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The inconsistency of French regulation mode faced with the financialization of accumulation pattern

The contributions of Regulation approach and neo-Cambridgian modelling

Mickaël Clévenot[1] and Yann Guy[2]

JEL : E12, E25, B15

Abstract: The absence of specifically dedicated method to represent financialized capitalism constitutes a significant gap in contemporary macroeconomic modelling considering the impact of finance on the rules of wealth production and distribution. From both the lessons of Regulation theory in terms of accumulation pattern and regulation mode declined through the concepts of institutional hierarchy and complementarity, and the neo-Cambridgian modelling framework, one tries to establish the causes which prevail in the divergence of American and French economies in the adoption of finance-led capitalism.

Keywords: modelling and macroeconomic simulation, institutional complementarity and hierarchy, accumulation regime, regulation pattern, financialization.

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Financial liberalization undertaken from the end of the 1970s in the United States and in Great Britain, has been followed in the current of the 1980s in a large majority of country. In France, liberalization of the stock-accounts is accomplished in 1989. It had been preceded by laws organizing national market liberalization since 1984. The impact of financial liberalization remains ambiguous considering the diversity of the results. In Japan, it brings to mind the deflationary crisis of the 1990s. In all the countries, it led to more or less pronounced banking crisis (Ben Gamra & Clévenot [2005]). In the medium-term, the United States and Great Britain experiment seems positive, whereas France suffers slow growth. It seems that financial liberalization requires an institutional environment which is not present everywhere. In other words, the new institutional hierarchy imposed by finance does not spontaneously find the complementarities that are necessary to the flowering of a finance-led accumulation pattern. One will try to determine these conditions thanks to models of closed economies.

Standard models fail to apprehend correctly formal treatment of accumulation pattern controlled by stock effects. The Neoclassical-Keynesian synthesis models produce many inconsistencies in analysis of the currency and of the financial titles, particularly in the stock-flow relations, because of the absence of accounting consistency and stock effects, which are however implicit in the definition of flows equilibrium links (Taylor [2004a, 2004b]). In neo-classical models with rational expectations, there is no differences between flows and stocks at the equilibrium, namely an flow or stock equilibrium is defined, but not there is no interactions between them (Foley [1975]).

The regulation theory teaches that transition from fordian regime to patrimonial regime expresses both an inversion of the institutional hierarchy and the formation of new complementarities. However, formal representation of financialized capitalism established by Regulationnists authors is also not satisfactory enough. Thus, in this article, one tries to model these relations thanks to neo-Cambridgian macroeconomic models. From the initial model sets up by Godley and Lavoie (2001), one modifies the locking-up variables in income distribution as well as the behaviour equations in order to represent institutional inversion phenomena. Firm's stockholding behaviour is studied from now on. The model is then outlined in three versions, in order to establish the installation requirements of a new coherence confronting the new political deal, the increase in power of finance and the weakening of workers power.

Section 1 Representations of finance-led capitalism

1.1. Theoretical presentation of financialized capitalism

Aglietta (1998) is the first economist in France who tries to provide a comprehensive representation of the financialized capitalism, named patrimonial capitalism. The Regulationnist author has advanced the notion of a mode of accumulation based on finance to explain the American performances. The reconfiguration of capitalism would be carried out from an inversion of the fordian institutional hierarchy. The wage labour nexus then dominating would become a variable subordinate to the constraints imposed by monetary regime and finance, which constituted the adjustment variables of the former period. Performances of the patrimonial ¨regime would be explained by the adequacy of the mode of regulation to accumulation pattern.

This idea caused many reactions insofar as the existence of an accumulation pattern implies its diffusion in other economies, including in France. This exportation of the American regime supposes, in theory, a major questioning of social relations which prevail in France since the post-war period, since it implies a substantial modification of the system of social protection. From this perspective, the question of existence of the patrimonial accumulation pattern in the United States has important implications for the French political economy. The weakness of the hexagonal economy during a broad part of the 1990s could thereby be explained by the lateness in new working rules adoption for finance-dominated economy (Aglietta [2000]).

In order to look into this considering, Regulationnists authors implemented several modelling. But the formalization of a financialized accumulation pattern whose United States of years 1990/2000 was supposed to be an archetype (Aglietta [1998]) is realized with a too partial description of the wealth effects (Boyer [2000]). If the financial aspects are more precisely handled, it is the macroeconomic closing which is lacking (Aglietta & Breton [2001], Aglietta & Rebérioux [2004]). However, financialization effects require special attention.

This dissatisfaction leads up to fall back on formalizations borrowed from the neo-Cambridgian approach developed by Godley and Lavoie (2001). One amends them and extends their analysis field. Even if it is not its first purpose, this approach known as "Stock Flow Consistent Approach to macroeconomic modelling" (SFCA), seems able to meet requirements of a macroeconomic analysis that fully takes into consideration the financial interactions. The modifications concerned some behavioural equations but especially modifications in the distributive aspects in order to reveal hierarchy and institutional complementarity

phenomena. The field of analysis was extended to more financial aspects as increase in securities issuing, increase in households, increase in shareholder pressure or share buybacks by firms while preserving the more traditional aspects of economic policy.

1.2. Formalization of the institutional hierarchy and complementarity

The fordian crisis, which starts in the late of the 1960s, gave rise to significant economic, institutional and political modifications. The transformations of accumulation pattern led to a structural crisis because of the inadequacy of the regulation mode. During the crisis, all institutions are affected: form of state interventions, form of competition, international regime, monetary system and wage relation. The modelling efforts will focus on these two last institutions. The modelling is limited with a closed economy, so that the globalisation implications cannot completely be dealt with.

The monetary system knew very important evolutions on the two sides of the Atlantic. Since 1979, policies against inflations and the abandonment of the fixed exchange rate regime (1971) support the transition from indebtedness regime to stock market regime, generating an inversion of the institutional hierarchy. Inflation revealed social conflict between capital and labour. Employment constitutes from now on the adjustment variable, instead of the monetary policy. The rise of unemployment in the last 1970s and during the 1980s establishes an unfavourable situation for the wage interest.

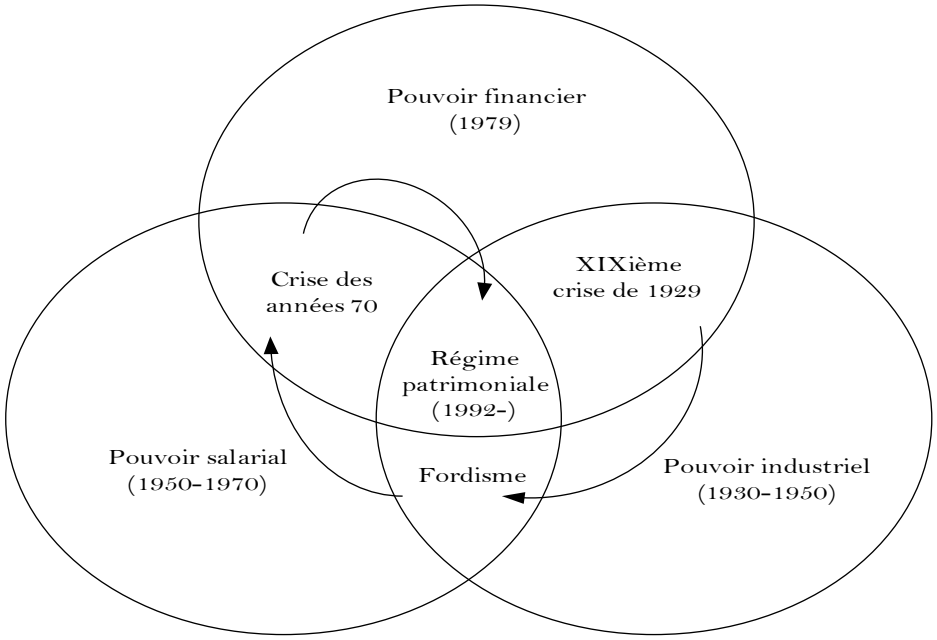
With the sustained and non-inflationary high growth in the United-States during the 1990s, it was reasonable to think that this country came out of the fordian crisis, in other words that the mode of regulation was adapted to new accumulation pattern. This new social and policy configuration during the 1990s appears to explain a new lease on life in the United States while it seems rather negative in France. Within the framework of this work, one will strive to explain this divergence.

The basic assumption consists in supposing that the accumulation pattern in France and in the United States imposed by finance has the same attributes and that the difference between the two economies depends on the mode of regulation. The difficulty is then in the way of formalizing the social power struggle, because institution hierarchy follows from this power struggle.

The social conflict is worked by former institutions and social history of the political economies in which it occurs. Thus, the modification of institutions is both an expression and a limit to this capacity of transformation. Their representation can help to understand the issues of the conflict, and possibly the ways in which could be established a new *status quo*. In

order to represent more simply the evolutions than one tries to apply, one refers to the illustration below.

Figure 1. Evolution of conflicting solidarity between three social groups



Capitalism passed by several phases of revival and stabilization phases of social conflict. Thanks to the figure, one can represent five different situations. The first corresponds to the crisis, no agreement is possible between the three social groups. Modelling could illustrate this situation by an over-determination of distribution relations leading to a structural instability such as those disclosed in the Harrod-Domar model.

Three intermediate situations, known as of social conflict stabilization, are possible. An agreement between the financiers and the industrialists is possible, as during second half of the XIX century. The payroll is subordinate to the financial profitability requirements, like with the demands related to the financing of capital accumulation. Under these conditions, wages constitute a remainder much dependant on the economic situation (competing wage convention Boyer [1978]). Since industrialization is well installed and as soon as luxury consumption does not manage any more to satisfy the industry outlets needs, an incomplementarity clearly appears between the institutions of the 1930s capitalism. It is however this crisis that will give rise to the Fordist period: an "agreement" between employees and industrialists against the financiers.

With the fordian crisis, workers power, which tended to liberate from the two other social groups, finds deeply dulled, while industrial power is reconstructed and financial power continues the reconquest of its strength from before the Second World War. However, weak-

ness of the wage incomes penalizes total dynamics through consumption. To cancel this risk weighing on the viability of an accumulation pattern, it is necessary to define allowances that will allow wage-related demand to be maintained to a satisfactory level. Indebtedness and price-cutting of capital goods as part of mondialized economy, are involved in the purchasing power maintenance. Nevertheless, within the framework of the model where households cannot get into debt and where one is in a closed economy, only financial incomes can offset weak wages. This situation corresponds to the theoretical framework of patrimonial capitalism. From a social point of view, this configuration constitutes a singular situation in which a balance between the three social groups could appear.

This situation would be made possible because of weak workers power, enabling reforms that validate by institutions the position of workers power like wage flexibilization of the wage labour nexus and liberal management of social protection. These modifications make it possible to increase long-run saving which increases firms' capital stock and reinforce the productive discipline through market vigilance and hostile operations. The financiers organize these transformations for the benefit of financial capital holders among which one should find an increasingly significant part of employees. From a macroeconomic point of view, the reduction of wages is offset by allowances of financial origin.

The differentiation of the configurations is justified by the concepts that theoretically base the consistency of finance-led regime: institutional hierarchy and complementarity. The institutional hierarchy is represented by the methods of income distributions, while the complementarities are transcribed in the consumption function. The variable that carries the closing of the distribution identifies the social group in a weak position. The group whose incomes are established like a fixed share of the GDP, net profit or investment determines degrees in social hierarchy. It is thus possible to determine the balance of power between the three actors of the models: households, firms and shareholders. These various rules of income distribution, incorporated in a specific institutional framework, allow making emerge more or less coherent situations, according to the determination rules of the consumption level. The most coherent financialized regime is represented by a weak workers power, an intermediate situation for the industrial power and a dominant position for the financiers. In this configuration, wages are less important but the financial incomes are higher. Also, propensities to spend wage incomes and financial incomes must change so that the rise of financial incomes compensates fall in wages in the definition of the consumption level. In the case of a wage reduction imposed by an increase in dividends, consumption and growth can be maintained whereas in a more Fordist regime where demand remains largely defined by wage incomes, consumption and growth should be weakened. The institutional inconsisten-

cies would thus contribute to explain divergences concerning the evolution of the French and American economies face with rise of finance. In all configurations, one retains a complete subordination of wages. They constitute a remainder. Profits should take this form in a traditional idea of the economy functioning. In the following section, we will reconsider more precisely these questions.

Section 2. Presentation of the model

The section begins with the presentation of the model accounting framework then models are presented through theirs equations and their diverse closures.

1. The social accounting framework

The model represents a closed economy, made up of 31 equations. Three agents are presents: households, companies and banks. The households have three types of earnings, wages (Wd), dividends (Fdm) and interest paid by the banks which remunerates theirs deposits ($rm*Md_{(-1)}$). Companies receive the proceeds from their production (GDP), plus the dividends that they perceive of their stockholding (Fde). Companies can buy back part of their owns equities. The interest of such a transaction lies in the possibility of exploring the consequences of equity repurchase policy such as they were implemented in the United States [3] and more recently in France. Saving of the companies, or retained profit (Fu), increase in debt (ΔLs) and new issues of securities ($pe*\Delta es$) are the resources that ensure the financing of productive and financial capital. Banks perceive the debtor interests paid by companies ($rl*Ld_{(-1)}$). They lend money with household deposits (ΔMs). Households could use their incomes in three ways: consumption (Cd), deposits (ΔMd), and equities ($\Delta Edm* Pe$).

[3] In the United States, the net equity issues have been negative since the middle of the Nineties. The argument according to which liberalization would make it possible to reduce costs of financing is thus called into question. This flaw makes it possible to underline a second aspect of financial liberalization; the capacity to operate quick capital restructuring. It is this element which constitutes the central point of contemporary financial logic: financial capital liquidity.

Table 1 : Income statement

	Uses				Ressources			
	Households	Companies		Banks	Households	Companies		Banks
Services and goods	Cd		Id			PIB		
Wages		Ws			Wd			
Dividends		Fd			Fdm	Fde		
Interests				Rm*Md(-1)	rm*Md(-1)			
		rl*Ld(-1)						rl*Ld(-1)
Self-financing		Fu					Fu	
Deposits	ΔMd							ΔMs
Loans				ΔLd			ΔLs	
Equities	Pe*ΔEdm	Pe*ΔEde					Pe*Δ Es	

Companies pay wages (Ws), distributed dividends (Fd) and interest ($rl*Ld_{(-1)}$). They buy part of the equities on stock market (ΔEde*Pe). They finance investment (Id). Banks pay deposits interest to households ($rm*Md_{(-1)}$) and provide the credit to the companies (ΔLd).

Balance sheet describes the evolution of asset stock of the various agents. Household's wealth (V) is composed of deposits and equities. The wealth of companies (Ve) is formed with physical and financial assets (Ede*Pe) minus liabilities: indebtedness and issued equities. Banks hold the loans to companies (Ls). Households' deposits are included in banks' liabilities.

Table 2 : Balance sheets

	Assets			Liabilities		
	Households	Companies	Banks	Households	Companies	Banks
Fixed capital		K				
Deposits	Md					Ms
Loans			Ls		Ld	
Actions	Pe* Edm	Pe* Ede			Pe* Es	
Richesse				V	Ve	0

2. Equations of the model

The equations presented are successively those of financial bloc, demand bloc, macroeconomic closing and distribution aspects. In this respect, only the first version of the model is described. The following configurations are specified in the recapitulative table to have an overall vision of it.

The financial block

The first three equations represent the companies' behaviours in term of gross equity issue (1), firms equity-demand (2) and households one (3). Equation 1 defines companies equity issuing. It is borrowed from N. Kaldor by Godley (1999). It corresponds to a fixed ratio

between investment and equity issuing. This simple formalization is abandoned. The writing which one retains, takes as a starting point the econometrics results established for France (Clévenot, Guy & Mazier [2007]). It indicates the presence of a positive effect between the possibilities of firms indebtedness refunding and the equity issuing ($\tau_1 > 0$), as well as a positive elasticity regarding debtor interest rate indicating a logical phenomenon of arbitration between the various sources of financing ($\tau_2 > 0$).

$$(1) \qquad \frac{\Delta Es * pe}{I} = \tau_1 * \left(\frac{L_{(-1)}}{Fu}\right) + \tau_2 * rl + \tau_0$$

Companies stockholding behaviour is also inspired by the econometric results obtained for France. One defines the variation of desired quantities of equities on the total assets of companies by a positive relation with the profitability of the previous equities held ((τ_1 *ree(-1)) and a positive relation with the return on investments ((τ_2*rcf), which represents a capacity of financing.

$$(2) \qquad \frac{\Delta Ede * pe}{\left(\left(Ede * pe\right) + K\right)} = \eta_1 * ree_{(-1)} + \eta_2 * rcf_{(-1)} + \eta_0$$

Households' demand for equities is made according to portfolio behaviour *a la* Tobin. It allows defining equity price. One supposes a negative relationship with the deposits profitability ($\psi_1 < 0$), a positive elasticity regarding return on equity previously held by households ($\psi_2 > 0$) and a negative effect, related to a demand for liquidity ($\psi_3 < 0$)

$$(3) \qquad \left(\frac{pe*Edm}{V}\right)^* = \psi_1 * rm + \psi_2 * rem(-1) + \psi_3 * \left(\frac{Yhr^*}{V^*}\right) + \psi_0$$

The three following accounting equations allow to endogeneize the overall equity demand (Ed) which corresponds to the demand of households (Edm) and companies (Ede). The net equity supply of the companies (Ese) is obtained by subtracting from gross equity issuing (Es), the companies demand (Ede). Lastly, the households demand is logically equivalent to the net supply of firms (6).

$$(4) \qquad Ed = Edm + Ede$$

$$(5) \qquad Ese = Es - Ede$$

$$(6) \qquad Edm = Ese$$

Variation of the households' deposits (ΔMd) is determined by an accounting equation. It means that deposits correspond to a balance between the different household incomes. Vari-

ation of households wealth (ΔV) corresponds to an increase in saving, i.e. incomes not consumed, at which it is necessary to withdraw the uses related to financial accumulation (Δ Edm*pe) which reduce households cash, and capital gains which are already considered in the evolution of wealth ($\Delta pe*Edm_{(-1)}$).

$$\Delta Md = \Delta V - pe * \Delta Edm - Edm_{(-1)} * \Delta pe \quad (7)$$

Companies debt (ΔLd) also corresponds to a "buffer", namely an adjustment variable which, if necessary, allows companies to fill in the weakness of their financing sources for investment if self-financing (Fu) and new net equity issue are not enough (ΔEse*pe). Accounting framework is fixed so that the amount of money supplied by households, through the intermediary of banks, corresponds exactly to the needs of companies, without writing explicit equation of this equality (L=M) which rises from the accounting balance of the model and which can be checked at the time of simulations.

$$\Delta Ld = I - Fu - \Delta Edm * pe - Fde \quad (8)$$ [4]

The amount of deposits anticipated by households $\left(Md^*\right)$ fits with the difference between their level of expected wealth $\left(V^*\right)$ and the amount of their financial saving (Edm*pe).

$$Md^* = V^* - \left(Edm * pe\right) \quad (9)$$

Debtor interest rate is equal to credit interest rate so as to avoid the appearance of banking profits which would complicate the model. The debtor rate is exogenous.

$$rm = rl \quad (10)$$

The two following equations represent the capital gains realized respectively by households and companies.

$$CGm = \Delta pe * Edm_{(-1)} \quad (11)$$

$$CGe = \Delta pe * Ede_{(-1)} \quad (12)$$

[4] Equation 8 should be written as follows: $\Delta Ld = I - Fu - \Delta Ese * pe - Fde$, the needs for external financing are represented by the difference between level of investment minus self-financing and net issuing of firms. However, one writes it by using the net equity purchases of households, what is equivalent from an accounting point of view, but reduced the difference with initial values because of calibrations difficulties, so that the equality Ld = Md is immediately observed, allowing to validate the accounting consistency of the model. Otherwise, convergence is underlying and not instantaneous. In order to correct this calibration problem, one chooses this option.

Equations (13) and (14) establish the amount of dividends perceived by households and companies which corresponds respectively to the share of equities held by households and companies.

$$\textbf{(13)} \qquad Fdm = Fd * \left(\frac{Edm}{Es} \right)$$

$$\textbf{(14)} \qquad Fde = Fd * \left(\frac{Ede}{Es} \right)$$

Equations (15) and (16) establish the rate of profitability of the equities held by households (rem) and by companies (ree).

$$\textbf{(15)} \qquad ree = \frac{(Fde + CGe)}{(pe_{(-1)} * Ede_{(-1)})}$$

$$\textbf{(16)} \qquad rem = \frac{(Fdm + CGm)}{(pe(-1) * Edm_{(-1)})}$$

Evolution of effective wealth (ΔV) results from households saving, at which are added capital gains. Expected wealth level corresponds to the previous wealth level at which household saving is incorporated, namely expected incomes less consumption plus capital gains.

$$\textbf{(17)} \qquad \Delta V = Yhr - Cons + CGm$$

$$\textbf{(18)} \qquad V^* = V_{(-1)} + Yhr^* + CGm - Cons$$

The demand block

Two specifications are retained to define consumption. In the first two patterns, it is identical (19.1 and 19.2). Household consumption is related to two propensities, which one to consume expected incomes $(\alpha_1 * Yhr^*)$ and which one to consume wealth $(\alpha_3 * V_{(-1)})$.

$$\textbf{(19.1)} \quad Cons = \alpha_0 + \alpha_1 * Yhr^* + \alpha_2 * V_{(-1)}$$

In the last pattern, to reveal the institutional complementarity necessary to the consistency of finance-led regime induced by the modification of institutional hierarchy, one reduces propensity to consume out of incomes ($\alpha_1 = 0.8$, $\alpha_{11} = 0.7$). Propensity to consume out of dividends and wealth do not change ($\alpha_{12} = 0.8$, $\alpha_2 = 0.05$). On the other hand, one reduces propensity to consume out of monetary incomes ($\alpha 13 = 0.5$) in order to reduce the effect of activity rise induced by the increase in monetary incomes after the rise of interest rates.

$$(19.3) \qquad Cons = \alpha_0 + \alpha_{11} * W_{(-1)} + \alpha_{12} * Fd_{(-1)} + \alpha_{13} * rl * L_{(-1)} + \alpha_2 * V_{(-1)}$$

The regular income follows the Haig-Simon definition retained by Godley. It corresponds to the addition of the resources drawn from dividends as well as the interests received by households from their deposit.

$$(20) \qquad Yhr = W + Fdm + rm * M_{(-1)}$$

Expectations are very rough compared to model with microeconomics foundations but it is about a theoretical choice meaning that at agglomerate level, there are regularities between various ratios. Expected income arises like the projection of past incomes multiplied by the effective growth rate of previous income.

$$(21) \qquad gy = \frac{\Delta Yhr}{Yhr_{(-1)}}$$

$$(22) \qquad Yhr^{*} = (1 + gy_{(-1)}) * Yhr_{(-1)}$$

The rate of capital accumulation determines the demand for investment from companies. This equation retains an acceleration effect by demand ($\phi_3 = 0.015$) and financials variables, elasticity regarding rate of profit $(\phi_1 = 0.5)$, elasticity regarding indebtedness ratio $(\phi_2 = 0.25)$ as well as a positive constant ($\phi_0 > 0$).

$$(23) \quad g = \phi_1 * rcf_{(-1)} - \phi_2 * \left(\frac{L_{(-1)}}{K_{(-1)}}\right) + \phi_3 * \left(\frac{\Delta PIB}{PIB_{(-1)}}\right) + \phi_0$$

Investment level rises from the rate of accumulation applied to capital stock of capital, at previous period.

$$(24) \qquad I = g * K_{(-1)}$$

$$(25) \qquad K = K_{(-1)} * (1 - \delta + g)$$

Macroeconomic closure and distribution aspects

Distribution aspects are essential in the modelling of the inversion of institutional hierarchy. Also, two equations are modified according to configurations, gross profit equation (28.3), and retained profits equation (29). The equation defining dividends does not evolve but the relationship between industrialists and financiers is modified through the equation of self-financing (29). The equation of wages is endogeneized, what underlines the wages subordination in incomes distribution.

GDP corresponds to the sum of firms' investment and households' consumption. **(26)**

$$PIB = Cons + I$$

Wages in this series of model are defined as would be profits, in the form of a remainder. They are established by balance between GDP and profits. This representation allows establishing wages like hierarchically inferior to self-financing (industrial power) and dividends (financial power).

$$\textbf{(27)} \qquad W = PIB - Ft$$

The determination of self-financing and gross profits equations thus will makes it possible to fix the dominant social group of the model. In first and last configurations, profits are defined in an accounting way as the sum of self-financing, dividends and debt burden. In the second they are established like a proportion of the GDP. They are defined like wages (υ_1 =0.33).

$$\textbf{(28.1)}\ Ft = Fu + Fd + rl * L(-1)$$

$$\textbf{(28.2)} \qquad Ft = \upsilon_1 * PIB - W0$$

$$\textbf{(28.3)}\ Ft = Fu + Fd + rl * L(-1)$$

The distribution of dividends is proportional to the gross profits level after debt repayment. The rule of dividends distribution is represented by (1-sf). This writing underlines the pressure exerted by shareholders.

$$\textbf{(29)} \qquad Fd = (1 - sf) * (Ft - rl * L_{(-1)})$$

The self-financing in the first configuration is proportional to the investment observed in the previous period (ϑ_1 = 0.33). In the second, it is established like a remainder on the basis of gross profits, at which one withdraws dividends and debt burden. In the last one, it is defined like wages by a proportion of GDP (υ_1 =0.1).

$$\textbf{(30.1)} \qquad Fu = \vartheta_1 * I(-1) - W0$$

$$\textbf{(30.2)} \qquad Fu = Ft - Fd - rl * L_{(-1)}$$

$$\textbf{(30.3)} \qquad Fu = \upsilon_1 * PIB_{(-1)} - W0$$

Finally, one can establish the rate of profit like a ratio of profit over capital stock.

$$\textbf{(31)} \qquad rcf = \frac{Fu}{K_{(-1)}}$$

The combination of these various methods of income distribution of income is supposed to allow defining the power of various social groups. Employees are the most weak. It remains to establish the relative position of industrialists and financiers.

In the first case, self-financing is imposed by industrialists as a fixed proportion of investment. Their situation is intermediate, they preserve a space decision but they don't enjoy growth directly. Gross profit, defined in an accounting-way, transfers to employees the requirements of income distribution closure. In the second case, gross profit is proportionally defined to GDP, what could lead to believe that industrials are dominants but self-financing is defined as a remainder. Industrials power is thus limited. The financial ones are dominant in this configuration. The importance of gross profits contributes to the reinforcement of paid dividends. In the last case, power is better distributed between industrialists and financiers since retained profit is directly fixed on GDP, industrialists take advantage of growth for investment financing. The accounting definition of gross profit makes it possible to transfer financial pressure on employees. In addition, the equation of consumption has been modified. Consumption is less dependent on wage incomes. Shareholders pressures should thus less affect households' consumption.

The Presentation of results is graphically carried out, generally over 100 periods. Periods cannot be comparable to years because the behaviours functions are established in an ad hoc way to allow models to converge towards a steady state. It is the cost of the models complexity. What one gains with macroeconomic closure, financial phenomena integration and accounting coherence, one loses it on the consistency of behavioural functions. To cure these disadvantages, models are retained only when they present good properties in terms of stability. Simulations are carried out on subjacent patterns which are coherent from the macroeconomic point of view[5]. The interpretation of results is carried out according to three periods: short, average and long run. The short run describes evolutions directly after the shock. Medium run is interested in the process of adjustment. The long run is the period where the shock has been absorbed and where pattern finds a form of stability. According to shocks, presentations can require less than 100 periods. In these cases, one reduces the periods covered by graphs for better perceiving medium run evolutions.

Simulations constitute the way to solve the model in its different closures. Simulations consist in modifying an exogenous parameter of the model and observing model behaviour after the shock. The graphs represent deviation from baseline in percent through the following formula:

$$\left(\frac{(X_1 - X_0)}{X_0}\right) * 100$$

[5] They do not present any anomaly in relative level: shares of wage in GDP, of investment and of equity prices, and their respective quantity, are always positive at the time of the shocks. The level of relevant ratios is defined with the parameters value, and the whole variables of the models, in table 3 in Annexes for all configurations.

Variable X shocked within the framework of scenario 1 is noted X_1. The value of initial variable is noted X_0. Some macroeconomic or financial variables are presented in order to clarify the model behaviour. Each configuration is illustrated by two graphs vertically organized so as to compare the different definitions.

Section 3. Simulations of the models

1. Scenario 1: Increase in consumption

Consumption increase is simulated by a permanent variation of constant in the consumption equation equivalent to one percent of GDP. The three configurations present different aspects. The first products transitory effects, while the two others describe permanent positive effect. In the configuration 3.1, the rise of GDP reaches more than 5 %, five periods after the shock. The extent of the movement is explained by the particular way in which income distribution is established. The rise of consumption leads to an increase in GDP which is not reflected immediately on gross profits. Wages increase clearly beyond the evolutions noted in the two others configurations, what places consumption on a high level. It is at the same time led by wages and by shock. After two cycles of ten periods, initial impulse erodes. The transitional aspect of the shock is due to the weak modification of investment financing conditions. There is no virtuous sequence towards investment contrary to the two others configurations, where both a decrease of indebtedness and a rise of undistributed profit are observed. In configuration 3.2, growth in short run is higher than in configuration 3.3. Consumption pushes growth, gross profits and retained profits. Unlike the preceding situation, undistributed profits are not set up on previous investment. Here, they are indirectly established on GDP. The self-financing rising results in a reduction of the debt. The rise of dividends is not any more only a drain for firms. The negative impact on investment of the rise of distributed profits is reduced. In the last configuration, debt is not immediately reduced. The rise in self-financing does not allow offsetting the fall in investment. Growth has a weaker impact on firms' investment because of the limitation of financing. This configuration is less led by investment. The virtuous process consumption, growth, investment plays in a less important way. In this configuration, industrial power is more constrained than one could imagine through income distribution. Threshold effects that depend on the initial levels in income distribution seem to appear.

Image 1: Increase in consumption, equivalent to one percent of GDP

2. Scenario 2: Investment rising

The shock of investment is simulated by a change on g0, in the equation of accumulation. The constant is fixed over the 2005 period at a level that allows the appearance of an instantaneous rise of investment, corresponding to one percent of GDP. Investment is approximately increase by 4 %, what corresponds to a rate of investment close to 25 % in the variations of the model. One can observe that the impact is permanent in spite of the instantaneous nature of the shock. It leads to an increase in GDP, consumption, investment, wages and dividends which fluctuate between 0.25 and 0.33 percent compared to the initial path. The rate of profit and the debt ratio are gradually restored on their starting level, after more or less strong fluctuations. If long run evolutions converge, short run evolutions are slightly different. In mode 3.1, during a few periods, consumption is pushed over its initial level both by the increase in growth and the increase in dividends. The level of undistributed profit is fixed on investment in the previous period, so that the rate of profit knows the strongest evolution in terms of amplitude but falls down quickly. In configuration 3.2, profit increases more slightly. This increase is indirectly fixed on GDP by gross profit. As the gross profit also defines dividends and as retained profit is a remainder, rate of profit knows a low and short rise. The oscillation is stronger in the second configuration than in the two others. The evolutions of GDP and wages are confused. This procyclicity explains the greatest oscillation of the model. In mode 3.3, the definition of consumption from wages, dividends and wealth observed at the previous period provoke a counter-cyclical process. After the shock, investment is compensated as component of total demand by households' consumption. This interpretation is confirmed by financial evolution of the variables whose amplitude in last pattern is more reduce.

Image 2: Increase in investment, equivalent to one percent of GDP

3. Scenario 3: Increase in wages

Wage increase is simulated by a final reduction of undistributed profits equivalent to one percent of GDP of the period 2005. In that way, one underlines the opposition of between wage and profit. In addition, it is not possible to operate differently considering the definition of wages as remainder of profits compared to GDP. One of the results in term of interest conflict also resides in the reduction of financial wealth importance, reducing the power of finance all the more. In the whole configurations, one can observe contradictory evolutions between short and long run. Revival effect induced by wages dominates in the short run, while financial effects of supply recession dominate medium and long run evolutions. The sign of the evolutions of the three models is identical, but the levels of each configuration can be rather different. Some symmetry can be observed in the first two regimes, the last one is

on the contrary more asymmetric with large divergence between short and long run. In the configuration 3.1, after five periods, wages have increased of more than 20 %, consumption sets up at 17 % and GDP at 12 % above baseline path. Profits are reduced by the reduction in self-financing caused by the rise of wages. Gross profits are also concerned since they are established as the sum of dividends, interest paid and self-financing. The reducing of gross profits involves that of dividends. Investment is reduced, facing with both indebtedness increasing and profits reduction, although the positive acceleration effect maintains it during the first periods after the shock, close to baseline path. The explosion of wages is explained by the shock but also by the rise of GDP. As gross profits do not depend directly on GDP, their increase is less strong than that of GDP, what increases the amount of wages all the more. The logic of the model, structurally unfavourable to employees, is reversed in this case. The different impacts for the configuration (3.2) are explained easily. The shock relates to gross profits, what divides by approximately 3 the impact of the shock on self-financing. The ratio between gross profits and undistributed profits is of one to three. In the last configuration, the effects of the wages rising are very quickly cancelled out. The rise of wages does not allow compensating for the reduction of dividends.

Image 3: Increase in wages, equivalent to one percent of GDP

4. Scenario 4: Increase of interest rates

The rise of interest rate is simulated by an increase of the debtor rates. It passes from 3 to 4 percents. Within the framework of endogenous money supply, the needs for finance of companies are satisfied without quantitative constraint. The only limit relates to the financing costs which possibly lead companies to reduce their investment. The rise of interest rates can lead to unusual situations. Within the classical framework, it must lead to a reduction of activity because of the rise of indebtedness costs and/or the reduction of firms' common stock. But as the banks do not make profits, it's the households that receive the intermediation margins. In this case, the rise in debt costs that reduces investment can be balanced by the increase in households' consumption. This effect appears in the three configurations but endures only in the first one, where the revival of activity is very limited in comparison with baseline path. The rise of interest rates is transferred on wages since gross profits are established as the sum of dividends, undistributed profits and debt costs and that wages are obtained by balance from GDP and gross profits. The rise of gross profits reduced wages. Consumption is slightly penalized for 3 periods after the shock but the increase in profits causes an increase in dividends. The rise of interest rates increases households' monetary incomes. In addition, the rise of profits allows reducing indebtedness and encourages increasing in-

vestment. Total demand increases, what the rise of GDP indicates. In the second configuration, the rise of interest rates generates a reduction of dividends which is not compensated by the rise of gross profits. Gross profits increase less quickly than GDP, what causes an increase in wages. Retained profits decrease too. Indebtedness increases and investment decreases but consumption is led by wages and monetary incomes. In the medium run, the recessionary effects finally appear. In the last configuration, evolutions are less ambiguous because wages drop and do not take part in the maintenance of consumption. The initial impulse is reduced and negative effects appear much more quickly since consumption function has a reduced elasticity regarding monetary incomes.

Image 4: Increase of interest rates from 3 to 4 %

5. Scenario 5: Increase of equity issuing

The increase in equity issuing is simulated by a positive variation of the constant τ_0 in the equation (1). It leads to an increase in the equity finance of investment equivalent to one percent of investment of 2005. The raising of the constant is permanent. The expected effects are an indebtedness reduction and an increase in investment and growth. These are precisely the results obtained in the three configurations. A negative effect is however present. The dilution effect related to the increasing equity issuing but a volume effect compensates for this fall of prices.

The evolutions are very close for the whole configurations. Investment is the first element that pushes growth. It is due to indebtedness reduction and to the increase of retained earnings. In the first configuration, gross profits increase less quickly than GDP, what leads to a clear rise of wages which maintain the demand from employees. The virtuous sequence between consumption and investment set up. In the second configuration, these are the distributed profits that increase the most quickly after investment. The rise of the gross profits also induces an increase in undistributed profits. One observes that a driving force slightly less important for the third configuration. Investment deviates slightly from the other variables contrary to the first two configurations. Consumption is lower than in the baseline during the first periods following the shock, whereas wages and distributed dividends increase but more slightly than in previous situations. In same time, monetary incomes decrease, and shareholders sustain capital losses.

Image 5: Increase of equity issuing, equivalent to one percent of GDP

6. Scenario 6: Increase in households' equities

The rise of household shareholding is simulated through the increase in ψ_0, the constant in the equation (3) which determines the household portfolio behaviour. This variation aims at increasing by one percent the share of equities in household financial capital. It passes from approximately 43 % to more than 44 %. Contrary to preceding scenarios, this shock generates effects that are specifics to each configuration, with a surprising effect for the first, namely an evolution which becomes negative in the long run. In spite of some contradictory oscillations in the medium run, the two following ones converge in the long run towards the expected results, but with weak effects on growth since after 40 periods, GDP is only little one percent above the reference scenario. For more financial aspects, one finds the opposition between evolution of equity prices and evolution of total portfolio of equities held, which is explained by diversification phenomena generated by the stability of the actors' portfolio behaviour.

The configuration (3.1) diverges from expectations. Instantaneously after the shock, investment reduces while one observes an increase of indebtedness contradictory with intuition of an increase of firms shareholders' equity. During the very first periods, firms increase their financial investments, because of the rising equity prices initiated by the increase of households demand. An opposition appears between real economy and financial economy. This first movement is symmetrical to increasing wages, consumption and GDP. It is induced by the reduction of self-financing caused by investment reduction. Undistributed profit is a function of last-period investment. The reduction of self-financing impacts negatively gross profits, what increases wages. Investment is restored by demand acceleration effects as well as profit recovery and debt reduction. But growth does not manage to stabilize and fall again. Consumption alone is not able to lead investment. The fixing of self-financing on former investment harms capacity of finance which results in an inescapable increase of indebtedness. In configuration 3.2, one finds the increase in short-run indebtedness caused by the financial investments of firms. The definition of self-financing less unfavourable to firms in the last configurations allows to reduce the debt and finally to relaunch investment.

Image 6: Increase in households' equities, equivalent to one percent of their financial wealth

7. Scenario 7: Increase in dividends

The dividends increase is simulated by the reduction of (sf) in the equation (29) establishing the distribution of profits. Initially, dividends represent 18 % of GDP, or 64 % of gross profits. The shock consists in increasing them by one percent of GDP. Dividends reach to 19

% of GDP. Expected results are related to the nature of pattern. The rise of dividends is financed either by a reduction of self-financing, or by a cut in wages. The question posed here is to know if the fall of investment in the first case or consumption in the second will be compensated by an increase in firms and households financial funds. In last configuration, there is no ambiguity. In the short run, like in the long run, the increase in dividends allows to compensate for the cut in wages. This process is facilitated by the modification of consumption equation where propensity to consume wages has been reduced. The fall of earned incomes less strongly impacts consumption. Moreover, the way of establishing profits does not penalize firms account since the shock is deferred on wages. Indebtedness is reduced, which supports investment. In addition, the impact on firms of dividend increase is limited insofar as firms take advantage too of this rise as shareholders. In the second configuration, these are undistributed profits that are used to finance the rise of dividends. Consumption is led by financial incomes, but firms' accounts are penalized. The increase in investment cannot be maintained. GDP evolution which is confused with wages one becomes clearly negative a shortly before the fortieth period. In configuration 3.1 total evolution is symmetrical. Adjustment relates to wages, while firms defer the whole financial constraints on employees. Consumption follows the wages which know a negative evolution. On the contrary, firms invest more because of the reduction of their indebtedness level partly thanks to the rise of dividends which is set on gross profits. The reduction of wages inflated gross profits, which explains the surge of dividends. The maintenance of investment makes it possible to contain the fall of activity. The rise of dividends finally manages to compensate for the cut in wages. The total demand is relaunched 5 periods after the shock and recovers a level closed to the baseline at the 25^{th} period.

Image 7: Increase in dividends, equivalent to one percent of GDP

8. Scenario 8: Share buybacks by firms

In this last scenario, one increases by one percent of firms' shareholding by the variation of the constant η_0. The share buyback policies are becoming numerous. Through this policy, firms try to increase shareholder value, to prevent from unfriendly takeovers and to increase their absorption capacity. All these elements of industrial economy cannot be recalled within the macroeconomic framework that one chose to mobilize. Attention is focused on the macroeconomic consequences of such practices. Effects are unspecified a priori, because the cash used in share buybacks is of course not used for productive investment, but income flows could be used for sellers' consumption. At macroeconomic level, this effect of leak from circuit disappears. By contrast, the increase in equity prices constitutes a potential escape, a

kind of inflation, if it does not correspond to an equivalent increase of produced value when equities will be resold[6].

This ambivalence shows through in the whole configurations where the first movement is a decline of activity related to the increase of indebtedness. The question of the debt ratio used, debt over fixed capital stock, can be asked insofar as one notices at the same time an increase in financial wealth. A financial illusion process could intervene in reality, especially in a context of regular increase in equity prices which would not penalize investment and could generate a cumulative dynamics which does not appear in the model. In the configuration (3.1), the positive effects of share buyback appears after forty periods, in the second, it is necessary to wait 75 periods. Coherence of the third configuration seems stronger. Positive effects appear after 15 periods. The configuration (3.2) is the clearest to interpret. Financial investment generates indebtedness which penalizes physical investment. Once first shock wave is absorbed, indebtedness decreases and rate of profit is stabilized whereas wages, consumption and growth continue to decrease. Thereafter, the reduction of indebtedness allows a resurgence of investment. This one leads growth, wages, dividends and consumption. Economy breaks the deadlock. The procyclic nature of pattern explains the depth of crisis. Gross profits fixed on GDP collapse with GDP. Undistributed profits followed and suffer the rise of indebtedness in addition. In the configuration (3.1), undistributed profits are fixed on past investment, what allows containing cumulative fall. Gross profit corresponds to the sum of distributed, undistributed profits, and debt service. The fall of undistributed profits is contained, while debt service increases. On the other hand, consumption and GDP know a more unfavourable evolution than in the configuration (3.2) in the short run, but it is less enduring. The good shape of gross profits gives rise to important dividends which allow consumption resurgence. The configuration (3.3) experiences a short term evolution less unfavourable than the first one, but its long-term evolution is less sustained. After the shock, it is the only one which maintains consumption. Gross profits are slightly reduced. This involves wage increase, reinforced by the increase in monetary incomes. Investment decline is partially compensated by the maintenance of consumption. The shock is quickly absorbed because of the weak impact on investment and consumption. Indebtedness is less strongly reduced than in the configuration (3.1) what explains the less strong slope of investment. Fi-

[6] If an important gap is observed between fundamental and nominal equity values at the time of equity resale, a process of depreciation process can occur. The rise in equity prices would have been drove by demand the request during the launching of pension funds. Reached to maturity, capitalized pension system could involve a fall of equity prices or inflation because of selling, what comes to the same thing as far as purchasing power is concerned.

nally, the differences between configurations seem to be sum up through the significance of equity prices evolution. Where financial wealth are the most developed, indebtedness is most reduced, which supports growth.

Image 8: Increase of one percent of share buybacks by firms

Conclusion

The method developed by the neo-Cambridgian approach seems able to recount specificities of finance-led capitalism. Structural models make it possible to specify the whole flows and stocks links, influence of wealth effects and leverage. The regulation theory allows specifying the transformations that took place in contemporary capitalism through the inversion of institutional hierarchy, the rise of financial power and the backward flow of the worker power.

The most salient results that one can retain of these various experiments relate to the opposition between wage increase which plays negatively as expected in a financialized regime, and rise in dividends which on the contrary plays positively in two cases out of three. These contradictory evolutions allow providing theoretical elements to explain divergences between France and the United States within the framework of a closed and financialized economy. France faced with an absence of consistent institutions that relates at the same time to the economy structures, its place in the world economy and also its regulation mode which remains marked by the heritage of fordian period.

From an economic point of view, France got into financialization. However, from a political point of view thus concerning the mode of regulation, resistances appear about the complete adoption of a financialized regime. The increase in inequalities which are bound there, excluding nature of finance-led regime, generate a political resistance. Also, France entered a financialized accumulation pattern constrained by extra-economic elements which do not prevent reduced and profitable capital accumulation but which are durably far away from the full employment. In order to attain a sustained high growth within a framework of increasing financialization, some institutional complementarities must emerge. In their absence, financial burden penalizes economic growth. In the model presented in this work, firms profit from financial dynamics as shareholder. Thus, when firms are not penalized by the form of income distribution, growth can be more constant.

These results however are conditioned by a strong household's involvement in the financial markets. However, this one is very uneven, even in the United States. In France, this involvement is more reduced in level, but it is as well concentrated. Financial wealth effects actually appeared in the United States, but real estate wealth effects have been more powerful, relegated by rising of households' debt. So as to identify an accumulation pattern, it is neces-

sary to establish the dynamic coherence of the American economic system. With this intention, one cannot elude international regime question which is not treated in present models which are closed. Consequently, even if these models are able to account for the first Regulationnists intuitions about the existence of a patrimonial regime, they cannot describe reality of the American macroeconomic closing within this framework still too narrow. To approach the real functioning of the American economy, the model should be open; households should be able to run into debt and to hold real estate assets.

In a theoretical point of view, the model meets some limits. Concerning the treatment of equity prices, on has tried to obtain a model where these ones are determined endogenously, but this lead to some paradoxical portfolio behaviours. An exogenous determination of equity prices should be experiment. The theoretical framework of endogenous money is not well-fitted to describe financialized regime where companies observe financial constraints. Finally, to improve the model, it could be interesting to introduce on one hand two types of households (poor and rich ones) where the first ones depends on wage to consume and the second ones only on dividends and capital gains, and on the other hand two sectors, small and big companies, differentiated by their access to equity finance and by they participation in general to stock market dynamics.

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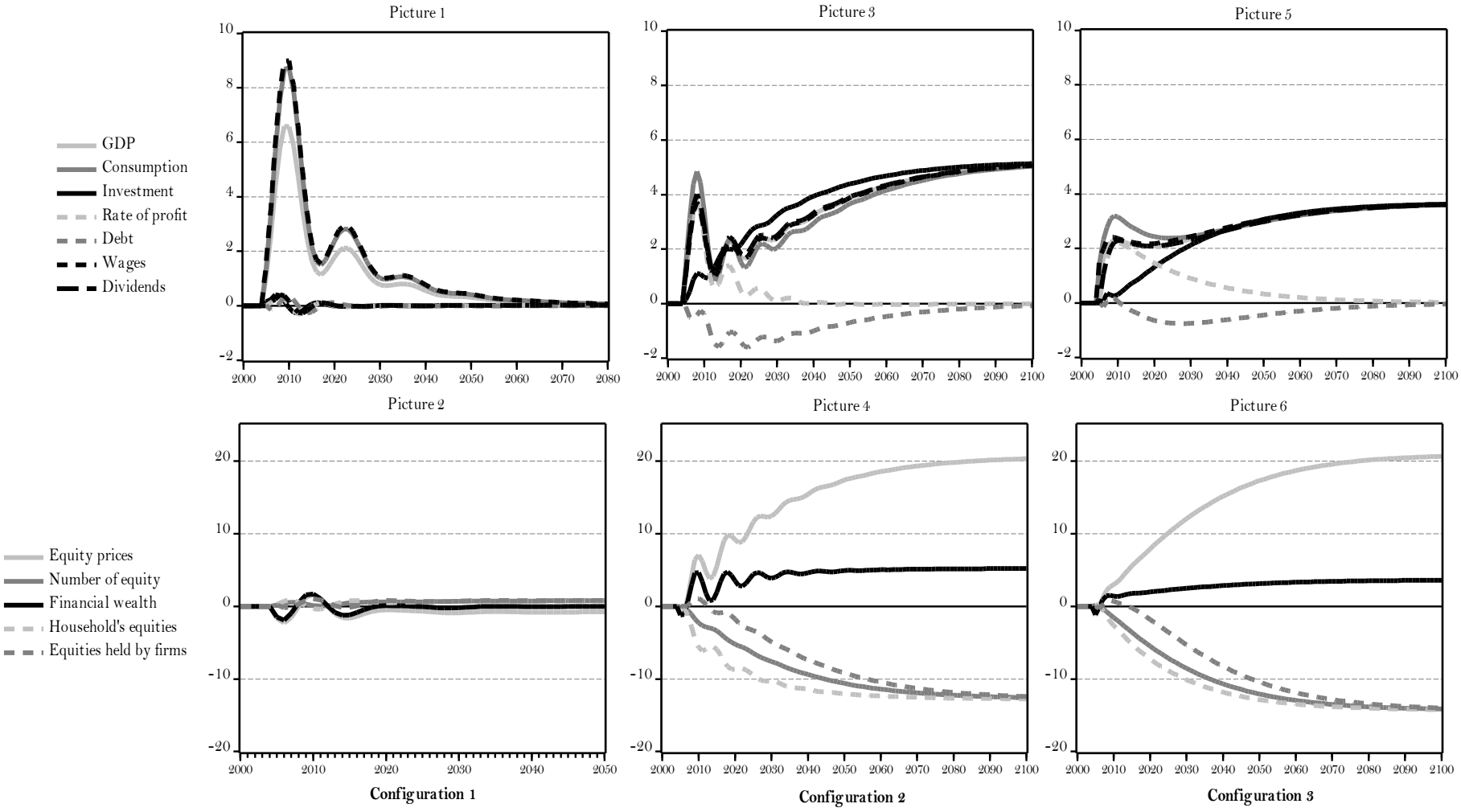
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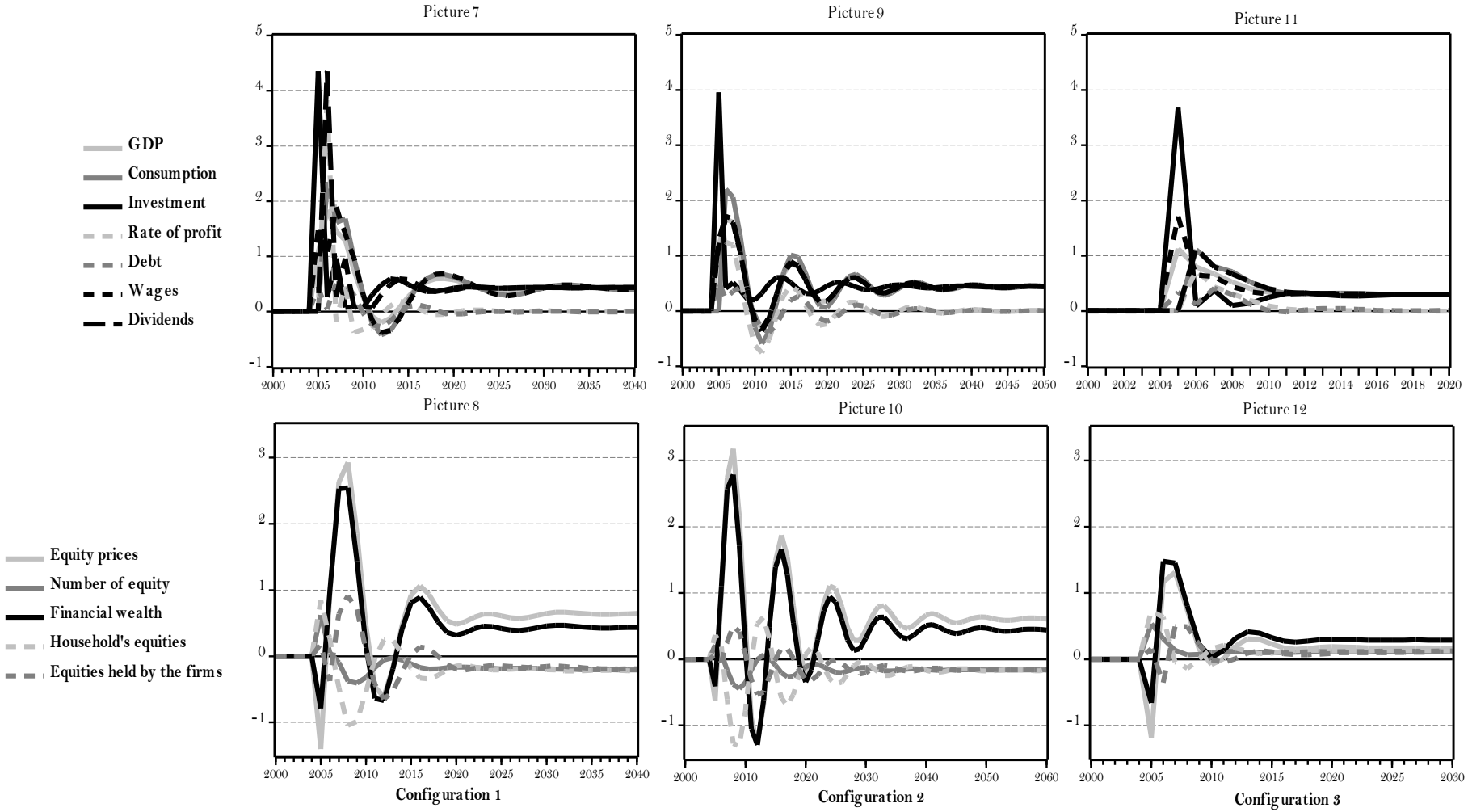
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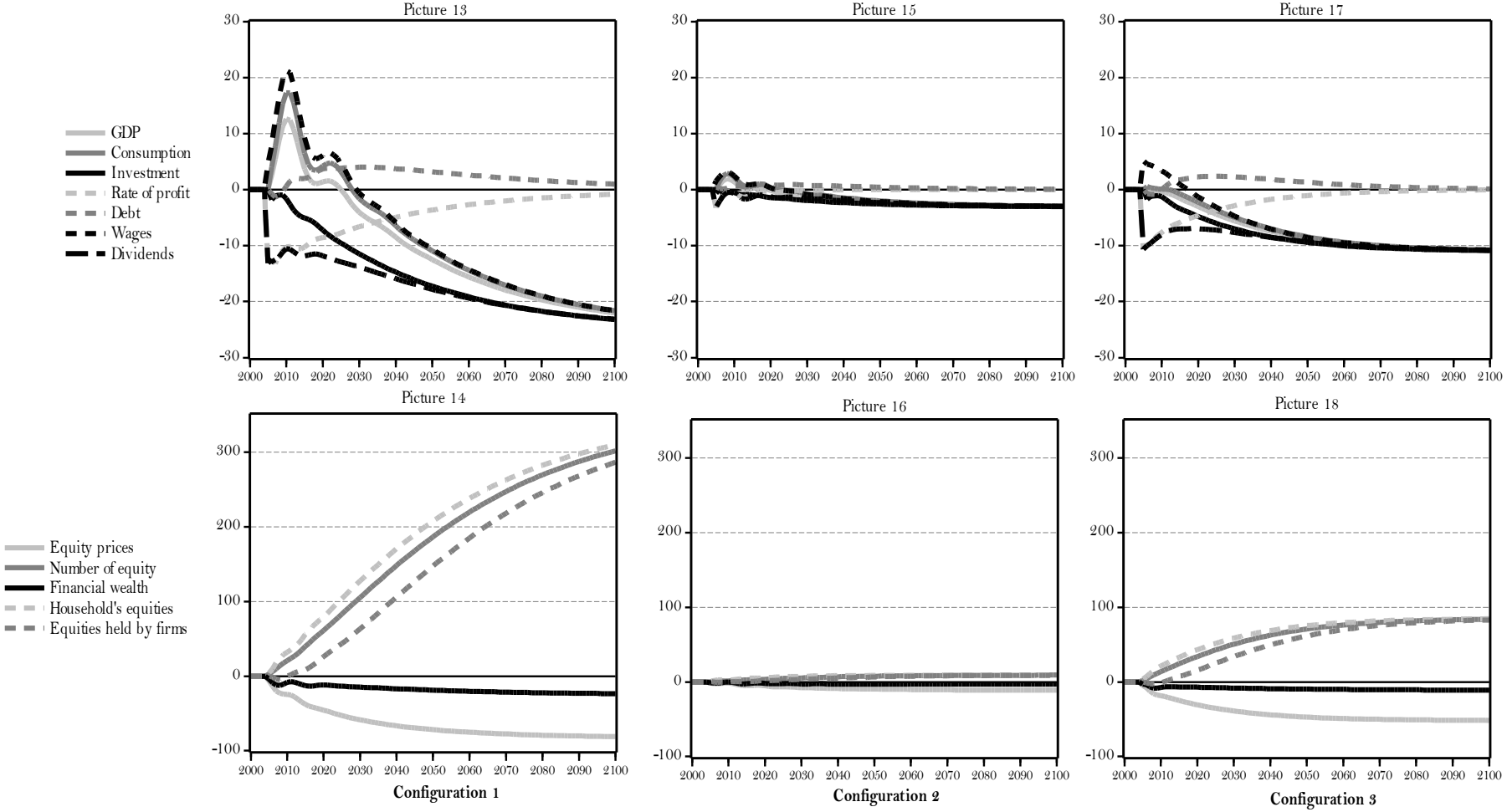
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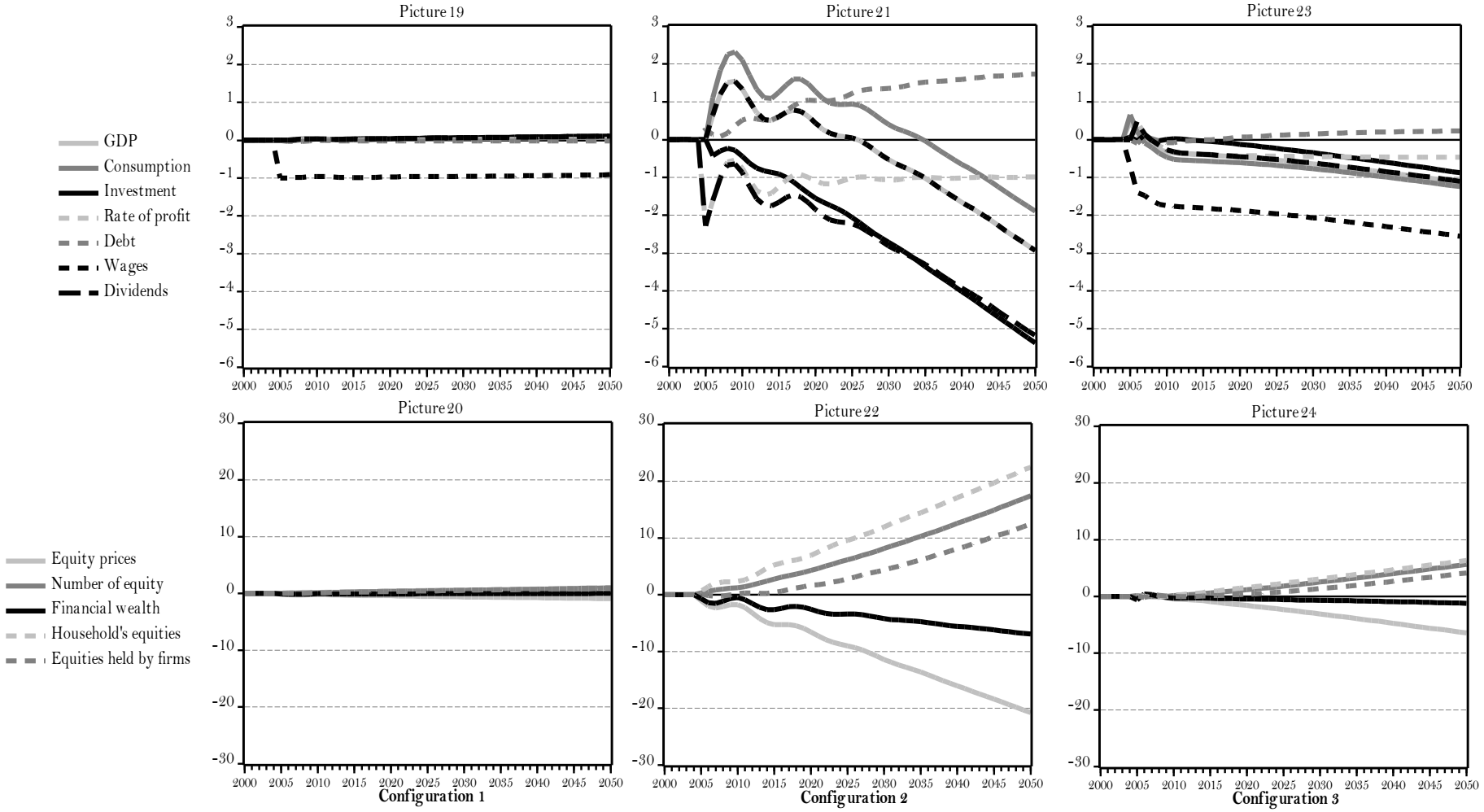
Scenario 1 : Increase in consumption, equivalent to one percent of GDP



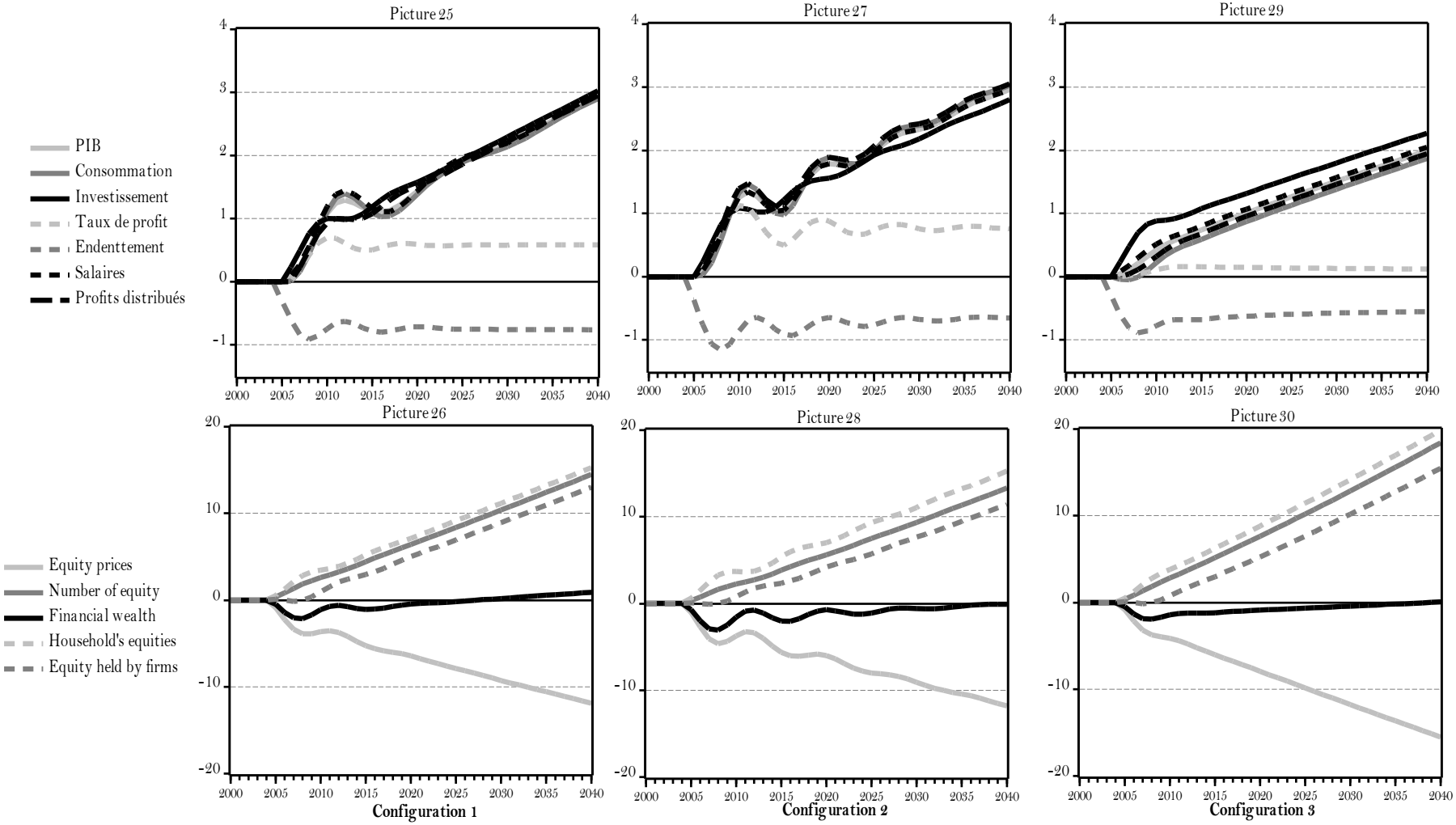
Scenario 2 : Increase in investment, equivalent to one percent of GDP



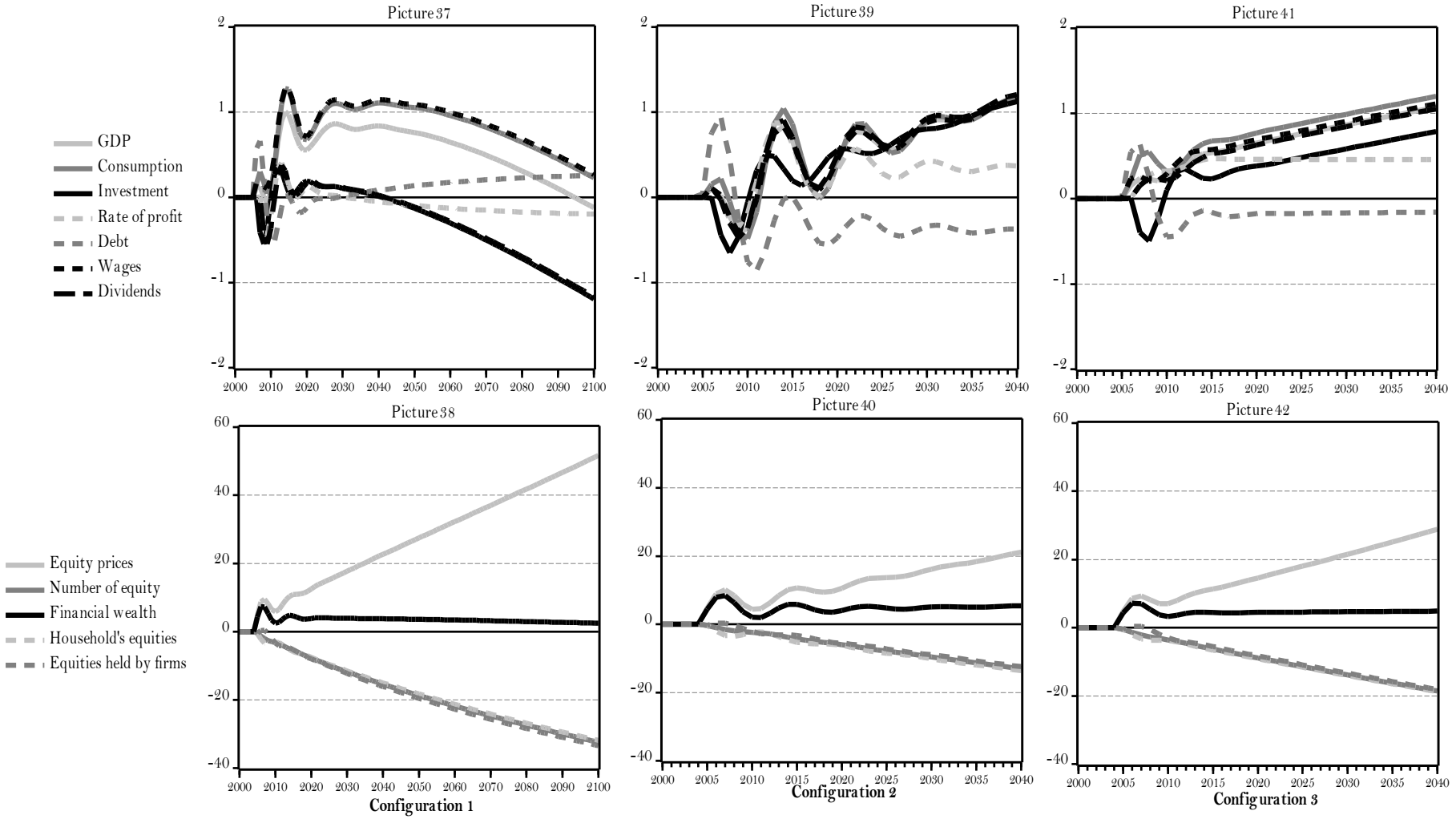
Scenario 3 : Increase in wages, equivalent to one percent of GDP



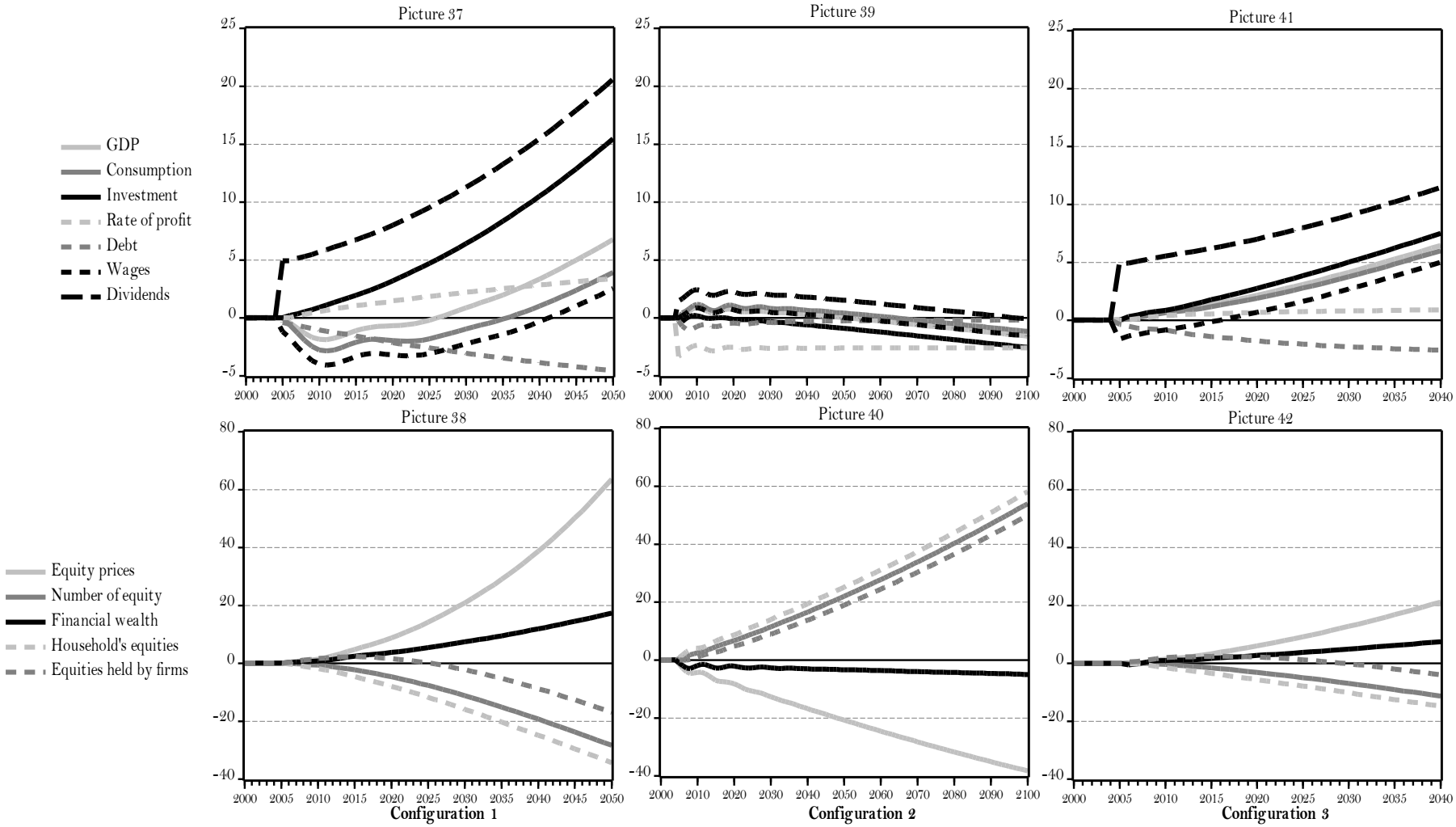
Scenario 4 : Increase of interest rates from 3 to 4 %



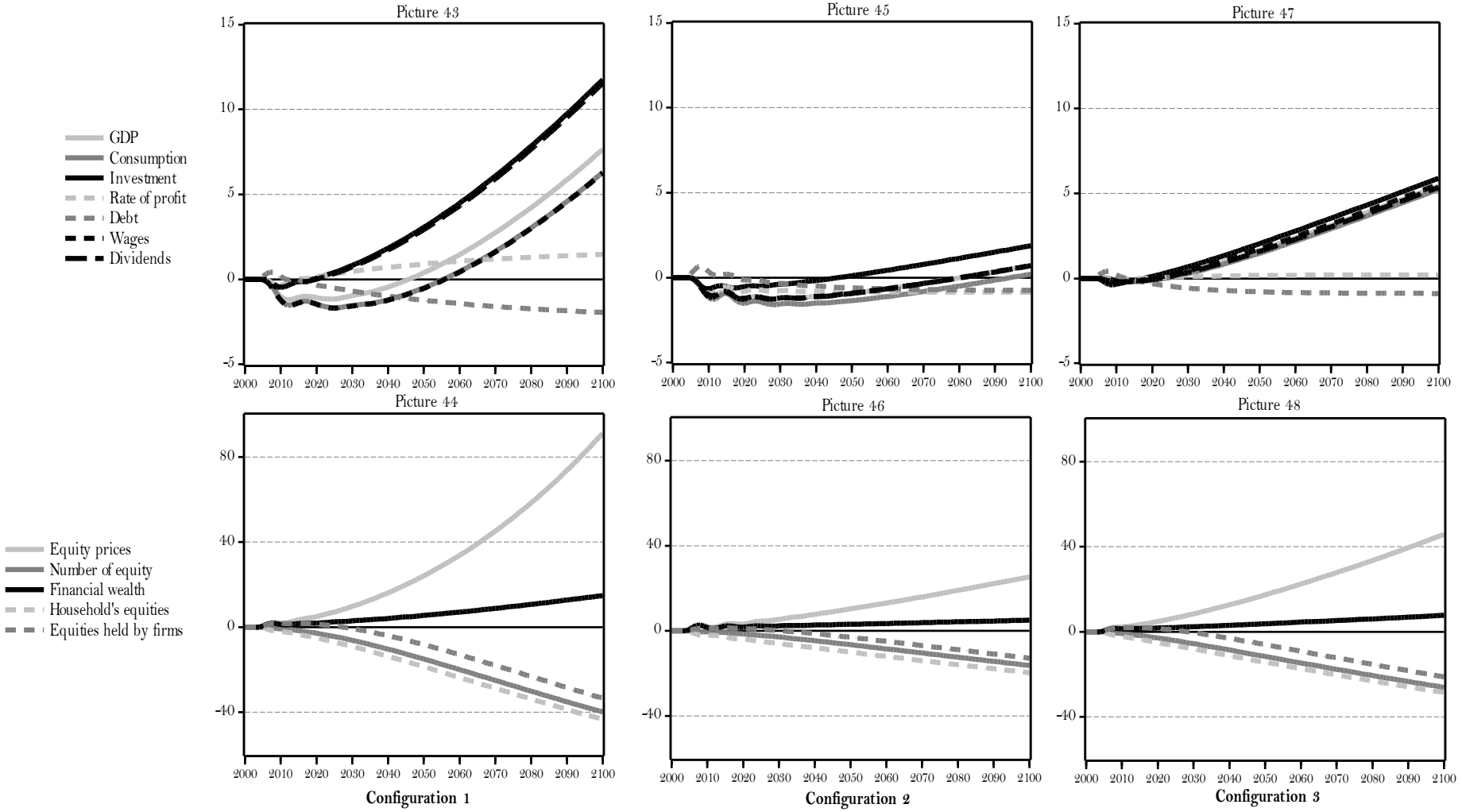
Scenario 5 : Increase of equity issuing, equivalent to one percent of GDP



Scenario 6 : Increase in households' equities, equivalent to one percent of their financial wealth



Scenario 7 : Increase in dividends, equivalent to one percent of GDP



Scenario 8 : Increase of one percent of share buybacks by firms

(1) $\frac{\Delta Es * pe}{I} = \tau_1 * \left(\frac{L_{(-1)}}{Fu}\right) + \tau_2 * rl + \tau_0$

(2) $\frac{\Delta Ede * pe}{((Ede * pe) + K)} = \eta_1 * ree_{(-1)} + \eta_2 * rcf_{(-1)} + \eta_0$

(3) $\frac{pe*Edm}{V^*} = \psi_1 * rm + \psi_2 * rem(-1) + \psi_3 * \left(\frac{Yhr^*}{V^*}\right) + \psi_0$

(4) $Ed = Edm + Ede$

(5) $Ese = Es - Ede$

(6) $Edm = Ese$

(7) $\Delta Md = \Delta V - pe * \Delta Edm - Edm_{(-1)} * \Delta pe$

(8) $\Delta Ld = I - Fu - \Delta Edm * pe\text{-}Fde$

(9) $Md^* = V^* - (Edm * pe)$

(10) $rm = rl$

(11) $CGm = \Delta pe * Edm_{(-1)}$

(12) $CGe = \Delta pe * Ede_{(-1)}$

(13) $Fdm = Fd * \left(\frac{Edm}{Es}\right)$

(14) $Fde = Fd * \left(\frac{Ede}{Es}\right)$

(15) $ree = \frac{(Fde + CGe)}{(pe_{(-1)} * Ede_{(-1)})}$

(16) $rem = \frac{(Fdm + CGm)}{(pe(-1) * Edm_{(-1)})}$

(17) $\Delta V = Yhr - Cons + CGm$

(18) $V^* = V_{(-1)} + Yhr^* + CGm - Cons$

(20) $Yhr = W + Fdm + rm * M_{(-1)}$

(21) $gy = \frac{\Delta Yhr}{Yhr_{(-1)}}$

(22) $Yhr^* = (1 + gy_{(-1)}) * Yhr_{(-1)}$

(23) $g = \phi_1 * rcf_{(-1)} - \phi_2 * \left(\frac{L_{(-1)}}{K_{(-1)}}\right) + \phi_3 * \left(\frac{\Delta PIB}{PIB_{(-1)}}\right) + \phi_0$

(24) $I = g * K_{(-1)}$

(25) $K = K_{(-1)} * (1 - \delta + g)$

(26) $PIB = Cons + I$

(31) $rcf = \frac{Fu}{K_{(-1)}}$

Configuration 3.1

(19.1) $Cons = \alpha_0 + \alpha_1 * Yhr^* + \alpha_2 * V_{(-1)}$

(27.1) $W = PIB - Ft$

(28.1) $Ft = Fu + Fd + rl * L(-1)$

(29.1) $Fd = (1 - sf) * (Ft - rl * L_{(-1)})$

(30.1) $Fu = \vartheta_1 * I(-1) - W_0$

Configuration 3.2

(19.2) $Cons = \alpha_0 + \alpha_1 * Yhr^* + \alpha_2 * V_{(-1)}$

(27.2) $W = PIB - Ft$

(28.2) $Ft = \upsilon_1 * PIB - W_0$

(29.2) $Fd = (1 - sf) * (Ft - rl * L_{(-1)})$

(30.2) $Fu = Ft - Fd - rl * L_{(-1)}$

Configuration 3.3

(19.3) $Cons = \alpha_0 + \alpha_{11} * W_{(-1)} + \alpha_{12} * Fd_{(-1)} + \alpha_{13} * rl * L_{(-1)} + \alpha_2 * V_{(-1)}$

(27.3) $W = PIB - Ft$

(28.3) $Ft = Fu + Fd + rl * L_{(-1)}$

(29.3) $Fd = (1 - sf) * (Ft - rl * L_{(-1)})$

(30.3) $Fu = \upsilon_1 * PIB(-1) - W_0$

Table 3. Summarization of the three configurations