941	2419	31230
1.3 Others	55417	68381	79713	83368	91255	95843
2 Total Receipts	**4288432**	**4528422**	**5023352**	**5734166**	**6489736**	**7039032**
2.1 Revenue Receipts	3132201	3376416	3797731	3851563	3834126	4682025
2.1.1 Tax Receipts	2622145	2978134	3278947	3231582	3175594	3829889
2.1.1.1 Taxes on commodities and services	1652377	1853859	2030050	2012578	2100982	2514708
2.1.1.2 Taxes on Income and Property	965622	1121189	1246083	1216203	1071552	1311449
2.1.1.3 Taxes of Union Territories (Without Legislature)	4146	3086	2814	2800	3060	3732
2.1.2 Non-Tax Receipts	510056	398282	518783	619981	658532	852135
2.1.2.1 Interest Receipts	33220	34224	36273	31137	39830	33198
2.2 Non-debt Capital Receipts	69063	142433	140287	110094	54861	201138
2.2.1 Recovery of Loans & Advances	20942	42213	44667	59515	21151	19581
2.2.2 Disinvestment proceeds	48122	100219	95621	50578	33710	181557
3 Gross Fiscal Deficit [1 - (2.1 + 2.2)]	**1064704**	**997097**	**1102729**	**1449230**	**2634928**	**2277532**
3A Sources of Financing: Institution-wise						
3A.1 Domestic Financing	1046708	989167	1097210	1440548	2580406	2276017
3A.1.1 Net Bank Credit to Government	617123	144792	387091	571872	890012	-----
3A.1.1.1 Net RBI Credit to Government	195816	-144847	325987	190241	107494	-----
3A.1.2 Non-Bank Credit to Government	429585	844375	710119	868676	1690394	-----
3A.2 External Financing	17997	7931	5519	8682	54522	1514
3B Sources of Financing: Instrument-wise						
3B.1 Domestic Financing	1046708	989167	1097210	1440548	2580406	2276017
3B.1.1 Market Borrowings (net)	689821	794856	795845	971378	1778062	1620936
3B.1.2 Small Savings (net)	35038	71222	88961	209232	455724	367863
3B.1.3 State Provident Funds (net)	45688	42351	51004	38280	47300	45504
3B.1.4 Reserve Funds	-6436	18423	-18298	10411	-3450	5051
3B.1.5 Deposits and Advances	17792	25138	66289	-14227	29050	28868
3B.1.6 Cash Balances	-22463	-12476	17395	-323279	34179	121663
3B.1.7 Others	287268	49653	96014	548753	239540	86132
3B.2 External Financing	17997	7931	5519	8682	54522	1514
4 Total Disbursements as per cent of GDP	*27.7*	*26.4*	*26.7*	*26.6*	*33.0*	*32.1*
5 Total Receipts as per cent of GDP	*27.9*	*26.5*	*26.6*	*28.2*	*32.9*	*31.6*
6 Revenue Receipts as per cent of GDP	*20.3*	*19.8*	*20.1*	*18.9*	*19.4*	*21.0*
7 Tax Receipts as per cent of GDP	*17.0*	*17.4*	*17.4*	*15.9*	*16.1*	*17.2*
8 Gross Fiscal Deficit as per cent of GDP	*6.9*	*5.8*	*5.8*	*7.1*	*13.3*	*10.2*

…: Not available. RE: Revised Estimates; BE: Budget Estimates

Source : Budget Documents of Central and State Governments.

No. 47: Financial Accommodation Availed by State Governments under various Facilities

(₹ Crore)

Sr. No	State/Union Territory	During May-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	713.3	31	2,041.41	31	1,952.02	20
2	Arunachal Pradesh	-	-	-	-	-	-
3	Assam	-	-	-	-	-	-
4	Bihar	-	-	-	-	-	-
5	Chhattisgarh	-	-	-	-	-	-
6	Goa	-	-	-	-	-	-
7	Gujarat	-	-	-	-	-	-
8	Haryana	471.37	5	78.68	3	-	-
9	Himachal Pradesh	-	-	-	-	-	-
10	Jammu & Kashmir UT	-	-	994.1	19	294.41	14
11	Jharkhand	-	-	-	-	-	-
12	Karnataka	-	-	-	-	-	-
13	Kerala	144.67	6	668.91	6	-	-
14	Madhya Pradesh	-	-	-	-	-	-
15	Maharashtra	1,960.24	12	-	-	-	-
16	Manipur	18.13	30	227.64	30	176.74	27
17	Meghalaya	89.77	17	23.26	5	-	-
18	Mizoram	33.28	7	52.11	1	-	-
19	Nagaland	104.18	11	44.59	5	-	-
20	Odisha	-	-	-	-	-	-
21	Puducherry	-	-	-	-	-	-
22	Punjab	545.18	15	-	-	-	-
23	Rajasthan	3,740.2	31	-	-	-	-
24	Tamil Nadu	-	-	-	-	-	-
25	Telangana	711.65	31	1,295.52	31	912.98	18
26	Tripura	-	-	-	-	-	-
27	Uttar Pradesh	-	-	-	-	-	-
28	Uttarakhand	-	-	-	-	-	-
29	West Bengal	-	-	-	-	-	-

Source: Reserve Bank of India.

No. 48: Investments by State Governments

(₹ Crore)

Sr. No	State/Union Territory	As on end of May 2022			
		Consolidated Sinking Fund (CSF)	Guarantee Redemption Fund (GRF)	Government Securities	Auction Treasury Bills (ATBs)
	1	2	3	4	5
1	Andhra Pradesh	9429	930	0	0
2	Arunachal Pradesh	2038	3	0	0
3	Assam	3096	71	0	0
4	Bihar	6363	0	0	8000
5	Chhattisgarh	5630	0	1	4508
6	Goa	738	363	0	0
7	Gujarat	8142	547	0	1000
8	Haryana	1368	1389	0	0
9	Himachal Pradesh	0	0	0	0
10	Jammu & Kashmir UT	0	0	0	0
11	Jharkhand	986	0	0	0
12	Karnataka	10420	0	0	25000
13	Kerala	2438	0	0	0
14	Madhya Pradesh	0	1044	0	0
15	Maharashtra	52999	1152	0	3000
16	Manipur	175	114	0	0
17	Meghalaya	888	62	9	0
18	Mizoram	443	53	0	0
19	Nagaland	1868	38	0	0
20	Odisha	14776	1665	96	41083
21	Puducherry	384	0	0	1123
22	Punjab	3046	0	8	0
23	Rajasthan	0	0	129	8600
24	Tamil Nadu	7579	0	28	9666
25	Telangana	6441	1405	0	0
26	Tripura	688	15	0	1600
27	Uttar Pradesh	3028	0	180	0
28	Uttarakhand	3914	154	0	0
29	West Bengal	10220	710	214	0
	Total	**157097**	**9715**	**664**	**103580**

No. 49: Market Borrowings of State Governments

(₹ Crore)

Sr. No.	State	2020-21		2021-22		2022-23						Total amount raised, so far in 2022-23	
						March		April		May			
		Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross Amount Raised	Net Amount Raised	Gross	Net
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Andhra Pradesh	50896	41915	46443	36692	3943	3363	4000	2695	7390	6810	11390	9505
2	Arunachal Pradesh	767	767	563	530	-	-33	-	-	-	-	-	-
3	Assam	15030	14230	12753	10753	600	600	-	-	-	-	-	-
4	Bihar	27285	24685	28489	24334	1489	334	-	-	-	-750	-	-750
5	Chhattisgarh	13000	10500	4000	913	-	-1587	-	-	-	-	-	-
6	Goa	3354	3054	2000	1450	200	150	-	-	-	-	-	-
7	Gujarat	44780	33280	31054	13554	5000	500	-	-	-	-3000	-	-3000
8	Haryana	30000	25550	30500	20683	10000	5678	-	-650	3000	1000	3000	350
9	Himachal Pradesh	6000	3755	4000	1875	-	-710	-	-	-	-	-	-
10	Jammu & Kashmir UT	9328	6020	8562	5373	1562	-52	-	-	1000	1000	1000	1000
11	Jharkhand	9400	8900	5000	3191	3500	2691	-	-	-	-	-	-
12	Karnataka	69000	61900	59000	49000	-	-1500	-	-	-	-	-	-
13	Kerala	28566	23066	27000	18120	7000	5900	-	-1000	-	-1000	-	-2000
14	Madhya Pradesh	45573	38773	22000	13900	4000	1400	-	-	-	-	-	-
15	Maharashtra	69000	50022	68750	40790	4000	1500	4000	4000	16000	13500	20000	17500
16	Manipur	1302	1044	1476	1326	180	180	-	-75	250	250	250	175
17	Meghalaya	1777	1587	1608	1298	80	80	-	-	-	-	-	-
18	Mizoram	944	677	747	447	90	40	-	-65	150	150	150	85
19	Nagaland	1721	1366	1727	1222	440	185	-	-	-	-	-	-
20	Odisha	3000	500	0	-6473	-	-1500	-	-1500	-	-	-	-1500
21	Puducherry	1390	790	1374	841	300	167	-	-	-	-	-	-
22	Punjab	32995	23467	25814	12428	6500	4497	1500	400	1500	800	3000	1200
23	Rajasthan	57359	44273	51149	38243	7380	2730	-	-	3500	3000	3500	3000
24	Sikkim	1292	1292	1511	1471	382	382	-	-	-	-	-	-
25	Tamil Nadu	87977	76796	87000	72500	24600	23300	-	-	-	-622	-	-622
26	Telangana	43784	37365	45716	38667	3029	2609	-	-945	-	-420	-	-1365
27	Tripura	1916	1631	300	0	-	-100	-	-	-	-	-	-
28	Uttar Pradesh	75500	59185	62500	42355	5000	2142	-	-	-	-1500	-	-1500
29	Uttarakhand	6200	5208	3200	1800	1000	700	-	-	-	-	-	-
30	West Bengal	59680	50180	67390	45199	13390	12722	-	-2500	2500	-	2500	-2500
	Grand Total	798816	651777	701626	492483	103665	66368	9500	360	35290	19218	44790	19578

- : Nil.

Note: The State of J&K has ceased to exist constitutionally from October 31, 2019 and the liabilities of the State continue to remain as liabilities of the new UT of Jammu and Kashmir.

Source: Reserve Bank of India.

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise

(Amount in ₹ Crore)

Item	2019-20				
	Q1	Q2	Q3	Q4	Annual
Net Financial Assets (I-II)	**252658.0**	**513118.4**	**400437.3**	**446254.3**	**1612468.0**
Per cent of GDP	*5.1*	*10.6*	*7.8*	*8.7*	*8.0*
I. Financial Assets	**413192.2**	**604322.7**	**538186.1**	**843385.9**	**2399086.9**
Per cent of GDP	*8.4*	*12.4*	*10.5*	*16.4*	*12.0*
of which:					
1.Total Deposits (a+b)	13020.4	299089.8	138131.8	473183.4	923425.5
(a) Bank Deposits	-9769.4	280588.7	130328.0	465529.7	866677.0
i. Commercial Banks	-13293.8	269475.4	66666.7	446006.7	768855.0
ii. Co-operative Banks	3524.4	11113.2	63661.3	19523.0	97822.0
(b) Non-Bank Deposits	22789.9	18501.2	7803.7	7653.7	56748.5
2. Life Insurance Funds	117394.9	107731.0	109895.6	37236.1	372257.5
3. Provident and Pension Funds (including PPF)	110601.0	113593.0	113676.0	117235.0	455104.9
4. Currency	61244.1	-26104.8	86832.6	160690.2	282662.1
5. Investments	43936.8	43018.8	22655.1	-11953.8	97656.9
of which:					
(a) Mutual Funds	23303.5	38382.2	19191.1	-19191.1	61685.7
(b) Equity	18648.2	2172.4	936.2	4981.0	26737.8
6. Small Savings (excluding PPF)	65930.8	65930.8	65930.8	65930.8	263723.4
II. Financial Liabilities	**160534.2**	**91204.3**	**137748.8**	**397131.6**	**786618.9**
Per cent of GDP	*3.2*	*1.9*	*2.7*	*7.7*	*3.9*
Loans (Borrowings) from					
1. Financial Corporations (a+b)	160500.7	91170.8	137715.2	397098.1	786484.7
(a) Banking Sector	141332.5	58250.2	121754.0	200413.2	521749.9
of which:					
Commercial Banks	135754.1	57135.0	87377.4	202214.2	482480.6
(b) Other Financial Institutions	19168.2	32920.5	15961.2	196684.8	264734.8
i. Non-Banking Financial Companies	-519.7	22976.7	29930.7	198264.3	250652.0
ii. Housing Finance Companies	17033.0	8093.1	-15710.4	-3093.1	6322.6
iii. Insurance Companies	2655.0	1850.8	1740.9	1513.6	7760.2
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8	33.8	33.8	135.1
3. General Government	-0.3	-0.3	-0.3	-0.3	-1.0

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise (Contd.)

(Amount in ₹ Crore)

Item	2020-21				
	Q1	Q2	Q3	Q4	Annual
Net Financial Assets (I-II)	**623053.8**	**592327.3**	**506558.3**	**581769.1**	**2303708.6**
Per cent of GDP	*16.1*	*12.5*	*9.3*	*10.1*	*11.6*
I. Financial Assets	**828447.4**	**630907.1**	**676131.6**	**973510.9**	**3108997.0**
Per cent of GDP	*21.4*	*13.4*	*12.4*	*16.9*	*15.7*
of which:					
1.Total Deposits (a+b)	297376.2	278589.7	158113.5	533651.5	1267730.9
(a) Bank Deposits	281155.1	264523.3	147037.2	535157.5	1227873.0
i. Commercial Banks	279010.5	262033.7	143558.6	471730.9	1156333.7
ii. Co-operative Banks	2144.6	2489.6	3478.6	63426.6	71539.3
(b) Non-Bank Deposits	16221.1	14066.4	11076.3	-1506.0	39857.9
2. Life Insurance Funds	122369.1	141443.4	155516.3	100812.3	520141.0
3. Provident and Pension Funds (including PPF)	121582.5	124106.5	124949.5	130185.5	500824.0
4. Currency	202432.7	21286.9	91456.0	66800.5	381976.1
5. Investments	6249.8	-12956.4	67659.3	63624.0	124576.7
of which:					
(a) Mutual Funds	-16021.0	-28837.7	57675.4	51267.0	64083.8
(b) Equity	18599.4	8291.5	5307.1	6333.3	38531.2
6. Small Savings (excluding PPF)	77381.6	77381.6	77381.6	77381.6	309526.3
II. Financial Liabilities	**205393.5**	**38579.8**	**169573.3**	**391741.8**	**805288.5**
Per cent of GDP	*5.3*	*0.8*	*3.1*	*6.8*	*4.1*
Loans (Borrowings) from					
1. Financial Corporations (a+b)	205436.7	38623.0	169616.5	391785.8	805462.1
(a) Banking Sector	211005.3	13211.7	139387.5	304100.8	667705.3
of which:					
Commercial Banks	211259.3	13213.8	140514.3	242476.0	607463.5
(b) Other Financial Institutions	-5568.6	25411.3	30229.0	87685.1	137756.8
i. Non-Banking Financial Companies	-15450.4	21627.1	15921.2	61326.1	83424.0
ii. Housing Finance Companies	10516.6	2875.1	13048.5	25336.1	51776.2
iii. Insurance Companies	-634.8	909.2	1259.3	1022.9	2556.6
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8	33.8	33.0	134.4
3. General Government	-77.0	-77.0	-77.0	-77.0	-308.0

No. 50 (a): Flow of Financial Assets and Liabilities of Households - Instrument-wise (Concld.)

(Amount in ₹ Crore)

Item	2021-22	
	Q1	Q2
Net Financial Assets (I-II)	**760273.0**	**388307.9**
Per cent of GDP	*14.8*	*6.9*
I. Financial Assets	**631184.5**	**567403.7**
Per cent of GDP	*12.3*	*10.1*
of which:		
1.Total Deposits (a+b)	146933.8	207184.4
(a) Bank Deposits	124803.6	201833.5
i. Commercial Banks	123282.3	200159.7
ii. Co-operative Banks	1521.3	1673.8
(b) Non-Bank Deposits	22130.2	5350.9
2. Life Insurance Funds	114617.8	127356.0
3. Provident and Pension Funds (including PPF)	129821.9	132967.9
4. Currency	128660.2	-68631.2
5. Investments	24929.6	82305.4
of which:		
(a) Mutual Funds	14573.0	63151.3
(b) Equity	4502.5	13218.5
6. Small Savings (excluding PPF)	85163.8	85163.8
II. Financial Liabilities	**-129088.5**	**179095.8**
Per cent of GDP	*-2.5*	*3.2*
Loans (Borrowings) from		
1. Financial Corporations (a+b)	-129109.8	179074.5
(a) Banking Sector	-105750.5	124240.8
of which:		
Commercial Banks	-98583.4	126251.1
(b) Other Financial Institutions	-23359.3	54833.7
i. Non-Banking Financial Companies	-31118.4	28880.1
ii. Housing Finance Companies	7132.0	24403.8
iii. Insurance Companies	627.1	1549.8
2. Non-Financial Corporations (Private Corporate Business)	33.8	33.8
3. General Government	-12.5	-12.5

Notes: 1. Net Financial Savings of households refer to the flow of net financial assets, which represents change in financial assets held by households minus change in their financial liabilities.
2. Data as ratios to GDP have been calculated based on the Second Advance Estimates of National Income 2021-22 released on February 28, 2022.
3. Figures in the columns may not add up to the total due to rounding off.

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators

(Amount in ₹ Crore)

Item	Jun-2019	Sep-2019	Dec-2019	Mar-2020
Financial Assets (a+b+c+d)	**16130869.8**	**16439609.3**	**16829228.1**	**17002698.8**
Per cent of GDP	*83.7*	*84.4*	*85.3*	*84.7*
(a) Bank Deposits (i+ii)	8831785.7	9111489.5	9239027.3	9688573.4
i. Commercial Banks	8131543.2	8401018.6	8467685.3	8913692.0
ii. Co-operative Banks	700242.5	710470.8	771341.9	774881.4
(b) Life Insurance Funds	3883609.7	3930727.6	4049902.5	3884771.5
(c) Currency	2010842.9	1984738.1	2071570.7	2232261.0
(d) Mutual funds	1404631.5	1412654.1	1468727.6	1197092.9
Financial Liabilities (a+b)	**6490282.2**	**6581453.0**	**6719168.2**	**7116266.3**
Per cent of GDP	*33.7*	*33.8*	*34.0*	*35.4*
Loans (Borrowings) from				
(a) Banking Sector	5268304.7	5326554.9	5448308.9	5648722.1
of which:				
i. Commercial Banks	4668496.4	4725631.3	4813008.7	5015222.9
ii. Co-operative Banks	513013.7	513764.2	542994.4	529720.6
(b) Other Financial Institutions	1221977.5	1254898.1	1270859.3	1467544.1
of which:				
i. Non-Banking Financial Companies	451922.3	474899.0	504829.7	703094.0
ii. Housing Finance Companies	673312.1	681405.2	665694.8	662601.7

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators (Contd.)

(Amount in ₹ Crore)

Item	Jun-2020	Sep-2020	Dec-2020	Mar-2021
Financial Assets (a+b+c+d)	**17850174.9**	**18408441.6**	**19129606.6**	**19979862.7**
Per cent of GDP	*93.9*	*97.6*	*99.7*	*100.9*
(a) Bank Deposits (i+ii)	9969728.5	10234251.8	10381289.0	10916446.4
i. Commercial Banks	9192702.5	9454736.2	9598294.8	10070025.7
ii. Co-operative Banks	777026.0	779515.6	782994.2	846420.7
(b) Life Insurance Funds	4102000.7	4274424.9	4551882.0	4718718.2
(c) Currency	2434693.7	2455980.6	2547436.6	2614237.0
(d) Mutual funds	1343752.0	1443784.4	1648999.0	1730461.0
Financial Liabilities (a+b)	**7321703.0**	**7360326.0**	**7529942.6**	**7921728.4**
Per cent of GDP	*38.5*	*39.0*	*39.3*	*40.0*
Loans (Borrowings) from				
(a) Banking Sector	5859727.5	5872939.2	6012326.7	6316427.4
of which:				
i. Commercial Banks	5226482.2	5239696.0	5380210.4	5622686.4
ii. Co-operative Banks	558551.1	558545.6	557545.8	608703.4
(b) Other Financial Institutions	1461975.5	1487386.9	1517615.9	1605301.0
of which:				
i. Non-Banking Financial Companies	687643.6	709270.7	725191.9	786518.0
ii. Housing Finance Companies	673118.3	675993.4	689041.8	714377.9

No. 50 (b): Stocks of Financial Assets and Liabilities of Households- Select Indicators (Concld.)

(Amount in ₹ Crore)

Item	Jun-2021	Sep-2021
Financial Assets (a+b+c+d)	**20533386.0**	**21086975.2**
Per cent of GDP	*97.4*	*98.1*
(a) Bank Deposits (i+ii)	11041250.0	11243083.5
i. Commercial Banks	10193308.0	10393467.7
ii. Co-operative Banks	847942.1	849615.9
(b) Life Insurance Funds	4894238.5	5105262.1
(c) Currency	2742897.3	2674266.1
(d) Mutual funds	1855000.1	2064363.5
Financial Liabilities (a+b)	**7793017.9**	**7972092.4**
Per cent of GDP	*37.0*	*37.1*
Loans (Borrowings) from		
(a) Banking Sector	6210676.9	6334917.7
of which:		
i. Commercial Banks	5524103.0	5650354.1
ii. Co-operative Banks	596687.9	603180.5
(b) Other Financial Institutions	1582341.0	1637174.6
of which:		
i. Non-Banking Financial Companies	755399.6	784279.7
ii. Housing Finance Companies	721510.0	745913.7

Notes: 1. Data have been compiled for select financial instruments only (loans from Banking Sector, NBFCs and HFCs) for which data are available.

2. Data as ratios to GDP have been calculated based on the Second Advance Estimates of National Income 2021-22 released on February 28, 2022.

3. Figures in the columns may not add up to the total due to rounding off.

Explanatory Notes to the Current Statistics

Table No. 1

1.2& 6: Annual data are average of months.
3.5 & 3.7: Relate to ratios of increments over financial year so far.
4.1 to 4.4, 4.8,4.9 &5: Relate to the last friday of the month/financial year.
4.5, 4.6 & 4.7: Relate to five major banks on the last Friday of the month/financial year.
4.10 to 4.12: Relate to the last auction day of the month/financial year.
4.13: Relate to last day of the month/ financial year
7.1&7.2: Relate to Foreign trade in US Dollar.

Table No. 2

2.1.2: Include paid-up capital, reserve fund and Long-Term Operations Funds.
2.2.2: Include cash, fixed deposits and short-term securities/bonds, e.g., issued by IIFC (UK).

Table No. 4

Maturity-wise position of outstanding forward contracts is available at http://nsdp.rbi.org.in under ''Reserves Template''.

Table No. 5

Special refinance facility to Others, i.e. to the EXIM Bank, is closed since March 31, 2013.

Table No. 6

For scheduled banks, March-end data pertain to the last reporting Friday.
2.2: Exclude balances held in IMF Account No.1, RBI employees' provident fund, pension fund, gratuity and superannuation fund.

Table Nos. 7 & 11

3.1 in Table 7 and 2.4 in Table 11: Include foreign currency denominated bonds issued by IIFC (UK).

Table No. 8

NM_2 and NM_3 do not include FCNR (B) deposits.
2.4: Consist of paid-up capital and reserves.
2.5: includes other demand and time liabilities of the banking system.

Table No. 9

Financial institutions comprise EXIM Bank, SIDBI, NABARD and NHB.
L_1 and L_2 are compiled monthly and L_3 quarterly.
Wherever data are not available, the last available data have been repeated.

Table No. 13

Data against column Nos. (1), (2) & (3) are Final and for column Nos. (4) & (5) data are Provisional.

Table No. 14

Data in column Nos. (4) & (8) are Provisional.

Table No. 17

2.1.1: Exclude reserve fund maintained by co-operative societies with State Co-operative Banks

2.1.2: Exclude borrowings from RBI, SBI, IDBI, NABARD, notified banks and State Governments.

4: Include borrowings from IDBI and NABARD.

Table No. 24

Primary Dealers (PDs) include banks undertaking PD business.

Table No. 30

Exclude private placement and offer for sale.

1: Exclude bonus shares.

2: Include cumulative convertible preference shares and equi-preference shares.

Table No. 32

Exclude investment in foreign currency denominated bonds issued by IIFC (UK), SDRs transferred by Government of India to RBI and foreign currency received under SAARC SWAP arrangement. Foreign currency assets in US dollar take into account appreciation/depreciation of non-US currencies (such as Euro, Sterling, Yen and Australian Dollar) held in reserves. Foreign exchange holdings are converted into rupees at rupee-US dollar RBI holding rates.

Table No. 34

1.1.1.1.2 & 1.1.1.1.1.4: Estimates.

1.1.1.2: Estimates for latest months.

'Other capital' pertains to debt transactions between parent and subsidiaries/branches of FDI enterprises.

Data may not tally with the BoP data due to lag in reporting.

Table No. 35

1.10: Include items such as subscription to journals, maintenance of investment abroad, student loan repayments and credit card payments.

Table No. 36

Increase in indices indicates appreciation of rupee and vice versa. For 6-Currency index, base year 2020-21 is a moving one, which gets updated every year. REER figures are based on Consumer Price Index (combined). The details on methodology used for compilation of NEER/REER indices are available in December 2005, April 2014 and January 2021 issues of the RBI Bulletin.

Table No. 37

Based on applications for ECB/Foreign Currency Convertible Bonds (FCCBs) which have been allotted loan registration number during the period.

Table Nos. 38, 39, 40 & 41

Explanatory notes on these tables are available in December issue of RBI Bulletin, 2012.

Table No. 43

Part I-A. Settlement systems

1.1.3: Tri- party Repo under the securities segment has been operationalised from November 05, 2018.

Part I-B. Payments systems

4.1.2: 'Others' includes e-commerce transactions and digital bill payments through ATMs, etc.

4.2.2: 'Others' includes e-commerce transactions, card to card transfers and digital bill payments through ATMs, etc.

5: Available from December 2010.

5.1: includes purchase of goods and services and fund transfer through wallets.

5.2.2: includes usage of PPI Cards for online transactions and other transactions.

6.1: Pertain to three grids – Mumbai, New Delhi and Chennai.

6.2: 'Others' comprises of Non-MICR transactions which pertains to clearing houses managed by 21 banks.

Part II-A. Other payment channels

1: Mobile Payments –
- Include transactions done through mobile apps of banks and UPI apps.
- The data from July 2017 includes only individual payments and corporate payments initiated, processed, and authorised using mobile device. Other corporate payments which are not initiated, processed, and authorised using mobile device are excluded.

2: Internet Payments – includes only e-commerce transactions through 'netbanking' and any financial transaction using internet banking website of the bank.

Part II-B. ATMs

3.3 and 4.2: only relates to transactions using bank issued PPIs.

Part III. Payment systems infrastructure

3: Includes ATMs deployed by Scheduled Commercial Banks (SCBs) and White Label ATM Operators (WLAOs). WLAs are included from April 2014 onwards.

Table No. 45

(-): represents nil or negligible

The revised table format since June 2016, incorporates the ownership pattern of State Governments Securities and Treasury Bills along with the Central Government Securities.

State Government Securities include special bonds issued under Ujwal DISCOM Assurance Yojana (UDAY) scheme.

Bank PDs are clubbed under Commercial Banks. However, they form very small fraction of total outstanding securities.

The category 'Others' comprises State Governments, Pension Funds, PSUs, Trusts, HUF/Individuals *etc.*

Table No. 46

GDP data is based on 2011-12 base. GDP data from 2019-20 pertains to the Provisional Estimates of National Income released by National Statistics Office on 29th May 2020. GDP for 2020-21 is from Union Budget 2020-21.
Data pertains to all States and Union Territories.
Total receipts and total expenditure exclude National Calamity Contingency Fund expenditure.
1 & 2: Data are net of repayments of the Central Government (including repayments to the NSSF) and State Governments.
1.3: Represents compensation and assignments by States to local bodies and Panchayati Raj institutions.
2: Data are net of variation in cash balances of the Central and State Governments and includes borrowing receipts of the Central and State Governments.
3A.1.1: Data as per RBI records.
3B.1.1: Borrowings through dated securities.
3B.1.2: Represent net investment in Central and State Governments' special securities by the National Small Savings Fund (NSSF).
This data may vary from previous publications due to adjustments across components with availability of new data.
3B.1.6: Include Ways and Means Advances by the Centre to the State Governments.
3B.1.7: Include Treasury Bills, loans from financial institutions, insurance and pension funds, remittances, cash balance investment account.

Table No. 47

SDF is availed by State Governments against the collateral of Consolidated Sinking Fund (CSF), Guarantee Redemption Fund (GRF) & Auction Treasury Bills (ATBs) balances and other investments in government securities.
WMA is advance by Reserve Bank of India to State Governments for meeting temporary cash mismatches.
OD is advanced to State Governments beyond their WMA limits.
Average amount Availed is the total accommodation (SDF/WMA/OD) availed divided by number of days for which accommodation was extended during the month.
- : Nil.

Table No. 48

CSF and GRF are reserve funds maintained by some State Governments with the Reserve Bank of India.
ATBs include Treasury bills of 91 days, 182 days and 364 days invested by State Governments in the primary market.
--: Not Applicable (not a member of the scheme).

The concepts and methodologies for Current Statistics are available in Comprehensive Guide for Current Statistics of the RBI Monthly Bulletin **(https://rbi.org.in/Scripts/PublicationsView.aspx?id=17618)**

Time series data of 'Current Statistics' is available at https://dbie.rbi.org.in.
Detailed explanatory notes are available in the relevant press releases issued by RBI and other publications/releases of the Bank such as **Handbook of Statistics on the Indian Economy**.

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