Srinivas Raghavendra

National University of Ireland Galway,
J. E. Cairnes School of Business &
Economics,
Ireland

✉ s.raghav@nuigalway.ie

The Principle of Effective Demand under Modern Finance: An Exploration in the Traditions of Kalecki and Keynes

Summary: The paper explores the principle of effective demand in the context of modern financialization. The traditional "two-sector" model is extended to include banking and finance sectors to examine the implications of the interaction between real and financial sector for effective demand in a closed economy. The analytical framework developed in the paper provides an intuitive understanding of the problem of effective demand in the investment led and consumption led regimes under financialization. It also brings out the underlying dynamics in terms of transfer of profit between the sectors that renders macroeconomic vulnerability in these regimes.

Key words: Effective demand, Profit realization, Securitization, Finance sector, Fictitious capital, Investment led regime, Consumption led regime, Underlying assets.

JEL: E11, E12, E20, E22, E24, E40, E44.

The principle of effective demand was discovered almost simultaneously but independently by the Polish economist Michal Kalecki (1966, 1971) and the British economist John M. Keynes (1936, 1937). Given their vastly different intellectual background Kalecki's theory had close resemblance to Marx's two department scheme and the profit realization problem with capitalists and workers; whereas Keynes stayed closer to the Marshallian distinction between households and firms, the former making the savings plan out of their presumed income and the firms making their investment plans on the basis of expected demand in the market. With a hindsight of eighty years we now recognize that the problem of profit realization, and that of investment saving equality are essentially the same (Joan Robinson 1964; Amit Bhaduri 1986) as one of the fundamental insights developed in the twentieth century into the analysis of the capitalist economy.

Neither Keynes nor Kalecki accepted the notion of neutrality of money developed originally by the Scottish philosopher Hume and embellished in various ways with the aid of various formulations of rational expectations by the Monetarist school. In their counter-offensive against Keynesian economics, they claimed that the effect

of money is essentially transient and in the long run leaves the real economy unaffected. In that long run at least Say's law holds and effective demand has no role to play. Since the frictionless long run equilibrium is a mythical theoretical state used as a benchmark for theory, it is a convenient point to start by recapitulating briefly how the properties of the long run are violated in the theories of Kalecki and Keynes in a monetary economy. Presented in an encapsulated form they are:

(1) It was Keynes who integrated in his theory a monetary economy with production in which money is a universal medium of both temporal and inter-temporal exchange. All transactions begin and end with money (Karl Marx 1887; Knut Wicksell and Tanelaton E. Claseen 1935). Since inter-temporal exchanges relate to an unforeseen future, some money will be held (provided the value of money is reasonably constant) as a store of wealth to impart flexibility in decision making to the money holder. Just as large firms would have a tendency to hold excess capacity for production to take advantage of unforeseen expansion of market through higher market share, there would be in general some preference for liquidity despite loss of interest income to insure against probable capital loss in holding less liquid assets;

(2) Wages are paid and wage bargains made in money terms because money is the legal tender for the universal medium of exchange irrespective of the implied product or real wage. Both Kalecki and Keynes argued that money wage cut may be ineffective in reducing the real wage because of a close link between the money wage rate and the price level. For Kalecki the industrial price was cost-determined by a given mark-up on prime cost which leaves the real wage constant. For Keynes money illusion on the part of the workers came into play to make it compatible with the profit maximizing equilibrium (and criticized by Milton Friedman 1969 as untenable in the longer run), although Keynes distanced from this position in the face of mounting evidence;

(3) The connection between the monetary economy and effective demand was made specially by Keynes. He pointed out that holding money is a leakage from demand. By this store of wealth property, savings held in money is an indefinite (i.e. without specific date) postponement of demand or purchase of goods or, as Marx had argued Say's Law fails in a monetary economy where supply does not necessarily create its own demand within any specified time period.

1. The Two-Sector Model

The two-sided role of the wage rate, as a cost depressing surplus or *potential* profit per worker, and as a source of demand helping potential profit to be realized into profit is at the core of the theory of effective demand (Bhaduri and Stephen Marglin 1990). Since this is relatively a familiar territory, we provide a short review and summary of the essential argument.

Investment goods sector   Consumption goods sector
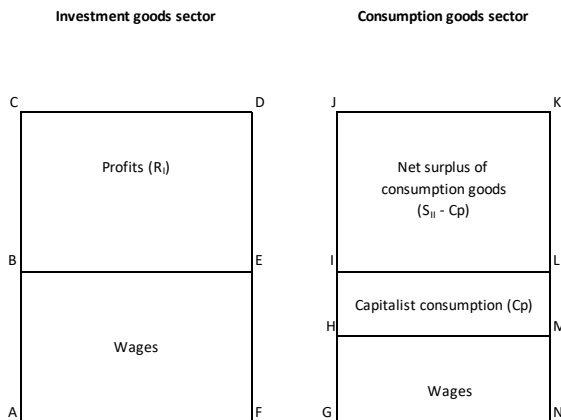
Source: Bhaduri (1986).

Figure 1 Two-Sector Economy

For the purpose of our analysis, we shall use the familiar "box" diagram, popularized by Bhaduri (1986), representation of a closed two-sector economy, where Department I producing investment goods (henceforth investment goods sector) and Department II producing consumption goods (henceforth consumption goods sector). Assuming that these sectors are vertically integrated, and the level of investment expenditure is autonomously given, with in the short period, and further that workers consume all their wages, the fundamental condition of macroeconomic balance in this economy is:

$$C - W_{II} = S_{II} = W_I + C_p \tag{1}$$

or

$$(S_{II} - C_p) = W_I, \tag{2}$$

where C is the output of final consumption goods, which is same as the value added by the consumption goods sector; W_{II} is the wage bill of the consumption goods sector; S_{II} is the surplus of consumption goods over the wage bill of the consumption goods sector; W_I is the wage bill of investment goods sector and C_p is the consumption by the entire capitalist class operating in both the sectors.

The balancing condition (2) simply means that the investment goods sector generates a wage bill, $W_I = ABEF$, which exactly matches the surplus of consumption goods $(S_{II} - C_p) = IJKL$, that remains after paying; (a) the wage bill in the consumption sector, $W_{II} = GHMN$; and (b) the consumption by the entire capitalist class, $C_p = HILM$. The significance of this simple device is that it captures the fundamental condition for balance in a capitalist economy, i.e. it shows that the *autonomous* expenditure decisions in the investment goods sector in the form of payment of wages to workers in that sector (i.e. *ABEF* in Figure 1) exactly matches the remaining "surplus" (i.e. *IJKL* in Figure 1) after capitalists' consumption C_p. In other words, the condition

means that the *size of the market* generated by the wage bill of the investment sector is *just large enough to transform the entire surplus of consumption goods sector* to *realized profits*. If the autonomous investment expenditure is larger (smaller) and consequently the wage bill smaller than $ABEF$, will give rise to decumulation (accumulation) of inventories $+A (-A)$ of final consumption goods, which in turn will lead to the *realization problem*, à la Marx or the *problem of effective demand*, à la Keynes.

However, at equilibrium, the economic meaning of the balance conditions (1) (and (2)) is that they show how the entire surplus S_{II} of consumption goods sector is being realized into profits of that sector, i.e.

$$S_{II} = W_I + C_p = R_{II}, \tag{3}$$

where R_{II} is the profits of the consumption goods sector.

A formally equivalent condition of (3) can be obtained by adding the realized profit of the investment goods sector, i.e. R_I (the area BCDE in Figure 1) on both sides yields:

$$R_I + W_I + C_p = R_I + R_{II} = R \tag{4}$$

where R represents the total profit realized in the economy. Note that since investment expenditure is treated as autonomous, it is assumed here that it is just sufficient so as not to lead any unplanned change in the level of inventories of final investment goods.

However, since $(R_I + W_I)$, by definition, the value added of the investment sector (I), which is also the final expenditure on investment goods, i.e. $R_I + W_I = I$, the preceding Equation (4) can be rewritten as:

Investment (I) + Capitalists' consumption (C_p) = Total profits (R).

Or, by rearranging terms we can restate the equilibrium condition as:

Investment (I) = Savings (S) $\tag{5}$

where $S = R - C_p$ is the total saving of the economy since capitalists are the only savers in the economy.

The preceding conditions (3) to (5) describe the same basic macroeconomic balance of the economy (2) in different ways. In terms of the fundamental condition of macroeconomic balance, the above two-sector model bring forth the essential point that autonomous expenditure in the investment goods sector, or Department I, create the condition for the net surplus generated in the consumption sector, or Department II, to be realized as profits.

1.1 Extensions to the Two-Sector Model: Introducing Financing Options

The simple box diagram illustration in Figure 1 can also be extended to take into account the financing of investment, either through equities or bank loans. Figure 2 shows the output expansion through equity-financed investment expenditure in the investment sector. Introducing equities, which is a liability for the issuing firms, imply introducing saving, and the corresponding dividend flows, which are the distributed profits. Since we assume only capitalists save, in the form of equities, for which they

earn dividends, we can modify Figure 2 to show the investment expenditure *via* equity. Firms in the investment goods sector are assumed to raise money for their investment by issuing equities, which are held by capitalists in both the sectors. In Figure 2, the total capitalists' saving is the area $M'I'L''M''$, which earn dividends, i.e. profits distributed by the investment sector firms for the owners of equities and is represented by the area $B''C'E'E$ in the investment sector.

The assumption here is that the money that is raised by issuing equities is used to finance the expansion of the investment goods sector, and the resulting expansion in the consumption goods sector (quantity adjustment) is shown in Figure 2. The increase in investment expenditure, is shown by the area $A'ACC''$, where the wage bill of the sector is increased by $A'ABB'$ and the profits by $B''CC''C'$. Note that the capitalists saving and distributed profits have not been deducted from this expansion to highlight that they are realised in the previous period. The same proportion can be applied to the current profits for the next round of expansion, going forward. The temporal dimension, which does not come through in the box diagram, should be kept in mind while interpreting the box diagrams.

Consequently, this expansion in the investment sector expands the size of the market for the consumption goods sector, or Department II, represented by the area $NJ'KN'$ and the increased net surplus for profit realization by $L'J'KL$. Although the introduction of the mode of financing investment expenditures incurred by the investment goods sector does not alter the macroeconomic balance condition (3) (or (5)), the illustration shows that the simple device of "box diagram" can be extended to analyse the implications of scenarios where both classes save, i.e. equities in this case, for effective demand in the economy.
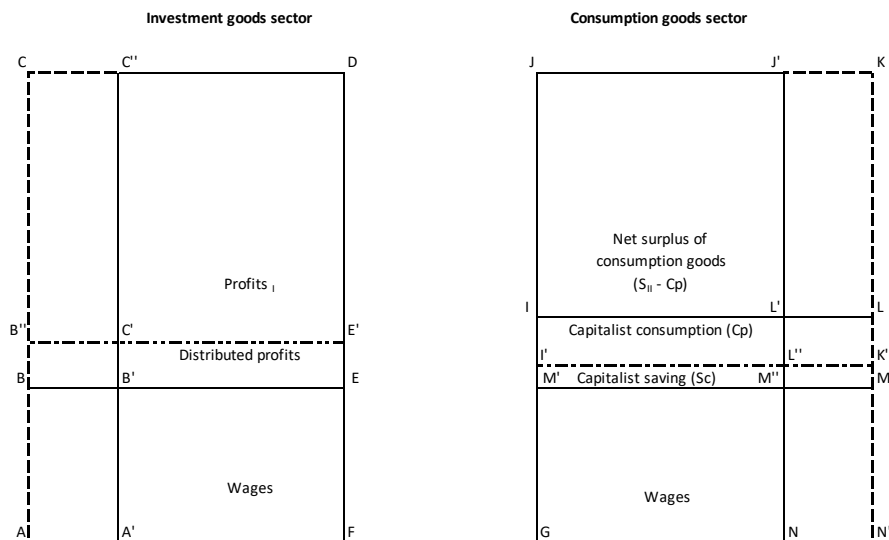
Figure 2 Equity Financed Investment Sector Expansion

In addition to equity financing, we can also introduce "loans" advanced by banks in the basic model. Figure 3, captures this scenario where the banking sector, Department III, advances loans to the investment sector firms and its net surplus is simply the net interest income earned from its loans. Although, banks can issue loans, *ex nihilo*, the realization of profits in the banking sector is determined by demand for loans from the investment goods sector. Thus, increase in investment expenditure fi-
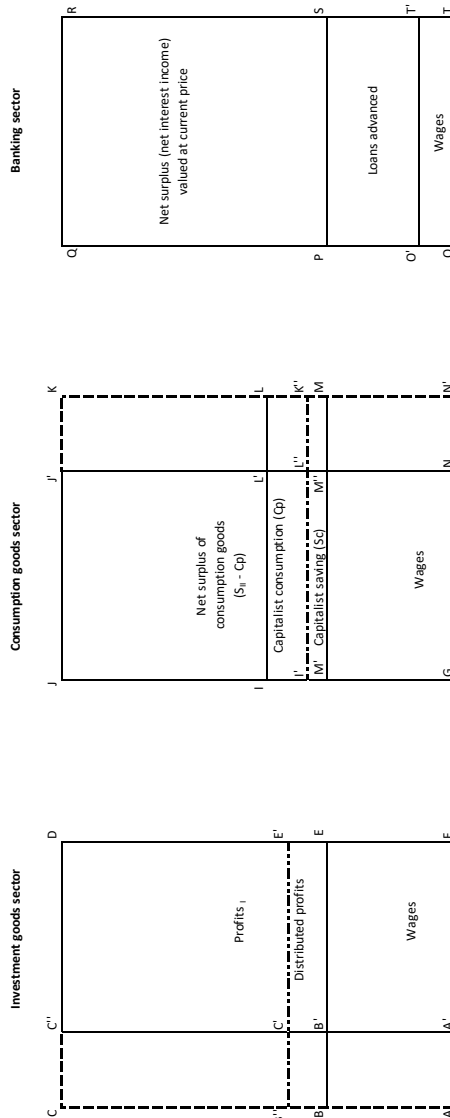
**Figure 3**　Equity and Bank Credit Financed Investment Sector Expansion

nanced either through the issuance of equities or through bank loans expands the market for the realization of profits for the consumption sector as discussed above, i.e. the increase in the net surplus of the consumption sector, represented by the area $L'J'KL$ in the consumption sector is realized to profits by the additional wage bill, i.e. demand, generated by the investment expenditure, represented by the area $A'ABB''$ in the investment sector as before. Again, this extension, shown in Figure 3, does not alter the macroeconomic balance condition 3 (or (5)), that the realization of surplus to profits in the consumption goods sector, depends on the wage bill of the investment goods sector. Both Figures 2 and 3, illustrate the possibilities of extending the original "box diagram" in Figure 1, to incorporate the financing options of investment' expenditure in the investment goods sector. Moreover, as we will see below, these illustrations show the robustness of the analytical device that is developed for this purpose and provides a basic framework for further analysis of more advanced scenarios such as savings in other financial assets, other than equities, and their implications to the realization of profits and effective demand in the economy.

2. The Four-Sector Model: Incorporating Modern Financial Sector

The preceding analysis of the two-sector model with equities held as assets, is now extended to incorporate a full-fledged modern finance sector, which introduces the possibility of investing in financial assets, such as securities and other second order derivatives. This extension will allow us to incorporate a differential pattern of investment on tangible assets and financial assets and study its consequent impact on effective demand in the economy.

A brief historical context is in order before proceeding with our extension of the two-sector model and further analysis. The period since 1980s, referred to as the "financialization" era in the literature, has witnessed profound changes in the way in which the financial markets and institutions interacted with the real economy. Although there is no one commonly agreed definition of the phenomenon "financialization", the term is often used to refer to the growing ascendency of "shareholder value" as a mode of corporate governance; or increasing political and economic power of a particular class grouping: the rentier class; or to a "pattern of accumulation in which profit making occurs increasingly through financial channels rather than through trade and commodity production" (Greta R. Krippner 2011). Regardless of definition, there exists substantial statistical evidence on the empirical characteristics of this period from around the world on the role of financial expansion on the real economic variables such as profit rate, capital accumulation, disposable income and functional and personal income distribution (Gerald A. Epstein 2005).

In particular, the divergence between rate of profit and the rate of (real) capital accumulation since the mid 1980s has been well documented in the literature (Gérard Duménil and Dominique Lévy 2004; Erdogan Bakir and Al Campbell 2010). For instance, Bakir and Campbell (2010) show that since the mid 1980s the rate of capital accumulation showed a general decline while the after tax profit rate recovered and showed substantial growth during the period 1980-1997. Furthermore, using firm level data of non-financial corporations (NFCs) in the US for the period 1973-2003, it is shown that the increasing share of the non-financial corporations' income is
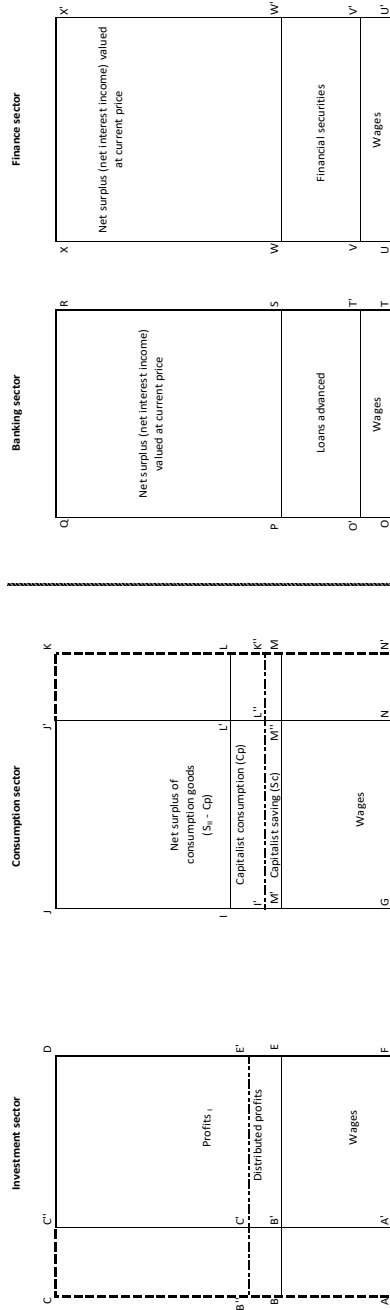
Source: Author's own calculation.

Figure 4 The Four-Sector Model

substantially contributed by financial assets rather than from tangible assets (Özgür Orhangazi 2008). Again, in the context of US economy, Özlem Onaran, Engelbert Stockhammer, and Lucas Grafl (2011) reinforce the above empirical results by documenting that the increase in profit share is driven by the increase in the rentier income (i.e. interest plus dividends) at the expense of profits in commodity production.

Therefore, it is clear from these empirical studies that the shift in the pattern of accumulation, from commodity production to the financial channels, has been one of the defining characteristics of the so called "financialization" period. The aim here is to extend our two-sector model using of some of the empirical features described in the literature and provide a simple theoretical framework to study the implications of financialization for effective demand in the economy.

We extend our two-sector model from the previous section to four-sectors where in addition to the original investment and consumption goods sectors, we introduce "banking" and "finance" sectors. The "banking" sector (or B-sector) comprise of the central bank and commercial banks that operate under the purview of the central bank or the monetary authority's lender of last resort guarantee. The "finance" sector (or F-sector), on the other hand, represent the "shadow banking institutions" such as the investment banks, hedge funds, financial insurance institutions and other entities such as mutual funds, pension funds that are thinly supervised and do not come under the purview of central banks' lender of last resort guarantee.

The separation between the banking sector (the B-sector) and the finance sector (the F-sector) is to capture the essential difference between the commercial banking activity to that of the investment banking activity, where the latter, using the process of securitization, creates the avenue for the commercial banks to off-load their loan book from their balance sheets. Note that this is a simplification for analytical purposes. The recent experience in the US, particularly in the aftermath of the replacement of the Glass-Steagall Act of 1933 with the Commodity Futures Modernization Act of 1999, reveals the extent of investment banking activities undertaken by the commercial banks. In fact, the finance sector, can be thought of an off-balance sheet entity of the commercial banking sector. We have abstracted away from these complications for analytical simplicity. The implications of varying degrees of interconnectedness between commercial banking and investment banking activities for aggregate demand is explored in Bhaduri and Srinivas Raghavendra (2017).

The modern financial sector has seen, at least since the 1990s, an explosion of "special purpose entities" (SPE) or "structured investment vehicles" (SIV), which issue securities backed by the underlying assets' cash flows. For example, the mortgage backed security (MBS) is a securitized asset backed by a pool of mortgage assets. The mortgage assets are financial assets with tangible asset as collateral, i.e. either house or commercial property. Similarly, automobile loans, aircraft leases etc., with respective tangible assets as collateral, can also serve as underlying assets. In principle, any asset capable of producing future cash flows can be securitised, for instance, the underlying asset can also be intangible assets like intellectual property in the form of patents, trademarks and copyrights (it is interesting to note that the first major intellectual property backed securities transaction was in 1997 when singer David Bowie raised $55 million by securitizing royalties from his back catalogue, Andrew Quinn

and David Burke 2014). Thus, a securitized asset is a pool of financial assets that promises potential future cash flows for the holders of these instruments.

As before, the assumptions of the four-sector model are as follows: all wages (and salaries) are consumed, i.e. spent on the consumption sector, and only profits are saved. Savings are held in equities and financial securities and derivatives. Thus, there are two types of income flows; one from commodity production and the other from financial income flows from equities (dividends) and securities and derivatives (interest and collateral cash flows).

As before, we assume both the production sectors are vertically integrated. The investment sector (I) is assumed to be autonomous and therefore as discussed previously in (3), the investment expenditure is equal to the value added of the sector, i.e. ($R_I + W_I = I$). There is no government in this model but the central bank, located in the banking sector, issues the legal tender for the economy and also performs the lender of the last resort for the commercial banks in the banking sector.

In terms of credit creation, the commercial banks create credit, *ex nihilo*, and this is indicated as the "loans advanced" area in the box in the banking sector. The banking sector's surplus is the net interest income arising from the balance between credit advanced and the interest payments on deposits. The banking sector profits are very much dependent on the demand from the investment sector, i.e. on the decision of the capitalists in the investment sector to invest in the tangible investment goods.

Similarly, the finance sector creates securities and derivatives using the underlying assets, partly the loan book of the commercial banks in the banking sector. Their surplus, again, is the net interest income plus cash flows arising from the derivative products, like securities, all valued at the current market price. Although it is true that the finance sector can expand the supply of securities and derivatives *ex nihilo* and its profit realization depends on the demand for its products, i.e. on the decision of the capitalists to save, the underlying dynamic of the problem of profit realization is different to that of the banking sector. We will elaborate on this point in the next section. Nevertheless, the problem of transformation of surplus in to profits, in the context of the finance sector, naturally leads to the so called "*no Ponzi*" condition, preventing paying debt with new higher debt, ad infinitum, in our model.

Denoting capitalist consumption expenditure by C_c, where $C_c = C_{IC} + C_{BC} + C_{FC}$, we can extend Equation (3) in the context of the four-sector model as:

$$W_{IC} + W_{BC} + W_{FC} + C_c = R_c \qquad (6)$$

yields the profit realization condition for the consumption sector in the four-sector model. Since all wages are consumed in all the sectors, i.e. W_{IC}, wages of the investment sector spent on consumption goods, or, W_{BC}, wages of the banking sector spent on consumption goods, and W_{FC}, wages of the finance sector spent on consumption goods, represent the wage bill in the investment, banking and finance sectors, we can rewrite (6) as:

$$W_I + W_B + W_F + C_c = R_C \qquad (7)$$

where W_I, W_B, W_F denote the wage bill of investment (I), banking (B) and finance (F) sectors respectively.

Adding the realized profit $(R_i + R_b + R_f)$ and subtracting C_c from both sides of Equation (7), we obtain the corresponding extended version of Equation (4) as:

$$R_I + R_B + R_F + W_I + W_B + W_F + C_c = R_C + R_I + R_B + R_F = R. \tag{8}$$

However, since $(R_j + W_j, \ i = I, B, F)$, by definition, the value added of the respective sectors, which is also the final expenditure on goods other than consumption goods, the preceding Equation (8) can be rewritten as:

$$I + B + F + C_c = R_C + R_I + R_B + R_F = R \tag{9}$$

where R_C, R_I, R_B, R_F represent profits in consumption, investment, banking, and finance sectors respectively, and R denotes the total profits. Equation (9) may be rewritten to show the usual condition for saving investment equality in this more general case as:

$$I + B + F + [(R_C + R_I) + (R_B + R_F)] - C_c = [R_1 + R_2] - C_c = R - C_c = S. \tag{10}$$

Since capitalists are the only savers in the economy, total saving S represents saving from total profit R. For notational compactness, we denote profits from the consumption and investment goods sectors, or the "real" sector of the economy, as $R_1 = (R_C + R_I)$ and profits from banking and finance sectors, or the "financial" sector of the economy, as $R_2 = (R_B + R_F)$.

Equation (10) is merely a restatement of the saving-investment equality condition involving explicitly the banking and the financial sectors. If the value added of the banking sector (B) is assumed to be only total net interest income on loans advanced by it, we can deduct the net interest income accruing to banks from both sides of (10) and rewrite:

$$I + F = S = s(R_1 + R_2) = S_R + S_F, \tag{11}$$

where S represents total saving out of profits from the real sector (S_R) and in the financial sector (S_F) respectively. Note that the symbol for saving net of interest has not been changed for notational simplicity. This assumption restricts commercial banks to only taking deposits and earning interest income in a fractional reserve system. In general, the finance sector can also be seen as a special purpose vehicle (SPV) of the commercial bank and while the commercial operation may be seen as interest earning operation, the active trading of their assets for capital gain is done by the SPV. See Bhaduri and Raghavendra (2017) for an exposition of the interconnectedness between commercial and investment banking, and its implications to profit led and wage led regimes.

Equation (11) is the familiar investment saving equality extended to the four-sector model with two types of investment expenditures representing the real (I) and financial (F) sectors. Their adjustment would usually be inter-related through profits expected in the two sectors. The former, i.e. expenditure on real investment depends on the stream of profits expected from investment projects, capitalized as present value. The latter is the value which the financial market currently places on it. Thus, the ratio (F/I) represents the choice between buying investment goods and acquiring their ownership rights in stock exchange and other financial markets (Keynes 1936;

James Tobin 1969). The most significant aspect of this extended investment saving equality condition lies in capturing the interaction between the real and financial sectors and thereby providing an analytical framework to study its implications for the level of effective demand, thereby the problem of profit realization in these sectors, all of which are explored in the following sections.

## 3. Interrelation between the Real and Financial Sectors

The extended saving investment equality given in (11) can also be viewed analogous to the macroeconomic equilibrium achieved by adjustments in current and capital accounts in the case of on open economy. We can see this by rewriting (11) as:

$$I - S_R = F - S_F \tag{12}$$

where any excess demand (expenditure) in the real sector would have to be matched by excess saving in the finance sector (see Bhaduri, Raghavendra, and Vishwesha Guttal 2015 for a more elaborate stock flow consistent model). This is analogous to the macroeconomic balance in the open economy context with $I - S = M - E$, where excess demand (expenditure) in the domestic sector is absorbed and matched by excess supply (earnings) in the external sector to achieve the equilibrium. However, the equilibrium adjustment between the real and financial sectors, and its implications for effective demand in the context of the modern financial economy is not obvious. This section aims to explain the equilibrium adjustment starting from a disequilibrium scenario using the four-sector box diagram (Figure 4) developed in the previous section.

First consider the case where there is excess demand in the real sector, i.e. investment expenditure is greater than the available saving in the real sector. From (12) it is clear that achieving macroeconomic equilibrium warrants the finance sector to generate net saving (saving less investment) to fund the real sector expenditure. Given the assumption that banking sector does not want to create additional assets, it is the saving of the finance sector, in the form of equities and bonds of the real sector, that funds the real sector expenditure. This scenario is shown in Figure 5 (by the arrows) where an increase in the investment expenditure of the real sector $(+I)$ is financed by an equivalent increase in the saving of the finance sector $(+S_F)$ to bring the macroeconomy to equilibrium (12). Essentially, net accumulation in the real sector is balanced by increase in net saving of the finance sector.

On the contrary, when the real sector disequilibrium is brought about by an unplanned inventory accumulation, due to lack of demand, saving exceeds investment since change in inventory is accounted as part of saving. In this scenario, the logic of (12) dictates that the finance sector expanding "financial investment" expenditure over its saving to achieve the macroeconomic equilibrium. Let us explain what the term "financial investment" means. When the real sector experiences unplanned inventory accumulation due to lack of demand, or equivalently non-performing loans, if these assets were funded by the banking sector, there is an incentive for the finance sector to buy the financial assets (i.e. the future cash flows) at a discount from the banks who would like to reduce its balance sheet to avoid potential losses. The finance sector buys these non-performing financial assets, at a discount, with an aim to profit from the securities trade. How does it make profit from the securities trade?
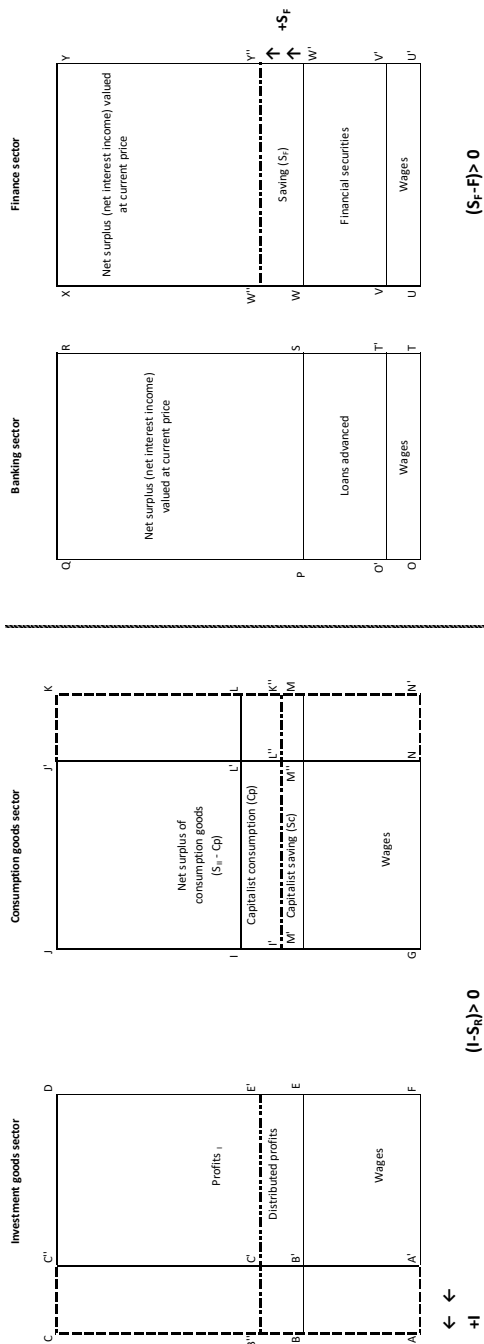
Figure 5 Equilibrium Adjustment Driven by the Real Sector
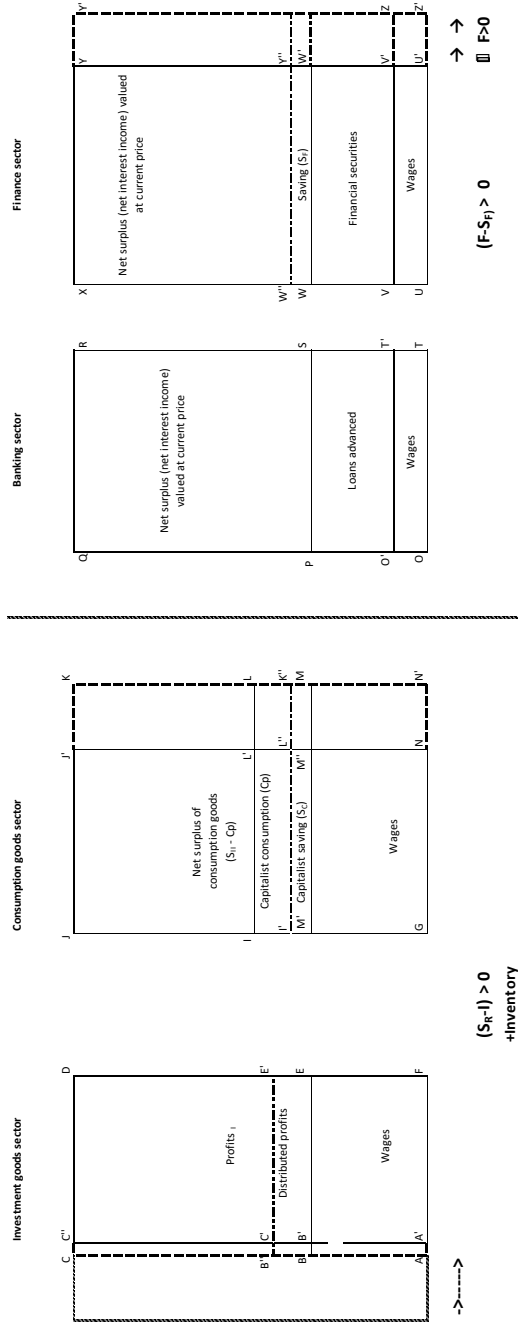
Source: Author's own calculation.

Figure 6 Equilibrium Adjustment Driven by the Finance Sector

When the finance sector buys these non-performing assets (loans) at a discount, it is essentially buying a potential future cash flow at a discount. For example, if the potential cash flow of a non-performing mortgage is 100k and assume that finance sector buys out this mortgage asset at some point before maturity, at a discount, say 50k. Assuming the default probability to be 20%, the effective potential cash flow of the mortgage asset at maturity is 80k. Therefore, the net potential profit for the finance sector is 30k, if it held the mortgage asset till its maturity, which translates to a maximum potential rate of return of 60%. Since holding the non-performing asset entails the risk of not realizing the expected cash flow to its potential, the finance sector would try and sell the asset before its maturity to realize profits to the extent possible. If it can sell the asset for 80k, then it would immediately realize the maximum potential profit of 60%. But, given the quality of the asset, it may not be feasible to realize the maximum potential rate of return. The securitization process enables the finance sector to combine assets with different risk profile to create financial securities that helps them realize the potential profit by selling these assets at a price above their original cost.

Thus, "financial investment" means the finance sector's investment in (buying) financial assets with an aim to profit from selling the potential cash flow. The financial security (liability) thus created may have one underlying financial asset, or a complex combination of many underlying financial assets. For example, consider a 10-year residential mortgage that has five more years to maturity. A financial security can be created on the basis of the expected cash flow from the mortgage over the remaining years to maturity, or from a combination of a pool of similar mortgages "sliced" in to various tranches, say 5th and 6th years expected cash flows, or 8th, 9th and 10th year expected cash flows etc. In this example, the underlying real asset is a pool of mortgages that is used to create one or multiple securities. In general, a pool of diverse financial assets (secured on differing tangible assets) can also be used as the underlying assets, which gives the finance sector more degrees of freedom to create tranches of securities with varying degrees of risk profile. In such a case, the complex combination of various underlying financial assets facilitates expansion of multiple financial liabilities. Thus, the process of securitization leads to a "de-coupling" effect whereby the "new" financial asset created by slicing and repackaging a diverse pool of underlying financial assets, the new financial asset thus created is increasingly de-coupled from the individual sources of expected cash flow.

Either way, in this scenario where there is inventory accumulation in the real sector due to lack of demand, the finance sector expands its investment expenditure and brings the economy to equilibrium (12). This scenario is shown in Figure 6, where the inventory accumulation in the real sector is highlighted by dotted lines and arrows to show the contraction in the investment goods sector (and noted as "+Inventory" in the figure) and the expansion of the financial sector is denoted by $\Delta F > 0$.

4. Aggregate Demand Regimes and Effective Demand

The descriptive analysis using the four-sector model developed in the previous section provides a framework to analyse the macroeconomic equilibrium adjustment process in the presence of a modern finance sector. However, the illustrational power of the

box diagrams has limits in terms of bringing out the underlying dynamic of the equilibrium adjustment in the two scenarios discussed in Section 3. To see this more formally, we assume that the expenditures and saving in both the sectors are driven by profits (derived from expected future cash flow) and assuming static expectations or Keynes' proposition that macroeconomic analysis is carried on the basis of convention that "business as usual" is not disturbed, (Keynes 1937), and express (10) using separate profit from commodity production (R_i) and profit due to financial operation (R_f) as:

$$I(R_i) + F(R_f) = S_R(R_i) + S_F(R_f). \tag{13}$$

Total differentiation of (13) and further simplification yields:

$$\frac{dR_f}{dR_i} = \frac{I_{R_i} - S_{R_i}}{S_{R_f} - I_{R_f}}, \tag{14}$$

where $I_{R_i}, S_{R_i}, I_{R_f}, S_{R_f}$ to denote the partial derivatives of investment and saving with respect to profits in the real and financial sectors respectively. Equation (14) shows that the relative change in profits between the financial sector *vis-à-vis* the real sector depend on the relative responsiveness of investment and saving to profits in the respective sectors. We can now investigate the two scenarios discussed in Section 3 using (14).

The first scenario where there is excess demand in the economy due to the expansion in the investment expenditure in the real sector (Figure 5), which in terms of (14) implies that investment responds more than saving with respect to profits rendering the numerator positive, i.e. $I_{R_i} - S_{R_i} > 0$. In order for the macroeconomic equilibrium (12) to be achieved, the finance sector must generate net saving (saving less investment) and in terms of (14) this means that finance sector's saving must respond more than investment with respect to profits making the denominator positive, i.e. $S_{R_f} - I_{R_f} > 0$. This implies that the finance sector's saving, by way of investing in the equities of real sector firms, funds the investment expenditure in the real sector. In economic terms this means that the expansion in the (real) investment expenditure, expands the size of the market and creates investor confidence in terms of profitability considerations, which leads the financial sector to expand its saving more than investment to fund the real sectors' expansion. This scenario where (real) investment expenditure responds more than saving to profits expanding the size of the market, yields the well-known *investment led* demand regime. Therefore, in this regime where the expansion of the investment goods sector generates aggregate demand *via* the dominant investment demand, the macroeconomic equilibrium is achieved by the finance sector's saving responding relatively more than investment to create a funding channel for the former.

In the second scenario where there is inventory accumulation (Figure 6), presumably due to lack of demand in the real sector, which in terms of (14) implies that saving responds more than investment with respect to profits, i.e. $I_{R_i} - S_{R_i} < 0$. The equilibrium adjustment would warrant the finance sector to expand in terms of its expenditure more than its saving and in terms of (14) this implies $S_{R_f} - I_{R_f} < 0$. As

discussed above, the finance sector expands its expenditure *via* securitization, the income flows arising for the holders of the financial securities in the real sector, in turn would expand aggregate demand in so far as they induce consumption demand relatively more than (real) investment demand, and thus yielding the well-known *consumption led* demand regime. Thus, in this regime where the dominant consumption demand expands aggregate demand, the macroeconomic equilibrium is achieved by the finance sector's investment expenditure responding more than saving to create an income stream for such an expansion.

The equilibrium adjustment in these regimes also draws attention to the nature of stability of these regimes. In the investment led regime, the expansion of the investment goods sector, financed by the finance sector, enlarges the size of the market for profit realization, which in turn, creates confidence in the minds of the investors in the finance sector in terms of securing a return for their investment. Therefore, this regime generates growth in output and employment driven by the expansion of the investment goods sector, which in turn fosters a stable climate of expectations for saver-lenders in the finance sector, and the economy expands by the accumulation of tangible assets.

On the other hand, the consumption led regime expands aggregate demand through the dominant consumption demand, which is, in effect, funded by the finance sector's investment expenditure. However, the expansion of the finance sector expenditure *via* the process of securitization, which gradually decouples the financial securities from the underlying tangibleassets, i.e. decouples the securities from the individual sources of expected cash flow. Thus in this regime, growth in aggregate demand is driven by the dominant consumption demand arising from the income generated by financial securities, which are ownership claims on pools of non-performing and performing financial assets secured on reals sectors' tangible assets. However, the stability of this aggregate demand regime depends on the income from financial assets, which depends on the realization of, uncertain, future, potential cash flows arising from a pool of financial assets secured on real sectors' tangible assets.

The analytical framework developed here can be extended further in different directions. In particular, in the context of the open economy, the framework provides an intuitive way to study the current issues in the international monetary system, particularly the dynamic of trade imbalance between countries, say for example the US *vis-à-vis* China. The persistence of the US current account deficit and the expansion of holding of the US dollar-denominated financial assets by China, can be seen through our case of equilibrium adjustment driven by the finance sector. As the country issuing international currency the US does not face a limitation on the size of its external deficit, and as long as creditors (China) are willing to demand dollar-denominated financial assets, the US would be in a position to sustain its large external deficit with China and other countries (see Sebastian Valdecantos and Gennaro Zezza 2015) for a stock-flow consistent analysis of trade imbalances). Further, it can also be shown that the trade imbalance dynamic can lead to the case of credit driven consumption led expansion which can be analysed in terms of both horizontal (quantity adjustment) and vertical (price adjustment) expansion of the finance sector.

5. Concluding Remarks

The main aim of the paper is to extend the two-sector model, articulated by Kalecki (1971) and further refined by Bhaduri (1986), to introduce banking and finance sectors, with some features resembling modern financial operations that creates funding options for expenditures in the real sector (both investment and consumption goods sectors), and to explore the interaction between the real and finance sectors. The extended four-sector model provides a simple framework to study the interrelation between the real and financial sectors and its consequences for effective demand under modern finance.

Our extension yields a modified macroeconomic equilibrium condition (11 or 12). The extended equilibrium condition brings out the underlying dynamic of equilibrium adjustment between the real and financial sectors. Two scenarios emerge. First, in case of excess demand in the real sector, the macroeconomic equilibrium (12) is brought about by the finance sector responding with more saving than its investment and creating a stable funding channel for the former. This scenario yields the well-known *investment led* demand regime where (real) investment responds more than saving to changes in profits, expanding the size of the market. In economic terms this means that the expansion in the (real) investment expenditure, expands the size of the market and profits in the real sector, which creates confidence in terms of profitability considerations and in turn leads the financial sector to expand its saving more than investment to fund the real sectors' expenditure. Thus, the investment led regime fosters a stable climate of profit expectations for saver-lenders, which augers well for the stability of this regime.

On the other hand, when there is inventory accumulation in the real sector, due to lack of effective demand, the equilibrium adjustment (12) is brought about by the expansion of the finance sector. The expansion of financial investment is primarily through buying financial assets secured on real sectors' tangible assets at a discount and securitizing them with an aim to making profits from the potential cash flow arising from a blended pool of underlying assets. The equilibrium adjustment stimulates the finance sector to expand in terms of its expenditure more than its saving consequently creating an income flow for the holders of these financial liabilities in the real sector, which triggers a dominant response from consumption *vis-à-vis* investment demand, thus yielding the *consumption led* regime. Thus, in this regime, growth in aggregate demand is driven by the dominant consumption demand arising from the income from holding the financial securities. However, since the income flow from these securities depend on the realization of the potential future cash flows from the discounted financial assets secured on real sector's tangible assets, the consumption led regime is relatively more vulnerable than the investment led regime.

The vulnerability of the consumption demand driven expansion stems from the fact that it is the expected future cash flows that is being transferred from the real sector at a discount creating a potential profit for the finance sector. In order to realize the discount driven potential profit, the finance sector transforms the expected cash flow from the real sector assets to interest-bearing financial securities *via* securitization. The income flow for the holders of the securities in the real sector expands aggregate demand through the dominant consumption demand, and in turn generates demand for

these assets, and thereby creates a reinforcing interaction between the real and financial sectors. However, the stability of such an expansion fundamentally depend, in a perverse way, on the transfer of potential profit (expected cash flow) from the real sector to the finance sector, or in other words, on the realization of potential profit from fictitious capital.

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