Wirtschaftsuniversität Wien
Vienna University of Economics and Business Administration

Working Papers Series:

Growth and Employment in Europe: Sustainability and Competitiveness

Working Paper No. 8

The slowdown of accumulation and the rise of European unemployment

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September, 1999

This is a draft. Comments are welcome!

This working paper series presents research results of the WU-Research Focus:
Growth and Employment in Europe, Sustainability and Competitiveness
The papers are available online under: http://www.wu-wien.ac.at/inst/vw1/gee/workp.html

The slowdown of accumulation and the rise of European unemployment

by

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Abstract

The paper aims at testing empirically two Keynesian hypotheses. First that increasing financial investment is one of the major causes for the slowdown in capital accumulation and, second, that this slowdown is one of major factors for rising unemployment rates. After presenting evidence from the National Accounts for the rising importance of dividend and interest income, econometric tests are performed for Germany, France, UK and the USA, and for the employment regressions, additionally for Italy. The choice of countries being determined by the interest in European unemployment and limited data availability. Overall, the findings are supportive of both hypotheses

Acknowledgements

The paper has benefited from comments by Fabio Rumler and discussions with Alfred Stiassny. All mistakes are mine.

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Introduction

Unemployment in the European Community has been around or above 10% for more than one and a half decades now. The conventional explanation for this is that European labour markets are inflexible and give too much power to insiders. Thus real wages are rigid and cannot adjust, i.e. fall, to full employment levels (e.g. Krugman 1994, Siebert 1997). More technically, the non-accelerating inflation rate of unemployment (NAIRU), that is the rate of unemployment at which the inflation rate is stable, has increased due to these rigidities, dragging actual unemployment along with it (for up to date formulations of this theory see (Nickell 1998, Phelps 1994, Lindbeck 1993). Blanchard (1990, 70) summarises this approach "Unemployment must reconcile the income claims of firms and workers. The aggregate demand relation, as usual, plays no other role in equilibrium than to determine the price level or the rate of inflation".

The fundamental presumption of this argument is that the reasons for unemployment are located on the labour market and aggregate demand plays no important role in the determination of the level of employment. In contrast, this paper takes an old Keynesian view, arguing that the level of demand on the goods market determines the level of employment (Keynes 1936, chapter 4). The crucial variable driving the growth of demand and output is investment. Hence explaining the slowdown in accumulation is tantamount to explaining the rising unemployment levels—but explaining this slowdown is no simple task. Instead of giving an exhaustive review of the various reasons that have been cited, we focus on the empirics of the rising return on financial investment that leads non-financial businesses to substitute financial investment for physical investment.

The argument is hardly original, though almost entirely neglected in the standard empirical analyses of European unemployment. Most Keynesian analyses, on the other hand remain on an abstract level (e.g. Davidson 1998). Thus what is original about this paper is that it provides empirical and econometric evidence to the Keynesian hypothesis.

The paper is structured as follows. Section one presents the accumulation and employment function to be tested later on. Section two illustrates the rise of financial investment and rentiers' income. Section three presents the econometric approach taken. Section four presents the empirical estimation of the investment function with close attention being paid to the time series properties of the variables involved and section five reports the results of the estimation of the employment function.

The accumulation and employment function

"[...] Keynesian models (...) are designed to project into the long period the central thesis of the General Theory, that firms are free, within wide limits, to accumulate as they please, and that the rate of saving of the economy as a whole accommodates itself to the rate of investment that they decree." Robinson (1962, 82). Investment plays the active role in Keynesian macro models, influencing the level of output through the multiplier.[1] It depends on expected profits, which shifts the question to how expectations are determined. In the short run, due to fundamental uncertainty they are elusive and predictable (Shackle, Vickers) In growth models, investment is endogenized by the factors that determine the profitability of physical investment: First demand factors, often captured in an accelerator term; second a profit term or a variable of income distribution; and, third, the opportunity cost of real investment, in other words: the attractiveness of alternatives to physical investment, namely financial investment.

These variables are operationalized differently by different authors. For convenience we will interpret capital productivity as an indicator of capacity utilisation and use it as the demand variable. As Marglin and Bhaduri 1990 have shown, using the profit share rather than the profit rate as the profit variable allows for a richer model, that is able to generate profit led as well as demand led regimes. It is difficult to come up with a comprehensive measure for the rate of return on

[1] Neo-Keynesian definitions of Keynesian economics would probably emphasize that an active role of the state can have positive effects for the economy. The notion of Keynesian economics utilized here is more akin to what is often called Post-Keynesian theory.

financial investment (in the empirical section this problem will be circumvented by using an indicator of receipts from financial investment).

Thus the accumulation function utilised takes the form:

accumulation function gk = a + b*ps + c*z + d*fi a, b > 0, d < 0 (eq. 1)

where gk growth rate of the capital stock (= investment / capital stock)
ps profit share
z capital productivity, capacity utilisation
fi financial investment

This formulation is an augmented version of the accumulation function proposed by Marglin and Bhaduri (1999) that came out of the debate around Kaleckian growth models.[2]

The model is complemented by an employment function. Following Keynes we assert that employment depends on sales. Thus, assuming exogenous technical progress, the development of employment depends on economic growth, which is captured by Okun's Law. Okun's Law, however, does not indicate the direction of causality. In Keynesian economics it is assumed that growth determines employment. Moreover, since we regard accumulation as the basic variable driving growth, we well make employment a function of accumulation, and, to adjust for cyclical movements, capacity utilisation.[3] This of course is a shortcut, bypassing the foreign sector, the state sector and assuming that the saving propensity does not change. Heroic assumptions indeed, but they allow us to focus on what we consider the core of the Keynesian argument.

Thus the employment function to be estimated is:

employment function e = f(z)+g(gk) (eq. 2)

where e is the employment rate.

This is admittedly a rather simple employment function, that would certainly deserve further elaboration. However it is worth noting that it need not be interpreted as a labour demand function, but can also be regarded as a reduced form equation and thus a genuine employment function. To illustrate the point

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[2] The main contribution of the recent debate are Rowthorn 1982 and Dutt 1984. Lavoie 1992 and Stockhammer forthcoming give overviews.

[3] Since we use capital productivity as indicator for capacity utilization, Y = z*K, where Y and K are the level of output and capital stock respectively. In growth rates we get $\hat{Y} = \hat{z} + gk$, here ^ indicates growth rates.

assume a standard labour supply curve, or if you prefer: wage setting curve, where wages (demanded) depend positively on employment and various shift factors, captured as (a) in equation 3a. Further assume a labour demand function that is increasing in growth and decreasing in wages. Thus we get

labour supply	$w = a + be$	$b > 0$	eq. 3a
labour demand	$e = c + dy - hw$	$d, f > 0$	eq. 3b

with

w wages

e employment rate

By substitution we get the employment function

$e = c + dy - ha - hbe,$

which reduces to:

employment function	$e = (c-ha)/(1+hb) + d/(1+hb)\, y$	eq. 3c

While the interpretation of the coefficients changes, the functional forms of (eq. 2) and (eq. 3c) are analogous for the purpose of econometric estimation, once we replace y in (3c) by z and gk. Note further that , in equation (3c), an increase in autonomous wage demand (a) would reduce employment, since $\frac{de}{da} < 0$. The main shortcoming of the present employment function is that not much attention is paid to shift variables on the labour demand or wage setting side.

The rise of rentiers' income

This section illustrates the rising role of financial investment and the income thereof. The first variable looked at are real interest rates. Then we will look at the non-financial business sector and finally we investigate profits in the financial sector. The data used on rentiers income are from the OECD National Accounts Detailed Tables data base.

The first table presents data on the real long term interest rate, here measured as the yield on long term government bond minus inflation (CPI). Interest rates are the most basic variable in discussing rates of return on financial investment. Real interest rates were at modest levels (around 2 or 3%) in the 60s, very low and often

negative in the 70s and increased to almost 5% and more after in the 1980s and 90s. (The major exception to this picture is Germany, where interest where at fairly high levels through the post-war era.) In the post-war era the financial sector was heavily regulated, often with ceilings for interest rates, as to foster growth in the real sector, thus the moderate interest rates back then. The negative interest rates in the 1970s are due to soaring inflation at this time. Ignited by the OPEC oil price increases and heightened distributional conflicts between capital and labour, most countries witnessed two digit inflation rates that eroded (real) returns on financial investment. In the early 1980s the monetarist revolution changed the priorities of economic policy in general and monetary policy in particular, leading to an anti-inflationist policy that resulted in historically high real interest rates.

Real long term interest rates (deflator: CPI)

	France	Germany	United States	United Kingdom	Italy	Japan
50-54	-1.32		1.97	-0.71	1.97	
55-59	0.38	4.82	1.81	2.49	4.38	
60-64	1.31	3.73	2.75	2.86	1.75	
65-69	2.14	4.92	1.73	3.45	4.11	2.05
70-74	0.71	3.15	0.68	0.91	-0.71	-3.20
75-79	-0.80	2.99	0.12	-2.27	-2.13	0.35
80-84	2.94	4.16	4.89	2.98	1.92	4.12
85-89	5.80	5.10	5.21	4.51	4.60	3.81
90-94	5.83	3.97	3.63	4.59	6.69	3.24
95/96	5.09	4.39	3.64	5.24	6.20	2.35

source: IMF

Next we take a look at non-financial enterprises. This is of particular interest, since much of the alleged changes in the relation between finance and enterprises should be reflected here. Three measures of rentiers income with respect to non-financial enterprises are discussed: interest & dividends received, interest & dividends paid, and the ratio of new liabilities to new financial assets.

First, dividend and interest received (by non-financial enterprises) compared to the operating surplus of non-financial enterprises. This is a measure that will exhibit an anti-cyclical pattern, since the denominator (operating surplus) has a strong pro-

cyclical behaviour. Hence the high rentiers income ratio in the period 1980-84, a time of recession, may tell more about the low profits than about a structural change in the income composition. In the econometric part we will divide rentiers income of the non-financial business sector by its value added to avoid this cyclical behaviour (see appendix 1 for the corresponding data).

Non-financial enterprises now get a significant part of their income from financial transactions. This share is around 50% (interest and dividend income as percent of operating surplus) in Anglo Saxon countries, and France. A trend to rising financial income is evident in Germany, France and the US. The UK and Japan had high levels in the 70s.

Dividend and interest received / operating surplus of non-financial enterprises

	W-Germany	Germany	France	USA	UK	Italy	Japan
60-64	0.038			0.171			
65-69	0.048			0.169	0.201		
70-74	0.068		0.092	0.292	0.467		0.181
75-79	0.064		0.164	0.327	0.447		0.201
80-84	0.099		0.300	0.494	0.356	0.269	0.189
85-89	0.092		0.250	0.520	0.325	0.198	0.174
90-94	0.135	0.129	0.415	0.567	0.472	0.197	0.191
95/96		0.105	0.481	0.508	0.399	0.188	0.118

W-Germany: 90-93

Italy: 82-89

UK: 68/69

source: OECD National Accounts

Next the interest and dividends payments of non-financial firms. Again we look at the ratio of these payments over the operating surplus. The numbers are surprisingly high. Except for Germany and Japan interest and dividend payments have exceeded the operating surplus at some point in time. Again we have a strong anti-cyclical pattern. Most countries exhibit the highest values in the early 80s. Except for UK and Japan, all countries have rising ratios until the early 80s, and a stagnation afterwards. However the levels in the late 80s and early 90s are significantly above Golden Age levels. In the UK and the USA close to all operating surplus is transformed into dividend and interest payments.

dividend and interest payments / operating surplus of non-financial enterprises

	France	W-Germany	UK	USA	Italy	Japan
60-64		0.172		0.488		
65-69		0.218	0.743	0.496		
70-74	0.591	0.309	1.019	0.712		0.691
75-79	0.846	0.324	1.057	0.722		0.816
80-84	1.210	0.452	0.882	1.009	1.077	0.722
85-89	0.829	0.373	0.789	0.958	0.688	0.590
90-94	0.978	0.427	1.145	1.012	0.761	0.698
95/96	1.005		0.981	0.848	0.579	0.564

source: OECD National Accounts

Finally, we turn to the incurrence of liabilities versus acquisition of assets by non-financial firms. Unfortunately here data availability is much more limited than for the previous measures. Except for the USA and Japan, data start in 1970 only. What is evident nonetheless is that by the early 90s non-financial businesses move to a net creditor position, while having been important net lenders previously (a value of less than one indicates that the sector is a net lender).

incurrence of liabilities/acquisition of assets by non-financial businesses

	W-Germany	France	UK	USA	Italy	Japan
60-64				1.906		1.624
65-69				1.840		1.511
70-74	3.129	1.913	2.844	1.829		1.730
75-79	2.330	1.705	1.390	1.232		1.600
80-84	2.569	1.535	0.944	1.403	2.121	1.790
85-89	1.696	1.196	1.088	1.341	1.873	1.512
90-94	1.137	0.956		0.863		3.823
95/96		0.789				1.465

source: OECD National Accounts

The evidence presented above does indicate that non-financial businesses do strongly experience the rise of interest and dividend incomes -- on the income side as well as on the expenditure side. It is almost tempting to speak of "rentieralization" of non-financial businesses. This is likely to affect their investment behaviour.

Lastly we look at profits in the financial sector. In the National Accounts this sector is defined as financial services, insurance, and real estate (FIRE). The data show

what share of the total operating surplus accrues to the financial sector. In all countries this share has risen considerably over the past three and a half decades, with interesting differences in levels. While in Germany (West) less than 10% of the total operating surplus go to the financial sector, in all other countries it is more than 30%, in the Anglo-Saxon countries more than 40%

OS of FIRE / total OS

	W-Germany	France	UK	USA	Italy	Japan
60-64	0.027			0.323		0.174
65-69	0.037			0.317		0.199
70-74	0.049		0.339	0.338	0.249	0.219
75-79	0.065	0.264	0.374	0.315	0.247	0.239
80-84	0.096	0.300	0.325	0.391	0.252	0.260
85-89	0.076	0.319	0.336	0.422	0.292	0.287
90-94	0.072	0.325	0.413	0.463	0.339	0.329
95/96			0.425	0.447	0.343	0.387

W-Germany: 60-93

France:77-92

UK: 70-95

source: OECD National Accounts

The overall evidence in this section clearly indicates the rising importance of rentiers income, i.e. dividend and interest income, by the private non-financial business sector and the rising ability of the financial sector, once regarded as unproductive, to appropriate profits. We do not want to dive into to debate why this has happened. Frequent explanations include monetarist policy of tight money, deregulation of financial markets, the globalisation of financial markets and the financial bubbles. What is of particular interest here is that the non-financial business sector is unambiguously part of these developments, which is likely to have an impact on its investment behaviour.

Time series analysis and unit roots

Ignited by Granger and Newbold 1974 and Nelson and Plosser 1982, one of the major debates in econometrics took place in the 1980s, setting new standards in the treatment of time series data. But despite of a decade or more of debate, there is no agreement as to the consequences and relevance of unit roots (this is nicely and informatively illustrated by Campbell and Perron 1991 and the replies by Cochrane (1991) and Miron (1991)).

Regressing a time series that has a unit root[4] onto another time series with a unit root may give rise to spurious regression results, that is inflated significance levels because the standard inference procedures due not apply. Typically such spurious regressions exhibit high R^2, but very low Durbin-Watson (dw) statistics.[5] Inconveniently for macroeconomists, many economic time series seem to exhibit unit roots (Nelson and Plosser 1982). Since then it has become fashionable to test for unit roots and cointegration,[6] and in the case of rejection of the cointegration hypothesis, to perform regressions in differences rather than in levels.

However, it has been pointed out that the hopes put into unit root have not been realised. First, there cannot be a conclusive test of unit roots with finite samples: Any 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). This of course also applies to cointegration tests. Second, while it was originally hoped unit root test would allow do discriminate between competing economic theories, it has been shown that various economic theories are consistent with the existence of unit roots in economic time series (Cochrane 1991, Miron 1991).

What do we learn from the debate? First to worry the time series properties of the variables, without throwing out the baby with the bath water. Defining variables in

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[4] If a series exhibits a unit root its current value can be written as its past value plus a random variable, this is also called a random walk. Such a series is called non-stationary, and has no fixed mean and an infinite variance, contrary to a stationary variable. If a non-stationary variable can be transformed into a stationary series by differencing once, it is called integrated of degree one (I(1)).

[5] A frequently found rule of thumb to determine whether a regression is spurious is to look whether its R2 exceeds its dw.

[6] Regressing two non-stationary variables onto each will generally result in a non-stationary residuals, thus the dw statistic converges to zero. However, if the two variable share a common stochastic trend, intuitively if there exists a long term relation, the residuals will be stationary. Then the two variables are said to be cointegrated. Most cointegration tests are analog to unit root tests on the residual, though with different critical values. (The seminal paper on cointegration is Engle and Granger 1987; a comprehensible introduction is offered in Charemza and Deadman 1997)

a regression in differences looses crucial long run information, whereas having variables in levels may give rise to the spurious regression results. Second that unit root tests by themselves cannot solve the question of whether to run a regression in differences or levels. Thus economic theory or even intuition have to be taken seriously. Overall, "since we can never know whether the data are trend stationary or difference stationary, any result that relies on the distinction is inherently uninteresting" (Miron 1991, 212). Thus we want to adopt a general procedure that allows for autocorrelation of the dependent variable without either imposing or ruling out a unit root restriction, but at the same time prevents spurious regression results. For this autoregressive distributed lag models (ADL)[7] or Cochrane-Orcutt correction for first order autocorrelation in the residuals are appropriate candidates (Hamilton 1994).

We will adopt an autoregressive distributed lag model (a row of a VAR, if you prefer) and then we will test restrictions on the ADL, in order to simplify the specification. This is desirable since the ADL specification will lead to multicollinearity problems because the independent variables enter the regression twice and are usually autocorrelated.

We are using something like a light hand version of "general to specific modelling" (Hendry et al 1984), with a special interest to the role of differences versus levels. Consider a simple ADL specification:

ADL $y_0 = a_0 + a_1*y_{-1} + a_2*x_0 + a_3*x_{-1}$ eq. 4a

Since we are interested in the role of differences versus levels, the ADL tested is reparameterized to

$y_0 = a_0 + a_1*y_1 + b_2*x_0 + b_3*\Delta x$, where $b_2=a_2+a_3$ and $b_3 = -a_3$ eq. 4b

In this formulation the variables appear in differences as well as levels, which is convenient in our search for the appropriate time series specification. Hence the

[7] ADL models have been shown to have desirable properties even in the face of unit roots (Sims, Stock, Watson 1990; Pesaran and Shin 1998), they "solve many of the problems associated with spurious regressions, although tests of some hypotheses will still involve non-standard distributions." Hamilton 1994, 562.

ADL will be estimated in this form. It is worth noting that we can also rewrite the above formulation to get Δy, a I(0) variable in any case, on the LHS:

$\Delta y = a_0 + b_1 * y_1 + b_2 * x_0 + b3 * \Delta x$, where $b_1 = (a_1 - 1)$, eq. 4c

the first part of which is the standard Dickey-Fuller unit root test. This transformation of y affects neither the parameter estimates nor the estimated standard error of a_0, b_2 and b_3.

Returning to equation (4b), if the "true" underlying relation between the variables were in differences, the estimates for a_1 should be close to unity and for b_2 close to zero. If, on the other hand the underlying relation is in levels, b_3 should converge to zero. For the coefficient a_1 there are several possibilities. First it could be unity, which means a unit root and the regression should be run in differences. Second it could be zero and the regression should be run in levels. Third, the coefficient is between zero and one, in which case we have partial adjustment.

Since it will be important later on, let us briefly consider this third case. If $0<a_1<1$ and $b_3=0$, the equation becomes:

partial adjustment model $y_0 = a_0 + a_1 y_{-1} + b_2 x_0$ eq. 4d

This specification is called partial-adjustment model because one way to generate this type of model is via assuming that x_0 does determine the desired level of y, (y*), and the actual y results from a partial adjustment to this desired level. $(1-a_1)$ then is the speed of adjustment and $b_2/(1-a_1)$ is the long run effect of x_0 on y. (see Hendry 1995, chap. 7 for an in depth treatment of partial adjustment models and their relation to the general ADL).

Explaining accumulation

The accumulation function to be estimated was presented above (eq. 1). Before proceeding to the estimation results, we will briefly discuss the data sources.

The rate of growth of the capital stock (gk) is the growth rate of gross business capital stock. The profit share (ps) is gross profit share in the business sector and capacity utilisation (z) is the capital productivity in the business sector. The data is

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.

The "rentiers share of the non-financial business sectors" measures the receipts from financial investment rather than financial investment itself. A measure for the latter was presented above, but is available for even shorter time periods only. Measures of the incentive for financial investment would make sense, but it is difficult to find comprehensive measure of the return on financial investment for long time periods. Variables like real interest rates and the rise in share prices were either insignificant or had the wrong sign. In the case of interest rates, it is a frequent conundrum in investment regressions. Hardly ever do they become significant without major modifications.[8] Survey papers like Chrinko 1993 and Ford and Poret 1991 conclude that while the cost of capital is sometimes statistically significant, it rarely has a strong effect on investment. Hence its omission, is unlikely to have a large effect on the estimated coefficients, if it has an effect at all.

Since the direction of causation (as well as simultaneity) are important issues here, all independent variables are lagged, hence, all x variables in equations 4a – 4d are lagged one more period. In the case of accumulation this is also sensible because of the time lag between investment decision and investment expenditure. We aim at testing one specification for all countries without much attempt to optimise the fit for each country, thus we abstain from including dummies or further country specific variables. Only for Germany a dummy variable for the year 1991 was necessary because this is the year of statistical unification by the OECD.

[8] For example Ford and Poret 1991 use different interest rates according to the source of funding and combine them by the relative share. Bhaskar and Glyn 1995 add interest rates and the deflator of capital goods prices and divide this by wages and the Solow growth residual as a proxy for technical progress.

We know from theory that unit root tests cannot help us distinguish sharply between difference stationarity and trend stationarity, however, we still performed unit root tests (reported in the appendix 3) to get an idea of how big the problem could be. For accumulation the ADF test without trend fails to reject the null hypothesis of a unit root in four out of six countries, the ADF with trend in three out of six. For ps the null is rejected in three countries, for z in only one. For rsnf the null was rejected in none of the four countries. Theoretically, it is implausible that growth rates of capital stock exhibit a unit root, i.e. that they are free to wander around, given that the interval - 5 to +10 probably captures the entire range of values that growth rates of capital stock have ever taken on.[9] Thus we interpret the results as a high degree of autocorrelation rather than of unit roots.

Given the strong a priori presumption that the growth rate of capital stock is stationary over long time periods and the prima facie evidence of the existence of a unit root in many of the time series cannot be rejected, we will adopt a flexible procedure, allowing for autocorrelation and influences in levels as well as in differences and adopt a ADL model that will be tested down afterwards.

Table 2.1 A reparameterized ADL model

	France	Germany	UK	USA
R2	.92	.97	.92	.83
n	79-97	62-94	70-96	62-97
const	-.01	-.14 ***	-.02	.01
t value	*.1*	*8*	*1.3*	.3
gkb1	.65	.06 *	.84 ***	.62 ***
t value	*1.2*	*1.7*	*6.4*	*4.1*
z1	0	.31 ***	.16 ***	-.01
t value	*0*	*6.4*	*3.1*	*.1*
d(z)	.1	.08	.12	.13 **
t value	*.5*	*.8*	*1*	*2*
ps1	.09 *	.16 ***	-.05	.04
t value	*2*	*3.1*	*.9*	*.3*
d(ps)	- .05	-.07	.02	.01
t value	*.7*	*.7*	*.4*	*.8*

[9] "The unit roots question amounts to the specification of units: should we use levels or first differences (etc.). For most series we know the answer. GNP, consumption, investment, etc. belong in growth rates. Variables that are already rates, such as interest rates, inflation, and unemployment belong in levels." Cochrane 1991, 207

rsnf1	- .29 **	.03	- .27 **	-.2
t value	*2.3*	*.1*	*2.6*	*1.6*
d(rsnf)	.09	-.6 **	.08	.02
t value	*.6*	*2.1*	*.8*	*.1*
dw	2.24	1.37	1.94	1.72

Calculations performed with Eviews. signs of t-values not reported.
*, ** and *** denote significance at 10, 5 and 1% respectively.

Table 2.1 above summarises the regression results of the ADL model. Overall the model performs modestly well, but given how little success the profession has had with explaining investment, the standards for investment regressions are low.

Since the regression is in levels and an autoregressive term is included, the R2 are very high with only the USA below 90%. The Durbin-Watson (dw) statistics is reported although its critical values do not apply since there is a lagged dependent variable on the RHS. But even without exact critical values it is clear that there are autocorrelation problems in Germany, whereas it will be less of problem with other countries. The low dw statistics, however, may simply reflect missing variables. The lagged value of accumulation is above .6 in all countries except Germany, thus confirming the high degree of autoregression that the unit root tests indicated. Capacity utilisation is statistically significant in levels in Germany and the UK, and in differences in the USA, while it is not at all significant in France. Profit shares are significant in levels in France and Germany; and the rentiers share of non-financial businesses is significant in levels in France and UK and in differences in Germany. Hence overall, the variables do exercise an influence on accumulation. The accumulation function used is thus validated.

With this knowledge there are two ways of proceeding in eliminating variables. Either the most plausible structure is imposed on all countries. Or we can tailor the best fitting time series structure for each country. This implies that the results cannot be directly compared any more and we run the danger of data mining. We are mainly interested in the first variant, but, for the sake of completeness, will present both results.

With the results above, the specification that on average performs best is to have all variables in levels (which are either growth rates or ratios in any case!) and an autoregressive term, which is a partial adjustment process. The partial adjustment specification for investment was also successfully used by Bhaskar and Glyn (1995) and Bowles and Boyer (1995), but neither of them included an indicator for returns on financial investment. Table 2.2 present the results of this regression. All 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. (Given the high R^2 and the low significance level of gk_{-1}, this may be due to multicollinearity problems.

Table 2.2 partial adjustment model $gk = b_0 + b_1 gk_{-1} + b_2 z_{-1} + b_3 ps_{-1} + b_4 rsnf_{-1}$

	Germany	France	UK	USA
r2	0.98	0.93	0.90	0.81
period	63-94	78-97	69-96	63-97
c	-0.12	-0.02	-0.05	-0.07
t-value	*-5.61*	*-0.21*	*-4.41*	*-1.43*
gk	0.08 **	0.74 **	0.80 ***	0.17
t-value	*2.48*	*2.28*	*7.25*	*0.39*
z	0.26 ***	0.00	0.18 ***	0.08
t-value	*5.93*	*0.00*	*4.68*	*0.70*
ps	0.17 ***	0.09 ***	0.01	0.18
t-value	*3.51*	*4.38*	*0.31*	*1.00*
rsnf	-0.20	-0.28 ***	-0.25 ***	-0.38 ***
t-value	*-1.21*	*-3.07*	*-3.16*	*-2.67*
dw	1.72	2.26	1.74	1.64
	ar(1)			ar(1)

Calculations performed with Eviews.
Dummy for Germany 1991 included. Coeff ps was multiplied by 100
*, ** and *** denote significance at 10, 5 and 1% respectively.

Customising a best fit regression based on the ADL results above give us the following specifications:

France: $gk = b_0 + b_1 gk_{-1} + b_2 \Delta z_{-1} + b_3 ps_{-1} + b_4 rsnf_{-1}$

Germany: $gk = b_0 + b_1 gk_{-1} + b_2 z_{-1} + b_3 ps_{-1} + b_4 \Delta rsnf_{-1}$

UK: $gk = b_0 + b_1 gk_{-1} + b_2 z_{-1} + b_3 \Delta ps_{-1} + b_4 rsnf_{-1}$

USA: $gk = b_0 + b_1 gk_{-1} + b_2 \Delta z_{-1} + b_3 \Delta ps_{-1} + b_4 rsnf_{-1}$

Table 2.3 Countrywise customised regression							
	France		Germany		UK		USA
R2	.93	R-squared	0.39	R-squared	0.90	R-squared	0.83
period	78-97		63-94		69-96		62-97
const	-.01 *	C	-0.14 ***	C	-0.04	C	0.02
t value	*1.7*		*-8.56*		*-5.29*		*3.68*
gk -1)	.74 ***	GK(-1)	0.07 ***	GK(-1)	0.80 ***	GK(-1)	0.64 ***
t value	*9.5*		*2.60*		*7.64*		*6.57*
d(z)	.03	Z(-1)	0.31 ***	Z(-1)	0.19 ***	D(Z(-1))	0.14 ***
t value	*.3*		*10.22*		*5.98*		*2.73*
ps	.08 ***	PS(-1)	0.16 ***	D(PS(-1))	0.02	D(PS(-1))	0.14
t value	*2.8*		*3.35*		*0.54*		*1.19*
rsnf	-.27 ***	D(RSNF(-1))	-0.48 ***	RSNF(-1)	-0.25 ***	RSNF(-1)	-0.18 ***
t value	*3*		*-2.46*		*-3.59*		*-3.04*
dw	2.35	dw	1.75	dw	1.74	dw	1.75

Dummy variable for 1991 for Germany included (unification).

It comes as no surprise that the explanatory power improves with the customised model. It is interesting to note, that the variables that are insignificant are the same as in the partial adjustment specification: capacity utilisation in France and the profit share in the UK and USA. Appendix 2 presents some calculations on the effect of the increase in rsnf on accumulation with the historical data.

Employment regression

Although we are interested in the problem of European unemployment, the variable to be explained econometrically is the employment rate of the private business sector, that is employment divided by working age population. The reason for this is that we do not want to invoke the concept of the labour force, since we know that those newly employed are as likely to have been unemployed as they have been "out of the labour force". This confirms the Keynesian notion of a flexible labour supply (e.g. Marglin 1984).

The source of the variables z, gk and ps was discussed above. The private employment ratios are the employment in the private sector divided by the prime

age population (15 to 65 of age), the data was extracted from the OECD Economic Outlook data base.

The employment function (equation 2) has been discussed above. Again we start our investigation by an reparameterized ADL.

Table 2.4 A reparameterized autoregressive distributed lag model

ep = ep(-1) + gk + d gk + z + d z					
	France	Germany	Italy	UK	USA
r2	1.00	0.99	0.99	0.96	0.98
period	66-96	62-96	62-96	64-96	62-96
C	0.06	0.10 ***	-0.03	-0.10	0.01
	1.05	*3.49*	*-0.73*	*-1.85*	*0.25*
ep	0.87 ***	0.62 ***	0.87 ***	1.02 ***	1.10 ***
	21.98	*6.82*	*18.82*	*17.62*	*26.07*
gk	0.47 **	0.37 *	0.23 *	0.09	0.54 ***
	1.88	*1.83*	*1.77*	*0.25*	*2.74*
d gk	-0.08	0.05	0.06	1.16 ***	0.29
	-0.24	1.15	0.36	3.23	1.08
z	-0.03	0.25 *	0.21 ***	0.26 ***	-0.11 **
	-0.15	*1.93*	*2.73*	*2.68*	*-2.26*
d z	0.46 ***	0.26 **	0.00	0.46 ***	0.30 ***
	2.24	*2.18*	*0.01*	*2.61*	*3.14*
dw	1.20	1.39	1.48	1.95	1.64

note. Germany dummy 1991 included to adjust for unification
Calculations performed with Eviews. signs of t-values not reported.
*, ** and *** denote significance at 10, 5 and 1% respectively.

The equation fits the data very well, with all R2 being above 95%, which, again, is no surprise in an ADL model. We note that the coefficient on ep_{-1} is .87 or above in all countries but Germany. Moreover, in the Anglo-Saxon countries it is above one. All coefficients have the predicted signs or are insignificant except for capacity utilisation in levels in the USA, where capacity utilisation is highly significant in differences, with the predicted sign. Capacity utilisation is significant in differences in all countries but Italy, where it is significant in levels, as it is in Germany and the UK, and, as already noted, with the wrong sign in the USA. The dw statistics though its critical values do not apply, is suggestive of autocorrelation problems in most countries. Since this may reflect missing variables, we should rather attempt

to include shift variables for wage setting than correct for genuine autocorrelation. This will be done at later stages of the research project.

Since the coefficients on the lagged employment ratio is above one in two of five countries (UK and the USA),[10] which makes no sense in an partial adjustment model, we interpret this as the presence of unit roots in this time series. This is also consistent with Keynesian a priori expectations. Unlike in a neo-classical or NAIRU system we expect the employment level to adjust without major frictions to labour demand, except maybe at times of prolonged expansion like the late 1960s. In any case, unlike accumulation, the regression results on private employment are not sensitive to the choice of units. Similar parameter estimates and significance levels are obtained in levels as well as in differences. Nor does using the output gap as the measure of capacity utilisation change much. We will thus only present the regression in differences.

Table 2.5 $\Delta ep = b_0 + b_1 \Delta gk + b_2 \Delta z$ ar(1)

	Germany	France	Italy	UK	US
R2	0.64	0.67	0.30	0.66	0.64
	63-96	67-96	63-96	65-96	63-96
C	-0.002	-0.003 *	-0.003 **	-0.002	0.003 **
	-1.04	*-1.91*	*-2.39*	*-0.56*	*2.10*
D(GK)	0.06	0.46*	0.31 **	1.70 ***	0.67 ***
	1.39	*1.73*	*2.48*	*4.22*	*3.47*
D(Z)	0.54 ***	0.25	0.04	0.39 **	0.17 **
	5.24	*1.62*	*0.28*	*2.30*	*2.39*
dw	1.81	1.87	1.84	1.88	2.21

note. Germany dummy 1991 included to adjust for unification. AR(1) correction performed for all countries.
Calculations performed with Eviews.
*, ** and *** denote significance at 10, 5 and 1% respectively.

The regression results provide strong empirical support for the Keynesian hypothesis that private employment is driven by private capital accumulation. All coefficients have the expected signs, with four out of five coefficients on capital

[10] It is interesting to note that, contrary to the results presented above, the ADF unit root rejects the null of unit root in the UK, but fails to reject the null in France.

accumulation being significant at 10% and four at 5%, with coefficients varying between 0.06 (Germany, insignificant) and 1.7 (UK significant). Currently I have no explanation for this tremendous spread. Capacity utilisation is significant (at the 5% level) in three of the five countries, picking up the cyclical component of employment changes. (Rowthorn (1995) estimated a similar equation in a cross country regression with long run average data, obtaining similar results.)

Conclusion

The paper was aimed at providing empirical support for the Keynesian hypothesis that increasing financial investment is one of the major causes for the slowdown in capital accumulation and that this slowdown is one of major factors for rising unemployment rates. The empirical test were performed for Germany, France, UK and the USA, and for the employment regressions, additionally for Italy. The choice of countries being determined by the interest in European unemployment and data availability. Overall, the findings are supportive of both hypotheses, but with some qualifications.

In the case of the accumulation function the regression results are sensitive to the choice of units. Economic reasoning makes unit roots in the growth rate of capital stock unlikely, although unit root tests fail to reject the null of a unit root. Unit root tests, however, are notorious for being unable to distinguish between autoregressive processes and unit roots. A partial adjustment model was chosen for economic as well as for econometric reasons. Since the actual capital stock is usually difficult to adjust to its desired level, partial adjustment models are appropriate. Econometrically they are attractive because they allow for autoregression. The model was found successful and can also be sustained as a special case of the more general distributed lag model. In most cases the rentiers share of the non-financial business sector is statistically as well as economically significant in explaining accumulation.

The employment function explained employment by capital accumulation and capacity utilisation. Since the choice of units has no big effect on the results, a difference specification was chosen and proved successful, with capital

accumulation being highly significant in most countries, but with a curiously high spread in the parameter estimates.

We can thus conclude that, at least for the small sample of countries investigated, the Keynesian story is plausible. Undoubtedly, further research in this direction is necessary. The policy conclusions of this analysis, however, are important. While the standard story recommends removing impediments of wage reduction, the Keynesian explanation put forward here, suggests that impediments of capital accumulation have to be removed, namely the high rates of return on financial investment.

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Appendix 1. Data on rsnf and gk

Dividend and interest received / value added of the private non-financial sector

	W-Germany	France	USA	UK
60-64	0.012	#DIV/0!	#DIV/0!	0.022
65-69	0.015	#DIV/0!	0.023	0.023
70-74	0.018	#DIV/0!	0.042	0.032
75-79	0.016	0.016	0.034	0.038
80-84	0.023	0.023	0.036	0.056
85-89	0.025	0.030	0.042	0.062
90-94	0.037	0.054	0.053	0.061
95/96	#DIV/0!	0.061	0.057	0.064

Growth rate of business gross capital stock

	Italy	Germany	France	UK	USA	Japan
60-64	6.5%	7.0%			3.0%	12.4%
65-69	4.7%	5.1%	4.8%	2.1%	4.7%	12.8%
70-74	4.4%	4.8%	5.5%	1.9%	4.0%	11.2%
75-79	3.1%	3.4%	3.8%	1.7%	3.5%	6.5%
80-84	2.4%	2.6%	2.5%	1.1%	3.0%	5.3%
85-89	2.8%	2.7%	2.6%	2.5%	2.6%	5.6%
90-95	2.5%	5.9%	2.4%	2.5%	1.6%	5.0%

Appendix 2. A back of the envelope calculation

To what extent can we explain the slowdown in accumulation from the mid 1960s to the early 1990s? To answer this question table A.1 below summarises the crucial coefficient estimates from the tables above.

Table A.1 Summary of the coefficients on the lagged dependent variable and RSNF from various specifications

	France	Germany	UK	USA
autoregressive term				
ADL	.65	.06	.84	.62
PAM	.74	.08	.8	.17
customised	.74	.07	.8	.64
coefficient on RSNF				
ADL	-.29	.03	-.27	-.2
PAM	-.28	-.2	-.25	-.38
customised	-.27	-.48	-.25	-.18

Taking some approximate averages from the values above, we can now calculate the long run effects 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 coefficient. Multiplying this by the change in the rentiers share we get the explained change in accumulation (column 7). Taking a stylised average of the various coefficients, we explain most of the slowdown. For the individual countries, the picture is mixed. For France and the UK we overexplain the slowdown in accumulation. This my be compensated for by the growth in the profit share that will tend to increase accumulation. For Germany we explain less than a quarter of the slowdown and for the USA we can explain about half of the slowdown.

	reg coeff	autoreg coeff	d RS	a	long run effect	explained d gK	d gK
	a*b	1-a			b		
France	-0.27	0.7	0.038	0.3	-0.9	-0.0342	-0.024
Germany	-0.2	0.07	0.022	0.93	-0.215	-0.0047	-0.022
UK	-0.26	0.8	0.03	0.2	-1.3	-0.0390	0.004
USA	-0.2	0.62	0.03	0.38	-0.526	-0.0158	-0.034
stylized avg.	-0.25	0.6	0.03	0.4	-0.625	-0.0188	-0.025

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. However, this will be due to the research strategy pursued here, to use identical specifications for all countries, with no attempt made to optimise the fit for individual countries by included dummies for example.

Appendix 3. Unit root tests

Growth rate of business sector capital stock: Unit root tests (annual data)

	D	F	UK	US	I	J
	1961-98	1963-98	1963-98	1961-98	1961-98	1961-98
ADF	2.3	1.07	2.24	2.65 *	2.76 *	.8
ADF + time	3.52 ***	2.21	2.8	3.59 **	3.27 *	2
diff ADF	4.02 ***	2.8 *	3.67 ***	5.3 ***	5.3 ***	3.96 ***
diff ADF +	4.1 **	2.7	3.5 **	5.2 ***	5.5 ***	3.9 **

signs suppressed
source: OECD Economic Outlook. KBV

Unit root test ps (profit share in the business sector)

	Germany	France	UK	USA	Italy
period	62-96	69-96	63-96	62-96	62-96
levels	1.58	1.46	5.15 ***	3.53 **	3.35 **
differences	4.48 ***	3 **			

note. Germany: a dummy for 1991 (unifcation) was included.
Unit root test are ADF, in levels including a time trend, in differences not.

Unit root test z (capital productivity)

	Germany	France	UK	USA	Italy
period	62-97	65-97	64-97	62-97	62-97
levels	2.45	2.8	4.01 **	2.86	2
differences	4.85 ***	3.27 **		4.74 ***	4.5 ***

note. Germany: a dummy for 1991 (unifcation) was included.
Unit root test are ADF, in levels including a time trend, in differences not.

RSNF: Unit root tests (annual data)

	D	F	UK	US
period	1962-93	1979-96	1971-95	1963-96
ADF + time	2.44	1.65	2.9	2.6
diff ADF	5.4 ***	2.26	4.6 ***	4.5 ***
2nd diff ADF		3.5 **		

signs suppressed
source: OECD Economic Outlook. KBV

Employment rates: Unit root tests

	D	F	UK	US	I
	1960-98	1960-98	1960-98	1960-98	1960-98
in levels					
ADF	1.36	1.09	3.2 **	.22	2.4
ADF + time	3.36 *	2.03	3.53 **	3.17 *	3.51 **
in differences					
diff ADF	4.36 ***	2.8	4.8 ***	4.9 ***	3.7 ***
diff ADF +	4.32 ***	2.7	4.7 ***	4.85 ***	3.8 ***

signs suppressed. computations with EViews
source: OECD Economic Outlook. POPT - ET