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FINANCIALIZATION AND THE SLOWDOWN OF ACCUMULATION

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Abstract

Over the past decades financial investment of non-financial businesses has been rising and accumulation of capital goods has been declining. The first part of the paper offers a novel theory to explain this phenomenon. Financialization, 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 financialization is tested econometrically by means of a time series analysis of aggregate business investment for USA, UK, France, and Germany. Extensive test of robustness are performed. For the first three countries evidence that confirms the negative effect of financialization on accumulation is found.

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Keywords

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JEL

E2, D2, G2

1. Introduction

The past decades have witnessed at the same time a rise in investments in financial assets and 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 to other economic actors, 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).

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

Financialization 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 agreed upon definition since it includes phenomena ranging from the globalisation of financial markets, the shareholder value revolution and the rise of incomes from financial investment (see Arrighi 1994, Chesnais 1997, various papers in the special issue of *Economy and Society* 2000, and Dumenil and Levy 2000 as important contributions). For the purpose of this paper we define financialization as the increased activity of non-financial businesses on financial markets and measure it by the corresponding income streams. The paper will argue that the process of financialization is linked to changes in the internal power structure of the firm. We base our analysis on a post-Keynesian¹ theory of the firm, distinguishing between workers, management

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 that is successful in combining post-Keynesian micro- 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.

and rentiers (shareholders). The "managerial capitalism" of the post-war era was characterised by relatively autonomous management that had a certain preference for growth (as opposed to profits). Through the shareholder revolution, its interests got 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, than such a change will lead to lower investment on the firm level. The theoretical parts of the paper elaborate this argument and its empirical parts test the influence of financialization of aggregate business investment econometrically.

The paper is structured as follows: 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 financialization. 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 financialization to the slowdown of accumulation. Section 10 concludes.

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 will 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 three social categories correspond: workers, (industrial) capitalists and rentiers. In the production 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.²

² 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 will 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.

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 proven 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 different types of income (as most people in fact do) (this fact is well known and debated among Marxists, e.g. Resnick and Wolff 1986, 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 rentier in the evening and on weekends living of 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 rentiers 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.

3. The post-Keynesian theory of the firm

What distinguishes the post-Keynesian approach to the firm from the simple version of the neo-classical 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 neo-classical models. The entire argument presented here can be reformulated in a neo-classical 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.³ 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 summarized 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 will propose a way to do so in the next section. Here we will 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 the absentee owners. While the latter are primarily interested in dividends and share prices, the former aspire power and prestige, that might be expressed in high market share and fast growth, luxurious offices and many subordinates. Due 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: "The objective of growth, rather than the consumption of profit, is predominant." (Lavoie 1992, 104).

It is important to note that such an institutional arrangement is historically specific to the post-war era. Doing some violence to actual historical complexity, we can say, that in the early 19th century many firms were owner controlled, a situation which had changed by the late 19th century when a wave of mergers led 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 labelled "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

³ 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).

fortifying 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, 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 the 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 managers and owners respectively.

$$U_M = U(g)$$

$$U_O = U(r)$$

where g investment or growth of the firm
r profitrate

These assumption are certainly unrealistic in their extreme form, but they simplify the presentation. All that is needed for the argument developed later is that management cares more about growth than owners.

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 neo-classical economists over the past decades after Miller and Modigliani (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.

$$\text{finance constraint: } g^{FC} \leq g(r) \quad \text{with } g' > 0$$

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 does harm future profits (the fact that current distributed profits and current investment expenditures are inversely related is trivial). This can be argued by start up costs of investment or by increasing managerial costs of fast growth (known as 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, 17; emphasis added). To be fair, this is not the only manifestation given, but the existence such a trade off is obviously implied.

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

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

Again this is a constraint that needs not be binding, but if the only variables that matter to management are growth and profits, as we will 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 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 feasible and g feasible.

insert figure 1 about here

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, 101f). This pursuit of power can only be successful if the firm is big, thus 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, 108). Overall, "In the Galbraithian and post-Keynesian firm, shareholders play a purely passive role" (Lavoie 1992, 107). Again, we insist that rentiers are unlikely to content themselves to such a passive role voluntarily. Rather it is specific historic circumstances, of the Golden Age regime where an interventionist state purposefully restricted the role of finance.

4. Financialization and management priorities

In the course of the 70s two institutional changes occurred that 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 is the carrot. Both have proven fairly effective in making management adopting shareholders' priorities and "profoundly altered patterns of managerial power and behaviour." (Baker and Smith 1998, 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 80s "the pendulum could swing back toward financial capitalism, which would limit managerial discretion in favour of more rigorous exploitation of corporate resources" (Baker and Smith 1998, 22). Marxists would probably agree but be more specific in saying "... 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, 18)

Both arguments are consistent with our post-Keynesian theory of the firm. 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)

insert figure 2 here

The new chosen growth-profit combination will exhibit higher profits and lower growth (figure 2). In the extreme case of perfect assimilation of managers by shareholder, they will adopt a vertical indifference curve and chose the profit maximising point. In 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 identify increasingly as rentiers and hence will also behave as such. We would expect higher dividend payout, lower growth and more financial investment of 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, Naumann and Rupp (2000).

5. The regression specification

The hypothesis of this paper is that financialization 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 financialization. The consequence of this is that management and thus non-financial business should become more rentiers-like, which among other things, means that they have less 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. Therefore, one has to be careful in interpreting the results. We cannot directly estimate the model developed, rather we estimate an investment function controlling for standard variables and include a proxy for financialization. The theory part merely provides the analytical basis for adding the financialization variable.

As an indicator for financialization we will use the interest and dividend income of the non-financial business sector divided by its value added, or, as we will 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. Since we defined classes by income types this is the proper indicator for our purposes.

To isolate the effect of financialization 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; and Chirinko 1993 as surveys). Our investment equation thus is:

$$ACCU = f(CAPUT, PS, CC; RSNF) \quad (1)$$

with the expected signs being: $f_{CAPUT} > 0, f_{PS} > 0, f_{CC} < 0, f_{RSNF} < 0$

where ACCU	accumulation
CAPUT	capacity utilisation
PS	profit share
CC	relative cost of capital
RSNF	rentiers' share of non-financial businesses

This specification is inspired by the reformulation of post-Keynesian investment function by Marglin and Bhaduri (1990), but contains the neo-classical approach (pioneered by Jorgensen 1963) as a special case. Keynesians argue for the importance demand effects and the role of profits –as source of internal finance and as proxy for profit expectations- , whereas neo-classical 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 neo-classical economists has 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, Kashyap and Whited 1995; see Hubbard 1998 as a survey). Since our empirical tests will refer

to comparative aggregate business investment, the closest comparable works are Ford and Poret (1990) from a neo-classical 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 higher rentiers 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 overall increase efficiency. 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 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 the financialization 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 data set. 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 data set). 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 below.

insert figure 3 here

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 many 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 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 will 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, Stock, Watson 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 at testing one specification for all countries without attempt 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 renters income and renters 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.

$$\begin{aligned}
 ACCU_t = & \mathbf{b}_o + \mathbf{b}_1 ACCU_{t-1} + \mathbf{b}_{11} ACCU_{t-2} + \mathbf{b}_2 CAPUT_{t-1} \\
 & + \mathbf{b}_4 PS_{t-1} + \mathbf{b}_6 CC_{t-1} + \mathbf{b}_8 RSNF_{t-1} + \mathbf{e}_t
 \end{aligned} \tag{2}$$

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.

insert table 1 here

Since the regression is in levels and autoregressive terms are included, the R2 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.⁴

Correlation among explanatory variables, unsurprisingly given that number of variables we employ, is a problem. Defining high correlation somewhat arbitrarily as a correlation coefficient higher than .8 (Kennedy 1992, 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 financialization, has the expected sign and is statistically significant at the 5% level in

⁴ 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 will as a standard test for first and second order autocorrelation. We still report the DW statistics because, even though its critical values do not apply, its value usually gives a good first idea of how serious autocorrelation problems are.

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 got with capital productivity.

Table 2 summarises the regression results of a reparameterized 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.

$$\begin{aligned}
 ACCU_t = & \mathbf{b}_o + \mathbf{b}_1 ACCU_{t-1} + \mathbf{b}_{11} ACCU_{t-2} + \mathbf{b}_2 CAPUT_{t-1} + \mathbf{b}_3 \Delta CAPUT_{t-1} \\
 & + \mathbf{b}_4 PS_{t-1} + \mathbf{b}_5 \Delta PS_{t-1} + \mathbf{b}_6 CC_{t-1} + \mathbf{b}_7 \Delta CC_{t-1} + \mathbf{b}_8 RSNF_{t-1} + \mathbf{b}_9 \Delta RSNF_{t-1} + \mathbf{e}_t
 \end{aligned} \quad (2)$$

insert table 2 here

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 higher than for levels three times.

Compared to 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 and signs stay within the same order of magnitude. Thus, the parameter estimates are not due to spurious regression results.

insert table 3 here

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 to the earlier regression can be reported. Autocorrelation problems decrease, but are still present in the USA. 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 financialization 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 effect significance of the coefficient on RSNF.

From a 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 that 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 financialization, RSNF, is picking up increased rentiers *payments* which in fact rose in parallel with rentiers *income*. To control for this, we included rentiers payments as well as rentiers income. If the significance of RSNF

were due to its correlation with payments, we would expect payments to have a negative sign and RSNF to switch to a positive sign.

insert table 4 here

The results are interesting. RPNF, the rentiers 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 .75 for Germany and above .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.

8. Interpretation and comparisons with other investment studies

Leaving aside the question of financialization for a moment, how do these results overall compare to the existing literature on investment functions? In short, 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 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 with 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 financialization 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 financialization? The lack of significance for Germany certainly is, since the literature regards Germany as a late comer 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 financialization has caused a reduction in accumulation rates, but they certainly provide strong initial support. The variable for financialization, RSNF, fares as good 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 like multicollinearity and some degree of autocorrelation for some countries. However, RSNF remains significant once autocorrelation is controlled for. But probably more important, 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,⁵ except for the second lag of the dependent variable. Unlike the 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

⁵ 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.

partial adjustment model.⁶ 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.⁷ Thus the only substantial difference is that we include a variable for the rentiers income.⁸

9. The economic significance of financialization

So far we have been concerned with the statistical significance of our measure of financialization. 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 financialization? To answer this question table 5 below summarises the coefficient estimates for the autoregression of ACCU and the coefficient estimates for RSNF.

insert table 5 here

Taking the mean from the values above, we can calculate the long run effect of the change in the rentiers share of non-financial businesses on capital accumulation. The long run effect of a change in the rentiers share is the regression coefficient divided by one minus the autoregressive coefficients. Multiplying this by the change in the rentiers share (column "ΔRSNF"), we get the explained change in accumulation (column "explained ΔACCU"), which

⁶ 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)

⁷ This is motivated by their purpose to estimate the effects of redistribution. Unemployment thus captures the disciplinary effect of capacity utilization 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 utilization. Unemployment is therefore a bad measure of capacity.

⁸ In terms of the Marglin-Bhaduri model this represents a shift variable for autonomous investment expenditures. Thus, our results regarding financialization 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 financialization story suggest a decrease in autonomous investment.

we contrast with the actual change in accumulation (column "actual ΔACCU "). 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).

insert table 6 here

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 ΔACCU " 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 and actual ΔACCU).

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 financialization potentially played an important role in reducing investment.

Conclusion

The paper developed and tested a theory arguing that financialization leads to a slowdown in accumulation. By means of an elaboration on earlier post-Keynesian theories of the firms, 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, UK, and the USA. The findings show some support for the hypothesis that financialization caused a slowdown in accumulation. We found full support for our hypothesis in the USA and France, some support in the UK, but none in Germany. Financialization occurred in the UK, but there is no general slowdown in accumulation because the UK already had very 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. The results are robust.

We conclude that financialization 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 endogenize capacity utilisation and on a microeconomic level it would be fruitful to test our underlying model, e.g. one could control for factors like the pay scheme of managers. Nonetheless, if our parameter estimates come close the actual effects this has strong implications. For France financialization explains the entire slowdown in accumulation, for the USA about on third of the slowdown. Financialization 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 on 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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Figure 1 Preferences and constraints in a managerial firm

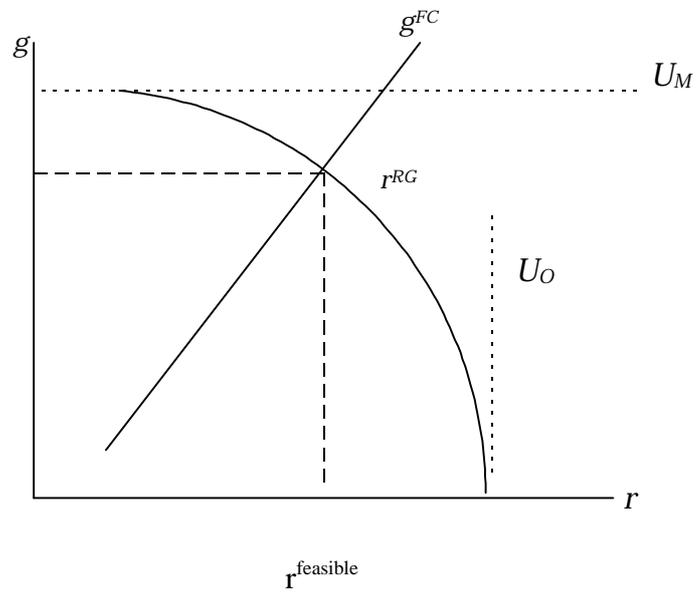


Figure.2 Preferences and constraints in the shareholder dominated firm

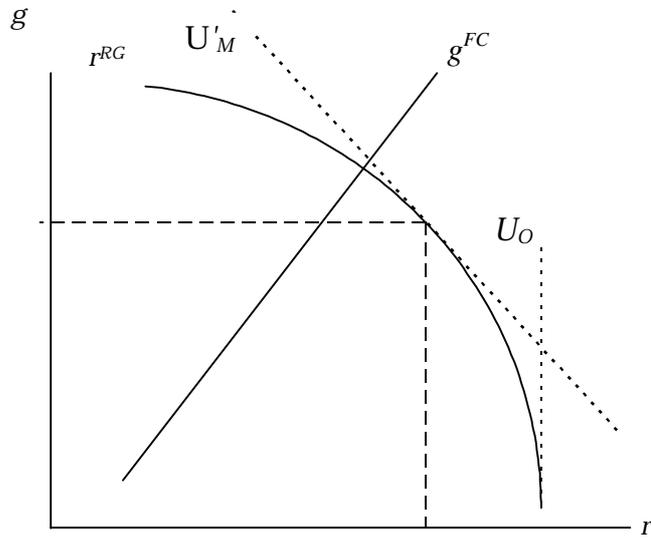


Figure 3

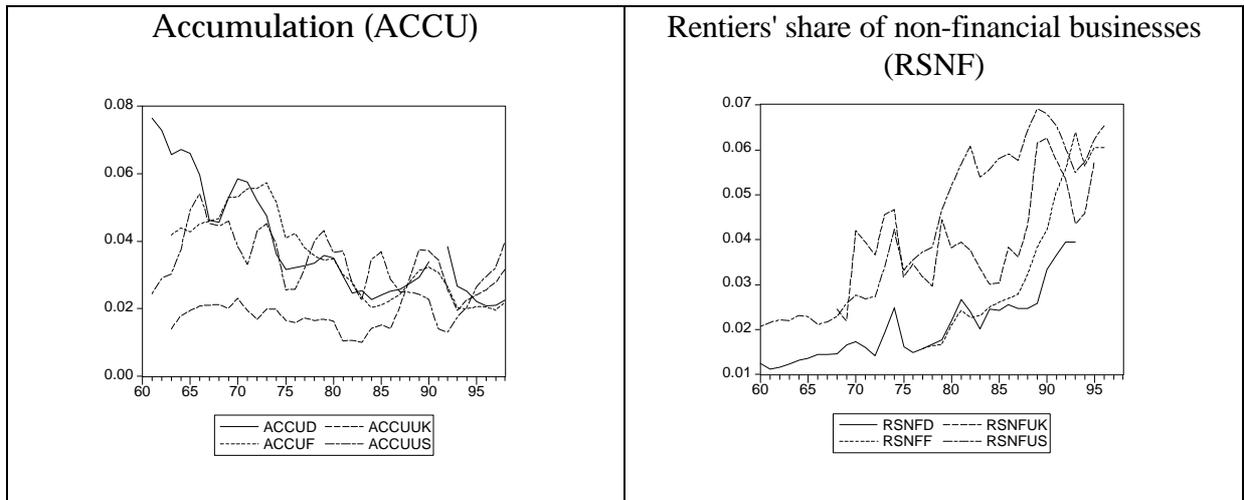


Table 1 Regression results: partial adjustment model

period	Germany 63-90	France 78-97	UK 70-96	USA 63-97
C	-0.09 ** <i>-2.44</i>	-0.03 <i>-0.40</i>	-0.03 <i>-1.96</i>	0.01 <i>0.14</i>
CAPUT ₋₁	0.19 ** <i>1.98</i>	0.09 <i>0.37</i>	0.16 *** <i>3.43</i>	-0.04 <i>-0.67</i>
PS ₋₁	0.001 ** <i>2.00</i>	0.001 <i>1.13</i>	0.000 <i>-0.08</i>	0.002 <i>1.63</i>
RSNF ₋₁	0.13 <i>0.40</i>	-0.21 <i>-1.71</i>	-0.22 ** <i>-2.38</i>	-0.37 *** <i>-3.67</i>
CC ₋₁	-0.001 <i>-1.43</i>	-0.001 <i>-1.25</i>	0.000 <i>-0.70</i>	0.000 <i>0.04</i>
ACCU ₋₁	0.72 *** <i>3.07</i>	0.68 <i>1.52</i>	0.93 *** <i>5.19</i>	0.84 *** <i>3.48</i>
ACCU ₋₂	-0.25 * <i>-1.69</i>	-0.05 <i>-0.19</i>	-0.17 <i>-0.90</i>	-0.40 ** <i>-2.69</i>
R-squared	0.96	0.94	0.90	0.82
Adjusted R-squared	0.95	0.91	0.88	0.79
GB Obs. R2	1.08	6.02 *	.89	6.55 **

Table 2 Regression results: ADL model

period	Germany 63-90	France 79-97	UK 71-96	USA 63-97
Const	-0.13 <i>-2.79</i>	0.01 <i>0.04</i>	-0.03 <i>-1.33</i>	-0.04 <i>-0.61</i>
ACCU ₋₁	0.85 *** <i>2.50</i>	0.33 <i>0.49</i>	0.96 *** <i>4.30</i>	0.71 *** <i>2.65</i>
ACCU ₋₂	-0.60 * <i>-1.89</i>	0.31 <i>0.64</i>	-0.09 <i>-0.38</i>	-0.37 <i>-1.42</i>
CAPUT ₋₁	0.31 ** <i>2.36</i>	-0.01 <i>-0.02</i>	0.14 ** <i>2.32</i>	0.07 <i>0.72</i>
ΔCAPUT ₋₁	-0.153 <i>-0.82</i>	0.195 <i>0.56</i>	0.182 <i>1.36</i>	0.039 <i>0.39</i>
PS ₋₁	0.001 * <i>1.84</i>	0.001 <i>0.91</i>	0.000 <i>-0.37</i>	0.001 <i>0.48</i>
ΔPS ₋₁	0.00 <i>0.33</i>	0.00 <i>-0.44</i>	0.00 <i>0.26</i>	0.00 <i>0.99</i>
RSNF ₋₁	0.36 <i>0.77</i>	-0.31 <i>-1.57</i>	-0.16 <i>-1.09</i>	-0.30 * <i>-1.91</i>
Δ RSNF ₋₁	-0.13 <i>-0.27</i>	0.19 <i>0.83</i>	0.03 <i>0.23</i>	0.39 <i>1.06</i>
CC ₋₁	0.000 <i>-0.62</i>	-0.001 <i>-1.20</i>	0.000 <i>0.79</i>	0.001 <i>0.89</i>
Δ CC ₋₁	0.000 <i>-0.78</i>	0.000 <i>0.41</i>	0.000 <i>-1.25</i>	-0.001 * <i>-1.72</i>
R-squared	0.97	0.94	0.93	0.86
Adjusted R-squared	0.95	0.86	0.88	0.79
GB Obs. R2	2.45	6.63 **	.61	6.72 **

Calculations performed with Eviews. Italic numbers are t-values.

*, ** and *** denote significance at 10, 5 and 1% respectively.

Table.3 Regression specification with output growth

period	Germany 63-90	France 78-97	UK 70-96	USA 63-97
const	-0.03 * <i>-1.85</i>	-0.02 <i>-1.67</i>	0.00 <i>-0.03</i>	0.01 <i>0.40</i>
GROWTH ₋₁	-0.01 <i>-0.11</i>	0.02 <i>0.31</i>	0.08 ** <i>2.52</i>	0.08 <i>1.24</i>
PS ₋₁	0.0012 ** <i>2.42</i>	0.0011 ** <i>2.38</i>	7.E-05 <i>0.10</i>	0.000 <i>0.24</i>
RSNF ₋₁	-0.22 <i>-0.83</i>	-0.32 *** <i>-2.66</i>	-0.04 <i>-0.34</i>	-0.22 *** <i>-2.45</i>
ΔCC ₋₁	-0.0004 <i>-1.12</i>	0.0004 <i>0.61</i>	-0.0003 ** <i>-1.71</i>	-0.001 <i>-1.47</i>
ACCU ₋₁	1.13 *** <i>4.26</i>	0.49 <i>1.13</i>	1.18 *** <i>6.63</i>	0.75 <i>3.09</i>
ACCU ₋₂	-0.36 <i>-1.60</i>	0.18 <i>0.52</i>	-0.28 <i>-1.45</i>	-0.22 <i>-0.99</i>
R2	0.96	0.93	0.89	0.84
adj R2	0.94	0.90	0.85	0.80
BG Obs. R2	2.16	4.11	1.1	4.45

Table.4 Regression including rentiers payments

period	Germany 63-90	France 78-97	UK 70-96	USA 63-97
const	-0.11 *** <i>-2.71</i>	-0.02 <i>-0.31</i>	-0.06 *** <i>-3.66</i>	0.00 <i>-0.05</i>
CAPUT ₋₁	0.25 ** <i>2.26</i>	0.03 <i>0.14</i>	0.20 *** <i>4.01</i>	-0.01 <i>-0.23</i>
PS ₋₁	0.0013 <i>1.21</i>	0.0012 ** <i>2.88</i>	0.0003 <i>0.60</i>	0.0012 <i>1.04</i>
RPNF ₋₁	-0.03 <i>-0.22</i>	-0.11 <i>-1.47</i>	-0.14 <i>-1.44</i>	0.08 <i>0.35</i>
RSNF ₋₁	0.20 <i>0.65</i>	-0.23 <i>-1.62</i>	0.04 <i>0.21</i>	-0.41 <i>-1.40</i>
Δ CC ₋₁	-0.0007 ** <i>-2.22</i>	0.0007 <i>0.94</i>	-0.0003 <i>-1.67</i>	-0.0006 <i>-1.20</i>
ACCU ₋₁	0.82 *** <i>3.55</i>	0.32 <i>0.59</i>	0.85 *** <i>4.64</i>	0.95 *** <i>4.60</i>
ACCU ₋₂	-0.47 *** <i>-2.81</i>	0.26 <i>0.82</i>	-0.06 <i>-0.29</i>	-0.46 *** <i>-2.95</i>
R2	0.97	0.94	0.92	0.83
Adj R2	0.95	0.91	0.89	0.79
GB Obs R2	1.32	8.25 **	2.57	6.69 **

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

	France	Germany	UK	USA
<i>autoregressive terms of ACCU</i>				
ADL	.64	.25	.85	.34
PAM	.7	.35	.73	.41
with growth	.67	.77	.9	.53
<i>mean</i>	<i>0.67</i>	<i>0.46</i>	<i>0.83</i>	<i>0.44</i>
<i>coefficient on RSNF</i>				
ADL	-.31	.36	-.16	-.3
PAM	-.33	.13	-.15	-.31
with growth	-.32	-.22	-.04	-.22
<i>mean</i>	<i>-0.32</i>	<i>0.09</i>	<i>-0.12</i>	<i>-0.27</i>

Table.6 Explaining the slowdown in accumulation

	reg coeff	autoreg coeff	Δ RSNF	long run effect	explained Δ ACCU	actual Δ ACCU
	b_{RSNF}	b_{ACCU}		\bar{b}_{RSNF}		
Germany	0.09	0.46	0.015	0.17	0.002	-0.021
France	-0.32	0.67	0.026	-0.97	-0.025	-0.027
UK	-0.12	0.83	0.034	-0.71	-0.024	0.005
USA	-0.28	0.43	0.015	-0.49	-0.007	-0.023
mean	-0.24	0.64	0.025	-0.67	-0.017	-0.015

Note. Δ RSNF and Δ ACCU are the difference between average rates 65-74 and 85-94.