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QUARTERLY ECONOMIC AND CREDIT DEVELOPMENTS

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Any errors or omissions remain the authors' responsibility

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PART A: MACRO-SCAN

I. THIS QUARTER, WE REFLECT ON GLOBAL CHAOS AND INDIAN ECONOMY

SMITA ROY TRIVEDI

As the geopolitical situation worsens with each quarter, and larger questions of partisanship and dominance in international politics take shape, the more pressing concern remains our connected backyards. How far will it impact us? Can we emerge from the geopolitical mess around us unscathed?

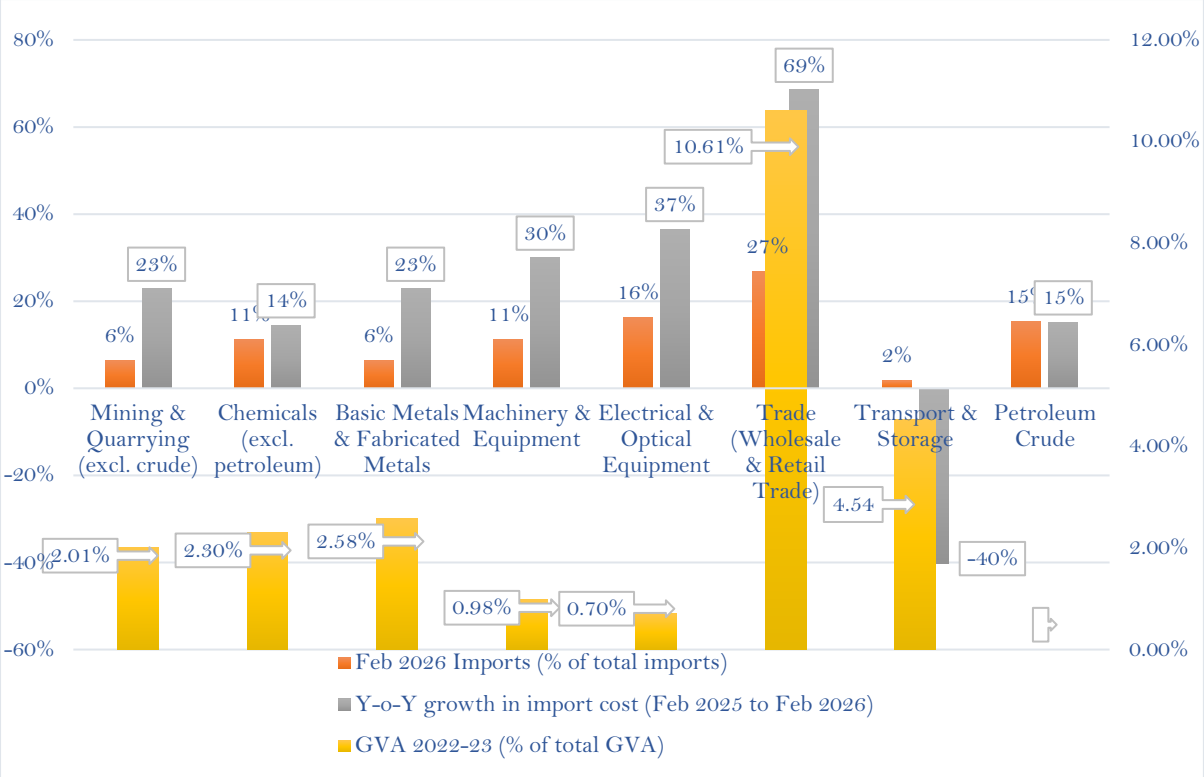
Does imports matter?

The global uncertainty and the " Triple Bind of Oil, Rupee and Trade" will impact the economy, as we have written here. We present an estimate of how much the impact is likely to be by comparing the spending on the most import-dependent sectors and examining their impact on GVA. Table 1 gives a detailed look at the Gross Value Added from these specific sectors and the import dependence. Data on sectoral economic activity is from the Reserve Bank of India's RBI KLEMS Database[2], and commodity-level trade data from Government of India's FTSPCC Trade Statistics portal[3].

For our analysis, we map the FTSPCC commodity codes to KLEMS sectors by grouping goods into economically comparable activities—for example, minerals and ores into mining, chemicals and plastics into the chemical sector, metals into basic metals, machinery and equipment categories into capital goods, and residual consumption goods into trade[4]. Petroleum crude and refined products are treated separately to separately see its impact on import cost, with the likely impact of the rise in crude seeping in transportations costs, production cost and living costs.

Figure I:A: GVA contribution and import cost of major sectors

[2] KLEMS provides gross value added (GVA) across industries based on inputs of capital, labour, energy, materials and services
[3] FTSPCC Trade Statistics portal reports monthly exports and imports by detailed commodity categories
[4] The mapping is done on a one-to-one, non-overlapping basis such that each commodity is assigned to a single sector, while ensuring consistency between trade data and GVA classification for analysis



Source: RBI, MOSPI, Author's calculations

Mining & Quarrying (excluding crude) accounts for 6% in February 2026, with a 23% year-on-year increase in import cost and a crucial GVA share of 2.01%. Chemicals, Basic Metals & Fabricated Metals, Machinery & Equipment, and Electrical & Optical Equipment together account for 44% in February 2026, with a combined contribution to GVA at 6.56%, signifying a high dependence on imports costs for these sectors. Trade (Wholesale & Retail Trade) accounts for 27% in February 2026, with a massive 69% increase in import cost, relative to a GVA share of 10.61%. Very likely, this sector will have crucial ramifications for both living costs and incomes for lower- and middle-income households.

Nearly 79% of India's imports are intermediate goods, highlighting the strong dependence of domestic production on imported inputs, with firm-level evidence showing foreign exchange spending at 25.5% of total sales in manufacturing (EXIM Working Paper, 2019). While policy emphasis has been placed on reducing import dependence, with 24 priority sectors including electronics, capital goods, and chemicals were identified under Make in India (DPIIT Annual Report, 2022-23), alongside public procurement provisions mandating 20–50% local content requirements to promote domestic value addition (DPIIT Annual Report, Ibid), the import costs suggest there has not been much headway in that.

Sectors that hold sway

A few pointers on the most vulnerable chinks in the armour now:

First, crude oil imports are about 80% of domestic consumption, also feeding into sectors like transport and power manufacturing will impact the most. Petroleum Crude accounts for 17% of imports in February 2025 and 15% in February 2026, with a 15% increase in import cost (Figure 1).

India's inflation remains obsessively sensitive to crude movements, with almost every episode of crude price escalation historically having led to destabilising price increases domestically. Consumer Price Index (CPI) climbed to a 13-month high of 3.4 per cent in March an increase from the 3.2 per cent recorded in February (Hindu Business Line, April 13. 2026) With crude oil prices rising sharply: crude spot crossing 140 in April 2026 (LSEG), another worrying trend is the 'rift in global oil markets' between physical crude trading at record highs and futures benchmarks (Reuters April 16, 2026)

Second, electronics is one of the most import-intensive sectors, with production highly linked to imported components like semiconductors and display units, which is likely to be impacted. Also in line are chemicals and chemical products, where imported intermediates are critical inputs: industry bodies (CII/FICCI) have repeatedly flagged dependence on China for these inputs as a major vulnerability.

Third, capital goods and machinery, metal-based industries show rising import intensity, particularly for high-grade inputs and specialised alloys. Capital goods and metal-based industries have experienced increasing import intensity over time, reflecting growing integration with global supply chains.

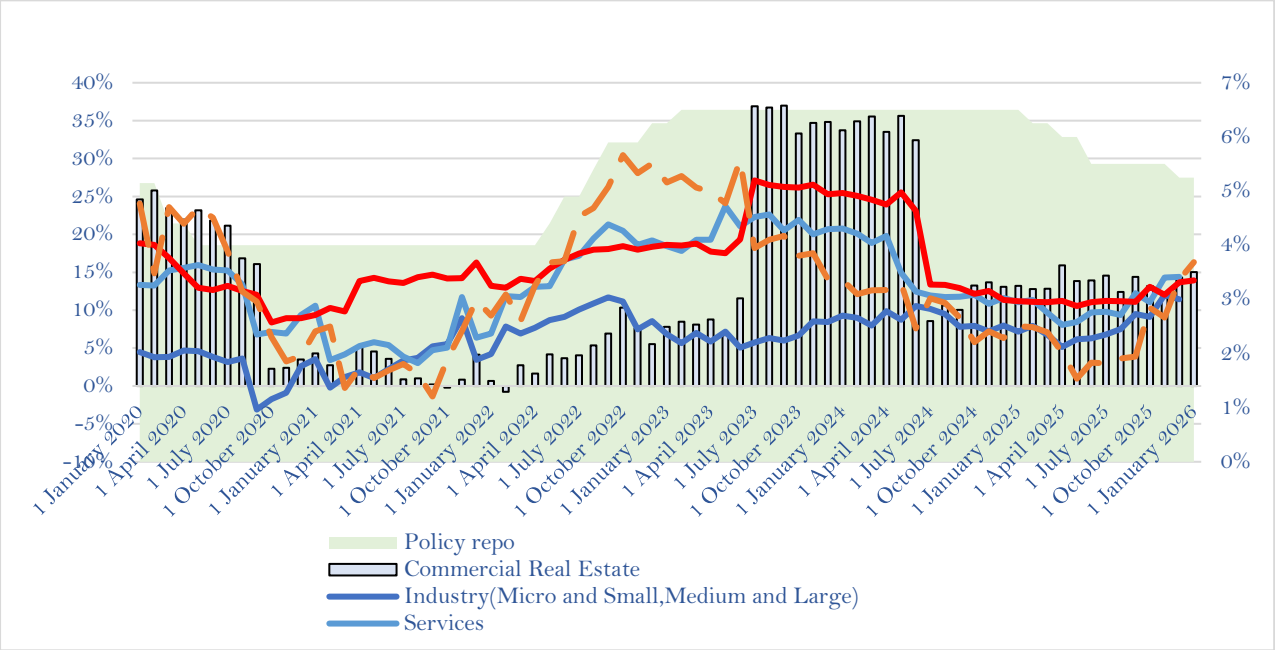
Do they matter to us?

Lending is the mainstay of banking and in the best and worst of times, it is lending that holds the banking ground. How do we lend to these sectors and how much will the banking sector be impacted by the exposure to these sectors? As we can see in Figure 2, the last one year, which saw series of repo rate cuts (shaded area) has been marked by good offtake in credit: industry has seen a sustained increase, but the highest growth has been noted in NBFC credit, followed by personal loans.

The growth in credit to industry is what needs to be sustained for a meaningful impact of the lower cost of capital.

Extending our analysis of the major sectors impacted by the geo-political tensions, we present now a detailed look at the share of each sector in total credit to the industry and the growth of credit pertaining to that sector. We look at the share of credit as on Jan 2026, and credit growth represents Y-o-Y growth for Jan 2026. The sectors highlighted in the preceding section: Chemicals, Engineering and Metals have a substantial exposure in terms of credit share, and robust credit growth which could be subdued if the global headwinds halt our tracks. An important trend is the reduced growth potential of credit to infra, which stands in contrast to its high, albeit declining share.

Figure I:2: Sectoral growth in bank credit



Source: RBI data, Author's calculations

Figure I:3: Share in total credit to industry and y-o-y credit growth in select sectors

Source: RBI

The approach to lending, therefore, given the global conditions should be positive yet cautious. Overoptimism of firms in face of global disarray needs to be calibrated by prudent lenders while lack of momentum in other needs egging. Stringent appraisal standards and consistent monitoring would remain the hallmark of good credit policy. The on-ground realities, as captured in our results of the NIBM lending perception survey presented in Micro-perceptions highlight this.

Carrying forward the story, argued by Balu Pawde in Section II, shows that realised GDP growth has consistently outperformed the expected GDP growth from SPF, showing a persistent gap between realised numbers and expectations in most of the variables. As highlighted, there is continuity without acceleration where growth remains resilient, and an indication that outcomes may slowly converge toward expectations. We highlight the external sector dynamics, iterating why rupee depreciation is expected and the linkage to crude prices (Section III).

On the Credit side, the growth has been majorly contributed by credit requirements of Industry (Micro Small Medium and Large Enterprises), followed by Services and Personal Loan segment as discussed by Elizabeth James in Section IV. Importantly, liquidity is being adequately maintained in the system, which would be crucial to keep the credit momentum. Debaditya Mohanti shows in Section IV liquidity conditions have been ample during Q4 FY2026, with surplus funds getting absorbed mostly through SDF, showing RBI's calibrated liquidity

operations were effective in keeping the overnight money market rates within the policy corridors.

The Financial markets reflect this concern with bond yields as presented by Yashveer Rawat in section VI. Equity markets have breached the lower bound of the up-trending channel which was in place since covid lows and On Nifty, 22100 may act as an important support for the market.

While the banking sector juggles with these macroeconomic dynamics, a revolution seethes underneath as banks gear up for the AI wave. We continue the story, with an insight from two seasoned industry experts in this issue. **Girish K. Palshikar and Manoj Apte write about use of Machine Learning techniques to detect instances of possible misinformation in semi-structured financial statements, which can be applied to other semi-structured financial documents like tax returns, invoices, Bill of Lading etc. (Section VI) .**

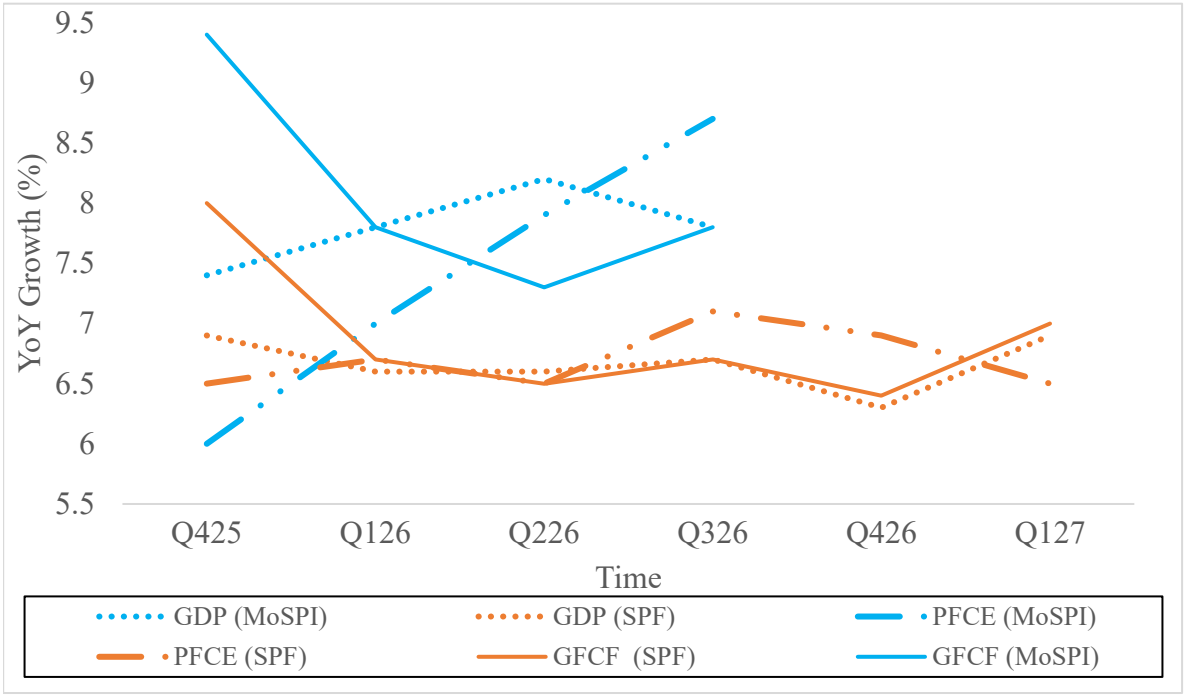
In Micro perceptions, we present the results of the pilot survey on lending trends, which highlights robust lending condition, yet some stress on the demand side. It also highlights a few key pointers about credit demand as gleaned through the qualitative interviews.

II. GROWTH AND INDUSTRIAL MOMENTUM

BALU PAWDE

This newsletter comes on the backdrop of revision in the national accounts methodology where the base year has shifted to 2022-23. This will incorporate richer administrative datasets such as MCA corporate filings, and GST. The new methodology adopts a double deflation to more accurately estimate real value added by separately deflating outputs and inputs. This enhances the precision of sectoral GVA measurement, especially in manufacturing and services, thereby improving the reliability of growth estimates and their interpretation for macroeconomic policy and analysis. The contents of this section follow up on the trends of economic growth, from the composition and sectoral view and what the trajectory may hold for the near-term performance, in the context of the discussion in the earlier issue of this newsletter. During Q3 of FY 2026, the real GDP grew at 7.8%, and the inflation was much below the target range of 2-6%. **Figure 1** tracks year-on-year growth in real GDP from MoSPI alongside projections from RBI's Survey of Professional Forecasters (SPF), while also plotting growth in Private Final Consumption Expenditure (PFCE) and Gross Fixed Capital Formation (GFCF) in both realised and expected terms. Over the observed quarters, realised GDP growth has consistently outperformed the expected GDP growth from SPF, showing a persistent gap between realised numbers and expectations in most of the variables discussed here and the realised numbers often outperform the expectations.

Figure 1. India's Recent GDP Growth



The internal composition of growth shows that the PFCE and GFCF both grew marginally. This growth is consistent with the SPF expectations in direction. The slight fall in the growth rate during Q2 and Q3 of FY 2026, can be observed despite Q2-Q3 increase in growth rates of GFCF and PFCE. The GFCE fell by 2.7% Y-o-Y in Q3. Figure 2 shows that the slight fall in the GDP growth during Q3 of FY26 was driven by the slowing growth of the services sector which grew at 9.5% during Q3 vis-à-vis 10.6% during Q2, a fall of 9 pp. The industry sector continued growing further at 9.7% during Q3 vis-à-vis 8.5% during Q2. The growth of agriculture sector fell to 1.4%. During Q2 and Q3 of FY26, the realised growth of industry and services continued to outperform the expectations of SPF, as they did during the Q1 and Q2. The realised growth in agriculture and allied sector however decelerated sharply while SPF projections for this sector remained relatively stable.

Figure 2. Sectoral Growth

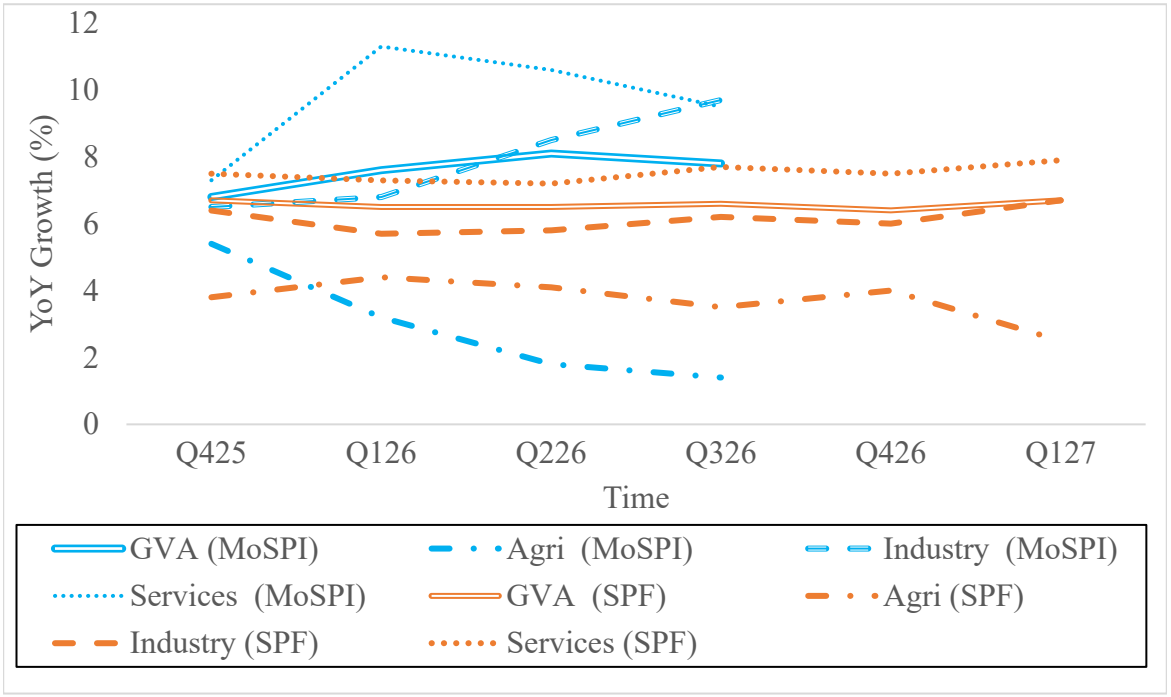


Figure 3 presents the expectations and high-frequency signals and bridges the gap between sentiment and output. All the PMI indices show a marginal slowdown during Q3 vis-à-vis Q2. In contrast, IIP growth plotted in the same Figure is upward, with highest growth around December 2025, before starting to fall in January 2026.

Inflation dynamics are presented in **Figure 4**. Although both headline CPI & WPI inflation have consistently fallen over the past year; Q3 of FY2026 onwards the inflation starts rising. WPI inflation continued hovering in the negative territory in Q3, but starts moving up in Q4. The realised CPI inflation starts to follow the SPF expectations closely during Q3 and Q4 and WPI inflation goes way above the SPF expectations in Q4. The rising inflation may affect the consumption and investment decisions going forward.

SPF projections extending into **Q4 FY26 and Q1 FY27** show GDP growth may pick up slightly, supported by growth in GFCF, although PFCE may moderate. Industry and services growth is expected to be stable, with agriculture growth slightly moderating. Inflation expectations show uptick, with both CPI and WPI based inflation expected to rise during Q4 and Q1 FY27. Taken together, the expectations point to **continuity without acceleration** where growth remains

resilient, and an indication that outcomes may slowly converge toward expectations. Subsequently, the credit demand may remain broad based but uneven with services and industry led growth supporting retail and MSME lending. Considering the expectations of higher inflation, we may expect commensurate interest rate movement.

Figure 3. Sectoral Growth

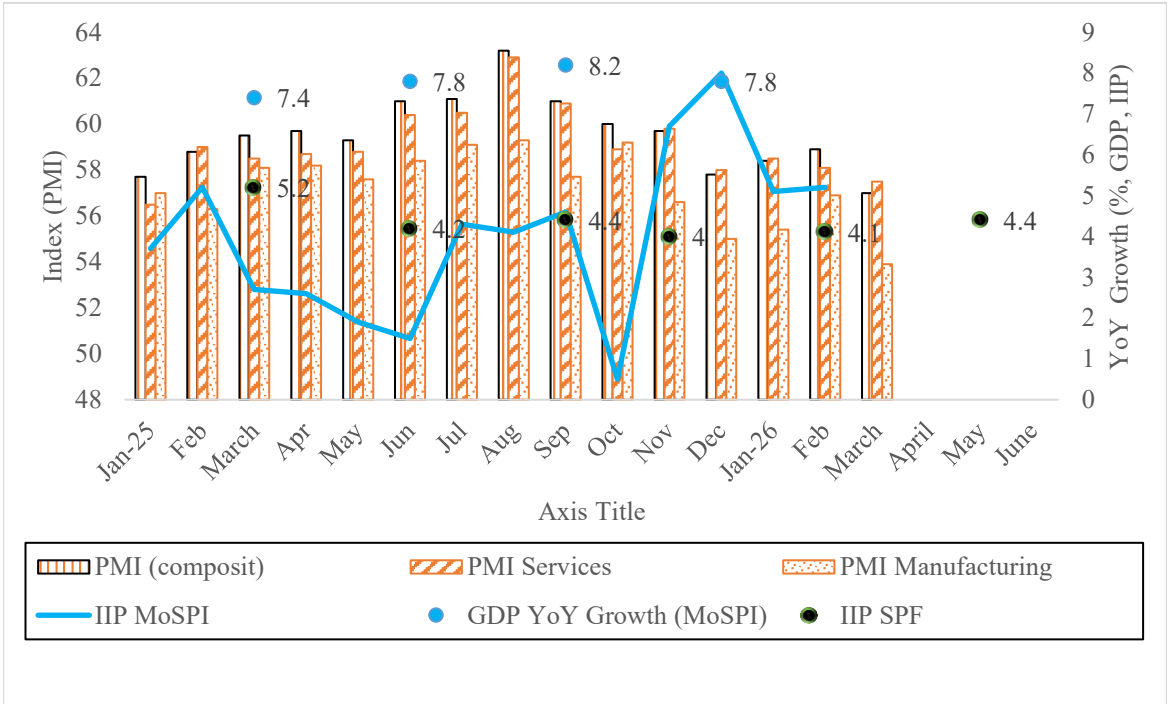
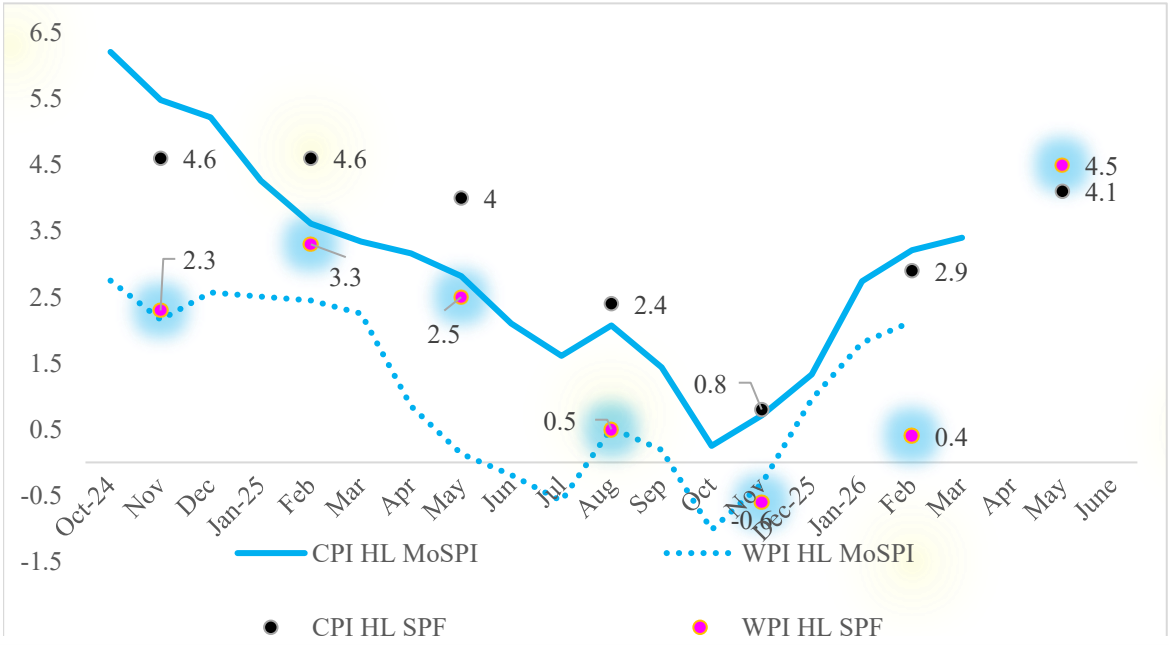


Figure 4. Inflation Dynamics



III. EXTERNAL SECTOR DYNAMICS

SMITA ROY TRIVEDI

On the external front, all eyes remain on the rupee in the last quarter with Indian rupee breached the 95 In April 2026. While the RBI intervention continues, including curbs on Indian financial institutions and corporate treasuries from taking bearish bets (Bloomberg, April 10, 2026), rupee continues to be vulnerable. Going forward, we expect this pressure to continue. First, as Figure III.A shows, there has been sustained deprecation in the currency from July 2025 onwards, which continued in tandem with the dollar weakening as seen from the DXY index movement. As rupee continues to hover on the 92-mark, the dollar index rising or finding support is likely to put pressure on rupee.

Figure III. A: Rupee and dollar index

Source: LSEG, Authors' annotations

Second, pressure on the trade balance will be driven largely by crude as shown in Figure III.B. Import demand is mostly being driven by crude, and have played a crucial role in the rupee fall. The cause remains India's energy dependency on crude: as on February 2026, in rupee terms, petroleum, crude & products constitute 20.36% of our import basket while petroleum products contribute around 9.36% to export earnings. Importantly this dependence of crude remains substantial despite years of policy focus on energy sufficiency, including bio-energy, green hydrogen and solar missions, and the build-up of strategic petroleum reserves. Therefore, easing crude

hassles and dollar demand from alternate trade partners, payment swaps, earmarking of reserves for crude, partial pass-through of price to consumers could be explored.

While RBI intervention in forex market has continued, there has been a growing concern on measures for intervention. Trying to stop speculation by such measures, may indeed backfire, as perceived divergence between policy intent and underlying fundamentals, reinforces one-way bets by market participants rather than deter them. Fighting speculation is akin to fighting shadows. Note that rupee was under unrelenting pressure much before the US-Iran war, notwithstanding India's real economy clocking an impressive over 8% growth and low inflation.

At this point, consistent and clear signalling is required. Following the 2013 episode, Rajan was successful in giving a clear signal on preventing "extreme volatility of the rupee", while not being "averse to adjustments" (Raghuram Rajan, 2014, Bloomberg TV). In August 2015, following Chinese devaluation and consequent extreme volatility in currency markets, the Governor's signal against competitive devaluations and rupee resilience worked well for allaying market fears. After 2013, this episode of oil prices spike is the first large macroeconomic supply shocks faced by the Government. Signals from the central bank that focus would be on making rupee fundamentally strong, without looking at value as such, might help at this point.

Figure III. B: Rupee, Crude and Dollar Index

Source: LSEG, Author's representation

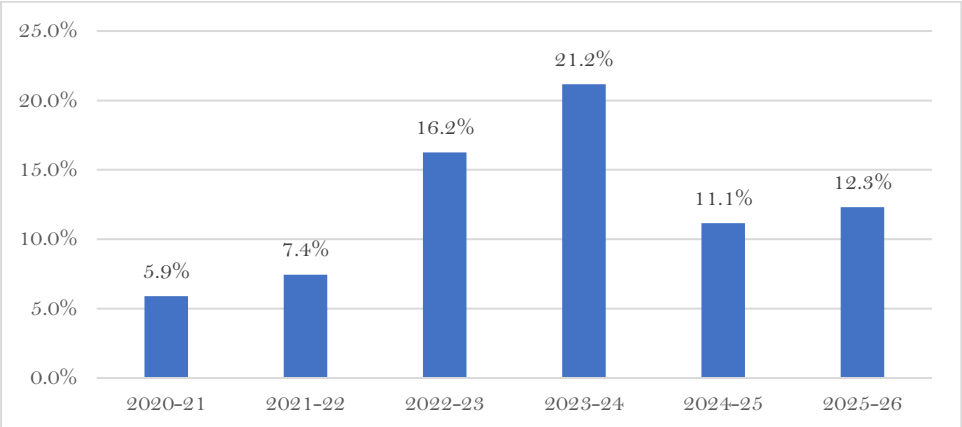
IV. DEPOSIT & CREDIT OUTLOOK: THE Q3 CREDIT SAGA

ELIZABETH JAMES

It is interesting to study the credit off take in Q3 of any FY which traditionally has been the festive season months, witnessing a spike in consumption. It is also the post monsoon season where agriculture credit picks up driven by purchase for kharif season. So have these "festive fuel" loaded months, given "credit power" to the lending institutions is revealed through the data analysis going further.

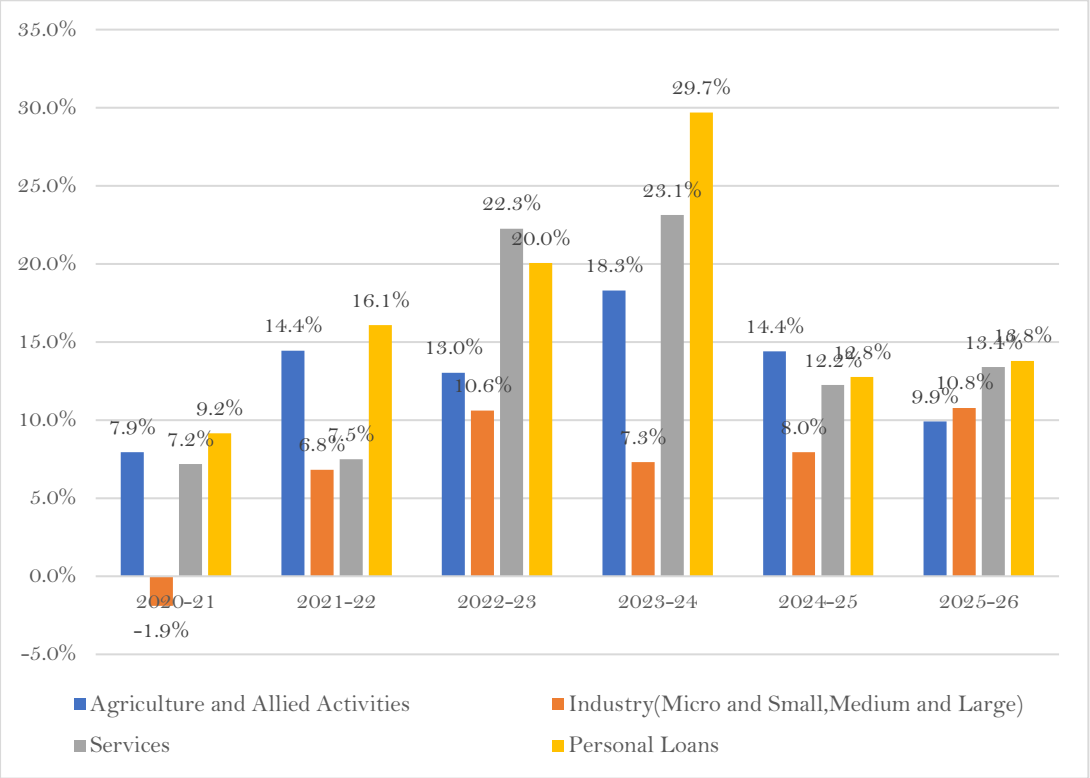
In totality i.e. the NFC (Non-Food Credit) from Q3 FY 2019-20, maximum growth has been witnessed in Q3 FY of 2022-23 to 2023-24 to the tune of 21.2%(Figure1). This is largely attributed to the vaccination coverage(COVID 19) that allowed consumers to spend money on contact-based services like bed and breakfast establishments, lodging facilities, shopping centers, the strengthening of corporate balance sheets, a well-capitalized public sector bank prepared to boost the supply of credit, the expansion of credit to the Micro, Small, and Medium Enterprises (MSME) sector, and growth in personal loans. Coming to the current scenario which is Q3 (2025-26) a growth of 12.3% was seen which was slightly higher than the 11.1% in previous Q3 (2024-25). An analysis into the components of NFC will give clarity on which component contributed to this increase. This growth has been majorly contributed by credit requirements of Industry (Micro Small Medium and Large Enterprises), followed by Services and Personal Loan segment respectively as per Figure 2 referred to as Big 3 in the paper.

Figure IV: A Y-O-Y Growth in Non-Food Credit (2019-20 to 2025-26)



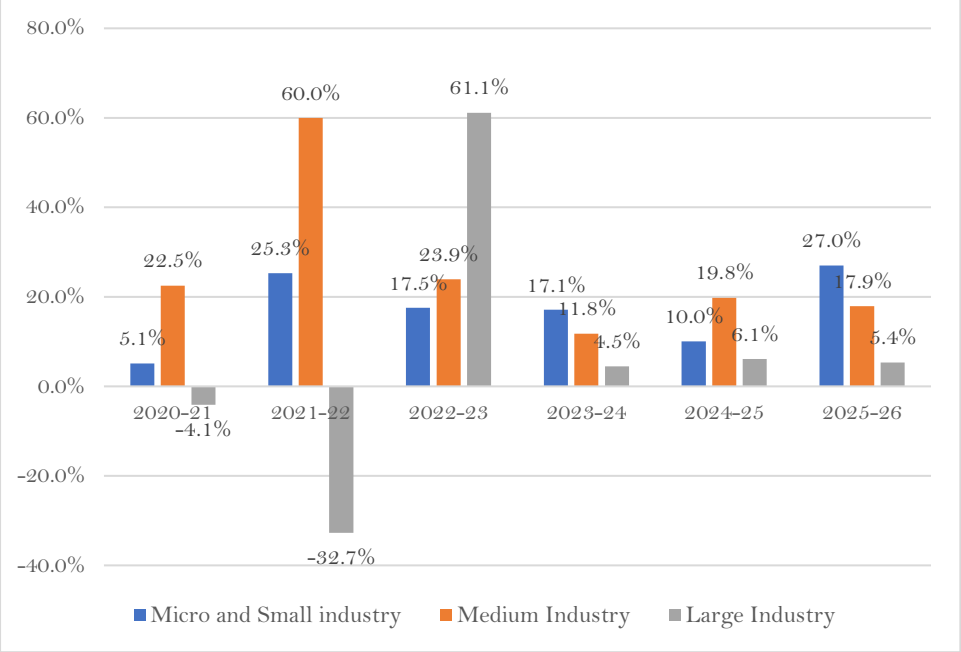
Source: RBI data, Authors calculations

Figure 2: Y-O-Y growth in components of Non-Food Credit(2019-20-2025-26)



Source: RBI data, Authors calculations

Figure 3: Y-O-Y Growth in the components of credit to Industry(2019-20 to 2025-26)



Source: RBI data, Authors calculations

Among these Big 3, when we further decipher for details, credit availed by Industry is the highest i.e. a rise from 8.0% in Q3 (2024-25) to 10.8% in 2025-26. Diving deep into the data shows that within the industry credit growth contributed by Micro and Small industries was the highest i.e. from 10.0% in Q3 (2024-25) it grew to 27.0% in 2025-26 as per Figure 3. The initiatives of the GOI (Government of India) to foster innovation, enhance competitiveness and better access to credit is only improving Y-O-Y for MSME with increase in credit guarantee covers, double guarantee cover for startups , cover for exporters , been a few recent initiatives. Hence the conducive environment is ensuring that the hunger pangs for credit are assuaged and the appetite for more credit by MSME is fanned.

The second among the Big 3 is the services sector. Continuing with the interpretations from Figure 2 we see that in Q3 (2023-24) the services sector growth was 23.1% which was the highest since Q3 (2019-20). A sizeable dip was seen in Q3(2023-24) to 12.2% majorly because of the unbridled growth in personal loans which invited curbs from the RBI (Reserve Bank of India) in the form of risk weights increase to 125% from 100% in bank lending to NBFCs (Non Banking Finance Companies). But Q3 (2025-26) showed not an impressive but slight improvement in growth to 13.4%. The sectors that attract more credit under services sector are Trade (Wholesale and Retail), Tourism, Hotels and Restaurants and NBFCs. The third among the Big 3 for Q3 (2025-26) is the Personal loan segment (Retail loans). Housing and personal loans, alongside credit card outstanding, are the growth drivers.

A loan that is making its mark is the gold loan which has seen growth since FY 2020 and soaring since FY 2024. The scenario is slightly worrying as these loans mainly (personal loans, credit cards and gold loans) are not constructive loans, hence canons of prudent lending should not be sidelined. Though the interest rates are high, but consumption loans still are the favourites, one of the reasons being no end use defined.

Credit to agriculture and allied activities had showed decent growth from 13.0% in Q3 2022-23 to 18.3% in 2023-24 (Figure 2)which was mainly due to favourable monsoon rains, government support schemes, and increased use of technology but was on a declining trend in 2024-25 to 14.4% and 9.9% in 2025-26 respectively.

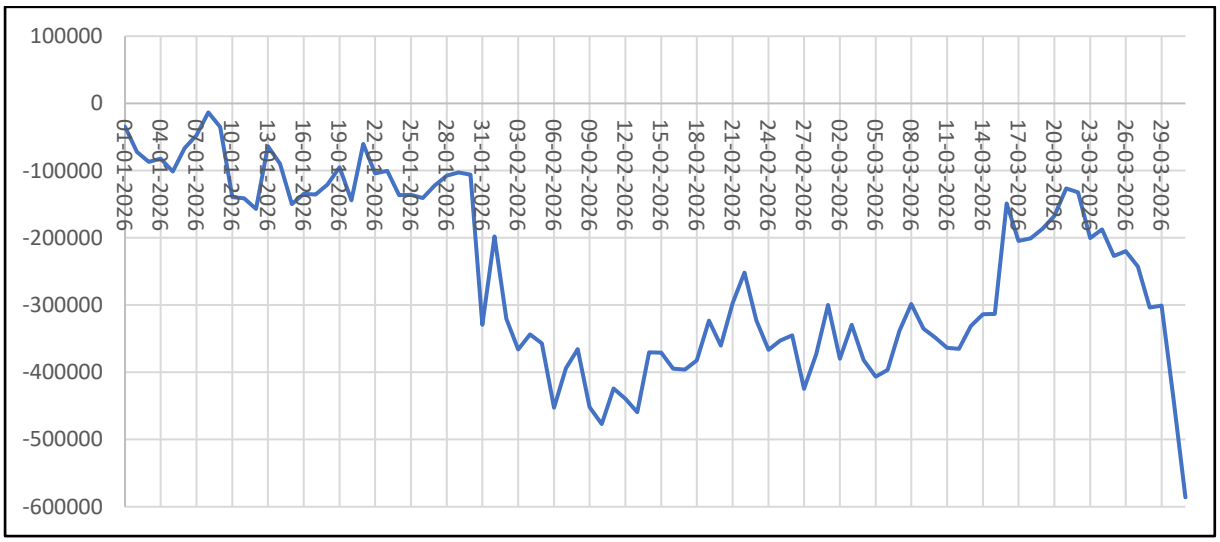
Ensuring financial security and better access to institutional financing for farmers continues to be a top policy objective for the government, as almost 46.1% of the population depends on agriculture and related businesses for their sustenance. To improve agricultural finance in this situation, a number of focused interventions have been implemented, with a focus on upgrading and growing the Kisan Credit Card (KCC).For a variety of agricultural needs, such as short-term crop cultivation, post-harvest operations, marketing-related costs, household consumption needs, working capital for farm maintenance, and investment credit for related and non-farm activities, the Revised Kisan Credit Card (2020) scheme aims to guarantee that farmers have access to sufficient and timely credit.

Overall, the picture remains the same in the sense that Micro and Small industries, Personal loans and loan to services sector remain the "face savers" in Q3 (2025-26) providing huge opportunity for banks to make them as strategic pillars for growth.

V. LIQUIDITY AND MONEY MARKET

DEBADITYA MOHANTI

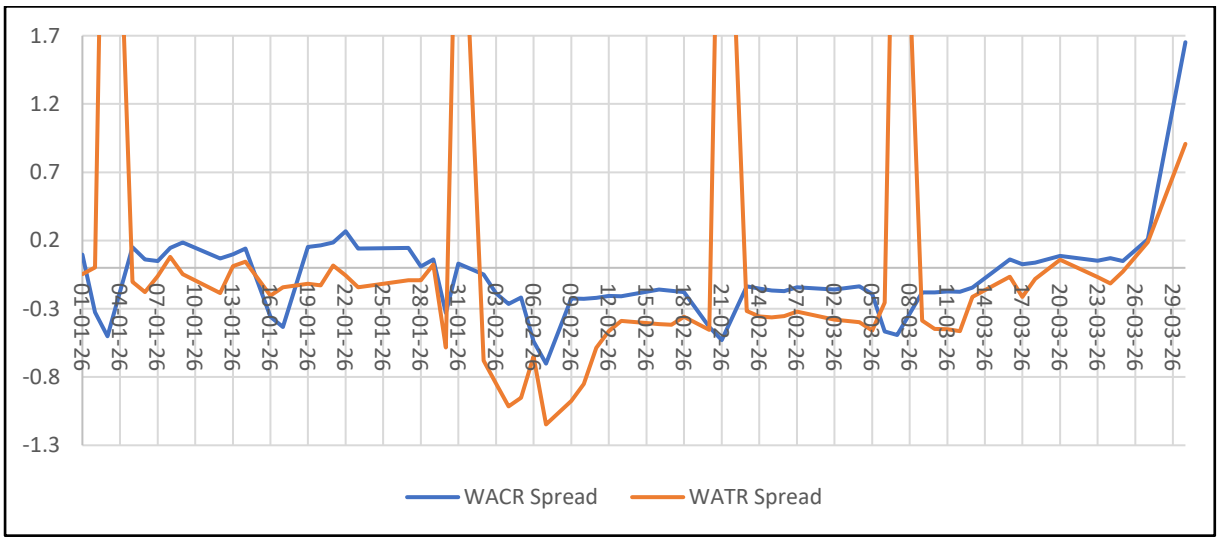
Figure V.A: Liquidity Operations by RBI: Net Injection (+)/ Absorption (-) Q4 FY2026



Source: RBI DBIE

Note: Net Liquidity Injection (+)/ Absorption (-) (includes LAF, OMO and others) in Rupees Crores

Figure V.B: Daily WACR Spread (over Policy Repo) and WATR Spread (over Policy Repo) Q4 FY2026



Source: RBI DBIE

Note: WACR: Weighted Average Call Rate and WATR: Weighted Average Triparty Repo Rate;

Vertical axis is in percentage

Table V.A: Summary Statistics

	Q4FY2026 (WACR Spread)	Q3FY2026 (WACR Spread)	Q4FY2026 (WATR Spread)	Q3FY2026 (WATR Spread)	Q4FY2026 (NLIQ)	Q3FY2026 (NLIQ)
Mean	-0.08	-0.09	0.02	0.28	-253428.58	-137781.93
Median	-0.15	-0.09	-0.20	-0.18	-297761.50	-152106.82
Maximum	1.65	0.31	5.19	5.25	-13405.00	59112.00
Minimum	-0.70	-0.49	-1.15	-0.47	-585965.00	-268926.28
Std. Dev.	0.31	0.19	1.21	1.43	134065.50	69465.32
Observations	63.00	68.00	63.00	68.00	90.00	92.00

Source: Author's estimates

Note: WACR Spread and WATR Spread (figures in percentage); NLIQ: Net Liquidity Injection (+)/ Absorption (-) (includes LAF, OMO and others) in Rupees Crores; Q4FY2026: Jan-Mar 2026 & Q3FY2026: Oct-Dec 2025

Liquidity Conditions and Money Market Signals in Q4 FY2026

Liquidity dynamics continued to reflect a surplus liquidity environment during Q4 FY2026 (Jan-Mar 2026). Figure V.A shows that the system liquidity has been consistently in the absorption mode. This indicates that surplus funds with the banking system are mostly absorbed by SDF, and also, there are hardly any instances of liquidity injection during this period. The average net liquidity absorption sharply rose to around Rs. 2.53 lakh crore, compared to about Rs. 1.38 lakh crore in Q3 FY2026. The median absorption has also deepened significantly in Q4, which again reinforces the surplus liquidity environment view.

From the Figure and the table, it can be observed that money market rates have been largely anchored to the policy rate during Q4 of FY 26. Figure V.B shows that the Weighted Average Call Rate (WACR) mostly hovered below the policy repo rate in Q4, barring a few instances. The summary table shows that the mean WACR spread stood at around –8 basis points in Q4 FY2026, compared to –9 basis points in Q3. This suggests that the WACR continues to be within the bounds of the policy corridor. However, volatility in call rates increased in Q4, with the standard deviation rising to about 31 basis points from 19 in Q3. This shows that while on average the call rate has been stable, there were relatively higher short-term fluctuations in overnight call markets in Q4.

Figure V.B and summary Table V.A show that the mean WATR spread declined about 2 basis points in Q4, from about 28 basis points in Q3. This shows that the WATR is closely aligned with the policy rate, similar to WACR rates. The standard deviation in Q4 showed some respite of 0.22 percentage points compared to Q3; however, it continued to be elevated at about 1.2 percentage points. This is due to the fact that there were some occasional spikes visible during Q4 with maximum spreads exceeding 5 percentage points. This suggests that while the Weighted Average Triparty Repo Rate (WATR) of the collateralized segment showed some moderation in average spreads in Q4, it continued to show significant volatility.

Overall, the evidence from the Figures and tables suggests that liquidity conditions have been ample during Q4 FY2026, with surplus funds getting absorbed mostly through SDF. RBI's calibrated liquidity operations were effective in keeping the overnight money market rates within the policy corridors. However, the relatively higher volatility in the WATR compared to the WACR continues to raise some concern in the collateralized funding segment.

VI. FINANCIAL MARKET DEVELOPMENTS

YASHVEER SINGH RAWAT

The Equity markets started new Calendar Year on a positive note with the Nifty touching the levels of 26300, however the sentiment turned negative towards the end of January as the markets went into the budget week. Although we had some positivity at the start of the Feb month in form of a trade deal agreement with US and the Budget but the market could not sustain and continued its selling spree. Mar 26 saw one of the biggest sell-offs in the Indian markets as the sentiment was further soured by the war in West Asia leading to closure of strait of Hormuz, which in turns has an impact on the countries Current Account Deficit due to increase import bill. The FII sold around Inr 122540 crore worth of securities in the Cash market whereas the DIIs bought Inr 142960 crore worth of stocks in the month of March. Going forward, while the global picture remain unclear, Indian equity markets may find some comfort from the lower valuations (PE of 20 as against the median PE of 22).

On technical Figures the markets have breached the lower bound of the up-trending channel which was in place since covid lows. The MACD indicator showing the lines moving apart along with an RSI of 44 suggest that the pressure to the downside may continue. 22100 may act as an important support for the market. In case, 22100 gets taken, we may see lower levels between 20200-20600.

Chart VI:A: Nifty movement

Source: LSEG

Bond markets saw some pressure on the yield on account of a huge supply of the State Development Loans. Various measures by the RBI to improve the liquidity

led to softening of money market yields with the TREPS rates falling much below the Repo rate. Buy back announcement however could not hold the longer end yields as they faced further pressure from increased borrowing from the central government as per the Budget document 2026. The sentiment further worsened in the month of March due to a spike in Crude oil prices after the war in west asia. This led to concerns on rising import bill and worsening Fiscal situation of the Government of India. The 10 Year yield s closed the year at a yield of 7.00%. Going forward the yields are expected to continue their upward trajectory as the global scenario still remains unclear due to the ongoing war and we may see levels of 7.40% on the 10-year security.

On Monthly technical Figures the 10-year benchmark (IN10YT=RR) have tested the upper bound of the symmetrical triangle and look to move further up. The MACD crossover further confirms the upside pressure. Expect the yields to move further up and test the levels of 7.40% in the next few months.

Chart VI:B: IN10YT movement

Source:LSEG

VII. TECHNOLOGY IN BANKING: EMERGING DEVELOPMENTS *[INVITED COLUMN]*

MISINFORMATION IN FINANCIAL STATEMENTS

GIRISH K. PALSHIKAR[5], MANOJ APTE[6]

A company summarizes its annual financial performance in carefully prepared semi-structured *financial statements (FS)*, like balance sheet (BS), profit-and-loss statement (P&L), cash-flow statement (CF) etc. These statements are prepared by adhering to guidelines such as *generally accepted accounting principles (GAAP)* and *international financial reporting standards (IFRS)*. Names of financial variables mentioned in FS and audit reports are influenced by norms, practices and standards within industries or nations. To facilitate comparison of FS across companies and across years, a hierarchical taxonomy of standardized classes of financial variables (called *categories*) is defined in the *eXtensible Business Reporting Language (XBRL)* standard. The Sarbanes-Oxley Act 2002 in US is designed to improve quality of financial reporting and public information disclosure.

FS are important in many practical applications, such as credit appraisal, risk analysis, taxation, investment decisions, regulatory compliance, corporate governance etc. For example, banks analyze FS of a corporate loan applicant for assessing its credit-worthiness. There are obvious incentives to hide, omit or falsify information in FS in order to misrepresent true financial health of the company. Methods of such creative accounting:

- reducing tax liabilities
- overstating assets, revenue or profits
- understating liabilities, expenses or losses (e.g., litigation costs, warranty obligations)
- delaying expenditures and advancing accounts receivables
- recording phantom inventory or inventory at bloated value
- nontransparent financial decisions such as investments and equity in joint ventures

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Misinformation in FS can have severe repercussions for stakeholders, including siphoning of money or goods, inability to compensate employees or suppliers, loan defaults, losses for investors, tax losses for government, damage to trust/reputation/goodwill, and even bankruptcy. It is difficult to estimate the extent to which misinformation is prevalent in FS. However, many large corporate frauds and bankruptcies (e.g., Enron 2001, WorldCom 2003, Satyam Computers 2009) were traced to accounting misinformation. For instance, WorldCom inflated the company's net income and cash flow by reporting a profit of $1.38B rather than a net loss in the first quarter of 2002. The company eventually went bankrupt.

An auditor validates and certifies that the financial data mentioned in the FS of a company is fair, accurate, free from material misstatement, and presented in accordance with the relevant accounting standards. If not, the auditor makes *adverse remarks* about potential instances of misinformation, frauds and other issues such as non-conformance, irregularities, inconsistencies, errors, inaccuracies, lapses, non-compliance, violations etc. Knowledge and experience of the auditor play a vital role to effectively detecting misinformation, which is a largely manual and effort-intensive process. At the first-cut, auditors detect misinformation using *red flags*, e.g., *inventory higher than sales*, *decrease in inventory turnover*, *increase in the cost of sales as a percentage of sales* etc.

Examples of auditor adverse remarks:

[1] Trade discount should have been netted off from Sales.

[2] Utilization of GDR proceeds for undisclosed purposes indicate violations of the FEMA Act.

[3] Management has not performed an impairment analysis on slow-moving consumer electronics which appear to be obsolete. In our opinion, the inventory value is overstated by Rs. YY.

[4] We were unable to obtain appropriate evidence regarding the existence of Accounts Receivable totalling Rs. YY from company ZZ.

Auditors validate data in FS of an individual company one-at-a-time, typically without referring to FS of other companies. However, nowadays, corpora of FS of many companies are available in public domain, often with associated audit reports[7]. This opens up the possibility of using ML based techniques for automatically detecting possible instances of misinformation in the given FS *F* of a particular company for a particular year, by "comparing" *F* with other FS in the corpus. Such techniques can be supplemented by eXplainable AI (XAI) techniques to generate an "explanation" of why the algorithm "thinks" there might be misinformation in *F*. Such techniques can only "point fingers" – actually validating whether the identified instances of misinformation in *F* are indeed so, needs to be investigated by an auditor or a forensic accountant.

There are usually only a few known instances misinformation and frauds in a FS corpus. Hence unsupervised ML techniques are useful. They work by representing each FS as a vector of financial variables (or ratios), and then comparing FS *F* of a given company, with that of a large set of peer companies in a given corpus of FS, and detect whether *F* is anomalous or unusual in a well-defined sense. The sense of what constitutes an unusual or anomalous is *not* specified in advance. If most FS in the corpus *D* are free of misinformation, then any FS that is "far away" from most of the FS in *D* is anomalous or unusual. Many such anomaly detection algorithms are available.

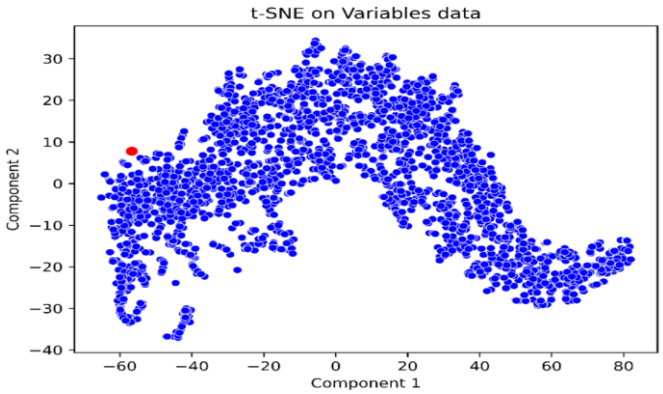

Figure 1. Visualization of FS of 4100 companies.

[7] See https://www.moneycontrol.com

Fig. 1 shows one particular FS (in red) which was flagged as "anomalous" in a corpus of FS of 4100 Indian companies. The auditors had already raised concerns regarding this FS, regarding overstatement of fixed assets and understatement of loss[8].

To conclude, ML techniques offer assistance to detect instances of possible misinformation in semi-structured financial statements. The techniques can be applied to other semi-structured financial documents like tax returns, invoices, Bill of Lading etc.

[8] https://www.tcs.com/what-we-do/research/white-paper/safeguard-organization-financial-mismanagement-fraud

LIST OF ABBRVIAITONS

- **DXY** – US Dollar Index
- **FII** – Foreign Institutional Investor
- **GATT** – General Agreement on Tariffs and Trade
- **GDP** – Gross Domestic Product
- **GFC** – Global Financial Crisis
- **GFCF** – Gross Fixed Capital Formation
- **IN10YT=RR** – Reuters Instrument Code (RIC) for India 10-year Government Bond Yield
- **INR** – Indian Rupee
- **MACD** – Moving Average Convergence Divergence
- **MoSPI** – Ministry of Statistics and Programme Implementation
- **OMO** – Open Market Operations
- **PCFC** – Pre-shipment Credit in Foreign Currency
- **PFCE** – Private Final Consumption Expenditure
- **RBI** – Reserve Bank of India
- **RSI** – Relative Strength Index
- **SPF** – RBI's Survey of Professional Forecasters
- **TREPS** – Tri-party Repo (Treasury Bills Repurchase) / Tri-party Repo Dealing System
- **WACR** – Weighted Average Call Rate
- **WTO** – World Trade Organization

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