

*SUBCONTRACTING, MONOPSONISTIC  
POWER AND DOMINATION IN A THREE SECTOR  
STOCK-FLOW CONSISTENT MODEL*

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Abstract

The aim of the paper is threefold. It first tries to develop the real side of Stock-Flow Consistent models while introducing three sectors, especially one “input sector”. Secondly, the paper analyses the consequences of the use of monopsonistic power by one of the sector, thereby illustrating what can be at stake in subcontracting relationships in the economy. It then stresses a double domination phenomenon undergone by small firms: they are dominated by big firms and by banks. It concludes that the competitive situation in which the small firms are can be negative for the economy as a whole if these firms try to report price cuts on workers either through wages’ restraints or productivity pressures.

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## **Introduction.**

Since Lavoie and Godley published their seminal paper in 2001, the stock-flow consistent way of modelling economic activity has become very fashionable among Post Keynesians, especially those interested in financial and monetary analysis. Stock-flow consistent models bring a consistency between stocks and flows, and so avoid “black holes” (Zezza and Dos Santos, 2004, p: 84) and inconsistent assumptions. This discipline allows for taking historical time seriously with the representation of a capitalist system that stresses traverse and shifting equilibria. However, as Kim (2006) points out, there has been little development in models including two sectors. SFC models have indeed been developed with a vertically integrated firms sector, producing its own capital goods, and producing consumption goods with labour. Kim (2006) provides for his part a two-sector model with target return pricing.

In this paper, we try to go further by adding a third sector to the model. We build a model where the consumption good sector is not integrated but buys a primary good to another sector (the input sector, hereafter the primary sector), both buying capital goods to the investment sector. In particular, we will analyse what happens when there are subcontracting relationships between the consumption good sector and the primary good sector. In that framework, we can model an economy where the consumption sector is composed of a small number of large firms whereas the primary sector is composed of a large number of small firms. This means that the consumption sector can use monopsonistic power to impose price cuts to the primary sector. But small firms of the primary sector are not only dominated by the consumption sector, but also by banks, who impose them higher interest rates and limit credit due to their smaller size and higher risk.

The paper is divided into five sections. In the first section, we discuss the links between the three different sectors, sometimes illustrated by French examples. In the second section, we will build the social accounting matrixes and establish the behavioural equations. The third section will be devoted to simulations on the basis of chosen shocks. The last section will be devoted to the role of bank discrimination and banks’ behaviour on the effects of the shocks.

## I. Real side of stock-flow consistent models.

SFC modelling has become increasingly fashionable among Post Keynesian economists since the publication of the “Lavoie-Godley” model in 2001 in the *Journal of Post Keynesian Economics*. Since then, a lot of developments have been achieved. However these developments often deal with the financial and/or monetary sides of the model. This trend is logical as it is precisely the purpose of that kind of model to focus on these aspects. The development of the real side of SFC models is not very frequent, if not inexistent for the moment. The decomposition between several sectors is not very widespread among Post Keynesians. For example, Lavoie and Ramirez-Gastón (1997) build a two-sector Kaleckian model. For his part, Kim (2006) introduces two sectors in a SFC model. But the distinction always concerns the difference between the investment sector and the consumption sector. In this paper we want to bring in a third sector so as to build a relation between the production of consumption goods and an input which is required to produce them. This kind of disaggregated framework is nearly absent of the Kaleckian models, except in Harck (1980), Harck (1981) and in some scattered but important writings of Kaldor.

However, these relationships between sectors can have important consequences. A notable one is the fact that the link between these two sectors can be more complex than a simple “buying” relationship. To the contrary, the consumption good sector can try to develop sub-contracting relationships with some firms of the primary sector<sup>1</sup>. Sub-contracting implies a subordination link: the “order giver” decides of the quality and the quantity of the primary good produced. If, as is the case in France, the order-giver sector is composed of a small number of big firms and the primary sector of a lot of small firms, the order-givers have indeed some monopsonistic power. They can use this power to make prices of the primary product decrease. If economists have always insisted on monopoly power, they have much less underlined the power a firm can have on the prices of its inputs. In some important industries, like cars industries or supermarkets, 2 or 3% price cuts each year can be imposed to suppliers.

The big problem from the analytical point of view is that if one uses usual pricing policies (mark-up pricing, full-cost pricing or even target return pricing) in a Kaleckian model, the price cut in input goods will be passed on the price of consumption goods mechanically. This will also be interpreted as a simple margin reduction for the primary

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<sup>1</sup> We will not discuss here of the reasons why firms may develop subcontracting instead of own production.

sector. But in the real world, on the one hand input price cuts are not necessarily passed on by big firms, and on the other hand suppliers can try to report the price cut to other agents, notably on workers through wage cuts “agreements”, often presented as the only way to make the firm survive. This is precisely what we will try to do in the paper. We will thus examine two types of mechanisms:

- First, the order-giver firms can maintain their price while imposing cost reductions in the price of their inputs;
- Second, order-taker firms may try to transfer, though not immediately, these price cuts to workers while trying to reduce wages, if we assume as Dallery and Van Treeck (2009), that in an economy where different social groups have different, not necessarily compatible objectives and different ability to impose them, conflicts prevail and so one class of agents may transfer the adjustment constraint to another one which is not dominant (workers in this case).

In such a framework, it is necessary to make some prices exogenous in the model, at least at the beginning in order to study the dynamics of the model. The model we will present is thus composed of three producing sectors, one producing capital goods for every sector (including itself), a second sector producing primary/input goods for the third sector, which produces consumption goods.

Our model will thus focus on a domination phenomenon of small suppliers by big firms. As is commonly said, small is beautiful but big is powerful. However this is clearly not the only domination small firms are subjected to. Small firms are also dominated by banks. There are several reasons why small firms are more dominated by banks than big firms are. First, there is a “size effect” which insures the lender that he will be reimbursed one way or another. Here it is the “too big to fail” theorem that applies: the 2008 crisis is a good example of a situation where big firms are helped by governments because letting them going bankrupt would represent a too big risk for the economy. At the opposite, a small firm going bankrupt is not a danger for the economy. The second reason concerns the sources of finance available to firms. Big firms are in general listed firms which can get money by issuing shares, whereas small (non listed) firms can’t do it, or can do it but not in the same proportions. Small firms are thus more dependent on banks in their activity. For banks, small firms are more risky. All

this explain why banks generally apply higher interest rates to small firms, and in the meantime why banks limit credit to them. Small firms are thus “double dominated”.

## II. The model.

### *a. Structure of the model.*

We start by making some simplifying assumptions, in order to isolate the real side of the economy.

- i. There is no government nor foreign sector;
- ii. The economy is composed of five sectors: households, banks, investment firms, primary firms and consumption firms;
- iii. There is no overhead labour;
- iv. There are no equities<sup>2</sup>;
- v. There is no capital depreciation;
- vi. The input/primary good is only a cost for the consumption sector: the output of the primary sector is entirely determined by the output of the consumption sector, given a fixed proportion  $\alpha$ . This input does not affect the productivity of workers. One may imagine that the consumption sector just buys the primary good and resale it as it is.

Table 1 presents the balance sheet matrix of our economy. The consumption sector is denoted as subscript “\_c”, the primary sector as subscript “\_m”, and the investment sector as subscript “\_i”.

<Insert Table 1 here>

Table 2 presents the stock matrix, which is very simple as we assumed away equities and portfolio choices.

<Insert Table 2 here>

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<sup>2</sup> This assumption may appear too unrealistic, but we insist on the fact that we only want to examine the real side of the model and let the introduction of equities for future research.

The next step is to present the accounting identities that come from the transaction matrix

$$W_c + W_m + W_i + \Pi_c^D + \Pi_m^D + \Pi_i^D + \Pi_b^D = p_c q_c + \Delta M^d \quad (1)$$

$$p_c q_c = p_m q_m + W_c + \Pi_c + i_c \cdot L_{c-1} \quad (2)$$

$$p_m q_m = W_m + \Pi_m + i_m \cdot L_{m-1} \quad (3)$$

$$p_i I_c = \Pi_c^U + \Delta L_c \quad (4)$$

$$p_i I_m = \Pi_m^U + \Delta L_m \quad (5)$$

$$p_i I_c + p_i I_m + p_i I_i = W_i + \Pi_i + i_i \cdot L_{i-1} \quad (6)$$

$$p_i I_i = \Pi_i^U + \Delta L_i \quad (7)$$

$$\Delta L_c + \Delta L_m + \Delta L_i = \Delta M^s \quad (8)$$

$$\Pi_c^U = \Pi_c - \Pi_c^D \quad (9)$$

$$\Pi_m^U = \Pi_m - \Pi_m^D \quad (10)$$

$$\Pi_i^U = \Pi_i - \Pi_i^D \quad (11)$$

$$\Pi_b = i_c \cdot L_c + i_m \cdot L_m + i_i \cdot L_i \quad (12)$$

$$\Pi_b^D = \Pi_b \quad (13)$$

$$\Delta M^d = \Delta M^s \quad (14)$$

We have here 14 accounting identities including 5 “non-trivial” rows<sup>3</sup>. We will have to use 13 of these equations and use one as the hidden equation to check the consistency of the model. The last non-trivial row (equation (14)) will be assigned to this role.

### *b. Households*

We then have to define the behavioural assumptions. Concerning households, they are assumed to consume a part  $a_1$  of their current wage, a part  $a_2$  of their current money stock and a part  $a_3$  of distributed profits:

$$C = a_1 \cdot (W_c + W_m + W_i) + a_2 \cdot M^d + a_3 \cdot (\Pi_c^D + \Pi_m^D + \Pi_i^D + \Pi_b^D) \quad (15)$$

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<sup>3</sup> A non trivial row is defined as a row that contains at least two different variables.

We will assume here that  $a_1 > a_3 > a_2$ .

The flow of demand for money (i.e., household current saving) is just the difference between households' revenue and their expenses:

$$\Delta M^d = (W_c + W_m + W_i) + (\Pi_c^D + \Pi_m^D + \Pi_i^D + \Pi_b^D) - C \quad (16)$$

### c. Firms

We assume that firms have a desired rate of accumulation and a desired amount of investment:

$$I_j^d = g_j^d \cdot K_{j-1} \quad \forall j = c, m, i. \quad (17)$$

We assume a rather traditional desired accumulation function: the desired rate of accumulation depends on animal spirits of firms, the rate of cash flow (rate of undistributed profits), the rate of capacity utilization and on a financial condition index (fci) which denotes the financial situation of firms (we choose to follow Le Héron and Mouakil 2008 on that point).

$$g_j^d = \gamma_{0j} + \gamma_{1j} \cdot r_{j(-1)}^{cf} + \gamma_{2j} \cdot u_{j(-1)} + \gamma_{3j} \cdot fci_j \quad (18)$$

$$fci_j = i_j \cdot lev_j \quad (19)$$

The desired amount of investment leads to a desired amount of external finance<sup>4</sup>:

$$\phi_j^d = p_i \cdot I_j^d - \Pi_j^U \quad (20)$$

This equation just means that firms always reinvest their undistributed profits.

The rate of cash flow (undistributed profits) is denoted as :

$$r_j^{cf} = \Pi_j^U / (p_i \cdot K_j) \quad (21)$$

and the level of indebtedness refers to the monetary capital of firms, estimated at its replacement cost rather than historical cost :

$$lev_j = L_{j-1} / (p_i \cdot K_{j-1}) \quad (22)$$

$$\Pi_j^U = \Pi_j - \Pi_j^D \quad (23)$$

We assume the that firms have an exogenous retention rate on profits :

$$\Pi_j^D = (1 - s_f) \cdot \Pi_j \quad (24)$$

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<sup>4</sup> In the model we will introduce some parameters so as to ensure that the desired external finance is never negative.

The equations of profits are specific to each sector:

$$\Pi_c = p_c \cdot q_c - w_c \cdot N_c - p_m \cdot q_m - i_c \cdot L_c \quad (25)$$

$$\Pi_m = p_m \cdot q_m - w_m \cdot N_m - i_m \cdot L_m \quad (26)$$

$$\Pi_i = p_i \cdot q_i - w_i \cdot N_i - i_i \cdot L_i \quad (27)$$

The utilization rates are defined as the ratio between current output and potential output:

$$u_j = q_j / q_j^{FC} \quad (28)$$

with potential output given by the capital stock and a technical coefficient:

$$q_j^{FC} = K_j / \sigma_j \quad (29)$$

The total level of employment in each sector is given by the ratio of the output and the productivity level:

$$N_j = q_j / \mu_j \quad (30)$$

The level of full employment for the economy as a whole is given by:

$$N_{FE} = \sum_{j=c,m,i} (q_j^{FC} / \mu_j) \quad (31)$$

which yields a particular definition of the unemployment rate:

$$Un = \frac{N_{FE} - \sum_{j=c,i,m} N_j}{N_{FE}} \quad (32)$$

It has to be noted now that even if we will present the evolution of the rate of unemployment we won't focus too much on this ratio because the definition is really too specific. Instead we will focus more on the potential employment, because it just denotes the maximal level of employment that the economy can provide at one point of time.

In traditional models, the labour productivity is assumed to be exogenously given. We prefer assume that productivity is variable, however not much, depending on the rate of utilization. The idea is that the more the rate of utilization of capacity, the more the productivity of labor<sup>5</sup>.

$$\mu_j = \mu_{j(-1)} + \phi \cdot (u_j - u_{j(-1)}) \quad (33)$$

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<sup>5</sup> In case of an unexpected surge in demand, firms prefer to increase the productivity of their workers instead of hiring new workers.



The determination of the levels of outputs is very specific to each sector:

$$p_c q_c = C \text{ which yields } q_c = (C / p_c) \quad (34)$$

The consumption sector is supposed to use a fixed proportion of the primary good for its own production:

$$q_m = \alpha \cdot q_c \quad (35)$$

Finally, the output of the investment sector is equal to the three sectors' investment expenses for the period:

$$p_i q_i = p_i (I_c + I_m + I_i) \Rightarrow q_i = (I_c + I_m + I_i) \quad (36)$$

#### *d. Prices and wages determination*

We assume the price of the consumption sector to be constant, so as to examine the consequences of costs cuts which are not passed through to the consumer.

$$P_c = P_{c0} \quad (37)$$

The price of the investment good is equal for his part to a simple mark-up pricing policy:

$$p_i = (1 + \theta_i) w_i / \mu_i \quad (38)$$

Concerning the price of the intermediate good, we will assume that it is subject to a bargaining process between firms of the primary sector and those of the consumption sector, each sector referring to a target price (which seems to be the case in the real world bargaining process about prices of inputs):

$$p_m = \Psi \tilde{p}_m^c + (1 - \Psi) \tilde{p}_m^m \quad (39)$$

with  $\Psi$  the bargaining position of the consumption firms,  $\tilde{p}_m^c$  the price of primary products targeted by consumption firms and  $\tilde{p}_m^m$  the targeted price of the primary firms for its own product.

Concerning wages, we will suppose that they are determined by a conflict between firms and workers in each sector:

$$w_j = \lambda_j \cdot \tilde{w}_j^f + (1 - \lambda_j) \tilde{w}_j^w \quad (40)$$

with  $\lambda_j$  the bargaining position of firms,  $\tilde{w}_j^f$  the targeted wage of firms and  $\tilde{w}_j^w$  the targeted wage of workers.

The total wage bill in each sector is thus:

$$W_j = w_j \cdot N_j \quad (41)$$

#### *e. Banks*

Banks are in our artificial economy a key agent. Their behaviour is very important for the activity of firms and the behaviours of other agents. Banks operate by lending money to firms for their investment expenses, and apply different interest rates to these loans.

First, we will assume, as Le Héron and Mouakil (2008) do, that banks can limit credit. Following them, we assume that banks can say “no” to the external finance desires of firms. This does not mean that money becomes exogenous. It just means that the desired rates of accumulation of firms are not always achieved due to banks’ behaviours. The extent to what banks limit credit will depend on several things, notably the risk of borrowers evaluated by a kind of lender’s risk ( $LR$ ). Banks will lend less money to firms judged as riskier. The core of our analysis is that banks consider small firms to be more risky than big firms, yielding less accepted external finance to small firms than to big firms. Moreover, the more indebted firms are, the riskier they are. And, the more profitable they are, the less risky they are.

The second specific behaviour is that banks apply different interest rates depending on the risk of firms. Not only do they limit credit to risky firms, but they also apply higher interest rates to them.

What we will assume now is that the firms of the input sector are the riskiest firms, because they are small, they can’t issue shares and banks know that the price of their product (so their turnover) is in part determined by the firms of the consumption sector, which are for their part big, powerful and less dependent to bank credit.

The accepted external finance is thus:

$$\varphi_j^a = (1 - LR_j) \cdot \varphi_j^d \quad (42)$$

$$LR_j = LR_{0j} + \varepsilon_{1j} \cdot lev_j - \varepsilon_{2j} \cdot r_{j-1}^{cf} \quad (43)$$

This gives birth to the realised or effective investment expenses (Le Héron and Mouakil, 2008):

$$I_j = (\Pi_j^U + \varphi_j^a) / p_i \quad (44)$$

Concerning interest rates, we have (Le Héron and Mouakil 2008):

$$i_j = i_0 \cdot (1 + LR_j) \quad (45)$$

$i_0$  being some kind of central bank base interest rate.

### III. Simulations: one shot shocks.

#### *III.1. One drop in the propensity to consume out of wages.*

In a first step, we will briefly present a traditional result for Post-Keynesian economists. We will analyse what happens if households' propensity to consume out of wages falls (here by 2 points). This first simulation allows us to reproduce a standard Post-Keynesian result, namely the paradox of thrift. In this case, the economy is experiencing decreases in its growth rate, its utilisation rate and its profit rate (see Figure 1).

The decrease in the propensity to consume out of wages implies less consumption and less demand for firms of the consumption sector. This demand contraction for these firms is passed through to the firms of the primary sector, because of the composition of consumption goods made with primary goods at a fixed proportion  $\alpha$ . Moreover the drop in the propensity to consume is also affecting the firms of the investment sector, because of the reduction of investment expenses stemming from depressed demand in the consumption and primary sectors. After these depressive initial shocks on utilization, accumulation and profit rates, the drops in productivity in different sector impulse a slight tendency to recover for the aggregate economy, since a drop in productivity decreases the unit profit margin of the consumption sector, the price of the consumption goods being given. This redistribution of income to workers reintroduces some positive dynamics explaining the slight recovery.

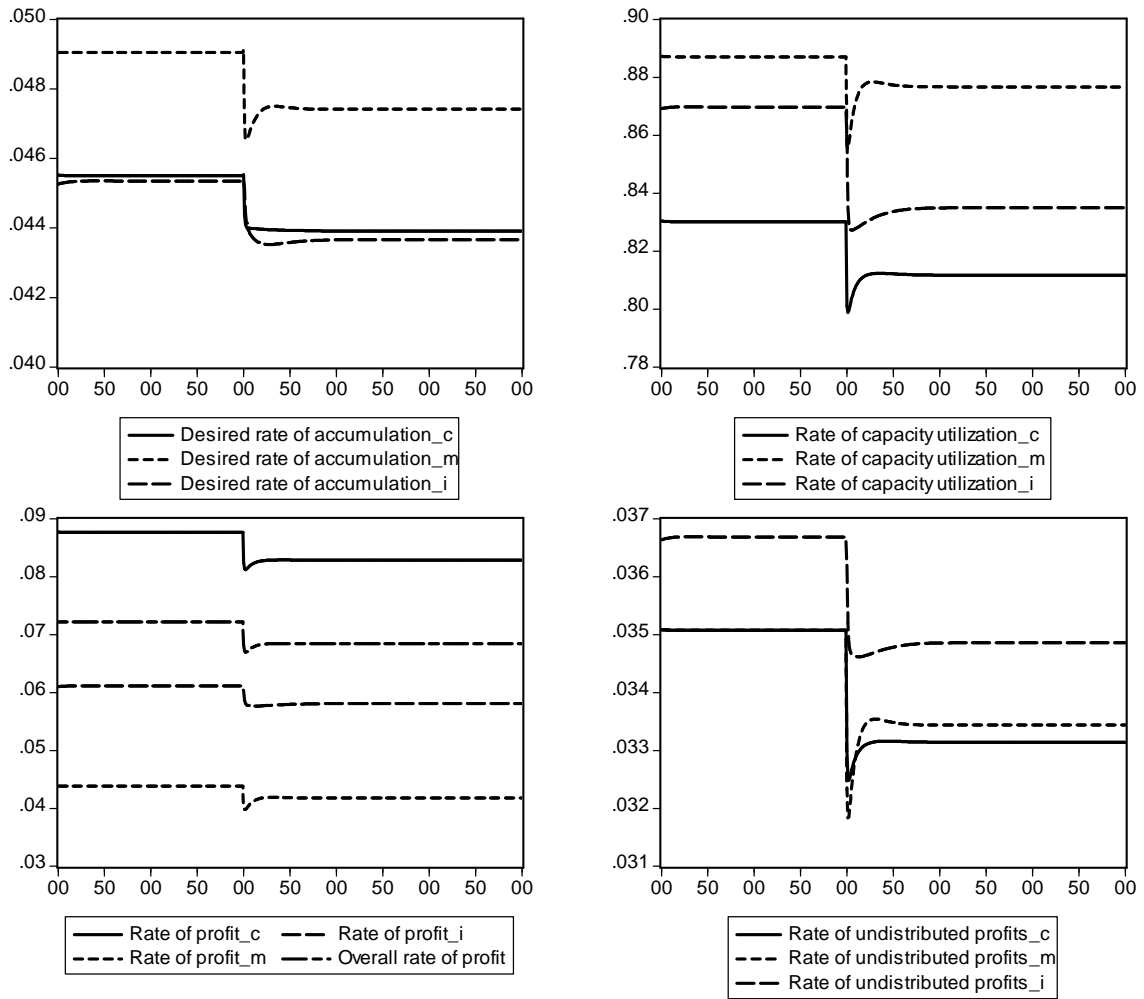


Figure 1.A: effects of a one fall in households' propensity to consume

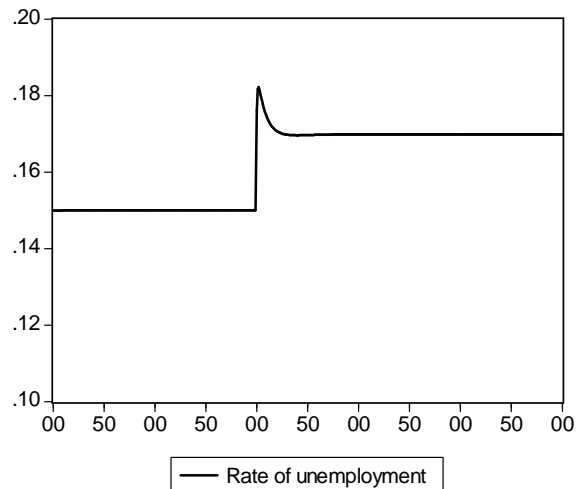


Figure 1.B: effects of a one fall in households' propensity to consume on unemployment

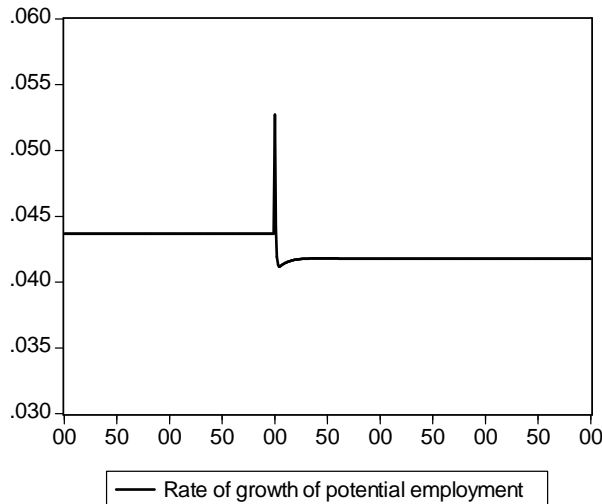


Figure 1.C: effects of a one fall in households' propensity to consume on potential employment.

### III.2. One shot drop in the price of the input good.

Let's face now the main purpose of our analysis. Due to a pressure to raise profit so as to satisfy greedy shareholders in a context of financialisation<sup>6</sup>, firms of the consumption sector could wish to raise their unit profit margin by raising the price of their product (the consumption good). However, facing strong competition on their market (notably due to the arrival of new competitors stemming from emerging countries), these firms may not necessarily be in such a position allowing them to increase their prices, so as to boost profitability for shareholders. If the firms of the consumption sector suffer from competition pressures and are afraid of the consequences of pushing up the price of their goods, they can try to increase their profit margin by reducing their costs. One way could be to reduce the wages of its own workers, but we will rather focus on the try to reduce the price of the inputs.

One way for firms of the consumption sector to raise their profit margins and satisfy shareholders' greediness is indeed to reduce the price it pays for the raw materials and semi-finished products. We are now going to examine what happens if the price of the primary product is reduced once without any change in other parameters. More precisely, we will suppose that the target price of the primary product by the consumption sector,  $\tilde{P}_m^c$ , decreases

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<sup>6</sup> Firms of the consumption sector are the big firms in which financialisation pressures for profit are the most relevant.

(here by 6.6 % exactly). The first effect of such a thing is to decrease the actual price of the primary product.

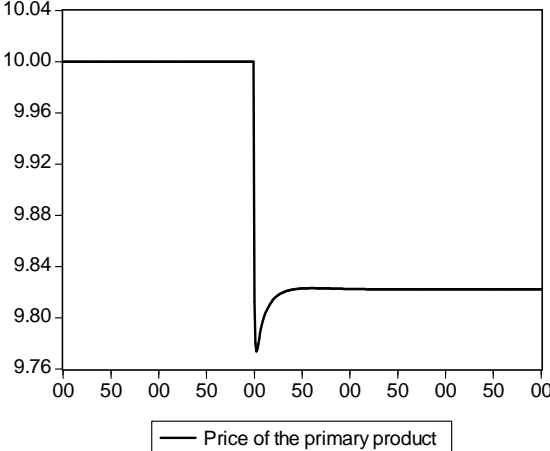


Figure 2.A. Effect of a cut in  $\tilde{p}_m^c$  on  $p_m$ .

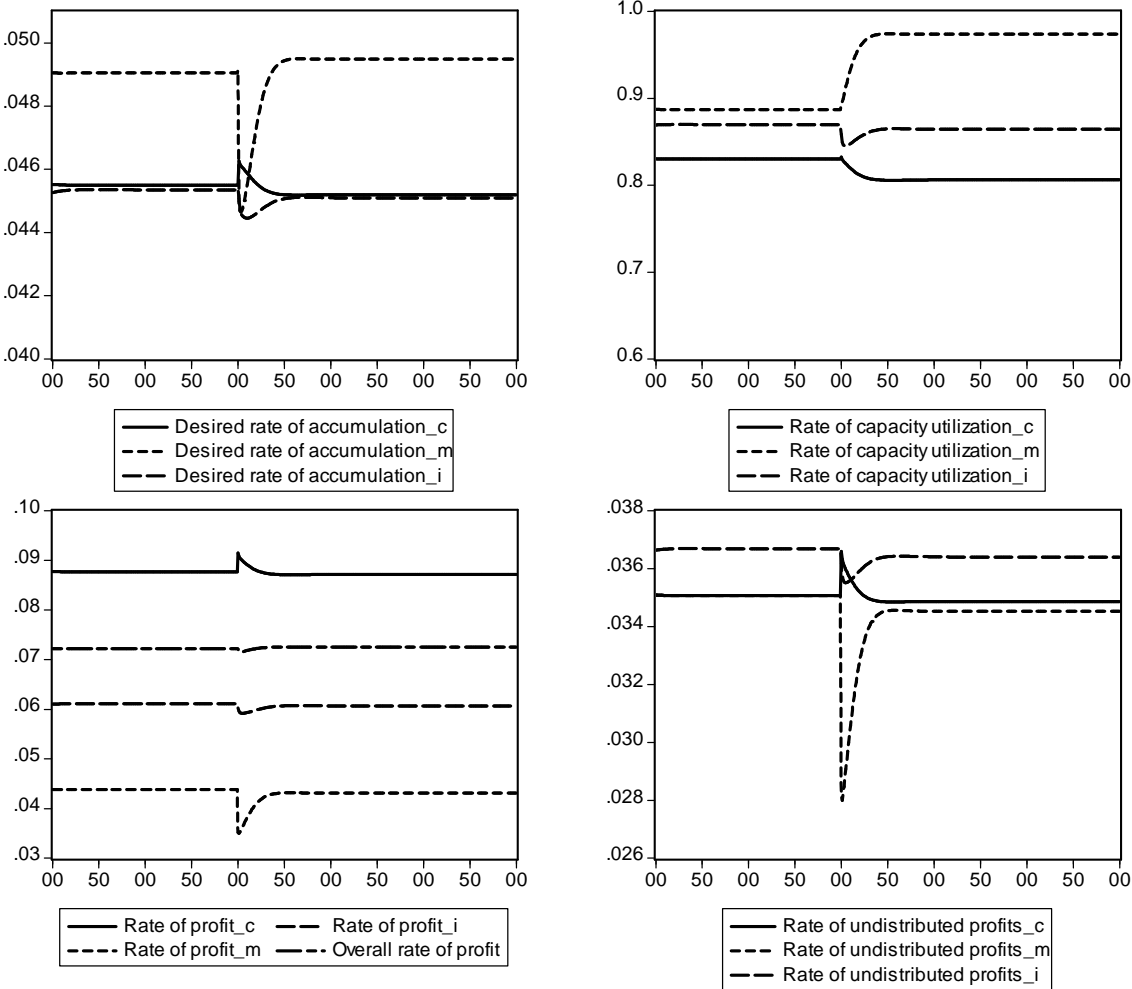


Figure 2.B: effects of a one shot drop in  $\tilde{p}_m^c$ .

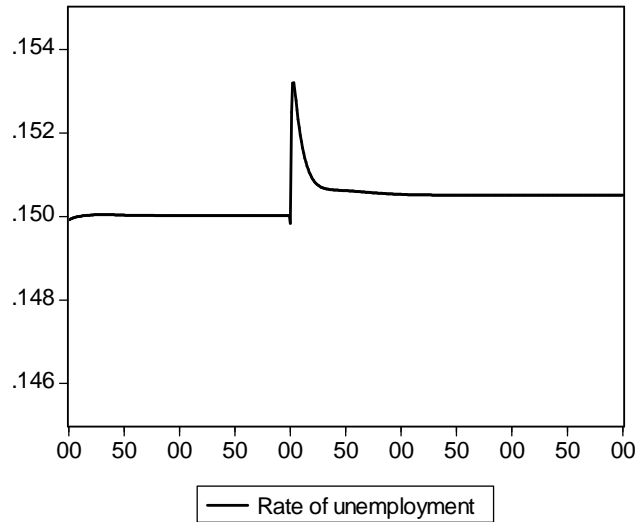


Figure 2.C: effects of a one shot drop in  $\tilde{p}_m^c$  on the rate of unemployment.

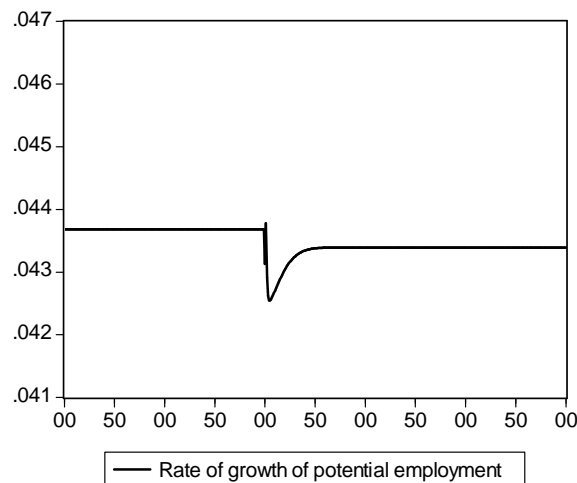


Figure 2.D: effects of a one shot drop in  $\tilde{p}_m^c$  on potential employment.

As is shown in Figures 2, in a first time, this leads to a higher rate of profit for the consumption sector and a lower one for the primary sector, the investment sector being only slightly affected. This leads however to a decline in the rate of utilization of the consumption sector and to a rise in the one of the primary sector. For the two sectors, the mechanisms at work are the same: for the primary (respectively, consumption) sector, the decline in the price of the primary product means a lower (resp., higher) profit margin; Then, initially, for a given level of capacity utilisation, it leads to a lower (resp., higher) profit rate; This lower (resp., higher) profitability discourages (resp., stimulates) investment, so that capital accumulation is reduced (resp., fostered); But, then, in a second time, for given demand conditions, the

decrease (resp., increase) in capital accumulation makes the growth of productive capacity become inferior (resp., superior) to the growth of demand, so that the utilisation rate goes up (resp., goes down); This last effect stimulates (resp., discourages) both the profit rate and the accumulation rate. This causal chain explains the reasons why, after the initial negative (resp., positive) shock on profit margin and consequently on profit and growth rates for the primary sector (resp., the consumption sector), the utilisation rate increases (resp., decreases) and stabilises the economy of this productive sector.

In the aggregate, the main result is that if we have a look at ratios of the whole economy, we can see that the average profit rate is left nearly unaffected by this shock. The rate of unemployment is slightly increased, because of the decline in the utilisation rate of the consumption sector prevailing over the increase in the utilisation rate of the primary sector.<sup>7</sup> However the economy as a whole can provide a bit less employment than before as the rate of growth of potential employment stabilizes at a lower level than before.

Other things should be noticed:

- First, banks' discrimination is intensified after the shock, since the differences in interest rates paid by firms of different sectors is enlarged (because of the evolutions of profit rates and leverage ratios that affect the lender's risks),
- Second, unit profit margins undergo slight, opposite evolutions after the initial shock due to the productivity variations caused by changes in utilization rates (see section III.1 for more on the underlying mechanism).

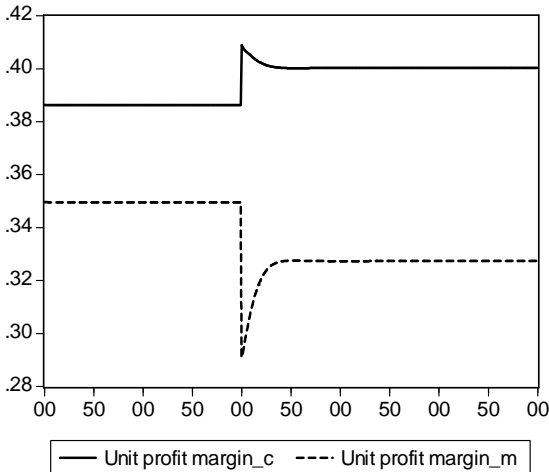


Figure 2.E: effects of a one shot drop in  $\tilde{p}_m^c$  on unit profit margins.

<sup>7</sup> Despite the comparative sizes of change, the change in utilisation of the consumption sector is more important because this sector is more weighted than the others in total production, and just as employment.



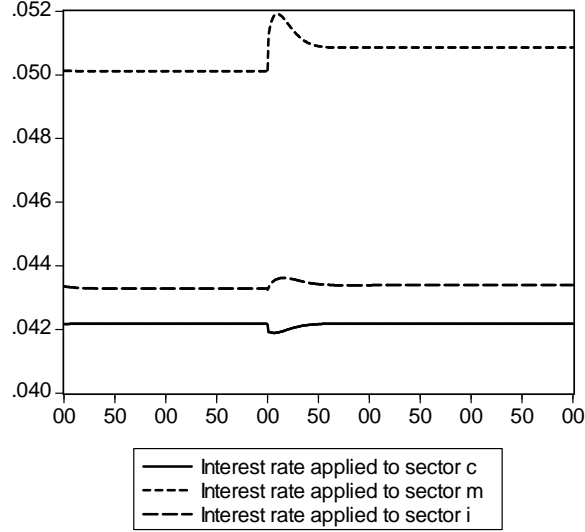


Figure 2.F: effects of a one shot drop in  $\tilde{p}_m^c$  on interest rates.

## IV. Endogenous transfer of the constraints.

### IV.1 Transfer of the constraint on the price of the input.

In the previous section, we analysed what could happen if households' propensity to consume out of wages falls, and if the consumption sector tries to achieve inputs price reductions to its suppliers. This sector tries to do so in order to meet profit requirements. In fact, one may think that the first shock could cause the second one: facing a decrease in the profit rate due to households' falling propensity to consume out of wages, the consumption sector could try to restore its profit rate to meet shareholders' profitability requirements by achieving costs reductions, here inputs price reductions. It means that there should be some kind of a transfer mechanism: firms of the consumption sector try to transfer to firms of the primary sector (their subcontractors) the consequences of the shock. In other words, big firms in the consumption sector try to use primary firms as a "profit reserve" for themselves. We could just mix the shocks analysed before, but the problem is that these shocks are for the moment exogenous. One may think that the transfer should be made endogenous. This is precisely what we are going to do now by introducing endogenous relative bargaining positions in the model.

$$\psi = \psi_0 + \vartheta_c \cdot (r_c^{init} - r_{m(-1)}) \quad (46)$$

Equation (46) just means that the relative bargaining position of consumption firms concerning the price of the input good depends on an initial parameter  $\Psi_0$  and on a function of an initial<sup>8</sup> profit rate  $r_c^{init}$ . We choose here to apply the endogenous transfer mechanism on the relative bargaining positions rather than on the targeted price because what is important in order to achieve price reduction is not to have a lower target but to be in stronger position to impose it. In our scenario, consumption firms are stronger in face of their suppliers because they can use the threat of breaking contracts if suppliers don't accept prices reductions.

The results of the simulation are given in Figure 3. The mechanisms at stake are partly the same as the ones implied in the first simulation (see Figure 1). The drop in the propensity to consume out of wages first leads to a decrease in the utilisation rate of the consumption and primary sectors, because firms of the consumption sector are obliged to produce less, and as a consequence, to buy less inputs to the primary sector. But in the meantime, the accumulation rate of the three sectors is negatively affected by the diminished utilization rate of the consumption and primary sectors. Therefore, the investment sector also undergoes a decrease in its utilization rate, because of these drops in investment plans. The decrease in utilization rates then induces a decrease in productivity, which means a decrease in unit profit margins for the consumption and primary sectors, their prices being given. This redistribution towards workers, in turn, leads to a recovery in demand, which, combined with the slowdown of accumulation and the implied low growth of potential output, results in a slight recovery of utilization rates.

For now, the explanation is the same as it was for the first simulation. But, in this simulation, firms of the consumption sector re-act to a precise shock which has not been underlined so far. Initially, the negative trend on utilization rates led to a drop in profit rates. Here, the mechanism alluded to in equation (46) precisely introduces a tendency for firms of the consumption sector to refuse this profit squeeze by harshening their position towards subcontractors in input price bargaining. The drop in their profit rate gives firms of the consumption sector legitimacy to re-negotiate their contracts with firms of the primary sector, and to impose them price cuts. Compared to the situation described in Figure 1, the main consequences are that firms of the primary sector undergo larger negative, constrained adjustments. The compulsory drop in their price leads to a larger decrease (than before) in their unit profit margin, in their profit and accumulation rates. Due to the constant input

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<sup>8</sup> This profit rate that is used as a reference could be a target rate of profit. However, for a purpose of simplicity we chose to assign it the stationary value it had before the shock: it could mean that before the shock, the consumption sector was satisfied with its profit rate.

demand stemming from firms of the consumption sector and due to the slowdown of the growth of potential output implied by diminished accumulation, the consequence is a slight increase in their utilization rate. Finally, despite their efforts to pressure their subcontractors, the firms of the consumption sector do not succeed in re-establishing their (target) profit rate. The cause is that while imposing the price cuts to primary sector firms, they counterbalanced the negative effects of decreased productivity (implied by diminished utilization rate) on their unit profit margin. In the end, the stability of their unit profit margin (instead of being reduced) prevents the recovery in demand to be fully effective. Compared to the situation in Figure 1, firms of the consumption sector experience a slightly lower utilization rate.

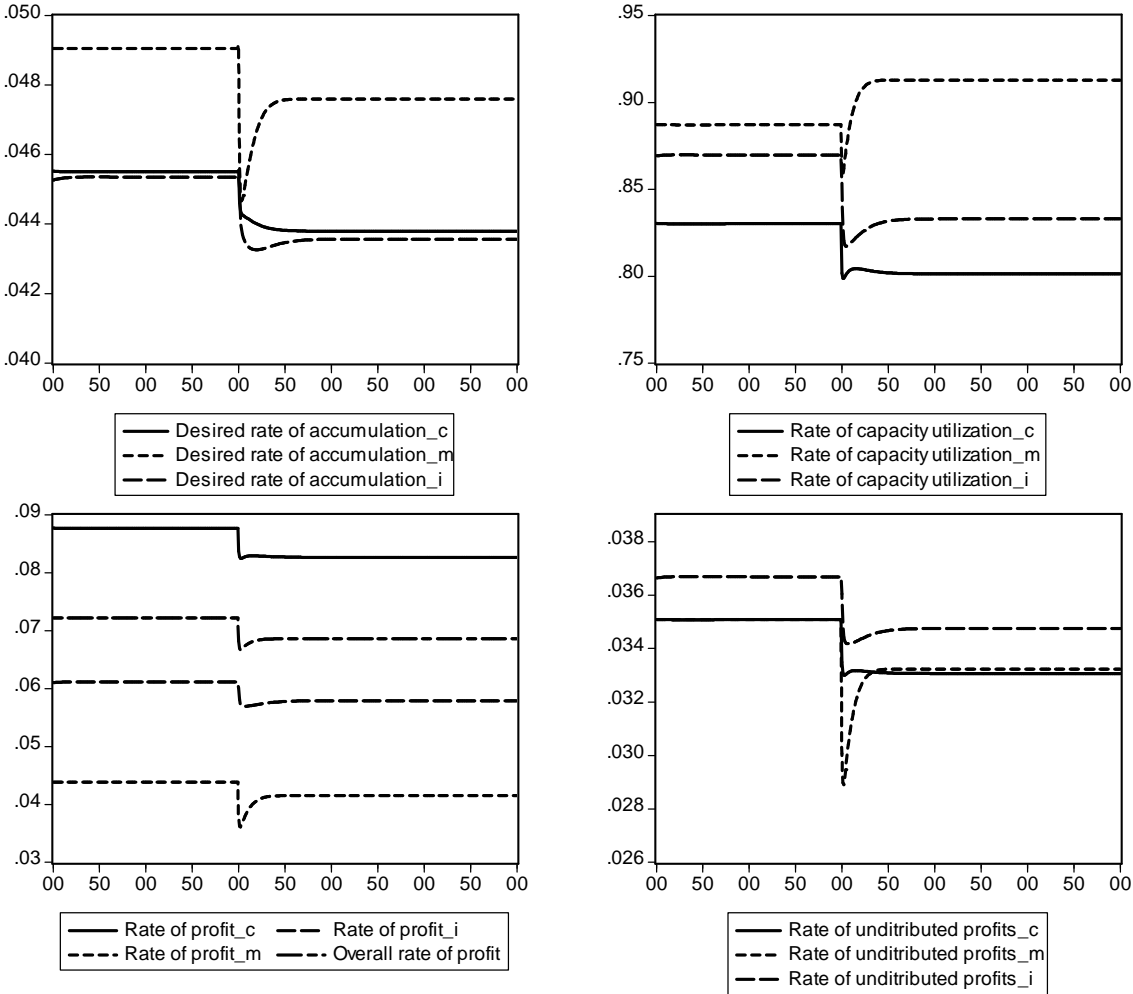


Figure 3.A: effects of a fall in the propensity to consume followed by an endogenous input price reduction.

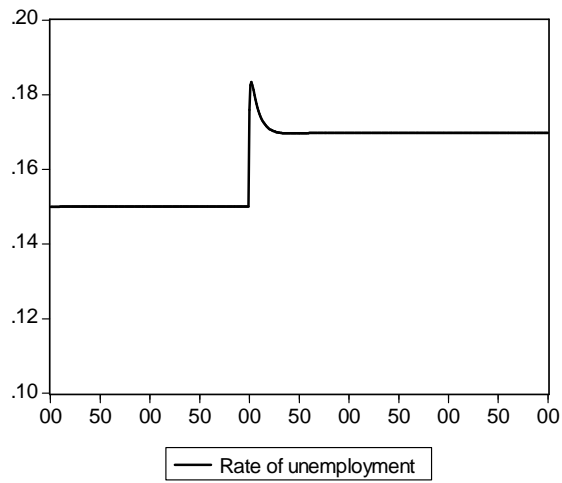


Figure 3.B: effects of a fall in the propensity to consume followed by an endogenous input price reduction on unemployment.

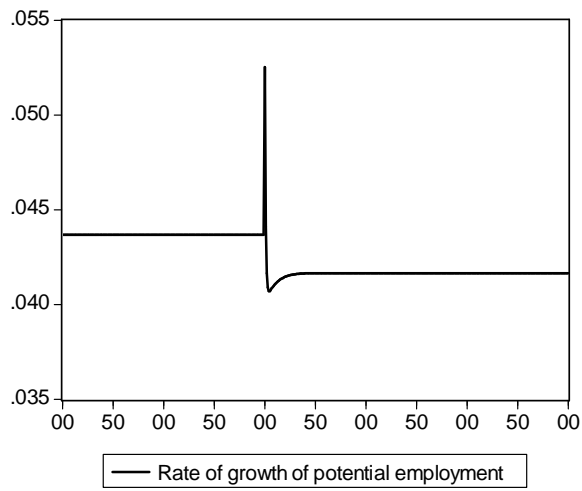


Figure 3.C: effects of a fall in the propensity to consume followed by an endogenous input price reduction on potential employment.

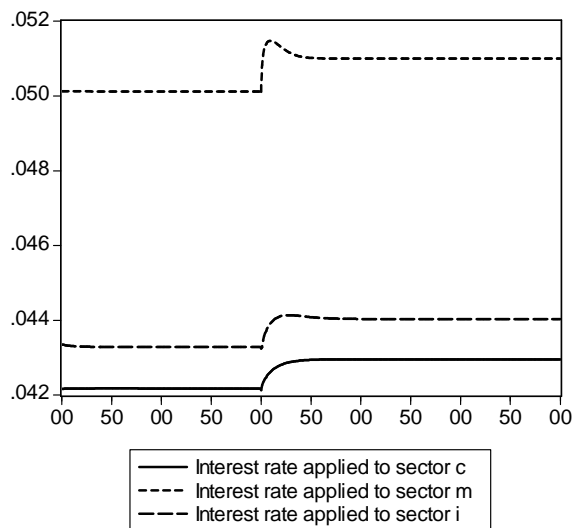


Figure 3.D: effects of a fall in the propensity to consume followed by an endogenous input price reduction on interest rates.

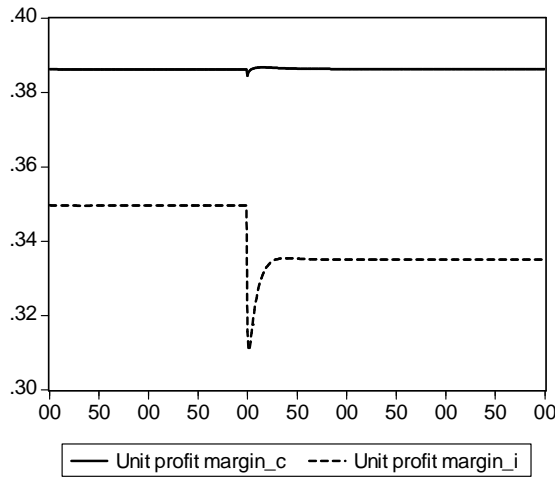


Figure 3.E: effects of a fall in the propensity to consume followed by an endogenous input price reduction on unit profit margins.

### III.2. “Transfer of the transfer” on the workers of primary sector.

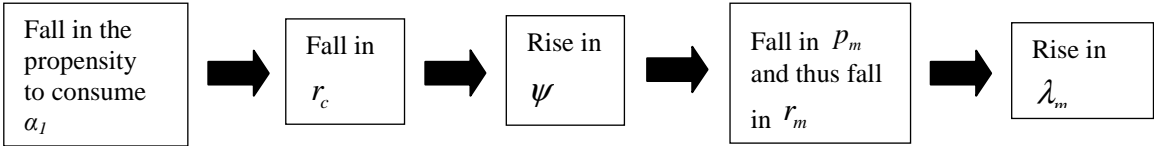
In fact, there is no reason why firms of the primary sector wouldn't try to report this lower unit profit margin, for example on the wages of its workers, or on productivity (or both). That is to say, in order to meet the requirements of the consumption sector in terms of prices, and instead of reducing its profit margin, the primary sector may try to set a lower price by lowering its wage rate, be it directly or by concluding agreements with workers to raise the number of worked hours without paying them, or even hiring new less-paid workers. Due to the assumed competition between sub-contractors, one may think that they cannot impose their price. But they can of course adjust their costs.

Especially, we will build a scenario where a fall in the propensity to consume of households has consequences which are transferred as far as possible to other agents. As before, the drop in the propensity to consume out of wages makes firms of the consumption sector re-arm their position towards firms of the primary sector in input price bargaining. But now, firms of the primary sector reinforce their position vis-à-vis their workers in wage bargaining. The mechanism involved is nearly the same as the one prevailing in input price bargaining. Due to the reduction in their profit rate, firms of the primary sector appear more legitimate to increase pressure on their workers. For this, we have one new equation:

$$\lambda_m = \lambda_0 + \vartheta_m \cdot (r_m^{init} - r_{m(-1)}) \quad (47)$$

While assuming this, we do not study coordination among different agents willing to contract, but we study how adjustment costs are passed through to the weakest link, after a kind of chain blackmail. Firms of the consumption sector refuse to support the burden of change

implied by the drop in the propensity to consume. As a consequence, they impose the charge of adjustment on their subcontractors. And then, subcontractors also refuse to bear the weight of the adjustment, and they transfer the constraint on the back of workers, who can't transfer the constraint on anyone or anything. The scenario is thus the following one:



The consequences of this double transfer of the constraint are far more important than before. Indeed, all the previous mechanisms at stake with the single transfer scenario (Figure 3) are still effective, but they are reinforced by the second transfer. With wage restraints in the primary sector, demand is more strongly depressed (utilization rates), and unemployment is higher. The last thing to be noticed is the temporary, cyclical evolutions of unit profit margins in the primary sector. This illustrates the “ping-pong” between firms and their workers: in a first step, firms undergo a strong decline in their unit profit margin due to the drop in their price imposed by firms of the consumption sector; but, in a second time, they transfer the costs of adjustment on their workers by reducing their wages, so much that the scale of their reaction entails an increase in their unit profit margin.

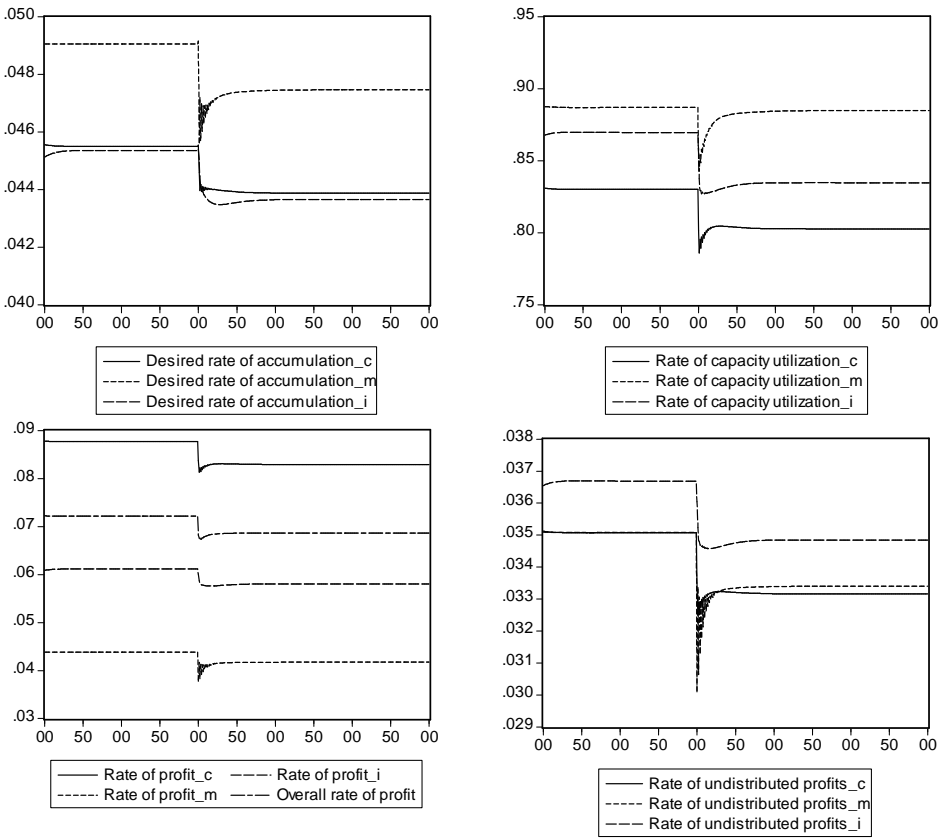


Figure 4A: effects of a drop in  $\alpha_l$  with endogenous transfers of constraints.

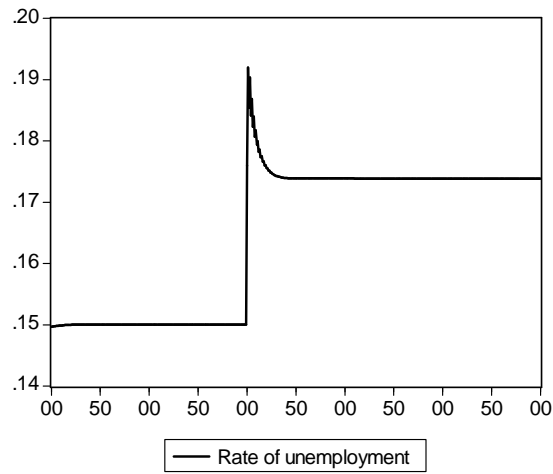


Figure 4B: effects on unemployment of a drop in  $\alpha_l$  with endogenous transfers of constraints.

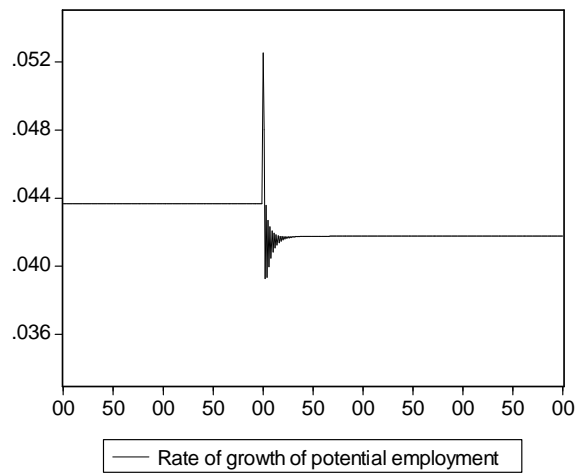


Figure 4C: effects on potential employment of a drop in  $\alpha_l$  with endogenous transfers of constraints.

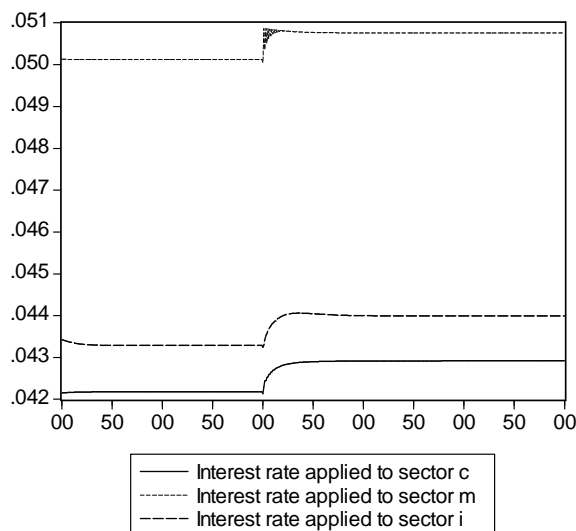


Figure 4D: effects on interest rates of a drop in  $\alpha_l$  with endogenous transfers of constraints.

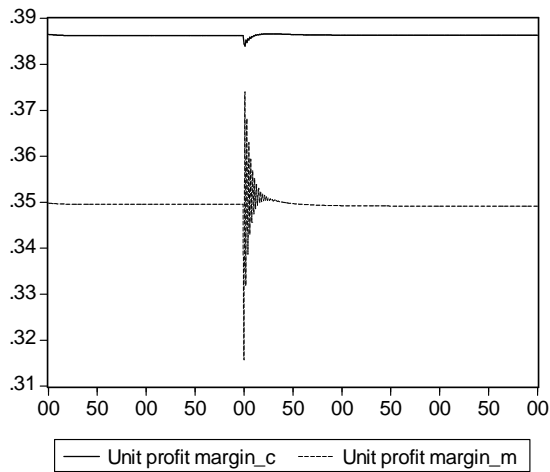


Figure 4E: effects on unit profit margins of a drop in  $\alpha_l$  with endogenous transfers of constraints.

## V. The role of bank discrimination.

Until now, we have not really insisted on the behaviour of banks. We underlined that while applying different risks parameters to the different sectors of our economy, banks contribute to defining the respective rates of effective accumulation. But one may wonder what is the importance of introducing such complications as equations (42) to (45). To understand more precisely the role of banks discrimination in the scenario we built just before, we will build in parallel the same scenario in the same model but without any bank discrimination (i.e.  $LR_{0j} = 0$ ,  $\varepsilon_{1j} = 0$  and  $\varepsilon_{2j} = 0$ ) that is to say, banks afford all credits that are demanded. In such a case, one can see on the following figures that bank discrimination reinforces the consequences of the different shocks we simulated in our model. If one considers the following graph, showing the accepted rate of accumulation (i.e. the rate at which firms of the consumption sector can accumulate given the loan conditions decided by banks) one can see that the accepted rate of accumulation is lower with discrimination than it would be without.

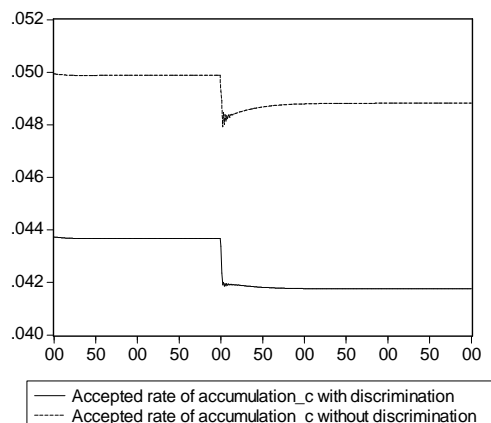


Figure 5.A. Bank discrimination and accepted rate of accumulation for sector c.



But this is absolutely not a surprising result since we precisely introduced in our model a credit rationing mechanism. What is pertinent for our analysis is thus not whether the levels of variables are different with or without discrimination, but whether the scale of the consequences of a specific shock is altered by this discrimination. On the next graphs, we will thus present the value of each variable divided by its ancient stationary value before the shock. The ratio will thus take the value “1” before the shock. Now, if bank discrimination has just a “level” effect, there should be no difference between the curve with discrimination and the curve without discrimination, each rate varying in the same proportions. But one can see that this isn’t the case in any of the graphs: whatever the variable at stake, bank discrimination has a scale effect: the consequences of the shock are greater with bank “sector-specific behaviour” than without.

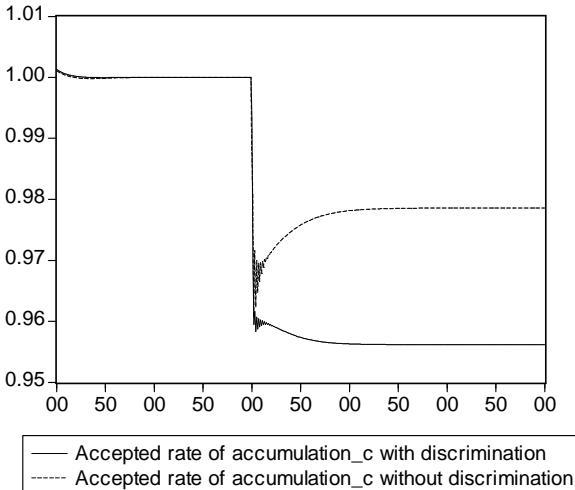


Figure 5.B. Effect of bank discrimination on the rate of accumulation of the consumption sector after the shock.

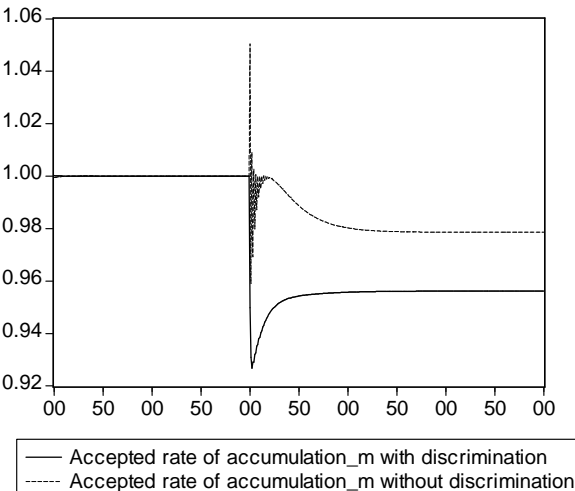


Figure 5.C. Effect of bank discrimination on the rate of accumulation of the primary sector after the shock.

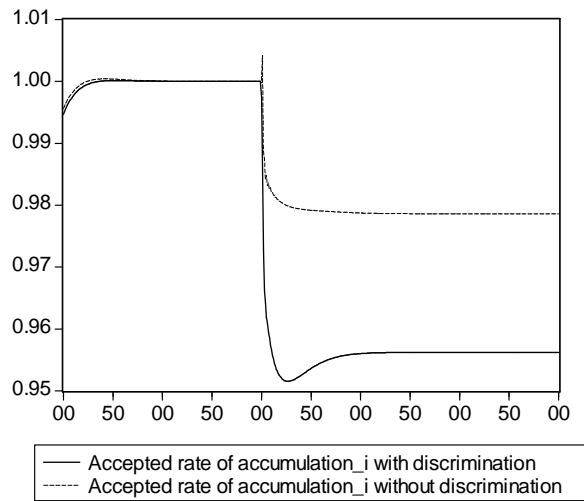


Figure 5.D. Effect of bank discrimination on the rate of accumulation of the investment sector after the shock.

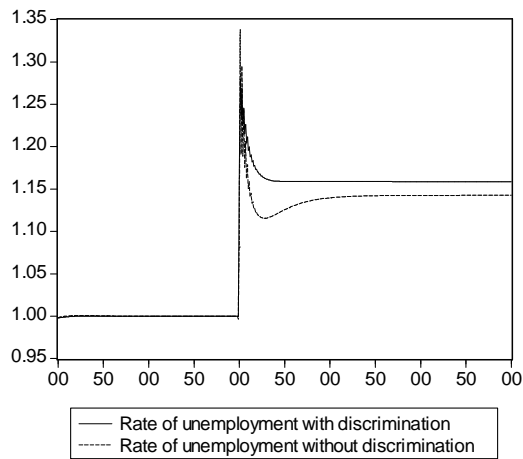


Figure 5.E. Effect of bank discrimination on the rate of unemployment after the shock.

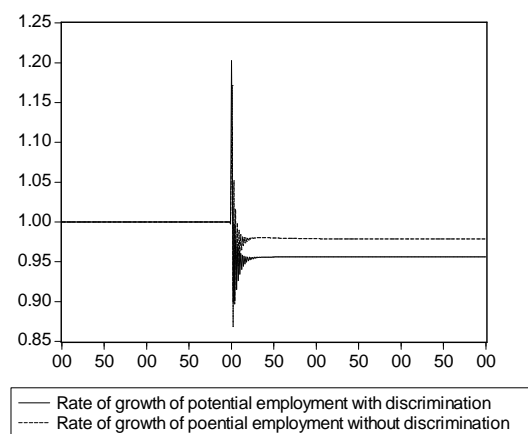


Figure 5.F. Effect of bank discrimination on the rate of accumulation of the consumption sector after the shock.

In particular, one can see that bank discrimination not only reduces the stationary level of accepted rates of accumulation, but that the accepted rate of accumulation are more reduced following a shock. Furthermore, one can see that following the initial shock, the rate of unemployment and the rate of growth of potential employment would decrease less if there

was no bank discrimination. Bank discrimination does not only put the variables at lower levels, it also exacerbates the consequences of a shock. In other words, in our model, banks have a procyclical role. Of course, they couldn't reverse the effects of the scenario described before: consequences would still be negative even if money creation was purely passive (or "passively endogenous") from their part. But here with "active endogenous" money creation, banks apply sector-specific risk parameters and are therefore a key actor in the strengthening of the consequences of a shock/crisis.

### **Concluding remarks on competition and economic policy.**

The paper drafts interesting conclusions on the real side of SFC models. While developing several sectors and especially one input sector in this kind of model, we are able to model subcontracting relationships in the economy. If we assume that "order-givers" are bigger than "order-takers", we can deduce that they get some monopsonistic power. Order-givers can use this power to achieve input price cuts they will not pass through to the consumer. Order-takers are thus in a situation of competition, and cannot refuse these price cuts. Neoclassical theory would thus conclude that competition would make margins decrease. As we showed, this is not the only, and all the most, this is not the most plausible case for the firms of the primary sector. But in a Post-Keynesian perspective, i.e. in markets without auctioneers and with pricing policies (Lee 1998), there is no reason why primary firms would accept to see their unit margins decrease. Everything leads to suppose that primary firms will try to adjust their costs, especially their labour cost, to this new situation. Competition thus leads firms to try to maintain their margins and certainly not to let them decrease. In our discussion, primary firms had two ways of maintaining their unit margins: lowering wages and improving productivity. In either case, the macroeconomic impact is negative.

Beyond equations and graphs, the model we built has theoretical underpinnings on the topic of competition. In our view, competition does not necessary lead to the maximization of welfare for the economy as a whole: neither does it not necessary lead to the maximization of consumers' surplus or well-being, nor does it induces price cuts. Indeed, the tensions on price involved by competition will not be the charge of firms under competition with a tendency to cut prices and profit margins to satisfy demanding consumers. The most likely situation rather refers to a tendency to cut costs, that is to say someone else's incomes (be it wages for workers or input prices for subcontractors). Here, competition is to be understood as a common excuse that can be used by firms to increase pressures on sub-ordinates and satisfy

greedy shareholders with rising profits. Letting competition rule economic activity can thus have damaging consequences as each agent will try to report the constraint on another one. In decentralised markets with different bargaining position, competition will be passed on by every one until it reaches the weakest agent in the economy.

As the present crisis showed, governments are concerned with a principle of systemic risk which prevents them to give up big firms (“too big to fail”). But, according to what we showed in this paper on the transfer of competition’s constraints, we may advocate a new principle preserving the weakest link: the “too small to pay” principle. Competition should thus be regulated to avoid pressures coming from upstream to downstream. Concretely, a kind of wages, price, and all the most, profit margins control should be re-introduce by the State to help the weakest link not to be the last innocent victim of a crime he is not responsible for. State intervention should then encapsulate all bargaining processes, from workers to consumers, by going from firms of the primary sector to firms of the consumption sector. When someone has a power on someone else, it is the role of a social State to monitor the effects of domination. If competition has to be the organizing principle of our economies, the logic consequence is that the State has to re-conquest its central part as fairness’ insurer among social relationships. We hope this kind of discussion will serve future research about the Post Keynesian and heterodox conception of competition in economic systems.

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**TABLE 2. Balance sheet matrix.**

	Households	Firms c	Firms m	Firms i	Banks	$\Sigma$
Capital		$p_i \cdot K_c$	$p_i \cdot K_m$	$p_i \cdot K_i$		$p_i(K_c + K_m + K_i)$
Loans		$-L_c$	$-L_m$	$-L_i$	$L_c + L_m + L_i$	0
Money	$+M^d$				$-M^s$	0
$\Sigma$	$+M^d$	$p_i \cdot K_c - L_c$	$p_i \cdot K_m - L_m$	$p_i \cdot K_i - L_i$	0	-