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Abstract

A growing literature suggests that 'financialization' may weaken the performance of non-financial corporations and constrain the growth of aggregate demand. This paper evaluates (some of) the claims that have been made using two alternative approaches (one derived from Skott (1981, 1988, 1989) and one from Lavoie and Godley (2001-2002)) and two different settings (a labor-constrained setting and a dual-economy setting). All models are in a structuralist / post Keynesian tradition and pay explicit attention to financial stock-flow relations. The results are insensitive to the precise specification of household saving behavior but depend critically on the labor market assumptions (labor-constrained vs dual) and the specification of the investment function (Harrodian vs stagnationist).

JEL classification: E12, E21, E44

Key words: financialization, stock-flow consistency, retention rate, external finance, new issue.

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1 Introduction

Along with neoliberalism and globalization, financialization has become a buzzword in recent years. The precise definition is not always clear but in a broad sense the term refers to "the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies" (Epstein 2005, p. 3). More specifically, financialization has been associated with a number of developments.[1] These developments include shifts in central bank policy toward a near-exclusive focus on price stability, large increases in financial flows both internationally and in domestic financial markets, improved financing for households and elements of consumption / credit driven growth, changes in corporate governance and attempts to align managerial incentives with shareholder interests via stock option plans, and an increased influence of financial institutions and institutional investors. Financial pressures, it is argued, have induced changes in management strategy from "retain and invest" to "downsize and distribute" (Lazonick & O'Sullivan (2000, p. 18)) and have affected firms' dividend, new issue and debt finance policies. In some accounts non-financial corporations "were forced to fund most of their capital investment externally in the neoliberal era" (Crotty 2005, p. 99).

These various changes associated with financialization may have implications for macroeconomic performance. Crotty (2005) has argued that financialization weakens non-financial corporations and constrains the growth of aggregate demand. In a similar vein, Duménil and Lévy (2001) suggest that financialization leads to instability and undermines growth and employment. Meanwhile, most of mainstream economics has been praising the potential benefits of financial liberalization, and some non-mainstream contributors have also seen financialization as a spur to growth. Thus, Boyer (2000) has suggested the potential for finance-led growth regimes as an alternative to the defunct Fordist regime.

Although most of the existing literature on financialization has been descriptive and empirical, more precise analytical treatments of some of the macroeconomic linkages have been presented by Boyer (2000), Aglietta and Breton (2001), Dutt (2005) and Stockhammer (2004, 2006).

According to Aglietta and Breton (2001) "[g]rowing financial liberalization has profoundly changed the connections between finance and the rest of the economy". Their analysis, however, is hard to follow, and the formal model does little to elucidate the mechanisms that could support the claims that are being made in the paper.[2] Boyer's (2000) model of finance-led growth basically boils

[1] Eatwell and Taylor (2000), Blecker (1999), Crotty (2005), Stockhammer (2004, 2006), Duménil and Lévy (2001), Boyer (2000), Aglietta and Breton (2001) and Froud et al (2000) are among the contributions to the growing literature on financialization. An International Working Group on Financialisation has also been set up with the aim of bringing together "an interdisciplinary network of researchers and practitioners interested in financialization and all the issues around relations between the capital market, firms and households." (http://www.iwgf.org/Events.htm).

[2] It is difficult, for instance, to justify their assumption of an exogenously given and constant (average) net rate of return ($E(\rho)$). The firm's credit constraint, second, is peculiar, as is the assumption that a risk premium is added to the risk-free interest rate *only* if the quantity

down to profit-led / exhilirationist regimes with a profit-wealth-consumption nexus as a driving force. Given the centrality of this nexus, however, a more careful modeling of the stock-flow relations and of the effects of financialization on wage formation would have been desirable. Boyer, for instance, assumes an exogenously given, constant $q-$ratio. This constancy assumption with respect to a key financial variable seems particularly unsatisfactory in a model that addresses the effects of financialization. The mechanism through which an increase in the 'profitability norm' generates a decline in the wage bill (for given values of output and the capital stock) is also unclear, as is the determination of the "profitability norm".[3]

The Stockhammer and Dutt papers do not suffer from weaknesses of the same kind. Stockhammer's 2004 analysis, however, is partial and his 2006 model is rudimentary in its treatment of the financial system; Dutt's analysis focuses exclusively on the relaxation of households' credit constraint and considers neither capital gains nor firms' financial decisions and balance sheets.

In this paper we explore the macroeconomic implications of changes in firms' financial decisions (retention rate, new equity issues, debt finance), 'animal spirits' (shifts in the investment function), household financial behavior (saving and portfolio decisions), and the level of interest rates. These changes are among the ones that have been highlighted by the financialization literature but clearly make up only a small subset of the issues that have been raised.

Three further limitations should be emphasized at the outset: (i) we limit ourselves to a closed economy, (ii) the emphasis is on the medium- and long-run effects with little or no attention to questions of short-run stability, and (iii) we ignore fiscal policy altogether and our treatment of monetary policy is kept almost embarrassingly simple. We limit the analysis in this way partly to keep it tractable, but also because many of the arguments advanced by the financialization literature concern the medium- and long-run effects of the changes in financial behavior and appear to be unrelated to open-economy complications or government policy. Thus, our simplifications may be justified by the limited objective of our analysis: to examine the logic underlying some of the claims that have been made in the financialization literature. It should be noted, however, that financialization may affect the properties of cyclical fluctuations, leading perhaps to an increase in the amplitude of fluctuations, and our analysis is clearly incomplete since we ignore these medium- and long-run effects on

constraint is binding. This problem has implications for the analysis of the firm's optimization problem. In this analysis, the crucial first order condition with respect to the debt ratio d overlooks the dependence of the interest rate r on the debt ratio. Intuitively, why would any firm ever want to choose $d = d_{\max}$ if by reducing its debt ratio marginally the interest rate on its debt drops by a finite amount? The calculation of solutions for r and $d_{\max}$ in the constrained regime is also wrong since it overlooks the fact that the default probability is itself a function of r (aside from this important point, the expressions for r and $d_{\max}$ also contain a minor error).

[3] Is this norm fixed without any feedback from actual profit rates? On p. 124 it is suggested that, as an extension, the norm could be determined "using an adaptive process taking into account the past record of the achieved rate of profit", but this extension is not pursued in the paper and it would seem to undermine the exogenous 'financialization' argument.

the higher moments of the variables. A more radical perspective, finally, may regard increasing financialization as merely a phase in a long cycle of endogenous changes in financial behavior and Minskian fragility. From this Minskian perspective our neglect of the dynamic interactions underlying the observed changes in financial behavior represents a major limitation.[4]

Two different settings are examined. The economy may be 'mature' in Kaldor's (1966) terminology and have a growth rate that is constrained by the available labor force. Alternatively, in the 'dual-economy' setting, the labor supply to the modern / capitalist sector of the economy is perfectly elastic. Both of these settings are analyzed using two alternative models: one is derived from Skott (1981, 1988, 1989) and the other from Lavoie and Godley (2001-2002). Both of the models are in a broadly structuralist/ post Keynesian tradition and both pay explicit attention to balance sheets and financial stock-flow relations. The two models differ in a number of respects. Interestingly, however, the differences with respect to the specification of financing, saving and portfolio decisions have little effect on the qualitative results. By contrast, the effects of financialization depend critically on the labor market assumptions (labor-constrained vs dual) and the specification of the investment function (Harrodian vs Kaleckian).

The rest of the paper is structured as follows. In section 2 we discuss some of the stylized facts relating to financialization and comment on the dangers of a purely partial analysis. Section 3 outlines our general framework, and Sections 4 and 5 consider the implications of changes in key financial variables in the context of the different models. Section 6, finally, discusses the main results and offers a few concluding comments and suggestions for further research.

2 Evidence

2.1 Some stylized facts

The stylized facts are largely well-known, and we confine ourselves to a brief description of some US data. The retention rate, first, has declined from around 85% in the 1970s to about 73% (Figure 1). It is worth pointing out that this change marks a return to retention rates that are at or below the levels of the 1950s. Looking at the whole period since 1950, the aberration may have been the high retention rates of the 1970s and 1980s.

The behavior of non-financial corporations with respect to new equity issues shows a clearer picture. Whether measured in terms of the value of new issues divided by the market value of outstanding equities (Figure 2) or, alternatively, by the share of new investment financed by new equity (Figure 3), there has been a significant decline in new issues. In the 1950s-1970s a small positive fraction of gross investment - on average about 5 percent - was financed by new issues. Since 1980, however, the rate of net issues has been negative in most

[4] Minskian models of endogenous movements in financial fragility have been presented by, among others, Taylor and O'Connell (1986), Lavoie (1986/87), Delli Gati and Gallegati (1990), Semmler (1987), Skott (1994).

years, and on average non-financial corporations have spent an amount equal to about 12 percent of their gross fixed investment to buy back equity.

Debt finance has become increasingly important. As shown in Figure 4, the ratio of debt to the replacement value of capital has increased from a level just above 30 percent in the 1950s to about 60 percent. The ratio increased steadily in the 1950s and 1960s reaching about 50 percent in the early 1970s before dropping back to about 35 percent around 1980. Thus, the increase has been very steep over the last 25 years. It should be noted, however, that Figure 4 depicts gross debt. Insofar as non-financial firms hold increasing amounts of financial assets, the movements in net debt could be very different. Data issues make it difficult to get a clear picture of changes in net debt.

Real rates of interest have fluctuated substantially (Figure 5). The early 1980s saw historically very high interest rate, but rates gradually decrease in the late 1980s and early 1990s and, after another increase in the mid 1990s, are now at, and in some cases below, their historical average. Thus, there is little support for common view that financialization has led to persistently high real rates of interest.

Turning now to household behavior, the well-known rise in the ratio of personal consumption to disposable personal income comes out clearly in Figure 6. The ratio of households' net financial wealth to disposable income, however, has shown much more stability (Figure 7). The stock market boom of the 1990s shows up in this ratio, but the value of the ratio is now back at the level that characterized the "golden age" of the 1950s and 1960s. The effects of stock market fluctuations, finally, show up strongly in the ratio of capital gains to disposable income in Figure 8. The distribution of these gains has been very unequal, but as an average for the household sector the capital gains (and losses) on financial assets have been very significant in some periods.

2.2 Dangers of a partial analysis

While the stylized facts of changes in financial variables are (relatively) clear, the interpretation and importance of these changes for the performance of the economy may not be obvious, and many of the arguments that have been advanced by the financialization literature have a partial flavor. As a case in point we may consider Stockhammer (2004). This paper, with its combination of theoretical argument and econometric work, presents a clear and interesting analysis. The partial nature of the analysis, however, is a limitation.

Financialization, Stockhammer argues, has generated a shift in firms' behavior from growth objectives toward shareholder interests. He formalizes this argument by assuming that the representative firm faces a growth-profit tradeoff. Managers pick some point on this $g - r$ frontier, and an increased emphasis on shareholder interests (partly because of increased takeover threats and partly because of changes in managerial pay structures) moves the optimal position in the direction of higher profit rates and lower growth.

The macroeconomic implications of this microeconomic analysis are not as straightforward as they may seem. Stockhammer does not specify firms' finance

constraint or discuss firms' financing decisions in any detail. Presumably, however, the movements along a $g - r$ frontier must be reflected - via the finance constraint - in changes in retention rates, external finance or the rate of new share issues. The changes in investment and firms' financial decisions interact with household and government behavior, and these macroeconomic interactions - equilibrium conditions for financial and goods markets - are ignored in the analysis. Putting it differently, an individual firm may face a perceived $g-r$ tradeoff but this perceived tradeoff does not extend to the macroeconomic level: changes in accumulation and financial behavior affect aggregate demand and thereby the position of the $g - r$ frontier. Thus, the micro tradeoff may not be stable.

Stockhammer tests the theory by estimating an investment function that includes "rentiers' share of the non-financial business sector" as an explanatory variable. It is unclear, however, how one should interpret the results. One might have thought, first, that a shift in firms' accumulation behavior would imply changes in the parameters of the investment function. Stockhammer does not consider this possibility. Instead, he argues, the behavioral shift is captured by an increase in the "rentiers' share", and a negative coefficient on this variable is seen as lending support to the theoretical argument. Even assuming, however, that an increase in the "rentiers' share" captures financial implications of a behavioral shift, a negative coefficient on this variable in the empirical work does not necessarily imply that the changes in financial behavior have had a negative effect on accumulation.[5] Aggregate demand and thereby the values of other explanatory variables in the regression may have been affected by the changes in financial behavior, and these indirect effects need to be taken into account.

Unlike in the 2004 paper, the macroeconomic dimension of shareholder-induced shifts in firms' investment behavior is analyzed by Stockhammer (2006) but this happens in a setting without differentiated financial assets and explicit stock-flow relations.

3 General framework

3.1 Firms, banks and households

This section presents our general framework. The framework leaves out open economy issues, there is no analysis of the short run and stability issues, and

[5] In fact the coefficient on rentiers' share is not negative in all specifications and it is insignificant in many. Moreover, there may be several explanations for a negative coefficient. Net financial income, first, is included in the gross profit share and for any given profit share, an increase in financial income implies a reduction in operating profits which presumably reduces the incentive to accumulate fixed capital. As noted by Stockhammer, second, an increase in gross financial income may mirror an increase in the cost of capital. Firms have both financial assets and liabilities and if the return on these move together, a rise in the cost of capital will be associated with an increase in gross financial income. This correlation becomes particularly important if the cost-of-capital variable that is included in the analysis provides a poor approximation to the actual cost of capital.

very limited attention to government policy. The purpose is to look at the interaction between firms and households across labor, goods and financial markets. Firms, it is assumed, make decisions concerning pricing / output, accumulation, and financing; households receive a return on their financial assets as well as wage income, and they make consumption and portfolio decisions; banks accept deposits and make loans. There are only two types of financial assets, equity and bank deposits, and banks are the only financial institution in the model.[6]

This framework - which generalizes the one in Skott (1988, 1989) - covers a number of special cases, including Harrodian specifications with or without labor constraints and Kaleckian models.

3.1.1 Firms

Finance constraint Consider first the finance constraint facing a single firm. The firm invests in real capital and pays out dividends and interest on its debt (bank loans). These expenses have to be matched by income flows and the proceeds from new issues of equity and new debt. As argued by the financialization literature, the firm may hold equity in other firms and own other financial assets (bank deposits). Income flows therefore include both profits and the interest and dividend income from the firm's current holdings of financial assets. Algebraically, the finance constraint can be written

$$pI_j + Div_j^L + iM_j^L + v\dot{N}_j^A + \dot{M}_j^A = \Pi_j + v\dot{N}_j^L + \dot{M}_j^L + iM_j^A + Div_j^A$$

where I, Π, Div, M and N denote real investment, nominal profits, dividends, bank loans / deposits and the number of shares. Subscripts j indicate firm, and superscripts denote assets (A) and liabilities (L); thus M_j^A is firm j's bank deposits and M_j^L the firm's bank loans. Bank loans and deposits carry the same interest rate (i), the price of investment goods (p) equals the general price of output in this one-sector model and, for simplicity, it is assumed that all shares have the same price, v.

If we aggregate across firms, the cross holdings of financial assets net out, and the aggregate finance constraint for the firm sector simplifies to:

$$pI + Div + iM = \Pi + v\dot{N} + \dot{M}$$

where I, Π, Div, M and N without sub- and superscripts - denote aggregate investment and aggregate profit, net dividend payments from firms to other sectors, net debt to other sectors, and the aggregate number of shares held by other sectors.

We assume that dividends are related to retained earnings

$$Div = (1 - s_f)(\Pi - rM) \tag{1}$$

[6] The liquid asset could also be interpreted as a short bond.

where r is the real rate of interest, $r = i - \hat{p}$. Thus, the finance constraint can also be rewritten

$$pI = s_f(\Pi - rM) + vN\hat{N} + M(\hat{M} - \hat{p}) \tag{2}$$

The finance constraint (2) shows that, given the levels of investment and profits and the inherited debt, firms cannot choose the retention rate, the rate of new issues and the amount of new debt independently. One of these three variables will have to accommodate so as to ensure that the finance constraint is being met. In reality, of course, there may be dynamic feedback effects: an unexpected need for external finance in one period, for instance, may influence firm's retention and/or new issue policies in subsequent periods.

Our purpose in this paper is to examine the comparative statics of changes in financial behavior and from this perspective it does not matter much which financial variable is designated as residual. In the analysis below we describe firms' financial behavior in terms of their retention rate (s_f). New issue policies can be captured by the growth of the number of shares ($\hat{N}$) or by the share of investment that is being financed by new issues. Skott uses the former and Lavoie-Godley the latter parameterization, and we follow these different parameterizations in the respective versions of the model.[7]

Pricing / output: the growth function It is often assumed that firms set prices and that output adjusts instantaneously and costlessly to match demand. The empirical evidence in favour of significant price rigidity is quite weak, however.[8] The real question, moreover, is not whether there is stickiness in prices but whether prices are more sticky than output. Production is subject to a production lag, and increases in production and employment give rise to substantial search, hiring and training costs; firing or layoffs also involve costs, both explicit costs like redundancy payments and hidden costs in the form of deteriorating industrial relations and morale. In a continuous-time setting one may approximate the effects of lags and adjustment costs by assuming that output is predetermined at each moment, that firms choose the rate of growth of output at each moment, rather than the level of output, and that this choice is made so as to balance the costs of changes against the benefits of moving toward a preferred level of output and employment. These costs and benefits

[7] One could also, following Eichner (1976) and Wood (1975) - assume that firms set the shares of investment that are to be financed by the three different sources, with both s_f and $\hat{N}$ varying in response to changes in accumulation. This case is considered in Skott (1989, chapter 7).

[8] The study by Levy et al. (1997) of menu costs in five supermarkets, for instance, is often cited in support of menu costs and price stickiness (e.g. Romer 2001, pp. 315-316). This study found that on average 16 percent of all prices were changed each *week*. These frequent changes in prices were not costless but the finding that menu costs constitute a significant proportion of net profits is largely irrelevant for an evaluation of price flexibility. With prohibitively high menu costs, for instance, there would be no price changes and the share of menu cost in revenue would be zero; negligible menu costs on the other hand may allow firms to change prices frequently as part of their marketing strategies, and the observed share of menu costs in net profits could be very high in this case.

are determined by demand signals from output markets and cost signals from input markets.

If prices are flexible, the demand signal can be captured by the prevailing profit share. The level of output is predetermined at any moment, and a rise in demand leads to an increase in the price of output. Wage contracts are cast in terms of money wages, and there is neither perfect foresight nor instantaneous feedbacks from output prices to money-wage rates. The real wage rate and the share of profits in income therefore respond to unanticipated movements in prices: a positive demand shock generates a rise in the profit share. Demand signals could also be reflected in inventories. For the aggregate economy, however, movements in inventories tend to amplify fluctuations in other demand components over the cycle and thus do not obviate the need for price adjustments. For simplicity, we disregard movements in inventories.

Turning to the signals from input markets, we leave out intermediate inputs and take labour to be the only input that is variable in the short run; changes in the capital stock take longer to implement and, partly because of that, firms typically maintain excess capital capacity. As far as production decisions are concerned, the labour market therefore provides the relevant signal, and we use the employment rate as the indicator of the state of the labour market. The rate of employment influences the costs of changing output through its effects on the availability of labour with the desired qualifications. High rates of employment increase the costs of recruitment, and since the quit rate tends to rise when labour markets are tight, the gross recruitment needs associated with any given rate of expansion increase at a time when low unemployment makes it difficult to attract new workers. High employment and high turnover of the labour force, on the other hand, may allow firms to contract production and employment more rapidly without significant redundancy costs. These standard microeconomic effects may be reinforced by broader Marxian effects on the social relations of production. A high rate of employment may have a negative impact on firms' growth plans because it strengthens workers vis-a-vis management and may lead to increased shop-floor militancy.

The analysis suggests that the rate of growth of production will be positively related to the profit share (π) and negatively related to the employment rate (e). Thus, the pricing / output decisions can be described by the following 'growth function'[9]

$$\hat{Y} = h(\pi, e); h_\pi > 0, h_e < 0. \tag{3}$$

The case of unlimited labor supplies can be obtained by setting $h_e = 0$, and the growth function yields the standard Kaleckian assumption of a fixed profit share $\bar{\pi}$ (a fixed markup on wage cost) if we have both $h_e = 0$ and $h_\pi = \infty$ at $\pi = \bar{\pi}$. One may note also that a static counterpart to equation (3) can be obtained by setting $\hat{Y} = 0$. The equation then defines the profit share as an increasing function of the employment rate. A short-run equilibrium relation of this kind

[9] Or 'output expansion function', using the terminology in Skott (1989, 1989a). The behavioral foundations of the function are discussed in greater detail in Skott (1989, chapter 4).

could be derived from profit maximization if firms have monopsony power and the perceived elasticity of labor supply to the individual firm is inversely related to the aggregate rate of employment.[10]

Accumulation As a general specification we may assume that the rate of accumulation depends on the rate of utilization of capital, the profit share, and financial variables like the real rate of interest, the valuation ratio (Tobin's q), and the ratios of debt and retained earnings to the value of the capital stock. Algebraically,

$$\frac{I}{K} = f(u, \pi, r, q, m, c) \tag{4}$$

where u is utilization, q the valuation ratio ($q = \frac{M+vN}{pK}$), and m and c the ratios of debt and retained earnings to capital ($m = \frac{M}{pK}, c = \frac{s_f(\Pi - rM)}{pK}$).

There is no consensus in the structuralist / post Keynesian literature concerning the long-run sensitivity of the accumulation rate to changes in the various arguments.[11] In the analysis below, we explore both Harrodian and Kaleckian specifications.

3.1.2 Banks

Banks give loans to firms and accept deposits from households. Neither firms nor households hold cash. When banks provide a loan to a firm, the money therefore returns to the bank immediately, either as deposits from households or because other firms use their increased revenues to reduce their debt. The loan and deposit rates are equal and there are no costs involved in banking. Thus, banks make neither profits nor losses,[12] and the firm sector has a net debt (M) that must equal the total deposits of the household sector (=money demand, M^H):

$$M = M^H$$

Banks determine the nominal interest rate. This nominal rate, however, will typically depend on inflation and to simplify the exposition, we treat the real rate of interest r ($= i - \hat{p}$) as the variable that is set by the banking system (and kept constant in steady growth).

[10] A positive relation between employment and the profit share could also arise from an inverse relation between the perceived demand elasticity and aggregate employment or as a result of a fixed markup on variable cost in a setting with overhead labor.

[11] See, among others, Auerbach and Skott (1988), Dutt (1997), Kurz (1986), Lavoie (1995) and Flaschel and Skott (2006).

[12] The share valuation of banks therefore is zero, and this simple version of the model does not capture the increasing share of the financial sector in GDP and of financial-sector profits in total profits.

3.1.3 Households

In analogy with firms, households face a budget (or finance) constraint. For the household sector as a whole it takes the form

$$pC + v\dot{N}^H + \dot{M}^H = W + Div^H + iM^H \tag{5}$$

where C is consumption, W wage income, N^H, M^H indicate household holdings of shares and deposits (money), and Div^H is dividend payments received by the household sector.

The steady-growth implications of household consumption and saving behavior can be described in terms of stock-flow ratios of assets to income. Specifically, let

$$M^H = \beta(i, r, r_e, \pi, ...)pY \tag{6}$$

$$vN^H = \alpha(i, r, r_e, \pi, ...)pY \tag{7}$$

where the stock-flow ratios α and β may depend on a number of variables, including the real rates of return on deposits (r) and equity (r_e). Theories differ with respect to the determination of the (steady-growth) values of these stock-flow ratios, and in sections 4-5 we examine different specifications. Some theories are cast in terms of flow-flow relations (e.g. consumption as a function of distributed incomes and capital gains, as in the Lavoie-Godley model) but even when this is the case, the specification of the flow-flow relations have implications for the steady-growth values of the stock-flow ratios, and the implied stock-flow ratios provide a clearer picture of the mechanisms behind the effects of changes in financial behavior.

The relation between the stock-flow ratios and consumption is straightforward. Using the budget constraint (5) and the dividend equation (1), the stock-flow relations (6)-(7) imply the following consumption function:

$$\frac{C}{K} = u[1 - s_f(\pi - r\beta) + \beta(\hat{p} - \hat{M}) - \alpha\hat{N}] \tag{8}$$

4 Harrodian accumulation

In this section we follow the Harrodian tradition and assume that the degree of excess capital capacity is at (or near) where firms want it to be. Firms will typically want a reserve of excess capacity, but if the degree of excess capacity persistently exceeds the desired reserve, they reduce their accumulation rate; conversely, if they find themselves with less than the desired excess capacity, they will gradually increase their rate of accumulation. Thus, a steady growth path with a constant accumulation rate requires the consistency of desired and actual degrees of excess capacity, that is,

$$u = u^* \tag{9}$$

where u is the output-capital ratio and u^* denotes the value of u when firms have the desired degree of excess capacity.[13] Equation (9) expresses the steady-growth accumulation function. The equation need not be satisfied outside steady growth, but a simple Harrodian specification implies that if $\hat{K}$ fluctuates within a relatively narrow band, the time-average of the output-capital ratio u must be approximately equal to u^* when the average is taken over a long period. To see this, consider the Harrodian investment function

$$\frac{d}{dt}\hat{K} = \lambda(u - u^*); \lambda > 0$$

Integration implies that $\bar{u} - u^* = \frac{\hat{K}_{t_1} - \hat{K}_{t_0}}{\lambda(t_1 - t_0)}$ where $\bar{u}$ is the average output-capital ratio over the interval $[t_0, t_1]$. If $\mid \hat{K}_{t_1} - \hat{K}_{t_0} \mid$ is bounded below some constant, it follows that $\bar{u}$ is close to u^* if the period is long ($\bar{u}$ converges to u^* for $t_1 - t_0$ going to infinity).

4.1 A mature economy: labor-constrained steady growth

The growth rate in a mature economy is labor constrained and the employment rate is constant in steady growth. The growth rate therefore must be equal to the growth of the labor force and, for simplicity, we shall take this 'natural rate of growth' (n) to be an exogenously given constant. Thus, in steady growth

$$\hat{Y} = n \tag{10}$$

Using (9) and (10) the equilibrium condition for the product market can now be written

$$\frac{C}{K} + n = u^*$$

or, using (6), (8), (9) and (10),

$$[1 - s_f(\pi - r\beta) - \beta n - \alpha\hat{N}] = \frac{u^* - n}{u^*} \tag{11}$$

The effects of changes in firms' financial behavior ($s_f, \hat{N}$), bank policy (r), or household saving and portfolio behavior can be derived from this equation. The qualitative results, however, depend on the properties of the α and $\beta-$functions that describe household behavior.

4.1.1 Inelastic stock-flow ratios

Assume first that α and β are both constant (independent of the various rates of return). The constancy of the term on the left hand side of equation (11)

[13] The $u = u^*$ condition is necessary but not sufficient. Firms must also make positive profits, cf. note 14 below.

implies that

$$\frac{\partial \pi}{\partial s_f} = -\frac{\pi - \beta r}{s_f} < 0 \tag{12}$$

$$\frac{\partial \pi}{\partial \hat{N}} = -\frac{\alpha}{s_f} < 0 \tag{13}$$

$$\frac{\partial \pi}{\partial r} = \beta > 0 \tag{14}$$

$$\frac{\partial \pi}{\partial \alpha} = -\frac{\hat{N}}{s_f}$$

$$\frac{\partial \pi}{\partial \beta} = \frac{s_f r - n}{s_f}$$

The signs of the effects of changes in s_f, $\hat{N}$ and r are unambiguous. If firms raise the retention rate or increase the rate of new issues, this will depress profitability, while an increase in the real interest rate raises the profit share.[14] The intuition is simple. An increase in s_f increases aggregate saving, given the share of profits, and to bring saving back into line with the steady-growth requirement, a reduction in the profit share is needed. An increase in the real interest rate (r) has the opposite effect since it reduces retained earnings and thus saving at any given share of profits. An increase in new issues ($\hat{N}$), like increases in the retention rate, raises aggregate saving but the mechanism may be a little less transparent. Saving goes up because the rise in $\hat{N}$ induces households to raise their saving. Share prices adjust so as to maintain a constant ratio ($= \alpha$) of the value of shares to income. The growth of real income is given, and if the rate of new issues has gone up, this means that real share prices will increase at a lower rate. Capital gains therefore are smaller and as a result households choose to save a larger proportion of their wage, dividend and interest income.

Financialization has been associated primarily with increased dividends (a decline in s_f), a decrease in the rate of new issues ($\hat{N}$) and an increase in the real rate of interest (although, as shown in section 2, the evidence for interest rates is questionable). Strikingly, in this model all of these changes unambiguously generate a rise in the steady-growth profit share and the steady-growth employment rate. The employment effect follows immediately from the growth function (3): whenever the profit share goes up, the employment rate must do the same in order to keep the growth rate unchanged.[15]

So far we have taken α and β to be constant. Even leaving aside the functional dependence of these ratios on, inter alia, the rates of return, financialization might generate a shift in the levels of α and β. Thus, it could be argued that financialization increases the availability of consumer credit and thereby

[14] A capitalist economy would not be viable if the steady growth path implied that profits fall short of real interest payments on the debt. Thus, the condition $\pi - \beta r > 0$ must hold, otherwise accumulation would collapse.

[15] In this paper we do not consider nominal wage formation and inflation explicitly. The NAIRU literature is enormous; one of us has analysed reasons for the absence of a NAIRU in earlier work (Skott 1997, 1999, 2005).

tends to reduce the ratio β. A reduction in β has two effects: it increases retained earnings (which tends to increase consumption) but if the growth rate of income is positive it also reduces the amount of saving that households need to carry out in order to maintain the money-income ratio at the desired value. Depending on parameter values, the balance of these two effects can be positive or negative.[16]

Changes in the α ratio are not usually seen as a key mechanism behind changes in economic performance.[17] Moreover, in this model the effects of autonomous shifts in α depend on the values of $\hat{N}$. This result is quite intuitive. The value of the equity-income ratio (α) simply does not affect saving if there are no new issues. Households can only save in the form of shares if other sectors (firms) are willing to sell shares. If that is not the case then an increase in the desire to own shares will simply generate higher share prices, and the desire will be met without any extra saving. With positive new issues, a higher valuation of shares (a higher α) implies an increase in household saving; with negative new issues, on the other hand, a higher valuation of shares implies that households receive higher revenues from their net sale of shares, and their saving out of wages, dividends and interest income is reduced.

In addition to the changes in financial behavior, financialization may have been associated with a downward shift in the investment function. In this Harrodian setting, such a shift would be reflected in a rise in the desired output-capital ratio u^*. This kind of change has the consequences that one would expect. Equation (11) implies that a rise in u^* leads to a decline in the profit share and, using the growth function (3), a fall a employment. Thus, according to this model the changes associated with neoliberalism and financialization have contradictory effects. The *net* effect may have been a deterioration of economic performance, but the negative impact comes from the shift in the investment function, rather than from the changes in financial behavior that have been highlighted in the literature.

[16] Our results for changes in β are closely related to those of Dutt's (2005) analysis of changes in consumer debt. Using a Kaleckian (stagnationist) model, Dutt shows that the short-run effect of an increase in households' debt-income ratio (corresponding to a decrease in β in this model) is unambiguously positive. This short-run result is not surprising since the the transition to a higher debt ratio is associated with extra consumption. The long-run effects on growth are ambiguous, however. In the long run, the debt ratio has increased (β has decreased), and this increase in the debt ratio implies a shift of disposable income from low-saving workers to high-saving capitalists. This contractionary effect may or may not be offset by a positive effect. Consumer debt grows at the same rate as output (and the capital stock) and this expansionary effect - consumers being allowed to increase their debt when output grows - depends on the growth rate. Thus, in Dutt's model, an increase in consumer debt will raise the growth rate if the initial growth rate is high while if output grows slowly, the increase in debt will reduce the growth rate. In this version of our model, the growth rate is exogenous but the analogous result in our model is that a decrease in β raises the profit share if the growth rate is high but reduces the profit share if the growth rate is small is low.

[17] One might consider the possibility that u^* depend on the valuation ratio (Tobin's q) and thereby on α and β. A high valuation ratio indicates a rate of profit that exceeds the cost of finance. The desired output-capital ratio may therefore be inversely related to the valuation rate. This expansionary impact of an increase and α and β is considered by Skott (1988, 1989).

How general are these conclusions? The assumption of exogenous $\alpha-$ and $\beta-$ ratios is clearly restrictive, but the qualitative results survive as long as α and β are relatively insensitive to changes in the financial parameters $(s_f, \hat{N}, r)$ and the profit share (π).

Differentiating equation (11) totally, we get

$$-s_f d\pi - \pi ds_f + (s_f r - n)d\beta + \beta(s_f dr + r ds_f) - \alpha d\hat{N} - \hat{N} d\alpha = 0 \tag{15}$$

where

$$d\alpha = \frac{\partial \alpha}{\partial s_f} ds_f + \frac{\partial \alpha}{\partial \hat{N}} d\hat{N} + \frac{\partial \alpha}{\partial r} dr + \frac{\partial \alpha}{\partial \pi} d\pi \tag{16}$$

$$d\beta = \frac{\partial \beta}{\partial s_f} ds_f + \frac{\partial \beta}{\partial \hat{N}} d\hat{N} + \frac{\partial \beta}{\partial r} dr + \frac{\partial \beta}{\partial \pi} d\pi \tag{17}$$

$s_f, \hat{N}, r$ and π may not influence α and β directly but they will do so indirectly via their effects on the various rates of return. Thus, the partial $\frac{\partial \alpha}{\partial s_f}$ includes the indirect effect on α of changes in rates of return generated by the change in s_f. The rate of return on equity, for instance, is given by $r_e = \frac{(1-s_f)(\pi - r\beta)pY}{vN} + \hat{v} - \hat{p} = \frac{(1-s_f)(\pi - r\beta)}{\alpha} + n - \hat{N}$ and an increase in s_f reduces r_e[18]

Using (15)-(17) we get

$$\frac{\partial \pi}{\partial s_f} = -\frac{\pi - \beta r - (s_f r - n)\frac{\partial \beta}{\partial s_f} + \hat{N}\frac{\partial \alpha}{\partial s_f}}{s_f - (s_f r - n)\frac{\partial \beta}{\partial \pi} + \hat{N}\frac{\partial \alpha}{\partial \pi}} \tag{18}$$

$$\frac{\partial \pi}{\partial \hat{N}} = -\frac{\alpha - (s_f r - n)\frac{\partial \beta}{\partial \hat{N}} + \hat{N}\frac{\partial \alpha}{\partial \hat{N}}}{s_f - (s_f r - n)\frac{\partial \beta}{\partial \pi} + \hat{N}\frac{\partial \alpha}{\partial \pi}} \tag{19}$$

$$\frac{\partial \pi}{\partial r} = \frac{s_f \beta + (s_f r - n)\frac{\partial \beta}{\partial r} - \hat{N}\frac{\partial \alpha}{\partial r}}{s_f - (s_f r - n)\frac{\partial \beta}{\partial \pi} + \hat{N}\frac{\partial \alpha}{\partial \pi}} \tag{20}$$

The signs of the partials of the profit share with respect to these three financial parameters are the same as in (12)-(14) as long as

$$\begin{aligned}
\pi - \beta r &> (s_f r - n)\frac{\partial \beta}{\partial s_f} - \hat{N}\frac{\partial \alpha}{\partial s_f} \\
\alpha &> (s_f r - n)\frac{\partial \beta}{\partial \hat{N}} - \hat{N}\frac{\partial \alpha}{\partial \hat{N}} \\
s_f \beta &> -(s_f r - n)\frac{\partial \beta}{\partial r} + \hat{N}\frac{\partial \alpha}{\partial r} \\
s_f &> (s_f r - n)\frac{\partial \beta}{\partial \pi} - \hat{N}\frac{\partial \alpha}{\partial \pi}
\end{aligned}$$

These 'inelasticity conditions' will automatically be satisfied if $(s_f r - n) = \hat{N} = 0$, irrespective how sensitive are α and β to variations in their arguments.

[18] Mathematically, perverse results are possible in which a rise in s_f increases the return. This could happen, for instance, if there is a strong inverse relation between α and r_e. The conditions that would give these perverse results can be ruled out on economic grounds.

Empirically, both $s_f r - n$ and $\hat{N}$ are close to zero, having at times been positive and at times negative. In fact, setting $(s_f r - n) = \hat{N} = 0$ is arguably a reasonable empirical benchmark. Thus, the qualitative results in (12)-(14) survive - at least as an outcome that holds for a range of empirically very plausible parameter values - in a more general model in which the stock-flow ratios are determined endogenously. It should be noted also that the different specifications used in Skott (1981, 1988, 1989) are special cases of the general model with endogenous α and β ratios;[19] all of these special cases satisfy the inelasticity conditions for any reasonable set of parameters, as does the flow-flow specification used by Lavoie and Godley (2001-2002) (see below).

Overall, then, while the implications of assuming elastic stock-flow ratios are clear - the comparative statics will be reversed - inelastic ratios appear to be the more interesting and empirically relevant case.[20]

4.1.2 The Lavoie-Godley specification of consumption

In the Lavoie-Godley model, consumption is a function of distributed income and capital gains. Thus, the consumption function is specified as a flow-flow relation. Using our notation, a general version of their consumption function can be written as:

$$\frac{C}{K} = \psi(y, \gamma), \qquad \psi_y > 0, \ \psi_\gamma > 0 \tag{21}$$

where y is households' distributed income and γ is capital gains, both variables as ratios of the capital stock ($y = [1 - s_f(\pi - r\beta) + \hat{p}\beta]u$ and $\gamma = \frac{vN(\hat{v}-\hat{p})}{pK}$). The proportion of the investment expenditure that is financed by equity issues is denoted as x. Lavoie and Godley take this proportion as the parameter describing new issue policies (instead of $\hat{N}$). By definition

$$\frac{vN}{pK}\hat{N} = x\frac{I}{K} = xg$$

where g is the accumulation rate. Thus, the ratio of capital gains to capital can be written

$$\gamma = \alpha u g - xg$$

The equilibrium condition (11) is general and still holds in the Lavoie-Godley specification and - using the definition of x - the equation can be written

$$u^* - n = u^* \left[1 - s_f(\pi - r\beta) - \beta n - \frac{xn}{u^*}\right] = \psi(y, \gamma) \tag{22}$$

[19] Skott (1989), for instance, assumes that β is exogenous and that $vN = \alpha(\pi, u, r, \beta)pY = (\pi - \frac{\delta}{u} - r\beta)pY$ where δ is the rate of depreciation; thus, share valuation is proportional to profits net of depreciation and real interest payments.

[20] We use the terms 'inelastic' and 'elastic' to denote the cases when the conditions hold and fail to hold, respectively. Intermediate cases in which some but not all of the conditions hold are clearly possible; in these cases only some of the signs of the partials in (12)-(14) will be preserved.

The steady growth value of β (and α) is affected by the consumption / saving function (21) and household portfolio decisions. In the Lavoie-Godley model these portfolio decisions are described by

$$\frac{M}{M+vN} \equiv \frac{\beta}{\alpha+\beta} = z(r, r^e, y), \quad z_r > 0, z_{r^e} < 0, \; z_y > 0 \tag{23}$$

where r^e is the rate of return on equities ($r^e = \frac{(1-s_f)(\pi-\beta r)u+n(\alpha u-x)}{\alpha u}$).

For some functional forms of ψ in (22) and z in (23), it may be possible to obtain analytical expressions for α and β, as in our general representation for the stock-flow ratios, (6) and (7); other specifications - including the ones used by Lavoie and Godley - may preclude explicit analytical expressions but the stock-flow implications can still be evaluated numerically.

With the relevant definitions, (22) and (23) determine the equilibrium values of π, α and β. Each exogenous variable (s_f, x, r, among others) affects the equilibrium stock-flow ratios α and β as well as the profit share π, and we get expressions that are analogous to (18)-(20):

$$\begin{aligned}
\frac{\partial \pi}{\partial s_f} &= -\frac{\pi - \beta r - (s_f r - n)\frac{\partial \beta}{\partial s_f}}{s_f - (s_f r - n)\frac{\partial \beta}{\partial \pi}} \\
\frac{\partial \pi}{\partial x} &= -\frac{n - (s_f r - n)u^* \frac{\partial \beta}{\partial x}}{s_f u^* - (s_f r - n)u^* \frac{\partial \beta}{\partial \pi}} \\
\frac{\partial \pi}{\partial r} &= \frac{s_f \beta + (s_f r - n)\frac{\partial \beta}{\partial r}}{s_f - (s_f r - n)\frac{\partial \beta}{\partial \pi}}
\end{aligned}$$

The total effect on the profit share of each parameter can be decomposed into the effect for a given α and β, and the derived effect via changes in α and β. The first effect is clear and straightforward as shown in section 4.1.1. Our main concern here is whether 'the inelasticity conditions' for stock-flow ratios hold in the Lavoie-Godley specification.

Using Lavoie and Godley's values for the parameters,[21] we find that in the Harrodian mature economy, the indirect effects via changes in α and β are quite small, with the direct effects corresponding to constant stock-flow ratios explaining most of the total effects. Table 1 shows the numerical results. The numbers in Table 1 indicate the derivatives of the profit share with respect to each exogenous parameter, evaluated at the equilibrium associated with Lavoie and Godley's original values of parameters.[22]

[21] Lavoie and Godley (2001-2002) did not report parameter values but have provided the values in private correspondence. These parameter values and our procedure of decomposition are given in the Appendix.

[22] In this paper we simply use Lavoie and Godley's parameter values, leaving for future research a more careful examination of whether our 'inelasticity conditions' are robust with respect to reasonable variations in these parameter values.

4.2 Dual economies: endogenous growth

We now turn to the case of dual economies, that is, economies in which the labor force does not constrain the rate of growth. This case may correspond to economies with large amounts of hidden unemployment in backward, non-capitalist sectors, or it could depict the case where the labor supply to the capitalist sector is perfectly elastic for other reasons (immigration, women's participation rate, endogenous fertility, or technical progress).

The growth function needs to be modified in a dual economy of this kind. The employment rate no longer serves as a relevant signal and therefore drops out of the growth function. Hence,

$$\hat{Y} = h(\pi); h' > 0$$

In steady growth we still have $g = \hat{Y} = \hat{K}$ and $u = u^*$, and the equilibrium condition for the product market takes the form

$$[1 - s_f(\pi - r\beta) - \beta h(\pi) - \alpha\hat{N}] = 1 - \frac{1}{u^*}h(\pi) \tag{24}$$

4.2.1 Inelastic stock-flow ratios

In the case with exogenous α and β ratios, equation (24) gives the following comparative statics:

$$\begin{aligned}
\frac{\partial\pi}{\partial s_f} &= -\frac{\pi - r\beta}{s_f + (\beta - \frac{1}{u^*})h'(\pi)} < 0 \\
\frac{\partial\pi}{\partial\hat{N}} &= -\frac{\alpha}{s_f + (\beta - \frac{1}{u^*})h'(\pi)} < 0 \\
\frac{\partial\pi}{\partial r} &= \frac{\beta s_f}{s_f + (\beta - \frac{1}{u^*})h'(\pi)} \\
\frac{\partial\pi}{\partial\alpha} &= -\frac{\hat{N}}{s_f + (\beta - \frac{1}{u^*})h'(\pi)} \\
\frac{\partial\pi}{\partial\beta} &= \frac{s_f r - n}{s_f + (\beta - \frac{1}{u^*})h'(\pi)}
\end{aligned}$$

The signs of these partials depend on the magnitude of $h'(\pi)$. The expression $\beta - \frac{1}{u^*} = \frac{M - pK}{pY}$ is negative for any empirically reasonable specification, and it follows that compared to the labor constrained case, the comparative statics are unchanged if h' is 'small' but reversed if h' is 'large'. The standard Kaleckian formulation with $\pi = \bar{\pi}$ corresponds to the limiting case with $h' \to \infty$. This may be an extreme case, but in the absence of labor constraints one would expect a high sensitivity of growth to variations in profitability. Thus, the large-h' case with the reversal of comparative statics for the profit share seems the most reasonable.

Changes in the profit share influence the growth rate in a dual economy, rather than the employment rate as in the labor-constrained economy. Expressions for the growth rate effects are readily obtained in the limiting case with a constant markup formulation ($h'(\pi) \to \infty$ at $\pi = \bar{\pi}$). In this limiting case equation (24) can be rewritten

$$[1 - s_f(\bar{\pi} - r\beta) - \beta g - \alpha\hat{N}] = 1 - \frac{1}{u^*}g$$

and

$$\begin{aligned}
\frac{\partial g}{\partial s_f} &= \frac{(\bar{\pi} - r\beta)u^*}{1 - \beta u^*} > 0 \\
\frac{\partial g}{\partial \hat{N}} &= \frac{\alpha u^*}{1 - \beta u^*} > 0 \\
\frac{\partial g}{\partial r} &= -\frac{s_f \beta u^*}{1 - \beta u^*} < 0 \\
\frac{\partial g}{\partial \alpha} &= \frac{\hat{N} u^*}{1 - \beta u^*} \\
\frac{\partial g}{\partial \beta} &= \frac{(g - s_f r)u^*}{1 - \beta u^*}
\end{aligned}$$

The signs of the effects of changes in $s_f, \hat{N}$ and r are clear. If firms raise the retention rate or increase the rate of new issues, this will increase the rate of capital accumulation, while an increase in the real interest rate slows down accumulation. The intuition is simple. Since u^* and $\bar{\pi}$ are unaffected by changes in $s_f, \hat{N}$ and r, the effects on accumulation of changes in $s_f, \hat{N}$ and r derive exclusively from their direct impacts on saving and the amount of available finance. Given that $u = u^*$ and $\pi = \bar{\pi}$, an increase in s_f or $\hat{N}$ must increase the amount of financial resources available to firms - raising the rate of capital accumulation - while a rise in r has the opposite effect on accumulation since it reduces the amount of retained earnings.[23]

4.2.2 The Lavoie-Godley specification of consumption

As we have seen in section 4.1.2, households' consumption/saving and portfolio decisions in Lavoie-Godley (2001-2002) implicitly define the stock-flow ratios, α and β, as functions of a number of variables, and the accumulation rate becomes an additional influence on α and β in the dual economy. Analogously to the analysis in section 4.1.2, we obtain the following comparative statics.

[23] It is easy to understand these comparative statics by looking at the closed-form solution for the rate of capital accumulation, i.e. $g = \frac{[s_f(\bar{\pi} - r\beta) + \alpha\hat{N}]u^*}{1 - \beta u^*}$.

$$
\begin{aligned}
\frac{\partial g}{\partial s_f} &= \frac{\bar{\pi} - r\beta - (s_f r - g)\frac{\partial \beta}{\partial s_f}}{\frac{1}{u^*}(1 - \beta u^* - x) + (s_f r - g)\frac{\partial \beta}{\partial g}} \\
\frac{\partial g}{\partial x} &= \frac{\frac{1}{u^*} g - (s_f r - g)\frac{\partial \beta}{\partial x}}{\frac{1}{u^*}(1 - \beta u^* - x) + (s_f r - g)\frac{\partial \beta}{\partial g}} \\
\frac{\partial g}{\partial r} &= -\frac{s_f \beta + (s_f r - g)\frac{\partial \beta}{\partial r}}{\frac{1}{u^*}(1 - \beta u^* - x) + (s_f r - g)\frac{\partial \beta}{\partial g}}
\end{aligned}
$$

We follow a decomposition procedure that is similar to the one in 4.1.1 in order to check if the inelasticity conditions for the stock-flow ratios hold in Harrodian dual economies. Table 2 reports the numerical results based on Lavoie and Godley's parameter values.

The signs of the derivatives of g with respect to the parameters are the same in the variable α and β regime as in the constant α and β regime, that is, our 'inelasticity conditions' hold in Harrodian dual economies with a Lavoie-Godley specification of consumption and portfolio behavior. However, the absolute values of the derivatives in the case of constant α and β are much greater than those in the case of variable α and β. Thus, the adjustment of α and β caused by changes in the parameters produce significant and partially offsetting effects on accumulation.

5 A Kaleckian model

Our Kaleckian model differs from Harrodian models with respect to the specification of accumulation. Unlike in the Harrodian framework, the utilization rate u becomes an accommodating variable, and a shift in aggregate demand may generate a permanent change in utilization. The profit share, by contrast, is treated as exogenous, $\pi = \bar{\pi}$, and the labor supply is taken be perfectly elastic (that is, the model describes the dual-economy case). The Kaleckian model, finally, often imposes 'stagnationist' assumptions which ensure that an increase in the profit share will reduce utilization; most of our results for the comparative statics of changes in financial behavior do not depend on these additional assumptions.

5.1 Inelastic stock-flow ratios

By using the definition of α and β, Tobin's q, the debt-capital ratio, and the ratio of retained earnings to capital can be written as:

$$
\begin{aligned}
q &= (\alpha + \beta)u \\
m &= \beta u \\
c &= s_f(\pi - r\beta)u
\end{aligned}
$$

Thus, for given values of $\bar{\pi}, \alpha$ and β, the accumulation function (4) becomes a function of utilization only:

$$\frac{I}{K} = f(u, \bar{\pi}, r, q, m, c) = f(u, \bar{\pi}, r, (\alpha+\beta)u, \beta u, s_f(\bar{\pi}-r\beta)u) \equiv \phi(u; \alpha, \beta, r, \bar{\pi}, s_f)$$

From (8) and the product market equilibrium condition, we now have

$$\phi(u; \alpha, \beta, r, \bar{\pi}, s_f) = [s_f(\bar{\pi} - r\beta) + \beta\phi(u) + \alpha\hat{N}]u \tag{25}$$

We may interpret the terms in the bracket on the right hand side of (25) as the average saving rate. Following the Kaleckian tradition, we assume that the traditional Keynesian short-run stability assumption holds in the long run, too, that is, we assume that saving is more responsive than investment to changes in the utilization rate. If the $\alpha-$ and $\beta-$ratios are exogenous, we then have

$$s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi' > 0 \tag{26}$$

and - assuming positive autonomous investment, $\phi(0; \alpha, \beta, r, \bar{\pi}, s_f) > 0$ - it can be shown that there is a unique positive solution for u in the interval $(0, \frac{1}{\beta})$.

For empirically reasonable magnitudes of the negative effect on capital accumulation of debt-capital ratio, accumulation is increasing in the utilization rate, i.e. $\phi'(u) > 0$,[24] and we have the following comparative statics for the utilization rate:

$$\frac{\partial u}{\partial \pi} = \frac{(1-\beta u)f_\pi + u s_f\{(1-\beta u)f_c - 1\}}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi'} \tag{27}$$

$$\frac{\partial u}{\partial s_f} = \frac{(\bar{\pi} - r\beta)u\{(1-\beta u)f_c - 1\}}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi'} < 0 \tag{28}$$

$$\frac{\partial u}{\partial \hat{N}} = -\frac{\alpha u}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi'} < 0$$

$$\frac{\partial u}{\partial r} = \frac{(1-\beta u)(f_r - f_c s_f \beta u) + s_f \beta u}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi'}$$

$$\frac{du}{d\alpha} = \frac{f_q(1-\beta u)u - \hat{N}u}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi'}$$

$$\frac{du}{d\beta} = \frac{(s_f r - g)u + (1-\beta u)(f_q + f_m - f_c s_f r)u}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha\hat{N} - \phi'}$$

The stagnationist case is obtained if an increase in the profit share generates a decline in utilization. Comparing (27) and (28) it is readily seen that in this stagnationist case an increase in the retention rate must depress the rate of utilization: it follows from (26) and (27) that $(1-\beta u)f_c < 1$ is a necessary condition for $\frac{\partial u}{\partial \pi} < 0$. However, the determinate sign of the partial derivative of the utilization rate with respect to the retention ratio can also be justified

[24] The mathematical condition for $\phi'(u) > 0$ is $\beta|f_m| < f_u + f_q(\alpha+\beta) + f_c s_f(\bar{\pi} - r\beta)$.

directly by the empirically mild assumption that $(1-\beta u)f_c < 1$.[25] Given this assumption, an increase in s_f lowers the utilization rate since, for a given u, saving rises more sharply than investment, and the utilization rate must decrease in order to restore the product market equilibrium. Analogously - and independently of whether $\frac{\partial u}{\partial \pi} < 0$ - the average saving rate rises as $\hat{N}$ increases since more household income goes to purchasing equities rather than buying consumer goods. This depresses the level of effective demand and results in a lower rate of utilization.

The increase in the real interest rate has a negative impact on both saving and investment. It lowers the amount of corporate saving, and the decrease in retained earnings depresses accumulation for a given rate of utilization. Saving falls more sharply than investment if the direct negative impact on investment of changes in r is not too large, i.e. $(1-\beta u)(f_r - f_c s_f \beta u) + s_f \beta u > 0$. Under this assumption, to restore the product market equilibrium, a higher utilization rate is required. However, if $(1-\beta u)(f_r - f_c s_f \beta u) + s_f \beta u < 0$, the higher real interest rate requires a lower utilization rate for the product market equilibrium. The effects of changes in a and β, again, are ambiguous.

The effects on accumulation of changes in the financial variables are given by:

$$\frac{\partial g}{\partial \pi} = f_\pi + s_f u f_c + \phi' \frac{\partial u}{\partial \pi} \tag{29}$$

$$\frac{\partial g}{\partial s_f} = f_c(\bar{\pi} - r\beta)u + \phi' \frac{\partial u}{\partial s_f} \tag{30}$$

$$\frac{\partial g}{\partial \hat{N}} = \phi' \frac{\partial u}{\partial \hat{N}} < 0 \tag{31}$$

$$\frac{\partial g}{\partial r} = f_r - f_c s_f \beta u + \phi' \frac{\partial u}{\partial r} \tag{32}$$

The result for $\frac{\partial g}{\partial \pi}$ in equation (29) is parallel to Marglin and Bhaduri's (1990) analysis of wage and profit led growth in a stagnationist regime. The direct and positive effect on accumulation of an increase in the profit share may or may not be dominated by the effect of a decline in utilization. A rise in the retention rate - equation (30) - also produces conflicting effects on accumulation. The first term in (30), $f_c(\bar{\pi} - r\beta)u$, captures a direct positive impact on accumulation from an increase in the amount of internal funds, but an increase in the retention rate also has a negative effect on accumulation by lowering the utilization rate (the second term in (30), $\phi' \frac{\partial u}{\partial s_f}$, is negative). Which effect dominates is an empirical matter but - using the expressions for $\frac{\partial u}{\partial \pi}$ and $\frac{\partial u}{\partial s_f}$ - it follows that in

[25] It is difficult to see how an increase in retained earnings - keeping constant u, π, r, q, m - can lead to a more than one-for-one increase in investment, that is, one would expect $f_c \leq 1$.

this model $\frac{\partial g}{\partial s_f} > 0$ is a sufficient condition for growth to be profit led.[26]

The effect on capital accumulation of an increase in the rate of equity issues is more clear-cut. An increase in $\hat{N}$ leads to a lower rate of utilization, and the lower utilization rate depresses capital accumulation.

Real interest rates have ambiguous effects. The direct effect on accumulation of a rise in the real rate of interest is negative but the derived effect on accumulation via changes in the utilization may be positive: $f_r - f_c s_f \beta u$ in (32) is negative, but the sign of $\phi' \frac{\partial u}{\partial r}$ in (32) can be positive or negative, leaving unclear the sign of the total effect. The ambiguity that characterizes the effects of changes in α and β on utilization also carry over to the effects on the growth rate.

Financialization, finally, may have been associated with a downward shift in the accumulation function, f (or ϕ). A downward shift of this kind leads to a lower utilization rate, and this fall in utilization exacerbates the decline in accumulation.

Strikingly, the comparative static results for a stagnationist dual economy resemble those for the mature Harrodian economy. A fall in the rate of new equity issues is expansionary in both models. In the stagnationist model it leads to a higher utilization rate and a higher accumulation rate; in the Harrodian model profits and employment both increase. A decrease in the retention rate, moreover, may (but need not) increase both the utilization rate and the capital accumulation rate in the stagnationist model and it raises profits and employment in the Harrodian case.

5.2 The Lavoie-Godley specification of consumption and accumulation

In Lavoie and Godley (2001-2002), the accumulation function is given by

$$g = \gamma_0 + \gamma_1 s_f \left(\bar{\pi} u - rm \right) - \gamma_2 rm + \gamma_3 q + \gamma_4 u$$

where γ_0, γ_1, γ_2, γ_3, and γ_4 are positive constants. Using the definitions of q, m, α and β, this accumulation function can be rewritten:

[26] We have

$$\begin{aligned}
\frac{\partial g}{\partial \pi} &= f_\pi + s_f u f_c + \phi' \frac{\partial u}{\partial \pi} \\
&= f_\pi + s_f u f_c + \phi' \frac{(1-\beta u) f_\pi + u s_f \{(1-\beta u) f_c - 1\}}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha \hat{N} - \phi'} \\
&= f_\pi + \phi' \frac{(1-\beta u) f_\pi}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha \hat{N} - \phi'} \\
&\quad + \frac{s_f}{\bar{\pi} - r\beta} [(\bar{\pi} - r\beta) u f_c + \phi' \frac{(\bar{\pi} - r\beta) u \{(1-\beta u) f_c - 1\}}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha \hat{N} - \phi'}] \\
&= f_\pi + \phi' \frac{(1-\beta u) f_\pi}{s_f(\bar{\pi} - r\beta) + \beta(\phi' u + g) + \alpha \hat{N} - \phi'} + \frac{s_f}{\bar{\pi} - r\beta} \frac{\partial g}{\partial s_f}
\end{aligned}$$

$$g = \gamma_0 + [\gamma_1 s_f\ (\ \bar{\pi} - r\beta) - \gamma_2 r\beta + \gamma_3(\alpha + \beta) + \gamma_4]u \tag{33}$$

If the α and β ratios are constant, we have a special linear version of our function $\phi(u)$ in the previous section, and the sensitivity of investment to the utilization rate depends on the various parameters, including α and β. The Lavoie-Godley specification of consumption and portfolio behavior, however, implies that the α and β ratios are endogenous and that the response of investment to changes in u will be affected by the endogenous adjustment of the stock-flow ratios α and β.

The consumption function and households' portfolio choice have been described already in section 4.1.2. For convenience we reproduce the key equations (22)-(23) here:

$$u - g = u\left[1 - s_f(\bar{\pi} - r\beta) - \beta g - \frac{xg}{u}\right] = \psi(y, \gamma) \tag{34}$$

$$\frac{\beta}{\alpha + \beta} = z(r, r^e, y) \tag{35}$$

where $\gamma = \alpha ug - xg$, $y = [1 - s_f(\bar{\pi} - r\beta) + \hat{p}\beta]u$, and $r^e = \frac{(1-s_f)(\bar{\pi}-\beta r)u + g(\alpha u - x)}{\alpha u}$. Unlike in section 4.1.2, g and u are endogenously determined while π is a parameter.

The system (33)-(35) determines four endogenous variables, g, u, α and β ((34) contains two equations). This system is equivalent to the steady-growth system in Lavoie and Godley (2000-2001).[27] It can be compared to one in which accumulation is described by (33), but in which α and β are assumed constant (that is, in which we drop (35) and the last equation in (34)).

Analytical solutions are hard to obtain, but using the original parameter values in Lavoie and Godley (2001-2002) our inelasticity conditions for stock-flow ratios survive in this stagnationist Lavoie-Godley system. Table 3 describes the numerical results. Qualitatively, the macroeconomic effects of financialization on the steady state are the same in the fixed α, β system and the Lavoie-Godley model. In both models, the effects of an increase in the retention rate are negative for both utilization and accumulation. Thus, given the parameter configuration, the direct positive impact of a rise in s_f on accumulation is dominated by its negative utilization effect on accumulation. A rise in the share of investment financed by new issues has a contractionary effect on both utilization and accumulation. An increase in the real interest rate on the utilization rate has an positive effect on the utilization rate, but this positive utilization effect is offset by the negative effect of the higher interest rate on accumulation: accumulation slows down in the face of the higher real rate of interest.

The similarity between the systems with constant and endogenous α and β ratios is not just qualitative. The derivatives of u and g with respect to the

[27] The only small difference between Lavoie and Godley steady-state system and ours lies in the lag structure of variables. In our analysis, we make all level variables in each equation contemporaneous.

various parameters are also similar in magnitudes. Thus, the effects on u and g of induced adjustments of α and β are quantitatively small.[28] This result is not surprising since, as indicated by Table 4, the values of the α and β ratios appear to be rather insensitive to variations in the financial parameters (the parameter changes in the table are very substantial).

6 Conclusion

Financialization is a short-hand expression for a number of developments over the last 30 years. The term is convenient but these developments may not have the coherence and unity suggested by the term and they may not signal the transition to some new 'regime'.

This paper is an attempt to show how the macroeconomic effects of some of the observed changes in financial behavior can be analyzed using existing theoretical frameworks . The models in sections 4-5 differ along three dimensions: (i) the role of labor constraints (mature vs dual economies), (ii) accumulation regimes (Harrodian vs stagnationist specifications), and (iii) the specification of household behavior (elastic vs inelastic stock-flow ratios). All three dimensions are important when it comes to evaluate the effects of the behavioral changes that have been associated with financialization.

Looking first at the third dimension, the comparative statics in the elastic stock-flow case are reversed compared to the case with inelastic stock-flow ratios. Phrased in this way, however, the result is not interesting since reversal of the results formed the basis for the definition of elastic stock-flow ratios. More interesting is the finding that all our specifications fall into the category of inelastic stock-flow ratios. We may not be able to conclude from this that all reasonable specifications are inelastic. We have shown, however, that a range of empirically plausible specifications will be stock-flow inelastic; it is striking, in particular, that models like that of Lavoie-Godley which have been built up from flow-flow relations also generate stock-flow ratios that are inelastic.

Assuming inelastic stock-flow ratio, some of the main results for the other two dimensions are summarized in Table 5. Consider a change in new issue policies.[29] A decrease in new issues will be expansionary in the mature Harrodian economy as well in the stagnationist dual economy. Expansionary means different things in the two regimes: the growth rate is exogenously given in the mature economy and expansionary refers to an increase in the rate of employment; in the dual economy, on the other hand, the labor supply is infinitely elastic (and the rate of employment ill-defined), and an expansionary effect is one that raises the growth rate.

[28] There is one possible exception: the quantitative effect of the real interest rate on utilization differs substantially in the two systems. Our numerical exercises, however, show that the difference tends to decrease if we consider non-marginal, discrete changes in the interest rate.

[29] The effects of changes in retention rates are a little less clear in that - essentially for Marglin-Bhaduri reasons - the growth effects are ambiguous in the stagnationist dual-economy case.

The Harrodian dual economy produces the opposite result: a decrease in new issues reduces the growth rate.[30] Intuitively, the growth rate (along the steady growth path) is constrained by the saving in the Harrodian dual economy, and a decrease in new issues reduces saving and thereby the growth rate. This argument is a straightforward generalization of what happens in the textbook version of Harrod's model. Once we move to a mature economy, however, the growth rate of output and the rate of accumulation will adjust to the natural rate. A decrease in new issues tends to reduce saving, and an increase in profits is needed to compensate for this reduction and maintain the rate of accumulation at the natural rate. An increase in profitability, in turn, must be offset by a rise in employment in order to keep the growth rate of output at the natural rate. Basically, moving from a mature to an dual-economy setting turns an expansionary change into a contractionary change.

Moving from a Harrodian to a stagnationist economy also tends to reverse the comparative statics. This, again, generalizes results that are well-known from comparisons of the textbook Harrod model with standard stagnationist formulations (e.g. Rowthorn (1981) and Dutt (1984)). The only difference is that here we have expanded the models to include financial factors that are usually left out.

These comparisons between mature and dual-economy versions of the Harrodian model and between Harrodian and stagnationist versions of the dual economy provide some intuition for the similarity between the mature Harrodian economy and the stagnationist dual economy: these latter economies differ in two dimensions and the two reversals of the comparative statics offset each other.

Of course, the dependence of the comparative statics on the specification of the model is not surprising. One contribution of this paper, however, is to clarify the conditions under which the different results obtain. Moreover, most studies of advanced capitalist economies by heterodox economists seem to be informed by either a Harrodian mature-economy perspective or by the stagnationist dual-economy framework (our own preference lies with the former, but the majority view probably favors the latter). 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 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.

Financialization involves broader issues that go beyond the questions discussed in this paper. One set of issues concerns international capital flows and the constraints implied by these flows on the policy options of nation states. Leaving aside the international dimension, issues of power provide an another example. It is often claimed that financialization is associated with the increased

[30] The Harrodian dual economy could be split into two cases, depending on the sensitivity of the growth function with respect to changes in the profit share. We focus on the high-sensitivity case, cf. section 4.1.2.

power of financial institutions. Auerbach (1988), however, presents the case for an alternative view:

> The present relationships between banks and firms, far from signalling the growing dominance of financial institutions represent a precisely contrary development. They result from the efforts of financial institutions to accommodate themselves to a far more insecure environment, one made insecure by the activities of financial institutions in competition with each other and by the ever more stringent demands made upon them by their clients, especially their business customers. (p.)

Disregarding power issues, an increase in competition and insecurity may have implications for financial stability as well as for the time horizons used by both firms and financial institutions. A relatively recent but now largely forgotten literature questioned the relative merits of competitive, market-based Anglo-Saxon financial systems compared to German-Japanese systems. The latter, it was argued, might help to alleviate a short-termist bias (e.g. Cosh et al 1990). More generally, a competitive financial system would not necessarily - even if it were fully 'efficient' - produce good macroeconomic results if the investment in physical and/ or human capital gives rise to significant externalities (as suggested by traditional development theory, post Keynesians like Kaldor, and recent endogenous growth theory). In the case of positive externalities, 'artificially low' interest rates may be desirable (Auerbach and Skott 1992).[31]

One may note, finally, that concerns over the excesses and questionable benefits of the financial system have been voiced before and that even the extent of resources that are put into the financial system may cause concern. Thus, Tobin (1984; reprinted 1987) confessed

> to an uneasy Physiocratic suspicion, perhaps unbecoming in an academic, that we are throwing more and more of our resources, including the cream of our youth, into financial activities remote from the production of goods and services, into activities that generate high private rewards disproportionate to their social productivity. (1987, p. 294)

Tobin's conclusion was motivated in part by the fact that 16 out of an elite group of 46 executives whose earnings exceeded one million dollars in 1983 were officers of financial companies. He also noted that graduates from the School of Organization and Management at Yale who took jobs in finance had starting salaries four times the poverty threshold for four-person families, and observed

[31] The relatively strong German and Japanese economic performance during the Golden Age could be explained, of course, by other factors, unrelated to the financial systems. Likewise, the relatively poor performance by the two economies in the more recent years may not reflect a need for reforms of the financial and/or labor market systems, as claimed by OECD and other international organisations. See Nakatani and Skott (2006) for discussion of the Japanese case.

that the average holding period for shares was only 19 months and that the Department of Finance categories of Finance and Insurance generate 4.5-5 per cent of GNP (1987, p. 282). These numbers seem almost quaint by today's standards,[32] and developments over the last 20 years can only reinforce ones Physiocratic suspicions.

7 Appendix: The Numerical Results in Tables 1, 2 and 3

In 4.1.2, 4.2.2, and 5.2 we used numerical methods to examine the comparative statics of two models: one with constant stock-flow ratios, α and β, and the other with Lavoie-Godley specifications on consumption and portfolio choice and induced variations in the stock-flows ratios. The analysis was conducted in the context of Harrodian mature economies (4.1.2), Harrodian dual economies (4.2.2), and Stagnationist dual economies (5.2) and the results summarized in Tables 1,2 and 3. In this appendix, we present the procedure that was used to find the values of the derivatives of the endogenous variables with respect to financial and other parameters. We do this in the context of Stagnationist dual economies (see Table 3 in 5.2) where the model with variable stock-flow ratios is the same as the one in Lavoie and Godley (2001-2002). The procedure in the other cases is similar and, in fact, less complicated.

The stagnationist dual economies with the variable α and β – Lavoie and Godley (2001-2002)

$$g = s_f(\pi u - rm) + mg + xg \tag{36}$$

$$g = \gamma_0 + \gamma_1 s_f(\pi u - rm) - \gamma_2 rm + \gamma_3 q + \gamma_4 u \tag{37}$$

$$u - g = a_1\{u - s_f(\pi u - rm)\} + \frac{a_1}{a_2}\gamma \tag{38}$$

$$m = (1 - \lambda_0 + \lambda_1 r - \lambda_2 r_e)q + \lambda_3\{u - s_f(\pi u - rm)\} \tag{39}$$

where $r^e = \frac{(1-s_f)(\pi u - rm)+\gamma}{q-m}$ and $\gamma = g(q-m) - xg$.

The symbols used here are the same as the ones in the main text of this paper. The inflation rate is assumed to be zero. (36) describes firms' finance constraint,

[32] In 2005, among CEO's in the top 189 efficient firms classified by Forbes, 164 earned more than \$2 million (or approximately \$1 million in 1983 dollars) and 46 of them belonged to financial companies (diversified financials, banking, and insurance). The average compensation of those 46 CEO's in financial companies was \$9.6 million or about 170 times the median U.S. family income in 2004 (see *The State of Working America 2006/2007* published by Economic Policy Institute). In 2004, the average holding period for shares had dropped to 12.1 months (*NYSE Historical Statistics*, http://www.nysedata.com). Finance and Insurance, as categorized by the Department of Commerce, accounted for 5.5% of employee compensation, about 5% of the employed labor force, 7.5% of after-tax corporate profits, and about 3% of personal consumption in 1983; in 2005 those corresponding figures were 7.6%, 4.3%, 11.1% and 5.9% in 2005, respectively (calculated from U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Account*).

(37) is the investment function, (38) describes the equilibrium condition for the product market where the right-hand side specifies households consumption behavior as a function of household distributed income and capital gains. (39) shows households' demand for money (portfolio choice). The following values are used by Lavoie and Godley (2001-2002).

$$\begin{array}{lllll} \gamma_0 = 0.0075 & \gamma_1 = 0.5 & \gamma_2 = 0.5 & \gamma_3 = 0.02 & \gamma_4 = 0.125 \\ s_f = 0.75 & x = 0.05 & \pi = 0.2498 & & \\ a_1 = 0.8 & a_2 = 4.5 & & & \\ \lambda_0 = 0.45 & \lambda_1 = 0.2 & \lambda_2 = 0.0133 & \lambda_3 = 0.0001 & r = 0.0275 \end{array}$$

Given these parameter, (36)-(39) determines the steady-state values of u, g, q and m. The system has multiple solutions due to nonlinearities of some equations. The number of solutions is six but five of them can be discarded on economic grounds since at least one of the variables $-$ including r^e $-$ is negative. The positive numerical solution is:

$$u^* = 0.188 \qquad g^* = 0.0545 \qquad q^* = 0.8789 \qquad m^* = 0.487 \tag{40}$$

The partial derivatives of the solutions for u and g with respect to s_f, x, r, π, and λ_0 are evaluated at (u^*, g^*, q^*, m^*). The obtained values were reported in the third and fifth columns of Table 3.

Using the definitions of α and β, we obtain the following equilibrium values for α and β:

$$\alpha^* = \frac{q^* - m^*}{u^*} = 2.07936 \qquad \beta^* = \frac{m^*}{u^*} = 2.58914$$

Using these steady-state values of stock-flow ratios, we can transform the variable α and β regime to the constant α and β regime by dropping the consumption and portfolio choice functions.

Constant α and β regime

$$\begin{aligned} g &= s_f(\pi u - rm) + mg + xg \\ g &= \gamma_0 + \gamma_1 s_f\,(\,\pi u - rm) - \gamma_2 rm + \gamma_3 q + \gamma_4 u \\ q &= (\alpha^* + \beta^*)u \\ m &= \beta^* u \end{aligned}$$

By construction, the above four equations must yield the same steady state values as in (40). Then, the partial derivatives of the solutions for u and g with respect to s_f, x, r, π, and λ_0, again, are evaluated at (u^*, g^*, q^*, m^*). The second and forth columns of Table 3 report these values.

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Graphs and Tables

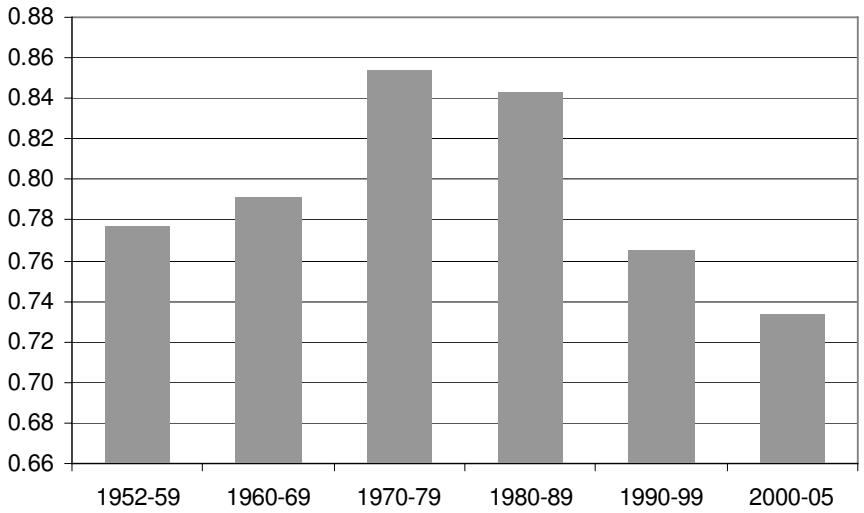

Figure 1: **The Retention Rate (1952-2005)**
Notes: The retention rate adjusted for inflation = 1−{ Net Dividends ÷ (U.S. Internal Funds + Net Dividends + Inflation rate × Net Liabilities)}. The inflation rates are based on the CPI and Net Liabilities refer to nonfarm nonfinancial corporate net liabilities. U.S internal funds = Profit (before taxes and after net interest payments) − Taxes on corporate income − Net dividends + Consumption of fixed capital + capital consumption adjustment.
Sources: Federal Reserve Board, *Flow of Funds Accounts of the United States*, Table F.102 and Table B.102; Bureau of Labor Statistics, *The Consumer Price Index*

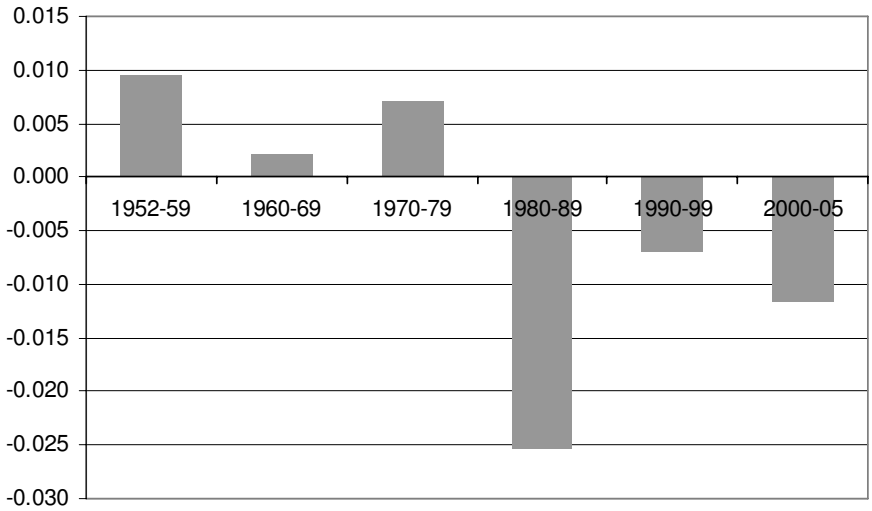

Figure 2: **The Rate of Net Issues of Equities (1952-2005)**
Notes: Net issues of nonfinancial corporate equities divided by the market value of nonfinancial corporate equities outstanding
Sources: Calculated from Federal Reserve Board, *Flow of Funds Accounts of the United States*, Table F.213 and Table B.102

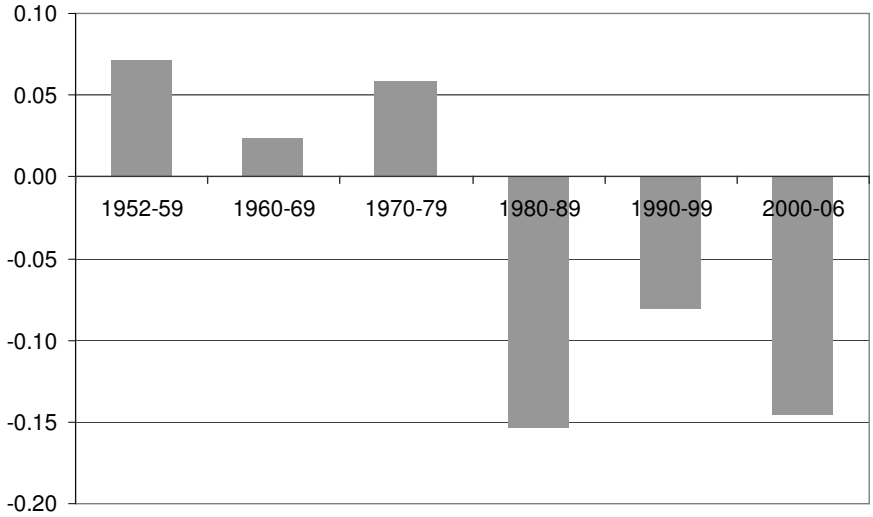

Figure 3: **The Ratio of Net Issues of Equities to Fixed Investment (1952-2005)**
Notes: Net issues of nonfinancial corporate equities divided by nonfarm nonfinancial corporate (gross) fixed investment Quarterly data.
Sources: Calculated from Federal Reserve Board, *Flow of Funds Accounts of the United States*, Table F.213 and Table F.102

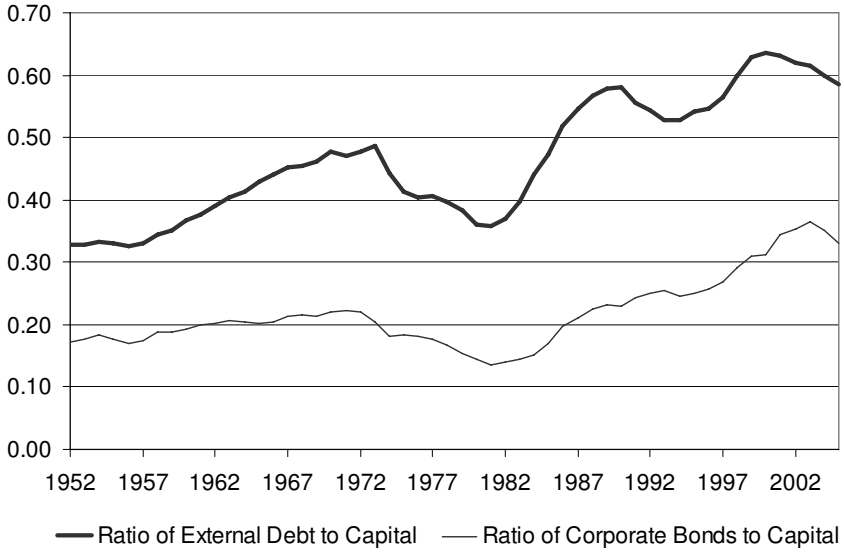

Figure 4: **The Ratio of Gross Debt to Capital: Nonfarm Nonfinancial Corporations (1952-2005)**
Notes: Gross debt = commercial paper + municipal securities + corporate bonds + bank loans + other loans and advances + mortgages. Capital = replacement cost of structures + replacement cost of equipment and software.
Sources: Calculated from Federal Reserve Board, *Flow of Funds Accounts of the United States*, Table B.102

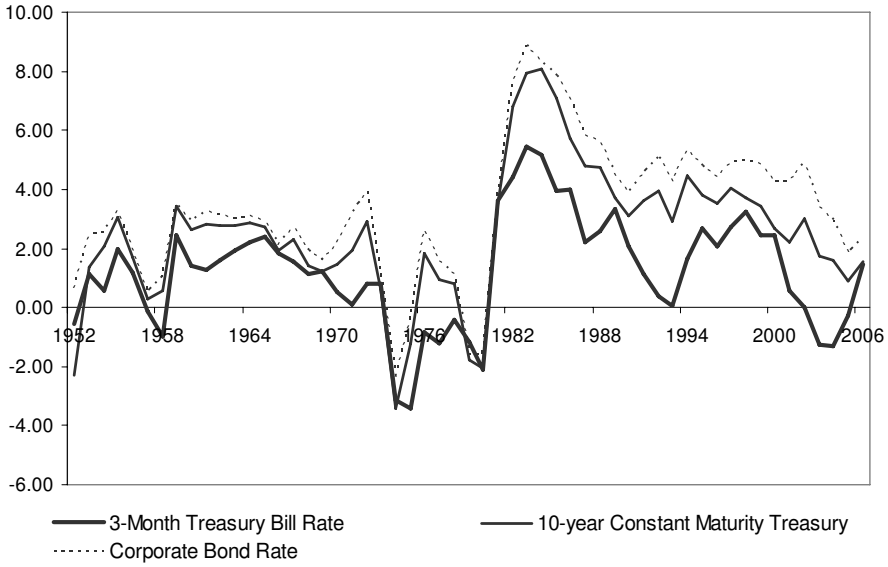

Figure 5: **Real Rates of Interest (1952-2006)**
Notes: Nominal rates minus inflation rates using the CPI
Sources: Calculated from Federal Reserve Board, *Federal Reserve Statistical Release*; Bureau of Labor Statistics, *The Consumer Price Index*

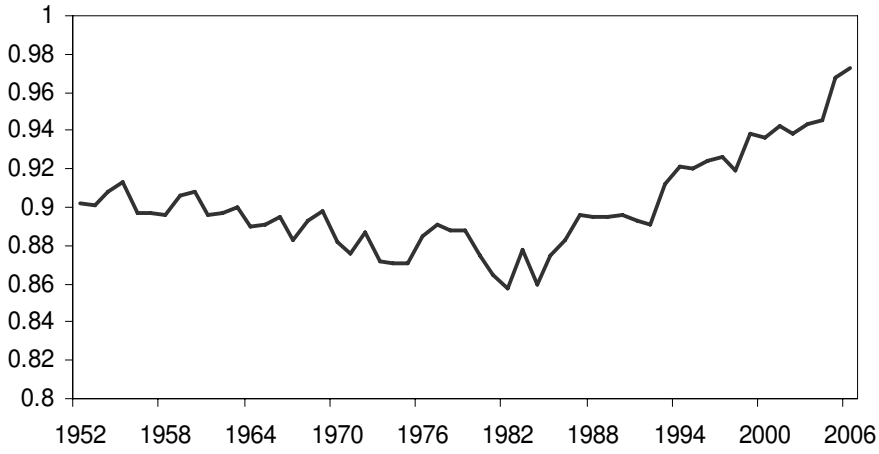

Figure 6: **The Ratio of Personal Consumption Expenditures to Disposable Personal Income (1952-2006)**
Sources: Calculated from U.S. Department of Commerce, Bureau of Economic Analysis, *National Income and Product Account*, Table. 2.9

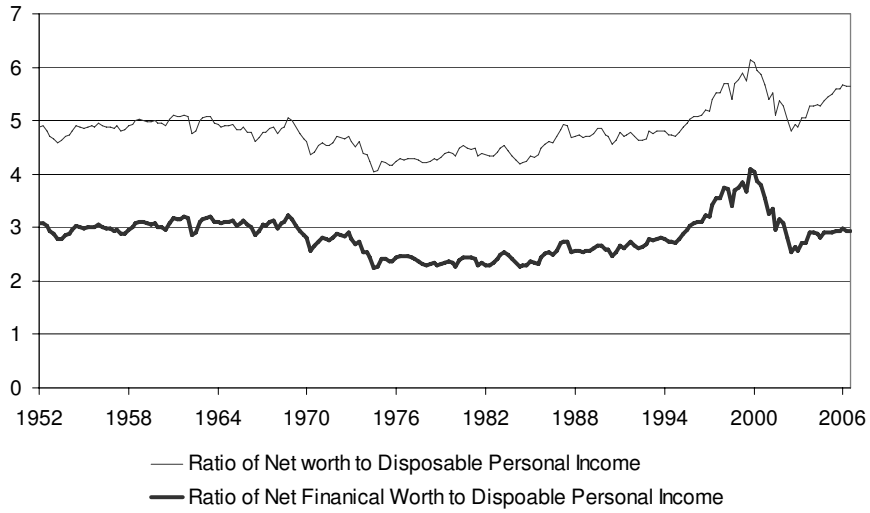

Figure 7: **The Ratio of Households' Net Financial Worth to Disposable Personal Income (1952-2006)**
Notes: Net Financial Worth = Households' Net Worth − Households' Tangible Assets. In other words, the gap between two graphs shown in the figure represents households' tangible assets divided by disposable person income
Sources: Federal Reserve Board, *Flow of Funds Accounts of the United States*, Table B.100

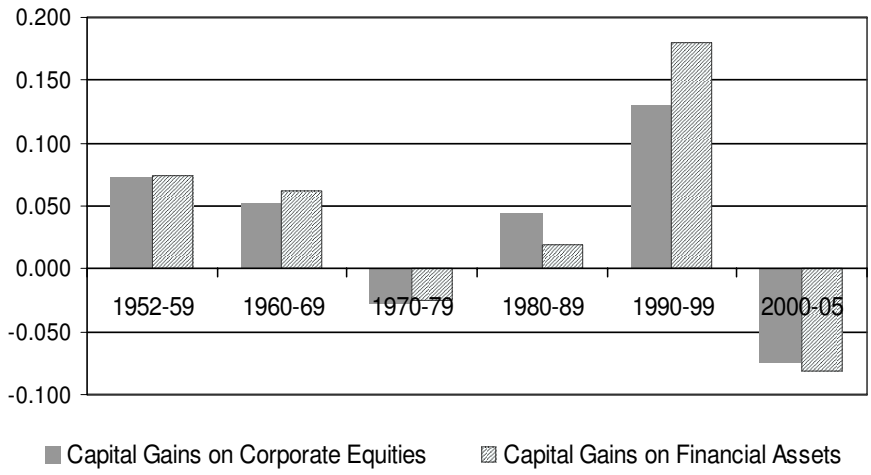

Figure 8: **The Ratio of Capital Gains on Financial Assets to Disposable Personal Income: Households and Nonprofit Organizations (1952-2005)**
Notes: Capital Gains on Corporate Equities = (Holding gains on corporate equities − inflation rate using the CPI × corporate equities outstanding held by households and nonprofit organizations)/ disposable personal income. Capital Gains on Financial Assets =(Holding gains on all financial assets − inflation rate using the CPI × all financial assets held by households and nonprofit organizations)/ disposable personal income.
Sources: Calculated from Federal Reserve Board, *Flow of Funds Accounts of the United States*, Table B.100 and Table R.100; Bureau of Labor Statistics, *The Consumer Price Index*

Table 1: **Effects of changes in parameters on the profit share in a Harrodian mature economy**

	Constant α and β regime	Variable α and β regime
The retention ratio	-0.238	-0.238
Equity issues	-0.386	-0.228
Real interest rate	2.589	2.575
Utilization	-1.948	-1.634
Propensity to hold equity	-	0.0717

Notes: Calculated based on parameter values in Lavoie and Godley (2001-2002)

Table 2: **Effects of changes in parameters on the accumulation rate in a Harrodian dual economy**

	Constant α and β regime	Variable α and β regime
The retention ratio	0.073	0.037
Equity issues	0.118	0.021
Real interest rate	-0.790	-0.396
Utilization	0.595	0.348
Profit share	0.305	0.154
Propensity to hold equity	-	-0.011

Notes: Calculated based on parameter values in Lavoie and Godley (2001-2002)

Table 3: **Effects of changes in parameters on the rates of utilization and accumulation in a stagnationist dual economy**

	Utilization		Accumulation	
Regimes	Constant α and β regime	Variable α and β regime	Constant α and β regime	Variable α and β regime
The retention ratio	-0.162	-0.186	-0.024	-0.028
Equity issues	-0.342	-0.352	-0.085	-0.087
Real interest rate	1.055	0.197	-0.163	-0.327
Profit share	-0.680	-0.780	-0.099	-0.118
Propensity to hold equity	-	0.296	-	0.092

Notes: Calculated based on parameter values in Lavoie and Godley (2001-2002)

Table 4: **Effects of Changes in Financial Variables on Stock-Flow Ratios**

	s_f			x			r		
	0.55	0.75	0.95	-0.05	0.05	0.15	0.01	0.0275	0.05
α	1.951	2.079	2.179	2.040	2.079	2.075	1.814	2.079	2.660
β	2.426	2.589	2.717	2.537	2.589	2.587	2.226	2.589	3.377

Notes: 0.75(s_f), 0.05(x), 0.0275(r), and the values for the parameters other than s_f, x, and r are the same as those used in Lavoie and Godley (2001-2002).

Table 5: **The Effects of a Decrease in the Retention Ratio or the Rate of Net Issues of Equities in Different Regimes**

	Mature Economies	Dual Economies
Harrodian	Profit share: Increase Employment: Increase	Growth: Decrease
Stagnationist		Utilization: Increase Growth: Ambiguous when $s_f \downarrow$ Growth: Increase when $\hat{N} \downarrow$