

Investment Slowdown in India: Role of Fiscal-Monetary policy and Economic Uncertainty

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Abstract

The current study attempts to understand the determinants of investment and the underlying reasons for its current slowdown in India. For the purpose, we estimate the investment functions by using the ARDL bounds-testing approach on quarterly data from 2004-05Q1 to 2019-20Q1 at three levels - aggregate investment, private investment and private corporate investment. The study finds that aggregate investment can be explained by aggregate demand, fiscal policy, monetary policy, financial resources, exchange rate and uncertainty. Similarly for private investment, determinants include public investment, fiscal deficit, cost of capital, business confidence and uncertainty, along with measures for demand and financial sector developments. Finally, private corporate investment is found to be responsive to bonds market development, real exchange rate, debt service ratio, business confidence and economic uncertainty, besides the conventional variables. Thus, in order to counter the current investment slowdown, there is a need to make efforts for developing capital markets, strengthening monetary transmission, implementing appropriate fiscal policies and, reducing uncertainty in the economy.

Keywords: Investment, India, Fiscal Policy, Monetary Policy, Economic Uncertainty

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1. Introduction

Growth theories – endogenous, exogenous and institutional – suggest that investment and therefore, capital formation is one of the key drivers of productivity-led growth (Solow, 1957; Mankiw, Romer, Weil, 1992; Romer, 1986; Lucas, 1988; Grossman and Helpman, 1991; Rodrick, 2003; Acemoglu, 2009). The empirical evidence from both cross sectional and country specific studies clearly establishes the fact that countries with higher investment rates are, in general, more successful than those with low and volatile investment cycles (Krugman, 1994; Dougherty and Jorgenson, 1996; Hermes & Lensink, 2003; Li & Liu 2005; Zou, 2006; Sahoo and Dash, 2009; 2012; Dash and Sahoo, 2010; Topcu *et al.*, 2020;). Low investment makes an economy perform below its potential capacity which in turn hinders structural transformation and limits opportunities for the poor to improve their livelihoods (White, 2005; Sackey, 2007). Such implications have been noticed in the global economy post GFC when the period of investment boom facilitated by a credit boom and financial leveraging before 2008 ended. Since then, investment rates have decelerated across the world, including amongst developing countries. Investment growth decelerated from 10% in 2010 to around 3.5% in 2017 in emerging markets and developing economies (EMDE). Lower investment growth in the post-crisis period has undermined output expansion and standards of living across countries (Gordon, 2018; Ollivaud *et al.*, 2018; OECD, 2017).

The investment rate in India increased from 20% in the early 1990s to 25% in the 2000s as the period witnessed wide ranging policy changes focussed on globalisation, privatisation and deregulation, which were implemented to ensure higher productivity-led growth and prevent any further balance of payment crises like 1991. From 2003-04 to 2007-08, India experienced a boom period of investment mostly contributed by private corporate sector investment³. With the occurrence of GFC, corporate sector investment declined immediately after the GFC, however this was balanced by household sector investment which continued to increase till 2011-12, causing aggregate investment rate to peak at 34.3% in 2011-12. However, the investment rate has declined thereafter and fell to 30.8% in 2018 before marginal increase in 2019 (Sahoo and Bishnoi, 2021). This has happened, in spite of the stable economic fundamentals and various policy measures announced by Indian government on diverse fronts' viz. prudential monetary policy, fiscal policy, instilling confidence by ease of doing business, legal and regulatory frameworks, etc. This disconnect requires a systematic answer to the ongoing public debate of investment slowdown, and more importantly when it has already

³The investment rate of India witnessed a jump from 28 % to 34 % during this period and corporate investment rate contributed to this jump.

affected India's growth momentum (Economic Survey, 2017-18) and sustaining 7–8% economic growth in the medium term seems difficult with current state of the economy. Therefore, it is important to empirically examine the factors associated with this slowdown in investment and accordingly, design policies that can help revive investment in the economy.

Moreover, the decline has been attributed largely to household sector investment falling from 15.75% in 2011-12 to 11.26% in 2017-18 (Sahoo and Bishnoi, 2021). This phenomenon marks a difference among private investment, and thereby necessitates to examine the investment dynamics at disaggregate level so as to understand the nature of slowdown more comprehensively. There are studies highlighting the investment heterogeneity across institutions such as private investment including the corporate investment, and their varying response with the prevailing macroeconomic policy framework.

Most of the existing literature has concentrated on aggregate investment while examining the investment slowdown in India. There are numerous studies highlighting the investment heterogeneity across institutions such as private investment including the corporate investment, and their varying response with the prevailing macroeconomic policy framework. This necessitates to examine the investment dynamics at disaggregate level so as to understand the nature of slowdown more comprehensively. In the current paper, we mainly focus on private investment i.e., households and private corporate sector, assuming it to be more market oriented and, responsive to changes in policy shifts and the overall macroeconomic environment. Our study distinguishes itself from previous studies, both in terms of its methodological approach and contextual empirical treatment. One, in terms of analysing the investment dynamics at more disaggregate level especially the corporate sector in addition to aggregate and private investment, which has remained beyond the current literature in Indian context. Additionally, models used in the current study do not merely cover standard macroeconomic variables (such as output, monetary and fiscal policy, external sector etc⁴.) for studying investment behaviour, rather deepens the understanding about recent policy debates on the subject, while including various structural and financial factors like business confidence and uncertainty; monetary policy transmission; corporate debt overhang and financial sector development.

As such, the present study applies the ARDL bounds-testing approach over quarterly data ranging from 2004-2019. The time period chosen covers both periods of investment boom (2004-2011) and its subsequent slowdown in recent years (2012-2019). The period is also

⁴ Many policy debates have cited that the weak investment performance has been associated with terms-of-trade shocks; slowing capital flows; debt burdens; bad balance sheets in both financial and corporate sectors; and uncertainties arising out of rising protectionism and geopolitical issues.

sufficient to examine the effectiveness of different policy measures implemented by the Indian government to counter the adverse impact of economic shocks of the past decade. The period after the GFC has been marked by changes in the monetary and fiscal policies of the country, along with the introduction of various measures to improve its business environment. In this context, the objective of current study is to not only understand the underlying factors for the investment slowdown in India, but also draw possible policy implications for reviving investment and achieving higher growth in the country.

2. Determinants of Investment: Literature Review

2.1. Studies on Factors Affecting Investment

There are plethora of cross sectional and country specific studies (Blejer and Khan, 1984; Aschauer, 1989; Greene and Villanueva, 1991; Atukeren, 2006; Cavallo and Daude, 2011) that have explored the key determinants of investment at an aggregate level, as well as at the level of industries and firms. There exist four broad theories for explaining investment behaviour, namely, accelerator theory, neoclassical theory, Q-theory and liquidity theory. The accelerator theory postulates that firms' investments are governed by changing demand conditions in an economy and is thus, influenced by its aggregate level of output. On the other hand, neoclassical theory puts more emphasis on the marginal product of capital and the cost function, including rental cost of capital, as determinants of corporate investment. Similarly, Q theory – wherein 'q' represents the ratio of the market value of a company to the replacement cost of its assets – assumes perfect competition and hypothesises that an excess of market valuation over replacement cost encourages investment. Lastly, the liquidity theory of investment acknowledges the existence of market imperfections owing to asymmetric information between firm and funds suppliers, which may limit firms' access to external finances. In such a situation, the liquidity of firms generated through internal source of funds affects investment decisions (Fazzari *et al* 1988).⁵

The existing empirical literature has examined these established theories along with several other macroeconomic factors to understand the direction and magnitude of their effects on investment. One of the most crucial factors that affects private investment is *aggregate demand*, for which GDP or GDP growth is often used as a proxy (Wai and Wong 1982; Greene and Villanueva 1991; Fielding 1997). Besides output, studies have also investigated the impact of *monetary policy* and changes in the interest rate on investment, the results of which have been mixed. Theoretical literature suggests that higher interest rates increase the cost of

⁵https://www.rbi.org.in/scripts/bs_viewcontent.aspx?Id=2358

borrowing and thereby, limits investment activities. The hypothesis has been supported by several empirical studies such as the study by Wuhan and Khursid (2015), which used the case study of China to show that there was a negative relationship between interest rate and investment in the long-run. On the other hand, as per the McKinnon-Shaw hypothesis (1973), higher interest rates can incentivize foreign capital inflows and encourage savings through financial intermediaries, which can in turn raise investible funds in a phenomenon known as the “conduit effect”.⁶

Similarly, there are mixed empirical results when it comes to the effect of *fiscal policy* on investment. A set of studies (Blejer and Khan, 1988; Aschauer, 1989; Greene and Villanueva, 1991; Atukeren, 2006; Martinez-Lopez, 2006; Cavallo and Daude, 2011) established the crowding-in hypothesis, wherein higher public investment on infrastructure and other public goods- by creating an investment friendly environment and improving marginal productivity of private capital – encourages private investment. But expansionary fiscal policies requiring excessive government borrowings can lead to both real and financial crowding out and thus, a fall in private investment. Moreover, the rising deficit can lead to distortionary taxation which can further discourage private investment (Carlton, 1983; Plaut and Pluta, 1983; Bartik, 1992).

There have also been studies which have examined the effect of *inflation*- an indicator usually considered to be a barometer of economic stability – on investment. Results reveal that high inflation levels can raise concerns amongst investors about a potential fall in demand and hence, producing at excess capacity. As a result, firms may be reluctant to invest when inflation levels rise in an economy (Beaudry *et al.*, 2001; Caballero and Pindyck, 1996; Bloom *et al.*, 2001). Further, high and rising inflation lowers purchasing power and adversely affects the supply of financial resources. In addition, the studies by Choi *et al.* (1995); Byrne and Davis, (2004); and Dasilva-Filho, (2007), argue higher rates of inflation create uncertainty and tend to reduce the real rate of return on investments, leading to investment rates. In contrast, stable prices reduce uncertainty and allow for a more favourable allocation of resources. This is supported by some studies such as the one by McClain and Nicholes (1994), which found that there was a positive relationship between moderate inflation and corporate investment.

In addition, the access and availability of *financial resources* is another factor that impacts investment, as it bridges the credit gap and allows for the completion of long-run investment projects. The development of financial markets, particularly capital markets, facilitates investment through access to financial resources via bonds, debentures and equity markets. Developed financial markets are instrumental for ensuring efficient allocation of capital

⁶ An analysis of determinants of private investment in Zimbabwe for the period 2009-2011

through a competitive price mechanism and channelizing the same to productive investments (Ngerebo, 2006; Wai and Wong, 1982; Ghura and Goodwin, 2000; Ndikumana, 2000). In contrast, financial repression policies, in the form of significant directed credit controls, appear to have retarded private investment. This was found to be the case in a study by Ang (2009) which analysed the role of financial sector policies in determining investment in India and Malaysia. Similarly, Lim (2013) - who considered various institutional and structural factors as determinants of investment using a panel data of 129 countries in the period 1980-2009 – reported that financial development and institutional quality were essential for explaining cross-country differences in capital formation.

Besides domestic factors, some empirical studies have also looked at the impact of different *external factors* on investment, including, external debt, capital inflows, terms of trade (TOT), foreign direct investment (FDI) and exchange rates. The role of external debt emanates from the complementary effect that external financial resources can have on domestic savings and hence, investment; this is especially the case in many developing countries where savings tend to be low owing to lower income levels (Were, 2001). However, rising debt can lead to debt overhang, utilization of internal sources for debt servicing, financial distress, credit supply restrictions and high default probabilities, particularly in the times of financial turbulence, which eventually lowers investment (Bernanket *et al.*, 1999; Buseti *et al.* 2016). The role of external constraints - such as debt shock and debt service – can also influence private investment (Borensztein, 1990; Greene and Villanueva, 1991). Giordano *et al.* (2019) had analysed data for firms in Italy to find indebtedness, represented by debt overhang and debt-service ratio, has a dampening effect on private investment. Studies also have captured the role of external sector through TOT, using it as proxy indicator for external shocks or openness of an economy. Deterioration in TOT can take place either through an increase in import prices or a decrease in export prices. A rise in import process can increase the demand for money required to finance imports which can raise interest rates and thereby, lower investment. On the other hand, a fall in export prices suggests lower demand in the external sector which could cause firms to defer their decision to invest in the economy (Seruvatu and Jayaraman, 2001; Cuadrosetal., 2004; Alwafi, 2017). Degree of trade liberalization⁷ could have either positive (Balasubramany *et al.* 1996) or negative (Serven, 2002) effects on investment.

Similarly, the impact of FDI on investment could be either positive or negative. FDI inflows can lead to positive spillovers by improving access to advanced technologies, newer markets, better management and branding networks. As a result, the overall productivity of an economy

⁷<https://www.jstor.org/stable/pdf/40376191.pdf?refreqid=excelsior%3Ad858b741fbcd2929087d104a6823dec9>

increases which can stimulate domestic investment (Noorzoy, 1979; Chen *et al.*, 2017). However, FDI can also crowd out domestic investment if local firms are underdeveloped and as such, foreign firms have an undue advantage in the domestic economy in terms of their technological and managerial expertise. In addition, resources like skilled labour, fiscal resources, etc., may be limited in developing countries and local firms may be unable to compete with foreign firms for these resources (Jansen, 1995).

The impact of real exchange rate (RER) on private investment is also ambiguous. Currency depreciation boosts exports and through the multiplier effect, domestic output. As a result, firms may increase investment in the economy to take advantage of the higher domestic and foreign demand. At the same time, if the country is import dependent and its import content of the exports is high, depreciation can put pressure on its balance sheet by increasing the cost of imported inputs. The worsening fiscal situation accompanied by falling profits for firms (as production costs increase due to costlier imports) will dampen investment activities in the economy (Bahmani-Oskooee *et al.*, 2016). Additionally, currency depreciation affects investment as it changes the cost of capital raised in overseas market.

Lastly, recent empirical literature has identified business confidence and economic uncertainty to be key factors for investment. Using US business confidence survey data for 1955Q1–2016Q4, Khan and Upadhyaya (2019) concluded that business confidence has predictive ability for investment cycle. As investment is forward-looking, investors look at future expectations and prefer to channel resources to stable economies, where there is less ambiguity and arbitrariness in policy implementation. As uncertainty influences these expectations, irrespective of its source, it affects the decision to invest (Economic Survey, 2018-19).

2.2 Studies on the Investment Slowdown in India

Theoretical and empirical literature have examined the underlining reasons for the investment slowdown in the post-GFC era, both at the global and national levels. According to Banerjee *et al.* (2015), uncertainty about the future state of the economy and expected profits is the dominating factor governing investment, rather than financing conditions. Kose *et al.* (2017) find that the investment slowdown has been most pronounced among the large, so-called BRICS (Brazil, Russia, India, China, South Africa) economies and in commodity exporters. The plausible factor for slowing investment rate in many emerging market and developing economies, include, low economic activity and weak growth prospects; terms-of-trade shocks for oil exporters; slowing FDI inflows for commodity importers (in which foreigners take an ownership role); private debt burdens; and increased political risks. Weak growth in developed economies, such as the United States and EU countries, have also worsened growth prospects

in developing economies and hence, discouraged private investment in such economies. Further as given in the paper, rising financial market uncertainty and macroeconomic policy uncertainty after the GFC have also played an important role in slowing down investment.

There have also been several studies which have examined recent trends in investment behaviour and its various determinants in India. Chakraborty (2007) studied the crowding out effect of public investment in India for the period 1970-71 to 2002-03 and found that there was no crowding out of private investment; rather, there was complementarity observed between public and private investment. Results of the study concluded that other macroeconomic variables (including cost and quantity of credit, and the output gap) were not as significant as public investment, particularly public infrastructure investment, in determining private corporate investment in the medium and long term. In contrast, Bahal *et al.*, (2018) reported that while public investment crowded out private investment in India over the period 1950-2012, the opposite was true when they restricted the sample to post 1980 or conducted a quarterly analysis since 1996, marking a heterogeneous response of investment inter-temporally. There have also been state-wise studies such as the one by Malik (2012), who had empirically analysed the determinants of investment in 15 Indian states for the period 1993-1994 to 2004-2005. He observed that gross fiscal deficit, infrastructure development, labour productivity and market size were key factors for explaining inter-state differences in investment.

There have also been some recent studies on the investment slowdown in India. Tokuoka (2012) used macro and firm-level micro data to understand the importance of macroeconomic and structural factors in explaining the slowdown in corporate investment. From the macro data, it was evident that macroeconomic factors could largely explain the behaviour of private corporate investment in India, but could not fully account for the current downturn. This implied that the changing business environment also had a significant impact on corporate investment. Results from the microdata supported this observation as they found that factors such as business climate, cost of doing business, financial sector development and state of infrastructure were also important macroeconomic dimensions affecting the recent deceleration in investment in India, however study could not answer the monetary policy role of past decade. Similarly, Anand and Tulin (2014) identified the key factors for slowdown of investment in India using quarterly data for the period 1996 to 2012. According to them, changes in real interest rates accounted for only a fraction of the reduction in investment. Moreover, standard macro-financial variables also did not seem to completely explain the reasons for falling investment rates. Instead, the current economic slowdown could be attributed in large part to

deteriorating business confidence and rising policy uncertainty. Policy uncertainty had caused investors to defer or cancel new investments, resulting in a deceleration in investment.

Besides these two studies, an RBI study (2013) had observed that India's post-crisis period was characterized by low real interest rate and low investment, as compared to higher interest rate and higher investment levels of the pre-crisis period. The fact that investment rates continued to be low, in the face of lower interest rates, is due to the decline in marginal productivity of capital, or expected return on new investment in post-GFC period. Thus, poor expectations on rates of return have dampened the effect of interest rates on investment and discouraged private investors from investing. In this context, experts have underlined the role of lowering the nominal policy interest rate further, even when high inflation persists or inflation expectations remain high.⁸ Another recent study by RBI (2019) has reported that gross capital formation in India has decelerated since 2011-12 due to a slowdown in investment by the private sector. This slowdown is due to corporate deleveraging in select industries as reflected in the improving interest coverage ratios. The slowdown in investment activity was also evident from the decline in financial flows from banks and non-banks to the commercial sector.

In addition to key investment determinants such as economic size, interest rate and bank credit, Raj *et al.* (2018) found that the real investment rate in India followed a three-year cycle between 1950- 51 to 2017-18. The study hails that timely assessment of cyclical investment is required for correcting and following appropriate policy measures in order to safeguard against future slowdown. Dastidar and Ahuja (2019) analysed the investment slowdown in India using OLS method for data spanning from 1995-2017 and considered demand as well as supply side factors. The study found that uncertainty in the overall macroeconomic and business environment, demand-side factors (especially external demand), real interest rates, and the pace of public investments had significant impacts on private business investments in India. Bhardwaj and Kumar (2019) noted that size matters a lot for investment in the context of monetary policy channels- credit as well as interest.

Based on the above arguments and empirical evidences, it is clear that slowdown of private investment in India could be due to a host of factors such as output, fiscal policy, monetary policy, inflation, availability of credit, uncertainty, trade openness, real exchange rates, external debt, and more-importantly with varying magnitude and direction over the period of time. It may be noted that most empirical studies have relied on the accelerator model to explain investment behaviour. But the accelerator model may be better suited for advanced economies

⁸<https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/IDGSR08082013.pdf>

as it based on assumptions of perfect capital market, absence of liquidity constraints, and abstraction from role of government. Accordingly, past research has highlighted the role played by financial sector development, measured by activities of financial intermediaries and capital markets, towards the determination of investment in developed economies (Gurley and Shaw, 1955; Greenwood & Smith, 1997). However, in recent years financial sectors have advanced in developing economies and constraining factors of investment likewise imperfect capital markets, less liquidity, higher interest rate and poor mobilization of financial resources - have eased. These hygienic factors are well experienced by India also since the beginning of 21st century. Thus, there may be a need to revisit the suitability of the basic accelerator model for explaining investment behaviour in developing economies.

According to the existing literature, the investment slowdown in India can be linked to debt burden and tight financial markets (RBI, 2019), heightened levels of policy uncertainty and unfavourable business environment (Tokuoka, 2012; RBI, 2013; Anand and Tulin 2014); slower pace of public investment (Bahal *et al.*, 2018) and macroeconomic uncertainty attached with fluctuating external demand (Dastidar and Ahuja, 2019). Most of these studies also reported that the economic activity, real interest rate, fiscal deficit and bank credit were the major determinants of investment activity in India. But almost all the studies have focussed on investment at an aggregate level and as such, have not analysed the effect of these factors on institutional level investment, such as corporate investment. In addition, the literature has overlooked the role of various institutional and financial factors such as the credit gap; monetary policy transmission effect; bonds market development; business confidence; and economic uncertainty⁹. In this context, the current study bridges these research gap with the inclusion of multidimensional indicators in its empirical analysis in order to study the nature of investment behaviour in India more comprehensively.

3. Methodology

After an extensive literature review and a careful look at the recent debates on investment slowdown, we examine the roles of several economic dimensions – including, aggregate demand, fiscal policy, monetary policy, financial flows, twin balance sheet indicators, business confidence, economic uncertainty and external sector - in determining investment. We put special emphasis on private investment in general and corporate investment¹⁰ in particular, as

⁹Dastidar and Ahuja (2019) considered the news based policy uncertainty index, however plethora of studies have considered the precise measurement of uncertainty through cross-sectional dispersion in the subjective expectations of firms interviewed (Giordano *et al.*, 2019).

¹⁰ This investment is measured with private non-financial corporate sector. Financial corporate sector investment is dropped due to its negligence share in overall investment.

they tend to be more market oriented and hence, more sensitive to macroeconomic changes. Thus, we estimate the following investment functions (Eq-1 to Eq-3) assuming the heterogeneity of investment across institutions. The total investment function (TINV) is estimated as:

$$TINV_t = \beta_0 + \beta_1 output_t + \beta_2 GFD_t + \beta_3 NX_t + \beta_4 CG_t + \beta_5 X_t + u_t \quad (1)$$

Where TINV is investment rate at aggregate level, GFD is gross fixed deficit, NX is the exchange rate, CG is credit gap and X is a set of variables capturing the financial development, business environment, uncertainty and monetary policy pass through effects. The detailed list of variables is presented in annexure table A1.

Since the investment slowdown in India is attributed to private investment, we also estimate the private investment function (PINV) separately. Private investment is sensitive to monetary and fiscal policy changes and accordingly, the base model has been modified to include variables for these policy measures. In order to check the effect of crowding out/in phenomena, we use public investment as an alternate to the fiscal policy. For capturing the effect of monetary policy, we have used real lending rate as it represents the rental cost of capital. X includes the same set of variables as of the base model. Thus, the private investment function is:

$$PINV_t = \beta_0 + \beta_1 output_t + \beta_2 GFD/Pub_Inv_t + \beta_3 RLR_t + \beta_4 X_t + u_t \quad (2)$$

Within private investment, corporate investment is relatively more market oriented and sensitive to changes in the macroeconomic environment. Scholars have also expressed the view that the slowdown of private investment, particularly corporate investment, is due to the twin balance sheet problem (i.e., when there is financial stress in both corporate and banking sector simultaneously) that has plagued the Indian economy since the GFC. The overleveraging of the corporate sector after the credit boom period of 2003-08 and the twin balance sheet problems have put pressure on debt sustainability in the wake of weak growth prospects. Thus, for the corporate investment function (CINV), we have modified the base investment model to include more indicators for debt. The 'X' set of variables has been expanded to include variables such as corporate indebtedness, debt service ratio, real exchange rate and financial constraint through credit gap. As such, the corporate investment function is represented by:

$$CINV = \beta_0 + \beta_1 output_t + \beta_2 GFD_t + \beta_3 RLR_t + \beta_4 X_t + u_t \quad (3)$$

3.1. Selection of Variables and Data Sources

In our investment functions (Eq-1 to Eq-3), the dependent variable i.e., aggregate investment is measured as gross capital formation as percentage of GDP. As for the explanatory variables,

aggregate demand is measured by real gross value added; fiscal policy by gross fiscal deficit as a percentage of GDP; and monetary policy by real lending rate and transmission effect i.e., gap between lending and repo rate. Public investment is also considered to examine the argument of crowding-in or crowding-out.

Additionally, we analyse the effect of banking and capital market developments on investment in our model. For the banking sector, we consider credit gap (actual values as compared to the trend level) as percentage of GDP, which captures the mismatch between demand and supply of financial resources. For measuring capital market development, we have used two indicators:(i) corporate debt as percentage of GDP (that includes the financial resources generated through bonds, treasury bills, etc) and (ii) debt overhang or the difference between the actual series and the trend series (debt to GDP ratio for firms is “gap” indicator widely used in macro-prudential literature and by policymakers (see BCBS, 2010)) as a proxy for debt overhang. In one of the models, the combined effect of financial development measured as bank credit and corporate debt as percentage of GDP in combined form is utilized. Moreover, the study also examines the role of the debt service ratio which is measured by the amount of income used for interest payments and amortisations. As economic uncertainty and business confidence also matter for investment (Giordano *et al.* 2019; RBI, 2013), we include economic uncertainty (Business Outlook Survey, RBI) measured through cross-sectional dispersion in the subjective expectations of firms interviewed by RBI.

The study utilises quarterly data from 2004-05Q1 to 2019-20Q1. The period chosen has several advantages for understanding the determinants of investment in India. For one, it covers the two distinct phases of investment behaviour – the period of high investment growth (2004-2011) and the period of investment slowdown (2012-19). The time period also marks a period of several policy changes, including changes in monetary and fiscal policies, and, various measures undertaken to improve the business environment. Examining the response of investment to these changes can help us understand the effect of different macroeconomic variables on investment. The data sources used for our empirical analysis include World Development Indicators; Bank for International Settlement and International Financial statistics; various RBI publications, including the Handbook of Statistics on Indian Economy and; a publication by Business Outlook. A detailed explanation of these variables and their sources is provided in Appendix Table A1.

3.3. Method of Analysis

Stationary properties are important for time series analysis. Given the stationary properties of variables, the study utilizes the Autoregressive Distributed Lag Model (ARDL) bounds-test

approach to identify the plausible factors explaining the investment behaviour in India. ARDL approach to co-integration developed by Pesaran *et al.*, (2001) has advantages that it can be applied irrespective of integration properties of the variables (mixture of I(0) and I (1)) variables (Pesaran and Pesaran, 1997). The first step in the ARDL analysis is to test the degree of integration of each variable, and the method's suitability rest upon the condition of no second order integration for either of series. De Vita *et al.* (2006) noted that the dependent variable should satisfy the condition of integrated or order 1; however, this is not widely claimed in the current literature.¹¹

The ARDL approach to co-integration involves the estimation of the following model:

$$\Delta Y_i = \beta_0 + \sum_{i=1}^p \psi_i \Delta Y_{t-i} + \sum_{i=1}^p \phi_i \Delta X_{t-i} + \sum_{i=1}^p \phi_i \Delta Z_{t-i} + \theta_1 Y_{t-1} + \theta_2 X_{t-1} + \theta_3 Z_{t-1} + u_t \quad \dots\dots\dots (1)$$

Where β_0 is drift term, Y is the dependent variable, X and Z are explanatory variables and u_t denotes the error term.

ARDL approach is a two steps process where our first concern is to identify the long-run relationship among the underlying variables using F-statistic and then estimate the coefficients of long-run relations in case of the existence of long long-run equilibrium relations between dependent and independent variables. If the long-run relationship exists then following error correction model is estimated:

$$\Delta Y_i = \beta_0 + \sum_{i=1}^p \psi_i \Delta Y_{t-i} + \sum_{i=1}^p \phi_i \Delta X_{t-i} + \sum_{i=1}^p \phi_i \Delta Z_{t-i} + \alpha ECM_{t-1} + u_t \quad \dots\dots\dots (2)$$

The error correction model (ECM) result indicates the speed of adjustment back to long-run equilibrium after a short-run shock.

4. Empirical Results and Discussion

4.1. Empirical Results of Unit Root and Cointegration Tests

The results of the unit root and cointegration tests are reported in Annex Table A2 & A3. The results of the Augmented Dickey Fuller (ADF) test reveal that most of the series are non-stationary at the level form except public investment, corporate investment, private non-financial sector credit, gross fiscal deficit and business confidence. However, all the series exhibit stationary behaviour at the first difference (Table A2).

As for the results of cointegration tests, the F-statistic and t-statistic are found to be significant when we consider aggregate investment as the dependent variable and all other variables as

¹¹<https://www.mdpi.com/2227-7099/7/4/105/htm>

explanatory variables, thereby confirming the long-run relationship at level form of the selected variables (Table A3). The evidence of long-run relationship suggests that aggregate demand, financial resources, exchange rate, monetary policy and fiscal policy are relevant for explaining aggregate investment behaviour in India. In case of private investment, there is long-run relationship between private investment and the variables included in the base investment function viz. output, fiscal deficit, and real lending rate. In subsequent models, business confidence, economic uncertainty, public investment and exchange rate also seem to have a co-integrating relationship with private investment. For the private corporate sector, investment is jointly explained by these macroeconomic variables along with other indicators for bonds market development, real exchange rate, debt service ratio, business confidence and economic uncertainty.

4.2. Long-Run Analysis of Determinants of Investment

4.2.1. Aggregate Investment

The estimation results for aggregate investment functions are reported in Table 1. The coefficient value for lagged error-term is negative and statistically significant in all the models suggesting that any disequilibrium in the past quarter is adjusted to the equilibrium level in the long-run. The output variable representing aggregate demand in the economy has a statistically significant and positive coefficient. The coefficient value indicates that 1% increase in output would lead to expansion in investment in the range of 0.42% to 0.54%. The finding is in accordance with the accelerator principle of investment theory, and thereby slower expansion in output in past decade can be regarded as key factor for lower investment rate. India's growth trajectory has been slowing over the last six years and reached its lowest level in 2020-21 as the Covid-19 pandemic had a devastating effect on aggregate demand. All the major components of aggregate demand - consumption, private investment and exports have been witnessing deceleration over the last few years (Sahoo and Ashwani, 2020).

Gross fiscal deficit is an indicator of fiscal policy and economic stability. Expansionary fiscal policies are expected to have positive impact on investment by improving marginal productivity and boosting domestic demand. This dimension holds positive and significant coefficient values in case of Models T2 & T3. The finding supports the crowding-in effect phenomenon of public expenditure, as reported by Chakraborty (2007) and Bahal *et al.*, (2018) in the Indian context. The post-crisis investment slowdown was accompanied by moderate levels of deficit as there has been some fiscal consolidation in recent years to curb inflation. The suitability of accelerator principal coupled with crowding-in effect clearly indicate that the revival of rural demand through fiscal policy is another important agenda.

Real interest rate is found to have a positive coefficient value in accordance (Model T4) with ‘McKinnon-Shaw’ hypothesis. The theory postulates that higher rates stimulate savings and create enough room for enhancing the liquidity position of credit delivery in the system and thus, boosts investment. We also capture the role of monetary policy transmission effect (Model T3) through the difference between lending and repo rates, the coefficient for which is found to be negative and significant. This indicates that the lack of monetary policy transmission does not help investment and the rise in the gap between the lending and repo rates rises has slowed down investment. In the post-GFC period, lending rates did not move in tandem with monetary policy benchmark rates as, banking and financial institutions found it difficult to pass on the benefits of an accommodative monetary policy due to increased financial stress, bad balance sheets and other efficiency criteria. In other words, lowering benchmark rates may not necessarily lead to expansion of investment in the absence of a proper monetary policy transmission mechanism. Therefore, creating a competitive and efficient financial development model for better transmission effect is a policy option. In such circumstance, the reduction in lending rate in the presence of lower inflation seems a viable policy suggestion to revive the corporate investment. But the same rests on the improved monetary policy transmission where India’s central bank has put special emphasis. Some of the policy suggestions have come in the form of ensuring the availability of efficient payment and settlement system, liquidity management especially in accordance to the demand and supply, integrated financial markets for better arbitrage processes and the capitalized banking system (Acharya, 2020), liquidity-enhancing interventions (Goyal, 2019) and recapitalization of banks (Muduli and Behra 2020). Here considering the empirical findings of our study, the key policy suggestion is that there must be address to resource mismatch issue as banks hesitate to fund amid growing NPAs and potential firms face capital shortage. There is need to have a mapping of surplus funds with those of the capital deficient but potential firms. We need to strengthen the intuitional capabilities for realizing this objective. Moreover, there is need to understand the dynamics of banking structure and its implications on their performance. The policies and regulatory environment promoting the healthy competition in the banking industry is much needed to enable the efficient-structure hypothesis for wider monetary policy transmission.

Model T4 puts emphasis on financial variables as determinants of investment along with the conventional indicators. The credit gap variable, a proxy for financial sector and availability of credit, has positive and significant coefficient value (Model T4) suggesting that positive credit gap (actual credit being higher than the trend level of credit) is associated higher investment. India has experienced very high positive credit gap before the GFC, a period which also

witnessed substantial increase in investment rate. However, the credit gap became negative after GFC, more so since the 2014 asset quality review, which has affected investment negatively. Therefore, credit gap is an important factor for explaining the recent slowdown in investment. As under Model T4, it is also observed that rising debt-gap have significantly negative impact on investment, thereby supporting the arguments put forth in the liquidity theory of investment. This finding offers a policy suggestion for increased liquidity into the system either through the loose monetary and fiscal policy and also to utilize the corpus of funds generated through the scheme like sovereign gold bond for strengthening the NBFCs and banking capital base eventually providing the funds for potential business entity in the economy. For catch-up, the liquidity into construction projects can boost the investment rate as this sector is contributing larger chunk of overall investment in India. However, the liquidity in manufacturing sector which is more prone to the spill-over effect with the rest of the sectors, requires more attention for investment revival.

In Model T3, we used an alternative variable for financial sector development given by the sum of bank credit and corporate debt expressed as percentage of GDP; the coefficient of variable was found to have expected sign but was statistically insignificant. This could be an upshot of the overleveraging of the corporate sector in India which made both banks and the corporate sector cautious about debt sustainability after the GFC. The construction sector, particularly investment in construction by household sector, has also declined substantially (almost 5% of GDP) due to falling property prices, bad balance sheets of companies and new regulations. This may have further discouraged the household sector from accumulating debt for construction type of investment activities.

Coming to the external sector, exchange rate is found to affect investment negatively implying that depreciation leads to lower investment. The possible reason for this is that depreciation makes imports costlier and make the business environment less conducive for accessing foreign resources, be it in the form of foreign investment or overseas financial borrowings. Moreover, depreciation increases price of imported goods - which are mostly inputs and intermediate goods in the Indian case - thereby potentially decreasing domestic investment due to a reduced profit margin. Although currency depreciation can increase domestic investment due to increased domestic and foreign demand as exports become relatively cheap, evidence shows that India has not been particular successful as an exporter. Infact, India has experienced negative exports for few quarters in last decade. Therefore, falling exchange rates could not help in sustaining higher growth in exports as compared to imports, and accordingly, the import side effect of currency depreciation on investment tends to dominate.

Lastly, the coefficient values for economic uncertainty (significant and negative) and business confidence (positive and significant) are found to be as expected. Economic uncertainty forces economic agents to defer investment, while improved business confidence motivates investors to cash-in on untapped economic activities. Our findings are in line with the Anand and Tulin (2014), who concluded that increased uncertainty and low business confidence have adversely affected investment in India.

Table 1: Long-run Analysis: Aggregate Investment

<i>Model T1</i>		<i>Model T2</i>		<i>Model T3</i>		<i>Model T4</i>	
Variable	Coefficient	Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
Speed of Adjustment							
<i>LI.</i>	-0.569*	<i>LI.</i>	-0.514*	<i>LI.</i>	-0.662*	<i>LI.</i>	-0.910*
Long-run							
<i>LOUTPUT</i>	42.53*	<i>LOUTPUT</i>	44.22*	<i>LOUTPUT</i>	44.67*	<i>LOUTPUT</i>	54.56*
<i>GFD</i>	0.394	<i>GFD</i>	0.515**	<i>GFD</i>	0.215*	<i>GFD</i>	0.252
<i>NX</i>	-0.462*	<i>NX</i>	-0.407*	<i>NX</i>	-0.601*	<i>NX</i>	-0.294*
<i>CREDIT_GAP</i>	0.045	<i>CREDIT_GAP</i>	0.078	<i>FDI</i>	0.017	<i>CREDIT_GAP</i>	0.541*
<i>EU</i>	-35.58**	<i>BC</i>	0.201***	<i>LR_REPO</i>	-0.716*	<i>DEBT_GAP</i>	-0.440*
				<i>EU</i>	-11.135	<i>REAL_LR</i>	0.199*

Source: Authors' Computation, Note: EU: Economic uncertainty, BC: Business confidence, Note: *, **, *** indicate the statistical significance at 1, 5 and 10% level, respectively,

4.2.2. Private Investment

The estimation results of private investment functions are reported in Table 2. The negative and significant coefficient value for past error term confirms the movement towards equilibrium in the long-run from the current disequilibrium. Similar to the aggregate investment, the output variable representing the demand side of the economy is statistically significant and positive (Models P1-P4). Thus, aggregate demand is a key factor in explaining private investment.

On the fiscal policy front, we find contrasting results with fiscal deficits having a positive effect (Model P3) and public investment having a negative effect (Model P4) on private investment. A larger government size matters for investment due to its effect on aggregate demand. In the aftermath of the financial crisis, there had been a decline in aggregate demand which is one of the major reasons for the economic slowdown and hence, investment in India. In such a situation, the higher fiscal deficit helped support large social programmes which boosted aggregate demand and investment in the economy. However higher public investment can raise

interest rates and limit financial resources for the private sector, which can crowd out private investment.

Similarly, private investment responds negatively to increases in real interest rates (Models P1, P2 and P4), even though increases in interest rate seems to positively impact aggregate investment. The reason being that aggregate investment includes public investment which is not purely guided by market principles whereas, private investment is sensitive to market dynamics as firms strive to maximise their profits. As per neoclassical theory, higher interest rates increase the cost of capital for private firms which discourages private investment. After the GFC, there has been an upward surge in real interest rate due to moderation of inflation rate. As such, the real interest rate does not matter much for private investment under normal circumstances. However, higher interest rate, accompanied by rising uncertainty, lack of aggregate demand and twin balance sheet problems, is certainly not conducive for private investment. Thus, higher real interest rate is relevant for private investment as it affects the policy scope for maintaining lower lending rates.

Amongst other variables, exchange rate has a significant and negative coefficient value (Model P4) which shows that depreciation lowers private investment. The Indian industry continues to be heavily dependent on imports for many of its inputs and intermediate products including, raw materials, machinery and equipment, oil etc. Depreciation increases the cost of such imports, affecting the profitability of private sector firms and hence, their willingness to invest. Similarly, economic uncertainty is also found to dampen private investment (Models P1, P2 and P4) and this finding is in line with the recent literature (Anand and Tulin, 2014). Economic uncertainty, business confidence and overall business climate are indicative of investors' expectations about rates of return and future growth prospects and as such, are essential for determining private investment. Finally, the indicator for the bonds market (Model P3) has a positive but insignificant value. Private investment includes household investment, but the household sector does not access funds directly through the bonds markets. Thus, developments in the bonds market have little bearing on household investment. Its effect on corporate investment has been elaborated in the next sub-section.

Table 2: Long-run Analysis: Private Investment

<i>Model P1</i>		<i>Model P2</i>		<i>Model P3</i>		<i>Model P4</i>	
Var.	Coefficient	Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
Speed of Adjustment							
<i>LI.</i>	-0.37*	<i>LI.</i>	-0.53*	<i>LI.</i>	-0.42*	<i>LI.</i>	-0.38*
Long-run							

<i>LOUTPUT</i>	9.66*	<i>LOUTPUT</i>	10.68*	<i>LOUTPUT</i>	8.99*	<i>Loutput</i>	36.99*
<i>GFD</i>	0.64	<i>GFD</i>	0.35	<i>GFD</i>	1.24*	<i>Pub_inv</i>	-1.42**
<i>RLR</i>	-0.52*	<i>RLR</i>	-0.47*	<i>RLR</i>	-0.24	<i>Rlr</i>	-0.52*
<i>EU</i>	-79.23*	<i>BC</i>	0.29*	<i>EU</i>	-93.28*	<i>Eu</i>	-41.25*
				<i>DEBT</i>	0.15	<i>Nx</i>	-0.35*

Source: Authors' Computation, Note: EU: Economic uncertainty, BC: Business confidence, RLR: Real lending rate, Debt: corporate debt (% of GDP), NX: Nominal exchange rate, Note: *, **, *** indicate the statistical significance at 1, 5 and 10% level, respectively

4.2.3. Private Corporate Investment

The results for the long-run analysis of private corporate investment are reported in Table 3. As with other components of investment, an increase in aggregate demand has a positive effect on private corporate sector investment in accordance with the accelerator principle of investment. After the GFC, and especially after 2012, the slowdown in growth has adversely affected demand and thereby, prospects for capacity expansion or new investments for the corporate sector. Infact, India's corporate sector has been suffering from excess capacities across industries for several years now.

However, unlike aggregate and private investment, rising fiscal deficit has a negative impact on corporate investment (Model C4). This may be due to the real and financial crowding out of private corporate investment as there is an increase in public investment. More importantly, monetary policy transmission effect has a significant and negative value (Model C4). It can be argued that the poor pass-through effect of monetary policy has been the reason for continuing slowdown in corporate investment, even when monetary policy rates were lowered. Thus, there is a need for a competitive financial system that ensures effective monetary policy transmission effect.

Amongst financial variables, credit-gap has a positive influence on private corporate sector investment (Models C2-C4), as evident from the positive and significant value of its coefficient. This clearly supports the idea that the slowdown of corporate sector investment is due to lower or negative credit gap, mostly due to the twin balance sheet problem. Moreover, the development of bond markets has a positive and significant effect on private corporate investment (Model C1) as it improves access to financial resources. In addition, the current study makes an attempt to understand how investment is affected by balance sheet indicators of the corporate sector, especially with respect to debt sustainability. For the purpose, we have considered debt-service ratio which indicates the utilisation of profits for interest payment of owed debt. The value of its coefficient is negative and significant (Model C3), indicating that rising debt pressure prevents the corporate sector from expanding their business activities.

In the external sector, real exchange rate has a significant and negative impact (Model C3) on private corporate investment, similar to aggregate and private investment. India is an important dependent country when it comes to essential inputs and intermediate products. Therefore, depreciation of exchange rate makes imports costlier and dampens private corporate investment. As for economic uncertainty and business confidence, they are also found to be significant determinants of corporate investment in India.

Table 3: Long-run Analysis: Corporate Investment

Model C1		Model C2		Model C3		Model C4	
Variable	Coefficient	Variable	Coefficient	Variable	Coefficient	Variable	Coefficient
Speed of Adjustment							
L1.	-0.618*	L1.	-0.701*	L1.	-0.698*	L1.	-0.748*
Long-run							
<i>LOUTPUT</i>	3.564**	<i>LOUTPUT</i>	21.70**	<i>LOUTPUT</i>	39.55*	<i>LOUTPUT</i>	12.472**
<i>GFD</i>	-0.100	<i>GFD</i>	-0.067	<i>GFD</i>	-0.038	<i>GFD</i>	-0.149***
<i>REAL_LR</i>	-0.013	<i>DSR</i>	-0.134	<i>DSR</i>	-0.793***	<i>CREDIT_GAP</i>	0.237*
<i>EU</i>	-3.367	<i>CREDIT_GAP</i>	0.275**	<i>CREDIT_GAP</i>	0.413*	<i>RX</i>	0.053
<i>DEBT</i>	0.173***	<i>RX</i>	-0.058	<i>RX</i>	-0.200*	<i>LR_REPO</i>	-0.292**
		<i>EU</i>	-13.44***	<i>BC</i>	0.211*		

Source: Authors' Computation, Note: EU: Economic uncertainty, BC: Business confidence, Debt: corporate debt (% of GDP), RX: Real effective exchange rate, *, **, *** indicate the statistical significance at 1, 5 and 10% level, respectively

5. Conclusion & Policy Suggestions

The objective of the study was to empirically investigate the major determinants of investment and understand the underlying reasons for its current slowdown in India. For the purpose, we considered various dimensions including aggregate demand, fiscal policy, monetary policy, financial development, external sector and prevailing business environment. We estimated the investment functions using quarterly data from 2004-05Q1 to 2019-20Q1 at three levels - aggregate investment, private investment and private corporate investment - for a comprehensive understanding of the direction and magnitude of the factors affecting investment. Results of our empirical analysis show that determinants of aggregate investment include aggregate demand, fiscal policy, monetary policy, financial resources, exchange rate and uncertainty. Similarly, for private investment, the determinants include public investment, fiscal deficit, user cost of capital and, business confidence and uncertainty, along with measures for demand and financial sector developments. Finally, private corporate investment is found to be responsive to bonds market development, real exchange rate, debt service ratio, business confidence and economic uncertainty in addition to the demand side and liquidity in the economy.

On the basis of the analysis, it can be argued that investment slowdown in India can be attributed to the unfavourable business environment and higher economic uncertainty of the post-GFC era. Increasing uncertainty and deteriorating business confidence has caused investors to defer or cancel new investments. The global crisis took a toll on the aggregate demand of the Indian economy which has led to a deceleration in investment since 2012. The problem has only been exacerbated with demonetisation and implementation of GST. There has also been a move towards fiscal consolidation and higher real interest rates in recent years which has definitely not helped the issue. Moreover, there also seems to be a shortage of financial resources for corporate sector investment, as evidenced by the twin balance sheet problem that has been plaguing India for several years now.

Thus, there is a need to focus on private investment for reviving investment in the country. Private investment is composed of household and corporate investment. Corporate sector investment may be boosted by developing financial markets. While the corporate sector has gradually started using bonds and capital markets, there is requirement for more financing options which can help fill the rising credit gap and provide the corporate sector access to financial resources at reasonable prices. Such a competitive financial system could also pave the way for more a robust monetary transmission effect which can increase investment. In contrast, the household sector relies on financial institutions from the banking and non-banking sector for household investment. As such, there should be emphasis on resource allocation through fiscal policy with more funding to the MSME sector and empowering financial intermediaries to create a spillover effect for propelling the investment by addressing the resource mismatch issue which can be better understood with micro level analysis of investment. The suitability of the accelerator principal in the Indian case clearly indicates the revival of rural demand through fiscal policy is another important agenda. Lastly, there needs to be continuous efforts on the part of the government to improve business confidence and reduce economic uncertainty for reviving investment in India.

Appendix A

Table A1: List of Selected Variables

Dimension	Measurement	Description	Variable Impact Channel	Source
Aggregate Investment	Real GFCF as % of GDP	GFCF_GDP		NAS
Private Investment	Real private GFCF as % of GDP	PRIVATE_GFCF		NAS
Corporate Investment	Real corporate GFCF as % of GDP	COR_GFCF		NAS
Aggregate Demand	Real Gross Value Added BY 2011-12 (Log value)	LOUTPUT	The accelerator theory underscores that firms' investment is a response of changing demand conditions and influenced by level of output in the economy.	NAS
Fiscal policy	Fiscal Deficit as % of GDP	GFD	Crowding-in as well as crowding-out effect	RBI
Monetary policy rate	Real Lending rate (% , Lending- CPI Inflation)	REAL_LR	The neoclassical theory of investment weighs more to the cost function including rental cost of capital as determinants of corporate investment	IMF & OECD
Monetary policy transmission	Lending rate excluding repo rate	LR_REPO	Monetary policy transmission effect. The falling gap suggests the bank efficiency and lowers the cost of capital which increases investment	IMF & (RBI)
Financial development	Credit plus corporate debt to Private non-financial sector (% of GDP)	FDI	It indicates the channelization of savings into investment. Enhanced credit to non-financial sector indicates the removal of market imperfections arising due to asymmetry of information between firms and funds suppliers	BIS
Financial resources constraint	Credit gap % of GDP (Non-financial corporate)	CREDIT_GAP	It indicates the mismatch between the financial resources from the trend line and higher gap on negative side results to the short-fall of funds	BIS
Bonds market development	Non-financial Corporate debt to GDP (%)	NFC_DEBT	Deep and liquid bond market potentially serves as an efficient channel to intermediate savings into investments. Better financial system composed of banks, equity and bond market helps in the efficient allocation of capital through competitive price mechanism	BIS
Funds utilization for debt purpose	Debt Service Ratio (Private non-financial sector)	DSR	Measure the amount of income used for interest payments and amortisations.	BIS
Debt overhang	Debt gap % of GDP (Non-financial corporate)	DEBT_GAP	Effect of debt overhang resulting from excessive leverage which limits the investment expenditure amid utilization of internal sources for debt servicing, high default probabilities and leading to financial distress	BIS
External sector	Nominal/Real Exchange Rate	NX/RX	Currency depreciation is generally expected to increase domestic investment due to increased domestic and foreign demand as exports become relatively cheap, leading to a healthy economic environment, thus to an increase in domestic investment. At the same time, depreciation impacts the price of imported variable inputs as well as the price of imported investment, potentially decreasing domestic investment due to a reduced profit margin.	BIS
Uncertainty	Economic Uncertainty	EU	Surges in economic policy uncertainty increase the systematic risk, and thereby the cost of capital in the economy. As a result, higher economic uncertainty lowers investment, especially because of the irreversibility of investment.	RBI
Business confidence	Business Confidence index	BC	Dasgupta and Lahiri (1993) show that business sentiments have explanatory power of forecasting business cycle turning points. Taylor and McNabb (2007) find that business confidence is procyclical	RBI

			and plays an important role in forecasting output downturns.	
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Table A2: Unit-root Test

Variable	Level Form		First Difference	
	Statistic	P-value	Statistic	P-value
GFCF_GDP	-3.167	0.022	-10.945	0.000
Pub_GFCF	-3.140	0.024	-8.920	0.000
Private_GFCF	-2.661	0.081	-9.645	0.000
Cor_GFCF	-3.225	0.019	-7.660	0.000
Loutput	-0.882	0.794	-8.120	0.000
GFD	-8.742	0.000	-12.520	0.000
Real_lr	-2.035	0.2716	-7.871	0.000
LR_Repo	-1.826	0.368	-6.839	0.000
FDI	-4.313	0.0004	-8.492	0.000
Credit_gap	-0.981	0.760	-8.810	0.000
Debt	-2.725	0.070	-6.391	0.000
DSR	-0.703	0.846	-2.750	0.066
Debt_gap	-2.493	0.117	-6.381	0.000
NX	-0.251	0.932	-7.418	0.000
RX	-2.028	0.274	-6.384	0.000
EU	-2.542	0.1055	-7.208	0.000
BC	-2.969	0.038	-9.442	0.000

Source: Authors' Computation

Table A3: Co-integration Relationship: Bounds-Test

Function	F-statistic	P-value	t-statistic	P-value
Aggregate Investment				
$gfcf_gdp = F(loutput, gfd, nx, credit_gap, EU)$	8.184	0.001	-4.220	0.042
$gfcf_gdp = F(loutput, gfd, nx, credit_gap, BC)$	5.714	0.011	-4.431	0.029
$gfcf_gdp = F(loutput, gfd, nx, real_lr, credit_gap, debt_gap)$	8.373	0.000	-5.398	0.006
$gfcf_gdp = F(loutput, gfd, nx, FDI, lr_repo, EU)$	12.288	0.000	-5.867	0.002
Private Investment				
$Private_Investment = F(loutput, gfd, real_lr)$	5.144	0.034	-3.914	0.038
$Private_Investment = F(loutput, gfd, real_lr, BC)$	4.986	0.034	-4.392	0.022
$Private_Investment = F(loutput, real_lr, EU, nx)$	5.352	0.021	-3.71	0.081
$Private_Investment = F(loutput, gfcf_public_gdp, real_lr, EU, nx)$	5.526	0.013	-4.435	0.032
Private Corporate Investment				
$Corporate_Investment = F(loutput, gfd, real_lr, EU, NFC_Debt)$	4.937	0.024	-5.216	0.007
$Corporate_Investment = F(loutput, gfd, dsr, credit_gap, rx, EU)$	3.900	0.072	-4.725	0.026
$Corporate_Investment = F(loutput, gfd, dsr, credit_gap, rx, BC)$	5.026	0.021	-5.175	0.011
$Corporate_Investment = F(loutput, gfd, credit_gap, rx, lr_repo)$	5.488	0.017	-5.013	0.010

Source: Authors' Computation

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