Balance Sheet Effect of Real Investment

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1. Introduction

The old debate on the relation between interest rate and investment seem to be back in Indian policy space. Private sector and the central government want softening of interest rate, on the presumption that borrowing cost negatively affects the demand for capital and durable consumer goods. On the other hand, monetary authorities does not want so, as that may harden inflation and fuel further inflationary expectation. It was widely speculated that the wish of the central government will be reflected in monetary policy, once the new governor assumes office, but it did not materialise fully.

The debate is excessively preoccupied with the downward sloping demand for capital goods (and consumer durables) with respect to borrowing cost (interest rate). The debate often overlooks the fact that interest rate is not the sole determinant of the level of investment[1]. If it were, the level of investment would remain unchanged most of the time as interest rates are often policy driven and are changed infrequently. Therefore the policy debate must be carried out looking beyond the usual investment demand schedule. This paper tries to do so by offering a different perspective.

In the relevant literature (see section 2 below) - in understanding the relation between stock of liquidity and the level of investment - the causation begins from a change in stock of liquidity. In Keynes's General Theory (1936), changes in nominal money stock affects the interest rate via liquidity preference. This in turn alters the cost of capital and, subsequently, spending on durable goods, such as fixed investment, housing, inventories and consumer durables. In turn, changes in aggregate demand affect the level of production. This process has come to known as monetary transmission mechanism. Therefore the fundamental reason for changes in expenditure is relative abundance or scarcity of liquidity that is willingly effected by monetary authority. However, the stock of liquidity available in the economy may affect investment in several ways without requiring interest rate to change first - a good example is liquidity trap. [2]

This paper explores one such possibility by posing a simple question - can composition of balance sheet affect the level of investment? The literature does not address this issue explicitly as transmission mechanism is about the effects of changing stock of liquidity on the economy. If the stock of liquidity is held constant to suppress the effects of transmission mechanism and the level of investment goes up (due to say 'animal spirit'), what are likely 'ex-post' balance sheet effects on financial markets that may call upon suitable intervention from monetary authority? The framework developed in this paper is based on general analytical argument and is not India-specific as such.

To understand why such an enquiry may offer useful policy insight, let us first quickly look into the relevant literature.

2. Literature

Let us look, in turn, into the issue of investment finance as set out in the theories of Keynes and Kalecki and in the literature on credit channel of monetary policy.

2.1. Investment Finance in Keynes and Kalecki

The distinguishing feature of investment goods production is that while expenditure (on labour, material etc.) is to be incurred now, the returns would be spread over multiple future periods. Financing of investment is the mobilization of liquid funds for this current expenditure which is a point input. The amount of funds to be obtained goes up with the level of investment. The issue is at what cost this funds can be obtained and how this cost would change with the level of investment. Cost essentially means the rate of interest. Intuitively it appears that requirement of more funds due to higher level of investment ought to exert pressure in the

1 See chapter 8 of Romer (2006) for a detailed discussion on investment.

2 Another example is a shift in the investment schedule caused by changes in business sentiments or by the so called Keynesian 'animal spirit'.

financial market in terms of pushing the interest rate up.

The linkage between investment finance and its cost has recurred and is captured in different ways in literature. The issue of investment financing is captured in the standard Keynesian IS-LM (Keynes, 1936) model in the following way. Starting from an equilibrium position, when (autonomous) investment goes up, say due to higher future profit expectation, IS curve shifts to the right and income goes up by virtue of the multiplier. Higher income calls for a higher transaction demand for money. Given a fixed nominal stock of money, higher transaction demand has to be met by releasing liquidity from the pool held for speculative and precautionary purpose. To induce people to do that willingly, interest rate must go up. So in the ex-post equilibrium both interest rate and income are higher. Note that such effect on interest rate is due to transaction demand and is not related to issue of investment finance as such.

When the equilibrium is reestablished after increase in investment, there will be additional saving arising out of higher income, and it is exactly enough (ensured by multiplier) to finance initial change in investment. Financement of investment is linked to additional saving available arising out of higher money income. This argument is captured by the statement that 'investment is self-financing', or 'investment finances itself'. This implies that there will be no problem of financing investment in the aggregate. Investment will eventually be matched by corresponding saving. Until saving equalizes investment, investment-saving gap will lead to changes in income but not in interest rate (recall that saving is function of income only in the standard IS-LM model) when excess capacity exists in the economy. This means that investment financing is not a problem as any level of investment can be financed at an unchanging rate of interest. The supply of funds is perfectly interest elastic in the sense that investment in the aggregate is not subject to a fund constraint.

Kalecki (1942) showed that, when wage earner do not save, real gross profit earned by capitalist as a class depends on their consumption and investment decisions formed in the past, with corrections made for unexpected changes in the inventory and prices. Saving out of this profit can continue to finance the same rate of investment in the subsequent period.

What happens if capitalists wish to invest and/or consume more? Kalecki argued that such increased expenditures are self-financing in the following way. Imagine that a particular capitalist borrows from the Central Bank (or for that matter from commercial bank), to invest over and above the level of preceding period. When such finance is spent, essentially that amount will be received by other capitalists under the form of profits (due to assumption that workers do not save), and put again into a bank as a savings deposit or used to pay off a debt to the Central Bank. Thus, Kalecki argues that, the circle will close itself. He also pointed out that credit inflation (money supplied by the banking system) is required to take care of an increase in investment. It is needed partly to finance investment and partly to support higher transaction demand due to higher level of economic activity and prices.

The statement 'investment finances itself' resembles that of Say's law, remembering that multiplier causes income to increase only in demand constraint economy. However, it must be emphasized that this statement does not anyway indicate that finance is irrelevant, but means only that finance is not a constraint in the aggregate.

After the publication of General Theory, Ohlin (1937) challenged Keynes's view on investment finance and pointed out that there is a problem of reconciling savings and investment until the multiplier works itself completely. The problem is the following; suppose there is an exogenous increase in effective demand due to change in investment. Consequently, via the multiplier, output will rise to meet the increased demand. However, during the process of adjustment towards the new equilibrium, planned savings and planned investment are not equal. Keynes then introduced the concept of 'revolving fund' to take care of interim difficulties in financing process when investment is not equal to saving. This is what is called the 'finance motive' which is a temporary demand for liquidity and is different from the demand for active balances which will arise as a

result of the investment activity whilst it is going on (Keynes, 1937 A, pp. 246). Such demand for fund is temporary as the very need arises because of the transient nature of disequilibrium in the financial market.

.. "finance" is essentially a revolving fund… When the flow of investment is at a steady rate, so that the flow of ex-ante investment is equal to the flow of ex-post investment, the whole of it can be provided in this way without any change in the liquidity position. But when the rate of investment is changing in the sense that the current rate of ex-ante investment is not equal to the current rate of ex-post investment, the question needs further consideration (Keynes, 1937B, pp 666).

It seems that, if a pool of liquidity is set aside, above difficulty can be side stepped and there will be no undue pressure on the interest rate during financing of investment. However if that is not sufficient, monetary authority will have to accordingly adjust the volume of liquidity even when the level of investment demand remains the same. Further, Keynesian theory does not distinguish between 'external' and 'internal' finance. It does not matter whether firms draw down their own reserves (retained earnings) or chooses to borrow from financial sector. In Keynes, external and internal finance are perfect substitutes, therefore there is no wedge between external and internal finance costs.

This paper will pose this issue against possible balance sheet effects of real investment by employing a framework due to Hicks (1977). To sharply bring out balance sheet effects, i.e. to focus on the direct effect of financing real investment, we shall assume that the stock of liquidity is held constant during the financing process. This would suppress the conventional transmission channel. Further, as in Keynesian theory of money market, we will adopt stock equilibrium for determination of interest rate. For this reason it is appropriate to look at the effects of real investment on balance sheet.

2.2. Credit Channel of Monetary Policy

Given uncertainty about the future, market outcomes will be efficient and Pareto-optimal as long as agents hold symmetric beliefs about the nature of uncertainty. But often there is asymmetry of information among agents. Therefore efficient contracts may not be possible for one simple reason: one party's insufficient knowledge about the other party involved in a transaction may prevent taking accurate decisions. In the context of financial markets, entrepreneurs often have more information about the project 'quality' than the investors. Under such condition, Keynesian assumption that internal and external funds of a firm are perfect substitute and therefore both have the same cost will no longer be valid. The difference between external and internal costs is known as 'external finance premium'. According to the literature on credit channel of monetary policy,[3] monetary policy affects the size of the external finance premium. Such premium reinforces the conventional transmission process. Two mechanisms have been suggested to explain the link between monetary policy actions and the external finance premium: the balance sheet channel and the bank lending channel.

The balance sheet channel postulates that the external finance premium should depend on borrower's financial position with net worth (measured by liquid assets plus marketable collateral). Higher net worth enables a borrower to self-finance a greater portion of investment project or enables to offer more collateral to guarantee the liabilities. Such insight explains why borrowers are often need to meet certain financial ratios, or are required to make down payments. An extensive theoretical literature has evolved around this idea to argue that endogenous pre cyclical movements in borrower balance sheets can amplify and propagate business cycles, a phenomenon that have been referred to as the 'financial accelerator' (Bernanke et. al., 1999).

Banks play an important role in overcoming informational problems in credit markets; as a result many borrowers are substantially bank dependent. Banks remain the dominant source of intermediated credit in most countries and specialize in overcoming informational problems and other frictions in credit markets. In the presence of asymmetric information

3 There is a vast literature on monetary transmission mechanism under imperfect information set up. See for instance, Bernanke and Gertler (1995) and Bernanke et al (1999) for general reference and Bhaumik and Majumdar (2007) and Bagchi, Das and Moitra (2002) for studies in the Indian context.

monitoring by banks can improve efficiency. Banks are better suited to economise on monitoring costs. Firms and banks develop long-term relationships, thus mitigating the effects of moral hazard. Monetary policy may also affect the external finance premium by shifting the supply of intermediated credit, particularly loans by commercial banks. Therefore, a reduction in the supply of bank credit, relative to other forms of credit, is likely to increase the external finance premium and to reduce real activity. This is the bank lending channel.

The framework that would be developed in this paper takes a different approach altogether. The credit channel literature shows how quality of today's balance sheet affects planned investment expenditure. Our analytical framework seeks to find out how 'ex-post' balance sheet affects planned investment expenditure. The conventional transmission mechanism begins with a change in the money supply and is therefore not suitable to address the question posed here. So to assess such financial consequences of real investment, we keep endowment of money constant - to block transmission channels of all variety.

We build up our arguments in sections 3 and 4.

3. The Financing Process

Macroeconomic equilibrium given by equality of saving and investment may be viewed from the perspectives of financial and commodity (real) markets. On the commodity market side, saving is unconsumed output and it is matched by investment which is demand for new capital goods by firms. On the financial side, saving is used for acquisition of financial assets that is matched by acquisition of financial liabilities by firms purchasing new capital goods. If saving is not equal to investment in the aggregate then it creates disequilibrium in asset as well as commodity market. Former leads to changes in interest rate whereas the latter causes output/prices to change. In Keynesian theory, disequilibrium or saving-investment gap is closed by changes in output (through multiplier). In contemporary finance, however, trading in asset is crucial to track changes in relative prices (which is relative rates of return) driven by changes in asset composition. Real investment affects asset markets in two ways. First, investment expenditure leads to asset accumulation, physical (production of capital goods) and financial (saving out of money income). Second, there is a change in the asset composition and hence in the relative prices of assets. The first effect is termed as scale effect and the second as composition effect here. The scale and composition effects may be compared with income and substitution effects of standard consumer theory.

To track financing process, assume that there are two financial assets, money (M) and share capital (K) available to hold wealth with a given stock of money ($M = \overline{M}$). There is one unit of share capital held by the households for each unit of physical capital held by firms. Let P be the money price of share capital and assume that it is market clearing supporting the equilibrium volume of asset exchange. We also assume that the financial wealth ($\frac{\overline{M}}{P}$+ K) is concentrated in households. Investment in any period is financed by issuing new share capital. This increases the stock of share capital in each period. At the beginning of the period liquidity preference has been satisfied through holding of desired ratio of money to share capital and is equal to the ratio in which they are supplied.

To carry out an investment plan firms demand money (finance) from household against fresh issue of share capital. Funds are then spent on new capital goods and associated expenditure on labour etc. This leads generation of income, additional saving out of additional income and subsequently households take decisions on disposition of the new saving.

Once investment activities are completed, the asset markets would be affected in the following way. First, investment expenditure leads to asset accumulation, both physical and financial. Second, changes in asset composition calls for a change in the relative prices of the assets (P) brought about through trade in existing assets. Assuming that the process of financing does not involve additional money creation (to rule out standard monetary transmission mechanism) what is the ex-post effect on the relative price of assets in equilibrium?

The price can be thought of as the return to share capital or equivalently the interest rate. To induce household

to part with the liquidity (equivalently to induce them to decrease the ratio of money to share capital) the price of share capital must rise to the extent at which it is just not worthwhile for investors to offer further inducements to holders of money to reduce their liquidity any more. At that rate of interest the demand for share capital will equal their supply. Once this transaction is complete, investors buy investment goods. So money holdings by firms come down. Income is generated in the investment goods sector accrue to the household and hence money circulates back to them. This restores the desired holding of money stock by the household. But due to supply of new share capital, the ex-post ratio of supply of money to share capital is lower. This ratio to be held willingly by the household, return to share capital must go up. So the ex-post interest rate must be higher than that in the beginning of the financing process.

Recognise that this ex-post effect is the outcome of changes in asset composition in the household balance sheet. We call this effect as the composition effect of investment finance. What is the likely effect of asset accumulation on the financial markets? The financing process brings about an increase in the stock of wealth through real investment. Since the process does not create money, this change is entirely due to higher ex-post endowment of share capital. In the beginning of the process, the households willingly held a part of their wealth in a non-interest bearing assets, i.e. in money. Ex-post, there is no reason to expect them to deviate from such a behaviour, so that a part of the additional wealth ought to be diverted to additional holding of money. This means that the wealth elasticity of money demand is not zero. As a result the equilibrium price of share capital must fall and that of money must rise (as the stock of money is given); in other words we should expect a rise in the interest rate. We call this ex-post wealth effect as the scale effect of investment finance.

The Keynesian 'finance motive' may now be given a re-interpretation. A 'motive' should lead people to hold additional stock of money willingly i.e. voluntarily. From this perspective it would seem appropriate to link finance motive to the financial consequence of real investment on the asset markets and specifically to the ex-post scale effect of investment financing. The scale effect gives rise to additional and voluntary demand for money by economic agents. It is also evident that this demand may not be temporary in nature like in Keynes' finance demand. Moreover, this demand may vary depending on the strength of wealth elasticity of money demand for each individual.

To summarise, there are two ex-post effects of investment finance on the interest rate. First due to the composition effect, and the second is due to the scale effect. Both result in an increase in rate of interest in the illustration taken above. If we were to write a money demand function for the households, it would look like the following.

$$\frac{M^d}{P} = f\,(Y,\ i);\ f_1 > 0 \text{ and } f_2 < 0$$

$$i = g\left(\frac{\overline{M}/P}{K}, \frac{\overline{M}}{P} + K\right);\ \ g_1 < 0 \text{ and } g_2 > 0$$

Keynes and Kalecki emphasise that the endowment of money with the household is ex-post unaffected because of the 'Widow's Cruse' property. So the need for ex-ante investment finance does not create any pressure on the money market.[4] However in our exercise of financing process we do not get the Keynes-Kalecki result, though the assumption of constant money supply and adoption of stock equilibrium for determination of interest rate are intact. Our result is different from that of Keynes and Kalecki because of the ex-post scale and composition effects of higher endowment of share capital (and wealth) resulting from real investment. This shows that the biblical Widow's Cruse property is not valid in the aggregate and consequently it cannot be ascertained that funds are not a constraint for investment.

4. Disaggregated Balance Sheet

We now expand balance sheet to explicitly include financial sector consisting of central and commercial banks. This classification is similar to that of Hicks (1977, pp 76-77). An investment process begins with expenditure of liquid assets, either already held by a firm (e.g. retained earnings) or acquired through issue of new securities. A decision to invest is a decision to

4 Changes in interest rate due to transaction demand are not relevant here.

become illiquid as the ex-post balance sheet of the firm would contain more illiquid assets (capital stock) and lesser liquid assets. What are the likely effects of a change in the composition of the balance sheet on the aggregate economy?

The balance sheet of a macro-economy is segregated into three sectors. There is Central Bank whose job is to conduct monetary policy as usual. Then there are banking sector and real sector. We club balance sheets of firm and household and denote it by real sector that produces commodity. The Central Bank does not lend directly to industry, so that it holds securities of only financial sector. This keeps the exogeneity of money supply intact as in Keynes (Hicks,1977, pp 76). Real sector's assets are money, M, term loans to financial sector, f (consisting of retained earnings of firms + household saving), and real assets, K. A notional liability is to be added for accounting balance, but is not shown here. Banking sector's liabilities are borrowings from real sector, f, and from Central Bank, F. its assets are loan to real sector, I, and money, m.

The respective assets and liabilities are shown below.

	Liabilities	Assets
Central Bank	Money *(M + m)*	Financial Securities *(F)*
Banking Sector	Financial Securities *(F + f)*	Industrial Securities *(I)* + Money *(m)*
Real Sector	Industrial Securities *(I)*	Real Assets *(K)* + Financial Securities *(f)* + Money *(M)*

Here total money supply or liquidity *(M + m)* is fixed by the Central Bank as in the IS-LM framework. For the present purpose let us interpret this aggregate supply of liquidity as the revolving fund meant for investment finance. This is done to focus on the issue of the adequacy of fixed pool of liquidity (and also to block usual monetary transmission effects) to take care of the requirement of finance for an unchanging level of investment.

Keynes-Kalecki position that in the aggregate financing of investment is not a constraint can now be shown at once. If we add the asset and liability side of all the sectors, we are left with only the real asset (capital stock) of industry, with a notional liability in the accounting sense. When investment projects are taken up, although sector wise balance sheet positions are different after the investment-saving equilibrium is reached, assets and liabilities would cancel out once again with higher real capital stock in the aggregate. Investment does affect the composition of assets and liabilities of different sectors. But such changes in sector wise composition of assets and liabilities are suppressed in the aggregate. Whatever be the source of finance, it cannot become a constraint in the aggregate. However, changes in the sector wise balance sheet cannot be ignored. The process and method of financing are important.

Let us assume that securities, i.e. financial and industrial, are less liquid than money. So in the liquidity spectrum, real assets are most illiquid and money is most liquid. The terms at which finances are obtained would depend on the existing relative liquidity position of the financier. The relative liquidity position is given by the ratio liquid-to-illiquid assets. If this ratio is already low then to induce the financier to become even more illiquid, a higher cost, in terms of interest rate payable, has to be incurred.

Now let us look at various ways in which funds can be mobilized. Assume that the process of financing involve a Keynesian short period so that the absolute level of price is fixed. Starting with above balance sheet position, real sector now wishes to invest by which real asset *(K)* will go up. Process of investment begins with money expenditure; formation of fixed assets is a consequence. Now current investment will increase future output. So a higher level of money stock, 'M' (higher transaction demand) would be required by the business. Clearly, current investment expenditure cannot be financed out of existing 'M' to a great extent.

There are two alternatives left. Funds can be borrowed from banking sector by increasing *'I'* (external finance), or can be spent out of retained earnings by reducing *'f'* (internal finance). When 'I' is increased, there is no

direct effect on real sector's liquidity position. However in the balance sheet of banks 'I' goes up and 'm' goes down (because liability side is unaffected). The required finance is obtained from the pool of liquidity held by the banking sector. The ex-post composition of assets ($\frac{m}{I}$), the relative liquidity, of banks goes down. As the effect is confined to banks' asset side only, liquidity is sharply diminished.

In the latter case, both *'f'* and *'m'* are diminished. Note that in this case, real sector's liquidity is diminished to the full extent of additional expenditure *'K'*. For banks, a fall in 'm' reduces liquidity whereas fall in 'f' increases liquidity. So relative liquidity position of banks ($\frac{m}{I}$) is less affected in this case. Hence, when the real sector draws on own fund the total effect on liquidity of banking sector is less severe than when the real sector borrows from banking sector.

So an increase in real investment, with a constant supply of liquidity *(M + m)*, must reduce liquidity somewhere. If investment is financed by borrowing (issuing more *'I'*), the main loss of liquidity falls on the banking system. When financing draws on own reserves (reducing *'f'* and exchanging it with *'m'*), the loss of liquidity mostly falls on real sector itself. For banks, the ex-post liquidity position in both the cases will be of important consideration for charging interest rate. On the other hand, when real sector spends out of retained earnings, it has to take into account interest foregone on financial securities 'f' and its ability to further choose this method. Hence the methods as well as the choice between the methods are significat while taking decisions on financing of investment.

This is for the change in the composition of assets. What is the consequence of a likely scale effect?

4.1. Disaggregated Balance Sheet: Scale Effect

The industrial sector would require more 'M' for the requirement of higher transaction demand for money, resulting from higher circulation of output due to higher real assets *'K'*. There is another additional source of demand for money. Because of real investment, wealth of the economy, $\left(\frac{M+m}{P}+K\right)$ goes up. There would be additional demand for money if some the additional wealth is sought to be held in liquid form. This scale effect would call for an increase in interest rate at a given level of liquidity. This additional demand can only be zero if wealth elasticity of money demand is zero, which clearly is an extreme assumption.

While Keynes's financial system comprised Central Bank (monetary authority) and capital market, a further disaggregation of sectors shows that the method of financing has effects on the liquidity. It cannot be ascertained that interest rate will remain unchanged in the face of such a greater demand for liquidity unless it is supplied from outside (here central bank). This analysis also sharply brings out another crucial feature of investment finance. As per Keynes, a given revolving fund for finance is insufficient only when level of investment changes. But it is now evident a revolving fund is not sufficient to keep liquidity pressure at bay, at an unchanged level of investment. Our analysis shows that any non-zero investment would exert balance sheet effects that are potential enough to change the interest rate. Further, when the level of investment remains constant over periods, depending on the method of financing, liquidity would be redistributed between sectors. Clearly, in investment finance, which sector holds the liquidity is an important consideration.

The financing process offers us another insight. The Keynesian transmission mechanism says that money or liquidity affects the level of investment through the changes in interest rate. Our analysis so far shows that investment may be directly affected by the availability of liquidity (or money supply) without requiring a change in the interest rate. This suggests that one can conceive of an investment function which contains liquidity as an explicit factor.

5. Discussion

The issue of investment finance deals with the likely constraints on the availability of funds in the aggregate and a consequent curtailment of the level of investment. To compare the literature on credit channel with our approach, note three important differences. First, our financing process does not involve any money creation; the stock of nominal money is given. By doing so, the

question of transmission mechanism of all variety through changes in money supply is ruled out. Second, our analyses do not rest on the issue of the 'quality' of the balance sheet of the borrower. In other words, ex-post effect of the requirement of financing does not involve market imperfections like information asymmetry. Third, our unit of analysis is at the level of sectors unlike at the firm level in this literature. In assessing the Keynes-Kalecki position on the financial consequences of real investment, it is crucial to keep two of their assumptions intact. One is the constant endowment of money; another is the stock equilibrium to determine the interest rate. The conventional transmission mechanism begins with a change in the money supply and thus one of the required assumptions is violated at the very outset.[5]

In our approach of looking into segregated balance sheet of the financial sector, it is the ex-post liquidity ratio that is relevant for decisions making on the part of industrial and banking sectors; not the 'quality' of the balance sheet. The internal funds of industry in our case can be designated as financial securities *(f)* plus money *'M'*. A part of this internal funds, *'M'*, which is the most liquid part, cannot be used because of a need of higher transaction balances required in the future. We have not distinguished between liquidity held by banks, *'m'*, from that by industry, *'M'* in terms degree of substitutability. The important issues here are the amount of liquidity and who holds it. Though it is also relevant for credit channel literature, the emphasis is on the perception of the quality (for e.g. whether securities are readily marketable) by the financier. So the 'effective' liquidity held by the firm may be lower than the 'actual' level. This paper argues that there may be enough liquidity (of high quality) available in the aggregate but financing by more borrowing may pose a problem because the existing liquidity condition of the banking sector may be tight, though it may be quite true that industry holds sufficient liquidity.

The credit channel literature shows how quality of today's balance sheet affects planned investment expenditure. Our analytical framework seeks to find out how ex-post balance sheet affects planned investment expenditure. In our case, both the financial and industrial sector would endogenise ex-post liquidity ratios and take financing decisions accordingly. Focusing at the level of industry and banking sectors even out individual firm or bank heterogeneities. A poor quality balance sheet of a specific firm would have much benign effect on the aggregate level of realised investment. Upon aggregation, information asymmetry, if present, would be operative at the sectoral level. One can surmise that firm level information asymmetries would have much reduced stature on the sectoral level. The bank lending channel would also be less functional as information flows happen between two sectors rather than between a firm and a bank. As a result it is possible to focus more on the availability of liquidity rather than on the nature of imperfections of the market.

6. Conclusion

Keynesian proposition that financing investment is not a problem in the aggregate relies on effective demand problem and multiplier. Any level of investment demand can be financed without any repercussions on money market because additional investment demand would always find matching saving through multiplier. The focus is on aggregate liquidity and therefore conventional monetary transmission mechanism relies on the effect of changing liquidity on interest rate. Our analyses show that, when one looks into sectoral balance sheet with fixed stock of liquidity, constancy of interest rate can no more be ascertained. Real investment creates pressure on interest rate via scale and composition effects of liquid-to-illiquid assets of a sector. Therefore balance sheet effects may require additional liquidity adjustment by the Central Bank in the intervening period between two monetary policy reviews depending on the course of real investment.

The usual monetary policy transmission mechanism can therefore be further extended to capture 'ex-post' balance sheet position of different sectors. When the level of investment goes up (through a shift in the investment schedule), interest rate would go up because of higher demand for money for transaction purpose.

5 Nevertheless, it must be emphasised that market imperfections are as important as balance sheet effects in determining borrowing cost.

But this may not be the only effect. It may so happen that, there is enough liquidity at the aggregate level, but the distribution of liquidity (ex-ante and ex-post) is such that method of financing becomes important. This effect is going to further complement the effect on borrowing cost due to credit channel of monetary policy. Distribution of liquidity is as important as volume of aggregate liquidity and complications arising out of asymmetric information captured in the quality of liquidity. This perspective may offer monetary authorities important insights to conduct monetary policy.

Acknowledgement

The author gratefully acknowledges detailed comments by Prof. Amitava Bose on an earlier version of the paper and useful comments from an anonymous referee of this journal.

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