Regimes of Interest Rates, Income Shares, Savings, and Investment: A Kaleckian Model and Empirical Estimations for some Advanced OECD-Economies[#]

Eckhard Hein (WSI in der Hans Boeckler Stiftung)[*]

Carsten Ochsen (Carl von Ossietzky Universitaet Oldenburg)

Abstract:

The first part of the paper deals with the effects of an exogenous variation in the monetary interest rate on the real equilibrium position of the economic system in a Kaleckian effective demand model. Different regimes of accumulation are derived and it is shown that a negative relation between the interest rate and the equilibrium rates of capacity utilisation, accumulation and profit usually expected in post-Keynesian theory only exists under special conditions. In the second part the model is applied to the data of some major OECD-countries, the relevant coefficients are estimated and the relevance for an explanation of the course of GDP and capital stock growth since the early 1960s is discussed.

[#] Paper to be presented at the conference "Old and New Growth Theories: an Assessment", Pisa, October 5-7, 2001. We would like to thank the participants in research seminars at the Universities of Chemnitz, Hohenheim and Oldenburg for helpful comments on earlier versions of the paper. Remaining errors are ours.

[*] Direct correspondence to: Dr. Eckhard Hein, Wirtschafts- und Sozialwissenschaftliches Institut (WSI) in der Hans Boeckler Stiftung, Bertha-v.-Suttner-Platz 1, 40227 Duesseldorf, Germany; eckhard-hein@boeckler.de.

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1. Introduction

In monetary analysis, as defined by Schumpeter (1954), monetary variables cannot be reduced to have merely temporary and out-of-equilibrium effects on the real variables of the economic system: production, employment, distribution and growth. Contrary to classical and neoclassical real analysis which reduces the relevance of monetary variables to determine only the level of prices in equilibrium, Keynes's main achievement was the research program of a „monetary theory of production" in which the monetary sphere, especially the monetary interest rate, is the major determinant of the real equilibrium of the economy. With this approach Keynes became the founding father of monetary analysis (Rogers, 1989).

The impacts of monetary variables, however, have rarely been considered to be relevant for the equilibrium solution in the post-Keynesian and Kaleckian models of growth and distribution after Keynes. In the models by Kaldor (1956, 1957, 1961) and J. Robinson (1962) the income shares are determined by investment which itself is influenced by the expected rate of profit. If the propensity to save out of profits exceeds the propensity to save out of wages changing income shares allow for the adjustment of savings to investment also in the long run, when the capital stock is fully utilised.[1] In the more recent models by Amadeo (1986, 1986a, 1987), Dutt (1984, 1987), Kurz (1994, 1995), Rowthorn (1981), and Taylor (1983) that are

[1] If a classical savings hypothesis is assumed we get the Cambridge-equation which relates the rate of profit (r) to the rate of capital accumulation (g) for a given propensity to save out of profits (s_π): $r=g/s_\pi$. For the older post-Keynesian model see also Marglin (1984).

based on the work by Kalecki (1954) and Steindl (1952) the rate of capacity utilisation is considered to be an endogenous variable of the accumulation process and is determined by investment, when the propensities to save out of profits and wages are given.[2] Income distribution depends on mark-up-pricing in oligopolistic markets with the mark-up as an indicator of the firms' capacity to enforce a certain claim on profits against labourers and competitors. In these Kaleckian models the rate of capacity utilisation is introduced as a major variable influencing investment.

Recently there have been attempts to introduce monetary variables into the Kaldorian and Kaleckian variants of the Post-Keynesian model by - among others - Lavoie (1992, 1993, 1995), Dutt/Amadeo (1993), Dutt (1992), Taylor (1985). Their models are, however, not fully convincing because of the investment functions used. In Lavoie (1995) the decisions to invest are assumed to depend on the difference between the rate of profit and the interest rate; in Lavoie (1992, pp. 362) the rate of capacity utilisation is also integrated and it is shown that the effects of the monetary interest rate upon the real equilibrium position of the economic system are not unique. Both models do not consider the profit share and hence the real wage as an independent determinant of investment. The same objection applies to the model by Dutt/Amadeo (1993), in which the decisions to invest are assumed to depend solely on the interest rate and the rate of capacity utilisation, and to the model by Dutt (1992) in which capacity utilisation and the difference between the rates of profit and interest are introduced as the variables determining investment. Taylor (1985) also introduces monetary elements only

[2] The following reasons are given for a deviation of capacity utilisation from full utilisation in the long run. On the one hand, the long run accumulation path only is a centre of gravity for cyclical fluctuations. Full utilisation of capacity is only achieved in the boom of the trade cycle. On average over the cycle, the rate of capacity utilisation will be well below full utilisation (Kalecki, 1971, p. 137). On the other hand, especially Steindl (1952, pp. 76) has made the argument that in oligopolistic markets firms deliberately hold excess capacity in order to meet unforeseen fluctuations in demand and to prevent potential competitors from market entry.

into an underconsumptionist model and makes the decisions to invest depend on the difference between the rates of profit and interest and on an accelerator term.

Lavoie (1993) has been the only paper to briefly sketch a model which also considers the effects of distribution and costs of production together with a monetary interest rate in the investment function. In this paper, as well as in Lavoie (1992, 1995), it is shown that the effects of variations in the interest rate on capacity utilisation and the profit rate depend on the parameters in the investment and the savings function and that there may arise a constellation in which a rising interest rate is associated with increasing rates of capacity utilisation and profits. In this paper we will reconsider the approach proposed by Lavoie, estimate the relevant coefficients of the model for some major OECD-countries and discuss the relevance of the model for an explanation of the development of output and capital accumulation in these countries from the 1960s to the mid 1990s.

In the first part of the paper we will develop a simplified model in the way proposed by Lavoie (1993). On the one hand, the direct impact of interest rate variations on business investment demand will be considered, extending a Bhaduri/Marglin (1990) type investment function.[3] On the other hand, the impact of interest rate variations on the distribution between profits of enterprise and rentiers' income and hence on consumption demand will be dealt with.[4] Contrary to Lavoie (1993) we will refrain from making the distribution between gross profits - including interest - and wages depend on the interest rate in our theoretical model, in order to keep the model as simple as possible, to minimise the potential regimes of

[3] Bhaduri/Marglin (1990) derived different regimes of accumulation in a non-monetary aggregate demand model in which investment is affected by effective demand and by costs of production.

4 Wealth effects of interest rate variations will not be discussed. Lavoie (1995) develops a post-Keynesian „Minsky-Steindl-model" in which some wealth effects are also considered.

accumulation and to stick as close as possible to a Kaleckian approach in which interest rate variations have no direct effect on income shares. The consequences of variations in the interest rate for the equilibrium rates of capacity utilisation, accumulation and profit will then be analysed and the conditions for different accumulation regimes will be derived.

Our simple theoretical model will then be applied to the data of some major OECD-countries in the second part of the paper. We will estimate the coefficients of our model and try to distinguish different accumulation regimes between countries and between time periods within economies. Here it is of special interest whether those regimes with a positive impact of interest rate increases upon capacity utilisation, investment or the profit rate can really be found empirically. Finally, we will deal with the question whether our model can contribute to an explanation for the development of capital accumulation and GDP-growth since the early 1960s.

2. A simple model of monetary interest rates, income shares and accumulation

The effects of interest rate variations on income distribution and investment will be studied in an aggregate demand-aggregate supply model for a closed economy with a constant-coefficient-technology and without economic activity by the state. The model builds on the work by Bhaduri/Marglin (1990) and Marglin/Bhaduri (1991). Into their non-monetary aggregate demand model an exogenously determined monetary interest rate is introduced. Following the post-Keynesian „horizontalist" monetary theory[5] by Kaldor (1970, 1982), Moore (1988, 1989), and Lavoie (1984, 1992, pp. 149, 1996) we assume that the interest rate is an exogenous variable for the investment process and is determined by the policy of the

[5] A survey of post-Keynesian monetary theory is given by Cottrell (1994), Pollin (1991), Rousseas (1998), and Wray (1990, 1992, 1992a).

central bank and by the liquidity preference of commercial banks and monetary wealth holders.[6] In the long run the pace of accumulation has no direct feedback on the interest rate.[7] The pace of accumulation is determined by the entrepreneurs' decisions to invest. But investment as the causal force of accumulation has to be financed by credit independently of savings, because investment precedes income and hence savings.[8] Credit is supplied by commercial banks and by those households with disposable monetary wealth. Only the banking sector, however, is capable of supplying any creditworthy demand for credit at a given interest rate. The resulting volume of credit is thus an endogenous variable of the accumulation process and is determined by the volume of debt financed investment. We further assume that the monetary circuit will be closed in every period, i.e. there is no varying demand for liquidity by private households.[9] Therefore, we do not have to distinguish between short-term finance of production and long-term finance of investment and only have to deal with the latter.[10] Under these conditions, we may assume a uniform interest rate.

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[6] Therefore, the central bank does not directly control the market rates of interest. These are determined by the mark-ups on the central bank's base rate according to risk, period of validity and degree of liquidity of promises to pay when liquidity preference is given.

[7] The position taken here differs from those post-Keynesian views which assume that a decreasing liquidity position of commercial banks and rising lender's and borrower's risk finally lead to rising interest rates when the volume of credit is expanding in the accumulation process (Minsky, 1986, Palley, 1996, Rousseas, 1998, Wray, 1990). If an accommodating policy of the central bank is supposed, however, there will be no decreasing liquidity position of commercial banks when credit is expanding. If we further suppose that commercial banks only supply credit to creditworthy borrowers there will also be no increasing borrower's or lender's risk when credit is increasing. For the economic system as a whole, increasing credit means increasing expenditures and hence increasing revenues from which credit can be repaid. There is therefore good reason to assume that the interest rate is the exogenous variable of the accumulation process and that the volumes of money and credit are endogenous variables. If interest rates are rising when the volume of credit is expanding this is due to restrictive monetary policies chosen by the central bank (Lavoie, 1996).

[8] Kaldor (1939) assumes that firms may finance investment by means of issuing bonds. But the demand for those bonds has to be financed by credit, because the income corresponding to investment has not been created when the demand for those bonds arises.

[9] A model of a monetary circuit can be found in Graziani (1989) and Hein (1997, pp. 227).

[10] For the distinction between short-term finance of production often called „finance" or „initial finance" and long-term finance of investment usually labelled „final finance" or „funding" see Graziani (1989) and Carvalho (1992, p. 151). Credit is created in order to supply the demand for „finance" or „initial finance" of production. „Final finance" or „funding" is supplied out of the income generated by production and describes the use of saved income for holding the property rights in the investment goods newly produced.

The aggregate demand-aggregate supply model can be written as follows:

$$r = \frac{\pi}{K} = \frac{\pi}{Y}\frac{Y}{Y^*}\frac{Y^*}{K} = hu\frac{1}{v}, \tag{1}$$

$$\sigma = \frac{S}{K} = \frac{\pi - Z + s_Z Z}{K} = r - (1 - s_Z)i, \qquad 0 < s_Z < 1, \tag{2}$$

$$g = \frac{I}{K} = \alpha + \beta u + \tau h + \theta i, \qquad \alpha, \beta, \tau > 0,\ \theta < 0, \qquad g > 0 \text{ for } r > i, \tag{3}$$

$$g = \sigma. \tag{4}$$

Equation (1) defines the profit rate (r) as the relation between the annual flow of total profits (π), including imputed and actual interest payments,[11] and the value of the capital stock in money terms (K). The profit rate depends on the profit share (h), the endogenously determined rate of capacity utilisation (u) as the relation between actual output (Y) and potential output (Y^*), and the capital-potential-output-ratio (v) which is a constant in our model. The profit share in this Kaleckian type model with constant unit labour costs up to full capacity output is assumed to be determined by firms' mark-up-pricing.[12] According to Arestis (1996) the mark-up is generally influenced by the substitution effect of price changes, the market entry effect, the threat of administrative price controls, and the strength of unions to answer increasing prices by increasing wages.

Within Kaleckian and post-Keynesian models of cost-plus-pricing variations in the interest rate have no direct impact on the mark-up and on distribution between total profits and wages

[11] In what follows, „total profits" always mean profits including imputed and actual interest payments, or the sum of profits of enterprise and interest.

[12] Writing w for the nominal wage rate, a for the constant labour-coefficient and m for the mark-up, we get the pricing equation: p = (1+m) wa. From this follows for the profit share: h = m / (1+m).

but only cause a redistribution between profits of enterprise and interest.[13] These models differ in so far from recent neo-Ricardian work in which changing interest rates directly affect the distribution of income between total profits and wages (Panico, 1985, Pivetti, 1985, 1988, 1991). There it is assumed that the exogenously given interest rate determines the rate of profit and closes the degree of freedom of the production price model by Sraffa (1960).[14]

Equations (2) - (4) determine the goods market equilibrium. Introducing the interest rate into the savings and investment function of the model the following aspects will be considered. First, interest payments by firms are an income for households that will affect households' expenditures and thus consumption demand and the rate of capacity utilisation. Second, interest payments are a cost for firms that will directly affect their decisions to accumulate. But there are also indirect effects of interest rate variations on investment, because investment decisions also depend on capacity utilisation.

In equation (2) for the savings rate (σ) which relates total savings (S) to the capital stock we assume a classical savings hypothesis, i.e. labourers do not save. The part of profits retained by firms is completely saved by definition. The relation of profits distributed to capital owner

[13] Neither in Kalecki's model of pricing (Kalecki, 1954) nor in Eichner's model (Eichner, 1980) a direct relation between interest rate and mark-up exists. Kalecki considers the mark-up to be determined by the degree of monopoly. Eichner assumes that the target rate of return is given by the internal means of finance required for an intended rate of accumulation. There is hence no direct influence of the interest rate on mark-up, real wage and the rate of profit. But there are indirect effects. If we follow Lavoie (1995) and assume an accumulation function that makes the decisions to invest depend on the difference between the rate of profit and the interest rate, we will get for Eichner's model, that - like the other older post-Keynesian models - assumes a normal rate of capacity utilisation in the long run, a reduction in the rates of accumulation and profit and a rising real wage after an increase in the interest rate. In Kalecki's model - with a variable equilibrium rate of capacity utilisation - the rates of accumulation, profit, and capacity utilisation will show a negative reaction when the interest rate rises, whereas the real wage will remain constant.

[14] According to this neo-Ricardian position, lasting changes in the interest rate cause changes in the price level in the same direction. As the rate of profit of enterprise is considered to be given by the risks and troubles of real investment and the nominal wage rate is also taken as given, the interest rate determines the rate of profit and the real wage becomes a residual variable. For an otherwise Kaleckian model that encompasses the neo-Ricardian case of a flexible mark-up with respect to the interest rate see Hein (1999).

households, the rentiers' income (Z), to the capital stock is given by the rate of interest.[15] Rentiers' income is used by capital owner households according to their propensity to save (s_z) for consumption and savings. Total savings therefore comprise retained profits and savings out of rentiers' income.[16] With the propensity to save out of rentiers' income given, the savings rate depends on the relation between the profit rate and the interest rate. The higher the interest rate at a given rate of profit the lower will be the savings rate, because income is transferred from firms that do not consume to rentiers' households who consume at least a part of their income.

The investment function (3) makes the rate of accumulation (g) that describes net investment (I) as a proportion of the capital stock depend on the expected profit rate and the interest rate. Assuming the technical conditions of production to be constant, the profit rate is decomposed into the profit share reflecting the development of unit labour costs and the rate of capacity utilisation indicating the development of demand. Firms have to finance at least a part of their investment by credit. We shall assume that the commercial banks' willingness to supply credit is positively correlated with the firms' internal means of finance. The higher the amount of own capital of the firm the higher the amount of debt capital that can be obtained for investment.[17] This position supposes that there is a maximum degree of indebtedness that banks are willing to tolerate in order to minimise borrowers' risk and that firms are willing to

[15] Rentiers' income contains the interest on credit, the dividends on shares, and the imputed interest on own capital. For the sake of simplicity we do not explicitly consider the proportion of debt finance of firms, which has been taken as a major determinant of investment in post-Keynesian models since Steindl (1952). For an otherwise similar model in which the debt-capital-ratio is treated explicitly see Hein (1999).

[16] This kind of savings hypothesis can be found in Lavoie (1993, 1992, pp. 362, 1995).

[17] A similar view was taken by J. Robinson (1962, p. 86) and by Kalecki (1971, p. 106). Recent empirical work has shown that the interest rate has important effects on investment through its impacts on internal funds and hence on the access to external borrowing in imperfect capital markets. The direct effects of interest rate changes on investment, however, are rather small or insignificant (see Fazzari/Hubbard/Peterson, 1988, Schiantarelli, 1996).

accept because of lenders' risk in a world of Keynesian uncertainty.[18] From this follows, that the higher retained earnings are the greater the prospects for expansion of the firm. As retained earnings depend on the difference between the rate of profit and the interest rate, the interest rate becomes an additional argument in the accumulation function. On the one hand, the higher the difference between the realised profit rate and the interest rate the higher the amount of the firm's internal means of finance and the higher the amount of credit the banks are willing to supply and firms are willing to lend without approaching the maximum degree of indebtedness of the firm given by borrower's and lender's risk. On the other hand, the higher the difference between the expected profit rate and the interest rate the higher the maximum degree of indebtedness banks and firms are willing to tolerate. The parameter α in the investment function stands for the motivation to accumulate which derives from the competition of firms independently of the development of distribution, effective demand or monetary policy. The intensity of the influence of effective demand is indicated by β, whereas τ shows the weight of distribution struggle and θ the impact of the interest rate. To induce investors to demand real capital goods instead of financial assets, the expected rate of profit on real investment has to exceed the rate of interest in financial markets. Equation (4) defines the goods market equilibrium.

The Keynesian stability condition for the g-σ-equilibria in the goods markets requires that the decisions to save respond more elastically to a variation in the rate of capacity utilisation than the decisions to invest:

[18] For a more complete post-Keynesian theory of credit rationing based on asymmetric expectations between lenders and borrowers in a world of fundamental uncertainty see Wolfson (1996).

$$\frac{\partial \sigma}{\partial u} - \frac{\partial g}{\partial u} > 0, \qquad \frac{h}{v} - \beta > 0. \tag{5}$$

The equilibrium values of the endogenous variables of the model are given by:

$$u^* = \frac{i(1 - s_Z + \theta) + \alpha + \tau h}{\frac{h}{v} - \beta} \tag{6}$$

$$g^* = \sigma^* = \frac{i\left[\beta(1 - s_Z) + \frac{h}{v}\theta\right] + \frac{h}{v}(\alpha + \tau h)}{\frac{h}{v} - \beta} \tag{7}$$

$$r^* = \frac{\frac{h}{v}\left[i(1 - s_Z + \theta) + \alpha + \tau h\right]}{\frac{h}{v} - \beta} \tag{8}$$

As equations (9) - (11) show, the effects of a variation in the exogenous interest rate on the equilibrium position of the system, i.e. on the equilibrium rates of capacity utilisation, accumulation and profit depend on the values of the parameters β, τ and θ in the investment function and s_Z in the savings function:

$$\frac{du}{di} = \frac{(1 - s_Z) + \theta}{\frac{h}{v} - \beta}, \tag{9}$$

$$\frac{dg}{di} = \frac{\beta(1 - s_Z) + \frac{h}{v}\theta}{\frac{h}{v} - \beta}, \tag{10}$$

$$\frac{dr}{di} = \frac{\frac{h}{v}(1 - s_Z + \theta)}{\frac{h}{v} - \beta}. \tag{11}$$

If only stable equilibria are considered we can distinguish four potential regimes of accumulation in our simple model, as is shown in table (1). Regime 1 is a special case in which interest variations only affect capital accumulation inversely but have no effects on capacity utilisation and the rate of profit. In this regime the effect of an interest rate variation on investment demand is exactly balanced by its opposite effect on consumption demand through redistribution between profits of enterprise and rentiers' income. Regime 2 shows the consequences usually associated with a rising interest rate in post-Keynesian models: the rates of capacity utilisation, capital accumulation and profit are decreasing.[19] This regime is dominated by a high responsiveness of investment to a change in the interest rate and a high propensity to save out of rentiers' income. If investment, however, is hardly affected by the interest rate and the propensity to save out of rentiers' income is relatively low, there may arise regimes of accumulation with positive responses throughout the rates of capacity utilisation, accumulation and profit to an increasing interest rate as in regime 4.

[Table (1) around here]

We may conclude the theoretical part of our paper with the result that the integration of the monetary interest rate into the simple aggregate demand-aggregate supply model has shown that this exogenously determined variable has a major influence on the real equilibrium position of the economic system. The effects of an interest rate variation on the equilibrium position, however, are not unique but depend on the values of the parameters in the accumulation and the savings function. Variations in the interest rate affect the equilibrium position of the system through different channels: Consumption demand is influenced by a

[19] For a survey of the integration of the interest rate into post-Keynesian models of growth and distribution see Lavoie (1995).

redistribution of income between rentiers and firms. Investment demand is affected directly by interest rate changes but there are also indirect impacts through the consequences interest rate variations have for consumption demand and the rate of capacity utilisation. Taking these effects into account, different reactions of the equilibrium position of the system to an interest rate variation have been derived. Therefore, no generally valid statement about the consequences a changing interest rate has for the equilibrium rates of capacity utilisation, accumulation and profit can be made. Following our model, assessing the effects of interest rate changes on capacity utilisation, accumulation and the profit rate requires some knowledge about the parameters in the accumulation and savings function. An attempt towards such an analysis will be made in the next part.

3. Interest rates, income shares, savings and investment: the empirical evidence for some OECD-countries

In this section we try to identify different regimes of accumulation between countries and between time periods within economies by means of calculating the values of the coefficients of the investment and the savings function which determine the accumulation regimes according to equations (9) - (11) and table (1). The parameters will be estimated for France, Germany, the UK and the USA as highly developed OECD-countries. The time period covered runs from 1961 to 1995 (for Germany to 1993). The limits were dictated by the available data of capital stock growth. Before estimating the coefficients of our model we will, however, describe general trends of some key variables which will facilitate the interpretation of the following estimations and give some arguments for the choice of sub-periods to be considered. Finally we will turn to the question whether our model can add to the explanation of the observed development in growth and capital formation since the early 1960s.

3.1. General trends of interest rates, income shares, investment and GDP

In table (2) the values of some key variables of monetary policy, income distribution, investment and growth for France, Germany[20], the UK and the USA can be found. The nominal short-term interest rate is the monetary variable directly controlled by monetary policies of the central bank. The real long-term interest rate is the monetary variable which should be highly relevant for investment decisions. It can only indirectly be affected by monetary policies. The profit share is the indicator for the development of functional income distribution on the one hand and of unit labour costs on the other hand. Depreciation allowances for fixed capital are not included and the profit share has been corrected for the labour income of the self-employed which was assumed to be equal to the average income of the employees. The development of capital accumulation is measured by the growth rate of the real gross capital stock in the private sector of the economies (agriculture, industry and services); dwellings and the capital stock of producers of government services are excluded. The rate of growth of real gross domestic product is used as an indicator for the development of demand and of economic activity. Average values over the trade cycle were calculated because the variables chosen show wide fluctuation over the cycle whereas we are interested in long-term trends.[21]

[Table (2) around here]

From table (2) we get the following general trends. First, we see an overall slowdown in capital accumulation since the 1960s which has continued until the end of our time-period,

[20] In what follows Germany refers to the former West Germany.

with the exception of the USA, where capital stock growth was slightly increasing in the 1970s. Second, there was also a slowdown in GDP-growth from the 1960s until the early 1980s, when this growth slowdown was stopped and a mild recovery set in. The exception is France, where this recovery only began after the recession of the mid 1990s. Third, real interest rates were considerably below GDP growth rates from 1960 until the recession of the early 1980s in France, the UK, the USA. In Germany this was the case only until the mid 1970s recession. Fourth, there has been a remarkable increase in real interest rates since the early 1980s, interest rates now exceeding GDP-growth rates by a considerable amount. Fifth, the profit share was generally falling from 1960 until the crisis of the early 1980s and has been increasing since then.

The recession in the early 1980s seems to split our time period into two sub-periods. The slowdown in capital accumulation and GDP-growth from the 1960s to the 1980s is associated with increasing labour income shares and real interest rates below GDP-growth. The time period from the early 1980s until the mid 1990s, however, is characterised by falling labour income shares and real interest rates considerably above GDP-growth rates. Only Germany seems to be an exception, because here the increase in real interest rates and the slowdown in GDP-growth can already be found in the cycle of the late 1970s. We also witness a stop in the slowdown and a slight recovery in GDP-growth since the recession of the early 1980s in Germany and the UK. In France and the USA the recovery has started after the recession of the early 1990s, but the following trade cycle is still incomplete so that a general trend cannot yet be derived.

[21] The end of a trade cycle is given by a local minimum of annual GDP-growth. Note that the trade cycle starting after the recession of the early 1990s has not yet been completed.

Here it is not the place to attempt a full explanation for the structural break in the development of advanced capitalism that became manifest in the early 1980s.[22] In what follows we will rather deal with the role real interest rate variations may play in explaining the development described above.

3.2 The effects of interest rate variations: econometric evidence

To assess the effects of real interest rate variations on the real economic process we will estimate the relevant coefficients of our model developed above for the whole time period under consideration and for the two sub-periods identified above, the first one ranging from the 1960s to the early 1980s and the second one from the early 1980s until the mid 1990s.[23]

In order to estimate the propensity to save out of rentiers' income, in the first step, we estimated the propensities to save out of wages and out of total profits. The following regression was run:

$$S_t = s_w(1-h_t)Y_t + s_\pi h_t Y_t + \varepsilon_t \tag{12}$$

$$\varepsilon_t = \rho\varepsilon_{t-1} + \mu_t \tag{12a}$$

[22] For a more detailed discussion within in a „social structures of accumulation"-framework see Hein/Ochsen (2000). There the structural break in the development of capitalism in the course of the 1970s is explained by the erosion of the two main pillars of the „golden-age"-period: the capital-labour-accord on the national level and the hegemonic currency system of Bretton-Woods on the international level.

[23] The existence of a structural break in economic development in the recession year of the early 1980s is confirmed by a Chow-breakpoint-test for the savings and the investment functions estimated below. For the test results see table (I) in the appendix.

S is total savings, s_w the propensity to save out of labour income, s_π the propensity to save out of profits, Y is net national income, h is the profit share as defined above, $\rho\varepsilon$ is an autoregressive term lagged by one year.[24] The estimation results for equation (12) are given in table (3). As can be seen, the savings propensities out wages are not significantly different from zero whereas the savings propensities out of profits are highly significantly positive.[25] The classical savings hypothesis in our model seems hence to be justified. The savings propensity out of profits is about one in France and Germany and is remarkably below one in the UK for all periods and in the USA for the whole period and the sub-period from the 1980s to the mid 1990s.

[Table (3) around here]

In the second step rentiers' income, which cannot be directly taken from the national accounts, had to be calculated. We assumed - following our theoretical model - that firms distribute rentiers' income according to the nominal long-term interest rate on the value of the capital stock, i.e. on the nominal net capital stock. From this assumption we could easily calculate the propensities to save out of rentiers' income from our estimations for the savings propensities out of total profits. From equation (2) we get:

$$s_\pi = \frac{S_\pi}{\pi} = \frac{\pi - Z + s_z Z}{\pi} = 1 - \frac{i}{r}(1 - s_z) \qquad (13)$$

[24] The parameter ρ is the first-order serial correlation coefficient of the used first-order autoregressive, or AR(1), model. The AR(1) model incorporates the residual from the past observation into the regression model for the current observation. μ_t is the one-period-ahead forecast error or the prediction error. It is the difference between the actual value of the dependent variable and a forecast made on the basis of the independent variables and the past forecast errors.

[25] Our results do not contradict those by Marglin/Bhaduri (1991) and by Bowles/Boyer (1995) who also find a significantly higher propensity to save out of profits than out of wages.

and hence

$$s_z = \frac{r}{i}(s_\pi - 1) + 1 \qquad (13a)$$

The values for the propensities to save out of rentiers' income can be found in table (4) in which r is the rate of profit relating nominal net profits - including actual and imputed interest payments but excluding labour income of the self-employed - to the nominal net capital stock and i^n is the nominal long-term interest rate. The savings propensities of rentiers in France and Germany are higher than in the UK and the USA (with the exception of the first sub-period) and the savings propensities are declining, comparing the two sub- periods, with the exception of Germany.

[Table (4) around here]

In a second regression we estimated the coefficient of the investment function. The regression introduces a time lag between investment decisions and the actual expansion of the capital stock and hence productive capacity:

$$g_{t+1} = \alpha + \beta\tilde{y}_t + \tau h_t + \theta i_t + \varepsilon_t . \qquad (14)$$

Capital accumulation is measured by the growth rate of the real gross capital stock in the private sector of the economy. In order to assess the influence of interest rate variations on capital accumulation the development of the real long-term interest rate is consulted, i.e. the nominal long-term interest rate corrected for the change in the price level. For the influence of distribution the profit share in the definition given above is considered. As reliable data for the

rate of capacity utilisation are not available for international comparisons, the rate of growth of GDP ($\tilde{y}$) is used as an indicator for the development of demand. The regression was again run for the whole period under consideration and for the two sub-periods. The results are presented in table (5).

[Table (5) around here]

Looking first at the determinants of investment in the whole period under consideration, from the early 1960s until the mid 1990s, we find that the real long-term interest rate had a significantly negative effect on capital stock growth in each economy. For France, Germany, and the USA we also see a significantly positive effect of GDP-growth, in the UK there is also a positive impact of the profit share.

This picture changes when we consider sub-periods. For the first period, from the early 1960s to the early 1980s, only in France and Germany a significantly negative impact of the interest rate on investment is maintained. In France also GDP-growth and the profit share have significantly positive impacts on capital accumulation, in Germany GDP-growth has a positive effect, too. For the UK we only find a positive effect of GDP-growth, in the USA of the profit share. In the second period there cannot be found any negative impacts of interest rates on investment any more, but there is a positive impact of GDP-growth in each country.

In the next step we tried to identify different regimes of accumulation between countries and between time periods within countries. The estimated values of the relevant coefficients were applied to determine the direction of change in the rates of capacity utilisation, accumulation and profit with respect to interest rate changes. Only significant values were used, otherwise

the values of the coefficients were assumed to be zero. The estimated values for the propensities of save out of rentiers' income are limited to one in order to avoid an excessive impact of this variable on the whole system. The question of stability of the g-σ-equilibria with respect to changes in the rate of capacity utilisation, raised in the theoretical model, is not addressed explicitly in the empirical part. When we inserted the calculated and estimated values into the stability condition we found that most of the cases are unstable.[26] But if we look at the standard errors of the estimated values for β we cannot be sure that the values for β really exceed the calculated values for h/v and render our system unstable. So we prefer to assume that our system is at least not permanently unstable. The reactions of the endogenous variables of the model with respect to interest rate changes are given in table (6).

[Table (6) around here]

From table (6) we get two remarkable results. First, comparing the reactions of the equilibrium positions in the four economies over the whole time period, we find that the rates of capacity utilisation, accumulation and profit in France and Germany show a negative response towards interest rate variation. In the UK and USA, however, we see a positive relation between the interest rate and the endogenous variables of the model, with the exception of the rate of capital accumulation in the UK. The differences between those two country groups are due to a higher (negative) reaction coefficient in the investment function and a higher propensity to save in the continental-European countries than in the Anglo-American countries. Interest rate variations had a strong inverse impact on investment demand in Germany and France whereas in these countries the effect upon consumption demand via a redistribution of profits from firms to rentiers' household was negligible. Under these

[26] See table (II) in the appendix..

conditions increasing real interest rates mean falling rates of capacity utilisation, capital accumulation and profit. In the UK and the USA, however, the inverse effect of interest rate variations on investment was smaller whereas the impact on consumption demand via redistribution of profits was considerably higher due to a low propensity to save out of rentiers' income. Under these conditions rising real interest rates are associated with rising rates of capacity utilisation and profit. In the USA we also have a positive effect on capital stock growth, whereas in the UK a positive impact on capital stock growth is prevented by an investment function that is inelastic with respect to demand growth.

Second, analysing the development between the two sub-periods within countries, we find that there is no change in the accumulation regimes in the UK. In both sub-periods there is a positive impact of interest rate variations on the equilibrium position of the system caused by the parameter constellation described above. In France, Germany and the USA, however, we witness a shift of regimes. This shift is most dramatic in France, where the first sub-period from the 1960s until the early 1980s shows the same pattern as the whole period: a negative reaction of the equilibrium position with respect to changes in the real long-term interest rate due to a highly inverse response of investment and a high propensity to save of rentiers. In the second sub-period from the early 1980s until the mid 1990s, however, the elasticity of investment decisions with respect to interest rate hikes declined and the savings propensities of rentiers also decreased. Increasing real interest rates now had a rather positive then negative impact on economic activity, capital stock growth and the profit rate. Also in Germany and the USA, comparing the pre- and the post- early 1980s periods, the regimes shift in the same direction as in France due to decreasing sensitivities of investment towards the interest rates and declining savings propensities out of rentiers' income. In Germany the inverse impact of interest rate variations on the equilibrium position of the system in the first sub-period was

replaced by an undetermined impact in the second sub-period; in the USA an undetermined relation was replaced by a positive impact of interest rate variations on output, investment and the profit rate.

3.3 The role of interest rate variations for the trends of investment and growth: an interpretation

Finally we would like to address the question of how our econometric results for the effects of interest rate variations fit into an explanation of the general trends of investment and growth in the developed OECD-countries, as shown in table (2). If we only looked at the estimation results for the whole period under consideration we would have to conclude that real interest rate hikes have been a major impediment for capital stock and GDP growth in Germany since the mid 1970s and in France since the early 1980s. Also for the UK real interest rate increases could be made responsible for the slowdown in capital accumulation since the early 1980s, but there was no negative impact on overall demand and output according to our estimations. Only for the USA our results for the whole period do not suggest a straightforward conclusion, because rising real interest rates should have stimulated demand and capital accumulation which obviously was not the case when interest rates rose remarkably in the 1980s.

If we consider sub-periods, however, we also have to revise our interpretation of the French, the German and the UK case. For the first sub-period we estimated a negative impact of real interest rate variations on capacity utilisation, capital accumulation and the rate of profit for France and Germany. But there was no dramatic increase in real interest rates in this period in

these countries. Only in Germany real interest rates rose at the end of the 1970s. For the UK we estimated no negative impact of real interest rates on the equilibrium position of the economic system in this period, and there was no increase in real interest rates in this period. One could rather argue that falling interest rates may have contributed to the slowdown in capital accumulation and growth. For the USA the estimated effects of interest rate variations are undetermined. The slowdown in growth and capital accumulation in the first period under consideration has therefore to be explained by other factors than real interest rate variations.

One of those factors may have been a falling profit share in this period which was assumed to be a constant in our estimations. A declining profit share, however, had negative impacts on investment, aggregate demand and output, because investment decisions were positively influenced by the profit share in France, Germany and the USA in the period ranging from the 1960s to the early 1980s, as can be seen in table (5). Further factors may have been those, which usually are associated with the erosion of the stable „golden age" constellation of accumulation of the 1950s and 1960s: the productivity growth slowdown and rising prices of imported raw materials, which fuelled the distribution struggle when full employment was reached, and the breakdown of the international currency system of Bretton Woods which increased uncertainty for cross-border economic transactions.

When real interest rates rose dramatically in the second sub-period starting with the early 1980s, our estimations - assuming a constant income distribution between wages and total profits - suggest that there was no negative impact of interest rates on demand, output and capital accumulation. Rising interest rates should have rather been conducive to consumption and investment demand as well as to output in France, the UK and the USA. In Germany the impact of interest rate variations was undetermined according to our estimations. But capital

stock growth continued to fall in our second sub-period and also GDP growth remained at a low level.

This apparent paradox suggests that the economic system may have rapidly adjusted to the interest rate shock of the early 1980s. As can be seen from table (2), rising interest rates and hence rising proportions of rentiers' income in national income have been accompanied by falling labour income shares in France, Germany and the USA from the beginnig of this period and in the UK from the early 1990s onwards. We suppose that rising interest costs could be shifted to prices by entrepreneurs so that profits of enterprise remained unaffected and, in the face of rising unemployment, labour had to bear the brunt. Our attempts to calculate the impact of real interest rate variations on the profit share, estimating an OLS-equation for the profit share with the real long term interest, the rate of unemployment, the rate of change in unemployment and GDP-growth as potentially explaining variables, however, were far from being conclusive.[27] Here further research in explaining income shares and the relationship between interest rates and profit shares, which seems to vary over time, is necessary. This, however, would exceed the scope of our paper.

The adjustment process supposed above caused macroeconomic costs: rising shares of rentiers' income at the expense of labour income meant a reduction in consumption demand, because the propensities to save out of wages were still below the propensities to save out of rentiers income in our second sub-period, as can be seen in tables (3) and (4). This slowdown in consumption demand caused by redistribution also affected investment demand in a negative way, because investment was significantly responsive to aggregate demand in this period in each country investigated, as is shown in table (5). These effects, caused by a

[27] The estimation results can be obtained from the authors.

redistribution of income at the expense of labour, seem to have overcompensated the positive effects of an interest rate hike estimated from our model, under the assumption of constant income shares.

4. Conclusions

Within a simple Kaleckian aggregate demand-aggregate supply model we have studied the effects of the monetary variable „interest rate" on the real variables capacity utilisation and capital accumulation. Within our model the monetary interest rate has a profound influence on the real equilibrium position of the economic system. But the response of the equilibrium to a variation in the interest rate is not unique. It depends on the reaction coefficients in the investment and the savings function. The equilibrium position of the economic system is therefore highly sensitive to the values of the coefficients in the model.

Confronting our model with the data of some major OECD-countries and estimating the coefficients we found that the real effects of the monetary interest rate indeed vary between economies and between periods of accumulation. Over the whole time period considered, from the early 1960s to the mid 1990s, interest rate variations have had an inverse impact on output, investment and the profit rate in France and Germany whereas the impact in the UK and the USA has been rather positive due to a lower propensity to save of rentiers and a lower responsiveness of investment. Comparing the sub-periods from the 1960s to the early 1980s and from the 1980s to the mid 1990s, each economy analysed seems to have moved towards the constellation of the UK and the USA. A positive relation between interest rates and economic activity as well as capital stock growth, therefore, seems to be empirically possible in some countries and in some time periods, if we follow our estimation results.

Applying our estimation results to the explanation of the general falling or stagnating trends of output growth and capital accumulation since the early 1960s, we found that in the first period until the early 1980s, for which we estimated a significantly negative impact of interest rate variations on these two variables for some countries, interest rates did not increase dramatically. Therefore, interest rate hikes cannot be made generally responsible for the slowdown in this period. This slowdown rather has to be explained by falling profit shares, because profitability had a positive impact on investment in this period, and by the general erosion of the „golden age" constellation of accumulation.

For the second period, starting in the early 1980s, interest rates increased dramatically but our estimations, assuming constant income shares, suggest that there was no inverse impact on investment and output. We suppose that this apparent paradox could be explained by a rapid adjustment of the economic system to higher real interest rates at the expense of labour income in this period, i.e. through variations in functional income distribution. Decreasing labour income shares, a significantly lower propensity to save out of labour income than out of rentiers' income and a high responsiveness of investment to demand seem to have been main causes for stagnating GDP growth and falling capital stock growth from the early 1980s to the mid 1990s. The relationship between real interest rates and the profit share, however, which is crucial for this explanation and which seems to vary between time periods, has to be explored in further research.

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Table 1: Responses of the profit share, the rate of capacity utilisation, the rate of accumulation and the rate of profit to a variation in the interest rate: possible stable regimes of accumulation*

Regime	$\frac{du}{di}$	$\frac{dg}{di}$	$\frac{dr}{di}$
	$\frac{du}{di} > 0, \text{if } (1-s_z) + \theta > 0$	$\frac{dg}{di} > 0, \text{if} \beta(1-s_z) + \frac{h}{v}\theta > 0$	$\frac{dr}{di} > 0, \text{if } (1-s_z) + \theta > 0$
1	0	-	0
2	-	-	-
3	+	-	+
4	+	+	+

* Note that θ is assumed to be negative and that the stability condition implies that $\frac{h}{v} > \beta$.

Table 2: Interest Rates, profit shares, GDP growth and capital stock growth on average over the business cycle (in %)

France		**1960-1975**	**1976-1981**	**1982-1993**	**1994-1997 (§)**
i^n		6,20	10,43	10,08	4,96
i (*)		1,10	1,15	5,54	5,24
h		17,82	12,60	16,81	21,30
$\tilde{y}$		4,83	2,29	1,77	1,95
g (#,~)		5,51	3,78	2,69	1,95
Germany	**1960-1967**	**1968-1975**	**1976-1982**	**1983-1994**	
i^n	4,53	7,34	7,13	6,40	
i (*)	3,12	2,23	3,63	4,36	
h	20,00	17,57	15,06	18,96	
$\tilde{y}$	3,78	3,32	1,69	2,60	
g (#)	6,36	4,87	3,18	2,68	
UK		**1960-1974**	**1975-1980**	**1981-1991**	**1992-1997 (§)**
i^n		7,25	9,12	11,79	6,77
i (*)		2,08	-3,51	4,42	5,08
h		18,51	13,84	13,64	16,47
$\tilde{y}$		2,80	1,80	2,57	2,96
g (#)		3,87	2,69	2,34	2,05
USA	**1960-1970**	**1971-1975**	**1976-1982**	**1983-1991**	**1992-1997 (§)**
i^n	4,36	5,88	7,88	8,25	4,78
i (*)	1,59	-0,68	0,15	5,24	4,45
h	17,98	17,19	17,13	18,22	20,94
$\tilde{y}$	3,84	2,33	2,77	2,33	3,24
g (#)	3,59	3,91	4,09	2,90	2,12

Notes: i^n: nominal short-term interest rates (3 months); i: real long-term interest rate, nominal long-term interest rate (more than 7 years) corrected for the growth rate of the GDP price index; h: profit share: net operating surplus excluding labour income of the self-employed but still including imputed and actual interest payments divided by net value added; $\tilde{y}$: annual growth rate of real GDP; g: annual growth rate of the real gross capital stock in agriculture, industry and services; (*): beginning 1961; (#): until 1996; (~): 1960-1964 without capital stock in services, (§) incomplete cycle.

Sources: Europäische Kommission, OECD, SVR, authors‘ calculations

Table 3: Regression results for the propensities to save out of wages and out of total profits (OLS)

$$S_t = s_w(1-h_t)Y_t + s_\pi h_t Y_t + \varepsilon_t$$

$$\varepsilon_t = \rho\varepsilon_{t-1} + \mu_t$$

	France			**Germany**			**UK**			**USA**		
	1961-1995	1961-1981	1982-1995	1961-1993	1961-1982	1983-1993	1961-1995	1961-1980	1981-1995	1961-1995	1961-1982	1983-1995
s_w	0,0933	0,0114	-0,1179	0,0812	-0,0298	-0,2573	0,0082	-0,0239	-0,0263	-0,1465	-0,1831	-0,0638
SE	0,0579	0,0183	0,1045	0,1099	0,0478	0,1394	0,0281	0,0140	0,0416	0,1222	0,0382	0,0499
t	1,6114	0,6273	-1,1283	0,7385	-0,6232	-1,8462	0,2922	-1,7143	-0,6326	-1,1996	-4,7980	-1,2794
p	0,1169	0,5383	0,2832	0,4660	0,5405	0,1021	0,7721	0,1046	0,5388	0,2391	0,0001	0,2296
s_π	1,0757	1,1436	0,8492	1,1397	1,0598	1,3665	0,2680	0,7998	0,3666	0,6671	1,5551	0,5072
SE	0,3162	0,1064	0,2514	0,1784	0,2459	0,4720	0,0903	0,0835	0,1550	0,1572	0,1875	0,1516
t	3,4025	10,7478	3,3778	6,3894	4,3098	2,8951	2,9676	9,5760	2,3656	4,2450	8,2946	3,3450
p	0,0018	0,0000	0,0062	0,0000	0,0004	0,0200	0,0056	0,0000	0,0357	0,0002	0,0000	0,0074
ρ	0,9982	0,0871	0,9038	1,0948	0,8319	0,9440	0,8509	0,5415	0,9392	1,1096	0,6061	0,8544
SE	0,0725	0,4219	0,1163	0,0686	0,1524	0,1753	0,0996	0,2059	0,2224	0,0668	0,2199	0,1784
t	13,7589	0,2064	7,7739	15,9612	5,4580	5,3867	8,5451	2,6296	4,2230	16,6230	2,7555	4,7885
p	0,0000	0,8388	0,0000	0,0000	0,0000	0,0007	0,0000	0,0176	0,0012	0,0000	0,0126	0,0007
R^2	0,8730	0,9678	0,8444	0,9444	0,8532	0,8282	0,9031	0,9727	0,4523	0,8417	0,9551	0,6374
DW	0,2820	1,5385	0,9761	1,8529	1,6741	2,1408	1,5072	1,7608	1,6808	1,3161	1,6511	2,4204
N	35	21	14	33	22	11	35	20	15	35	22	13

Notes: s_w: propensity to save out of wages; s_π: propensity to save out of total profits; h: profit share, excluding labour income of the self-employed; Y: national income; ρ: autoregressive term; SE: standard error; t: t-statistics; p: p-value; R^2: adjusted R^2; DW: Durban-Watson-statistics.
Sources: OECD, authors' calculations.

Table 4: Calculation of the propensities to save out of rentiers' income

		r	i^n	s_π	s_z
France	1961-1995	0,1286	0,0937	1,0757	1,1040
	1961-1981	0,1279	0,0878	1,1436	1,2091
	1982-1995	0,1297	0,1024	0,8492	0,8090
Germany	1961-1993	0,1120	0,0746	1,1397	1,2097
	1961-1982	0,1123	0,0759	1,0598	1,0885
	1983-1993	0,1115	0,0721	1,3665	1,5671
UK	1961-1995	0,0784	0,0991	0,2680	0,4203
	1961-1980	0,0850	0,0973	0,7998	0,8252
	1981-1995	0,0698	0,1014	0,3666	0,5643
USA	1961-1995	0,1602	0,0736	0,6671	0,2757
	1961-1982	0,1604	0,0663	1,5551	2,3424
	1983-1995	0,1598	0,0860	0,5072	0,0838

Notes: r: rate of profit relating nominal profits, excluding labour income of the self-employed and depreciations of fixed capital, to the nominal net capital stock; i^n: nominal long-term interest rate; s_π: propensity to save out of profits which was estimated according to table 3; s_z: propensity to save out rentiers income which was calculated under the assumption that firms distribute income to rentiers according to the nominal interest rate on the nominal net capital stock.
Sources: OECD, SVR, authors' calculations.

Table 5: Regression results for the effects of demand growth, profit shares and real interest rates on capital stock growth (OLS)

$$g_{t+1} = \alpha + \beta\tilde{y}_t + \tau h_t + \theta i_t + \varepsilon_t$$

	France			**Germany**			**UK**			**USA**		
	1961-1995	1961-1981	1982-1995	1961-1993	1961-1982	1983-1993	1961-1995	1961-1980	1981-1995	1961-1995	1961-1982	1983-1995
α	0,0289	0,0235	0,0154	0,0233	-0,0337	0,0018	-0,0001	0,0218	0,0473	0,0381	-0,0067	0,0144
SE	0,0054	0,0047	0,0069	0,0169	0,0112	0,0144	0,0071	0,0131	0,0109	0,0119	0,0119	0,0151
t	5,3042	4,9864	2,2106	1,3801	-2,9926	0,1234	-0,0166	1,6607	4,3020	3,1810	-0,5628	0,9522
p	0,0000	0,0001	0,0515	0,1781	0,0078	0,9052	0,9869	0,1162	0,0013	0,0033	0,5805	0,3659
β	0,3520	0,1419	0,2380	0,2255	-0,0812	0,1901	0,0808	0,2122	0,2096	0,1796	0,0389	0,1698
SE	0,0625	0,0583	0,0912	0,1065	0,0756	0,0682	0,0732	0,0823	0,0795	0,0546	0,0471	0,0728
t	5,6337	2,4356	2,6096	2,1176	-1,0741	2,7864	1,1050	2,5798	2,6352	3,2893	0,8255	2,3313
p	0,0000	0,0262	0,0261	0,0429	0,2970	0,0270	0,2777	0,0201	0,0232	0,0025	0,4199	0,0446
τ	0,0551	0,1402	-0,0068	0,1352	0,5133	0,0904	0,1863	0,0431	-0,1606	-0,0353	0,2464	-0,0418
SE	0,0358	0,0344	0,0356	0,1005	0,0701	0,0653	0,0501	0,0826	0,0959	0,0698	0,0713	0,0682
t	1,5385	4,0714	-0,1905	1,3447	7,3184	1,3841	3,7212	0,5218	-1,6749	-0,5056	3,4554	-0,6135
p	0,1341	0,0008	0,8527	0,1891	0,0000	0,2089	0,0008	0,6090	0,1221	0,6167	0,0028	0,5547
θ	-0,3080	-0,1263	0,1191	-0,4260	-0,2370	0,0721	-0,0791	0,0492	-0,1404	-0,1670	-0,0721	0,2843
SE	0,0470	0,0491	0,1236	0,1318	0,0871	0,1318	0,0342	0,0599	0,1016	0,0436	0,0543	0,1047
t	-6,5523	-2,5716	0,9637	-3,2315	-2,7203	0,5470	-2,3121	0,8203	-1,3825	-3,8298	-1,3292	2,7153
p	0,0000	0,0198	0,3579	0,0031	0,0140	0,6014	0,0276	0,4241	0,1943	0,0006	0,2004	0,0238
R^2	0,7994	0,7166	0,3253	0,4953	0,8462	0,7462	0,4509	0,5549	0,3410	0,4372	0,5418	0,7157
DW	1,6283	1,9442	1,1390	0,5143	0,7135	1,7580	1,0552	1,1187	1,6536	0,6393	1,4244	2,1549
N	35	21	14	33	22	11	35	20	15	35	22	13

Notes: g: annual growth rate of real gross capital stock; $\tilde{y}$: annual growth rate of real GDP; h: profit share, excluding labour income of the self employed; i: real long-term interest rate; SE: standard error; t: t-statistics; p: p-value; R^2: adjusted R^2; DW: Durban-Watson-statistics.
Sources: OECD, SVR, authors‘ calculations.

Table 6: Regimes of accumulation with respect to interest rate variations

		$\frac{du}{di} > 0, \text{if } (1-s_z)+\theta > 0$	$\frac{dg}{di} > 0, \text{if} \beta(1-s_z)+\frac{h}{v}\theta > 0$	$\frac{dr}{di} > 0, \text{if } (1-s_z)+\theta > 0$
France	1961-1995	0 - 0,308 **< 0**	0,352*0 + 0,1019*(-0,308) **< 0**	**< 0**
	1961-1981	0 - 0,1263 **< 0**	0,1419*0 + 1,1073*(-0,1263) **< 0**	**< 0**
	1982-1995	0,191 + 0 **> 0**	0,238*0,191 + 0,0936*0 **> 0**	**> 0**
Germany	1961-1993	0 - 0,426 **< 0**	0,2255*0 + 0,0934*(-0,426) **< 0**	**< 0**
	1961-1982	0 - 0,237 **< 0**	0*0 + 0,0966*(-0,237) **< 0**	**< 0**
	1983-1993	0 - 0 **= 0**	0,1901*0 + 0,0865*0 **= 0**	**= 0**
UK	1961-1995	0,5797 - 0,0791 **> 0**	0*0,5797 + 0,0658*(-0,0791) **< 0**	**> 0**
	1961-1980	0,1748 - 0 **> 0**	0,2122*0,1748 + 0,0743*0 **> 0**	**> 0**
	1981-1995	0,4357 - 0 **> 0**	0,2096*0,4357 + 0,0539*0 **> 0**	**> 0**
USA	1961-1995	0,7243 - 0,167 **> 0**	0,1796*0,7243 + 0,1136*(-0,167) **> 0**	**> 0**
	1961-1980	0 - 0 **= 0**	0*0 + 0,1179*0 **= 0**	**= 0**
	1981-1995	0,9162 + 0,2843 **> 0**	0,1698*0,9162 + 0,1076*0,2843 **> 0**	**> 0**

Notes: The values of the parameters s_z, θ and β are taken from tables 4 and 5. The values for the propensities to save out of rentiers' income are limited to one. Only significant values of the estimated parameters are taken into account. Otherwise the values are taken to be zero. The profit share (h) does not include the labour income of the self-employed. The capital-output-ratio (v) is the ratio of the nominal gross capital stock and of nominal GDP.
Sources: tables 4 and 5, OECD, authors' calculations

Appendix, Table I: Chow-Breakpoint-Tests

$g_{t+1} = \alpha + \beta\tilde{y}_t + \tau h_t + \theta i_t + \varepsilon_t$			$S_t = s_w(1-h_t)Y_t + s_\pi h_t Y_t + \rho\varepsilon_{t-1} + \mu_t$	
France				
year	1982		year	1982
F-Test	11,6797		F-Test	30,3075
p	0,0000		p	0,0000
Germany				
year	1983		year	1983
F-Test	27,5682		F-Test	13,3320
p	0,0000		p	0,0001
UK				
year	1981		year	1981
F-Test	7,9400		F-Test	12,0793
p	0,0002		p	0,0001
USA				
year	1983		year	1983
F-Test	12,4428		F-Test	62,2406
p	0,0000		p	0,0000

Appendix, Table II: Stability/Instability

		stability if: $\frac{h}{v} - \beta > 0$
France	1961-1995	0,1019 - 0,352 **< 0**
	1961-1981	0,1073 - 0,1419 **< 0**
	1982-1995	0,0936 - 0,238 **< 0**
Germany	1961-1993	0,0934 - 0,2255 **< 0**
	1961-1982	0,0966 + 0 **> 0**
	1983-1993	0,0865 - 0,1901 **< 0**
UK	1961-1995	0,0658 - 0 **> 0**
	1961-1980	0,0743 - 0,2122 **< 0**
	1981-1995	0,0539 - 0,2096 **< 0**
USA	1961-1995	0,1136 - 0,1796 **< 0**
	1961-1980	0,1179 - 0 **> 0**
	1981-1995	0,1076 - 0,1698 **< 0**

Notes: The values for β are taken from table 5. The profit share (h) does not include the labour income of the self-employed. The capital-output-ratio (v) is the ratio of the nominal gross capital stock and of nominal GDP.
Sources: see table 5, OECD, authors' calculations.