Financialisation and the slowdown of accumulation

Engelbert Stockhammer★

Over the past decades, the financial investment of non-financial businesses has been rising, and the accumulation of capital goods has been declining. The first part of the paper offers a novel theory to explain this phenomenon. Financialisation, the shareholder revolution and the development of a market for corporate control have shifted power to shareholders and thus changed management priorities, leading to a reduction in the desired growth rate. In the second part, the link between accumulation and financialisation is tested econometrically by means of a time series analysis of aggregate business investment for the USA, the UK, France and Germany. Extensive tests of robustness are performed. For the first three countries, evidence supporting the negative effect of financialisation on accumulation is found.

Introduction

The past decades have witnessed a rise in investments in financial assets at the same time as a slowdown of accumulation of physical assets. Some economists, and even more political activists, have argued that there is a structural link between the two phenomena: financial investment is replacing physical investment. However, most economists remain unconvinced. Financial investment is a transfer of assets, not a use of income. Buying stocks transfers liquidity from one economic agent to another, possibly from firms with bad investment opportunities to ones with good opportunities. Thus, macroeconomically, financial investment cannot substitute for physical investment (e.g., Tobin, 1997).

Even if financial investment had adverse effects on the accumulation of physical capital, would it matter? Growth theories, of course, do suggest that the answer is yes. Marxian and Keynesian theories, in particular, have stressed the role of accumulation and investment as the driving force behind growth. But even recent debates on the 'new economy' and the knowledge-based economy which emphasise the crucial role of knowledge and information (OECD, 1996) do not necessarily imply that accumulation becomes irrelevant. On the

contrary, since physical capital and skills are often complementary and technological progress has to be embodied in new machinery, capital accumulation may well be a precondition of knowledge-based growth. Moreover, accumulation still turns out to be a major determinant in comparative growth studies (e.g., De Long and Summers, 1991) and the slowdown in accumulation has been identified as one the reasons for the rise in European unemployment (e.g., Rowthorn, 1995).

This paper has two aims. First, it presents a novel theory of how financialisation, via a change in management priorities, may affect desired growth rates. Second, the link between accumulation and rentier income, i.e., income from financial assets and transactions, is tested econometrically.

Financialisation is a recent term, still ill-defined, which summarises a broad range of phenomena including the globalisation of financial markets, the shareholder value revolution and the rise of incomes from financial investment. For the purpose of this paper, financialisation will be narrowly defined as the increased activity of non-financial businesses on financial markets, and it will be measured by the corresponding income streams. The paper argues that the process of financialisation is linked to changes in the internal power structure of the firm. We base our analysis on a Post-Keynesian[1] theory of the firm, distinguishing between workers, management and rentiers (shareholders). The 'managerial capitalism' of the post-war era was characterised by relatively autonomous management which had a certain preference for growth (as opposed to profits). Through the shareholder revolution, its interests were realigned with those of shareholders, who have a stronger preference for profits, as opposed to growth. If the firm faces a growth–profit trade-off, such a change will lead to lower investment at the firm level. The theoretical parts of the paper elaborate this argument and its empirical parts test the influence of the financialisation of aggregate business investment econometrically.

The paper is structured as follows: Section 1 clarifies the notion of financialisation; Section 2 discusses the class structure of the firm. Section 3 summarises the Post-Keynesian theory of the firm and argues that it is bound to the specific period of managerial capitalism. Section 4 extends the theory to the context of financialisation. Section 5 presents the econometric specification that the theoretical discussion leads to. Section 6 discusses data sources and econometric issues. Section 7 presents the results of the econometric study, with particular emphasis on the robustness of the results. Section 8 interprets the findings and compares them with previous findings in the mainstream as well as in the Post-Keynesian tradition. Section 9 offers calculations to assess the contribution of financialisation to the slowdown of accumulation. Section 10 concludes.

1. Financialisation

Financialisation is a recent term to capture transformations within the financial sector as well as in the relation between the financial sector and other economic sectors. There is no

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[1] We use Post-Keynesian theory in an inclusive sense, implying that it can potentially integrate various streams of heterodox economics. In this sense, we are closer to Lavoie (1992) than to Davidson (1994). Davidson bases his Post-Keynesian approach on fundamental uncertainty and non-ergodicity, whereas Lavoie integrates a rich variety of heterodox economics. Such an attempt of integration raises the issue of consistency, and Lavoie attempts to provide a consistent framework. While we applaud his seminal presentation, which is successful in combining Post-Keynesian microeconomics and macroeconomics, we are not fully satisfied with the degree of theoretical consistency he offers. In particular, there is a strong asymmetry in that Lavoie borrows heavily from institutional economics in his theory of the firm and from Marxists in the theory of accumulation. If we are serious about the integration of different approaches, classes have to matter in the firm and institutions for accumulation.

agreed definition, since it includes phenomena ranging from the globalisation of financial markets, the shareholder revolution and the rise of incomes from financial investment. Moreover, there are various disciplines that have made contributions to the debate. In this section, no exhaustive overview of the literature is given, or indeed possible, but three core areas of debate around financialisation are identified in which to situate the argument developed below. Finally, some stylised facts on the countries under investigation in the empirical part will be summarised.

The first area of debate around financialisation is the study of corporate governance and labour relations. Authors like Froud *et al.* (2000) analyse the discourse of shareholder value and its impact on corporate restructuring. They argue that restructuring in pursuit of the goals set by financial markets is unlikely to meet its objectives (increased profitability etc.), but does have a negative impact on labour. Similarly, Lazonick and O'Sullivan (2000) argue for the USA that there has been a shift in management strategies from 'retain and invest' to 'downsize and distribute'. In both cases, the effects of financial markets on the system and the objectives of corporate governance is the object of investigation, together with the implications for labour, i.e., distributional issues at the firm level.

Second, there have been attempts to explore the macroeconomic dynamics of the effects of financial markets and shareholder value orientation on business decisions. Boyer (2000) has offered the most complete formal macroeconomic treatment of what he called a 'finance-led accumulation regime'. He posits changes in investment behaviour, a re-distribution from labour to shareholders which gives rise to a stock market boom, which in turn fuels consumption expenditures; he then analyses under which conditions such a finance-led growth regime can be stable. Aglietta (2000) offers a similar analysis, but without a formal model, and assigns a greater role to productivity gains through the 'new economy'. Neither of these authors offers a detailed analysis of changes in investment behaviour.

A third relevant debate is the one on financial systems. In this debate, the term 'financialisation' is not used, rather the contrast between bank-based and market-based financial systems is at the centre (as an overview see Grabel, 1997). Bank-based financial systems are characterised by long-run relations between banks and firms, based on trust and a long time horizon. Market-based systems, on the other hand, exhibit decentralised ownership and relations with short time horizons. The former are often supposed to be more conducive to growth. Closely connected to this debate, recent research on corporate finance has analysed and compared different sources for the finance of investment across countries (Mayer, 1988). Schaberg (1999) is a sophisticated example of this literature, giving a careful empirical analysis of the key countries. Building on H. Minsky's investment theory, he proposes a theoretical foundation for analysing the behavioural effects of different financial systems. This allows him to derive hypotheses about the differences between investment behaviour in bank-based and market-based regimes; however, he does not discuss changes within the market-based system in the context of shareholder value orientation.

In what follows, a theory of the effect of financialisation on the investment behaviour of non-financial businesses will be proposed. Financialisation will be defined as the engagement of non-financial businesses in financial markets. These financial activities are interpreted as reflecting a shift in the firm's objectives and a rising influence of shareholder interests in the firm. Thus, a narrow concept of financialisation is used which has the advantage of allowing us to derive a testable hypothesis. The argument is based on the Post-Keynesian theory of investment, which for our purposes has to be developed further.

To do so, we draw on all three of the above areas of inquiry. We take qualitative changes highlighted in the corporate governance literature as our starting point and derive a specific quantitative hypothesis about investment behaviour. Thus, we complement the macro-economic discussion that so far has not had much to say on investment. In constructing our indicator for financialisation, we draw on the literature on corporate finance.

To conclude the discussion on the notion of financialisation, some stylised findings on the extent to which the phenomenon has occurred in the USA, the UK, France and Germany will be given. For easons of space, this involves gross simplification and the reader is referred to the special issue of *Economy and Society* (2000) and Schaberg (1999) for more extensive discussions.

The USA and the UK have a long tradition of strong financial markets and also have been the first countries to experience the shareholder revolution. The development of a market for corporate control, of new financial instruments and the emergence of institutional investors in the 1970s have given shareholders the power to monitor and, if considered necessary, to punish management which in the meantime has accepted the pursuit of shareholder value as its priority.

Germany (and Japan) is the standard example of a bank-based financial system, with close ties between industry and banks and relatively unimportant capital markets, expressed in low rates of capitalisation, centralised shareholdings etc. Furthermore, institutional invest-ors, in particular pension funds, play a minor role. The discourse of shareholder value is a phenomenon of the 1990s and arguably has had effects only in the recent past. France has been an intermediate case between a bank-based and a market-based system that is of particular interest because it has experienced the most pronounced changes in its financial system over the past decades: Schaberg now classifies it as market-based. Simultaneously, shareholder value orientation has had a strong impact since the mid 1980s (Morin 2000).

2. Class analysis

Classes, or preferably class positions, can be defined with respect to the type of income received, the role in the production process and the political process. We shall focus on the first dimension and merely note the other two dimensions briefly. With respect to types of income, we distinguish three income classes: recipients of wages, recipients of profits and recipients of interest payments, dividends and rents. To these income categories corre-spond three social categories: workers, (industrial) capitalists and rentiers. In the pro-duction process capitalists wield power, as they control and organise production, whereas workers perform the work. Rentiers, as absentee owners, play no role in the production process, but provide the initial finance to start the business and receive part of the surplus as distributed profits.[1]

The distinction of income classes goes back to the classical economists and can also be found in Keynes (1971), who distinguished between the 'earners', 'the business class' and 'investors', respectively, and has proved fruitful since. Recent examples of applications of three class models include Epstein (1994) and Dutt (1992).

Note that we have defined class with respect to a type of income received. Therefore, any individual and even groups of individuals will occupy multiple class positions if they receive

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[1] Dividends and interest payment, of course, are paid out of profits. Therefore, capitalists and rentiers may be considered part of the same class. However, they occupy different positions within the production process and, as we shall argue in Section 3, they have different interests. Hence, we regard the distinction between (industrial) capitalists and rentiers as important—even if it is an intra-class distinction.

different types of income (as most people in fact do) (this fact is well known and debated among Marxists, e.g., Resnick and Wolff, 1987; Wright, 1985). Moreover, the 'industrial capitalist' is an abstract category that, at least in modern capitalism, does not exist as such. The capitalist is defined by virtue of receiving profit income, part of which will be distributed as dividends or interest payments to rentiers. Any real-life capitalist will therefore have a double position: as the capitalist during the day, making decisions concerning the firm, and as a rentier in the evening and on weekends, living off the income distributed to the owner of the firm.

The classification becomes even more complex for modern day managers, who take the role of capitalists in terms of exerting power in the firm and making decisions (e.g., concerning investment expenditures), but typically receive wage income and, more importantly now, receive rentier income, often in the form of stock options. Managers therefore have multiple, at times even contradictory, class positions. Their interests and preferences hence depend strongly on the institutional setting of the economy, or more specifically the firm.

The classification of present day rentiers has apparently become easier as pension funds and investment funds have become institutional representations of previously decentralised savings. However, this simplicity is deceptive. First, in the above outline of class theory the income streams corresponding to classes were emphasised. Today's rentiers, however, may be as much concerned about the valuation of existing assets (and consequently capital gains) as they are about income. Second, while pension and investment funds may constitute the most conspicuous form of rentiers, they are not the only form, and there is no reason to presume that other actors may not pursue rentier activities. Indeed, rentier activities and the interests of non-financial businesses are at the core of the argument developed below.

3. The Post-Keynesian theory of the firm

What distinguishes the Post-Keynesian approach to the firm from the simple version of the neoclassical approach is that the goal of the firm is not simply taken to be profit maximisation. This is a difference that may disappear in more sophisticated neoclassical models. The entire argument presented here can be reformulated in a neoclassical model, i.e., assuming utility maximising individuals. Our presentation will proceed along these lines.

Post-Keynesians are readily willing to accept that there are more goals to a capitalist firm than the maximisation of profits: the growth of the firm, the expansion of its market share, exerting power over its workers or suppliers and so on. The specific goal, or the weight of these goals, will depend on the specific institutional setting of the firm and the economy.[1] In contemporary capitalism, the pursuit of growth is regarded as the major aim of firms, which stems from the analysis of managerial capitalism.

Developed by Galbraith (1967) and Eichner (1976), and summarised neatly by Lavoie (1992), Post Keynesians have a well-elaborated theory of the firm *in the age of managerial capitalism*, but have done little to adapt this theory to contemporary changes in corporate governance. We shall propose a way to do so in the next section. Here we shall review the theory of the managerial firm and point out its shortcomings.

The centrepiece of the theory is the separation between ownership and control. Management has objectives distinct from those of the absentee owners. While the latter

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[1] However, the urge to grow and the quest for survival are often equated and take a somewhat more fundamental place in the literature (e.g., Robinson, 1962).

are primarily interested in dividends and share prices, the former aspire to power and prestige, that might be expressed in high market share and fast growth, luxurious offices and many subordinates. Owing to various laws and an asymmetry in information about what exactly is going on in the firm and how to run it, management has the upper hand. As a consequence: '[t]he objective of growth, rather than the consumption of profit, is predominant' (Lavoie, 1992, p. 104).

It is important to note that such an institutional arrangement is historically specific to the post-World War II era. Doing some violence to actual historical complexity, we can say, that in the early nineteenth century, many firms were owner controlled, a situation which had changed by the late nineteenth century, when a wave of mergers lead to a consolidation of industry. In the course of this development, two groups of actors emerged as important: financial capitalists and management. The financial sector gained a crucial position in financing the mergers and the time of the turn of the century has also been labeled 'financial capitalism'. Salaried managers now ran these giant firms, giving rise to what Chandler (1977) called 'managerial capitalism'. After the crises of the 1930s, governments severely restricted the influence of the financial sector, thereby strengthening the position of management. 'Money managers refrained from sitting on boards; and bankers, fearing liabilities, remained aloof from the governance affairs of companies to which they had loaned money. Investment bankers found that they could make plenty of money arranging transactions, while avoiding the liabilities and opprobrium associated with financial control of corporations' (Baker and Smith, 1998, p. 8).

Analysts of managerial capitalism (e.g., Chandler), Post Keynesians (Galbraith, Eichner) and proponents of shareholder value (Baker and Smith) agree on the broad characteristics of managerial capitalism, though they have different attitudes towards it. While proponents of shareholder value emphasise its wasteful aspects (growth as opposed to efficiency), others are more taken by the administrative abilities of the class of managers (Chandler, 1977). However, all agree on the bias towards growth inherent in the arrangement.

Let us now formalise the argument. We assume that only two variables, growth and profits, enter management's and the owners' utility functions. Further, we assume that management only cares about growth, and owners only care about profits. Thus, we get the following utility functions U_M and U_O, for mangers and owners, respectively.

$$U_M = U(g)$$

$$U_O = U(r)$$

where g is the investment or growth of the firm and r the profit rate.

Obviously, this crude simplifications are made for the sake of clarity of the argument rather than for realism. What is needed for the argument developed is that management cares more about growth than owners. Two points need clarification. First, it is frequently argued that financial markets, here equivalent to owners, have a shorter time horizon than society or even banks (e.g., Schaberg, 1999). They are interested in short-run returns and underinvest in long-run projects, thus harming the growth perspectives of the economy. In particular, it has been argued that bank-based financial systems will exhibit higher growth rates than market-based financial systems. Such an argument about different time horizons is complementary to our story, and indeed strengthens it. However, our model does not rely on the assumption of different time horizons, and emphasises differences in interests rather than in time horizons.

Second, there may be many more things that management and owners could care about. One of them gained prominence during the stock market boom of the 1980s and 1990s: capital gains. Asset prices, though not a decision variable of the firm, have become a target for firms' behaviour in their quest to create shareholder value. It will be argued in Section 4 that the pursuit of shareholder value is equivalent to giving a higher weight to profits in the simple objective function of the firms to be discussed.

To analyse the actual levels of growth and profits chosen, one has to take into account the constraints the firm faces. The two constraints discussed by Post Keynesians are: the finance constraint and the profit–growth trade-off.

Inside finance and outside finance are different. This is one of the basic assertions of Post-Keynesian economics that has been slowly and painfully rediscovered by neoclassical economists over the past decades after Modigliani and Miller (1958). Following the principle of increasing risk, firms are reluctant to accept high leverage rates, since a failure will put the existence of the firm at risk. Banks, on the other hand, will take current profit and wealth as a proxy for a firm's reliability, and give credit only to firms that are already profitable. For simplicity, assume that banks give loans as a multiple of the profit earned last year. From this, it follows that we can write the amount of investment feasible for a firm as a function of profits:

$$\text{finance constraint} : g_{\text{FC}} \le g(r) \text{ with } g' > 0$$

Finance is limited by profits minus dividends paid, i.e., retained earnings, and outside finance which is a positive function of profits. Note that this constraint need not be binding. It tells how much the firm can possibly invest, not necessarily how much it will invest.

The second fundamental constraint is the growth–profit trade-off. It is assumed that there is some relevant region where an increase in investment harms future profits (the fact that current distributed profits and current investment expenditures are inversely related is trivial). This can be argued to be the start-up costs of investment or the increasing managerial costs of fast growth (known as the Penrose effect). Though it may not be obvious that growth harms profits, Post Keynesians and recent literature on shareholder value agree, e.g., a recent OECD publication reads: 'Among the manifestations of this lack of control over management were *the pursuit of market share and growth at the expense of profitability* . . . .' (OECD, 1998, p. 17; emphasis added). To be fair, this is not the only manifestation given, but the existence such a trade-off is obviously implied. More formally, with standard cost functions profitability will be concave in investment. Thus, above the profit-maximising level of investment, a trade-off will exist. The assertion here is that management will choose a point in this region: thus the trade-off exists.

Accepting the trade-off, we get profits as a function of investment:

$$\text{profit}-\text{growth trade-off} : r_{\text{RG}} = r(g) \text{ with } r' < 0$$

Again, this is a constraint that need not be binding, but if the only variables that matter to management are growth and profits, as we assume below, then the firm will choose a point inside the constraint only by mistake.

In Figure 1, management's indifference curve is horizontal (U_{M}), whereas that of the owners' is vertical (U_{O}). Taking the finance constraint and the growth–profit trade-off, the growth rate desired by management will in general not be feasible. Thus, the finance constraint is binding. The actual growth and profit combination chosen will thus be what we designated as r^{MF} and g^{MF}.
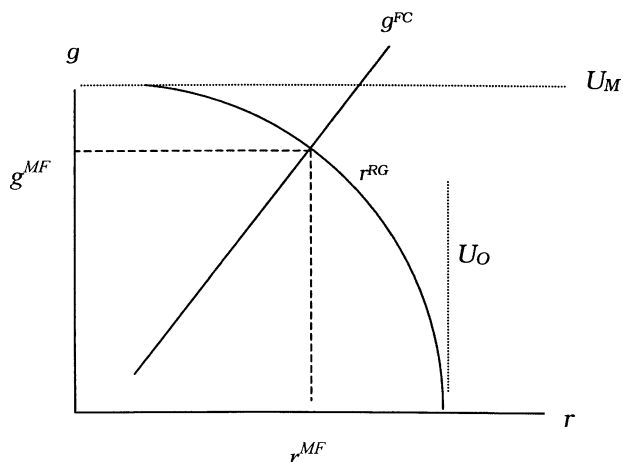
Fig. 1. *Preferences and constraints in a managerial firm (MF).*

The Post-Keynesian model has been taken as an ahistoric model of the firm by some authors. While Eichner and Galbraith emphasise the separation of ownership and control, Lavoie argues that 'that there is no need to emphasise that divorce. Whether the owners are still in control or not is irrelevant: those individuals taking decisions within the firm are in search of power; and their behaviour and motivations will reflect that fundamental fact' (Lavoie, 1992, pp. 101 ff). This pursuit of power can only be successful if the firm is big, thus having the unambiguous goal of growth.

We disagree with this position, emphasising the need to regard this model of the firm as the result of specific historic circumstances. The class perspective outlined above indicates that managers occupy a complex position with potentially contradictory interests. Therefore, it is impossible to define their interests without reference to institutions. Furthermore, rentiers are underestimated in the managerial model. Rentiers are easily satisfied in this model: 'Managers mitigate the fluctuations of dividends in the attempt to keep the shareholders happy and the stock market quiet. Managers usually keep constant the level of dividends or have them slowly increasing, assuming that shareholders do not object to the existing level of dividend payment or dividend ratio ... ' (Lavoie, 1992, p. 108). Overall, 'In the Galbraithian and Post-Keynesian firm, shareholders play a purely passive role' (Lavoie, 1992, p. 107). Again, we insist that rentiers are unlikely to content themselves to such a passive role voluntarily. Rather, it is in the specific historic circumstances of the Golden Age regime that an interventionist state purposefully restricted the role of finance.

4. Financialisation and management priorities

In the course of the 1970s, two institutional changes occurred which helped to align management's interests with shareholders' interests: the development of new financial instruments that allowed hostile take-overs and changes in the pay structure of managers. Among the former were tender offers and junk bonds (Baker and Smith, 1998), among the latter were performance-related pay schemes and stock options (Lazonick and O'Sullivan, 2000). The former play the role of the stick, the latter are the carrot. Both have proved fairly effective in making management adopting shareholders' priorities and have 'profoundly altered patterns of managerial power and behaviour' (Baker and Smith, 1998, p. 3).

The effects of this development are viewed differently—unsurprisingly, since it represents a shift in the power structure within the firm. Baker and Smith emphatically welcome that, after the deregulation and changes of the 1970s and 1980s, 'the pendulum could swing back toward financial capitalism, which would limit managerial discretion in favor of more rigorous exploitation of corporate resources' (Baker and Smith, 1998, p. 22). Marxists would probably agree but be more specific in adding 'rigorous exploitation of workers'. Lazonick and O'Sullivan, on the other hand, write: 'In the name of creating 'shareholder value', the past two decades have witnessed a marked shift in the strategic orientation of top corporate managers in the allocation of corporate resources and returns away from "retain and reinvest" and towards "downsize and distribute"' (Lazonick and O'Sullivan, 2000, p. 18).

While there may be little disagreement that changes in corporate governance have occurred, it may be less clear what modern owners want. In their present institutional incarnation as pension or investment funds, rentiers may well care more about capital gains, i.e., asset prices, than about profits. Though obviously not a choice variable of the firm, asset prices have indeed become a target of firms which engage in activities ranging from installing departments of investor relations to share buy backs in order to influence stock prices. However, it has become painfully clear over the past two years that asset prices are notoriously hard to predict, let alone influence. Overall, it is clear that in the simple model proposed asset prices as a target side with profits. First, if valued by fundamentals, an asset price equals the discounted expected profit (or dividend) stream. Second, there is a clear correlation between asset prices and profits, as witness the shivers that profit warnings send thorough stock markets. Third, the bias against growth is testified by the positive correlation of asset prices and reduction in force (i.e., firing) announcements (Farber and Hallock, 1999).

In the model proposed, an increase in shareholder power translates into the following: Management has an ambiguous class position, and its interests are therefore sensitive to institutional changes. Changes in the pay structure as well as the threat of hostile take-overs will make it adopt shareholders' preferences. In the figure above, management's utility function will rotate (U' instead of U, see Figure 2).

The new growth–profit combination chosen by the shareholder-dominated firm will exhibit higher profits and lower growth (r^{SDF} and g^{SDF} in Figure 2). In the extreme case of perfect assimilation of managers by shareholders, they will adopt a vertical indifference curve and choose the profit maximising point. At the new optimal point, the finance constraint is not binding. Firms could grow faster, given their access to finance, but they choose not to, because that would reduce profitability.

If our story were true, one would expect that managers and consequently non-financial businesses to identify increasingly as rentiers and hence also to behave as such. We should expect higher dividend payout, lower growth and more financial investment by non-financial businesses. Note that our story avoids assigning the active role exclusively to rentiers and financial markets. Given the ambiguous class positions of management, they may, after initial changes actively promote and further the shareholder value orientation, as noticed by Lazonick and O'Sullivan (2000) and Jürgens *et al*. (2000).

It is, of course, difficult to operationalise the concept of financialisation for quantitative research. The interest and dividend income (for short: rentiers' income) of non-financial businesses will be used as a proxy for financialisation. This measure does correspond to the income-related definition of class. It measures to what extent non-financial businesses have acquired rentier status and, as has been argued, the hypothesis is that this corresponds to
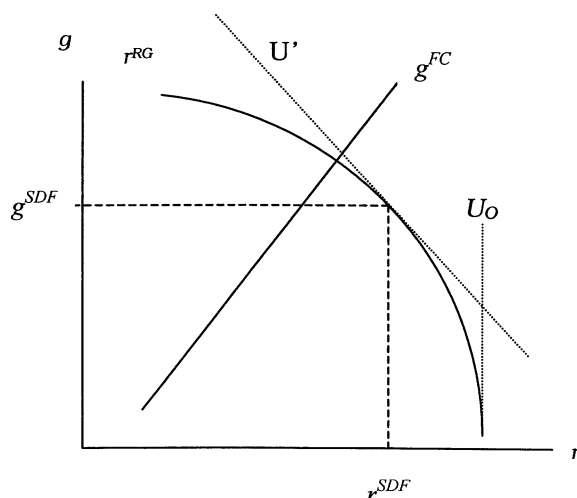
Fig. 2. *Preferences and constraints in the shareholder dominated firm (SDF).*

a change in management priorities. This measure obviously also has shortcomings. First, it is an indirect measure, a proxy, because we cannot measure the changes in management priorities directly; instead, we look at a measure that, in our hypothesis, is itself a result of the change in attitudes. Second, rentiers' income may rise because interest rates or dividend payout ratios have risen or because more financial investment has been undertaken. Thus we cannot distinguish between additional income due to changes in management priorities and that due to changes in rates of return. In the econometric analysis, this problem is countered by including interest rates in the regression, thus controlling for one important measure of financial rates of return.

5. The regression specification

The hypothesis of this paper is that financialisation contributed to the slowdown in accumulation since the Golden Age. As we have argued above, management adopted the preferences of rentiers in the process of institutional changes of financialisation. The consequence of this is that management and thus non-financial business should become more rentier-like, which among other things, means that they have fewer growth-oriented priorities and invest in financial markets.

In the following sections, empirical tests of this hypothesis by means of macroeconomic data will be presented. This requires some clarification, since the theory presented in the previous sections was essentially microeconomic. However, the phenomenon that we wish to explain, i.e., the slowdown of accumulation, is a macroeconomic one.

To get from the microeconomic theory proposed to a macroeconomic test, the implicit assumption of a representative firms is made. Since this assumption is debatable, two comments are in place. First, while the assumption of a representative firm is used, the model differs fundamentally from representative agent models, because the assumption of homogenous firms is essentially used to highlight the role of different actors and their contradictory interests. Second, empirically the question is how good an approximation is this assumption with respect to the problem at hand? Since the argument presented is centred around the adoption of shareholder value and the corresponding changes in

corporate governance, it refers to listed companies, i.e., large corporations. A huge number of firms are, or course, small and medium-sized enterprises that are not listed and to which our argument has little relevance. Thus, in the empirical test, we really test a dual hypothesis: first, that the behavioural changes took place as suggested in the corporate sector; second, that the corporate sector is big enough to make a difference in the macro-economic data.

Thus, we estimate an investment function controlling for standard variables and include a proxy for financialisation. The theory part provides the analytical basis for adding the financialisation variable. As an indicator for financialisation we shall use the interest and dividend income of the non-financial business sector divided by its value added, or, as we shall henceforth say, the 'rentiers' share of non-financial businesses' (*RSNF*). The numerator of this expression captures the rentiers' income. Note that the 'rentiers' share of the non-financial business sectors' measures the receipts from financial investment rather than financial investment itself. It is derived from the National Accounts and thus a flow magnitude that does not include revaluation of assets.

To isolate the effect of financialisation on investment, we control for other variables that effect investment decisions. Thus, we include an accelerator term, a profit term and a term for the relative cost of capital as the standard variables in the literature (see Meyer and Kuh, 1957; Jorgenson, 1971; Chirinko, 1993, as surveys).[1] Our investment equation thus is:

$$ACCU = f(CAPUT, PS, CC; RSNF) \tag{1}$$

with the expected signs being: $f_{CAPUT} > 0$, $f_{PS} > 0$, $f_{CC} < 0$, $f_{RSNF} < 0$, where *ACCU*, *CAPUT*, *PS*, *CC* and *RSNF* denote accumulation, capacity utilisation, the profit share, the relative cost of capital and the rentiers' share of non-financial businesses, respectively.

This specification is inspired by the reformulation of Post-Keynesian investment function by Marglin and Bhaduri (1990), but contains the neoclassical approach (pioneered by Jorgensen, 1963) as a special case. Keynesians argue for the importance of demand effects and the role of profits—as source of internal finance and as proxy for profit expectations—whereas neoclassical economists emphasise the role of the relative cost of capital and accept the role of output.

On the issue of internal finance, a certain convergence of Keynesians and neoclassical economists occurred in the 1980s, with market imperfections playing an important role in economic theory and the pioneering empirical work by Fazzari and Hubbard, who showed its empirical relevance in a series of firm level studies (e.g., Fazzari and Mott, 1986; Hubbard *et al.*, 1995; see Hubbard, 1998, for a survey). Since our empirical tests will refer to comparative aggregate business investment, the closest comparable works are Ford and Poret (1990) from a neoclassical perspective, and Bhaskar and Glyn (1995) and Bowles and Boyer (1995) from a Post-Keynesian perspective. A detailed comparison with these works will be given after the presentation of the empirical results.

We expect the higher rentier income of non-financial businesses to have a negative effect on their accumulation. Note that this is in contrast to the argument of firms being finance constrained as well as to the argument that financial investment by firms will increase efficiency overall. According to the first argument, the effect should be positive, rentiers' income is still income, after all. According to the second argument, we expect a positive

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[1] It has been pointed out to me in discussion that there are other factors explaining the slowdown of accumulation, such as structural changes and the shift from manufacturing to services, which have largely been ignored in the literature on investment. This paper shares this shortcoming of the literature, since a complete discussion is well beyond its scope.

effect (if firms that previously had no finance now have access to finance) or no effect (if only the allocation of investment is effected). However, we argue that this type of income is an expression of financialisation and thus has a negative effect on the desired rate of growth.

6. Data sources and econometric issues

The rate of growth of the capital stock (*ACCU*) is the growth rate of gross business capital stock. The profit share (*PS*) is gross profit share in the business sector and capacity utilisation (*CAPUT*) is the detrended capital productivity in the business sector. The data are from the OECD *Economic Outlook* database. The cost of capital measure is the (short term) interest rate times the price index of investment goods divided by the wage costs per worker (all from the OECD *Economic Outlook* database). The 'rentiers' share of the non-financial business sector' (*RSNF*) is the interest and dividend income received by non-financial businesses divided by their value added. The data were extracted from the Detailed Tables of the OECD *National Accounts*. Unfortunately, the calculation of these series is possible only for a few countries. Furthermore, the time periods for which we were able to compile the data, differ across countries. Plots of *ACCU* and *RSNF* can be found in Figure 3.

Equation (1) above abstracts from the question of units and the lag structure imposed. Since virtually all variables employed do exhibit high degrees of autocorrelation—in may cases unit root tests fail to reject the unit root hypothesis—time series issues have to be taken seriously. Unit root tests, however, are notorious for their weak power: any time series with a unit root can be approximated arbitrarily close by a trend stationary process and vice versa (this has become known as the 'near observational equivalence of trend- and difference-stationary processes' (Christiano and Eichenbaum, 1990); summarised as rules 7 and 9 in Campbell and Perron, 1991). Note, that our variables are already defined in growth rates (in the case of *ACCU*) or ratios (*CAPUT*, *RSNF*, *PS*). Intuitively, it is implausible that these variables exhibit a unit root. A difference stationary variable has no fixed mean and is thus free to wander around. The interval −5 to +10 probably captures
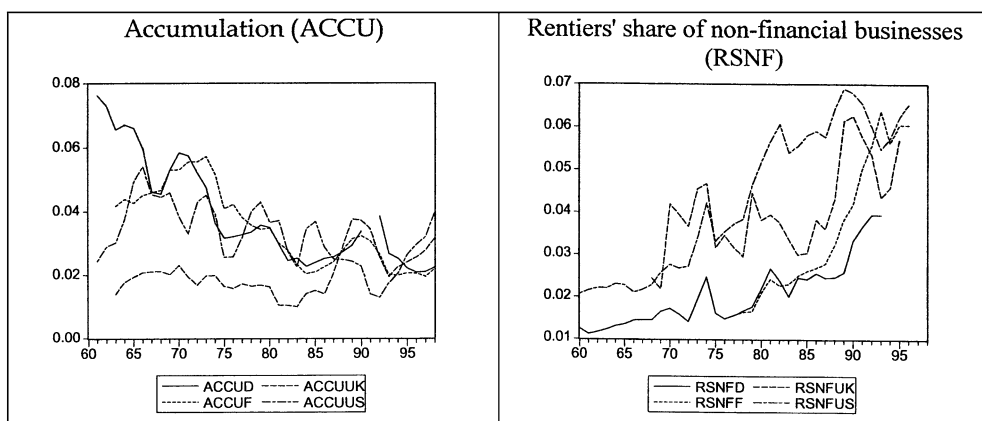
Note: Suffixes D, F, UK and US denote Germany, France, UK and USA respectively.

Fig. 3. *Left-hand side, accumulation (ACCU); right-hand side, rentier share of non-financial businesses (RSNF). Note: Suffixes D, F, UK and US denote Germany, France, the UK and the USA, respectively.*

the entire range of values that growth rates of capital stock have ever taken on, which is highly improbable for a unit root variable. Thus, we interpret the results as a high degree of autocorrelation rather than as unit roots.

Following the literature (Bhaskar and Glyn, 1995; Bowles and Boyer, 1995), we shall mostly use partial adjustment models (PAM) in the estimations. To ensure that the results are not spurious, i.e., caused by spurious correlations between unit root variables, an autoregressive distributed lag model (ADL) is also estimated. ADL models have been shown to have desirable properties even in the face of unit roots (Sims *et al.*, 1990), they 'solve many of the problems associated with spurious regressions, although tests of some hypotheses will still involve non-standard distributions' (Hamilton, 1994, 562). All explanatory variables are lagged. In the case of accumulation, this is also sensible because of the time lag between investment decision and investment expenditure. Furthermore, it prevents problems of simultaneity and inverse causation. For example, since we use last year's capacity utilisation, it cannot be influenced by this year's investment.

7. Regression results

We aim to test one specification for all countries without attempting to optimise the fit for each country. Thus, we abstain from including dummies or other country-specific variables. Rather, we examine the sensitivity of the results to changes in the time series specification and their robustness to changes in the variables. We first present a PAM model and second an ADL model, which is a more general model. Third, we test whether the measure of *CAPUT* effects the results and, fourth, rentier income and rentier payments are included separately. A second lag of the dependent variable was included in all specifications, because diagnostic tests indicated the possibility of second-order autocorrelation.

$$ACCU_t = \beta_0 + \beta_1 ACCU_{t-1} + \beta_{11} ACCU_{t-2} + \beta_2 CAPUT_{t-1}$$
$$+ \beta_4 PS_{t-1} + \beta_6 CC_{t-1} + \beta_8 RSNF_{t-1} + \varepsilon_t \tag{2}$$

Table 1 present the results of this regression of the PAM specification. Most variables have the expected signs, with two out of the three being significant for each country. Only for the USA is only one variable, *RSNF*, significant. Since the regression is in levels, and autoregressive terms are included, the R^2 are very high, with only the USA below 90%. Autocorrelation is a problem in France and the USA, even though we included two lagged variables. This may reflect missing variables. However, it is not obvious what these variables would be. Since we are dealing with regression equations where lagged dependent variables enter on the right-hand side, the critical values of the Durbin Watson statistics are invalid. Instead, the more general Godfrey–Breusch test for serial correlation is used. This test is not restricted to first-order autocorrelation.[1]

The time period under investigation, ranging from the 1960s to the 1990s covers the Golden Age as well as the neoliberal revolution starting in the late 1970s with Thatcher, Reagan and Volcker. These fundamental changes in economic policy may, of course, affect investment behaviour. Thus, Chow tests were performed to test for a structural break in 1980. These tests fail to reject the null of no structural break, i.e., they suggest the absence of a structural break.

[1] The test belongs to the class of asymptotic (large sample) tests known as Lagrange multiplier (LM) tests. Its null hypothesis is 'no serial correlation'. We shall use it to test for first-order and second-order autocorrelation.

Table 1. *Regression results: partial adjustment model*

Period	Germany 63–90	France 78–97	UK 70–96	USA 63–97
C	−0.09★★	−0.03	−0.03	0.01
	−2.44	*−0.40*	*−1.96*	*0.14*
$CAPUT_{-1}$	0.19★★	0.09	0.16★★★	−0.04
	1.98	*0.37*	*3.43*	*−0.67*
PS_{-1}	0.001★★	0.001	0.000	0.002
	2.00	*1.13*	*−0.08*	*1.63*
$RSNF_{-1}$	0.13	−0.21	−0.22★★	−0.37★★★
	0.40	*−1.71*	*−2.38*	*−3.67*
CC_{-1}	−0.001	−0.001	0.000	0.000
	−1.43	*−1.25*	*−0.70*	*0.04*
$ACCU_{-1}$	0.72★★★	0.68	0.93★★★	0.84★★★
	3.07	*1.52*	*5.19*	*3.48*
$ACCU_{-2}$	−0.25★	−0.05	−0.17	−0.40★★
	−1.69	*−0.19*	*−0.90*	*−2.69*
R-squared	0.96	0.94	0.90	0.82
Adjusted *R*-squared	0.95	0.91	0.88	0.79
GB Obs. R^2	1.08	6.02★	.89	6.55★★
Chow Breakpoint Test 1980				
F-stat.	1.22		1.00	0.67
Prob.	*0.35*		*0.48*	*0.69*

Calculations performed with Eviews. Italic numbers are *t*-values, unless noted otherwise.
*, ** and *** denote significance at 10, 5 and 1%, respectively.
GB is the Godfrey–Breusch test for autocorrelation.

Correlation among explanatory variables, unsurprisingly given the number of variables we employ, is a problem. Defining high correlation somewhat arbitrarily as a correlation coefficient higher than 0.8 (Kennedy, 1992, p. 180), *PS* is correlated with *RSNF* and *CC* in France. *CAPUT* and *RSNF* are correlated in Germany. *CAPUT* is highly correlated with past *ACCU* in both Germany and France. This may inflate the estimated standard errors.

The autoregressive term is statistically significant in three of the four countries. *RSNF*, our proxy for financialisation, has the expected sign and is statistically significant at the 5% level in two countries (UK, USA) and in France at the 11% level. It has a negative sign and is statistically insignificant in Germany. The control variables perform modestly well, which is not unusual for comparative investment regressions (Ford and Poret, 1991). *CAPUT* has the expected sign three times and is statically significant at the 5% level twice. *PS* also has the expected sign three times, but is statistically significant only once. Only *CC* exhibits the 'wrong' sign three times and is not significant at all.

We also tested whether the results were due to our somewhat unconventional measure of capacity utilisation. This is clearly not the case. We used the output gap and the rate of growth of business sector output, both of which confirmed the results that we obtained with capital productivity.

Table 2 summarises the regression results of a reparameterised ADL model. It contains all variables in levels as well as in differences and is intended to check whether the PAM is a plausible special case of the general ADL.

Table 2. *Regression results: ADL model*

Period	Germany 63–90	France 79–97	UK 71–96	USA 63–97
Const.	−0.13	0.01	−0.03	−0.04
	−2.79	*0.04*	*−1.33*	*−0.61*
$ACCU_{-1}$	0.85★★★	0.33	0.96★★★	0.71★★★
	2.50	*0.49*	*4.30*	*2.65*
$ACCU_{-2}$	−0.60★	0.31	−0.09	−0.37
	−1.89	*0.64*	*−0.38*	*−1.42*
$CAPUT_{-1}$	0.31★★	−0.01	0.14★★	0.07
	2.36	*−0.02*	*2.32*	*0.72*
$\Delta CAPUT_{-1}$	−0.153	0.195	0.182	0.039
	−0.82	*0.56*	*1.36*	*0.39*
PS_{-1}	0.001★	0.001	0.000	0.001
	1.84	*0.91*	*−0.37*	*0.48*
ΔPS_{-1}	0.00	0.00	0.00	0.00
	0.33	*−0.44*	*0.26*	*0.99*
$RSNF_{-1}$	0.36	−0.31	−0.16	−0.30★
	0.77	*−1.57*	*−1.09*	*−1.91*
$\Delta RSNF_{-1}$	−0.13	0.19	0.03	0.39
	−0.27	*0.83*	*0.23*	*1.06*
CC_{-1}	0.000	−0.001	0.000	0.001
	−0.62	*−1.20*	*0.79*	*0.89*
ΔCC_{-1}	0.000	0.000	0.000	−0.001★
	−0.78	*0.41*	*−1.25*	*−1.72*
R-squared	0.97	0.94	0.93	0.86
Adj. R-squared	0.95	0.86	0.88	0.79
GB obs. R^2	2.45	6.63★★	0.61	6.72★★

Calculations performed with Eviews. Italic numbers are *t*-values, unless noted otherwise.
★, ★★ and ★★★ denote significance at 10, 5 and 1%, respectively.
GB is the Godfrey–Breusch test for autocorrelation.

$$ACCU_t = \beta_0 + \beta_1 ACCU_{t-1} + \beta_{11} ACCU_{t-2} + \beta_2 CAPUT_{t-1} + \beta_3 \Delta CAPUT_{t-1}$$
$$+ \beta_4 PS_{t-1} + \beta_5 \Delta PS_{t-1} + \beta_6 CC_{t-1} + \beta_7 \Delta CC_{t-1} \qquad (3)$$
$$+ \beta_8 RSNF_{t-1} + \beta_9 \Delta RSNF_{t-1} + \varepsilon_t$$

We regard the ADL model as a starting point to narrow down the number of parameters. The *t*-values reported are free of spurious correlation problems arising from unit roots. However, they do suffer from multicollinearity, since we have ten variables included. The information we wish to extract from the ADL model is whether the variables should be included in levels or in differences. With respect to this question, the results are somewhat ambiguous, but strongly suggestive, if we take the higher *t*-value as the indicator: *T*-values are higher for levels rather than differences for all countries for *RSNF*, and three times for *CAPUT* and *PS*. Only for *CC* do we have an indication that differences may be the more appropriate specification, *t*-values for differences are three times higher than for levels.

Compared with the PAM specification, the coefficient estimates of *RSNF* experience, like the other estimates, a drop in their *t*-values, but do not vary greatly. They keep their signs and stay within the same order of magnitude. Thus, the parameter estimates of the PAM specification are not due to spurious regression results.

It is conceivable that *RSNF* is dominated by nominal interest rates and thus by monetary policy. In consequence, *RSNF* may be a proxy for central bank engineered recessions. however, since the regression already controlled for *CC* and *CAPUT*, this is not likely. To ensure the robustness of the results, further tests were performed.

Table 3 reports the results of this regression with output growth of the business sector (GROWTH) instead of *CAPUT* and including *CC* in difference form. Few changes compared with the earlier regression can be reported. Autocorrelation problems decrease, but are still present in the USA. There is no indication of a structural break. Note that output growth performs worse than capacity utilisation. Its significance is very sensitive to the lags in accumulation. It is significant only in the UK. Other parameter estimates are hardly affected. *CC* ceases to be significant in Germany but turns significant in the UK. *RSNF* remains highly significant in France and the USA. Therefore the significance of financialisation does not rest on the specification of capacity utilisation.

While we reject second-order autocorrelation in this specification for both France and the USA, we do so by a very thin margin. Since autocorrelation was a persistent problem for these countries in earlier specifications, we tested whether our findings are related to second-order autocorrelation. (First-order autocorrelation does not seem to be a problem.) A first suspicion is, of course, that this indicates missing variables. We therefore experimented with adding more lagged variables, but this did not cure autocorrelation. Finally we resorted to the rather crude method of including the second lag of the error of the OLS estimate. This does not affect the significance of the coefficient on *RSNF*.

Table 3. *Regression specification with output growth*

Period	Germany 63−90	France 78−97	UK 70−96	USA 63−97
Const.	−0.03*	−0.02	0.00	0.01
	−1.85	*−1.67*	*−0.03*	*0.40*
$GROWTH_{-1}$	−0.01	0.02	0.08**	0.08
	−0.11	*0.31*	*2.52*	*1.24*
PS_{-1}	0.0012**	0.0011**	7.E−05	0.000
	2.42	*2.38*	*0.10*	*0.24*
$RSNF_{-1}$	−0.22	−0.32***	−0.04	−0.22***
	−0.83	*−2.66*	*−0.34*	*−2.45*
ΔCC_{-1}	−0.0004	0.0004	−0.0003**	−0.001
	−1.12	*0.61*	*−1.71*	*−1.47*
$ACCU_{-1}$	1.13***	0.49	1.18***	0.75
	4.26	*1.13*	*6.63*	*3.09*
$ACCU_{-2}$	−0.36	0.18	−0.28	−0.22
	−1.60	*0.52*	*−1.45*	*−0.99*
R^2	0.96	0.93	0.89	0.84
Adj. R^2	0.94	0.90	0.85	0.80
BG obs. R^2	2.16	4.11	1.1	4.45
Chow Breakpoint Test 1980				
F-stat.	1.01		1.43	1.25
Prob.	*0.46*		*0.28*	*0.32*

Calculations performed with Eviews. Italic numbers are *t*-values.
*, ** and *** denote significance at 10, 5 and 1%, respectively.
GB is the Godfrey–Breusch test for autocorrelation.

The parameter estimates and statistical significance of *RSNF* do not depend on how the cost of capital is measured. Using nominal (long-term) interests instead of *CC* in fact improves the results of the coefficient for *RSNF*, which is statistically significant at least at the 5% level in UK and USA and at the 10% level in France.

From an internal finance point of view, it may be surprising that rentiers' *income* should affect accumulation in a negative way. If firms were finance constrained, it should rather increase accumulation. This concerns the core of our argument, which implies that firms (on average) are not constrained by finance (profits are high), but their priorities make them choose not to invest. However, it might be that our measure of financialisation, *RSNF*, is picking up increased *rentier payments* which in fact rose in parallel with *rentier income*. To control for this, we included rentier payments as well as rentier income. If the significance of *RSNF* were due to its correlation with payments, we should expect payments to have a negative sign and *RSNF* to switch to a positive sign.

The results, summarised in Table 4, are interesting. *RPNF*, the rentier payments (divided by the value added) of the business sector, are not significant, but close to the 10% level in France and the UK, both with a negative sign, as expected. *RSNF* does lose significance but keeps its sign in France and the USA, in both countries being close to the 10% level. It is not overly surprising that none of the two variables are significant, because they are highly correlated (the correlation coefficient is 0.75 for Germany and above 0.9 for all other countries). Note that for both France and the USA, the *t*-value is greater for *RSNF* than for *RPNF*. From this, we conclude that *RSNF* does play an independent role. As in previous specifications, autocorrelation problems exist in France and the USA.

Table 4. *Regression specification including rentiers payments*

Period	Germany 63–90	France 78–97	UK 70–96	USA 63–97
Const.	−0.11***	−0.02	−0.06***	0.00
	−2.71	*−0.31*	*−3.66*	*−0.05*
$CAPUT_{-1}$	0.25**	0.03	0.20***	−0.01
	2.26	*0.14*	*4.01*	*−0.23*
PS_{-1}	0.0013	0.0012**	0.0003	0.0012
	1.21	*2.88*	*0.60*	*1.04*
$RPNF_{-1}$	−0.03	−0.11	−0.14	0.08
	−0.22	*−1.47*	*−1.44*	*0.35*
$RSNF_{-1}$	0.20	−0.23	0.04	−0.41
	0.65	*−1.62*	*0.21*	*−1.40*
ΔCC_{-1}	−0.0007**	0.0007	−0.0003	−0.0006
	−2.22	*0.94*	*−1.67*	*−1.20*
$ACCU_{-1}$	0.82***	0.32	0.85***	0.95***
	3.55	*0.59*	*4.64*	*4.60*
$ACCU_{-2}$	−0.47***	0.26	−0.06	−0.46***
	−2.81	*0.82*	*−0.29*	*−2.95*
R^2	0.97	0.94	0.92	0.83
Adj. R^2	0.95	0.91	0.89	0.79
GB Obs. R^2	1.32	8.25**	2.57	6.69**

Calculations performed with Eviews. Italic numbers are *t*-values.
*, ** and *** denote significance at 10, 5 and 1%, respectively.
GB is the Godfrey–Breusch test for autocorrelation.

8. Interpretation and comparisons with other investment studies

Leaving aside the question of financialisation for a moment, how do these results overall compare with the existing literature on investment functions? In brief, they mostly confirm it. First, and unfortunately, we confirm that standard variables have problems in explaining investment and that lagged investment itself may, in fact, explain most of current investment. Second, and more encouraging, the standard variables do play a role: roughly half of the time they are significant with the expected sign. Third, and most surprising, the accelerator term does not perform better than other variables. This, at first sight, contradicts previous findings. It is due to the fact that two lags of investment were included. This is consistent with findings by Ford and Poret (1991). Nonetheless, changes in capacity utilisation still by far explain most of the short-run changes in accumulation. Multiplying the standard deviation of each variable by the corresponding parameter estimate gives by far the highest value for *CAPUT*. Fourth, the importance of past profits is confirmed. Even though the second lag in accumulation also decreases their significance, internal finance is statistically significant in many specifications. Fifth, the cost of capital has only a limited influence. Only in one country, Germany, is it consistently significant; in all others it is not.

We note the following pattern regarding countries: Germany conforms to the standard model of investment: capacity, profits and the cost of capital are statistically significant, our variable of financialisation is not. In France, the profit share and the rentiers' share of non-financial businesses are consistently significant. In the UK, capacity utilisation is significant and, depending on the specification, the *RSNF* is too. In particular, including *CC* in differences rather than levels has an adverse effect on the significance of *RSNF*. In the USA, *RSNF* is the only consistently significant variable; the profit share is sometimes. Are these findings consistent with our story on financialisation? The lack of significance for Germany certainly is, since the literature regards Germany as a latecomer in the development of shareholder value and our time series for Germany ends in 1990 (to avoid the statistical problems of unification).

Our tests can hardly be conclusive of our hypothesis that financialisation has caused a reduction in accumulation rates, but they certainly provide strong initial support. The variable for financialisation, *RSNF*, fares as well as any standard variable in investment regressions. It is robust to changes in the specification, especially with respect to how we measure capacity utilisation. However, some caveats apply. There are technical problems such as multicollinearity and some degree of autocorrelation for some countries. However, *RSNF* remains significant once autocorrelation is controlled for. But probably more importantly, the general results of our investment function are not overwhelming, though certainly not worse than many other studies. While we may have made some contribution to explaining the recent slowdown in accumulation, investment remains the bane of empirical macroeconomics.

Finally, we want to point out some technical differences to Bhaskar and Glyn (1995) and Bowles and Boyer (1995), who provide empirical tests of the Marglin–Bhaduri investment function. All of them adopt a partial adjustment model. Thus, there is no difference in the time series specification,[1] except for the second lag of the dependent variable. Unlike the

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[1] Bowles and Boyer (1995) do add a time trend, which we do not. Their approach may be appropriate if one is interested in short-run effects. In a more long-run analysis, it is hard to interpret the time trend. Unsurprisingly, Bowles and Boyer do encounter high autocorrelation problems. In most of our specifications, a time trend is not statistically significant and does not effect the significance of *RSNF*.

previous literature, we derive the specification from a more general ADL model and test robustness. Bhaskar and Glyn (1995) also test for cointegration, but this is inappropriate in the context of a partial adjustment model.[1] There are some differences in the variables used. Bahskar and Glyn (1995) use a somewhat different measure of the cost of capital (they adjust for technical progress via a Solow residual), and Bowles and Boyer (1995) use the employment rate as the measure of capacity utilisation.[2] Thus, the only substantial difference is that we include a variable for the rentiers income.[3]

9. The economic significance of financialisation

So far, we have been concerned with the statistical significance of our measure of financialisation. Next, we wish to investigate its economic significance (McCloskey and Ziliak, 1996), or in other words: To what extent can we explain the slowdown in accumulation from the late 1960s to the early 1990s as the result of financialisation? To answer this question, Table 5 summarises the coefficient estimates for the autoregression of *ACCU* and the coefficient estimates for *RSNF*.

Taking the mean from the values above, we can calculate the long-run effect of the change in the rentier share of non-financial businesses on capital accumulation. The long-run effect of a change in the rentier share is the regression coefficient divided by one minus the autoregressive coefficients. Multiplying this by the change in the rentier share (column '$\Delta RSNF$'), we get the explained change in accumulation (column 'explained $\Delta ACCU$'), which we contrast with the actual change in accumulation (column 'actual $\Delta ACCU$'). The changes refer to the differences between the average of the period 1964–74 and of the period 1985–94 (or the closest value we had).

Unsurprisingly, this value varies greatly between countries. For Germany, where most coefficient estimates for *RSNF* were positive, we calculate a positive contribution to accumulation. For France, we explain almost the entire slowdown in accumulation. The UK is the only country where there was no slowdown in accumulation. Note that our 'explained $\Delta ACCU$' for the UK is about as high as for France. Thus, even though the coefficient estimates for UK were not *statistically* significant, they are *economically* significant, i.e., if the point estimates were correct, *RSNF* would have a strong impact on accumulation. In the USA, we roughly explain a third of the reduction in accumulation. Taking the mean of the various coefficients for individual countries, we explain the entire slowdown of accumulation from the late 1960s to the late 1980s (as can be seen by comparing the columns explained with actual $\Delta ACCU$).

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[1] First, we have argued that there are theoretical reasons to assume that accumulation is I(0) rather than I(1). Second, even if accumulation were I(1) testing for cointegration in a partial adjustment model is meaningless: since an I(1) variable by definition is, technically speaking, cointegrated with its lagged value, i.e., there exists a linear combination that is I(0), and the partial adjustment model includes a lagged value of the dependent variable, the resulting error term has to be I(0). Finally, they use incorrect critical values (ADF critical values differ for a unit root test and cointegration tests).

[2] This is motivated by their purpose to estimate the effects of redistribution. Unemployment thus captures the disciplinary effect of capacity utilisation on wages. For our purpose and context, i.e., European unemployment, this is unacceptable. However, since the slowdown in accumulation changes the link between unemployment and capacity utilisation. Unemployment is therefore a bad measure of capacity.

[3] In terms of the Marglin–Bhaduri model, this represents a shift variable for autonomous investment expenditures. Thus, our results regarding financialisation suggest an interpretation of the end of the Golden Age that differs from the one given by Marglin and Bhaduri (1990) themselves. Rather than adverse changes in the profit and capacity sensitivity of investment demand, the financialisation story suggests a decease in autonomous investment.

Table 5. *Summary of the coefficients on the lagged dependent variable and RSNF from various specifications*

	France	Germany	UK	USA
Autoregressive terms of ACCU				
ADL	0.64	0.25	0.85	0.34
PAM	0.7	0.35	0.73	0.41
With growth	0.67	0.77	0.9	0.53
Mean	*0.67*	*0.46*	*0.83*	*0.44*
Coefficient on RSNF				
ADL	−0.31	0.36	−0.16	−0.3
PAM	−0.21	0.13	−0.22	−0.37
With growth	−0.32	−0.22	−0.04	−0.22
Mean	*−0.32*	*0.09*	*−0.12*	*−0.27*

Note: ADL and PAM denote autoregressive distributive lag model (table 1) and partial adjustment model (Table 2), respectively. 'With growth' refers to the PAM specification with GDP growth instead of *CAPUT* (Table 3).

Table 6. *Explaining the slowdown in accumulation*

	Reg. coeff β_{RSNF}	Autoreg. coeff β_{ACCU}	$\Delta RSNF$	Long-run effect $\bar{\beta}_{RSNF}$	Explained $\Delta ACCU$	Actual $\Delta ACCU$
Germany	0.09	0.5	0.015	0.18	0.003	−0.021
France	−0.28	0.65	0.026	−0.8	−0.021	−0.027
UK	−0.14	0.84	0.034	−0.88	−0.030	0.005
USA	−0.3	0.44	0.015	−0.54	−0.008	−0.023
Mean	−0.24	0.64	0.025	−0.67	−0.017	−0.015

Note. $\Delta RSNF$ and $\Delta ACCU$ are the difference between average rates 65–74 and 85–94.

Thus, while on the average, the story that increased financial investment caused the slowdown in accumulation can be substantiated, our calculations for individual countries vary in plausibility. The calculations certainly do confirm that financialisation potentially played an important role in reducing investment.

10. Conclusion

The paper developed and tested a theory, arguing that financialisation leads to a slowdown in accumulation. By means of an elaboration on earlier Post-Keynesian theories of the firm, we showed how the 'shareholder revolution', i.e., the development of a market for corporate control and the reorientation of management priorities along the lines of creating shareholder value, leads to a reduction in the growth rate desired by firms. Managers have various goals in running a firm; in particular, growth is an intrinsic goal and maximising profits is not the exclusive goal, whereas shareholders will exclusively be interested in profits. Bodies of literature as diverse as business history (Chandler), post-Keynesians (Galbraith, Eichner) and recent management literature (Baker and Smith) agree on these

stylised facts, implying that the firm faces a trade-off between growth and profits. The shareholder revolution included a market for corporate control, i.e., the possibility of firing managers, and performance-related pay schemes. These institutional changes will lead managers to adopt management policy closer to shareholders' preferences, i.e., profitability will gain in weight relative to growth. If the firm in fact faces a trade-off between profits and growth, this translates into lower investment activity.

The empirical tests were performed with annual data for the business sector for Germany, France, the UK and the USA. The findings show some support for the hypothesis that financialisation caused a slowdown in accumulation. We found strong support for our hypothesis in the USA and France, some support in the UK, but none in Germany. Financialisation occurred in the UK, but there was no general slowdown in accumulation because the UK already had rather low accumulation rates in the Golden Age. The insignificant findings for Germany are consistent with our story, since the literature indicates that shareholder value orientation is a very new phenomenon in Germany. We did perform tests for robustness and experimented with the lag structure, which showed that the results are robust.

We conclude that financialisation is likely to have the effects implied by our theory, but further research is needed to confirm the findings. On a macroeconomic level, a systems approach would be desirable to endogenise capacity utilisation and, on a microeconomic level, it would be fruitful to test our underlying model, e.g., one could control for factors such as the pay scheme of managers. Nonetheless, if our parameter estimates come close the actual effects, this has strong implications. For France, financialisation explains the entire slowdown in accumulation, for the USA about one-third of the slowdown. Financialisation, therefore, can potentially explain an economically significant part of the slowdown in accumulation.

Our analysis does not lend itself to straightforward policy conclusions, rather it suggests that changes in financial markets and organisational structures in the firm have to be discussed simultaneously. Regulation of financial markets and the empowerment of growth interested groups within the firm should go hand in hand. But organisational changes will take time. Therefore, if investment is to be increased in the short run, public investment may be a more effective way to do so.

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Appendix

Variable	Definition	Source
ACCU	Growth rate of gross business sector capital stock	OECD *Economic Outlook* database
CAPUT	Capital productivity in the business sector: GDP of the business sector/ gross capital stock of the business sector	OECD *Economic Outlook* database
Growth	Growth real business sector GDP	OECD *Economic Outlook* database
PS	Profit share in the business sector	OECD *Economic Outlook* database
CC	Relative cost of capital: deflator of capital goods plus short-run interest rate/real wage costs	OECD *Economic Outlook* database
RSNF	Interest and dividend income of non-financial businesses/value added of non-financial businesses	OECD *National Accounts*, vol. II database
RPNF	Interest and dividend payments of non-financial businesses/value added of non-financial businesses	OECD *National Accounts*, vol. II database