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A Synthetic, Stock-Flow Consistent Macroeconomic Model of Financialisation

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A Synthetic, Stock-Flow Consistent Macroeconomic Model of Financialisation

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Abstract

This article is centred around the notions of shareholder value orientation and financialisation. Shareholder value orientation is reflected by a high dividend payout ratio applied by firms and the reluctance of firms to finance physical investment via new equity issues. Financialisation is the more general development towards an increased importance of the financial sector of the economy relative to the non-financial sector. In this article, a synthetic, stock flow consistent model is developed that attempts to encompass and at times adjust some important recent works on the effects of financialisation. This includes contributions from the fields of mainstream information economics and Post Keynesian economics. We conduct simulations reflecting increased shareholder value orientation and show that the model produces a number of results that appear consistent with many stylised facts particularly of the US economy since the early 1980s.

Key Words: Stocks and Flows, Corporate Governance, Investment Finance, Payout Policy, Income Distribution.

JEL classifications: E10 E21 D14 G11 G32 G35 E25

ca. 7.500 words

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1. Introduction

This article is centred around the notions of shareholder value orientation and financialisation, with the former being one (important) constituent of the latter. Shareholder value orientation is defined as the increased dominance of shareholders over management and workers in corporate governance. Financialisation is the more general development towards an increased importance of the financial sector of the economy relative to the non-financial sector.

The objectives of the article are the following: first, we develop a synthetic, stock flow consistent (SFC) macroeconomic model of financialisation. Thanks to the SFC modelling approach, based on computer-based solution methods (see Godley and Lavoie, 2007, for a systematic presentation), we can integrate several important facets of financialisation into one macroeconomic model, and consider how the effects that are ascribed to this complex phenomenon in partial analyses in the existing literature may be linked. This includes both mainstream and Post Keynesian contributions. We focus on the implications of financialisation for accumulation, profitability, output growth, financial wealth and indebtedness of households and firms, and income distribution.

Second, we conduct simulations on our model and concentrate on two experiments reflecting increasing shareholder value orientation: one is an increase in the dividend payout ratio of non-financial firms, the other is a reduction in the contribution of new equity issues to the financing of physical investment. We argue that the results of our experiments realistically reflect many important stylised facts particularly of the US economy since the early 1980s, when the “shareholder revolution” started. Interestingly, the results of our experiments are not unique but different “cases” are obtained depending on one strategic parameter value in the investment function of the model. Higher dividend payments and lower equity issues can have either positive or negative effects on physical accumulation, firms’ profit rate and output growth, and different implications for the evolution of households’ and firms’ wealth and indebtedness. While these conclusions appear consistent with empirical experience, they generalise the results obtained by Lavoie and Godley (2001-2, pp. 305-7) in their path-breaking contribution to SFC modelling within a Post Keynesian framework. In their analysis, shareholder value orientation, measured in terms of dividend payments and share buybacks, has uniquely positive effects on the overall economy. In our model, such outcomes are possible but not very likely. Consequently, the model also encompasses more pessimistic views of shareholder value orientation, such as that expressed by Stockhammer (2005-6), who observes “an interesting puzzle in macroeconomic trends: the ratio of investment to profits [...] shows a declining trend (p. 197)”. In effect, with the notable exception of the “New Economy” boom of the late 1990s, shareholder value orientation seems to be linked to a divergence of macro-

economic accumulation and profit rates, which clearly poses a challenge to traditional Post Keynesian analysis. We show how this “investment-profit puzzle” can be resolved and what implications this has for the other aspects of financialisation mentioned above.

The article proceeds as follows: in section 2, some important previous work on financialisation and shareholder value orientation is discussed in light of the empirical facts. Section 3 presents our own synthetic, stock-flow consistent model of an economy containing an industrial sector, a household sector composed of workers and rentiers, a private banking sector, and a stock market. The behavioural equations of the model are based on the considerations developed in section 2. The simulation results are discussed in section 4 and compared to some key conclusions obtained in the existing literature in section 5. Section 6 concludes.

2. Models of Financialisation in the Light of Stylised Facts

In this section, we discuss in turn three phenomena associated with shareholder value orientation and financialisation: the (usually) reduced propensity to invest of non-financial firms; the divergence of accumulation and profit rates at the macroeconomic level; and changes in the distribution of income. Focusing in particular on the US economy, we relate these empirical developments to both mainstream and Post Keynesian theory.

The Growth-Profit Trade-Off, Shareholder Value Orientation and Accumulation

The idea of there being a conflict between an individual firm’s growth and its profitability is widely accepted by economists and by public opinion.

To begin with, a standard intuition is that technical inefficiency problems arise from very fast expansion, which makes the acquisition of knowledge about new products and markets difficult to organise. This is the well-known “Penrose effect” (Penrose, 1959), or “growth-profit trade-off” (Stockhammer, 2004, 2005-6) which is a standard concept in both mainstream and Post Keynesian economics (Lavoie, 1992, pp. 114 et seq.).

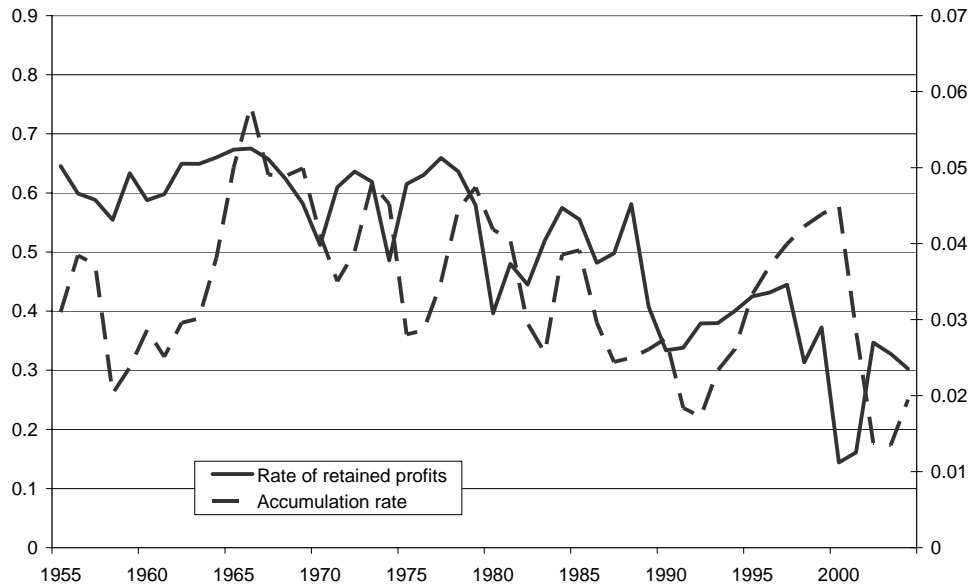
Moreover, it is generally recognised that different groups within a firm, namely managements on the one hand and shareholders on the other, follow rather conflicting objectives. In the Post Keynesian view, managers have traditionally been seen as caring mainly about the long-term survival of their firms (and hence jobs, fame and influence), for which high accumulation appears to be the best guarantee: “management wants to maximize the size and power of the firm and the share of primary markets in which it operates, not the current value of the firm” (Crotty, 1990, p. 533). Conversely, “stockholders typically have only a fleeting relation with any particular enterprise” (ibid., p. 534). Their typical criterion for choosing

stocks is the expected rate of return. In the “New Institutional Economics” (NIE) literature, managers are conceptualised as the agents of shareholders. However, as management holds at most a small fraction of the firm’s equity, it has an incentive “to consume more on the job than is agreed on in his contract” (Fama, 1980, p. 296) at the expense of the firm’s present value.¹ Many authors have argued that the strengthening of shareholder preferences will therefore enhance productive efficiency, by disciplining managements e.g. via high dividend payments and high leverage reducing the “free cash flow” at the disposal of managements, the threat of “mergers and the market for corporate control” (Manne, 1965), a competitive “market for managers” (Fama, 1980), and stock-price oriented remuneration schemes. However, serious empirical evidence suggests that managers, as they are increasingly aligned to shareholder preferences, “would avoid initiating a very positive NPV [net present value, TvT] project if it meant falling short of the current quarter’s consensus earnings” (Graham et al., 2004, p. 1). One explanation for this is that due to asymmetric information, shareholders tend to focus on short-term financial returns, while the costs of acquiring knowledge about the actual long-term potential of a firm are often prohibitive: “Managers describe a trade-off between the short-term need to ‘deliver earnings’ and the long-term objective of making value-maximizing investment decisions. Executives believe that hitting earnings benchmarks builds credibility with the market and helps to maintain or increase their firm’s stock price” (Graham et al., 2004, p. 2; for similar conclusions, see, e.g., Porter, 1992, Cheng et al., 2005). Post Keynesian authors have focused on the potentially negative effects for effective demand and growth associated with a reduced propensity to invest as a result of shareholder value orientation (e.g. Crotty, 1992; Stockhammer, 2005-6).

Two well-established stylised facts suggest that shareholder value orientation since the early 1980s has indeed tended to contain managements’ desire to accumulate physical capital, which was prevalent during the “Fordist era”: first, the increase in firms’ dividend payout ratio together with a strong positive correlation between the availability of internal sources of finance and physical investment (see figure 1); and second, the very limited, and in fact declining, role of the stock market for providing investment finance to firms (see figure 2).

¹ Such wasteful (present value-reducing) “benefits in kind” can include “physical appointments of the office”, the “attractiveness of the secretarial staff”, or “a larger than optimal computer to play with” (Jensen and Meckling, 1976, p. 312). This trivialisation of managers’ desire to accumulate has always been rejected by Post Keynesian and institutionalist authors (e.g. Galbraith, 1969; Eichner, 1976; Lavoie, 1992).

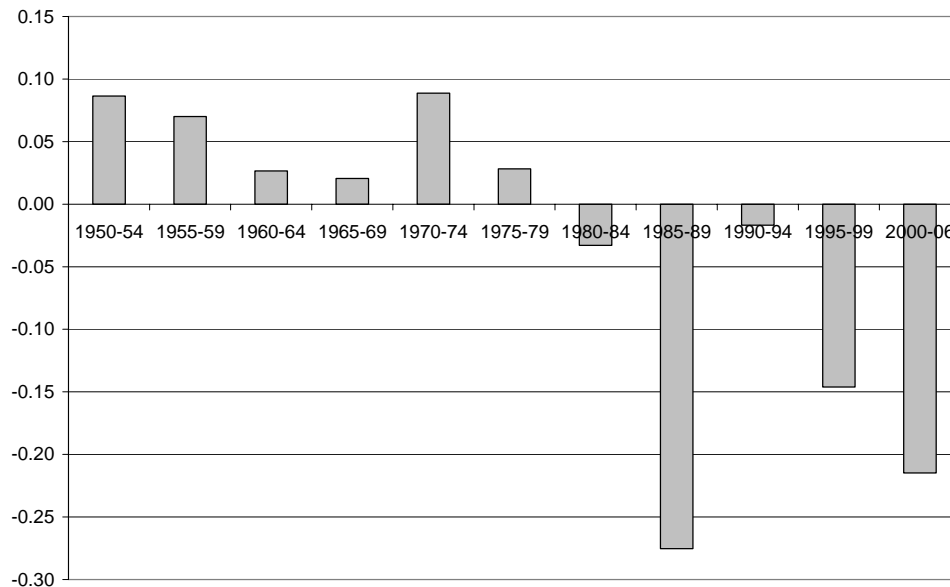
Figure 1: Accumulation Rate (Right Scale) and Rate of Retained Profits, Private Corporations, USA



Note: Rate of retained profits = Undistributed corporate profits/Corporate profits after tax, net of interest payments; Accumulation rate = Growth rate of corporate net capital stock.

Sources: NIPA, tables 1.10, 7.11, Fixed Assets Tables, table 6.1 (Bureau of Economic Analysis); author's calculations.

Figure 2: Ratio of Net Issues of Equities to Gross Fixed Investment, Nonfinancial Corporations, USA

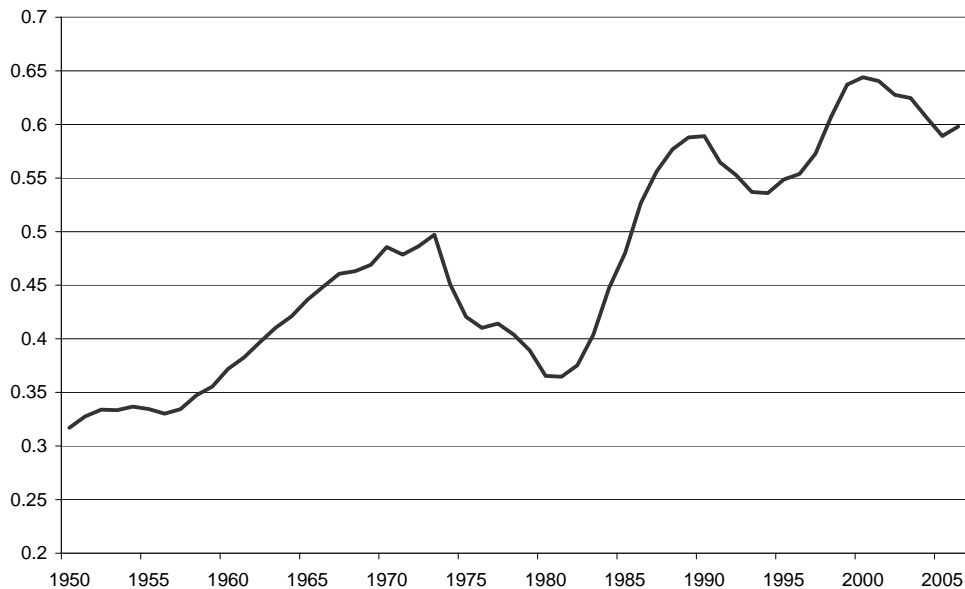


Source: Flow of Funds Accounts (Federal Reserve); Table F.102; author's calculations.

A high dividend payout ratio is consistent with a policy of “downsize and distribute”, as opposed to a strategy of “retain and invest”, traditionally favoured by managements (see Lazonick and O’Sullivan, 2000). The importance of internal funds for physical investment has already been recognised by Kalecki (1937) with his “principle of increasing risk”: firms and their creditors face an increasing risk of default with the proportion of external finance in-

creasing. Another explanation of firms' heavy reliance on internal funds is that in "imperfect capital markets" with asymmetric information, the providers of external finance will require a monetary premium compensating for the risk of management shirking or engaging in very risky investment projects, which may lead to adverse selection (Stiglitz and Weiss, 1981). As for equity finance, existing shareholders will often resist the augmentation of a firm's own capital: the (announcement of the) emission of new equities will be interpreted by shareholders as a signal that the management considers the firm to be overvalued, hence inducing shareholders to sell the firm's stock with the result of a decline in its price. However, both dividend payments and share buybacks, while stimulating the rate of return on equity, at least in the short run, reduce firms' internal funds and hence potentially long-run accumulation.

Figure 3: Ratio of Gross Debt to Capital Stock, Nonfinancial Corporations, USA



Note: Debt = Credit market instruments; Capital Stock = Replacement cost of structures.

Source: Flow of Funds Accounts; Table B.102; author's calculations.

The overwhelming majority of empirical studies on financial structure indicate indeed that "retained earnings are by far and away the dominant source of finance in all countries" (Mayer and Sussman, 2002; see also Mayer, 1988, Rajan and Zingales, 1995).² Corbett and Jenkinson (1997) show that for US non-financial private enterprises the contribution of internal funds to the financing of physical investment has increased from about 75 per cent in the early 1970s to above 100 per cent in the 1990s. Also, the contribution of new equity to the

² Interestingly, Corbett and Jenkinson (1997) find that in the US and the UK – countries with so-called "market-based" financial systems – firms relied more heavily on internal means of finance than in Germany and Japan, where the financial system was traditionally considered "bank-based", during 1970-94. In the US and the UK, the contribution of new equity to the financing of investment was negative, while it was positive (but small) in Germany and Japan.

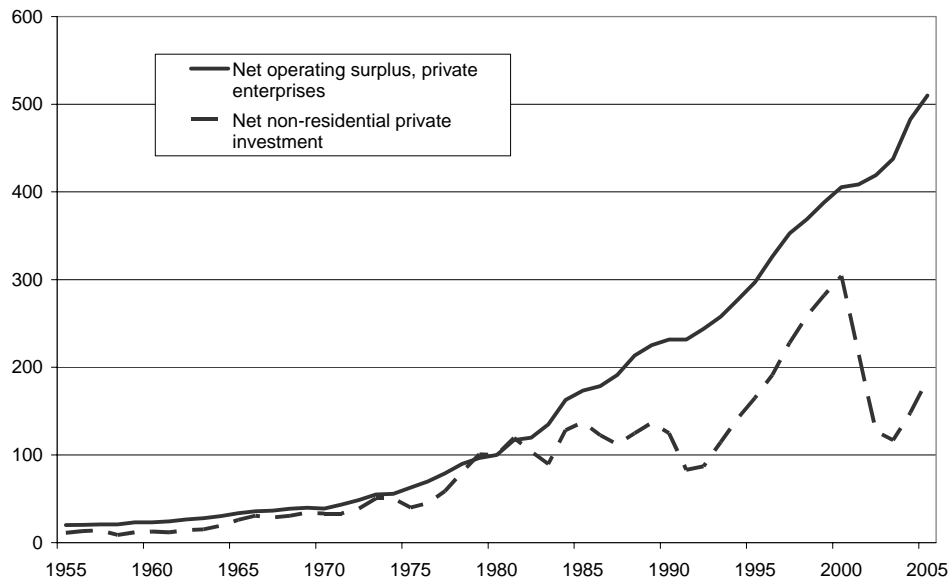
financing of investment has been negative in the US since the early 1980s, while it had been positive but small in earlier decades (see figure 2). In fact, there are many theoretical explanations of why debt finance is usually preferred over equity finance, when internal funds are not sufficiently available (for surveys, see Harris and Raviv, 1991, and Frank and Goyal, 2005). One important result in many theories is the existence of a creditor-shareholder conflict: shareholders typically wish to stimulate the potential return on equity via relatively risky and highly leveraged investment strategies, while bondholders and banks advocate more conservative investments and fear that high leverage ratios increase the risk of default. Therefore, increasing leverage ratios of firms can be an indirect result of shareholder value orientation, when firms increasingly distribute dividends to shareholders and restrict equity issues. Figure 3 shows that firms' leverage has indeed been increasing since the early 1980s.

There is also econometric evidence that shareholder value orientation contributed to the slowdown of accumulation in the past decades (see, e.g., Stockhammer, 2004; van Treeck, 2007). However, figures 1-3 point to one important exception, namely the "New Economy" boom of the late 1990s. During this period, accumulation strongly recovered, while dividend payments were very high and firms bought back shares. This pattern corresponds to what Lavoie and Godley (2001-2, pp. 306-7) seem to consider as representative of the functioning of a "monetary economy". As will be seen below, in our model shareholder value orientation can affect accumulation either positively or negatively.

The "Investment-Profit Puzzle" and the Surge in Financial Wealth and Consumer Credit

The "investment-profit puzzle" (Stockhammer, 2005-6) describes an interesting phenomenon in a number of developed economies since the early 1980s, where accumulation has generally been declining while profit rates have shown a tendency to rise. As is well known, traditional Post Keynesian analysis formalises a "double-sided [positive] relationship between the rate of profit and the rate of accumulation" (Robinson, 1962, p. 12). This is most obvious in the Cambridge equation, which has the accumulation rate as "a function of the rate of profit that induces it" and the profit rate as "a function of the rate of accumulation that generates it" (Robinson, 1962, p. 48). Figure 4 indicates that the macroeconomic relationship between investment and profits has considerably weakened in the US since the early 1980s, with the "New Economy" boom being again a notable exception.³

³ Duménil and Lévy (2001, p. 589) calculate a profit rate for the total private US economy and show that it has heavily declined from the mid-1960s to the early 1980s, but has been strongly recovering since then.

Figure 4: Investment and Profits, USA, 1980 = 100

Source: NIPA, table 1.10; Fixed Assets Tables, table 5.9; author's calculations.

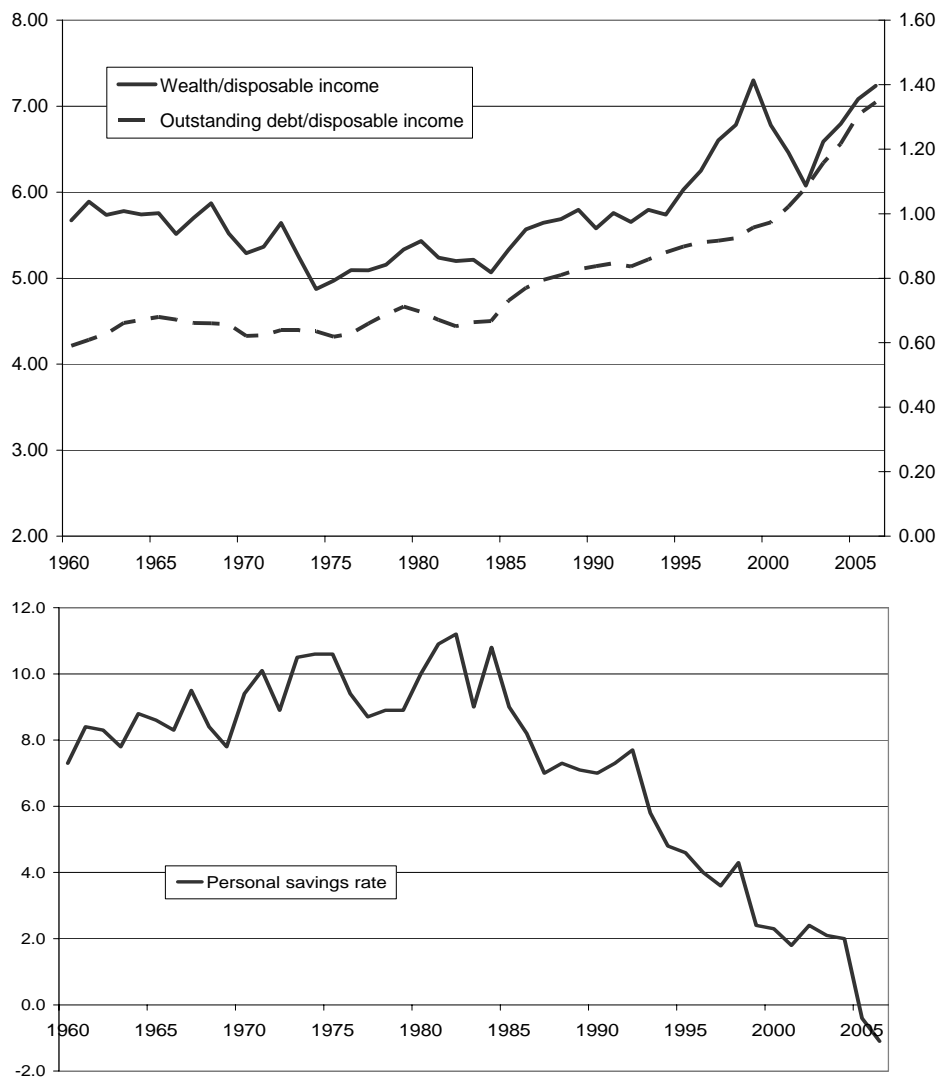
In an attempt to propose one potential solution to the “investment-profit puzzle”, van Treeck (2007) and Hein and van Treeck (2007) have included terms capturing shareholder value orientation in the investment function of their respective models. In both models, an increase in the dividend payout ratio can have different effects on accumulation, profit rate and capacity utilisation. One possibility is an “intermediate case”, in which higher dividend payments depress the accumulation rate but the surge in consumption out of capital income stimulates the profit rate. Similar solutions to the “investment-profit puzzle” are discussed by Van de Velde (2005, pp. 184 et seq.), Cordonnier (2006) and Lavoie (2006, p. 20).

The aforementioned models do not explicitly take into account the interaction between flows and stocks, such as the importance of financial wealth for investment and consumption, which is a crucial element of financialisation. Rudimentary analyses hereof are Boyer (2000), Aglietta (2000) and Stockhammer (2005-6). In these models, shareholder value orientation exerts a direct negative effect on investment, but is also linked to rising stock prices and hence financial wealth of households, which in turn stimulates consumption (and possibly investment via Tobin's q). However, the channels by which shareholder value orientation stimulates equity prices are not entirely clear in these models. While Tobin's q is exogenous in Boyer (2000), in Stockhammer (2005-6) wealth is a simple linear function in profits. A more convincing treatment is proposed by Lavoie and Godley (2001-2), where stock prices are jointly determined by the supply of equity decided by firms and households' portfolio choice.

An interesting weakness in many models of wealth-based growth is pointed at by Bhaduri et al. (2006). It is recalled that stock market wealth is purely “virtual wealth (which) is realiz-

able individually or on a micro-, but not collectively on a macro-scale” (p. 414). Clearly, were a sufficiently large number of shareholders to sell their stocks in order to increase consumption, stock prices would decline and virtual wealth be destroyed. Hence, “the institutional arrangements of an overdraft economy become essential to maintain a boom fuelled by credit rather than realized capital gains.” (ibid., p. 414).⁴ Figure 5 shows that the decline in the personal savings rate in recent times has indeed been associated with a rapid increase in both household wealth and indebtedness. Interestingly, the massive decline in the US personal savings rate in the recent past can be fully explained by the reduced propensity to save of the highest income quintile alone, which holds 80-90 per cent of equity and has particularly benefited from both dividend payments and rising financial wealth (see Maki and Palumbo, 2001).

Figure 5: Household Wealth (Left Scale) and Indebtedness, Personal Savings Rate (%), USA



Source: Flow of Funds Accounts, tables F.100, B.100; NIPA, table 2.1; author’s calculations.

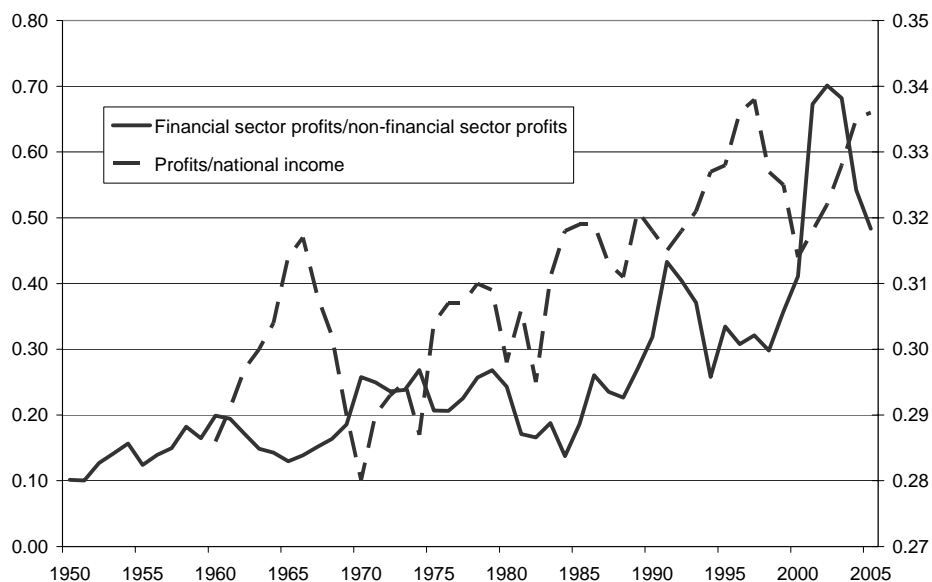
⁴ As emphasised by Dutt (2006, p. 343), the expansion of consumer credit has been facilitated by the “deregulation of the financial system allowing home equity lending, adjustable consumer loans and securitization [...], and technological changes in credit reporting in the USA in the 1980s [...]”.

The analysis of Bhaduri et al. (2006) is particularly interesting because it derives conditions under which “the level of real income and, of virtual wealth may be seen to move in opposite directions” (p. 418). This possibility arises because wealth-based consumption, while having expansionary effects in the first place, may raise the debt/income ratio of households and hence both reduce creditworthiness and increase interest and repayment obligations. As a result, households’ propensity to consume would need to decline again in the longer run. Such considerations will also be integrated in our synthetic model of financialisation.

Financialisation and Income Distribution

Financialisation has been accompanied by an increasing share of profits in national income (see figure 6). Hein (2006, 2007) has integrated the distribution effects of monetary policy into a Post Keynesian model of growth and distribution and argued that rising interest rates are likely to be translated into higher prices by firms, that is, firms’ mark-up and hence the profit share are “interest-elastic”. In our view, this idea can be readily extended to shareholder value orientation, which, according to many analyses, has also contributed to the decline in the share of wages in national income (see, e.g., Boyer, 2000).

Figure 6: Share of Profits in National Income (Right Scale), Ratio of Financial Sector Profits to Non-Financial Sector Profits, USA



Sources: AMECO database, NIPA, table 6.16; author’s calculations.

Another aspect of financialisation is the rapid increase in financial sector profits relative to non-financial sector profits (figure 6), which is to a large extent due to the rapid expansion of financial wealth as well as to the increase of corporate and consumer debt (figures 3 and 5).

Clearly, banks, pension and mutual funds, which administer the overwhelming part of household wealth and debt, benefit from administration fees and interest payments.⁵

A further corollary of shareholder value orientation appears to be the increasing gap between manager wages and blue collar wages.⁶ Palley (2006) and Lavoie (2006) have analysed this phenomenon of “cadrisme” (Lavoie, 2006) within the framework of Post Keynesian models of growth and distribution. In our view, shareholder value orientation is closely related to the redistribution from blue collar to management wages. As mentioned above, management income is nowadays to a large extent “performance-related”, that is, closely linked to corporate profits and financial returns (via e.g. stock options and remuneration pegged to profits or stock prices). Therefore, as managements increasingly adopt (or are forced to adopt) shareholder interests, manager income for the purposes of analysis (although not in terms of national accounts) can be understood as part of distributed profits.

In the next section, we present our simple stock-flow consistent macro model, which attempts to encompass both the theoretical work and the stylised facts sketched above.

3. A Synthetic, Stock-Flow Consistent Model

The accounting framework of our model is inspired by and in many aspects similar to the seminal work of Lavoie and Godley (2001-2). Unlike the latter, however, our model includes an explicit distinction between workers and rentiers who together constitute the household sector, as in Dos Santos and Zezza (2006). Another extension is that households have access to credit in our model, as in Godley and Lavoie (2007, pp. 378 et seq.). Also, banks make profits in our model. In this section, the main focus is on the behavioural equations of the model, which are based on the arguments developed in the previous section. Adding a number of accounting identities, we obtain a full stock-flow consistent macro model with a total of 57 equations and relevant definitions.⁷

The accounting framework of the model is given by the balance sheet and transactions matrices in tables 1 and 2. The subscripts d and s denote demand and supply, r , w , and f respectively are rentiers’, workers’, and firms’ demand. For example, the third row in the balance sheet matrix says that the supply of loans, L_s , must be equal to the demand of loans by rentiers, L_r , and firms, L_f . Our model describes a pure Wicksellian credit economy, where

⁵ Not only banks and other financial intermediaries increasingly rely on the granting of loans as a source of profits. As an interesting piece of anecdotic evidence, note that in 2004Q2, “both General Motors and Ford earn(ed) more from providing auto and mortgages loans than from selling cars” (Chancellor, 2005, p. 162).

⁶ In the US, the share of wages paid to the nine lower income quintiles has declined by about 12 percentage points during 1970-2000. During 1980-2000, the share received by the highest 1 per cent income fractile has approximately doubled from around 5 per cent to above 10 per cent (Piketty and Saez, 2003, table A2).

⁷ An EViews programme of the model and the simulations can be obtained from the author on request.

money, M_s , is created by private banks and takes the form of deposits, M_r . Workers only receive wages, W_s , and spend all wage income on consumption, C_w . They do not have access to loans, L . Rentiers hold all household net worth, V . They receive dividends, FD , from firms, and interests on deposits, $i_m M_{(-1)}$, from banks, with i_m being the interest rate on deposits, M . They also pay interests on loans, $i_l L_{r(-1)}$. Banks make profits, $i_l L_{(-1)} - i_m M_{(-1)}$, but they distribute all their profits, FB , to rentiers.⁸ Firms produce consumption goods, C_s , and capital goods, I_s , and pay wages, W_d , to workers, dividends to rentiers and interests to banks. Investment is financed via undistributed profits, FU , new bank loans, ΔL_f , and new equity issues, $\Delta e_s p_e$, where e_s is the quantity of equity supplied, and p_e is the price of equity.

Table 1: Balance Sheet Matrix

	Households		Firms	Banks	TOTAL
	Workers	Rentiers			
Money		+ M_r		- M_s	0
Equities		+ $e_r p_e$	- $e_s p_e$		0
Loans		- L_r	- L_f	+ L_s	0
Capital			+ K		+ K
TOTAL (net worth)	0	V	$K - e_s p_e - L_f$	0	+ K

Table 2: Transactions Matrix

	Households		Firms		Banks		TOTAL
	Workers	Rentiers	Current	Capital	Current	Capital	0
Consumption	- C_w	- C_r	+ C_s				0
Investment			+ I_s	- I_d			0
Wages	+ W_s		- W_d				0
Profits		+ FD	- FT	+ FU			0
Interests _{loans}		- $i_l L_{r,-1}$	- $i_l L_{f,-1}$		+ $i_l L_{,-1}$		0
Interests _{deposits}		+ $i_m M_{,-1}$			- $i_m M_{,-1}$		0
Bank profits		+ FB			- FB		0
Δ loans		+ ΔL_r		+ ΔL_f		- ΔL_s	0
Δ money		- ΔM_r				+ ΔM_s	0
Issues of equities		- $\Delta e_r p_e$		+ $\Delta e_s p_e$			0
TOTAL	0	0	0	0	0	0	0

In what follows, we present the behavioural equations and some important definitions:

Firms: Investment, Pricing, and Financing Decisions

$$g^i = \gamma_0 + \gamma_1 r_{cf(-1)} - \gamma_2 DIVK_{(-1)} + \gamma_3 q_{(-1)} + \gamma_4 u_{(-1)} \quad (1)$$

⁸ In the aggregate, rentiers recover at the end of each period all profits made by banks from making loans to rentiers at the beginning of the same period.

$$r_{cf} = FU / K = r - i_t LEV - DIVK \quad (2)$$

$$r = FT / K \quad (3)$$

$$LEV = L_{f(-1)} / K \quad (4)$$

$$DIVK = FD / K \quad (5)$$

$$FD = (1 - s_f)(FT_{(-1)} - i_{t(-1)}L_{f(-2)})(1 + g_{(-1)}) \quad (6)$$

$$q = (L_f + e_s p_e) / K \quad (7)$$

$$u = y / y^{pot}, \text{ with } y^{pot} = K / v, v = K / y^{pot} \quad (8)$$

$$y = C_s + I_s \quad (9)$$

$$p = (1 + \rho)w_r / \mu \quad (10)$$

$$\rho = \rho_0 * [1 + (1 - s_f)] \quad (11)$$

$$FT = [\rho / (1 + \rho)]y \quad (12)$$

$$(e_s - e_{s(-1)})p_e = xI_{d(-1)} \quad (13)$$

Equation 1 is the investment function. The accumulation rate depends positively on the rate of retained profits, r_{cf} , Tobin's q , and the rate of capacity utilisation, u . The rate of retained profits is defined in equation 2, where r is the overall rate of profit (equation 3), $i_t LEV$ is the ratio of interest payments to capital stock, with LEV being firms' leverage ratio (equation 4), and $DIVK$ is the ratio of dividend payments to capital stock (equation 5). A strategic parameter is s_f , the retention rate of profit, in equation 6: in each period, a fraction $(1 - s_f)$ of (expected) profits net of interest payments is distributed to shareholders. The definition of Tobin's q (equation 7) obtains from firms' balance sheet (table 1). Whenever stock market capitalisation is equal to the replacement costs of capital stock, we have $q = 1$. The rate of capacity utilisation is defined in equation 8, with the capital/full capacity ratio, v , technologically given.⁹

Notice that equation 1 is very close to the investment function used by Lavoie and Godley (2001-2) and Ndikumana (1999), but in our model the variable $DIVK$ plays the strategic role, while in the models of Ndikumana and Lavoie and Godley, the focus is on $i_t LEV$. Ndikumana and Lavoie and Godley effectively assume that interest payments have a stronger negative

⁹ The macroeconomic relation between investment and productive efficiency is not explicitly analysed. On the one hand, the "Penrose effect" discussed in section 2 may lead to a positive effect of g on v and/or a negative effect on μ (equation 10). On the other, investment is likely to favour technological progress (e.g. Kaldor, 1957).

effect on accumulation than dividend payments ($iLEV$ enters their investment function twice with a negative coefficient, once directly and once indirectly by reducing the cash flow). In our view, while both interest and dividend payments are costs from the point of view of management, the variable $DIVK$ furthermore proxies shareholders' influence in corporate governance (see also Hein and van Treeck, 2007). Following the arguments presented in section 2, shareholder value orientation can be expected to significantly restrict both managers' ability and their willingness to invest. Note also that econometric estimation for the US by van Treeck (2007) suggests that net dividend payments have had a stronger negative effect on accumulation than net interest payments in recent decades. At the same time, as indicated by US national accounts, the ratio of net dividend payments to net interest payments made by businesses has significantly increased during the past two decades or so. In van Treeck (2007) and Hein and van Treeck (2007), we have extended more traditional Kaleckian investment function for arguments capturing shareholder value orientation. In the present context, the investment function in equation 1 has been chosen because it encompasses both Post Keynesian and mainstream theories of investment, including q -theory in the tradition of Tobin (for a discussion of q -theory, see Crotty (1990) and Tobin and Brainard (1990)).

Equations 10-12 describe the standard Kaleckian pricing procedure in a one-good world. Price, p , is obtained from applying a mark-up, ρ , over unit labour costs, w_r/μ . There is no inflation, and price is normalised to unity. Firms can hire as many workers as they wish at the exogenously given wage rate.¹⁰ In the goods market, supply adjusts to demand, y , in each period (equation 9). The mark-up is elastic with respect to changes in the dividend payout ratio, $(1 - s_f)$, which is a variation of Hein's (2006, 2007) "interest-elastic mark-up" discussed above.

According to equation 13, firms finance a fixed proportion x of investment via the emission of new equities, irrespective of their price, as in Kaldor (1966) and Lavoie and Godley (2001-2). It follows that firms' demand of new loans for financing investment is a residual, given the amount of undistributed profits and new equities.

Households: Consumption, Borrowing, and Portfolio Decisions

$$C_d = C_w + C_r = W_s + a_1 Y_{dr}^{\text{exp}} + a_2 \Delta L_r \quad (14)$$

$$Y_{dr} = FD + r_m M_{d(-1)} - i_l L_{r(-1)} + FB \quad (15)$$

¹⁰ We set $w_r = 1$ and $\mu = 1 + \rho$ so that, contrary to usual formalisation, the real wage does not depend on the mark-up. Rather, a higher mark-up implies that a given output level is produced with fewer workers, with labour demand (and employment) given by $N_d (= N_s) = y/\mu$. Thus, the mark-up determines the share of profits in national income (equation 12), which is the important relation in our context. Wages are given as $W_d = W_s = N_d w_r$.

$$\Delta L_r = b_1(1 - BUR)V^{\text{exp}} - \text{rep}L_{r(-1)} \quad (16)$$

$$BUR = (\text{rep}L_{r(-1)} + i_l L_{r(-1)}) / Y_{dr} \quad (17)$$

$$(p_e e_d / V)^{\text{exp}} = \lambda_0 - \lambda_1 i_m + \lambda_2 r e_{(-1)} - \lambda_3 Y_{dr}^{\text{exp}} / V^{\text{exp}} \quad (18)$$

$$r e = (FD + CG) / p_{e(-1)} e_{d(-1)} \quad (19)$$

Equation 14 is the consumption function. As is obvious from the balance sheet matrix, all wages are consumed. Rentiers consume part of their expected¹¹ disposable income, Y_{dr} , defined in equation 15, and a fraction of new net loans, ΔL_r , which are granted to them by banks on the basis of expected financial wealth, V , which serves as collateral (equation 16), similar as in Bhaduri et al. (2006, equation 11, p. 420). The higher rentiers' burden of debt, BUR , defined in equation 17, the lower their creditworthiness. In each period, rentiers repay a fraction rep of their outstanding debt. Equation 18 reflects rentiers' portfolio choice following standard Tobinesque principles, as in e.g. Lavoie and Godley (2001-2) and Dos Santos and Zezza (2006).¹² The demand for equities as a share of total wealth depends on an exogenous target proportion, λ_0 , and furthermore positively on the rate of return of equity, $r e$, and negatively on the interest rate on deposits and expected income (transactions demand for money). Equation 19 defines the rate of return on equity as the sum of dividends and capital gains, CG , divided by (lagged) market capitalisation.

Banks: Interest and Lending Decisions

$$FB = i_l L_{s(-1)} - i_m M_{s(-1)} \quad (20)$$

$$i_l = (1 + \rho_b) r_m \quad (21)$$

$$L_s = L_d \quad (22)$$

$$M_s = L_s \quad (23)$$

Banks make profits, FB (equation 20), as the interest rate on loans exceeds that on deposits by a factor $(1 + \rho_b)$ (equation 21). Banks grant as many loans as are demanded (equation 22), given the restriction from equation 16. Loans are equal in value to deposits (equation 23).

¹¹ Following Lavoie and Godley (2001-2), expectations in our model are adaptive (except stock market expectations), so that e.g. $Y_{dr}^{\text{exp}} = (1 + \hat{Y}_{dr(-1)})Y_{dr(-1)}$, with \hat{Y}_{dr} being the rate of growth of rentier disposable income.

¹² Expected market capitalisation, $(p_e e_s)^{\text{exp}}$ is equal to actual market capitalisation, $p_e e_s$.

Income distribution

Equations 24-26 define the share of profits in national income, h , the rentier share in household disposable income, h_r , and the share of bank profits in total profits, h_b , respectively.

$$h = \rho / (1 + \rho) = FT / y \quad (24)$$

$$h_r = Y_{dr} / (Y_{dr} + W_d) \quad (25)$$

$$h_b = FB / FT \quad (26)$$

Systemwide implications

The only price that is endogenously determined by the interaction of supply and demand is the price of equity (see Lavoie and Godley (2001-2, p. 293)). Therefore it holds that

$$e_d = e_s. \quad (27)$$

Equation (28) is a redundant equation insofar as it is logically implied by the setup of the stock-flow consistent system. Hence, we re-find the well-known result that the equality of “money demand” and “money supply” is not an equilibrium condition but follows from the very logic of a monetary production economy, in which money is endogenous:

$$M_s = M_d. \quad (28)$$

4. Experiments

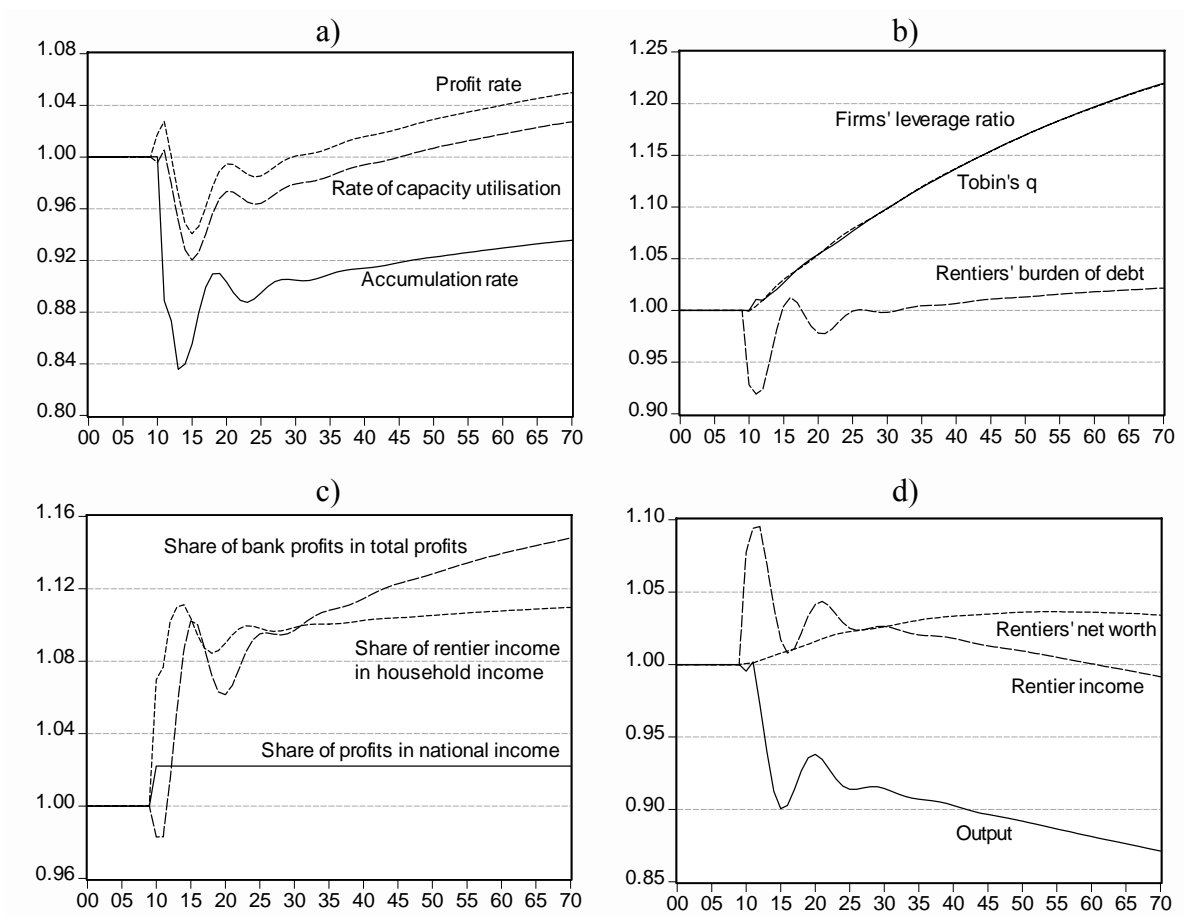
Below, we discuss in turn the effects of an increase in the dividend payout ratio, $(1 - s_f)$, and of a reduction in the proportion of new equity issues in investment finance, x . After finding a stable baseline steady state for our model using reasonable parameter values (reported in the Appendix) and initial values for the endogenous variables, we shock the relevant parameter and follow the reaction of some important variables relative to their baseline values. No particular importance should be attached to the unit of time underlying our simulations. In our subsequent discussion, we mainly focus on the “long run”, which in our context should be thought of as a period of no more than a few years.

Effects of a Higher Dividend Payout Ratio

As for our first experiment, three cases can be distinguished which arise from the variation of the coefficient on Tobin’s q in the investment function. It is small in the “normal case”, large

in the “puzzling case” and takes an intermediate value in the “intermediate case”.

Figure 7a: Effects of a Decrease in the Retention Rate, Intermediate Case



In the intermediate case (figure 7a), the profit rate increases in the long run despite a decline in the accumulation rate, following an increase in the dividend payout ratio (see panel a). The intuition behind this solution to the “investment-profit puzzle” is that an increased dividend payout ratio hampers both firms’ ability and willingness to invest, while rentiers (which includes managers, as discussed above) increase their consumption. This is possible for two reasons: first, higher dividend income (and higher interest income resulting from increased leverage of firms, as discussed below) directly increases rentiers’ disposable income and hence consumption opportunities. Second, part of the increment in rentier income is invested on the stock market, which stimulates rentiers’ financial wealth. This, in turn, allows (initially) for a faster expansion of consumer credit, further contributing to higher capitalist consumption. Formally, the drop in g is overcompensated for by the increase in C_r/K : “capitalists get what they spend” ($r = g + C_r/K$). Note that the increase in Tobin’s q (panel b) stabilises accumulation somewhat in the longer run, but this indirect effect is weaker than the direct negative effect emanating from the higher dividend payout ratio. The increase in the profit

share explains why the profit rate reacts more favourably to the higher dividend payout ratio than the rate of capacity utilisation, given that $r = (FT/y)(y/y^{\text{pot}})(y^{\text{pot}}/K) = hu/v$.

Of course, there are important drawbacks to this accumulation regime: first, shareholder value orientation is associated with higher financial fragility. As shown in panel b, firms' leverage ratio increases, following the reduction in their internal means of finance and the slowdown in accumulation, and exhibits only a sluggish tendency to stabilise in the long run. Similarly, rentiers' burden of debt increases slightly in the long run, after dropping sharply on impact. Although, by construction, rentiers in the aggregate are a net creditor in our model, a higher burden of debt may make financial distress for some households more likely, in case an unexpected event triggers a financial asset deflation. Furthermore, the increasing burden of debt reduces rentiers' ability to secure new consumer credit. According to our simulations, rentiers' propensity to consume out of their disposable income first increases, but then declines again, and stabilises at almost exactly its baseline value in the long run.

Panel c of figure 7a shows the implications of shareholder value orientation for the distribution of income. The share of wages in national income declines due to the dividend-elastic mark-up. Simultaneously, the share of rentier/manager income in household income increases as a combined result of the decline in the wage share and the redistribution from retained profits to dividends and interests. Also, the share of bank profits in total profits increases due to the higher leverage of firms.

Panel d indicates that the virtual economy (financial wealth) and the real economy (output) temporarily move in opposite directions,¹³ as envisaged by Bhaduri et al. (2006) in a different framework. Clearly, the increase in wealth is not enough to trigger an investment and growth boom. Eventually, rentier income too falls below its baseline value, despite the redistribution of income. In the long run, financial wealth starts to slowly decline, too.

As a general conclusion, the intermediate case describes a perfectly sustainable scenario, with all important ratios, such as the profit rate, accumulation rate, output growth, rentiers' burden of debt, or firms' leverage ratio, eventually yielding stable values following the initial shock. Nevertheless, the drop in accumulation may seriously endanger long-term real economic development. Although the slowdown of output growth is relatively modest in our simulations,¹⁴ the long-term effects on productive capacity and potential output may be substantial due to the negative effects of lower accumulation on productivity growth, which are not incorporated in our model. Yet, our simulation results show that rentiers clearly benefit

¹³ The result remains unchanged, when stock market capitalisation instead of rentiers' net worth is taken to represent the virtual economy.

¹⁴ Output growth stabilises at about 3.2 per cent, which is 0.15 percentage points lower compared to baseline.

from the increased dividend payout ratio over a considerable period of time, in terms of both relative and absolute income gains.

Figure 7b: Effects of a Decrease in the Retention Rate, Normal Case

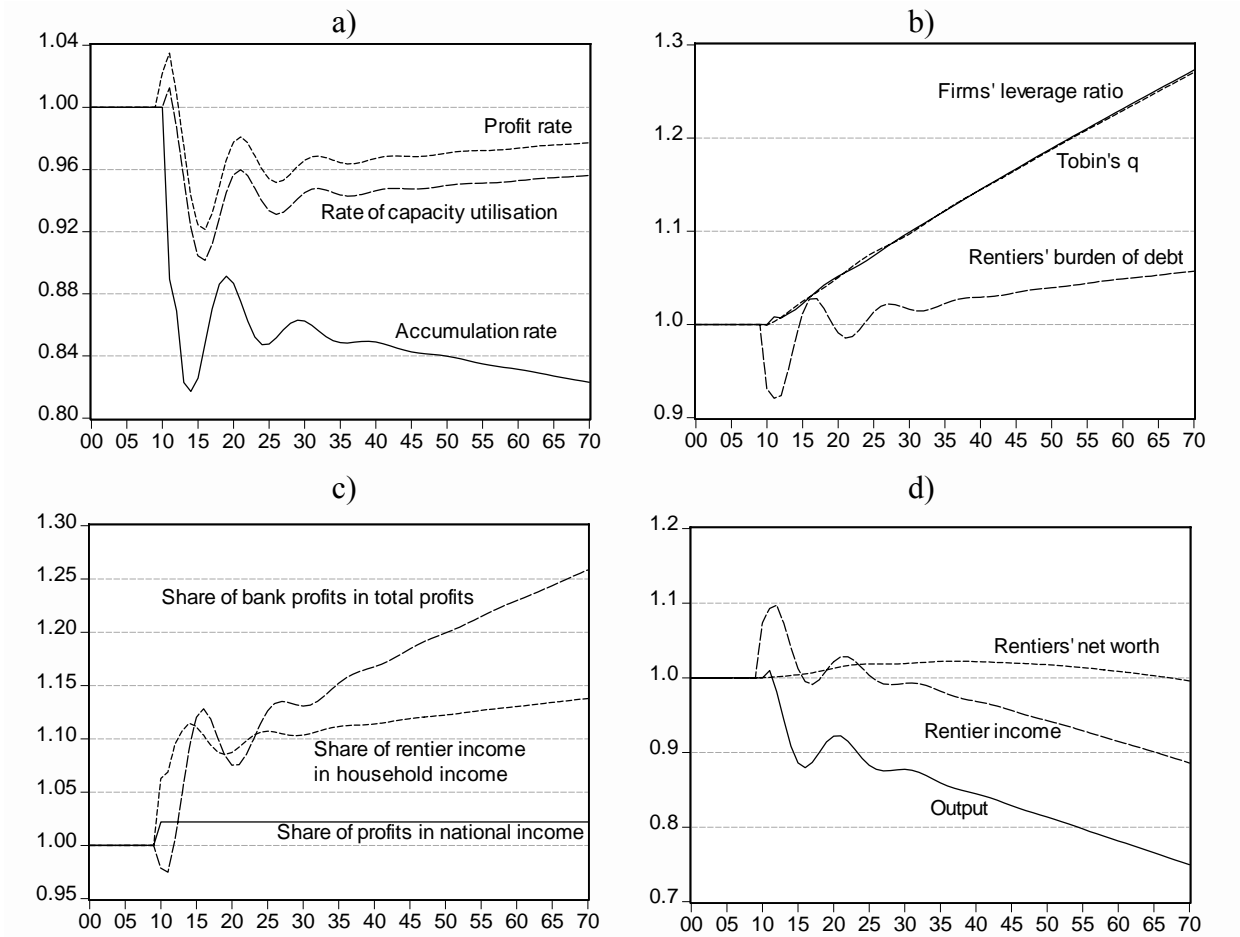


Figure 7b reports the results for the normal case. Here, the decline in the retention rate reduces both the accumulation rate and the profit rate and capacity utilisation (panel a). This is due to the absence of a sufficiently strong positive effect of Tobin's q on accumulation.

Another main difference compared to the intermediate case is that firms' leverage ratio does not stabilise in the long run but increases apparently without bound (panel b). This is reminiscent of Steindl's (1976, pp. 113 et seq.) "paradox of debt": although firms cut investment expenditure, their leverage ratio not only increases but potentially explodes in an adverse macroeconomic environment (see also Lavoie, 1995, and Hein, 2006, 2007). Similarly, rentiers' burden of debt increases sooner and heavier than in the intermediate case, thereby reducing the initial positive effect of rentier consumption on the profit rate and output. Note that, as a consequence, the propensity to consume out of rentier income, after an initial hike, soon declines relative to its baseline value without stabilising in the long run.

As shown in panel d, the virtual and the real economy follow a common downward trend

in the long run, with financial wealth initially increasing but eventually declining relative to the baseline scenario. Rentier income also declines very quickly compared to baseline. In conjunction with the distributionary implications shown in panel c, we obtain as a special case a result formulated by Dos Santos and Zezza (2006, p. 16): “Any attempt at increasing distributed profits, at the expenses of firms’ retained profits, will provide only temporary benefits to owners of equities, since the drop in gross profit generated by slower growth and the higher cost of borrowing will slowly offset the initial gain. The only beneficiary of this redistribution of income will be the banking sector, which will increase its stock of loans to firms and thus obtain a growing stream of interest payments.” Interestingly, the redistribution in favour of banks is considerably more pronounced in the normal case than it is in the intermediate case, as both firms’ leverage and rentiers’ burden of debt increase much stronger.

As an overall conclusion, the normal case describes an unstable scenario, that is, some important ratios, including the accumulation rate, firms’ leverage ratio and the share of bank profits in total profits, do not converge to sustainable levels even in the very long run. The redistribution towards profits and rentier income is linked to overall economic stagnation.

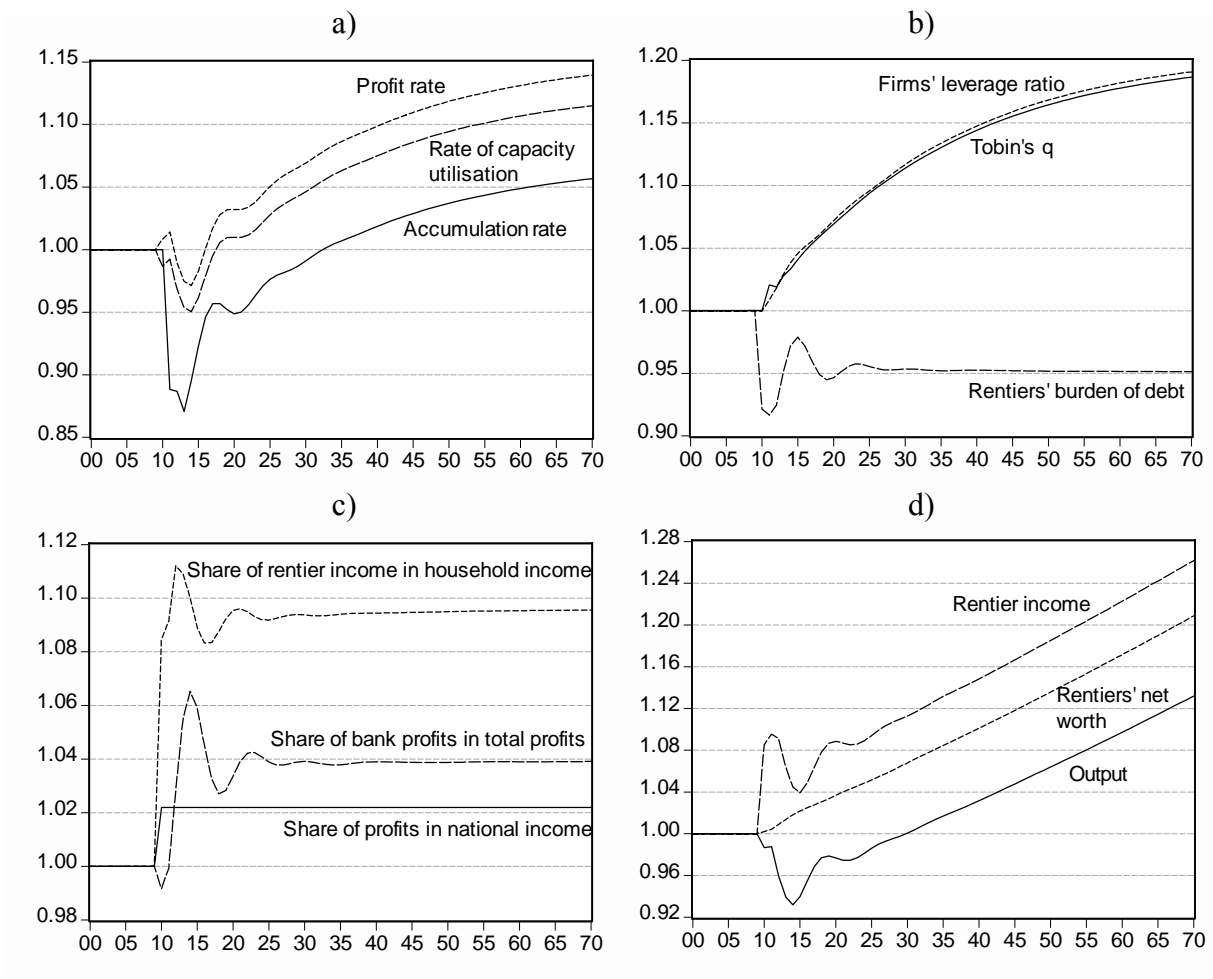
In the puzzling case (figure 7c), the lower retention rate is accompanied by higher accumulation, profit rate, and capacity utilisation in the long run (see panel a). The reason is that higher rentier income stimulates consumption and stock market wealth, with the increase in Tobin’s q exhibiting a very strong positive effect on investment.

As shown in panel b, firms’ leverage increases less than in the normal and intermediate cases and quickly converges to a new stable level, which is again consistent with the paradox of debt: firms steadily increase investment expenditure and take ever-higher amounts of loans, but due to favourable macroeconomic circumstances their debt/capital ratio stabilises at a moderate level. Rentiers’ burden of debt even declines relative to its baseline value. Note that, as a corollary, rentiers’ propensity to consume soon stabilises at a permanently higher level.

Notice that, due to the favourable development of firms’ and households’ interest obligations, the share of financial sector profits in total profits increases far less than in the normal and intermediate cases (panel c).

Finally, virtual and real economy move in the same direction, with financial wealth and output significantly increasing compared to baseline (panel d).

The puzzling case features stable results, with all important ratios yielding stable values in the long run. Note that this applies also to the rate of return on equity, which, while initially rising in all cases, eventually falls below its baseline value in the normal and intermediate cases. In the puzzling case, shareholder value orientation positively affects the rate of return on equity, rentier income, but also the overall economy.

Figure 7c: Effects of a Decrease in the Retention Rate, Puzzling Case

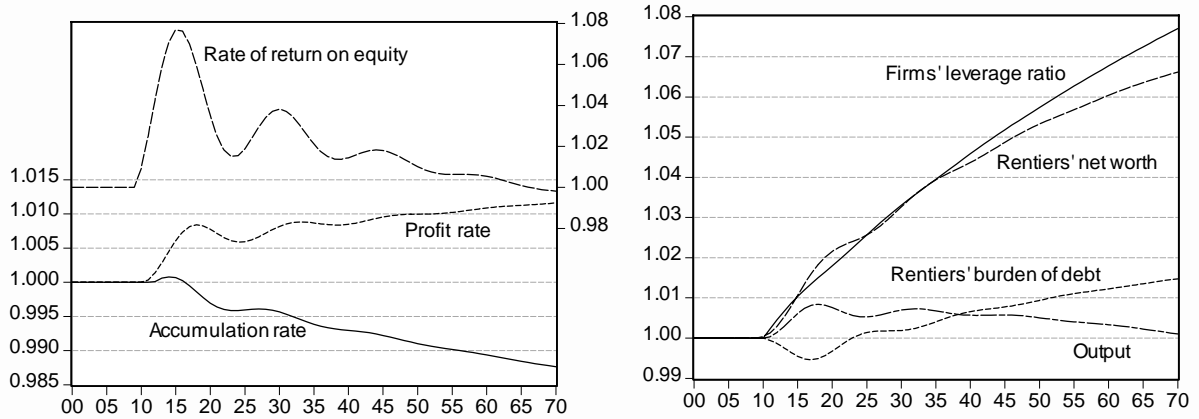
Effects of a Reduced Proportion of New Equity Issues in Investment Finance

Figure 8 displays the results of our second experiment. Now, two cases can be distinguished, depending on the value of Tobin's q . In the normal case (panel a), the coefficient on Tobin's q in the investment function is very low, as in the normal case from figure 7a. In this case, accumulation slows down because firms need to finance a larger proportion of investment with bank loans with the result of higher leverage and higher interest obligations. At the same time, the relative reduction in the quantity of equities supplied boosts rentiers' interest income and stock market wealth and hence consumption. This effect is so strong that the profit rate increases so that we obtain a further potential solution to the "investment-profit puzzle".

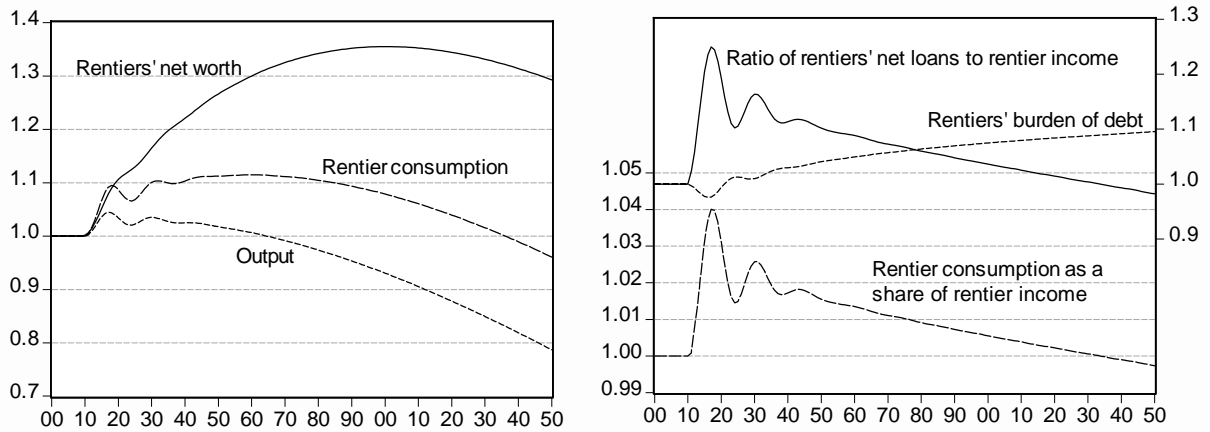
The rate of return on equity first strongly increases but then starts to decline and falls behind its baseline value in the long run. Output follows a similar pattern. At first, the increase in consumption has expansionary effects, but in the longer run, these are overwhelmed by the drop in accumulation. Firms' leverage ratio stabilises only very sluggishly.

Figure 8: Effects of a Decrease in New Issues of Equity

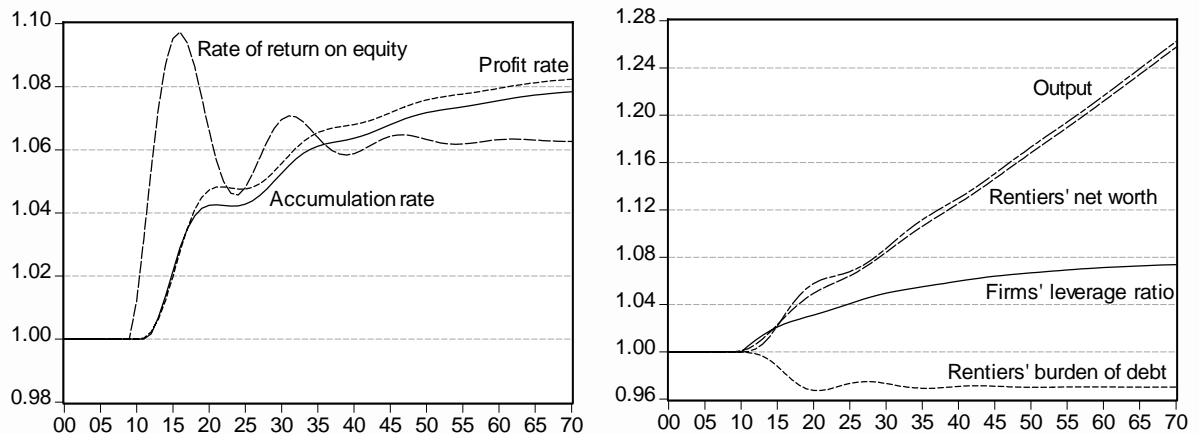
a) Normal Case



b) Normal Case: the very long run



c) Puzzling Case



As panel a is not very informative about the interaction of the virtual and the real economy in the sense of Bhaduri et al. (2006), we show the reaction of some important variables over a longer period in panel b.¹⁵ It can be seen that financial wealth and output eventually

¹⁵ For this experiment, we have simulated a larger reduction of new equity issues. This does not alter the qualitative results.

move in opposite directions, after the initial hike in output. At first, both financial wealth and rentier consumption increase, while output is already declining. Then, as rentiers' burden of debt starts increasing, their ability to secure new consumer credit is weakened, with the result of a lower propensity to consume and a lower level of consumption out of rentier income, compared to baseline. In a final phase, financial wealth also starts decreasing, but even after a considerable period of time it is still substantially higher than its baseline value, while output is much lower compared to baseline.

Panel c of figure 8 shows the results of the puzzling case. Its essential results obtain when the coefficient on Tobin's q in the investment function takes the value of either the intermediate or the puzzling case from the preceding experiment. It resembles largely the puzzling case from the preceding experiment. That is, a positive reaction of the overall economy appears to be more likely in the case of reduced equity issues than in the case of higher dividend payments. As shown in the figure, accumulation rate, profit rate, and the rate of return on equity increase and stabilise quickly after the initial shock. This is because investment is stimulated by the increase of Tobin's q , resulting from the relative decline of the supply of equities, and this effect is stronger than the negative effect of rising interest obligations.

Firms' leverage ratio converges quickly to a moderately higher level, compared to baseline. Rentiers' burden of debt reaches a permanently lower level, resulting in a higher propensity to consume out of rentier income. Real and virtual economy move closely together.

5. The Simulation Results in Light of the Stylised Facts and in Comparison with Results from Previous Models of Financialisation

The experience of the stock-market driven "New Economy" boom in the US in the late 1990s has provoked an increased academic interest in the possibility of a "finance-led growth regime" (Boyer (2000)). Our simulation results (and recent empirical evidence) suggest, however, that some of the conclusions drawn in earlier work may have been somewhat too optimistic in this respect. Most prominently, in Lavoie and Godley (2001-2), "with the chosen parameters, [...] an increase in the retention ratio does have a negative effect on the [long-run] rate of growth of the economy" (pp. 306-7). Similarly, it is concluded that "(l)arger issues of equities have detrimental effects on a monetary economy, leading to a fall in the growth rate, the rate of profit, and the rate of return on equities. [...] Reciprocally, when companies buy back their shares from households, as done in the late 1990s, it should have a positive effect on the overall economy" (ibid, p. 306). The same general conclusions are drawn by Skott and Ryoo (2007), who have reviewed the macroeconomic implications of financialisa-

tion in stock-flow consistent frameworks of both Harrodian and Kaleckian inspiration.¹⁶

In contrast, the results of our first experiment in the previous section suggest that an increase in the dividend payout ratio will not necessarily be expansionary. On the contrary, while our normal case (figure 7b) appears to be most in line with traditional Post Keynesian convictions (and perhaps accumulation dynamics prior to the 1980s), the intermediate case (figure 7a) is a solution to the “investment-profit puzzle”, recognised previously by some authors (e.g. Stockhammer (2005-6)), and an approximation of the empirical accumulation regime in the US and possibly other countries since the early 1980s. As shown in figure 1 above, the share of profits distributed to shareholders substantially increased during this period, while accumulation declined most of the time. The long-run results in our puzzling case (figure 7c) may correspond to the growth dynamics of the so-called New Economy boom of the late 1990s, which saw dividend payments rising along with accumulation, but this period was clearly exceptional.

Note also that our model, with the underlying conception of management remuneration as part of distributed profits, reaches the “most significant result” of Lavoie (2006): “increases in managerial costs may have either positive or negative effects on rates of capacity utilization, profit rates, growth rates and net profits shares [= profits minus management remuneration, TvT], even when propensities to save out of wages and salaries are assumed away” (p. 23).

Notice further that all the essential results of our first experiment can also be obtained with more standard variants of Post Keynesian investment functions. For instance, van Treeck (2007) and Hein and van Treeck (2007) have extended the well-known model by Bhaduri and Marglin (1990). In these models, shareholder value orientation can have different effects on equilibrium accumulation, profit rate and capacity utilisation, depending on the sensitivity of investment with respect to changes in the dividend payout ratio, the profit share and capacity utilisation, and rentiers’ propensity to consume. As in the present model, a normal, an intermediate and a puzzling case can be distinguished.

As for our second experiment, only the puzzling case (figure 8) is consistent with the results obtained by Lavoie and Godley (2001-2) and Skott and Ryoo (2007). Admittedly, in the late 1990s, when accumulation temporarily recovered, the contribution of new equities to the financing of physical investment was highly negative and declining relative to the early 1990s (see figure 2 above). However, during 1985-1989 and 2000-2006, investment activity was

¹⁶ “The two perspectives are quite different, but our results in this paper show that when it comes to an evaluation of the effects of the changes in financial behavior over the last 30 years, the qualitative conclusions are rather similar. A downward shift of the accumulation (function) will be contractionary; decreases in retained earnings, a decline in new issues of equity and increased reliance on external finance, on the other hand, will tend to be expansionary in both frameworks (Skott and Ryoo (2007, p. 25))”.

particularly weak (see figures 1, 4), while firms engaged in extremely large share buybacks. During the same periods, profits developed very positively (see figure 4), which is reminiscent of the normal case in terms of figure 8.

Note that the essential results of our second experiment are also robust to changes in the specification of the investment function. However, when Tobin's q is excluded from the investment function, the puzzling case in terms of figure 8 becomes, of course, less likely.

The conclusions obtained from our experiments complement the results derived by Lavoie's (1995) "Minsky-Steindl model" and by Hein's (2006, 2007) extensions of this model. These models focus on interest rate variations, which can have different effects on accumulation, profit rate, and capacity utilisation. Also, conditions under which the leverage ratio converges to a stable level, following a change in the interest rate, are formally derived. The approach taken in our model is similar, but has focused on changes in shareholder value orientation rather than interest rate variations. Clearly, stock market effects on investment, various forms of income redistribution as well as wealth-based and credit-fuelled consumption, as analysed in our model, are further elements of a synthesis of Minskyan reasoning and a Steindlian/Kaleckian macroeconomic framework. In our simulations, shareholder value orientation is associated with a redistribution of income at the expense of (blue collar) workers and in favour of rentiers. While this is consistent with the empirical facts (figure 6), it is also linked to stagnationist effects on the overall economy in the normal and intermediate cases of our simulations, which is a confirmation of traditional Kaleckian insights. Notice also that figures 3 and 5 above, although certainly not providing robust empirical proof, can in part be interpreted as evidence in favour of Steindl's paradox of debt, as analysed in the previous section. During the 1980s, when accumulation declined, firms' leverage heavily increased, even more strongly than during the 1990s, when accumulation and output growth was much higher. Household indebtedness experienced an unprecedented hike in recent years, while accumulation and output growth have been considerably weaker than during the 1990s.

Furthermore, our simulation results seem to confirm the warning expressed by Bhaduri et al. (2006, p. 426), according to which "it is misleading to accept blindly the performance of the stock market as a reliable barometer of the health of the real economy". In effect, our proposed solutions to the "investment-profit puzzle" also imply that the virtual and the real economy may move in opposite directions over a considerable period of time (figures 7a, 8). As indicated by figures 4 and 5, the ratio of household wealth to disposable income significantly increased during the 1980s, when accumulation was particularly weak and output growth lower than in the 1960s, when household wealth developed only sluggishly.

Finally, in our normal and intermediate cases, shareholder value orientation has a benefi-

cial effect on the rate of return on equity and on rentier income only in the short to medium run, but a negative one in the longer run. This seems to confirm empirical findings according to which firms willingly sacrifice “economic value” in favour of positive short-term financial results, due to the fear of a “severe (stock) market reaction to missing an earnings target” (Graham et al., 2004, p. 1).

6. Final Remarks

In this paper, a number of existing contributions on the micro- and macroeconomic effects of shareholder value orientation have been reviewed and taken as building blocks for our own stock-flow consistent model of financialisation. Our simulation results appear consistent with many stylised facts particularly of the US economy since the early 1980s.

While encompassing some important results from partial analyses in the existing literature, our model also allows putting into perspective the conclusions derived from earlier work on financialisation within stock-flow consistent frameworks. In particular, in the path breaking contribution by Lavoie and Godley (2001-2) and in the survey article by Skott and Ryoo (2007), shareholder value orientation, as defined in the present paper, tends to have uniquely positive effects on the overall economy. In our model, these effects can be either positive or negative, which appears more in line with empirical facts.

Important limitations of our model are the absence of a government and a foreign sector. Also, technological progress, inflation and the possibility of changes in relative prices are not explicitly considered and our analysis of employment is very rudimentary. A more sophisticated treatment of these issues is required to fully understand the macroeconomic effects of financialisation.

Appendix: Parameter Values Used for the Simulations**Equations for Firms**

γ_0	γ_1	γ_2	γ_3	γ_4	ρ_0	x	s_f
0.033	0.4	0.9	0.0	0.015	0.33	0.05	0.5
			0.01				
			0.045				

Equations for Households

a_1	a_2	b_1	λ_0	λ_1	λ_2	λ_3	rep
0.6	0.50	0.03	0.85	0.20	0.013	0.0001	0.03

Equations for Banks

r_m	ρ_b
0.0275	0.25

Note: With the chosen values, we obtained realistic steady state solutions for the endogenous variables. The essential results of the model can be obtained with many different plausible parameter constellations.

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