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Labour market reforms and economic growth – the European experience in the nineties*

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Abstract

Inflexible labour markets combined with high welfare costs are often thought to be the main cause of low growth in Europe. This paper uses OECD data to assess the relative impact of regulation on differences in economic performance across countries since 1990. The impact of regulation is compared first to that of macroeconomic policies such as fiscal policy, monetary policy and macroeconomic cost management. Secondly it is compared to that of policies boosting investment into long run growth, such as research, education and the diffusion of technology. The main result is that while economic performance is related to regulation, the connection to regulatory change in the nineties is less easy to demonstrate. The impact of macroeconomic policy is important insofar as the US applied more growth-oriented fiscal and monetary policies, and some European countries succeeded – in the wake of a severe crisis in competitiveness - in bringing private and public costs in line with productivity and tax revenues. Finally, boosting investment into future growth by encouraging research, education and technology diffusion seem to be at least as important as an agenda focussing on labour market flexibility. Differences in the dynamics of these "drivers of long run growth" are consistent with the differences in growth performance between the US and Europe, as well as between individual European countries.

JEL: E60, O11, O40

Keywords: Labour market reforms, market regulation, economic growth, transatlantic differences

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Labour market reforms and economic growth – the European experience in the nineties

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1. Introduction and outline

This paper assesses the impact of labour market institutions and reforms on economic performance since 1990. When analysing the reasons for slow growth in Europe during the nineties, many researchers (including those from the OECD, EU, and IMF) single out Europe's inflexible labour markets as the primary suspect. If, however, we look into the theoretical or empirical growth literature, the main determinants of long run growth in developed countries are research, education and the diffusion of technologies. The functioning of labour and product markets is indirectly relevant to economic growth, insofar as supply reacts to shifting demand more quickly in less regulated markets and since research incentives depend on institutions, competition and openness. The ability to appropriate profits in exchange for research expenditures is specifically addressed by new growth theory. Last but not least, macroeconomic policy and price competitiveness are important to growth. Despite all the caveats regarding lags in decision making and implementation, and despite of all policy inefficiency claims, the nineties have shown that macroeconomic policy can be supportive of growth. Fiscal or monetary policy may reduce cyclical imbalances and uncertainty, and, through low interest rates, can encourage investment. Empirically-oriented studies – based either on evolutionary models or on management literature – stress price competitiveness and export market shares as important to medium-term performance; we therefore investigate the contribution of strategies to balancing costs and productivity, taxes and revenues, and to devaluating the currency. We group fiscal and monetary policy together with macroeconomic cost management under the term of a broadly defined "macroeconomic policy."

The objective of this paper is to investigate the relative importance of regulation to growth performance. Since our main focus is labour market regulation and the literature has provided evidence that some labour market regulations matter and some do not, we

investigate several types of labour market regulation covered in the OECD Regulatory Database. We extend the analyses to product market regulation.

Research on the impact of regulation initially concentrated on unemployment. Nickel (1997) has shown that certain rigidities will aggravate unemployment, such as (i) generous unlimited benefits, free of obligations and without sufficient assistance in finding new employment, (ii) high unionisation lacking co-ordination between employers and employees and (iii) high taxes on labour. However, other regulations have no negative impact and can serve useful purposes. Layard et al. (1991) studied the impact of institutions and shocks on the UK labour market. The fact that Europe did perform well in the sixties and seventies, with the same labour market institutions, is explained by the finding that the interaction between labour market institutions and macroeconomic shocks matters (Bertola et al., 2001, Blanchard, Wolfers, 2000). Ljungqvist (2003) claims that employment protection reduces unemployment in tranquil times, although it simultaneously decreases productivity and increases unemployment during turbulent periods. Botero et al. (2003) show that rich countries have less regulated labour markets, but spend more on social security, indicating that regulation and welfare spending are not substitutes. Indicators of both regulation and welfare spending should be taken into account by empirical research. Higher regulation leads to higher unemployment, lower employment and a larger unofficial economy.¹

What is astonishing is that there is very little literature which compares the impact of labour market institutions to (i) that of the determinants of long-term growth, as proposed in economic growth theory, or to (ii) macroeconomic policy. The impact of innovation systems or of research inputs and of labour market regulation is usually dealt with separately in the literature. An exception is the OECD growth project (OECD, 2003), which addresses innovation and regulation together, as either competitive or complementary forces of national performance. It is the objective of this paper to relate growth to regulation, investment into future growth and macroeconomic policies, and specifically to investigate their relative importance.²

Section 2 presents a stylised background model which relates our approach to empirical growth literature and to studies of the competitiveness of nations, but which also highlights

¹ The impact of regulation on (un)employment is an ongoing research subject. The most extreme opinions can be summarized by the quotations of Nickell (2003, p. 25): "the countries which still have high unemployment today simply have too few ticks and/or too many crosses" (where ticks are policy changes towards deregulation and crosses towards regulation) and Schettkat (2003, p. 32) in the same publication: "the idea that European unemployment is caused by a European welfare state mechanism is extremely weak".

our focus. Growth in labour productivity is conjectured to depend primarily on institutions, secondly on economic growth drivers, and thirdly on macroeconomic policy. The first category includes variables for the regulation of product and labour markets; in the second group we focus on investment into research, education and new technologies; the third group comprises indicators of fiscal and monetary policy and of price competitiveness, such as wages, unit costs and currency values. Section 3 argues that analyses of short periods with much turbulence should not rely on one single indicator of growth, but rather integrate indicators of growth in output, productivity and employment. Specifically, European countries pursued different strategies for splitting output into productivity and employment. Countries with above average growth in output, productivity and employment have doubtless pursued a successful economic policy. Splitting output growth between productivity growth or employment generation may reflect policy priorities to either foster competitiveness or combat unemployment. A set of nine performance indicators is used to compare the performances of the US and Europe in Section 4 and to assess the differences between the European Union member countries in Section 5. Section 6 investigates the closeness of fit between growth performance and proxies of the three strategies for each EU country. Section 7 tests the robustness of the results, and discusses causality and possible complements between the strategies which determine economic performance. Section 8 summarises our work.

2. A framework for explaining growth performance

Empirical growth literature explains differences in economic dynamics by means of a large set of variables. The variables are usually derived in formal models of growth; some of them determine the steady state growth path of an economy, others influence economic growth in the transition period towards the steady state³.

In empirical research, variables were added more or less in reference to theoretical models. The large number of potential growth determinants has induced researchers to base estimates on data sets for a large number of countries. The fact that the models explain the determinants of long-run growth suggests using long time series. Panel data research is attractive for both reasons. Our objective however is to explain growth differences over the

² Since the time period is rather short, the number of countries small, and the explanatory variables exhibit little time variation, we do not apply the panel technique.

³ For overviews of growth theory see Aghion, Howitt (1998), Barro, Sala-i-Martin (2003), for economic policy to accelerate growth see Ahn, Hemmings (2000), for empirical growth studies see Temple (1999), Bassanini et al. (2001), OECD (2003B), Rogers (2003).

past ten to fifteen years, and to focus first on the striking differences between the US and the European Union and secondly on those across 14 European countries.

We start from a stylised model, which reflects mainstream growth theory and mirrors the main results of empirical studies (equation 1). Growth in real GDP per worker depends on two sets of variables X , Z , and the starting level of productivity. As is usual in the literature, we use the lower case letter y to denote per worker or per capita GDP.

$$(1) \quad dy/dt = f(X, Z, y_{-t})$$

In this general model, X comprises a set of basic economic growth determinants, such as the rate of physical investment, human capital or research; Z characterises a set of institutions, such as product or labour market regulation, or legal and institutional variables, the rule of law, corruption etc. y_{-t} denotes lagged income per worker, thereby accounting for the convergence in incomes implied by many growth models.

Our main focus, labour market regulation, is part of Z . Since labour and product market regulation are to some extent complementary, we also include product market indicators in a broader set of regulatory variables, which we will call REG. Previous literature has cautioned that specific features of labour market regulation are more important than others; therefore we also use subindicators of different aspects of labour market regulation, as far as they are available in the OECD regulatory database.

In specifying X , we focus on variables representing research, human capital and the speed of diffusion of new technologies. This emphasis is based on the fact that the economies of the US and the EU are highly developed, and new economic growth literature focuses on these activities. For less developed economies, it would be important to include the share of physical investment, population growth, abundance of resources, etc. Our focus on developed countries induces us further to drop past income as a variable, since the countries analysed are rather homogenous in their levels of development. We name the variables investigated in this group "growth drivers" (GD) or investment into future growth.

Macroeconomic policy and price competitiveness are somewhere between being "economic" and "institutional" determinants. Many studies include the size of government or the share of taxes in GDP as basic economic determinants (for a survey see Nijkamp, Poot, 2003, or Zagler, Durnecker, 2003). We decided to group government expenditures together with other fiscal and monetary variables into a separate group of macroeconomic variables. Government expenditures may have a negative effect on growth if the government consumes resources needed by the private sector and if the taxes required to finance them are not covered by high productivity. On the other hand, government expenditures may

increase stability, they may stimulate demand when it is weak, and they may provide infrastructure and skills which increase the productivity of the private sector. Taxes combined with labour costs and productivity define the price competitiveness of countries. Price competitiveness and changes in export market shares are included in evolutionary growth models (Fagerberg, 2004). Several European countries were challenged in their international competitiveness, as they faced a severe crisis in the early nineties, upon which they implemented strategies to reduce private and public costs. Two cyclical downturns took place during the period under investigation, one in 1992/93 and one in 2001/02. To varying degrees, attempts were made to stabilise short-run growth by means of monetary and fiscal policy in both the US and in Europe. European countries strove to fulfil the Maastricht criteria in order to gain membership to the Monetary Union. Later on, the rules of the Stability and Growth Pacts limited budget deficits, even when they had the potential to counteract downturns. Combining strategies to regain price competitiveness with ones to stabilise demand produces a heterogeneous group of variables under the heading MACRO.

Thus, our modified background model could be characterized by equation (2), with REG indicating product and labour market regulation, MACRO incorporating policies to stabilise demand, to encourage growth by means of low interest rates or to enforce cost competitiveness, and GD denoting mainstream economic growth determinants (research, human capital, or technology diffusion).

$$(2) \quad dy/dt = f (REG, MACRO, GD)$$

Two more modifications of the standard empirical growth models seemed to be advisable. First, we prefer using a broader measure of performance than output per worker; secondly, we hypothesise that levels of, as well as changes in policies were important. The reason behind the two alterations is the turbulence of the past ten to fifteen years, which prevents the economic growth path from being considered as one of "steady state". Consequently, many countries did not focus their economic policies on labour productivity growth; some explicitly tried to stabilise employment by limiting increases in productivity, for example by shortening the number of hours worked per week. We therefore feel uncomfortable in equating performance with labour productivity growth. Instead, we measure performance according to a set of indicators, which include growth in output, productivity and employment (see Section 3). Secondly, we want to be open to the hypothesis that growth depends not only on the levels of the indicators, but also on how they change over time. Net increases in research expenditures are more likely to be directed towards new areas, while current levels are often maintained for traditional institutions and fields. The same may be true for regulation: not only the degree of regulation is important; changes in regulation may

specifically boost entry and growth in the short run. Similarly, the level of government expenditure and its change is important. This leads us to the final stylised background model (3), in which economic performance (EP) – an indicator which combines nine indicators of economic dynamics - depends on regulation and regulatory change, on macroeconomic policy and its change, and on the level and dynamics of growth drivers.

$$(3) \quad EP = f \{ (REG, MACRO, GD); (dREG/dt, dMACRO/dt, dGD/dt) \}$$

EP = Economic performance = set of indicators of dy/dt , dY/dt , dL/dt

Remember that equation (3) is not thought of as a formal model, which can be estimated by means of a cross section, time series or panel technique⁴, but as a background model, which provides structure to the empirical analysis. We investigate the relationship between performance and its determinants first in turn and then try to learn more about their interrelation and relative importance to growth over the past ten years. Lacking justification for a specific functional form of the relationship induces us to rely mainly on rank correlations (and finally on a set of regressions based on these ranks).

3. Measuring performance

While output per worker is the most widely used measure of economic performance, it is not the only available indicator of productivity and there are arguments in favour of not focussing on productivity alone, but also on output dynamics and employment generation. Unemployment was high during the period investigated; some European countries did not try to increase productivity but rather sought to stabilise or increase employment by, for example, reducing working hours or encouraging part time and temporary work.

Even for productivity, taking real GDP per worker as an indicator is not the only option.⁵ Total factor productivity relates output to all inputs. The construction of this variable is, however, fraught with many problems. Existing data reveal moderate differences across countries and over time, often not much larger than the differences between results based on different

⁴ The number of countries is too small, the time period too short for an econometric estimation. Extending the time period is not appropriate, since we want to focus on policy change specifically in the nineties. We refrain from expanding the number of countries because we want to concentrate on the relatively homogenous group of European Union member countries. For Europe, we take the 14 members of the EU before its enlargement in 2004 (excluding Luxembourg).

⁵ We could also use output per capita, as some theoretical models do. Aside from efficiency, output per capita depends on social and economic factors like female participation rates and the existence of a pension system. Per capita growth is further influenced by demography and immigration. While per capita figures may be more suitable for the assessment of welfare and long-run economic progress, per worker growth is closer to efficiency and is our choice.

techniques of estimation. Estimates are specifically difficult for the end of the time series - the period in which we are specifically interested. Since it is often argued that productivity in the service sector is difficult to measure, we add productivity in manufacturing as the third indicator. It is therefore our choice to measure productivity by means of three indicators: GDP per worker, total factor productivity and productivity in manufacturing.

While productivity reflects technical progress and defines the scope of long-run improvements in factor incomes, it was not the dominant policy goal in many countries. Unemployment was high, the work force was growing and governments had to balance income goals with employment goals. Countries achieving relatively high output growth, but using it more to increase employment than to increase productivity should not be regarded as less successful than countries achieving the same output growth with declining employment. We therefore add three indicators of output growth: growth in real GDP, growth in manufacturing output and growth in potential output. This last indicator should ideally correct for cyclical fluctuations. However, like total factor productivity, it is quite sensitive to estimation procedures, specifically during times of turbulence and at the end of the series.

As the third component, we include three indicators of employment: the employment rate (relative to population), unemployment and employment growth. Rates and the level of change are intentionally combined, since it is easier to increase employment when starting from a very low employment rate.

In summary, we combine nine performance indicators, three for productivity growth, three for output growth and three for employment. Weighting each indicator equally in the final performance ranking may be suboptimal, but tests have shown that other weights do not change the ranking dramatically. We use data for the last ten years available (1994/2003); the first and last year had approximately the same degrees of capacity utilisation (we test the robustness of the results by extending the length of the period investigated back to 1990).

4. Europe vs. the US: differences in performance and all three policy sets

European growth was disappointing during the nineties. The productivity gap between the US and Europe, which had been narrowing over the previous decades, widened again, specifically for output per worker and since the mid nineties. During the first years of the new decade, the superior performance of the US has continued.

The US leads in all nine performance indicators

Measuring performance by the nine performance indicators introduced above reveals that according to all nine indicators (see Table 1), the US outperformed Europe throughout the ten years between 1994 and 2003, as well as for the entire period since 1990. Taking the last ten years as the main period of investigation, total economic growth as well as manufacturing growth in the USA were 1 percentage point higher than in Europe. Employment increased by 1.5 % per year in the US, as compared to 0.9 % in Europe. In the US, the employment rate was more than ten points higher (and increasing), while the unemployment rate was 9 % in Europe and 5 % in the US. The difference in labour productivity growth was somewhat less than one percentage point. The smallest difference measured was for growth in total factor productivity. At this point, we should recall that total factor productivity is theoretically very attractive, since it relates trend output to all inputs, but is at the same time very difficult to measure. The very subtle differences and the slight acceleration in the US during the second half of the nineties suggest that this indicator may underrate the productivity resurgence which has been taking place in the US since the mid nineties.

Table 1: Performance differences USA vs. EU

	1990/2003			1994/2003		
	USA	EU	USA/EU	USA	EU	USA/EU
Real growth of GDP	2.82	1.98	+	3.26	2.22	+
Macro productivity growth	1.55	1.45	+	1.67	1.32	+
Manufacturing growth	3.92	1.62	+	3.43	2.40	+
Productivity growth in manufacturing	5.06	2.68	+	3.78	3.01	+
Potential output growth	3.00	2.20	+	3.20	2.14	+
Total Factor Productivity growth	1.04	0.88	+	1.16	0.90	+
Employment rate, average	79.11	64.57	+	79.73	64.64	+
Unemployment rate, average	5.56	8.34	+	5.29	9.09	+
Employment growth	1.19	0.75	+	1.46	0.92	+

Source: WIFO calculations using AMECO, OECD (ECO).

Product and labour markets are less regulated in the US

The OECD Regulatory Database provides indicators describing product market regulation and labour market regulation. The information is ranked on a scale ranging from 0 (unregulated) to 6 (highly regulated).

The time-varying indicator of product market regulation (PMR_{dyn}) measures the degree of regulation and the liberalisation of network industries: it rates the US at 1.36 in 1998, while the

unweighted EU average is 3.26. Only the United Kingdom is less regulated (1.02) than the US. The difference in regulation was larger in 1990, namely 2.21 in the US vs. 4.73 in Europe. The change in the direction of liberalisation in absolute terms was larger in Europe.

For labour market regulation (EPL), the difference between the US and Europe seems to be even greater. The US labour market is assessed as being practically unregulated, with an index of 0.2. The European labour market is graded at 2.4 on a scale of 0 to 6. Even in the most market-oriented European country – the United Kingdom – the labour market is more regulated than in the US. Strict regulation is reported for southern European countries, as well as for France and Germany (3.1 and 2.8 respectively in 1998). European labour markets were moderately deregulated in the nineties, as is reflected by a decrease in the index from 2.9 to 2.4. Only minor changes were made in regular contracts - the bulk of change took place via the deregulation of temporary contracts.⁶ For temporary contracts, regulation in the United Kingdom, Ireland, Denmark, and the Netherlands is no longer stricter than in the US. The US has not altered its – albeit low – degree of labour market regulation, neither for regular nor for temporary contracts.

Taken as a whole, this information illustrates how Europe's product and labour markets⁷ are still more highly regulated than those in the US, although the differences between the US and Europe have decreased somewhat for labour markets. For product markets, the difference decreased in absolute terms, but increased slightly when measured in relative terms.

Table 2: Regulation and regulatory change 1990 and 1998: EU vs. USA

	Product market regulation Dynamic indicator (network industries)			Employment regulation (EPL) All contracts			Employment regulation Regular contracts			Employment regulation Temporary contracts		
	1990	1998	1998-1990	1990	1998	1998-1990	1990	1998	1998-1990	1990	1998	1998-1990
EU	4.73	3.26	-1.46	2.86	2.43	-0.43	2.66	2.51	-0.14	3.06	2.34	-0.71
USA	2.21	1.36	-0.85	0.20	0.20	0.00	0.10	0.10	0.00	0.30	0.30	0.00

Source: OECD Regulatory Indicators.

⁶ The degree of regulation for permanent contracts is measured by the procedural requirements (delay) necessary before notice of dismissal can take place (prewarnings), notice and severance payments, penalties for unfair dismissals etc. The regulation of temporary contracts is assessed according to the reasons for which temporary working contracts are offered, maximum renewals, and maximum cumulated duration.

⁷ For a microeconomic approach see Michie, Sheehan (2003), who report that "functional flexibility" such as flexible work practices, human resource management and industrial relation systems are positively related to innovation, while "external flexibility" (temporary contracts, for example) is negatively related to growth.

US fiscal and monetary policy is more growth oriented

US monetary policy in the nineties not only actively fostered price stability, but also assumed responsibility for economic growth and output stability. In nominal interest rates amounted to 8.4 % in the EU, in contrast to 3.1 % in the US. In addition, real rates differed by more than 4 percentage points (4.9 % vs. 0.7 %). During the recent recession, the US reduced interest rates early and courageously, in order to support economic growth, ultimately arriving at a Fed rate of 1 % in mid 2003 vs. 2 % in Europe. The US strategy was implemented by a monetary authority with a reputation of being tough and inflation-minded, and which acknowledged its legal responsibility for stability and growth. It was administered by a chairman of the Federal Reserve Bank, who exerted his authority and actively accepted responsibility for the economic fate of his country. The fiscal deficits during the recession of 2001/2003 were not restrained by rigid policy rules. The US budget position switched from one of surplus to a large deficit, with the balance shifting between 1998 and 2002 by 3.5 % in the US but only by 0.3 % in Europe. In 2004, the overall government deficit amounts to about 5 % of GDP in the US, while in the European Union it is 2.5 %.

Viewed over a longer perspective, government policy was somewhat more restrictive in the US. The share of debt to GDP decreased by 14 percentage points in the US between 1993 and 2002 and increased by 4 percentage points in Europe. Government expenditures relative to GDP fell from 36.2 (1993) to 34.8 (2002) in the US⁸. The share of social spending in GDP increased in Europe from 25.5 % to 27.3 % (ESSOS database), partly reflecting higher unemployment and the use of early pension and disability schemes to combat unemployment. The ratio of social spending relative to GDP increased in the US by 0.8 %.⁹ Wages, as well as unit labour costs, increased much faster in the US, but this was not the result of income policy or demand management but rather the outcome of increasing growth in GDP and labour demand. A moderate cost containing strategy was – aside from the containment of government expenditures – the decline of the value of the dollar between 1992 and 2003 by 4 %.

⁸ The share of government expenditures relative to GDP fell from 52.4% to 47.4% in Europe, but recall that the 1993 level was influenced by booming unemployment benefits. For the same reason, the peak of social spending was reached in 1993 (at 28.8 %).

⁹ According to the OECD database, public welfare spending is 24 % in Europe and 16.4 % in the US. These numbers depend on several statistical issues: whether or not benefits are taxed, whether they are paid as transfers or via tax deductions, and whether or not private spending is included. The difference is largest for gross public spending and smallest for net spending including private contributions (25.8 % vs. 23.4 %, OECD, 2003A).

Table 3: Macroeconomic policy USA and Europe 1994/2003

	USA				EU			
	1993	2000	2003	Change ¹⁾	1993	2000	2003	Change ¹⁾
Government expenditures in % of GDP; absolute change	36.2	32.3	35.2	-1.0	52.4	47.1	47.8	-4.6
Taxes in % of GDP; absolute change	31.2	33.8	31.6	0.4	46.8	45.9	45.8	-1.0
Debts in % of GDP; absolute change	76.5	59.9	62.3	-14.2	64.5	64.2	63.5	-1.1
Deficit in % of GDP; absolute change ²⁾	-5.0	1.5	-3.6	1.4	-5.6	-1.1	-2.0	3.7
Social expenditures in % of GDP; absolute change ³⁾	13.4	14.7	-	1.2	23.5	26.1	-	2.7
Wages in bn €; growth p.a.	3257.4	6196.8	5820.9	6.0	3212.0	4363.6	4791.0	4.1
Wages per worker; growth p.a.	25193.5	41546.8	39241.9	4.5	20726.7	26187.5	28283.0	3.2
Unit Labour Costs 1995=100; growth p.a.	108.9	155.9	139.5	2.5	99.5	111.6	117.3	1.7
Currency ; US relative to EU ⁴⁾	108.5	138.0	141.1	1.3				
Nominal interest rates ⁵⁾	3.08	6.53	1.80	-1.3	8.43	4.77	3.48	-4.9
Real interest rates ⁵⁾	0.67	4.33	0.66	0.0	4.85	3.19	0.99	-3.9

¹⁾ Absolute change for shares (as government expenditures in % of GDP) 2003 minus 1993 and relative change p.a. for indices (like wages) starting with change 1993/94.

²⁾ A minus indicates lower deficit than in the starting year or higher surplus.

³⁾ 1990/1999.

⁴⁾ Increase implies devaluation of the \$ relative to Euro (and ECU).

⁵⁾ Last year 2002.

Source: WIFO calculations using AMECO.

The US is widening its lead in long-run growth determinants

The investments of countries into future growth are measured by variables which theory and empirical studies have shown to be important to long-run growth. The set comprises indicators of research input and output, of educational attainment at the secondary and tertiary levels, ICT expenditures and the use of personal computers, internet and cellular phones (as a proxy for the speed of diffusion of new technologies). Finally, the share of technology-driven industries, of high-skill industries and ICT industries is measured in order to determine how research, education and the application of information technology is reflected in real industry structures. The astonishing result is that in 1990, the US was leading in all 16 indicators. During the nineties, the EU began to catch up in five indicators (surpassing the US in two, namely cellular phones and telecommunication hardware infrastructure), while the difference is still increasing for 11 indicators (see Table 4). The higher rate of growth in the US during the nineties and in more recent years comes of no surprise, once we are familiar with this evidence.¹⁰

¹⁰ Some of the advantages of investment into future components of growth already existed during past decades, when Europe was growing faster than the US. There are two explanations for this: first of all, productivity was still much lower in Europe, so that higher European growth contained an element of catching up, which grew smaller as European productivity approached that of the US in 1990. Secondly, it may be argued that the European system of innovation may have been well adapted to imitation and diffusion periods, while the US innovation system is better suited to periods witnessing the emergence of new general purpose technologies like ICT (Aiginger, Landesmann, 2002).

Summing up the information in this section reveals that US policy differed during the nineties from that of Europe in all three policy sets. US markets were less regulated, with a particularly large difference in labour markets. Monetary and fiscal policy- the latter at least during the most recent crisis - was more growth oriented in the US. A moderate devaluation of the dollar was supportive of economic growth, and wages increased faster in the US. The US economy invested more into the long-run determinants of growth; in 1990, they were leading in all 16 indicators. The differences in labour market regulation declined, while differences in macroeconomic policy and growth drivers widened during the nineties.

Table 4: Investment into the future growth

	1990		1999		Lead of US (+) resp. EU (-) 1990	Change in favour of US (+) resp. EU (-) 1990/1999
	EU	USA	EU	USA		
Indicators on R&D: input and output						
Total expenditure on R&D in % of GDP	1.88	2.65	1.86	2.66	+	+
Business Enterprise Expenditure on R&D (BERD) in % of GDP	1.20	1.98	1.15	2.04	+	+
Research intensity in manufacturing	2.00	3.07	2.01	3.23	+	+
Publications per inhabitant	6.15	9.52	8.14	9.27	+	-
Patents per resident	2.24	3.63	2.48	4.48	+	+
Indicators on education system: input and output						
Percentage of the population that has attained at least upper secondary education by age group (1998) ¹⁾	53.00	87.00	70.00	88.00	+	-
Percentage of the population that has attained at least tertiary education, by age group (1998) ¹⁾	19.00	37.00	25.00	36.00	+	-
Indicators on ICT: production and use						
ICT expenditure in % of GDP	3.69	5.65	6.40	8.75	+	+
Information technology (IT) expenditure in % of GDP	1.69	2.97	2.71	5.50	+	+
Telecommunication (TLC) expenditure in % of GDP	2.00	2.67	3.69	3.25	+	-
PCs per 1000 inhabitant	0.93	2.53	2.49	5.17	+	+
Internet users per 1000 inhabitant	0.03	0.18	1.59	2.72	+	+
Cellular Mobile Subscribers per 100 capita	1.52	4.25	39.59	31.16	+	-
Indicators on share of "progressive" industries						
Share of technology driven industries in nominal value added	21.85	26.46	22.92	30.27	+	+
Share of skill intensive industries in nominal value added	16.81	18.27	16.67	18.64	+	+
Share of ICT industries in nominal value added	7.28	10.07	6.80	14.31	+	+

¹⁾ For percentage of work force with secondary and tertiary education the older (45-54) and the younger (25-34) age groups in 1998 are compared.

5. Differences in the growth dynamics of European countries

Differences in economic performance across European countries grew during the nineties. We use the indicators proposed in Section 3 to rank the European countries according to their growth performances over the past ten years. The procedure is first to rank the countries for each of the nine indicators chosen, then to calculate the average rank for each country and to determine the final rank according to this average (see Table 5, last row).

With the lowest average rank, Ireland has the best growth performance. It is leading in all indicators of output and productivity growth; it is also leading in employment growth, even though unemployment once was historically high and the employment rate started from a low level. Finland finishes second, placing between the 2nd and 4th for all indicators on output and productivity growth. Unemployment is still rather high in Finland, albeit decreasing. Sweden is ranked third, it has focussed somewhat more than Finland on productivity growth. Employment growth is lower in Sweden since the employment rate was rather high at the start of the nineties. Denmark's rankings are better than the European average according to each single indicator, more for employment than for growth. Output growth is only marginally higher than the European average, but there was no crisis during the first part of the nineties and Denmark already had the highest per capita GDP of all countries, so that growth rates slightly above average were quite remarkable.

Table 5: Performance differences across European countries 1994/2003

	Belgium	Denmark	Germany	Greece	Spain	France	Ireland	Italy	Netherlands	Austria	Portugal	Finland	Sweden	United Kingdom
Real growth of GDP	2.1	2.6	1.4	3.3	3.2	2.0	7.9	1.7	2.5	2.1	2.6	3.6	2.9	2.9
Macro productivity growth	1.0	1.8	1.2	2.5	0.9	1.2	3.7	1.1	1.0	1.7	1.7	2.2	2.2	1.8
Manufacturing growth ¹⁾	2.3	3.8	2.5	2.2	3.1	2.2	13.5	1.9	1.7	4.7	3.0	5.7	4.1	0.8
Productivity growth in manufacturing	3.2	3.9	4.0	3.4	1.2	2.8	13.0	1.9	2.5	5.6	3.6	4.3	3.8	2.0
Potential output	2.0	2.2	1.6	2.8	3.0	2.0	7.3	1.6	2.5	2.1	2.6	2.9	2.5	2.7
Total Factor Productivity	0.7	1.6	0.6	1.7	0.4	0.8	3.6	0.7	0.8	0.8	0.7	2.5	2.1	1.4
Employment rate, average	59.4	76.3	67.7	53.3	54.6	61.7	61.2	57.2	71.7	72.9	69.2	63.7	73.3	74.9
Unemployment rate, average	8.5	5.8	8.5	10.0	15.0	10.6	8.6	10.6	4.5	4.1	5.8	12.2	7.5	6.8
Employment growth	1.1	0.7	0.2	0.8	2.2	1.0	4.0	0.7	1.8	0.3	0.9	1.3	0.6	1.1
Average rank ²⁾	9.6	5.8	10.0	7.2	9.2	9.8	2.9	12.1	7.9	6.8	6.8	4.6	5.6	6.9
Superrank final ³⁾	11	4	13	8	10	12	1	14	9	5	5	2	3	7

¹⁾ Manufacturing in Japan and USA only until 2001.

²⁾ Average over the rankings for each of the nine indicators.

³⁾ Ranking of the countries using the average ranks.

Source: WIFO calculations using AMECO (November 2003).

Italy is rated among the bottom three countries according to all nine indicators. Germany has the lowest levels of growth in output, potential output and employment. Total factor productivity is second lowest. This underperformance is partly related to German Unification and to a transitory unification boom in the early nineties, but Germany's status as the European laggard with respect to dynamics has become a stylised fact. France is below the European average in eight of nine indicators, with a slightly above average performance in employment generation (due to efforts to reduce the work week). On average, France ranks 12th, with the third poorest performance of the 14 member countries. Thus the three largest continental economies are low performers.

The southern peripheral countries of Europe rank moderately. Portugal, Greece and Spain successfully caught up in per capita GDP in the nineties, although the process was slow and there were residual problems in productivity and employment. Three economies with rather high levels of per capita income, namely the Netherlands, Belgium and Austria, could not widen their lead and appear to be "stuck in the middle" to a certain extent, as far as growth is concerned. The UK is also ranked moderately, with above average growth, although deficits in productivity and infrastructure must be acknowledged.

It is reassuring that other rankings arrive at similar results. The Structural Indicators of the EU Commission, as well as the European Innovation Scoreboard reveal Sweden, Finland, and Denmark to be top countries. These countries are also ranked - among the EU member countries - as the 1st, 2nd, and 3rd in the World Competitiveness Report 2002 of the World Economic Forum (WEF), and among the top countries in the ratings of the IMD (2003).

Table 6: Regulation and regulatory change in EU countries

	Product market regulation Dynamic indicator (network industries)			Employment regulation (EPL) All contracts			Employment regulation Regular contracts			Employment regulation Temporary contracts		
	1990	1998	1998-1990	1990	1998	1998-1990	1990	1998	1998-1990	1990	1998	1998-1990
Belgium	4.99	3.35	-1.64	2.4	1.5	-0.90	1.8	1.7	-0.10	3.1	1.2	-1.90
Denmark	4.68	2.95	-1.73	3.6	2.8	-0.80	2.9	3.0	0.10	4.2	2.5	-1.70
Germany	4.13	2.59	-1.54	3.6	3.5	-0.10	2.8	2.6	-0.20	4.5	4.5	0.00
Greece	5.67	5.08	-0.59	3.7	3.2	-0.50	3.8	2.8	-1.00	3.5	3.7	0.20
Spain	4.32	3.24	-1.08	2.7	3.1	0.40	2.4	2.5	0.10	3.0	3.7	0.70
France	5.01	3.92	-1.09	1.0	1.0	0.00	1.7	1.7	0.00	0.3	0.3	0.00
Ireland	5.05	4.26	-0.79	4.2	3.3	-0.90	3.0	3.0	0.00	5.3	3.6	-1.70
Italy	5.78	4.32	-1.45	3.1	2.4	-0.70	3.1	3.2	0.10	3.0	1.5	-1.50
Netherlands	5.48	2.86	-2.62	2.4	2.4	0.00	2.8	2.8	0.00	2.0	2.0	0.00
Austria	4.41	3.19	-1.22	4.2	3.7	-0.50	5.0	4.3	-0.70	3.5	3.2	-0.30
Portugal	5.29	4.13	-1.16	2.2	2.1	-0.10	2.5	2.3	-0.20	1.9	1.9	0.00
Finland	4.59	2.59	-1.99	3.4	2.4	-1.00	3.1	3.0	-0.10	3.8	1.8	-2.00
Sweden	4.08	2.19	-1.89	0.5	0.5	0.00	0.7	0.7	0.00	0.3	0.3	0.00
United King.	2.69	1.02	-1.67	2.9	2.4	-0.43	2.7	2.5	-0.14	3.1	2.3	-0.71
EU	4.73	3.26	-1.46	0.2	0.2	0.00	0.1	0.1	0.00	0.3	0.3	0.00
Top 3	4.45	2.58	-1.87	2.5	1.9	-0.60	2.2	2.2	0.00	2.8	1.5	-1.23
Big 3c	4.97	3.61	-1.36	2.6	2.3	-0.27	2.5	2.5	-0.03	2.6	2.1	-0.50

Source: OECD Regulatory Indicators.

6. The closeness of fit between performance and strategies for Europe

In this section we relate the performance differences of the individual European countries to differences in regulation, macroeconomic policy and investment into the future. We do this by comparing the performance rankings of countries for 1994/2003 with their relative rankings in regulation, in cost cutting and investment into growth drivers. This provides a tentative answer to the questions (1) how close is the relationship between performance and individual strategies and (2) whether the regime at the start of the period or its change during the period was more important. Since the main focus of this paper is on the impact of regulation,

we will specifically investigate the relationship between performance and various sub-strategies (product vs. labour regulation; permanent vs. irregular contracts; costs vs. administrative regulations).

Performance correlates with the level of regulation in 1990

The fit between the degree of regulation at the start of the period and growth performance is significant for overall regulation¹¹ in 1990 and for several sub-indicators. The UK and Ireland had the lowest degree of regulation, with Finland, Denmark and Austria following. Of these countries, Ireland, Finland and Denmark are among the top performers, while the United Kingdom and Austria enjoyed at least medium growth performances. Italy's economy was the most highly regulated and grew the least, thus strengthening the relationship (see Figure 1). France and Germany performed poorly, but started the period with average ranks for regulation. Sweden initially had a similar degree of regulation, but then enacted the most radical form of regulatory change and enjoyed excellent growth performance. The slightly above average rates of growth in Portugal and to a certain extent in Greece were achieved under a relatively regulated framework. This might indicate that the given speed of catching up achieved by these countries was not influenced by their regulatory schemes.

As far as regulatory *change* is concerned, Sweden and Denmark are leaders in growth, and have decreased regulation courageously. France is a laggard in both performance and deregulation, followed to a certain extent by Spain and Germany. Since their markets were unregulated from the beginning, Ireland and Finland had no need to deregulate; they enjoyed the two best ranks in growth performance. Cautious steps towards deregulation did not boost growth in Italy and Belgium, but were sufficient in Portugal and Austria for somewhat better performances. In general, growth performance is also related to the *change* in regulation between 1990 and 1998, but the relation is not significant¹².

Free entry and flexible temporary contracts are specifically important

If we look at the individual indicators, we find that the extent of labour market regulation in 1990 is related to the growth performance of the past ten years. For product market regulation, there is a significant relationship according to the static indicator, which assesses

¹¹ Overall regulation is a combined index of product and labour market regulation (which are weighted equally). For product market regulation, the indicator for network industries is used (PMR_{dyn}).

¹² Considering the small number of countries, a relation may exist, but this is not confirmed by the statistical tests.

the general regulatory regime across the whole economy¹³, but not for the indicator which focuses on network industries (PMRdyn). The correlation between the rankings for growth performance and barriers to entry is highly significant, as is that for administrative regulation (Table 7). Domestic deregulation seems to be more important than outward-oriented policies, perhaps since trade liberalisation has been widely established among EU member countries.

Table 7: The relation between growth performance and regulation (t-values)

	Growth of performance 1994/2003		Growth of performance 1990/2003	
Regulatory overall indicator 1990 ¹⁾	-1.99	*	-1.44	
Regulatory change ²⁾	-1.32		-0.93	
Employment regulation 1990	-2.12	*	-1.53	
Employment regulation; change	0.54		0.53	
Regular contracts 1990	-0.45		0.06	
Regular contracts; change	-1.63		-0.53	
Temporary contracts 1990	-2.61	**	-2.37	**
Temporary contracts; change	0.21		-0.30	
Procedural inconveniences 1990	-0.22		0.10	
Procedural inconveniences; change	-1.27		-0.44	
Direct cost of dismissals 1990	-0.52		0.11	
Direct cost of dismissals; change	0.02		0.24	
Delay of dismissals 1990	0.29		-0.38	
Delay of dismissals; change	-1.34		-0.32	
Temporary contracts: procedures 1990	-2.32	**	-2.31	**
Temporary contracts: procedures; change	0.28		-0.19	
Temporary contracts: duration 1990	-3.24	**	-2.67	**
Temporary contracts: duration; change	0.76		0.20	
Product market regulation 1998	-1.93	*	-3.13	**
Inward-oriented policies 1998	-2.48	**	-4.90	**
Outward-oriented policies 1998	-0.94		-1.61	
State control 1998	-1.45		-2.67	**
Barriers to entrepreneurship 1998	-2.82	**	-4.42	**
Barriers to trade and investment 1998	-0.59		-1.13	
Economic regulation 1998	-1.45		-2.04	
Administrative regulation 1998	-2.95	**	-4.34	**
Product market regulation 1990 (PMRdyn)	0.71		0.79	
Product market regulation; change	0.27		0.52	

* significant 90%

** significant 95%

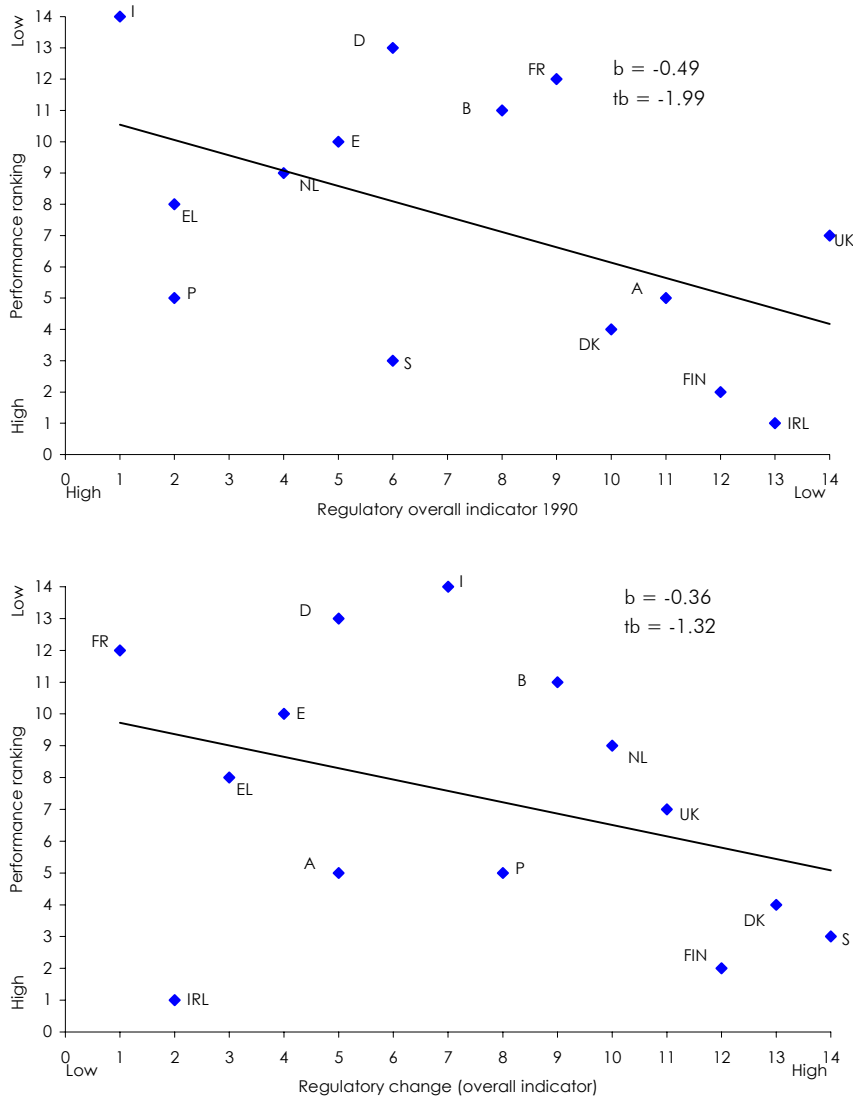
1) Average over product and labour market regulation rankings (50% : 50%)

2) Change means relative change 1990/1998

Source: OECD Regulatory Indicators.

¹³ This indicator is only available only for 1998. We can therefore neither relate growth performance to product market regulation at the start of the period, nor calculate its relation to the change in product market regulation.

Figure 1: Performance and regulation 1990 and regulatory change



Regarding labour market regulation¹⁴, growth is significantly higher in countries which had fewer restrictions on temporary contracts in 1990. This fit is supported on the one hand by Finland, Ireland, and the UK, where good performances were combined with low levels of regulation, and by Italy Germany, Belgium and Greece on the other hand. There is no relation between growth performance and changes in the regulation of temporary

¹⁴ The data set contains 15 indicators of employment protection, grouped according to regular contracts, fixed term contracts and temporary work arrangements. For fixed contracts, EPL measures procedural requirements, notice and severance payments, and standards of or penalties for unfair dismissal.

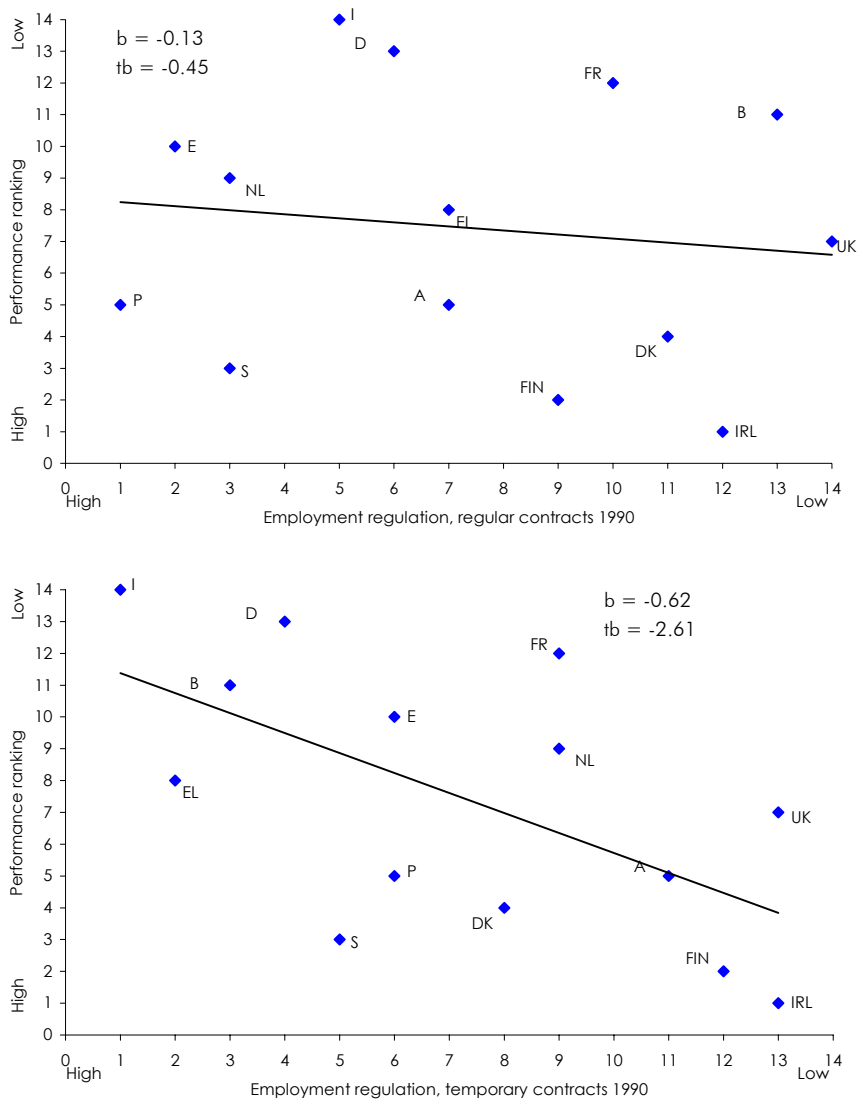
contracts¹⁵. Sweden and Denmark deregulated temporary contracts and did grow fast, but other high-growth countries were already less regulated at the start (Finland, Ireland). Decreasing restrictions on temporary contracts boosted growth temporarily in the Netherlands; moderate steps in this direction were taken in Belgium, Germany and Italy, but were apparently not sufficient to increase growth. As far as temporary contracts are concerned, both components – namely the maximum length of time for which temporary contracts are legal, as well as the procedures required for temporary contracts, are important to good growth performances. This is also true for the level of regulation in 1990 (as well as in later years), although the change in these regulatory regimes is not related to growth. The relation between growth and the degree of regulation of regular contracts¹⁶ is insignificant. Sweden and Portugal had high growth and highly regulated regular contracts; in Belgium growth was low and labour markets were less regulated. France, Italy and Germany had near average degrees of regulation for regular contracts, but underperformed in growth.

There is a slight but nevertheless insignificant correlation between growth and change in labour market regulation. The Nordic economies deregulated and in comparison, all big continental economies did considerably less. The correlation is weakened by Ireland, which had no regulation at the start, and by Spain, which deregulated strongly from a very high initial level, but did not excel in performance. Additionally, several low performers are ranked moderately with regard to changes in labour market regulation (Italy and Germany). If we split regulation into the costs of dismissals and the time which must elapse before a dismissal can take effect (the delay), both are weakly related to growth performance (with a negative sign).

¹⁵ Changes regarding permanent contracts were made in Finland, Portugal, and Spain, which have waived regulations for permanent workers significantly (Nicoletti, 2002, p. 49). In Finland, the delay between the start of notice and the notice period itself were reduced, and procedures were simplified somewhat (Nicoletti, 2002, p. 49).

¹⁶ Examples of changes in the regulation of temporary contracts in a number of countries (e.g. Belgium, Denmark, Germany, Italy, the Netherlands, Norway and Sweden) are that fixed term contracts and contracts under TWAs or both can now be used in a wider range of situations than in the early nineties. In Denmark and Sweden, all restrictions on the types of work for which TWA employment is legal have been removed... (Nicoletti, 2002, p. 49). France has restricted the types of jobs that can be offered by TWAs and reduced the maximum number of successive fixed term contracts. In Denmark, the restrictions on the number of renewals have been removed. The maximum duration of successive contracts has been increased in Germany, Belgium, Denmark, Japan, Italy, and the Netherlands (Nicoletti et al., 2000 p. 50).

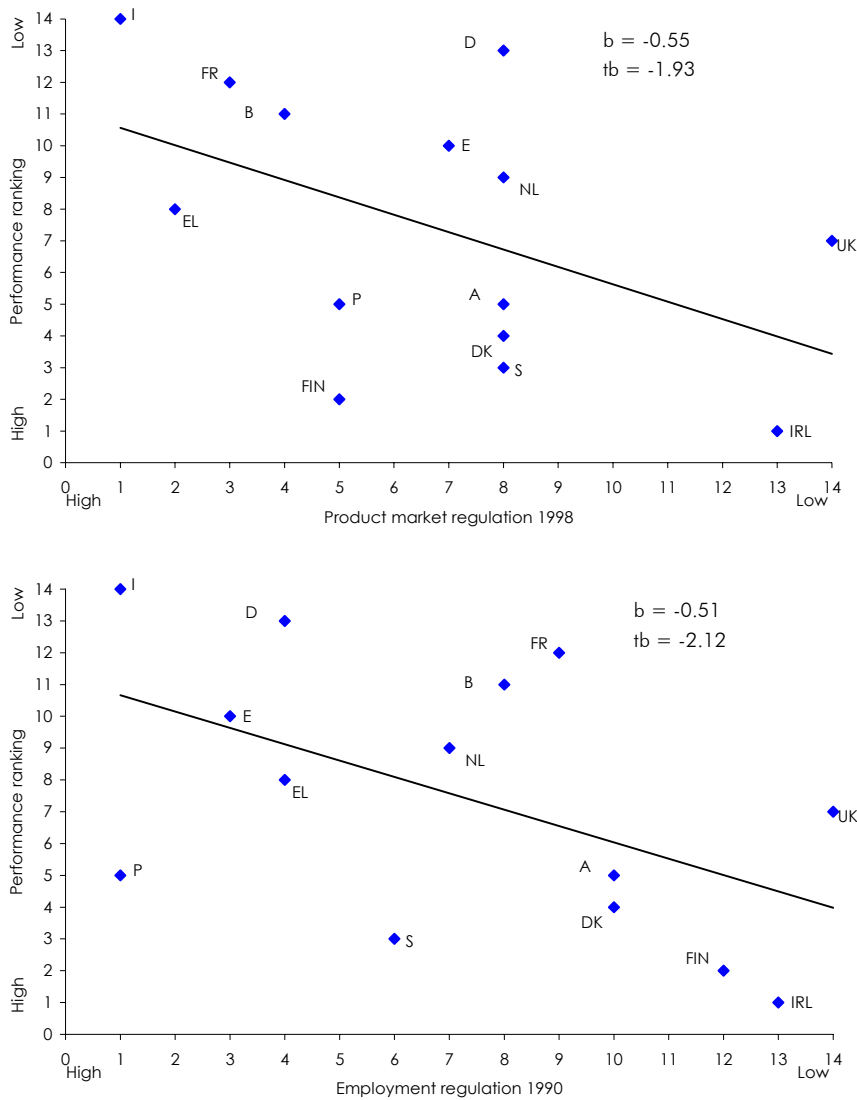
Figure 2: Performance and regulation of regular and temporary contracts 1990



Summing up the evidence, growth performance is related to some aspects of regulation. This holds for barriers to entrepreneurship and administrative regulation as subcategories of product market regulation and for procedures and length of temporary contracts in the field of labour market regulation. High costs and delayed dismissals do not seem to be related to performance and there appears to be no correlation between performance and the regulation of regular labour contracts. The overall relation is significant only for the level of labour market regulation in 1990, not for the change during the nineties. Some of the good performers, such as Sweden, Denmark and Finland, deregulated their product and labour markets considerably. Nevertheless, in Ireland - the best performer - the labour market was already unregulated in 1990, and there is little relation between performance and regulatory

change for the rest of the countries. To a certain extent, the disappointing fit may be due to the fact that some aspects of the "level" of regulation at the start and other aspects of "change" are important to growth. Investigating level and change separately, in correlation, may lead us to underestimate the impact. Within labour markets, liberal regimes for temporary contracts seem to be more important than flexibility for regular contracts.

Figure 3: Performance and product and labour market regulation 1990



Cost cutting and performance are only weakly related

The fit between cost cutting¹⁷ and performance is positive, but very weak. Sweden and Finland are leading in cost cutting strategies and in performance. They devaluated their currencies in the early nineties, and successfully managed to regain growth and competitiveness. Both countries dampened wage increases and government expenditures, and both countries are now enjoying budget surpluses; the share of debt in relation to GDP has returned to same level at which it was at the start of the nineties. In Sweden and Ireland, the share of government expenditures in GDP fell dramatically. Social expenditures relative to GDP are still high, but the difference in comparison to other European countries has decreased. Italy tried to cut costs by depreciating its currency, but to no avail. Spain followed Italy's example with mixed success. At the other end of the spectrum, France did not apply a low cost strategy, but rather tried to spread employment by reducing the work week and implementing targeted spending programs. Nevertheless, France suffered slow growth. As the highest-wage country, Germany initially increased wages faster than its competitors, but altered its course in the mid nineties. However, this policy also did not have a positive impact on growth. In order to finance unification, Germany increased taxes, and deficits as well as debt continued to rise more and more, while growth declined. Revenues were insufficient, which resulted in less spending and investment. The rankings of Denmark and Ireland in cost-cutting are low and moderate respectively, but both countries nevertheless managed to grow fast.

As far as other macroeconomic indicators are concerned, the European Union tended to reduce differences in monetary and fiscal policies of its member countries. Nominal interest rates nearly converged, which for Greece, Spain and Portugal implied specifically high reductions in an important cost component and in some years even negative real rates; all three countries resumed catching up to the European average in the nineties. The largest reduction in government expenditures relative to GDP over the past 10 years occurred in Sweden, Finland and Ireland. In part, this reflects the crisis of the early nineties, as well as discretionary budget cuts. Finland, Denmark and Sweden achieved budget surpluses even in 2003, while Germany, France, Italy and Portugal suffered deficits of more than 3 % of GDP, which were primarily a reflection of slow growth and decreasing tax revenues (partly accentuated by tax reforms). The UK boosted economic growth by devaluating its currency,

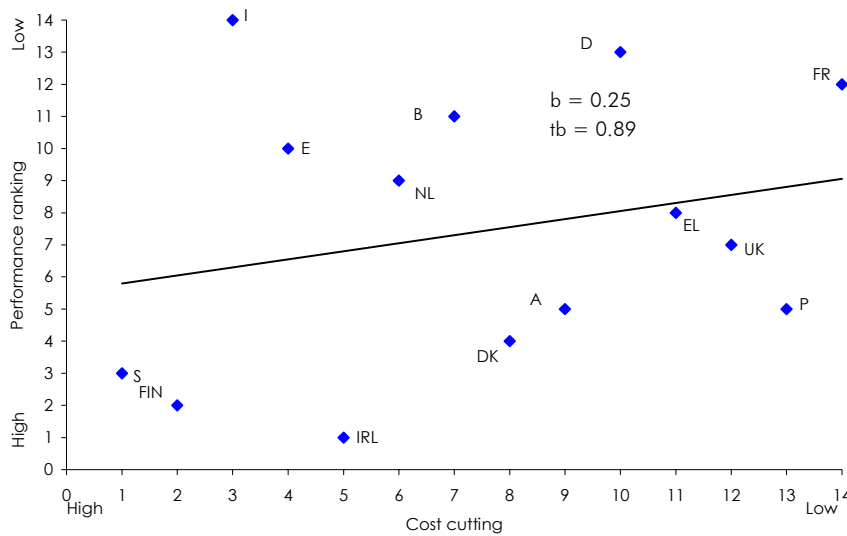
¹⁷ Cost cutting strategies summarise indicators for wages, unit labour costs, government expenditures and currency development (with devaluation as a cost reducing strategy).

but did not pursue other cost cutting strategies in the nineties, since it had already done so in the eighties. The UK did however try to combat deficits in infrastructure.

Table 8: Macroeconomic policy indicators for Europe

	Belgium	Denmark	Germany	Greece	Spain	France	Ireland	Italy	Netherlands	Austria	Portugal	Finland	Sweden	United Kingdom	EU
Government expenditures in % of GDP															
1993	55.42	60.74	49.28	46.00	48.42	55.14	44.66	57.61	55.49	57.89	47.72	63.53	72.44	45.44	52.41
2003	49.62	54.36	48.79	47.12	39.77	54.45	34.24	47.42	47.23	52.06	47.01	49.44	59.03	41.91	47.79
Taxes in % of GDP															
1993	49.22	61.06	45.93	37.21	42.11	49.63	43.97	48.25	53.55	53.66	40.24	61.98	63.61	38.93	46.77
2003	49.88	56.42	46.16	45.60	39.41	50.83	33.01	45.36	46.22	51.05	43.78	52.87	60.06	39.44	45.81
Debts in % of GDP															
1993	138.19	78.04	46.95	110.12	58.39	45.29	96.30	118.11	79.03	61.81	59.12	56.01	71.19	45.37	64.52
2003	102.74	42.70	62.67	100.96	52.46	62.29	33.36	106.04	52.43	68.51	59.47	42.26	50.92	39.04	63.46
Deficit in % of GDP															
1993	-6.20	0.32	-3.35	-8.79	-6.31	-5.51	-0.69	-9.36	-1.93	-4.24	-7.48	-1.55	-8.83	-6.51	-5.63
2003	0.26	2.06	-2.63	-1.52	-0.36	-3.62	-1.24	-2.06	-1.01	-1.02	-3.23	3.43	1.03	-2.47	-1.98
Social expenditures in % of GDP															
1989	26.18	29.95	22.63	18.11	18.58	25.47	18.56	22.93	29.05	26.20	13.78	23.93	31.48	21.98	23.49
1998	27.02	30.87	29.24	22.73	21.57	29.52	15.77	26.42	28.57	27.77	19.31	27.55	34.14	25.59	26.15
Currency															
1993	104.82	103.56	105.67	75.16	87.23	104.22	96.25	82.64	106.91	106.09	96.61	72.69	82.55	91.03	-
2002	105.16	0.00	104.59	59.11	77.94	105.34	97.47	78.60	105.45	105.16	90.50	81.85	81.21	114.52	-
Nominal short-term interest rates															
1993	8.08	10.50	7.24	23.47	11.69	8.59	9.27	10.19	6.85	7.23	13.25	7.77	8.78	5.94	8.43
2002	3.32	3.54	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	4.24	4.06	3.48
Real short-term interest rates															
1993	3.91	8.99	3.45	7.90	6.84	6.13	3.89	6.03	4.92	4.17	5.47	5.30	5.71	3.26	4.85
2002	0.97	2.45	1.69	-0.36	-1.03	1.57	-2.15	0.56	0.13	2.00	-1.19	2.04	2.88	0.84	0.99
Wages; increase p.a.															
1994/2003	3.75	4.74	1.92	7.17	5.07	3.63	10.30	3.31	5.14	2.79	5.66	6.20	5.07	7.10	4.08
Wages per worker; increase p.a.															
1994/2003	3.07	3.97	1.66	6.59	2.88	2.62	5.95	2.67	3.30	2.46	4.70	4.74	4.42	6.01	3.16
Unit labour costs; increase p.a.															
1994/2003	1.31	1.83	0.57	2.70	1.45	1.15	1.64	1.29	2.16	0.62	3.35	2.24	2.08	4.05	1.66

Figure 4: Performance vs. cost cutting across European countries



Remark: Cost cutting overall indicator is a ranking using 8 subrankings as for increases of government expenditures, taxes, debts, deficit, social expenditures, wages, unit labour costs and currency.

Source: WIFO calculations using AMECO.

The best fit: performance and the dynamics of growth drivers

The correlation between growth performance and the dynamics of investment is extremely close. The five countries with the best growth performances have increased investment most strongly. Germany and France have decreased their investments in the majority of growth drivers or at least increased them less than the other countries. Ranking the changes between 1990 and 2000 for the 16 individual growth drivers, reveals Germany to be the least dynamic country, followed by France and Italy. For Germany and France, this is a move from a relatively good position (3rd and 6th) to a moderate one. Italy had already been lagging (11th position in 1990).

Table 9: Ranking of European Countries for Growth Drivers and their dynamics

	Average rank over all indicators		Ranking		Ranking of changes "Dynamic of future investment"
	1990	1998	1990	1998	
Belgium	8.50	8.75	10	10	7
Denmark	5.13	5.31	4	3	5
Germany	4.31	6.63	3	6	14
Greece	12.63	11.94	14	14	10
Spain	11.06	9.94	12	12	8
France	6.38	7.13	7	7	13
Ireland	7.44	7.81	8	8	3
Italy	10.06	9.44	11	11	12
Netherlands	5.44	6.19	5	5	6
Austria	8.44	8.31	9	9	4
Portugal	12.00	11.25	13	13	8
Finland	5.69	4.13	6	2	1
Sweden	3.06	1.94	1	1	2
United Kingdom	4.19	5.63	2	4	11

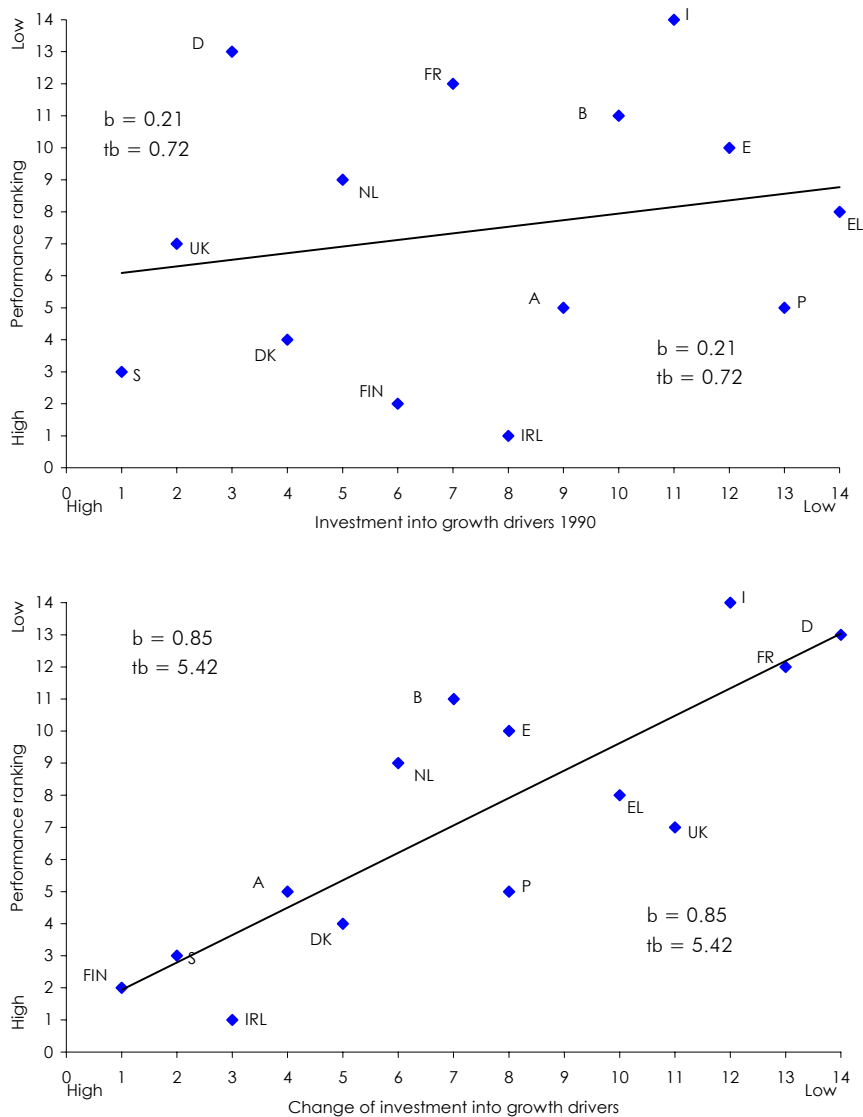
Remark: For the indicators used see Table 4.

Specifically impressive is the switch in research input. In 1981, Germany and France had research expenditures in relation to GDP of 2.5 % and 1.9 % respectively, which were higher than those of the Scandinavian countries (1.5 %). The lines crossed in the second half of the eighties and today Sweden and Finland have research expenditures relative to GDP of about 3.5 %, thereby surpassing the US as well. Germany and France did not increase their research expenditures relative to GDP.

When countries are ranked according to growth drivers, Sweden places first. It is among the three best performing countries in 15 of 16 indicators and leads in seven, most prominently in research expenditures, publications, and IT expenditures. Finland ranks second and made the greatest leap forward during the nineties: it excels in educational quality (as seen in the

OECD Pisa ratings) and in the share of workers with tertiary educations. It increased R&D in relation to GDP from 1.2 % to 3.4 % within 20 years. Denmark emphasised the diffusion of technology, creating clusters in information technology, health and biotechnology. In the large economies, the R&D ratio has been falling slightly.¹⁸

Figure 5: Performance, level of growth drivers 1990 and change of investment into growth drivers



¹⁸ In the overall ranking, Germany placed 3rd in 1990 and is now 6th. France and Italy maintained their unsatisfactory positions (ranks 6 and 11, respectively). If changes between the start and end of the nineties are ranked, Germany, France and Italy place 14th, 13th, and 12th.

In 1990, the relationship between performance and growth drivers was positive, but insignificant. The reason for the low fit in 1990 was that Ireland had a very low level of investment in growth drivers, and the positions of Finland and Denmark were not that excellent. At the other end of the spectrum, in 1990, Germany was a leader in research specifically, and in growth drivers in general. Along the same line, the United Kingdom was positioned well for many growth determinants, which was not fully substantiated by later growth in output and productivity. Portugal and Spain achieved above average or average performances, despite very weak positions in growth drivers (catching up does not depend on these growth drivers, but is related to physical investment).

The low fit in 1990 and the excellent fit between performance and the dynamics of growth drivers cautions us to simplify the story too much and claim a one-sided causality. Demand growth increases profits and also encourages research expenditures (see Section 7). The acceleration of economic growth in the second half of the nineties then was clearly supportive of the further increases in research expenditures.

7. Robustness and caveats

Measured against historical standards, the nineties span a very short time period, full of turbulence, external shocks and institutional changes. We tried to take this into account by building a rather robust and comprehensive performance indicator, and by collecting evidence via correlations and rankings instead of fine-tuning with multivariate regressions based on noisy quantitative data. We can show in this section that the results are somewhat more robust than they outwardly appear. In addition, we will discuss causality and ultimately provide a subjective explanation which is consistent with the evidence.

The performance ranking is rather robust with respect to the indicators. Adding indicators such as inflation, government expenditures, budget deficits, or per capita income in 1990 does not really change the rating. It is also robust with respect to the period: the decision to evaluate the last ten years (which implies using data from 1994 – 2003) could at first glance appear somewhat problematic, since just prior to this period several countries experienced severe crises. However, when we extended the period to 1990 - 2003, the only effect was that the excellence of Sweden and Finland was downgraded slightly, and Austria climbed up to rank 2 or 3. In all these cases, our opinion is that the ranking derived for the period 1994 - 2003 is more indicative of the long-run future trend. Sweden and Finland consistently fared better during the period of sluggish European growth in 2000/2004, and Austria's performance did not return to above average standards. The positions of Germany and France improve with

the inclusion of the early nineties, but again the trend of the most recent years and the consensus of economic analyses of OECD or EU Commission today is more in line with the patterns of the second half of the nineties than with the performance of these countries in the first half of the nineties.

As far as causality is concerned, we tried to face the problem of reversed causality by introducing a time lag. Performance between 1994 and 2003 is related to indicators of regulation and growth drivers for 1990 (and their change up to 1998 or 2000). There are, however, indications that the feedback from growth to research strengthens the principal causality between research and growth. Some of the regressions are as close for later years as for earlier ones, a few come even closer. The feedback is rational and should be expected: countries with good performances can more easily deregulate labour markets, since in good times it is easier for people to find new jobs when they lose their old ones. Furthermore, it is easier for people in temporary contracts to switch to regular ones, when they prefer. Countries with high growth can afford to increase expenditures, even when there is a long time span between the expenditures and their eventual results, as in the case of future investments. Firms in growing markets have more funds which they can allocate to research and education. We want, however, to stress that the strategies of Sweden and Finland to boost investment into R&D, to upgrade their education systems, and to grasp the advantages of the information society, as well as Denmark's clustering policy and its striving for excellence in education and the diffusion of technologies, started in the eighties.¹⁹ The same is true for Ireland's quest for high-technology firms and the upgrading of education. A second piece of evidence that causality works primarily from investment towards growth is that during the crisis in the early nineties, research expenditures increased fast relative to GDP. If, on the contrary, research were to follow profits and demand, expenditures in Finland and Sweden would have plunged in 1992/93. On the other hand, neither France, Germany nor Italy developed a specific strategy to boost technology in general or information technology in specific in the nineties. Germany was preoccupied with enlargement and disregarded the critique voiced during the eighties that the country with the highest wages was underrepresented in high-tech sectors and had an inefficient system of education. France emphasised prestigious millennium and space projects, started late with privatisation, and reduced the work week rather than investing into new technologies. Ireland did not invest in research and is still a laggard in this line, but did move prudently into foreign investment in high-tech and high-growth industries. Furthermore, Ireland restructured and

¹⁹ Hutschenreiter (1990), Lindbeck, Molander (1994), OECD (2003A).

upgraded its education system, persuaded foreign firms to upgrade their plants and created regional clusters for manufacturing and services, including software and call centres. This created spillovers of foreign plants and intensified forward and backward linkages.

Table 10: Performance and its relation to three policy strategies

Equation	Cost cutting		Overall regulation 1990		Regulatory change 1998/1990		Growth drivers 1990		Growth drivers change 1999/1990		R ²
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value	
(1)	0.25	0.89									0.062
(2)			-0.49	-1.99 *							0.248
(3)					-0.36	-1.32					0.127
(4)							0.21	0.72			0.042
(5)									0.85	5.42 **	0.710
(6)			-0.35	-1.32	-0.21	-0.79					0.048
(7)							0.18	0.82	0.64	2.85 **	0.374
(8)			-0.16	-0.69					0.61	2.53 **	0.363
(9)	-0.52	-2.04 **	-0.01	-0.06					0.98	3.50 **	0.505

Cost cutting: combined indicator using government expenditures, taxes, public debt, deficit, social expenditures (all as a percentage of GDP), wages and unit labour costs and currency (using rankings with equal weight for each indicator).

Overall regulation: Average over product and labour market regulation (50% : 50%).

Growth drivers: 16 indicators (see Table 4; using rankings with equal weight for each indicator).

Performance: 9 indicators on productivity, output and employment (see Table 1).

In trying to gather more evidence of the relationships between the strategies, we combined the level of and changes in regulation with the level of and changes in investment into future growth, plus cost cutting, in one equation (see Table 10, rows 6 and 7). The results did not change. Combining levels and changes in the same equation does even out the differences in significance for regulation (both are now insignificant, but the t-value of regulatory change increased), as well as for the growth drivers (the coefficient for dynamics remained significant, but the t-value for the level increased). Combining the dynamics of growth drivers with the level of regulation renders the first variable insignificant (Table 10, row 8). Combining all three in one equation makes cost cutting significant, while the dynamics of investment remain the strongest variable in all equations.

Altogether, the best interpretation of the findings may be that the three strategies worked together in supporting growth performance, with the dynamics of investment being the strongest element²⁰. Cost cutting as the only strategy to boost growth will not work. The

²⁰ The impact of research on growth can also be derived for standard growth accounting: Growth in output depends only on the quantity and quality of factor inputs and technical progress. Anything that inhibits growth must reduce either investment or skill acquisition. This may be low R&D, which itself originates in labour market rigidities: using

devaluation in Italy was not complemented by a reform of its institutions and did not prove to be sustainable, since Italy did not boost investment into research, education and new technologies. On the other hand, the devaluations of Sweden and Finland were made sustainable over the long run, since a short-run cost containment policy (dampening of wage increases and ceilings for increases in government expenditures) was complemented by enhancing productivity and by investing into drivers of long-run growth.

To a certain degree, it might be a surprise that welfare states had relatively deregulated labour and liberalized product markets and additionally pursued courageous steps in the direction of making labour contracts even more flexible (mainly by easing the regulations for temporary contracts). Denmark and to a certain extent Sweden chose a specific form of labour market policy which combined flexibility for firms with security for employees. The latter was achieved by helping employees to improve their qualifications and regain employment partly by upgrading their skills, partly by increasing geographical mobility and by introducing welfare to work strategies with true assistance and a human touch. Germany and France did not pursue a growth oriented strategy in the nineties. Investment into the future was rather strong in the beginning, but this strategy was not followed in the nineties; reforms to upgrade and modernise education were not high on the agenda. Labour costs remained high in the western part of Germany and in the east were set at a level higher than justified by productivity. German unification implied increasing social transfers and shifting resources towards construction instead of intangibles. Deregulation in product and labour markets was pursued very reluctantly, since unemployment was high and de-industrialisation in the eastern parts of the country discouraged hopes that persons who had lost their jobs would be re-employed. If many analysts single out labour market flexibility as the most important problem, and implicitly or explicitly suggest that if labour markets are deregulated, Germany will return to its old growth trajectory, our evidence calls for caution: labour costs, transfers from West to East, and government deficits are high. But equally or even more important, investments into growth drivers have decreased and are far lower than in other high-wage countries. As far as the dynamics of growth drivers is concerned, Germany ranks 14th and therefore last.

The evidence presented suggests that the countries which performed best did rely on all three policies investigated. They restored cost competitiveness through a mild version of cost cutting; they decreased an already low degree of regulation, and increased investment into long-run growth very courageously. None of these countries relied on an agenda of

labour market regulation or the low impact of research to explain sluggish growth may therefore be complementary (or observationally equivalent). I owe this remark to an anonymous reader of this paper.

deregulation alone. What seems to be most important to their success is that they created a virtuous circle from research to growth and then from growth to research. We do not know what would have happened if the successful countries had not intensified their investment. It is possible that deregulation still would have set free the forces of innovation and entrepreneurial spirit, but we do not know how long this would have taken and if the cumulative forces of decreasing demand would not have been stronger. If the problem of inflexible labour markets is aggravated by globalisation and structural change, the helping hand of macroeconomic policy and the supporting forces of growth are specifically important.

8. Summary

(1) During the nineties, following decades of catching up, growth in output and productivity in Europe fell below that of the US. The growth differential continued into the most recent years. Many analysts and specifically publications by the OECD, IMF and the European Commission single out inflexible labour markets and welfare costs as the most important reasons for European underperformance during the nineties. This paper tries to assess the impact of regulation on economic performance and to compare it to the impact of macroeconomic policies and to that of investment into economic growth, for example in research, education and new technologies.

(2) Economic performance is measured according to a set of nine indicators of growth in output, productivity and employment. We prefer this comprehensive approach to that of using a single indicator for performance, since the period under investigation was very turbulent, most economies were not on a steady state path and individuals as well as the government had different preferences and priorities with respect to income growth, productivity and employment. Some countries intentionally tried to stabilise employment at the cost of forfeiting productivity growth, thus limiting the rise of unemployment.

(3) Structural policies and institutions, which influence the workings of markets, are an important policy area. The stricter regulation of labour and product markets and higher welfare costs are major differences between the EU and the US. They lead to higher tax rates and more expensive labour in Europe. This paper focuses on the impact of regulation on performance. Our analysis confirms a weakly negative impact of regulation on macroeconomic performance, but casts doubt on the hypothesis that this is the single most important explanation of the performance difference between the US and Europe in the nineties and between countries which perform well and poorly within Europe.

(4) While there were differences between the US and Europe as to the degree of regulation, these differences were already evident during periods of higher European growth in output and productivity. The differences in product as well as labour market regulation grew smaller in the nineties. As far as macro economic policy is concerned, Europe reduced its budget deficits in the nineties, without arriving at a surplus, and then did not increase its expenditures and its budget deficits as strongly as the US did during the slow growth period of 2001/03. Monetary policy was also less growth oriented. Macroeconomic policy contributed to higher growth in the US. The most striking difference, however, is revealed for drivers of long term growth. The US was leading in 1990 according to all 16 indicators of research input and output, secondary and tertiary educational attainment, and investment into information technology. The US has - partly as a consequence -- an industry structure with larger shares in technology driven and high skill industries. The difference already present in 1990 was accentuated in 11 of the 16 indicators investigated. Thus, while differences in regulation decreased in the nineties, the differences in macroeconomic policy increased, and the initial differences in investment into future growth widened.

(5) Differences in economic performance across Europe became more pronounced as a result of (i) Ireland's excellent performance, (ii) very good performances by Sweden, Denmark and Finland (specifically but not only after combating a crisis in the early nineties), and (iii) the slightly above average performances of the three southern peripheral economies. On the other hand, Germany, France and Italy exhibited disappointing growth in output, productivity and employment. The three small European countries with high per capita income – Austria, the Netherlands and Belgium –displayed average performances. The performances of individual countries are weakly related to cost cutting strategies. They were significantly related to the level of regulation in 1990, but only weakly related to regulatory change between 1990 and 1998. Furthermore, performance is loosely related to the level of investment into growth drivers in 1990 and very closely related to the dynamics of investment. These results are robust as to the exact measures of performance and regulation used and whether the time period chosen comprises the last ten years or the entire period starting in 1990.

(6) Within the available set of regulation indicators, some indicators of product and some indicators of labour market regulation are significantly related to growth performance. Among product market indicators, differences in entry conditions and administrative procedures are significantly related to performance, and barriers to trade no longer seem to be important. Within labour market regulation, the regulation of temporary contracts is important (procedures as well as the maximum time interval permitted), while the regulation

of fixed contracts - the costs of or delays in dismissals - seem to be unrelated to performance. Looking at the country picture reveals that the connection between regulatory change and performance is not stronger, since Ireland, Finland and the United Kingdom already had deregulated markets in 1990 and managed to achieve high and respectively medium levels of growth. Cautious steps towards deregulation did not boost growth in Italy and Belgium, but were sufficient in Portugal and Austria for somewhat better performances. Sweden and Denmark are leaders in growth and decreased regulation considerably.

(7) The correlation between performance and the dynamics of growth drivers is close, since the five countries with the best performances increased future investments strongly (Ireland, Sweden, Finland, Denmark, Austria). At the other end of the scale, Germany and France did not increase investments to the same extent that other countries did and now rank 13th and 14th in investment dynamics. The relation between performance and investment levels in 1990 is less close, since Ireland and the three southern European countries, which were in the process of catching up, had low levels of research expenditures. At that time, Germany still had relatively high levels of investment and France held a moderate position. Germany had the highest level of research expenditures in the eighties, but could not transfer this into growth, due to a weak position in high-tech industries; from 1990 onwards, Germany lost its good position in research expenditures, did not upgrade its education system and did not become a leader in information technology. An important component in the low dynamics of German future investments may be due to the budgetary strain attributable to the costs of unification. This is one example of feedback from growth to investment which we have to expect.

(8) Summing up the evidence, all three top performers seem to have applied all three strategies. They pursued a mild form of cost cutting; they reformed already flexible labour market institutions by substituting direct regulation with an active labour market policy, enforcing training, geographical mobility, and activation policy. Most importantly, the successful countries actively promoted investment into the future. This combination of strategies makes a final judgement as to the relative impact of the policies difficult. However, none of these countries pursued a strategy of first making markets more flexible or reducing social costs aggressively, and then waiting for the markets to work. Industrial policy, innovation regimes and embracing the advantages of information technologies were an integral part of the strategies of the European countries with the best growth performances.

(9) Germany and Italy, though by far not leaders in deregulation, are ranked 5th and 7th as far as regulatory change is concerned. However, since they did not boost and sometimes even decreased their relative efforts to support the long-run drivers of growth, a moderate level of

regulatory change was not enough. Unambitious investments into growth drivers did not generate output growth in France, which is the laggard in deregulation. Italy pursued an ambitious cost cutting strategy: its currency was devaluated and government deficits and expenditures were reduced. Growth still did not rebound, since competition was not encouraged and there was not enough investment into future growth. A growth-oriented macroeconomic policy is supportive of long-run growth, and as the US experience of the nineties indicates, it could also prove specifically important in the period during which flexibility is being increased and investment in future growth has not yet started or has not yet begun to show results. A one-sided policy which focuses exclusively on making the labour market more flexible is risky and may at the least take a very long time before it starts to boost growth. While the strategies optimally work together in a complementary way, creating either a virtuous or a vicious cycle, the analysis tends to ascribe a very prominent role to the dynamics of investments into research, human capital and new technologies.

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