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### Macroeconomic Policy and Unemployment: Empirical Evidence from the Euroland\*

By

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**Abstract:** The emergence of the neo-liberal doctrine in the European Union (EU), as this is reflected by the prevalence of monetarism and market deregulation, has spawned a wave of criticism to be leveled at the way national macroeconomic policies have been conducted, with more emphasis on the unprecedented high level of unemployment experienced by virtually all EU countries. A theoretical exploration of this new policy orientation is being pursued in an attempt to unveil a potential mechanism responsible for the dire employment record. This paper's primary aim is to gain an empirical insight into, a somehow forgotten, relationship between capital stock and unemployment. The conducted econometric analysis provides useful empirical results, which support the relevant literature and argues in favour of implementing an alternative, macroeconomic policy in the EU.

**Key words:** *Macroeconomic Policy, Capital Stock, Unemployment, Pooled Estimators, Random Coefficients.* 

JEL Classification: B22; E12.

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#### 1. Introduction

Over the last decades unemployment has risen dramatically in most of the European countries. The commonality of the unemployment experience throughout the European Union (EU), outweigh the particular economic situations and domestic economic-structures of individual countries. Common experience suggests that the causes of persistent unemployment rates are related to factors that have influenced all EU countries in a broadly similar manner, rather than in the individual circumstances of each country. While possible sources of this common problem have been cited and investigated in the literature<sup>1</sup>, a growing body of research focuses on the adverse impact that the implemented macroeconomic policies in Europe since the 1980's and especially in the 1990's have had on capital accumulation and unemployment.

The major objective of this paper is twofold in a sense that it purports to unravel the deflationary bias of the implemented macroeconomic policy as well as econometrically examine the relationship between capital stock and unemployment. More specifically, in section 2 an exploration of the main features of the neo-liberal regime will be pursued in an attempt to provide a more lucid idea of the policies implied and the extent to which the EU economies have been affected by the new economic principles. Section 3 exposes the key mechanism through which the policy ramifications resulting from the prevalence of the neo-liberal thinking in Europe might have affected unemployment. In particular, we focus on issues relating to the role of effective demand in creating industrial capacity and therefore, employment. In section 4, panel data analysis provides the main econometric framework on the basis of which we conduct our empirical investigation for 15 EU countries from 1961 to 2000. Finally, section 5 concludes by providing alternative policy recommendation.

# 2. Market Flexibility and Price Stability. A Neo-liberal Policy Strategy for Europe

The collapse of the international monetary system established in Bretton Woods and the rise of neo-liberalism as a global development strategy stimulated significant changes in the policy making the last two decades with considerable effects on national macroeconomic systems. In particular, market-deregulation policies adopted by many developed countries within a flexible exchange rate regime, laid the foundations for the development of a highly and globally integrated financial system, which has been left to its own self-regulated devices; a system under which exchange as well as credit controls were abolished, and restrictions on cross market access for financial institutions were scrapped. In this new financial environment, short-term interest rates provided the platform on which monetarism and deflation were established as the predominant economic principles. Governments around the globe nowadays tailor policies to suit the interests of the financial sector. A credible government is one that pursues 'market friendly' policies in accordance with what markets perceive as 'sound'. Any divergence from monetary targets has to be met with harsh financial costs, which in turn will result in a major financial crisis and poor economic performance.

The emerging policy regime appears to have been perceived rather blissfully, should one take into account the unprecedented support exhibited by a number of finance ministers as well as private bankers throughout Europe. At present, the EU's macroeconomic and structural policy agenda is closely aligned with the one proposed by neo-liberalism. The new policy consensus strongly influenced by the free-market approach, has established a set of rules and regulations tailored to enable the EU countries to integrate their economies. Such a process makes monetarism and free market to be distinct features of the policy framework in the EU the last two decades, but especially in the 1990's.

The essential features of the new policy mantra can be summarized as follows: For EU governments the criteria of convergence of the Treaty of Maastricht and the regulations imposed by the Stability and Growth Pact are the exclusive source of economic policy targets of the countries which have joined the euro and strongly constrain the policies of those who do not join (Allsopp and Vines, 1996; Moss and Michie, 1998; Arestis, et. all., 2001). They are presented as the only policy option in a context of globalization. National budgets are limited by strict deficit and debt restrictions (Kenen, 1995), and branded as inflationary which have to be reduced promptly. On the other hand there is not an appropriate expansion of the EU budget to offset contractionary effects and resulting distortions within the EU. In this manner, national governments are stripped off their right to formulate demand management policies and therefore create the economic conditions within which employment could flourish. As a result, fiscal policy has been rendered, to an extent, ineffective in the EU economies. Monetary policy has been entrusted to an independent central bank (ECB) which is to refrain from financing any public programs aiming exclusively at controlling inflation (Kenen, 1995; Bean, 1998). Inflation is seen to be a monetary phenomenon which can be managed through monetary policy. Consequently, restrictive money and credit policies in conjunction with tight fiscal policies have been put in place to suppress inflation. Contemporary orthodoxy regards the fight against inflation as the key objective of economic policy in achieving macroeconomic equilibrium (Buti and Sapir, 1998).

The resulting obsession with fighting inflation, at least within the EU zone, has created a macroeconomic environment devoid of any explicit employment target.

The level of unemployment is seen to fluctuate around a supply determined equilibrium. The intellectual basis of this approach is rooted in the concept of NAIRU (Non-accelerating Inflation Rate of Unemployment). The main cause of unemployment in terms of this theory lies in rigidities in the labour market and the provisions of the welfare state, which make it unattractive for people to seek work<sup>2</sup>. The whole concept of the NAIRU, which can be detected in the works of Friedman (1968) and Phelps (1968), encouraged the idea that policy should be directed to establishing a minimum level of unemployment so that inflation remains unchanged.

Persistence in unemployment is put down to labour market rigidities, which together with poor education and motivation are preventing the unemployed from getting work on existing capital stock (Layard and Nickell, 1986; Layard and Jackman, 1991).<sup>3</sup> Increasing market flexibility can be achieved through means such as deregulation, reduction of trade-union power, and the pruning of the welfare state. The clearing of such institutional 'imperfections' in the labour market is being conceptualised as a precondition of economy's path towards a general equilibrium, to the extent that flexibility and liberalisation spread to product and money markets CEPR (1995).

#### 3. Macroeconomic Policy, Effective demand and Unemployment

The authoritarian way by which the neo-liberal doctrine commenced its campaign for a free market orientated economy and price stability was seen as a major threat to macroeconomic stability and the welfare of the European economies. Questions, such as 'why job creation in Europe did not keep up with the rate of labour demand growth?' or 'how can we achieve higher real wages?' still remain unanswered. Solutions can be envisaged if there is a sustained trend increase in the rate of growth of output and productivity in European economies<sup>4</sup>. The main concern however, is how to bring about a sustained rise in the rate of growth of employment with higher real wages without risking unacceptable inflation.

Neoliberalism postulates that the failure of EU member states to deal with unemployment might simply imply that we are still away from long-run equilibrium. But it might also imply that neoliberalism is incapable of reducing unemployment.

Within the context of NAIRU, the unemployment rate is totally unaffected by the amount of economy's capital stock. Investment and capital accumulation are not in the picture. Despite the fact that under certain conditions, capital stock might have some influence on inflation and unemployment, it never enters the equation when policy is formulated<sup>5</sup>. Labour market flexibility as a policy prescription may be coherent from a free-market standpoint. However, it overlooks the possibility that the new restrictive policy regime, which has been established in Europe since the 1970's, may have negatively affected unemployment.

There are, of course, a wide variety of factors that may affect the unemployment trends apart from institutional rigidities, including the age of the population, government employment schemes, 'labour-hoarding', and employment in the 'informal economy'. Eatwell (1995) argues that whilst these effects may have some influence, the most important determinant of the common experience of growing unemployment in many of the advanced capitalist countries has been the slow-down in the growth of aggregate demand since the 1980s. Moreover, he highlights the importance of labour-market policies by stating that "it is the impact of labour-market policies which determine whether there is any employment in excess if that which might be expected from the growth of effective demand" (Eatwell 1997: p.78). Furthermore, Singh (1997) maintains that it is not price stability and

liberalization that promote economic growth and employment, but rather faster growth of production and employment are essential for sustaining the new liberal economic order. Singh also claims, the facts concerning inter-temporal variations in unemployment rates and real wages in industrial countries are much more easily explained by variations in the rate of growth of real demand rather than by the NAIRU approach. Boltho and Glyn (1995) stress, the reason for much higher unemployment in the post-1980s period is not 'jobless growth', but rather a much slower rate of economic growth. They emphasise that the structure of the current policy-regime has significantly contributed to slower and unstable growth of the 1980s and 1990s.

During the 'Great Depression' government intervention was a key element in the fight against unemployment. In the post-war era, the promotion of full employment was seen as an incessant endeavour to implement macroeconomic policies designed to manage aggregate demand. It is common knowledge that Keynes and Kalecki independently came up with the principle of effective demand in stimulating economic growth. Their discovery was based on the notion that a market economy would not necessarily generate full employment of all resources. According to their perspectives, the reason for this was not some market imperfection, such as rigidity of prices or wages, but rather, insufficient effective demand. In other words, in capitalist economies there is not a self-equilibrated mechanism that could guarantee full employment. Full employment is not feasible, unless some exogenous injection of demand is provided.

In addition, unlike the labour-market flexibility approach, the demand growth strategy is a positive-sum game which benefits simultaneously all countries, which

will gain from an acceleration in EU growth through much the same channels by which they were disadvantaged by slower economic growth the last two decades.

In this context, it is important to specify a channel through which the deflationary fiscal and especially monetary policy might have negatively affected European unemployment. A possible channel for such a negative development is through the effects that the new policy regime has had on capital accumulation and the formation of capital stock in the industrial sector<sup>6</sup>. Michie and Smith (1996), Alexiou and Pitelis (2003) among others note that the reliance on deflationary fiscal and monetary policies to fight inflation is likely to have eroded the industrial capacity in many countries in the EU reinforcing a deindustrialization process in many of the European economies. The thrust of their argument is that low investment in manufacturing in many European countries has been a significant factor behind the dramatic rise in European unemployment. In this perspective, education and training programmes attract concern, however, they are considered to be inadequate to tackle the unemployment problem. The lack of job opportunities is more crucial. A major reduction in unemployment requires additional investment in productive capacity that will create jobs. Rowthorn (1995) maintains that this aspect to the unemployment problem has been neglected in the enthusiasm for labour-market issues. The capacity problem is rejected by neo-liberal economists, who regard the problem of job creation as being mainly a matter of encouraging more employment on existing capital stock and not to increase the amount of this stock.

Capacity deficiencies may have operated as a significant constraint for the full employment of the labour force. Smith (1996) advances this argument by stating that the current economic situation is one where there is a danger that increasing demand

will lead to shortages of capacity and inflationary price increases, while unemployment might still remains high.

Within a Keynesian-Kaleckian framework, investment responds to demand and the expectations of the growth of demand<sup>7</sup>. Firm's decisions to expand capacity are based to a large extent on their assessment of their expectations of future sales and their perception of risk (Smith, 1996; Driver, 1996). Firms' formation of expectations depends, to a great extent, on the understanding of government's policy objectives. Such a risk becomes evident in so far as demand may not expand sufficiently to meet the capacity's expansion. The deflationary nature of the macro-policies pursued in the EU region over the last decade has choked off aggregate demand, and in effect sales. As a result firms have formed their decisions on a somewhat economic environment hostile to increasing profit margins.

Industrial firms need to be confident that demand will grow at such a rate as to validate any expansion of their capacity. Negative experiences and information over the stance of macroeconomic policy and the growth rate of demand make managers to be cautious about the possibility of overestimating future sales. Since the penalties associated with such practice tend to be much greater than for losing potential business by failing to expand.

The risk of investing in capacity that will not be fully utilised is related to the possibility of sales' failure and the consequent fall in firm's profit, as well as the ability of firms to absorb it. The latter links the demand with the supply side factors that lie behind the capacity limits on employment. The fact that capitalists engage in production activity in order to make profits, constitutes a fundamental reason why entrepreneurs can decide to keep money idle and the economy can experience unemployment. The system's degree of liquidity preference is ostensibly,

immediately, and directly related to entrepreneurs' expectation of profit, which is the driving force in a capitalist economy. Employment will expand only if there is a permanent increase in real demand and output that stimulates business profits, not just because there is a cut in wages. Yet, a reduction in wages could, in principle, reduce real aggregate demand and adversely affected business expectations and real investment.

Apart from demand expectations, investment is inclined to be affected by fluctuations of financial variables such as interest rates, which have been relatively high due to the emerging global, monetary and financial environment. 'Globalization of financial markets and international financial competition in conjunction with a highly mobile and speculative capital have increased volatility in government bond prices, which in conjunction with exchange rate instability and currency speculation have increased the risk premium on lending' (Alexiou and Pitelis, 2003, p. 620).

The overall uncertainty that increasingly characterizes the economic environment and the greater fluctuations in the components of final demand, have a negative effect on the corporate inducement to invest. The implementation of a permanent restrictive monetary policy to combat inflation has created a bias towards high real interest rates as well as credit obstacles, which have discouraged investment and business confidence (Rowthorn, 1995; Hutton 1995; Smith, 1996).

The rebuilding of industrial capacity is therefore a key requirement for creating employment. The long implementation of restrictive macroeconomic policies is likely to have contributed to a productive investment failure in the EU. Lack of investment, in turn, has constrained technological progress and the expansion of demand to the levels required to restore full employment. As Scott (1992) has argued,

any type of investment creates new investment opportunities and *visa versa*. The cumulative effect of this process has caused capacity problems.

In sketch of the above arguments, the emerging policy orientation in the Euroland might have been injurious to business demand expectations which in conjunction with the high cost of capital have negatively affected strategies of undertaking new, productive investment. A decreasing rate of growth of productive capacity, in turn, might have constrained new job opportunities in the EU area, contributing to the very high levels of unemployment.

#### 4. Empirical analysis

Prior to embarking on the regression analysis it is imperative that we get an indication as to how some key policy variables have fluctuated over the years. A quick inspection of tables 1 and 2 reflects the restrictiveness of monetary and fiscal policy in the EU. More specifically, the first three periods are dominated by relatively low (and in some instances even negative) real interest rates whilst in the three successive ones, the pattern changes dramatically, as in the majority of the countries real interest rates have more than doubled.

#### [insert table1]

Table 2 unravels the economic path, as this is reflected by the budget deficit, that EU member states have been instructed to follow, should they wish to be in line with the rules and regulations implied by both the Maastrich treaty and the Stability and Growth Pact. The key feature that emerges in nearly all EU economies is the all and out effort by all countries to balance their budgets<sup>8</sup>. According to Alexiou (2004, p.93)

"pursuing balanced or in surplus budgets as means of revitalising investment has dominated EU's economic policy. Such a belief draws on the notion that long term economic growth is contingent upon a nation's saving rate. Higher saving will lead to greater investment, which in turn will galvanise economic activity".

#### [insert table2]

After enjoying more or less full employment during the 1950s and 1960s, leading European countries were faced with the spectre of mass unemployment in the 1980s and 1990s. Since the thrust of our exposition so far concerns the alarmingly declining trend of the growth rate of capital stock in manufacturing, and the ensuing implications that stem from it, it would be interesting to show how capital stock and unemployment have behaved over the years. The dominant pattern that emerges by looking at both tables 3 and 4 is that the two underlying variables appear to fluctuate in a rather inverse fashion.

#### [insert tables 3 and 4]

More specifically, the unemployment rate has rapidly increased whereas the growth rate of capital stock has severely decreased in nearly all EU countries, most evidently in the 1990's. Such a pattern suggests that the low growth of real capital stock, which implies a low rate of investment, is likely to have been inadequate to employ the available labour force in a satisfactory way, so that to reduce unemployment. In addition, the destruction of industry's productive capacity might have further contributed to the persisting problem of unemployment.

On the basis of our analysis up to now, one could argue that the way macroeconomic policy has been conducted over the last decades in EU has had an adverse impact on employment creation due to erosion it caused to manufacturing's capital stock.

#### <u>The Model</u>

Prior to engaging in the empirical investigation it is deemed imperative that we gain some further insight into the relationship between the variables in question as well as draw inferences about the temporal priority. In doing so, a legitimate way of testing such hypotheses - the pairwise Granger causality test - has been employed.

#### [insert Table 5]

On the basis of the results obtained one could very confidently argue that capital stock causes the unemployment pair-wise but not vice versa, and therefore it serves as the explanatory variable of unemployment at least within the EU area<sup>9</sup>.

As it has transpired from the preceding exposition, one channel through which unemployment could be affected is that of the capital stock. So, we proceed to estimating an equation where the unemployment rate is regressed on the growth rate capital stock. In view of the emerging economic developments that have been shaping up after the collapse of the fixed exchange rate regime established at Bretton Woods as well as after the ratification of the Maastricht treaty, we have incorporated two dummy variables in attempt to capture the ensuing effects on employment.

The following model therefore provides the platform on which the main hypothesis will be tested.

$$U = f(LC, D^*, D)$$
(1)  
(- + +)

(expected signs are given in parentheses)

where  $U_{it}$  is the unemployment rate,  $LC_{it}$  is the growth rate of capital stock (manufacturing),  $D_t^*$  is a dummy variable that takes the value 0 for 1961 to 1972 and 1 for 1973 to 2000 (captures the effect of the new policy regime after the collapse of Bretton Woods),  $D_t$  is a dummy variable that takes the value 0 for 1961 to 1991 and 1 for 1992 to 2000 (captures the effect of Maastricht Treaty).

#### **Estimation**

Even though the scope of this study is far from getting bogged down into the very sophisticated theoretical arguments as to which is the most plausible estimator, three different approaches have been used to gauge the robustness of our results<sup>10</sup>. We set off with the standard pooled estimators i.e. OLS, which ignores the country effects; the within estimator where heterogeneity between cross-section units or time periods is captured by individual or time specific intercepts and GLS, which assumes that country effects are random; we then proceed to employing the random coefficient (RC) regression estimator (i.e. a weighted average of the least squares estimates where the weights are inversely proportional to their variance-covariance matrices) proposed by Swamy (1970); and finally we utilize the approach put forward by Pesaran and Smith (1995) on the basis of which averaging the individual country regressions will yield a consistent estimate of the parameters<sup>11</sup>.

The data set used for the estimation of the model consists of *N* cross-sectional units, denoted i = 1, ..., N, observed at each of *T* time periods, denoted t = 1, ..., T. In

this context, annual data for 15 EU countries from 1961 to 2000, (so N = 15; T = 40) has been used. The main data provider was OECD: Economic Outlook and National Accounts.

In an attempt to model the unemployment rate  $U_{it}$ , as a function of the growth rate of capital stock<sup>12</sup> LC<sub>it</sub> and the two dummy variables, several specifications of equation (1) following a general to specific approach, were estimated.

What follows, is the presentation of the standard pool estimates, the random coefficients estimates as well as the estimates resulting from averaging individual regressions.

#### [insert table 6]

On the basis of the selection criteria (Schwarz (S.I.C) and Akaike (A.I.C) Information criteria<sup>13</sup>) as well as the tests (*F-test, Hausman-test*<sup>14</sup>) that were conducted to determine the most coherent model, the fixed effects model is preferred to both the pooled model as well as to the random effects one.

#### [insert table 7]

#### Interpretation of results

Despite the fact that the random coefficients model transpired to be the most preferable <sup>15</sup> one, all models support our hypothesis, reinforcing our arguments expounded through out this study. More specifically, the negative and statistically significant coefficient<sup>16</sup> of  $LC_{it-1}$  in all models, suggests that a 1 per cent increase in capital stock will cause unemployment to go down by (0.1), (0.22) and (0.09) per cent in all three models respectively. Bearing in mind that the undertaken investigation concerns the growth rate of capital stock in the manufacturing sector, it could be argued that an increase in capital stock in all productive sectors will provide an

additional stimuli in employment creation. In addition, the positive and statistically significant coefficients of both dummy variables reflect the adverse effects that the emergence of the new policy consensus within the EU area – as reflected by both the emergence of neo-liberalism and the deflationary bias of the Maastricht rules - had on European employment.

#### 5. Conclusions

Economies throughout Europe have failed to deliver the prosperous economic future that the architects of the current economic system had initially pledged to deliver. After the fixed exchange rate mechanism, established at Bretton Woods, had broken down, the world economy reverted to the pre-war state of mass unemployment. The prevalence of monetarist and free-market thinking among the political leadership of the industrial nations effectively ruled out any major structural reforms in the management of the world economy. Indulging in neo-liberal-type policies to expand productive capacity and stir the economy towards recovery has been once again an elusive objective.

Over the past two decades the commitment to full employment has been abandoned and mass unemployment has manifested itself in being an integral part of the capitalist world. The adoption of tighter fiscal and monetary policies to combat inflation caused unemployment to reach unprecedented levels, which in turn has caused a number of social problems such as the growth of poverty, homelessness to grow at a prodigious rate. As a result, Europe's economic and political stability has been under threat.

The empirical findings of this paper suggest that a potential factor behind European unemployment is insufficient growth of capital stock. Therefore measures

to stimulate productive investment could play an important role in helping to reduce unemployment. For this to occur, the industrial sector should assume a new role.

The fact that in the last two decades growth was skewed towards services, particularly financial services, raises the question of whether manufacturing matters after all. The European employment problem requires a large and competitive manufacturing sector in order to generate sufficient job growth. Both healthy manufacturing and reliable services are conducive to economic prosperity.

The extension of the market for manufactured products would lead through the benefits of economies of scale to increased competitive advantage and hence to increased economic growth. This will have a positive effect on the expansion of the service sector, in terms of both output and employment. Nonetheless, should full employment be attained, there must be sufficient demand for manufactured products.

In addition, achieving economic conditions that promote full employment requires an investment strategy that will enable Europe to increase the quality and quantity in terms of both equipment and structure. Training as such can be perceived as being an important tool to enhance industrial performance, however, giving the unemployed skills when they do not have many opportunities to use them is ineffectual.

It has been envisaged that the adoption of demand side policies is conducive to stimulating investment growth in EU. Nonetheless, for such a prospect to be realised, it is necessary that changes in the current, neo-liberal macroeconomic structure take place. This means that macroeconomic policy should aim at ensuring a continuous expansion of demand matched, via more productive investment, by increased employment and output rather than by inflation.

It should be stressed however, that in creating industrial confidence that promotes sustainable expansion, supply side policies have a key role to play as well. The ever so changing global economic environment - reflected in Europe by the accession of the new member states - has alerted the European industry which faces fierce competition from cheap-labour economies. Expansionary macroeconomic policies to the extent that improve industrial capacity and increase productivity are a vital part of an appropriate industrial strategy. Credit reallocation policies and the establishment of a pay-bargaining system in EU are essential so that the rate of increase in money wages is equal to or to close proximity (even exceed by little) the rate of increase in labour productivity. Through channels like these, industrial activity (investment), productivity and competitiveness could be stimulated. It is therefore imperative that we reap the benefits of competitiveness stemming from supply-side polices, in today's global financial markets where systematic upward pressures on euro have had detrimental effects on Europe's exports and industry's international trade shares.

Prior to wrapping up this piece of work we should emphasize that our investigation concerned probably one of the most significant factors (capacity constraints) that has caused unemployment to increase within the Euroland due to the macroeconomic policy adopted by the existing member states over the last two decades or so. It would have been rather speculative to incorporate the 10 new EU member states in our framework as these countries have not been fully integrated (both economically and monetary) with the rest of the EU, and pass any judgments on the future of those economies. The macroeconomic performance of those countries is still to be seen considering the new economic environment they have entered. The emerging results produced in this study could be treated as something that the new

member states should watch out for, given the miserable employment performance of the existing member states.

Countries	1961-	1967-	1973-	1979-	1985-	1992-
	66	72	<b>78</b>	84	91	01
Germany	3.5	4.3	3.2	4.2	5.4	4.5
France	2.1	2.7	0.3	3	6.4	5.6
Italy	0.7	2.5	-4.3	1	6.1	6.9
Netherlands	1.2	1.6	0.7	4.5	6	5
Belgium	3.2	3.3	-0.4	5.3	6.4	5.4
Lux.	N/A	N/A	N/A	N/A	N/A	N/A
U.K	2.5	2	-2.4	2.9	4.7	5.8
Ireland	2.1	1.4	-1.4	0.9	6.8	5.8
Denmark	2	4.1	5.5	8.7	6.5	5.9
Spain	0.5	2.8	-3.9	1.8	6.2	5.5
Greece	N/A	N/A	N/A	N/A	N/A	N/A
Portugal	3.1	0.3	-6.2	0.6	8.8	6.3
Sweden	1.8	2.2	-0.6	2.7	4.8	6.5
Finland	2.8	2.5	-3.8	1.2	5.8	6.2
Austria	3.1	3.3	2	4	5.1	3.9

 Table 1.
 Long-run Real Interest Rates (averages)

Source: OECD, Economic Outlook.

**Table 2.** Budget Deficit as a percentage of % of GDP (averages)

Countries	1961.	1967-	1973-	1979-	1985-	1992.
Countres	66	72	78	84	91	01
Germany	N/A	0.5	1.4	0.1	3.2	-0.6
France	N/A	N/A	0.3	-0.6	-0.3	1.5
Italy	N/A	1.4	-0.7	-0.9	-0.9	1.0
Netherlands	N/A	1.9	2.5	2.3	2.7	4.1
Belgium	N/A	N/A	-0.4	-1.5	2.7	4.9
Lux.	N/A	N/A	N/A	N/A	N/A	N/A
U.K	N/A	1.2	-1.2	0.6	-2.5	-1.3
Ireland	N/A	N/A	-4.2	-9.2	-1.2	1.4
Denmark	N/A	N/A	-2.9	-3.4	-2.0	1.3
Spain	N/A	N/A	-2.1	-1.3	-1.1	-1.3
Greece	N/A	N/A	-3.9	-5.3	-4.5	-4.0
Portugal	N/A	N/A	-4.5	-6.6	0.4	-4.7
Sweden	N/A	N/A	-1.2	-1.8	-1.0	2.0
Finland	N/A	N/A	-2.4	-1.2	-3.1	3.4
Austria	N/A	-0.5	-1.6	-0.7	0.1	-2.1

Source: OECD, Economic Outlook.

Countries	1961-	1967-	1973-	1979-	1985-	1992-
	66	72	<b>78</b>	84	91	00
Germany	0.7	1.0	3.1	5.5	7.2	9.6
France	1.6	2.5	4.1	7.6	9.8	11.9
Italy	3.6	4.1	4.7	6.8	9.6	11.2
Netherlands	N/A	1.3	3.4	7.3	7.4	6.4
Belgium	2.1	2.3	4.9	10.7	10.5	12.4
Lux.	N/A	N/A	0.4	1.2	1.5	2.7
U.K	1.6	2.5	3.7	8.1	8.5	8.1
Ireland	4.9	5.4	7.3	10.9	15.9	12.9
Denmark	1.3	1.6	4.6	8.8	8.9	10.0
Spain	2.4	3.0	4.4	14.9	18.9	22.0
Greece	5.2	4.3	1.9	5.0	7.5	9.9
Portugal	2.0	3.9	4.7	7.9	6.3	6.4
Sweden	1.5	2.2	1.9	2.7	2.2	7.5
Finland	1.4	2.7	3.9	5.2	4.9	15.8
Austria	1.9	1.5	1.5	2.7	4.6	6.0

 Table 3. Unemployment Rate (averages)

Source: OECD, Economic Outlook.

**Table 4.** Capital Stock in EU countries, (average growth rates)

Countries	1961-	1967-	1973-	1979-	1985-	1992-
	66	72	<b>78</b>	<b>84</b>	91	00
Germany	9.2	9.6	4.1	4.9	7.1	3.1
France	13.0	11.0	12.3	9.5	8.0	-0.9
Italy	7.5	11.2	21.1	17.9	9.2	1.8
Netherlands	11.7	10.1	9.7	2.9	5.2	2.9
Belgium	11.4	8.4	12.1	1.8	9.1	2.1
Lux.	11.2	10.9	7.6	6.6	14.5	3.1
U.K	9.0	9.1	17.3	10.2	8.9	1.9
Ireland	14.3	17.8	23.7	11.7	4.3	6.7
Denmark	13.4	12.2	10.9	6.7	5.3	3.3
Spain	19.4	13.5	19.9	11.1	15.5	2.2
Greece	13.9	16.2	18.4	16.9	19.7	10.0
Portugal	10.0	13.9	23.6	20.8	19.2	6.1
Sweden	10.9	6.8	10.1	10.8	12.0	7.9
Finland	8.7	13.9	13.7	13.6	12.9	13.6
Austria	10.7	11.9	6.9	4.7	8.1	4.5

Source: OECD Economic Outlook

	Null hypothesis:	Null hypothesis:
Country	UN does not Granger	CS does not Granger
-	Cause CS	Cause UN
	F-test (Prob.)	F-test (Prob.)
France	2.15 (0.14)	25.1 (0.00)
Finland	1.12 (0.30)	27.9 (0.00)
Sweden	2.36 (0.11)	10.7 (0.00)
UK	2.60 (0.08)	7.9 (0.00)
Greece	1.13 (0.28)	10.2 (0.00)
Austria	0.02 (0.98)	18.6 (0.00)
Belgium	0.45 (0.16)	9.91 (0.00)
Ireland	2.17 (0.13)	5.89 (0.01)
Denmark	0.03 (0.90)	44.2 (0.00)
Germany	2.49 (0.13)	0.69 (0.42)
Portugal	1.14 (0.27)	0.75 (0.40)
Spain	1.13 (0.29)	30.7 (0.00)
Netherlands	3.11 (0.07)	12.4 (0.00)
Italy	1.11 (0.31)	20.5 (0.00)
Luxemburg	2.37 (0.08)	15.6 (0.00)

#### Table 5. Granger Causality Tests.

*Note:* Where UN and CS stand for unemployment rate and capital stock respectively. The test has been conducted at the 5% level of significance.

Model Type	$LC_{it-1}$	$D_t^*$	$D_t$
FEM	-0.10 (0.02)	4.15 (0.29)	2.97 (0.39)
RCM	-0.22 (0.01)	4.78 (0.46)	3.31 (0.44)
P&S	-0.09 (0.03)	3.89 (0.18)	2.89 (0.35)

**Table 6.** Dependent variable is  $U_{it}$ 

Note: FEM stands for Fixed Effects Model

*RCM* stands for Random Coefficient Model *P&S* stands for Pesaran and Smith Standard errors are given in parentheses.

	Pooled	Fixed Effects	Random Effects
С	2.83		3.22
	(0.39)		(0.62)
$LC_{it-1}$	0.01	-0.10	-0.09
	(0.02)	(0.02)	(0.01)
$D_t^*$	3.64	4.15	4.12
	(0.38)	(0.29)	(0.29)
$D_t$	3.45	2.97	3.00
	(0.35)	(0.39)	(0.40)
$R^2$	0.27	0.57	0.57
DW	1.79	1.87	1.84

## **Table 7**. Dependent Variable is $U_{it}$

(Standard errors in parenthesis)

#### <u>Endnotes:</u>

<sup>1</sup> Bean 1994 provides an overview on this.

<sup>2</sup> For more on this see for example Layard and Nickell, (1986); Layard and Jackman (1991).

<sup>3</sup> The importance of education and training has recently been emphasized by endogenous growth models where the growth rate of productivity is associated with the level of education. An educated and motivated work-force is able to facilitate the development of, adapt more easily to, and exploit more fully new processes and techniques of production (Romer, (1986); (1990), Lucas, (1988)).

<sup>4</sup> See further Boltho and Glyn (1995).

<sup>5</sup> Capital accumulation has no effect on unemployment only under the empirically doubtful assumption that the elasticity of substitution between labour and capital is equal to unity (see Malinvaud (1980); Rowthorn, (1999)).

<sup>6</sup> A number of scholars have argued in favour of this. A case in point is Malinvaud, (1985); Bean, (1989); (1994); Rowthorn, (1995); (1999); Smith, (1996); Kitson and Michie, (1996); Arestis and Sawyer, (1998).

<sup>7</sup> The important relationship between investment and demand is overlooked in many recent discussions of economic growth, which ignore demand constraints on the level of economic activity. Investment can increase, as well as respond to, the level of demand, affecting the scale of production as well as its structure, organisation and technological efficiency (see Scott, 1992).

<sup>8</sup> It should be noted that the 3% of GDP limit for public deficits was transgressed in the two largest economies of the EU, in Germany and France, and it will again be missed in 2004.

<sup>9</sup> It should be stressed that for Germany and Portugal the results are rather ambiguous.

<sup>10</sup> In spite of the growing concern of potential heterogeneity among the cross-sectional units when performing pooled data analysis, proponents of the homogeneous panel sustain that gains from pooling outweigh any costs. In contrast, a number of scholars, (see for example: Robertson and Symons (1992), Pesaran and Smith (1995), and Pesaran, Smith and Im (1996)) dismiss pooling the data across heterogeneous units on the grounds that heterogeneous estimates can be combined to obtain homogeneous estimates. More specifically, Pesaran and Smith (1995) argue that the inherent parameter heterogeneity of panels makes the homogeneous assumption redundant and therefore the average from individual regressions should be used instead. Maddala, Srivastava and Li (1994) and Maddala et al. (1997) on the other hand, are very much in favor of estimators that shrink the heterogeneous estimators towards the pooled homogeneous estimator. It worth noting however, that the recent development of a number of heterogeneous estimators, relatively little is known as to how effective those are. (For an extensive analysis on applications of random coefficient models see Swamy and Tavlas, (1995)).

<sup>11</sup> This is the case as long as N and T tend to infinity.

<sup>12</sup> It should be stressed that during the investigation a number of various specifications containing up to four lags were estimated.

<sup>13</sup> Pooled model: AIC –2.55; SIC –2.42, Fixed effect model: AIC –2.76; SIC –2.74,
Random effect model: AIC –2.65; SIC –2.41.

<sup>14</sup> F-test: 23.04 p-value: [0.00], Hausman-test : 15.75 p-value: [0.00]

<sup>15</sup> On the basis of the selection criteria used i.e. minimizing the Swartz Bayesian, and Akaike information criteria, the random coefficient's model provided the best fit.

<sup>16</sup> By taking capital stock lagged once, we want to emphasize the inherent dynamic relationship between the two variables.

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