

Modern Finance and Effective Demand

JEL codes: *E10, E12, E40, E44, E51*

Paper prepared for the research seminar on “Modern Finance and Aggregate Demand: A new analytical framework for policy” in the National Bank of Poland, Warsazawa

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1. Introduction

The principle of effective demand was discovered almost simultaneously but independently by the Polish economist Kalecki (1933/1971, 1937/1971) and the British economist 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and that of investment saving equality are essentially the same (Robinson, 1964; Bhaduri, 1986; Laski, 2016 unpublished) as one of the fundamental insights developed in the twentieth century into the working of the capitalist economy.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 (Marx, 1867-94; Wicksell, 1901/1934). 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, or paying an insurance premium, there would be in general some preference for liquidity despite loss of interest income and defense 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 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 real wage because of a close link between the money wage rate and the price level. For Kalecki 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 maximization equilibrium (and criticized by Friedman (1968) as untenable in the longer run), although Keynes soon began distancing himself 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.

2. 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. Emphasizing only one aspect or the other has resulted in much unnecessary controversy (Bhaduri and Marglin, 1990). Since this should be relatively familiar territory, we provide a short review and summary of the essential argument.

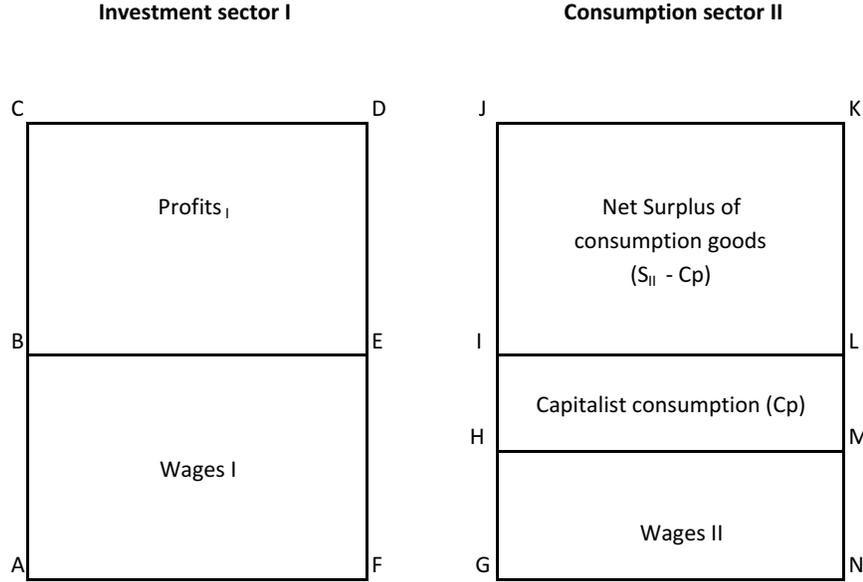


Figure 1: Two-Sector economy

For the purpose of our analysis, we shall use the familiar ‘box’ diagram representation of a closed two-sector economy, where Department I producing investment goods and Department II producing consumption goods (Bhaduri, 1986). 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,

$$C - W_{II} = S_{II} = W_I + C_p \quad (1)$$

or,

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

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

The balancing condition (2) simply means that the investment 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 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, or in Department I is *just large enough to transform the entire surplus of consumption goods sector*, or in Department II, to *realized profits*. If the autonomous investment expenditure is smaller (larger) and consequently the wage bill smaller than $ABEF$, will give rise to accumulation (decumulation) 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 Department II is being realized into profits of that Department, i.e.,

$$S_{II} = W_I + C_p = R_{II} \quad (3)$$

where R_{II} is the profits of the consumption sector (Department II).

A formally equivalent condition of (3) can be obtained by adding the realized profit of Department I, i.e. R_I (the area BCDE in Figure 1) on both sides yields¹,

$$R_I + W_I + C_p = R_I + R_{II} = R \quad (4)$$

where R represents the total profit realized in the economy.

¹ Since, investment expenditure is treated as autonomous, it is assumed 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,

$$\text{Investment } (I) + \text{Capitalists' consumption } (C_p) = \text{total profits } (R)$$

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

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

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

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 sector, or Department I creates the condition for the net surplus generated in the consumption sector, or Department II, to be realized as profits.

2.1 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, implies introducing saving and dividend flows, which are distributed profits. Assuming both workers and capitalists also save in the form of equities, for which they earn dividends, we can modify Figure 2 to show the investment expenditure via equity financing. Firms in the investment sector assumed to raise money for their investment by issuing equities, which are held by workers and capitalists in both the sectors. In Figure 2, the areas $BB''E'E$ in the investment sector, or Department I and $HH'M''M$ in the consumption sector, or Department II represent workers' saving and the total capitalists' saving is the area $HI'L'M''$. The distributed profits, i.e. the dividends that is being paid out by the investment sector firms for the owners of equities is represented by the area $B''C'D'E$ in the Investment sector.

The assumption here is that the money that is raised by issuing equities is to finance the expansion of the investment goods sector, and the resulting expansion in the consumption sector (quantity adjustment) is shown in Figure 2. The increase in investment expenditure, financed by issuing equities, is shown by the area $A'ACC''$, where the wage bill of the sector is increased by $A'ABB''$ and the profits by $B''BCC''$.² Consequently, this expansion in the investment sector, or Department I, expands the size of the market for the consumption goods sectors, or Department II, represented by the area $NJ'KN'$ and the increased net surplus for profit realization by $I''J'KL$. Although the introduction of the mode of financing investment expenditures in the investment sector does not alter the macroeconomic balance condition (3) (or (5))³, the illustration shows that the simple device of “box diagram” can be extended to analyze the implications of scenarios where both classes save in financial assets, i.e. equities in this case, other than in cash, for effective demand in the economy.

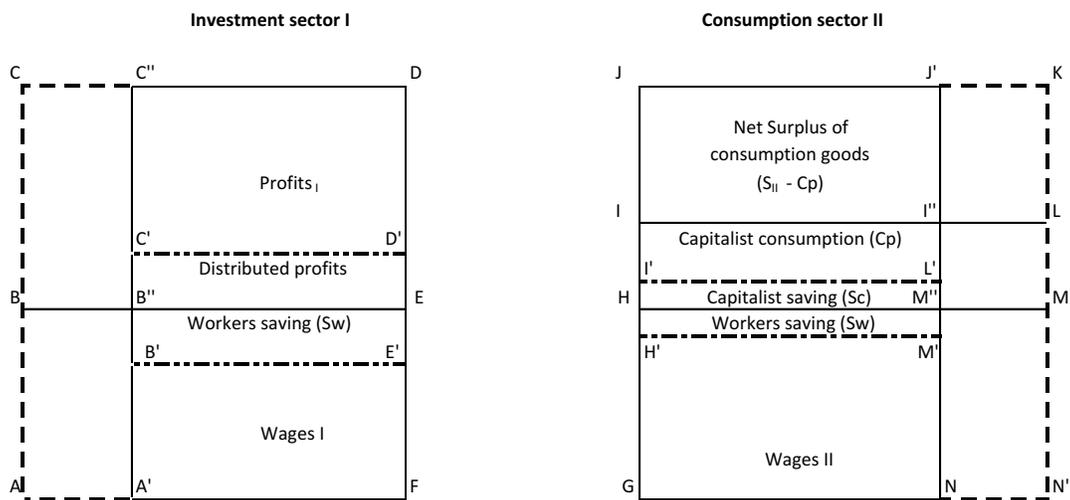


Figure 2: Equity financed investment sector expansion

² The distributed profits and workers saving have not deducted from this expansion to highlight that they are realised in the previous period. The same proportion can be applied to the current profits and wages for the next round of expansion, going forward.

³ Note that the equilibrium condition (5) will hold, although with modifications to include the differential saving propensities, as equities are valued at current market price. Hence, there is no capital gain in this model.

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 bank sector is determined by demand for loans from the investment sector, or Department I. Thus, increase in investment expenditure financed either through 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 $I''J'KL$ 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 sector, or Department II depends on the wage bill of the investment sector, or Department I. 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 Department I. 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 realization of profits and effective demand in the economy.

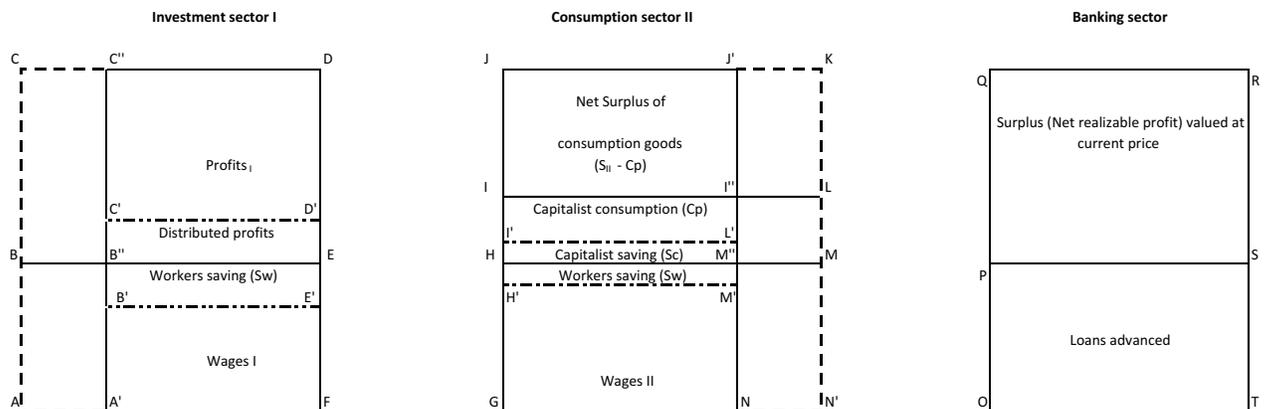


Figure 3: Equity and bank credit financed investment sector expansion

3. The Four-Sector model: Introducing Modern Financial Sector

The preceding analysis of the two-sector model with financial assets, i.e. equities, is now extended to incorporate a full-fledged modern finance sector, which introduces the possibility of investing in financial assets that are derivatives of equities, such as securities and other second order derivatives. This extension will allow us to incorporate differential rates of returns on real tangible assets and financial assets and its consequent impact on investment expenditure in Department I and 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 the growing ascendancy 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” (Krippner, 2004). Regardless of definition, there exists a 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 (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 (Duménil and Lévy 2004, Bakir and 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 substantially contributed by financial assets rather than from real tangible assets (Orhangazi, 2008). Again, in the context of

US economy, Onaran *et al.* (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 non-rentier profit income.

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 'financialisation' period. The aim here is to extend our two-sector model to capture some of the characteristics of the *stylized facts* in the literature and provide a simple theoretical framework to study the implications of financialisation 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 sectors, we introduce 'banking' and 'finance sectors. The 'banking' sector (or B-sector for short) comprise of the central bank, commercial banks and other financial institutions such as the pension funds and mutual funds that operate under the purview of the central bank or the monetary authority's lender of last resort guarantee. The 'finance' sector (henceforth F-sector), on the other hand, represent the 'shadow banking institutions' such as the investment banks, hedge funds, financial insurance institutions and other entities that are thinly supervised and do not come under the purview of central banks' lender of last resort guarantee.

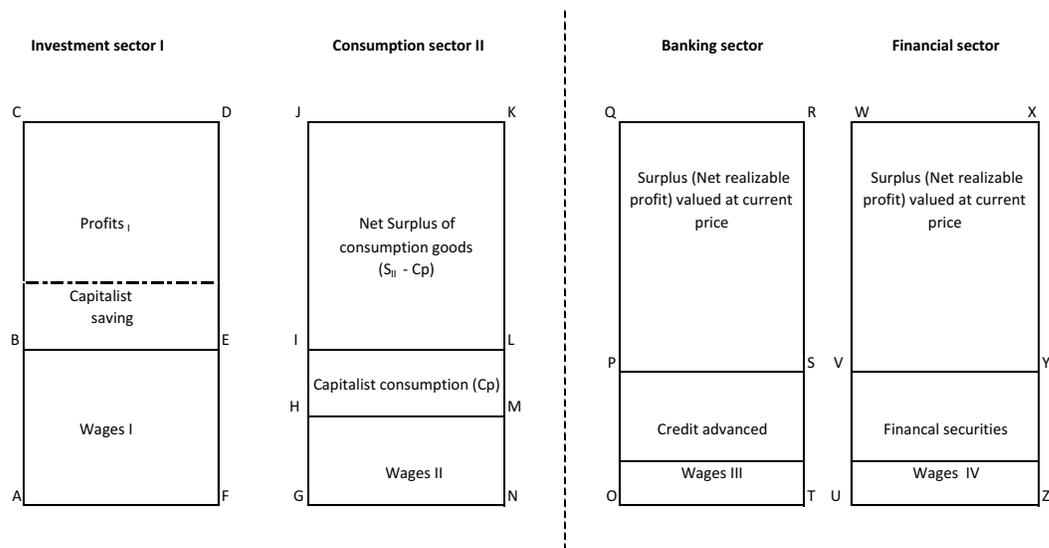


Figure 4: The four-sector model

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. The modern financial sector has seen, at least since the 1990s, an explosion of ‘special purpose entities’ (SPE) or ‘structured investment vehicles’, whose securities, i.e. derivatives, are backed by the underlying assets’ cash flows, i.e. mortgages, issued by the commercial banks.⁴ The derivative products both that are backed by real tangible assets, like the Asset Backed Securities (ABS), and those that based on financial assets, like the CDOs and CDO-squared etc., provide a the source of financial income flows.

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. In terms of savings, although it is not indicated in Figure 4, the investment sector firms issue equities and hence savings can be held in cash, equities and other financial securities and derivatives. Thus, there

⁴ See Bhaduri et al. (2015), particularly Section 3, for a detailed discussion on the process of securitization in the modern financial system.

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 'credit advanced' area in the box in the Banking sector. The banking sector's surplus is the net interest payments arising from the balance between credit advanced to the interest payments to deposits evaluated at the current market price. However, only when the current market price (replacement cost) of the collaterals that are the underlying assets of the loans is above the issue price (construction cost), the banks are able to transform their surplus into profits. The current market value of the collateral very much depends on the demand for such assets arising elsewhere, i.e. the investment sector. Therefore, the realization of profit of the banking sector is very much dependent on the demand from the Investment sector expenditures. When the investment sector expands, it creates the demand for credit for the payment of wages for workers involved in the production. Therefore, even though, the banks can create credit, independent of deposits, their profit realization is very much dependent on the demand from the investment sector, on the decision of capitalists in the investment sector to invest in the real 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 payments plus cash flows arising from the credit derivative products, like credit default swaps, all valued at the current market price. Depending on the difference between the market price and the issue price of the securities and derivatives, their profit realization depends on the demand for its products from the investment sector. That is, the finance sector

can expand the supply of securities and derivatives, but their profit realization very much depends on the demand from the investment sector, on the decision of the capitalists in the investment sector to invest in the financial goods. Thus, the problem of transformation of surplus in to profits naturally leads to the so called ‘No Ponzi’ condition, preventing paying debt with new higher debt, ad infinitum, in our model.

Even though, all the assumptions and other details of the model is not shown in Figure 4, we show the accounting basis of the expenditure-income flows of the four-sector model using a cross expenditure-income matrix, shown in Table 1, which is drawn from the interrelationship between the sectors as discussed in Section 2. In Table 1, the four sectors are denoted by consumption sector (C), investment sector (I), banking sector (B) and finance sector (F).

	C	I	B	F
C	E_{CC}	E_{CI}	E_{CB}	E_{CF}
I	E_{IC}	E_{II}	E_{IB}	E_{IF}
B	E_{BC}	E_{BI}	E_{BB}	E_{BF}
F	E_{FC}	E_{FI}	E_{FB}	E_{FF}

Table 1: Cross expenditure-income matrix

The entries, E_{ij} represents expenditure by sector i on sector j. For instance, the entry E_{IC} denotes the expenditure by the investment sector on consumption goods. Therefore, by construction, the entries when read along the row indicate income from the row sector to the column sector and when read along the column indicate expenditure from the column sector to the row sector. Thus, the row total, $\sum_j E_{ij}$, yields the value of output of the sector from income side and the column total, $\sum_i E_{ij}$, yields the value of output of the sector from the expenditure side.

In terms of profit realization, as in the two-sector model, each sector is able to realize profit from surplus according to expenditure by other sector. For instance, take the case of consumption sector. It's profit realization from surplus depends on the expenditure from other sectors, as in equation (3), but in this case of four-sectors, depends on

$$S_C = E_{IC} + E_{BC} + E_{FC} = R_C \quad (6)$$

or

$$S_C = [(W_{IC} + C_{IC}) + (W_{BC} + C_{BC}) + (W_{FC} + C_{FC})] = R_C \quad (7)$$

where the expenditures ($E_{ij}, i, = I, B, F, j = C$) arise both from workers' consumption ($W_{ij}, i = I, B, F, j = C$) and capitalist consumption expenditure ($C_{ic}, i = I, B, F, j = C$) for consumption goods from each sector. Note that the surplus of the consumption sector (S_C) is the net of its own expenditure E_{CC} , i.e. expenditures arising from wages (W_{CC}) and capitalist consumption (C_{CC}) of the consumption sector. For each sector, we would have a similar relation viz., S_I, S_B, S_F . Note that the No-Ponzi condition means that no sector can realize its profits without expenditure from other sectors, i.e. the diagonal entries, E_{ii} , the own expenditures in each sector on their own is not sufficient for profit realization. In terms of the finance sector, this means that is not possible for paying old debt with the proceeds of the new higher debt, ad infinitum.

Denoting capitalist consumption expenditure by C^c , where $C^c = C_{IC} + C_{BC} + C_{FC}$, and rewriting equation (7) as

$$W_{IC} + W_{BC} + W_{FC} + C^c = R_C \quad (8)$$

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 these sectors, we can rewrite (8) as

$$W_I + W_B + W_F + C^c = R_C$$

where $W_i, i = I, B, F$ denote the wage bill of investment, banking and finance sectors respectively.

A formally equivalent condition of (8) can be obtained by adding the realized profits of the other sectors, i.e.

$$R_I + R_B + R_F + W_I + W_B + W_F + C^c = R_C + R_I + R_B + R_F = R \quad (9)$$

where $R_i, i = I, B, F$ represent profits in investment, banking, and finance sectors and R denote the total profits.

However, since $(R_i + W_i, i = I, B, F)$, by definition, the value added of the respective sectors, which is also the final expenditure on goods other than consumption goods, the preceding equation (9) can be rewritten as

$$I + B + F + C^c = (R_C + R_I) + (R_B + R_F) = R \quad (10)$$

where I, B and F are the value added of investment, banking and the finance sectors respectively.

Deducting B (interest income of banks) and C_c from (10), we can restate the equilibrium condition for the four-sector economy as

$$I + F = \text{Saving out of profits after interest payments}$$

i.e.

$$I(R_I) + I(R_F) = (\hat{R}_C + \hat{R}_I) + (\hat{R}_B + \hat{R}_F) = (S_C + S_I) + (S_B + S_F) \quad (11)$$

where the variables with hats, $\hat{R}_C, \hat{R}_I, \hat{R}_B,$ and \hat{R}_F represent net of interest payments and after consumption by capitalists.

Let us assume constant saving propensities, s_r , for the real part of the economy, represented by the production sectors of consumption and investment sectors, i.e., $S_r = s_r(S_C + S_I)$ and s_f , for the financial part of the economy, represented by the banking and finance sectors, i.e., $S_f = s_f(S_B + S_F)$.

Total differentiation of (11) and collecting terms yields,

$$\kappa = \frac{\left(\frac{\partial F}{\partial R_F} - s_f \right)}{\left(s_r - \frac{\partial I}{\partial R_I} \right)} = \frac{dR_I}{dR_F} \quad (12)$$

The denominator of (12) is the relative response of saving and investment for changes in profits in the real production sectors, or the real economy, and it is assumed to be positive owing to the Keynesian stability condition. Therefore, the ratio $\left(\frac{dR_I}{dR_F} \right)$ of the change in the level of profits in the real economy vis-à-vis the financial economy depends on the relative response of financial investment and financial saving to financial profits. If the latter is positive when $\frac{\partial F}{\partial R_F} > s_f$, i.e. when financial investment responds more than saving for a unit change in financial profits and vice versa.

The economic intuition of (12) can be seen clearly if we see it from the point of view of rate of return on real (ρ_r) and financial investment (ρ_F). Assuming $\rho_r = \frac{dR_I}{I}$ and $\rho_F = \frac{dR_F}{F}$, the positive or negative value of the slope k in (12) implies whether

$$\frac{I}{F} \lessgtr \frac{dR_I}{dR_F} \quad (13)$$

i.e. whether the real rate of return is greater or less than the financial rate of return, or $\rho_r \lessgtr \rho_F$. When the rate of return on the real investment (I) is greater than the financial investment (F), the output in the economy expands via higher investment expenditure, that is through real capital accumulation. On the other hand, if the rate of return on the financial investment (F) is greater than the real investment, which implies that the finance sector would expand, either via creating new securities (horizontal expansion of the finance sector box in Figure 4) or due to appreciation of value of the existing securities (vertical expansion of financial sector box in Figure 4). In both these case, the higher level of net surplus in the finance sector, need not necessarily be realized into profit, as the loss of demand due to the fall in the level of real investment expenditure might more than outweigh the positive demand owing

arising from increase financial investment expenditure. That is, in this case, the negative impact of the composition of total investment in the economy in favor of financial investment, the so called *composition effect*, may outweigh any positive demand generating influence of the expansion in financial income flows, arising from either quantity or price adjustment in the finance sector.

4. Aggregate demand under financialisation: A particular case

Using the general analytical framework in the previous section, we now provide one possible way of modeling the dynamics of aggregate demand within the context of the four-sector economy. As we noted before, the introduction of the finance sector provides a way to incorporate financial income flows in addition to income from commodity production, for example, profits in the case of Capitalists. As we see from (12) and (13) that expansion of the real economy depends on the relative impact of investment expenditure in generating effective demand in the economy. We can also see, from (13), that the relative rate of return on real investment (ρ_r) and financial investment (ρ_F) would determine change in the sign of $\left(\frac{dR_I}{dR_F}\right)$ endogenously. In this section we explore the dynamics using a particular illustration. Here again, we assume that workers consume all they earn, so only capitalists save out of their profits.

In order to capture the real income flows and financial income flows, in the context of the short-period, we propose a decomposition of the rate of profit as,

$$\frac{R}{K} = \frac{R}{FI} \frac{FI}{K} \quad (14)$$

where R is profits, K is the real tangible capital stock, FI denotes the financial flows from interest income and dividends flow from holding securities and equities. For notational convenience, we denote the ratios as: $r = \frac{R}{K}$, $\phi = \frac{R}{FI}$ and $f = \frac{FI}{K}$.

The decomposition (14) allows us specify investment expenditure as a function of these two ratios, profits to financial income (ϕ) and financial income to real tangible capital stock (f). It

is economically meaningful to assume that when profits from commodity production increases vis-à-vis financial income, there would be an increase in the level of investment expenditure in the commodity production in the investment goods sector. On the other hand, when financial income is higher than the income from commodity production, investment expenditure would move towards the finance sector. Therefore, the investment function can be expressed as,

$$I = I(\phi, f) \quad (15)$$

with partial derivatives $I_\phi > 0$ and $I_f < 0$. The partial derivative I_f , captures the so called composition effect.

The aggregate saving is a function of profits, since only capitalists save, and can further decomposed to incorporate the financial income flows as,

$$S = s \left(\frac{R}{FI} FI \right), \quad \text{where } 1 > s > 0 \quad (16)$$

Again, using the previous notations, and denoting FI , the financial income flows variable as Γ , the saving function is rewritten as,

$$S = s \cdot \phi \cdot \Gamma \quad (17)$$

where s is the saving propensity.

The equilibrium condition yields,

$$I(\phi, f) = s \cdot \phi \cdot \Gamma \quad (18)$$

Total differentiation of (18) and collecting the terms yields,

$$df = \left[\frac{(I_\phi - s\Gamma)}{\left(s\phi \frac{d\Gamma}{df} - I_f \right)} \right] d\phi \quad (19)$$

The numerator in (19) is the relative response of investment and saving to the ratio of profits to financial income, i.e. $(I_\phi - S_\phi)$ and denominator captures the relative response of investment

and saving with respect to financial income to capital stock ratio (f), i.e. $(S_f \frac{d\Gamma}{df} - I_f)$. With $\frac{d\Gamma}{df} > 0$ and $I_f < 0$, the denominator of (19) is unambiguously positive. In any case, the Keynesian stability condition will make the denominator of (19) positive. Thus, equation (19) gives rise to a relation between the rate of change in financial income to capital stock ratio (df), depends on the sign of the relative response of investment and saving to the ratio of profits to financial income ($I_\phi - S_\phi$) and the rate of change in the profits to financial income ratio ($d\phi$).

From (14) we have,

$$r = \phi f$$

Total differentiation and rearranging the terms yields,

$$d\phi = \phi \left(\frac{dr}{r} - \frac{df}{f} \right) \quad (20)$$

where the rate of change of profits to financial income ratio depends of the relative change between the *real* rate of profit $\left(\frac{dr}{r}\right)$ and the *financial* rate of profit $\left(\frac{df}{f}\right)$, i.e., $d\phi \geq 0$ when $\left(\frac{dr}{r} - \frac{df}{f}\right) \geq 0$.

Therefore, equation (19) together with (20) now defines the motion of the economy, i.e.,

$$df = \left[\frac{(I_\phi - s\Gamma)}{\left(s\phi \frac{d\Gamma}{df} - I_f\right)} \right] d\phi$$

where

$$d\phi = \phi \left(\frac{dr}{r} - \frac{df}{f} \right) \quad (21)$$

Equation (21) shows that the expansion of financial income in the economy depends not only on whether investment responds more than saving to change in profits to financial income

ratio, but also also the relative rate of return in real and financial investment. Figure 5, summarizes all possible scenarios in the investment led (when $(I_\phi - S_\phi) > 0$) and consumption (when $(I_\phi - S_\phi) < 0$) led aggregate demand regimes. For the purpose of this paper, we shall only analyze the case of investment led regime.

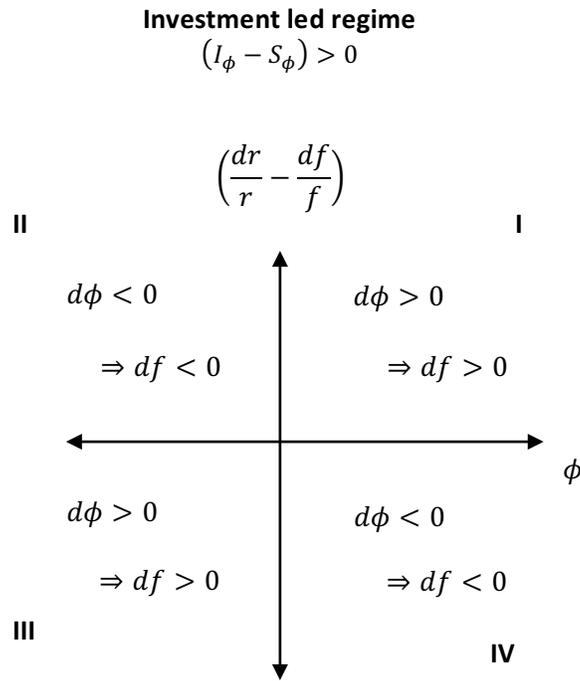


Figure 5: Expansion and contraction of financial income in the investment led regime

In terms of interpreting the result, for the sake of simplicity, let us consider only the positive values of ϕ , i.e. quadrants I and IV in Figure 5. Let us consider first the Investment led regime, $(I_\phi - S_\phi) > 0$. In the positive orthant, quadrant I we have both $d\phi > 0$ and the real rate of profit is greater than financial rate of profit, $\left(\frac{dr}{r} - \frac{df}{f}\right) > 0$. In this quadrant, equation (21) would result in expansion in the ratio of financial income to capital stock, i.e. $df > 0$. In this regime, with return on real tangible assets is greater than return on financial assets, investment expenditure on real investment will expand output and aggregate demand. At the same time, given that some of these expenditure is equity financed, expansion in real investment will also lead to increase in dividend income for the equity

holders. Thus in this quadrant, expansion in investment expenditure also leads to increase in financial income, mainly from via dividends from equities. In other words, this case represents the case of exhilarationist expansion in real investment leads to increase in financial income.

On the other hand, in quadrant IV, we have $d\phi > 0$, but return on financial investment is greater than the return on real investment, i.e. $\left(\frac{dr}{r} - \frac{df}{f}\right) < 0$. Therefore, in this case of investment responding more than saving, higher return on financial investment will lead to the higher investment expenditure in the financial sector. However, higher financial investment expenditure leading to increased surplus in the finance sector may not be realized as the negative impact of reduction in real investment expenditure on profits, particularly via the reduction in capitalist expenditure, might outweigh any positive impact of the expansion of the financial investment. Thus, although the return on financial investment is relatively greater than the return on real investment, investment exhilarationist expansion in financial investment may lead to contraction in financial income ($df < 0$).

In terms of the dynamics, equation (21) would imply that the investment led regime may give rise to cycles between the quadrants I and IV, i.e. expansion in financial income in quadrant I, if leads to relative increase in the return on financial investment, the dynamics of the system will take the economy to quadrant IV. Further expansion of investment expenditure on the finance sector, would lead to contraction of financial income, owing to the problem of profit realization of the finance sector, and will result in the cyclical movement between quadrants I and IV in this regime.

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