

InTeReg Research Report No. 33-2005

*THE WAY TO LISBON -
A CRITICAL ASSESSMENT*

Andreas Schibany, Gerhard Streicher

January 2005

THE WAY TO LISBON

A CRITICAL ASSESSMENT

Andreas Schibany

Joanneum Research, Institute of Technology and Regional Policy
Wiedner Hauptstrasse 76, 1040 Vienna, Austria
e-mail: andreas.schibany@joanneum.at
tel: +43 1 581 75 20/2823

Gerhard Streicher

Joanneum Research, Institute of Technology and Regional Policy
Wiedner Hauptstrasse 76, 1040 Vienna, Austria
e-mail: gerhard.streicher@joanneum.at
tel: +43 1 581 75 20/2814

Abstract:

Nearly five years after the agreement to the Lisbon targets the overall picture is very mixed. Some indicators show that Europe does not approach but instead distances itself from the Lisbon targets. This report investigates several aspects of growth enhancing policies and questions the preferred comparison of the EU with the US. It analyses the implications of creating an internal market and indicates that competition enhancing policy primarily depends on the commitment and implementation by the Member States.

Keywords: Growth, R&D, Competition, Internal Market

JEL Classification: O40, O30,

The study was commissioned by the Austrian Ministry of Economics and Labour and is part of the initiative 'Platform Innovation'. Parts of the study were presented at the European Forum Alpbach 2004.

Contents

1	INTRODUCTION	4
2	ECONOMIC GROWTH IN THE US AND THE EU – A COMPARISON	7
2.1.	Labour productivity	9
2.2.	Labour input	11
2.3.	Development of relative GDP – 1992-2002.....	13
2.4.	Some conclusions.....	14
2.4.1	Time for a new Eurosclerosis?	15
3	SOME EXPLANATIONS OF THE RECENT US BOOM.....	17
3.1.	The positive feedback-loop of macroeconomics	17
3.2.	The contribution of ICT to the Productivity Growth Revival	18
3.2.1	ICT as a source of growth	19
3.2.2	The comparison between US and Europe.....	21
3.2.3	Concluding remarks.....	25
4	THE EUROPEAN TARGETS – LISBON AND BARCELONA	26
4.1.	The Lisbon-strategy	27
4.1.1	Where does the EU stand now?.....	29
4.1.2	The mid-term review of the Lisbon process - the Kok-Report	30
4.2.	The 3 % - target of Barcelona.....	32
4.2.1	What does the 3 %-target mean?.....	33
4.2.2	The two-third target	36
4.2.3	A final remark on the Barcelona target	38
4.3.	What makes the difference in R&D intensity between The US and The EU?	38
4.3.1	Defence research makes the difference.....	41
4.3.2	Concluding remarks.....	44
5	ENHANCING GROWTH – THE SAPIR REPORT.....	45
5.1.	Growth policy in a new context.....	45
5.2.	The recommendations.....	47
5.2.1	Make the Single Market more dynamic.....	48
5.2.2	Boosting investment in knowledge	48
5.2.3	Improving EMU’s macroeconomic policy framework	49
5.2.4	Convergence and restructuring in an enlarged EU	49
5.2.5	Effective EU governance.....	50
5.2.6	Mobilising the EU budget	50
6	IT’S THE INTERNAL MARKET, STUPID.....	51
6.1.	Competition drives productivity growth	52
6.2.	The limited role of Brussels.....	55
6.3.	The enabling role of the Member States	56

	3
6.3.1 Concluding remarks.....	61
7 THE DRIVER OF GROWTH.....	62
7.1. A quick refresher course in European innovation policy	62
7.1.1 Human resources	65
7.1.2 Finance for innovation.....	66
8 CONCLUSIONS.....	69
9 REFERENCES.....	72

1 Introduction

Book titles can be an excellent indicator for pessimism in Europe's economic outlook. For example, two economics books on the bestsellers list in France in 2003 were called "La France qui tombe" (The fall of France) (Baverez 2003) and "Le desarroi Francais" (The French disarray) (Duhamel 2003). In Germany books called "Ist Deutschland noch zu retten?" (Can Germany be rescued?) (Sinn 2004) or "Der kranke Mann Europas" (The sick man of Europe) (Sinn 2003). This offers a vision in which the two largest European countries perceive themselves to be falling behind with little hope for the future.

Furthermore, messages coming from the European Commission (EC) tend to include alarming signals and the drawing up of a negative assessment of the European Union in comparison with the US. For instance, the European Commission detected 'structural weaknesses' leading to a 'negative picture' in Europe. It is also suggested that this 'alarming trend' could 'lead to a loss of growth and competitiveness in an increasing global economy'.

When assessing the present situation one should keep the waves of history in mind. It was in the 1980's when the newspapers were filled with stories of Japanese manufacturing firms flooding the US and the European markets with their products and wiping out companies and jobs in the Western hemisphere. By 1990 Japan had become the beauty queen of the economic world, with the US appearing inferior. In the same year nearly all policy papers were written in accordance with the important role of MITI. However, the boom phase of the 1990's suggested that the US switched from an inferior to a superior economic block. As it was with Japan in the 1980's by the year 2000 the US was the king of the mountain and the European view has switched from east to west.

Regardless, the 'negative picture' drawn by many European leaders and the European Commission remains surprising considering the process of economic integration over the past decade. One could think that the establishment of the Single Market in 1993, the launch of the Euro in 1999, the decision to enlarge the European Union by ten new Member States in 2004, as well as institutional reforms on European level could have inspired a more positive view of the future.

While macroeconomic stability has improved considerably in Europe and a strong emphasis on cohesion has been preserved, the EU economic system has failed to deliver a satisfactory growth performance. Growth has been mediocre with European performance deteriorating – both absolutely and in comparison with the United States. Even the retrospect analysis of the boom years in the second half of the 90's shows that the average growth rates of real GDP, labour productivity and total factor productivity in the European Union have fallen behind those of the US. This is remarkable as it is the first time since World War II that these performance measures have shown lower growth rates for the EU for several years in a row. It is even more remarkable when one considers that the size of the European market, the high level of human resources, capital and infrastructure, the potential for catching up with the US, and the effort made to promote more competition should have provided a basis solid enough for sustainable growth.

While the miracle of the US economic performance between 1995 and mid 2000 was a source of pride on the western side of the Atlantic, lamentation over Europe's performance has corresponded to this on the eastern side. Although the boom years of the US miracle were followed by a slowdown in late 2000 and early 2001 it seems that the US had benefited more from the core of the miracle, the acceleration in technical progress centred round the New Economy and the resulting post-1995 productivity growth revival, than the EU had.

It can now be said that the EU reacted to this new type of *Eurosclerosis* excessively. The EU's economic coordination fever has yielded more than nine coordination processes, not a single one of which existed before the Maastricht Treaty and four of which are new since Amsterdam (1997).¹ Beside the coordination processes, the European Commission initiated an inflation of action plans and communication-papers, all of which focus on better coordination in reaching well defined targets. This multitude of the coordination processes and action plans often overlap (reading them all is also rather time consuming) but all continue to exist. No serious questions were raised by the European Commission about the nature, remit, participation or consequences of the implementation reports of any of these processes. Although the Lisbon process is based on a strong political consensus and is meant to be highly relevant for secular economic growth, the subject matter typically (like all other processes) falls under the competence of the Member States. The resulting diversity, as well as legitimacy, militates against a more centralising role of the EU level of government. This makes concerted measures rather implausible.

Based on this *liaison dangereuse* between EU policy and national economic policy the present report follows the assumption that most explanation for the European 'stuck in a rut' can be found at the national level. Moreover, the EU has not yet found a sound interface, between national and EU levels, in some of the policy areas considered crucial for achieving the Lisbon targets.

Apart from policy, which is one side of the coin, the lack of a sustainable growth in the EU and the post-1995 productivity growth revival in the US has generated a growth industry of its own, in the form of academic analysis of the sources and determinants of the revival. This, the other side of the coin, has led to a renewed interest in the chief factors driving economic growth as well as the policies that might influence it. Several studies and reports have analysed the sources of economic growth and the main factors explaining the divergence between the EU and the US. However, economists have become cautious when claiming that authoritative 'growth strategies' can be designed so easily.² This was pointed out by the Sapir-Report (Sapir et al. 2003) – the difficulties in translating economic theory into sustainable growth strategies.

The report is structured as follows:

¹ Namely, the Stability and Growth Pact, the Eurogroup, the Luxembourg, Bologna-, Cardiff-, Cologne-, Lisbon- and Barcelona process and the BEPGs (Basic Economic Policy Guidelines).

² 'Is the reason that we all talk about growth that we understand so little about it? It is certainly the case that growth theory is now a much more powerful tool than it was before Solow put pencil to paper ... Economics is full of big ideas on the importance of incentives, markets, budget constraints and property rights. It offers powerful ways of analysing the allocative and distributional consequences of policy changes. The key is to realise that these principles do not translate directly into specific policy recommendations. That translation requires the analyst to supply many additional ingredients that are contingent on the economic and political context, and cannot be done a priori' (Rodrik 2003, p. 29)

The first section of this study presents some stylised facts about the growth differential between EU and US and its determinants. It also offers a more optimistic assessment of the present economic situation in Europe.

The second section contains a critical assessment of the contribution of ICT to the US growth performance, arguing that it was primarily the intensity of competition in the service sector which contributed most to the US boom in labour productivity.

The third section of the report tries to shed light on some aspects of the Lisbon process by summarizing the mid-term review of the process. It also discusses the 'Barcelona targets'. Additionally, the main divergence between the US and the European R&D system is discussed, which is, namely, the different expenditures in defence R&D.

The fourth section is concerned with the so called 'Sapir-Report' and the recommendations for enhancing growth performance in the EU.

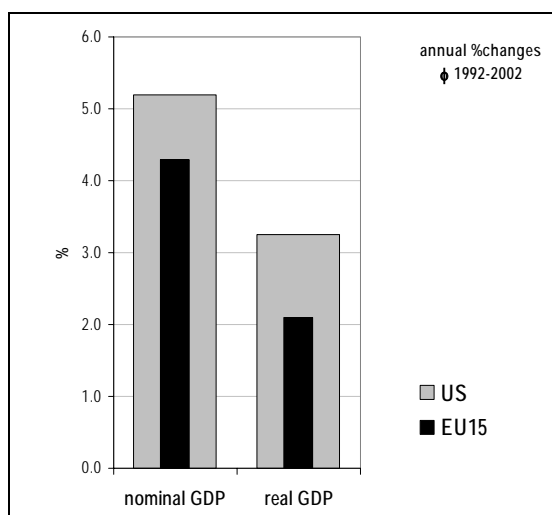
The last two sections focus on two important aspects of the European integration process, i.e. the realisation of the internal market and innovation as one of the driving forces to enhance competitiveness.

2 Economic growth in the US and the EU – a comparison

The mediocre growth performance in the EU as well as the American boom of the late 90's (and the recovery at the beginning of this decade) has lain to rest one of the main myths of the second half of the 90's: the business cycle is not dead. In order to understand the sources of growth, one must consider what causes one developed country to grow more rapidly than another? Why did the US, a country already in the lead terms of GDP per capita, appear to find a new gear in the 90's that allowed it to forge further ahead of some major EU economies?

Figure 1 shows average economic growth rates between 1992 and 2002 for the US and for the European Union in its 1995-manifestation.³

Figure 1: GDP growth EU and US, ϕ 1992-2002



Source: AMECO data base; own calculations

At +2.10 %, Europe's average annual growth rate of real GDP is appreciably (more than a third) smaller than the US-rate of +3.25 % (in nominal terms, the gap is relatively smaller). Although the two numbers are not strictly comparable due to somewhat differing accounting practices⁴, this difference cannot be simply set aside as a statistical blip.

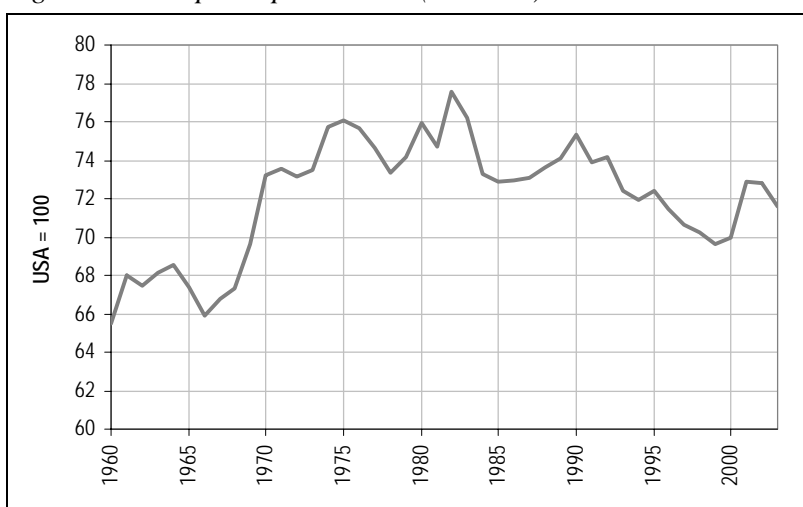
A long-term view (Figure 2) shows, for the EU, that after a phase of very rapid catching-up with the US in the early post-war period, convergence at the level of GDP per capita came to an end at the beginning of the 70's and has remained unchanged since at around 73 % of the US level. This fact suggests a Europe stuck at a substantially lower standard of living than the US and, moreover, unable to catch up. Thus even if income per person is growing at almost

³ Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

⁴ For example, in the European Union, firms' purchases of software are counted as business expenditures, thereby reducing GDP. On the other hand, in the US, they are counted as GDP-neutral investment (see section 2.4.1).

the same pace as in the US, Europeans are still stuck with much lower living standards than Americans.

Figure 2: GDP per capita at PPP (US=100)



Source: AMECO data base; own calculations

GDP per capita can be decomposed into two factors, which are needed to explain divergent growth patterns: labour productivity and labour utilisation. Hence,

$$\text{Trend growth of GDP per capita} = \text{Trend growth in labour productivity} + \text{Change in labour utilisation}$$

Although the links between welfare, economic output and productivity are complex in practice and theory, conceptually the idea is simple. If productivity increases, with other things remaining equal, aggregate economic welfare increases. As Paul Krugman once put it, productivity is not everything, but it is almost everything. Thus, productivity is the engine that drives rising living standards. Labour utilisation (employment rates combined with hours worked) is the other important factor in accounting for differences in the GDP per capita levels. These two factors are interrelated insofar as unemployed people of working age generally have lower education levels, and thus lower potential productivity than those who are employed. The following Table 1 shows the development of the two factors over time and in relation to the US.

Table 1: GDP per capita, GDP per hour worked and hours worked

	GDP per capita		GDP per hour worked		Hours worked per capita	
	1970	2000	1970	2000	1970	2000
United States	100	100	100	100	100	100
EU-15	71	70	65	91	101	77

Source: AMECO data base; own calculations

The gap, measured as GDP per capita, between the EU-15 and the US has remained roughly constant, as has been mentioned above. The next two columns however show that labour productivity, measured by GDP per hour worked, has increased much faster in Europe than in the US, from 65 % of the US in 1970 to roughly 91 % in 2000. These data are quite impressive,

showing that over the period of 30 years Europe has almost caught up with US levels of output per hour. Nevertheless, Europe still remains significantly behind in output per capita. How could Europe be so productive yet so poor?

The last two columns, which show the hours worked per capita offer the answer: the relative hours worked per capita have decreased in roughly the same proportion as the relative EU-15 labour productivity has increased.

In other words, the steep fall in the number of hours worked per head of population in Europe compared to the US has compensated for the rise in relative labour productivity per hours. Hence, despite having high productivity growth rates since 1970 (the higher growth rate of labour productivity ended in the mid 1990's and has since then been slower than in the US) the lower employment rates and shorter average working hours per employee help to explain the bulk of the income gap with the US, whose labour utilisation was higher.

2.1. LABOUR PRODUCTIVITY

Perhaps troubling for Europe is the fact that the recent period has largely been an exception to the predominant trend of the last decades. While European private sector productivity is no longer gaining ground and labour input is still shrinking, the strong performance of the US has reflected both productivity and employment growth over recent years. Productivity growth, especially, accelerated markedly over the second half of the 90's, and as of late has begun to accelerate even more rapidly.

However, as was mentioned before, history tells us another story. Statistics suggest that the average annual growth rate in labour productivity in the last two decades was higher in Europe than in the US. In the period 1979-1998 the GDP per working hour grew at an annually rate of 2.3 % in the EU compared with 1.5 % in the US. In that light, the economic performance of the EU in general does not look so bad, as until the second half of the 90's the EU productivity appeared to grow at a higher rate than the US.

But the end of the 90's marked a new trend in the labour productivity in Europe in comparison with the US: in 1999-02 the labour productivity in the EU shows an average growth rate of 1.6 % (vs. 1.9 % in the US).

Figure 3: Annual growth in total productivity, 1979-2002 (5-year moving average)



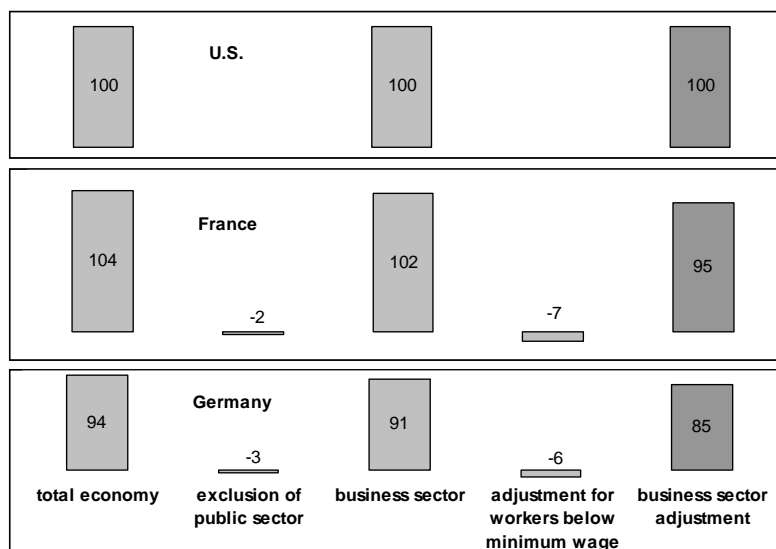
Source: AMECO; Groningen Growth and Development Centre, 60-Industry Database, <http://www.ggd.net>; OECD; own calculations

A comparison of labour productivity levels simply measured as total output of the economy, i.e. GDP, divided by the total hours worked, reveal important shortcomings resulting in distortions. One has to compare issues only through excluding those biases which are hardly measurable and thus hardly comparable. Such computation was made by McKinsey (McKinsey 2002) by adjusting the figures:

- Net output created by the public sector is extremely difficult to measure. By focusing on the private business sector McKinsey excluded public administration, education, and health from the productivity measure.
- The minimum wage is typically higher in Europe than in the US. Hence, high reservation wages prevent the employment of the lowest productivity workers which result in a higher productivity of those employed. In comparing labour productivity across countries the analysis has to control for this effect.

McKinsey made the analysis for France and Germany in relation to the US. For nearly fifty years France and Germany were steadily narrowing the labour productivity gap with the US, but from the mid 90's onwards this situation reversed. US productivity grew at a faster rate than in France and Germany and this gap started to widen again. When using adjusted data the productivity gap compared with US levels, in 2000, is estimated to have been 5 % in France and 15 % in Germany.

Figure 4: Labour Productivity adjustments, 2000, GDP per hour worked, Index 100=US level



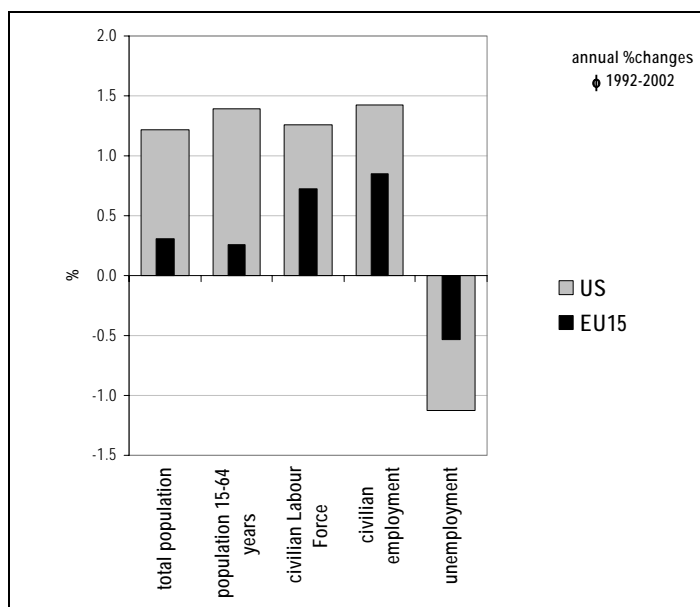
Source: McKinsey Global Institute, 2002; OECD; Groningen Growth and Development Centre, 60-Industry Database, <http://www.ggdc.net>

The slower growth of labour productivity within recent years is one of the explaining factors for the still existent gap in GDP per capita between the EU and the US. Still, this factor must be combined with other explaining factors, for example the labour input. These two factors in combination determine how many people earn how much money to spend. If productivity is lower and a smaller percentage of the European population is in work (and work fewer hours) than in the US, this also means that, on average, each individual in the EU earns less and has less income available to spend and save than their counterpart in the US

2.2. LABOUR INPUT

GDP, as the most aggregate indicator, sums up the economic activity of whole societies: it represents the total sum of all (paid) work performed by all members of this society during some work-year. Some of the parameters used by the US and EU to describe ‘all members of a society’ and even ‘some work-year’ are very different:

Figure 5: Key growth rates in the EU and the US, ϕ 1992-2002



Source: AMECO data base; own calculations

The US experienced far higher population growth (+1.2 vs. +0.3 %); even higher was the growth differential in the population cohort aged 15-64 years, the economically active age group. Interestingly, the gaps in both labour force and employment are considerably narrower. Table 2 resolves this seeming paradox:

Table 2: Population and employment US and EU-15, 1992 and 2002

		total population	population 15-64	labour force	civilian employment	unemployment
			total population	pop 15-64	labor force	labor force
EU15	1992	366,579	67.0	67.7	91.3	8.7
	2002	378,134	66.7	70.9	92.4	7.7
US	1992	255,410	65.5	76.5	92.7	7.3
	2002	288,205	66.6	75.5	94.2	5.8

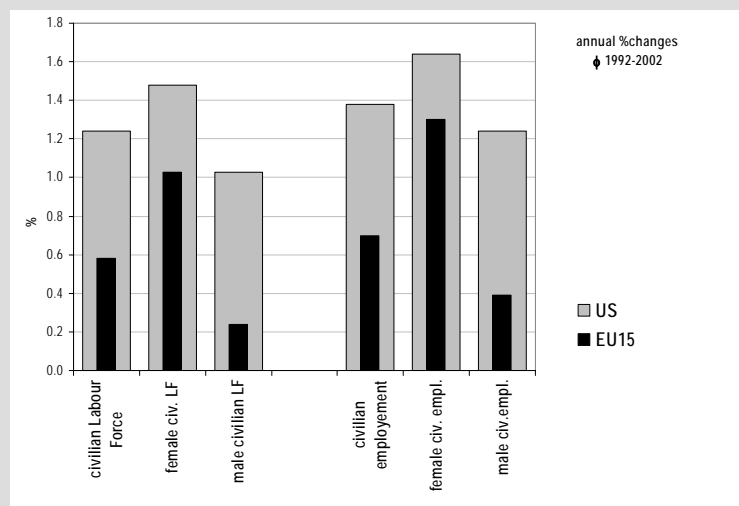
Source: AMECO data base; own calculations

Labour force, as a proportion of the economically active population in the European Union, grew from under 67 % in 1992 to almost 71 % in 2002, whereas this share fell slightly in the United States. In the US, unemployment fell twice as fast as in the EU-15, to 5.8 % in 2002 (down 20 % since 1992). In the EU unemployment fell only modestly by 10 percent, to 7.7 % in 2002.

Excursus: Labour force developments 1992-2002

As a share of total population aged 15-64, labour force experienced greater expansion in the EU (from 67.7 to 70.9 %), even if the overall share is still appreciably higher in the US (where it fell slightly from 76.5 to 75.5 %). Predominantly, this development can be traced to rising female participation in the European labour force:

Figure 6: growth rates by sex, labour force and employment



Source: OECD; own calculations

In Europe, male labour force grows at about the same rate as the group of males aged 15-64; consequently, for males, the share of labour force to population aged 15-64 remains constant at about 78 %. In the US, this proportion diminishes between 1992 and 2002: from more than 84 to less than 81 %.

Female labour force exhibits stronger growth than with 15-64 year olds: in Europe, it grows 4 times as fast. Though much smaller, this gap also shows up in the US figures. As a consequence, to which the female population aged 15-64 contributes, female labour force rose by more than 5 points from less than 57 to more than 61 % in Europe. In the US, it rose by only 1 point, although the level, at 70 % in 2002, is still far higher than in Europe. In both regions, female shares in both labour force and employment went up, by more than 2 points each in Europe and 1 point in the US.

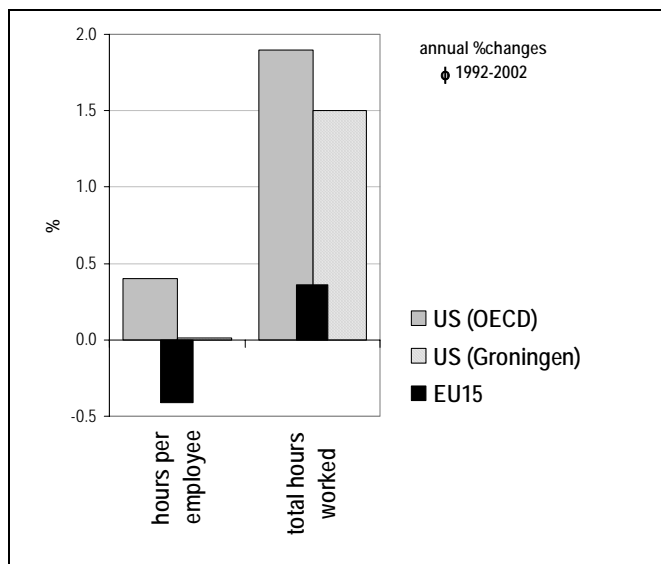
Table 3:

		<u>female labour force</u> female population 15-64	<u>male labour force</u> male population 15-64	<u>female employment</u> female labour force	<u>male employment</u> male labour force	female share in labour force	female share in employment
EU15	1992	56.8	78.0	88.7	91.6	41.9	41.2
	2002	61.4	77.9	91.2	92.9	43.8	43.4
US	1992	69.1	84.2	93.0	92.1	45.4	45.6
	2002	70.1	80.8	94.4	94.1	46.5	46.6

Source: OECD; own calculations

One more indicator, average hours worked per employee, can also be useful. This, however, is certainly the most difficult to estimate and thus the most unreliable. Therefore, in the following Figure 7, two growth rates for the US are included.

Figure 7: Annual change in hours worked, ϕ 1992-2002



Source: Groningen Growth and Development Centre, 60-Industry Database, <http://www.ggd.net>; OECD; own calculations

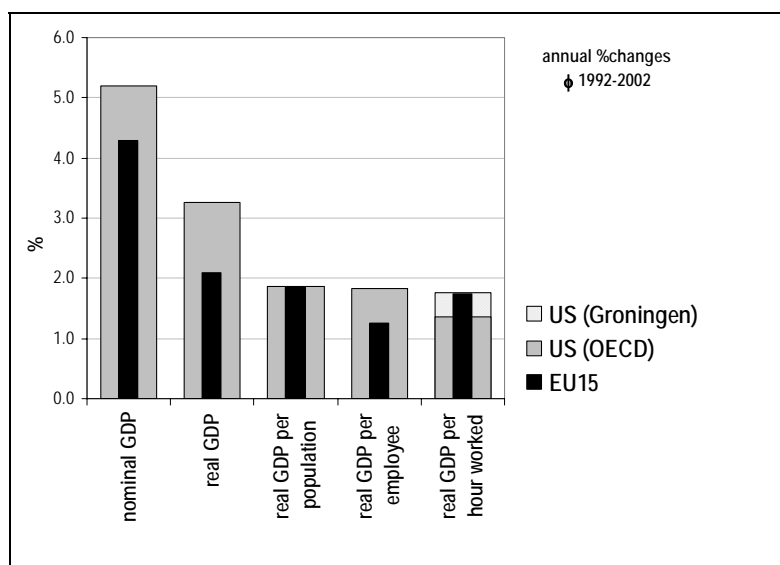
The Groningen Growth and Development Center regards annual hours per employee as more or less constant (at about 1700 hours per year), whereas the OECD reports an annual rise of +0.4 % (to 1870 hours per employee and year in 2002). The two data bases agree on the European numbers: an average annual decrease of -0.4 % to 1560 hours in 2002. Whatever the correct number for the United States, it seems clear that Europe experienced a less favourable development in its working year.

As to total hours worked in either economy, America's expanded by +1.5 or +1.9 % a year (depending on the data base), while Europe's has expanded by a much less impressive +0.4 % a year since 1992.

2.3. DEVELOPMENT OF RELATIVE GDP – 1992-2002

Having now described the various developments within societal indicators, different adaptations to overall GDP growth rates can be calculated. As can be seen in Figure 8, the large gap in real GDP growth becomes smaller or disappears when relative numbers are used: in absolute terms, real US-GDP grew 55 % faster than EU-GDP; this gap is somewhat smaller for GDP per employee. Real GDP per population, however, is virtually the same in the two regions, as is real GDP per hour worked (defined by Groningen. According to the OECD data base, real GDP per hour actually grew faster in the EU-15 than in the US).

Figure 8: Growth rates of relative GDP indicators, US and EU-15, ϕ 1992-2002



Source: Groningen Growth and Development Centre, 60-Industry Database, <http://www.ggdc.net>; OECD; own calculations

2.4. SOME CONCLUSIONS

In the period since 1992, the US has certainly been the more dynamic economy, if only due to its much faster population growth. At the same time, America was able to reduce its unemployment figures more effectively than the EU-15. On the bright side, Europe seemed to be on par (or probably even ahead) in productivity development – although for this, a much more detailed analysis would be warranted, taking into account different sectoral developments in the US and the EU-15. However, in assessing the economic status-quo it seems fair not to take only the last years into account, but to extend the comparison to a longer period.

This superior development in productivity, however, can also be seen as a mixed blessing, especially when set alongside the less satisfying decline in unemployment. It seems to be one of the strengths of the American economy that it is able to accommodate much more easily to changes on the supply side, or, to be more precise, with changes in population. Labour markets, which are more rigid in Europe, are less adaptable to positive populations shocks – as witness to this, one has only to bring into mind the nervous discussions which have accompanied the entry of 10 new member states in 2004, which has led to severe “transition regulations” for the free movement of labour in several of the 15 existing member states (it is a safe bet that this ‘nervousness’ will turn into hysteria in the run-up to a possible future entry of Turkey; this, however, is not to assert that a putative EU-entry of Turkey would be trouble- and cost-free). In a way, lower productivity growth is probably a necessary consequence of lower unemployment. For instance, one way to raise productivity is certainly to get rid of more ‘unproductive’ parts of employment – the old, the handicapped, maybe even the young. In probably all of these categories, the US fares better, but certainly in the employment of older workers; whereas in Europe, less than a quarter of people aged 60-64 are in employment, the respective figure for America is almost 50 %. So, in a way, Europe desperately needs faster productivity growth, in order to pay for all of its relatively young retirees.

2.4.1 Time for a new Eurosclerosis?

Looking back at the past few decades, the performance of Europe has been substantially better than is typically perceived. It is overshadowed by the impressive growth of the US economy over the past couple of years. But over the last 25 years, productivity growth has been much faster in Europe than in the US. Productivity levels (GDP per working hour) are roughly similar today in the EU and in the US. The main difference is that Europe has used some of the increase in productivity to increase leisure time rather than income, while the US has done the opposite. It is thus mostly the expression of a preference, where most, but not all, of the fall in working hours over the past 30 years is due to a preference for more leisure opportunities as incomes have increased. Europeans simply have a higher preference for leisure than the Americans.

Moreover, the recent recovery of the US economy should not be mystified. Surely, America's stronger rebound since the global economic downturn in 2001 results out of greater flexibility in its economy, but the main explanation for America's rapid recovery is that it has enjoyed the biggest monetary and fiscal stimulus in its history. Since 2000 America's structural budget deficit has increased significantly and stands now at almost 5 % of GDP. Meanwhile, the euro area has had no net stimulus. America has a current account deficit of 5 % of GDP, while the euro area has a small surplus. American households now save less than 2 % of their disposable income, while the saving rate in the euro area stand at a comfortable 12 %. Total household debt in America amounts to 84 % of GDP, compared with only 50 % in the euro zone.

Another important caveat should be mentioned when comparing the EU with the US: the comparison of official statistics can be misleading. It is probable that one compares apples with pears simply because there are differences in the way that GDP is measured in different countries. For example, the American statistics count firms' spending on computer software as investment, so it contributes to GDP. In Europe it is generally counted as a current expense and is excluded from final output. Another example to understate Europe's growth performance relative to the US is the price deflator used to convert growth in nominal spending on information technology equipment into real terms. In the US, if a computer costs the same as two years ago, but is twice as powerful, then this is counted as a 50 % fall in price. Though logical, most of the European countries do not allow fully for improvements in computer quality.

Finally, the measure of living standard (GDP per capita) should not be mixed up with welfare. Robert Gordon (2004) has pointed out that the simple GDP comparisons overstate America's living standards, and he finds impressive arguments. R. Gordon argues that a significant fraction of GDP in the US does not improve welfare but rather involves fighting the environment, whether this need is created by nature or man-made decisions. America has to spend more than Europe on both heating and air conditioning because of its more extreme climate. This boosts GDP, but does not enhance welfare. America's higher crime rate means that more of its GDP is spent on home and business security. The cost of keeping two million people in prison, a much larger percentage of its population than in Europe, boosts America's GDP, but not its welfare. These kinds of investments (not to mention the belligerence of the US) are simple less necessary in Europe. Who knows how much GDP is spent on extra highways and extra energy to support the dispersion of the American population into huge metropolitan

areas spreading over hundreds or even thousands of square miles (grounded on excessive energy use)? Furthermore, the conveniences of Europe's public transport systems do not show up in GDP figures.

Taking all these factors into account (and adding in the value of extra leisure time), R. Gordon reckons that perhaps half to the remaining measured EU / US gap in living standards would vanish with a full balance sheet linking welfare to measured output.

And last but not least one should not forget that economic ups and downs in Europe are very much determined by the big countries, i.e. especially Germany as the largest country in the EU. Most of the underperformance in Europe can be explained by Germany, whose economy has struggled since German reunification. This translated into to a transfer of enormous volumes of money. Strip out Germany and the euro area's annual growth in GDP per person rises to exact the same rate as in the US. However, many regard these computations as gimmicks which may cover the political value *per se* of the reunification.

3 Some explanations of the recent US boom

The impressive growth performance of the US in the second half of the 90's along with the growth of productivity raises the question of whether one can speak of a structural break in either the US or EU output and productivity growth since 1995. Although it is too early to answer this question in a definitive way, many observers believe that the US has experienced a structural break leading to somewhat faster productivity growth, which may continue into the first decade of the 21st century (see for example Jorgenson et al. 2003). Do the fruits of the post-1995 productivity growth revival remain and accelerate the future growth potential of the US? To address such a question one should keep in mind that the pessimism within the EU is based on the developments since the mid-90's.

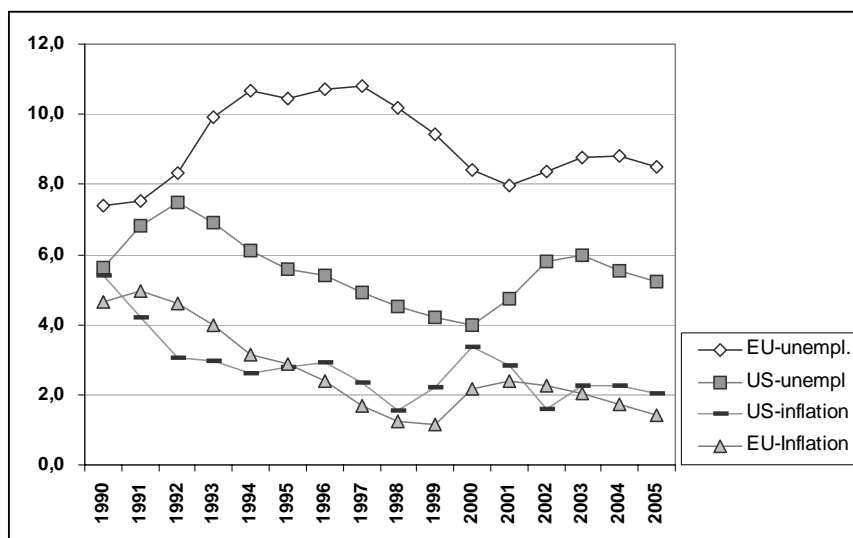
However, there is now a widespread consensus that both factors in conjunction, the macroeconomic environment and the productivity growth were essential for the US boom. Monetary policy was less aggressive in the late 90's than in the late 80's, because the US economy appeared to have experienced a sharp change in behaviour in two ways:

- Unemployment was allowed to decline because inflation remained low.
- The second change of behaviour was the growth in productivity.

3.1. THE POSITIVE FEEDBACK-LOOP OF MACROECONOMICS

The unemployment rate in 1999-2000 fell to 4 % in the US, the lowest rate since the 1966-70 period during which inflation accelerated steadily. Yet in 1998 and early 1999, prior to the 1999-2000 upsurge in oil prices, inflation not only failed to accelerate but rather decelerated. Compared with the EU, Figure 9 shows the sharp contrast concerning the unemployment rate in the EU, which fell from 10.4 % on average in the post-1995 period to 8.4 % in 2000. The low inflation rate in the EU did not ameliorate employment in any way.

Figure 9: Unemployment and inflation rates in the US and EU (1990-2005)



Source: OECD (2004a)

Taking a general view of the unemployment-inflation relationship, it appears superficially that much support does not exist for a negative Phillips-curve unemployment-inflation trade-off. Especially in the second half of the 90's the unemployment and inflation rates appear to be positively correlated, with the unemployment rate behaving as a lagging indicator, moving a year or two later than inflation at the end of the previous decade. There was at the beginning of the new decade no real consensus to explain the positive correlation of inflation and unemployment in the late 1990's. Gordon (1998, 2002) has attempted to use a common framework to explain why the performance of the 70's (with high unemployment rates as reacting to the high inflation rates) was so bad and that of the 90's was so good, pointing to the role of adverse supply shocks in the earlier episode and beneficial supply shocks more recently. In his interpretation inflation in the period 1996-1998 was held down by 'old' supply shocks, which are falling real prices of imports and energy, and by two 'new' supply shock: the accelerating decline in computer prices and the productivity growth revival, which directly reduced the growth in unit labour costs (and hence inflation).

To put the 'micro'-components into conjunction with the 'macro'-components the following can be considered (see Gordon 2002). The macroeconomic environment in the US of the late 1990's reflected a remarkable 'positive feedback loop' in which four major factors achieved historically unprecedented performance, and in doing so, fed back and reinforced the behaviour of others. The boom in ICT investment (see below), fuelled the stock market boom and contributed to low inflation. The stock market provided a source of cheap finance to spur the ICT investment boom and added to output growth through its welfare effect on consumer behaviour. Low inflation made it possible for the Federal Reserve (the Fed) to avoid tight monetary policy, while monetary policy, by keeping the interest rates relatively low, boosted the demand for ICT investment and supported the stock market boom. Each of these elements made the demand for ICT investment higher than it would have been otherwise, and created a larger response of real ICT investment to rapid declined in ICT prices than would have occurred without the macro positive feedback loop.... At the end the bubble burst.

3.2. THE CONTRIBUTION OF ICT TO THE PRODUCTIVITY GROWTH REVIVAL

If there was a consensus at the beginning of this decade about anything regarding the growth performance, it was that the core of the 'growth-engine' was acceleration in technological progress centred on Information and Communication Technology (ICT) and the internet. Hence, the clearest manifestation of the boom, the post-1995 productivity growth revival, could be traced directly to the ICT revolution. One way of describing the changing relationship between technology and economic performance is the famous Robert M. Solow's 1987 saying that, "we can see the computer age everywhere but in the productivity statistics." This 'Solow paradox' was taken for a decade as a truism, reflecting a co-existence of explosive growth in computer growth with a dismal growth in labour productivity. But by the end of the 90's a new picture emerged, indicating that the technological revolution represented by the *New Economy* was responsible directly or indirectly, not just for the productivity growth acceleration in the US, but also the other manifestations of the boom-phase, including the stock

market and wealth boom. Thus, as was admitted by its inventor, Solow's paradox is now obsolete.⁵

Whether the ICT investment boom in the 90's was the sole cause of the productivity growth revival or only a large cause, its role in the revival was central, raising the question of whether or not it can recur in the future or was fundamentally temporary. The importance of this question is clear considering the present question of whether productivity slowdown in the EU is of structural nature.

3.2.1 ICT as a source of growth

Today one can find a mass of literature on the interplay between ICT investment and the productivity growth revival in the US (see Jorgenson and Stiroh 2000, Jorgenson 2001, 2002, Oliner and Sichel 2000, 2002). The primary goal in these studies is to calculate the impact of ICT to labour productivity not only in the computer-producing industry but its spillovers into the whole economy. It thus separates the computer-producing sector from the computer-using sector. However, no one denies that there has been an impressive acceleration of output and productivity in the production of computers, but the real issue has been the response of productivity to the ICT investment by 95 % of the rest of the economy, i.e. sectors which are engaged in using computers rather than producing them. Three effects of ICT on the whole economy can thus be distinguished:

- The performance of the ICT-producing sector.
- The investment of the non-computer producing economy in ICT-equipment, which accelerates the rate of capital input (*capital deepening*). This reveals the fact that any growing economy achieves a growth rate of its capital input that is faster than its labour input, thus equipping each unit of labour with an ever-growing quantity of capital.
- The third effect would imply that investment in ICT has a higher rate of return than other investments and creates spill-over effects on business practices and productivity. Evidence of this spillover effect could be the acceleration in the total factor productivity (TFP) in the ICT-using economy, as an indirect effect of ICT investment.

Oliner and Sichel (2002) - as the most prominent approach - began their computations with the labour productivity growth and then subtracted the contribution of capital deepening and changes in labour quality, arriving at the growth rate of TFP. The location of TFP growth by industry was then examined, and the total of TFP growth is disaggregated into the portion occurring in the ICT sector and a residual for other sectors. The results are shown in Table 4.

⁵ See New York Times, 12. March 2000.

Table 4: Contributions to Growth in Labour productivity by Source

	1973-1995	1995-2001	Post-1995 Change
Labour Productivity	1.40	2.25	0.85
Contribution from:			
Capital Deepening	0.71	1.17	0.46
Information Technology Capital	0.42	0.97	0.55
Other Capital	0.30	0.20	-0.10
Labour Quality	0.27	0.25	-0.02
Total Factor Productivity	0.42	0.83	0.41
Information Technology Capital	0.30	0.73	0.43
Other Sectors	0.12	0.10	-0.02
Memo: Total IT Contribution	0.72	1.70	0.98

Source: Oliner and Sichel (2002), Gordon (2003)

As was mentioned by Gordon (2003), "... these findings are very striking". This is shown in the right column, where the total revival of labour productivity growth is 0.85 points, divided into contributions of 0.55 points of capital deepening, 0.43 points of acceleration in TFP growth in ICT industries. However, the non-ICT part suggests a relatively minor impact. Capital deepening of non-ICT capital contributes -0.10 points and the acceleration of TFP growth in non-ICT part of the economy exhibits -0.02 points. Gordon (2003) concludes that Oliner and Sichel (2002) 'overexplain' the post-1995 productivity growth revival without any reference to innovation or organisational improvements outside the production and use of ICT capital. In most of the *New Economy* studies the contribution of ICT (or high-tech) investment to average labour productivity has been exaggerated. The possibility that Oliner and Sichel (2002) exaggerated the role of ICT (either the role of ICT capital deepening or indeed of ICT gains in TFP), would imply that the residual role of non-ICT TFP growth is greater than it appears in Table 4.

At the same time, numerous recent studies question the share of ICT-use to the post-1995 productivity growth revival. Most of these studies are related to the wholesale and retail sector where the productivity growth is most evident. The findings of Foster et al. (2001) – to mention only of few of these endeavours - are based on a study of individual retail establishments and show that over a ten-year horizon *all* retail productivity growth can be attributed to more productive entry of new firms that displace the less productive existing firms. 'Net entry accounts for virtually all of the labour productivity growth in retail trade. The reason for this is that, "very large rates of entry exist along with the very low productivity rates of existing businesses" (p. 36). Despite the massive investment of the retail industry in ICT equipment, the productivity dynamics of newly established firms reflect substantial learning and selection processes.

The Foster et al. (2001) findings seem to contrast to the Oliner and Sichel conclusions that all of the productivity growth of the 1990's was the direct result of the purchase of new computers and ICT-equipment. One can, however, presume that all retailers, regardless of whether they are new or old establishments, have adopted ICT technologies making it likely that the productivity revival in retailing involves far more than the use of computers, and may include large size, economies of scale that reduce cost and raise revenue and other efficiency gains.

The studies by Triplett and Bosworth (2003) are focused on the acceleration of labour productivity in the service sector and examination of the sources of this productivity growth. They saw the major source of the average labour-productivity-growth acceleration in service industries in the great expansion of total factor productivity after 1995. It went from essentially zero in the earlier period to a rate of 1.4 percent per year, on a weighted basis. Considering that TFP is always a small number that is a remarkable expansion. ICT played, in their analysis, a substantial role in labour productivity growth, but its role in the acceleration in the post-1995 period was smaller, largely because the effect of ICT in these service industries is already apparent in the numbers before 1995. Purchased intermediate inputs also made a substantial contribution to average labour productivity growth, especially in the service industries that showed the greatest acceleration. This finding reflects the role of ‘contracting out’ to improve efficiency.

The eminent role of the service sector in the acceleration of productivity in the US was also emphasised by Lewis (2004) – as the last example. In today’s industrialised countries only 20-25 % of workers work in manufacturing and about 5 % in agriculture. Thus most workers are employed in the service sector, which means that the standard of living is primarily determined by the productivity of service industry workers. However, in the second half of the 1990’s, only six of the sixty sectors making up the US economy accounted for about 75 % of the total gross productivity growth acceleration of all sectors with some productivity acceleration. These sectors were wholesale trade, retail trade, security broker, microprocessors, computer assembly, and mobile telephone services. Within these sectors, it is most surprising that even the productivity acceleration in microprocessors was not caused by technological innovations (ICT inherent), but the result of traditional microeconomic competitive dynamics. In the middle of the 1990’s, Intel, challenged by a competitor for the first time, changed its product line strategy to bring its more powerful chips to the market faster. This action alone abruptly increased the value of the microprocessor chips sold to the market.

The productivity acceleration of the retail sector was determined by one big player: Wal-Mart’s innovative way of retailing and its sufficiently large market share (‘Wal-Mart Effect’). By the end of the 1990’s Wal-Mart has increased its market share to 30 % and one third of the productivity growth jump in general merchandise retailing came from Wal-Mart’s accelerated rate of improvement. Competitors thus faced the choice of either getting as good as Wal-Mart or going out of business. The remaining or new established firms began (or started) their rate of productivity improvement in an attempt to catch Wal-Mart which caused a general productivity growth acceleration. And the cause of Wal-Mart’s success in productivity growth in the second half of the 1990’s was less information technology as the adoption of Wal-Mart’s ‘big box’ store, an invention which goes back into the 1960’s.

Finally, we want to question the role of ICT as the central explaining factor for productivity acceleration by contrasting the EU with the US.

3.2.2 The comparison between US and Europe

Behind the idea of contrasting the US with Europe concerning the role of ICT as the main determinant for productivity was the following question: how could ICT be the main source of the US growth revival, as it was described by Oliner and Sichel (2002), while Europe fell

behind? Business firms and individuals in Europe use the same computers and Microsoft software as Americans and retailing in Europe uses the same ICT equipment as in the US. The share of ICT services in total business services value added in some Nordic countries surpass the US and the same can be shown with the PC intensity. These indicators may challenge the notion that ICT investment has been the main source of the contrasting productivity performance in Europe.

Quantitative evidence is provided by van Ark et al. (2002) in which a taxonomy was developed in order to divide industries into ICT producing, ICT using and non-ICT industries differentiated by manufacturing and service sector. This classification was taken from the OECD (2002a) with the aim of separating the industries that make intensive use of ICT from those that do not, allowing one to trace the location of productivity growth acceleration and deceleration to particular industrial sectors (see also O'Mahony et al. 2003).

Table 5 shows that the main difference between the US and the EU neither lies in the ICT producing nor using sector. A look at the non-ICT sector, which includes about two thirds of the total economy, makes the core of the European problem visible: this sector exhibited a deceleration of productivity growth in the late 1990's greater than the deceleration of the European economy as a whole. Concerning the manufacturing sector alone, Table 5 clearly shows a decline to a rate which was still higher than in the US

Table 5: Labour Productivity by Sector, annual growth rates in % and GDP shares

	Productivity growth				GDP share	
	US		EU		2000	
	1990-95	1995-00	1990-95	1995-00	EU	US
Total Economy	1.1	2.5	1.9	1.4	100	100
ICT producing industries	8.1	10.1	6.7	8.7	5.9	7.3
ICT producing manufacturing	15.1	23.7	11.1	13.8	1.6	2.6
ICT producing services	3.1	1.8	4.4	6.5	4.3	4.7
ICT using industries	1.5	4.7	1.7	1.6	27.0	30.6
ICT using manufacturing	-0.3	1.2	3.1	2.1	5.9	4.3
ICT using services	1.9	5.4	1.1	1.4	21.1	26.3
Non-ICT industries	0.2	0.5	1.6	0.7	67.1	62.1
Non-ICT manufacturing	3.0	1.4	3.8	1.5	11.9	9.3
Non-ICT services	-0.4	0.4	0.6	0.2	44.7	43.0
Non-ICT other	0.7	0.6	2.7	1.9	10.5	9.8

Source: van Ark et al. (2002)

A main hypothesis of most of the New Economy papers is that Europe has missed the ICT revolution in the sense that production of ICT has been more limited in Europe. Table 5 shows that the share of the ICT producing sector in GDP is higher in the US than in Europe (7.3 % versus 5.9 %). But this difference is small. Moreover, the labour productivity growth rates within the ICT-producing sector in both the US and the EU are considerably greater than in all other sectors and show a similar time pattern with accelerated growth in the late 1990's (although at a higher rate in the US).

Another hypothesis might point to an insufficient use of ICT. Table 5 shows that the core of the US success story appears to have been in ICT-using industries. In the second half of the

90's labour productivity growth in the ICT-using service sector was indeed much higher in the US than in the EU: 5.4 % versus 1.4 %. This finding is quantitatively important because this sector accounts for about one fourth of GDP.

In a separate analysis van Ark et al. (2002) examines the difference between the EU and the US in terms of industry contributions to aggregate productivity growth. Thus they allocate the aggregate difference in productivity growth between the US and the EU (which is 1.1 percentage points from 1995-2000) to the individual industries. The result is quite impressive and reveals the heart of the US success story: 0.9 percentage points of the of 1.1 differential, i.e. literally *all* the productivity growth differential of the US over the EU in the late 1990's, comes from three industries: retail, wholesale, and securities trading industries. Productivity in the securities sector seems largely attributable to transactions associated with the US bubble economy of the late 90's. But nevertheless these sectors account for most of the labour differential between Europe and the US. Semiconductors however, as an ICT-producing industry, show the highest share and contribute substantially to labour productivity growth. The remaining industries had a small positive or negative differentials, netting out to zero.

Table 6: Contribution to the US-EU productivity gap by industry, 1995-00

Top 5	Industry	Total
1	Semiconductors	0.361
2	Securities	0.355
3	Retail trade	0.317
4	Wholesale trade	0.233
5	Construction	0.157
Bottom 5		
1	Food products	-0.067
2	Health	-0.064
3	Government	-0.061
4	Social/personal services	-0.061
5	Computer services	-0.052

Source: van Ark et al. (2002)

What is common to these sectors beside a pattern of ICT producing or ICT using activities? First of all, these sectors were highly competitive due to the presence of aggressive market leaders, as in retail, wholesale and electronics, or as a result of deregulation, as in securities (or telecom). Secondly, they were free to respond to demand factors through the creation and pricing of new products and services.

It is without question that the contribution of the ICT-producing sector to productivity was significant. Although it accounted for 7 % of GDP in 2000, this sector contributed a disproportionate 36 % to productivity growth between 1995 and 2000. The semiconductor industry, especially, experienced one of the highest labour productivity growth rates in the 90's. But the role of ICT was only one of several factors at work in the productivity jump in the US. Innovation (including but not limited to ICT and its applicants), competition, and demand factors were important causes as well. The data from the ICT using sectors highlighted the enabling role of ICT as a key component for managerial innovation that allows firms to compete in a

modern economy. It enabled the managerial and technical innovations that emerged in response to changing competitive landscapes and demand environments faced by firms in the 90's. Thus, simply spending on more ICT does not automatically lead to higher productivity growth. ICT investments were often necessary to improve productivity, but they mostly required corresponding business process changes in order to have a significant impact.

The right competitive context was also essential. Retail saw strong growth from dominant players and thus increases in competitive intensity. Large retails like Wal-Mart leveraged ICT to manage the increasing complexity of their operations and to improve their efficiency in the face of competition. Or to offer another example, competition enhancing deregulations along with ICT investments help banks to manage transaction complexity and achieve scale benefits.

The very detailed sector specific studies across 15 countries done by McKinsey (2002) indicate that the key to productivity gains at the sector level is not only investment in ICT but the successful development, diffusion and leverage of business and technology innovation. This is one crucial explaining factor for the slowdown of productivity growth in Europe: the ability to develop innovative products, services and process is essential and should not be underestimated as a method to improve an individual company's performance and productivity. But the diffusion and leverage of innovation, the creation of conditions that reward innovation of all kinds, plays a far greater role in explaining productivity differences. As specific sector cases illustrate, insufficient competition, poor regulation of complex sectors, the presence of obstacles to new business development, the constraints of distortions caused by zoning and development regulations, and weak corporate governance are among the leading culprits limiting innovation across Europe (McKinsey 2002).

These findings indicate the major (possible) factors explaining Europe's poor performance in the late 1990's. Just as was argued earlier, the US retailing sector has achieved efficiency gains for reasons not directly related to computers. Therefore, one can suggest in parallel that Europe has fallen back because European firms are much less free to develop the 'big boxes' retail formats. This leads to regulation issues, among other things, as a major hindrance for competition and flexibility in Europe. Just to mention only one example: the European Commission sees one of the main hindrances to the realisation of the Lisbon strategy in the weaknesses of the internal market and the lack of competitiveness.

"The internal market is still highly fragmented in the services sector, especially in distribution and retail sales. The service sector accounts for 70 % of GDP. But companies and consumers continue to suffer from many restrictions on establishing businesses and the provision of cross-border services. This seriously restricts the European economy's competitiveness." (EC 2004a).

However, the productivity growth rates of the computer industry (i.e. the ICT-producing industry) in the US are quite impressive, and virtually all the productivity growth jump came from a jump in the capabilities of microprocessors. But what is conclusive is that it was competitive dynamics in the microprocessor industry which caused a shortening in the time-to-market and hence the increase in productivity in the ICT-using industry.

3.2.3 Concluding remarks

The section shows that the main determinant of the average labour productivity growth in the US can be attributed to the labour productivity growth in the service sector, with a share of the service sector in total gross value added of nearly 75 % (OECD Scoreboard 2003) the productivity growth within this sector has a huge impact on rising living standards.

That means that the standard of living in rich countries is determined primarily by the productivity of service industry workers. In other words, it's the productivity of the massive number of workers in retailing, wholesaling, and construction that give the US the highest GDP per capita in the world, and not the high-tech workers in computers and biotechnology.

Another issue, the economic ups and downs in Europe, which should also be kept in mind, are heavily linked to the big countries, i.e. especially Germany as the largest player. Ten years ago, many people in Europe and in the US thought that Germany had surpassed the US, that the German economic model was superior, and that the US was going to change its model to keep up. Germany was, at this time, seen as the growth engine within Europe. One of the major reasons for the strong position within Europe was (beside the Deutsche Mark) the extraordinary success of German manufacturing. With the formation of the European common market in the 1980's, European manufacturers were able to compete on even terms across Europe, while at the same time still being protected from the full force of global competition (see Lewis 2004). The productivity of German manufacturers in most industries was higher than in the rest of Europe, and Germany was thus able to export strongly throughout Europe. This success caused many European manufacturers, especially in Germany, to take their eye off the global ball. Moreover, especially in Germany, manufacturing was considered to be the important part of an economy; services were simply supporting at best. There was simply no understanding of the essential role services play in modern, complex economies. The service sector in all advanced economies is much larger than the manufacturing, construction, utilities, and mining sectors combined. Thus, the productivity of the service sector is the main determinant of the economic standard of living.

4 The European Targets – Lisbon and Barcelona

Let us remember the results of the previous sections: compared with the best performer such as the US at the end of the 1990's, the EU lags behind both in terms of growth, employment and productivity. At the beginning of this decade there was (and still is) no sign that the EU is catching up with the US in terms of GDP per capita, which has been 30 % lower for the last 30 years than the US. In the 1990's, covering the boom period of the second half, the average real GDP growth rate was 2.2 % in the EU and 2.9 % in the US. Only once, at a peak in the year 2000, the real GDP growth rate exhibited 3.7 %, thus an average growth rate of more than 3 %. Hence, while macroeconomic stability has considerably improved during the 1990's and a strong emphasis on cohesion has been preserved, the EU system has failed to deliver a satisfactory growth performance.

Although this starting position was not very advantageous, the European Council at Lisbon in March 2000 set out a ten-year strategy to make the EU the world most dynamic and competitive economy ('Lisbon strategy').

“The Union has today set itself a new strategic goal for the next decade: to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion. Achieving this goal requires an overall strategy aimed at ... sustaining the healthy economic outlook and favourable growth prospects by applying an appropriate macro-economic policy mix.

This strategy is designed to enable the Union to regain the conditions for full employment, and to strengthen regional cohesion in the European Union ... If the measures set out below are implemented against a sound macro-economic background, an average economic growth rate of around 3% should be a realistic prospect for the coming years.”(European Council, Presidency Conclusions, 23 and 24 March 2000).

Reading these conclusions one can see how Lisbon was, in fact, a 'quick fix', declared by the European leaders and driven by the notion that Europe needs nothing more than new targets. Regarding the European performance during the 1990's, neither a 'healthy economic outlook', nor a 'realistic prospect of growth rate of 3 % for the coming years' seems realistic. Moreover, the gap between unfulfilled expectations and reality can certainly contribute to the downbeat morale which is currently impeding the recovery. Instead of formulating good-will prophecies leaders should, in the future, be leading the reform process towards more realistic and achievable objectives.

Concerning the question of how to reach the goal, two years later the European Council found an answer at the summit in Barcelona in March 2002. The Heads of States and Government agreed to the following goals:

- R&D investment in the EU must be increased with the aim of approaching 3 % of GDP by 2010 up from 1.9 % in 2000.
- They also called for an increase of the level of business funding. Two-thirds of this new R&D investment should come from the private sector.

The assessment of these goals contained the same blue-eyed approach as with the Lisbon target. The Barcelona targets were assessed by the European Commission as ‘ambitious but realistic’ (EC 2002). The comparison with other big economic blocks constitutes the main criterion for the objectives set at Barcelona. Strengthening the R&D and innovation Systems are thus essential in reaching the Lisbon strategic goals.

Still, the growth performance has remained unsatisfactory and the notion has emerged that growth must become Europe’s number one economic priority. With this in mind, a group of high-level, independent experts (under the chair of A. Sapir) were invited in July 2002 to analyse the consequence of the Lisbon agenda and to formulate crucial recommendations, which are to ensure that the EU economic system achieves higher sustained growth (‘Sapir-Report’). The high-level group chaired by W. Kok prepared in November 2004 a mid-term review of the Lisbon strategy (‘Kok-Report’). The mandate of this report was ‘to identify measures which together form a consistent strategy for the European economies to achieve the Lisbon objectives and targets’.

Some of these processes and assessments will be discussed in the following sections.

4.1. THE LISBON-STRATEGY

As an empirical basis for measuring progress towards the Lisbon targets was necessary, the European Council invited ‘the Commission to draw up an annual synthesis report on progress on the basis of structural indicators to be agreed upon relating to employment, innovation, economic reform and social cohesion’ (§ 36).

Out of 42 structural indicators⁶, from a list consisting of 107 indicators including disaggregations and sub-indicators, the European Commission has selected a sub-set of 14 ‘key-indicators’, which should provide a snapshot of progress towards the Lisbon strategy goals. By developing a method to monitor progress, the European Council is thus able to provide policy orientations based on the situation on the ground. Hopefully, the ‘key-indicators’ will help to analyse Member States’ policy and to identify the good performers and those who face the biggest challenges. By and large, the indicators are a useful tool enabling a clear picture of the Member States’ positions relative to the most important Lisbon targets. Moreover, the indicators are easy to understand and highly policy relevant.

The indicators cover six areas:

- Economic performance
- Employment
- Education, research and innovation
- Economic reforms
- Social cohesion
- The environment

⁶ The long list of indicators are maintained by Eurostat in its publicly-accessible database New Cronos and on the structural indicators website (<http://europa.eu.int/comm/eurostat/structuralindicators>)

The structural indicators proposed for the Spring Report 2004 are shown in the following Table 7.

Table 7: Relative performance according to the structural indicators (2003)

	AT	DE	DK	FI	FR	NL	SE	UK	EU-15	USA	Target 2010
GDP per capita at PPS	111.4	98.8	112.9	100.6	103.8	109.9	105.6	108.9	100	140.3	
Labour productivity per employee at PPS	96.4	94.3	97.8	98.6	113.7	95.2	96.5	101.9	100	121.6	
Employment rate ³	69.2	65.0	75.1	67.7	63.2	73.5	72.9	71.8	64.4	71.2	70.0
Employment rate females ³	62.8	59.0	70.5	65.7	57.2	65.8	71.5	65.3	56.0	65.7	60.0
Employment rate of older people ³	30.4	39.5	60.2	49.6	36.8	44.8	68.6	55.5	41.7	59.9	50.0
Education attainment (20-24) ³	83.8	72.5	74.4	85.2	80.9	73.3	85.6	78.2	73.8		
Expenditure on R&D (% of GDP)	2.2	2.5	2.5	3.4	2.2	1.9	4.3	1.9	2.0	2.8	3.0
Business investment (% of GDP)	20.3	16.3	18.2	15.3	15.9	16.5	12.6	14.6	16.7		
Comparative price level ²	102	104	131	123	100	102	117	108	100	113	
At-risk-of-poverty rate ³	12.0	11.0	10.0	11.0	15.0	11.0	9.0	17.0	15.0		
Long-term unemployment rate ³	1.1	4.6	1.1	2.3	3.5	1.0	1.0	1.1	3.3		
Dispersion of regional employment rates	3.1	6.0	-	6.1	5.0	2.4	4.3	6.0	12.0		
Greenhouse gas emissions ²	108.5	81.1	99.2	106.8	98.1	100.6	96.3	85.1	97.1	113.1	92.0
Energy intensity of the economy ²	146	165	123	272	187	202	224	212	191	330	
Volume of transport ²	120	102	85	95	96	97	90	86	102	91	

Source: European Commission, Kok-Report (2004), Eurostat ; ² 2002, ³ in %

Indicators represent, in principle, a meaningful criteria for measuring the achievement of economic policy goals in the EU. But, as we have shown in the previous chapters, Europe lacks in productivity and growth. Growth is foremost influenced by different variables such as the volume and age of fixed capital, the volume of labour input (depending on demographic variables, labour force participation, migration), the macroeconomic stability (interest rates, inflation, savings and investment ratio), the well-functioning of factor markets (capital, labour), international relations (trade, technological spillovers, foreign investment) and competition intensity. All of this is only partly within the scope that the structural indicators exercise.

Another issue was raised by Walterskirchen (2004), pointing out that the EU structural indicators are often misused for the purpose of an international ‘beauty contest’, even if the European Council and the European Commission have explicitly cautioned against the setting up of country rankings, i.e. a mechanical application of the indicators and their adding up to a total (Composite Index). Many organisations are very much eager to work with such summarization of specific indicators (see for example the World Economic Forum 2004). The approach take by the World Economic Forum (WEF) is especially specific:

- The WEF uses indicators different from those developed by the European Commission. However, according to the WEF these indicators are critical for national competitiveness. For each indicator a score (and ranking) for each country is calculated.
- The ‘overall Lisbon score’ (i.e. composite index) for each country is calculated as an unweighted average of the individual scores.

This method of adding up to a total overall score is not meaningful for several reasons (see Walterskirchen 2004). One encounters problems with an unweighted average, in which

widely heterogeneous indicators for different kind of objectives are added up. Moreover, a country's position in an international comparison may be influenced by the cyclical situation, or by other exogenous factors not determined by policy.

However, this critique of composite indicators also stands up against indices like the summary innovation index as a part of the European Innovation Scoreboard. The European Commission should take this criticism regarding the explanatory power of composite indicators serious and should avoid the creation of summary indices without value and political relevance.

4.1.1 Where does the EU stand now?

The European Union has now been implementing the Lisbon Strategy for four years – time enough to look at the interim results. In the report to the spring European Council the European Commission shows the state of progress made since 2000 (EC 2004a).

One of the main results of the Commission-report was:

“... that measures taken at the European Level are only part of the formula for putting the Lisbon strategy on the right track; numerous reforms and investments, which are the responsibility of the Member States, have yet to be achieved.”(EC 2004a)

The overall assessment of the progress within the Lisbon process is disappointing,

“ ... the overall implementation levels and the progress made in Member States are still insufficient, and there are still major problems in some areas which are holding back the strategy as a whole and may inhibit the return to strong growth.”(EC 2004a)

The analysis on the level of the specific indicators shows even more disappointing results (EC 2004a):

- Growth in Europe has remained low over the past three years...
- ... for well known reasons: employment and productivity are still not contributing enough. Very little job creation is foreseen for 2004 and the unemployment rate should continue to rise slightly to 8.2 %. The productivity growth rate per employed person in Europe continues to go down and is now fluctuating between 0.5 % and 1 % (as against 2 % in the US).
- Investment by businesses fell from 18.3 % of GDP in 2000 to 17.2 % in 2002.
- The same applies to public investment which, in terms of percentage of GDP, is now far lower than in the US (3.3 % as against 2.4 % in 2003).
- Investment in R&D has been fragmented and sluggish. Overall R&D investment in the European Union approaches 2 % of GDP, but at an annual growth rate of 4 % (1997-02) which is wholly insufficient to meet the 3 % target by 2010.
- The European Union is facing a slowdown in its product market integration, with cross-border manufacturing trade shrinking by 0.3 % in 2002.
- The internal market is still highly fragmented in the services sector, especially in distribution and retail sales. Companies and consumers continue to suffer from many restrictions on establishing businesses and the provision of cross-border services.
- The rate of transposition of directives linked to the internal market has fallen appreciably over the past few months.

- Beyond transpositions, which are the bare minimum, Member States also have a duty to actually implement these provisions to guarantee that the reforms take effect. However, the number of open infringement procedures is still over one thousand and their number has been decreasing by no more than 3 % over the past few years.

Transposition of ‘Lisbon’ directives:

The EU has adopted over 70 directives under the Lisbon strategy⁷, which should make for greater harmonisation and a joint regulatory framework helping to reinforce the internal market. The 40 directives should have been transposed by the end of 2003.

- Member States’ average transposition rate for these 40 directives is only 58.3 %, i.e. a very poor showing.
- Only 7 out of these 40 directives have been transposed by all Member States.

- The Commission sees a real risk of poverty increasing in several Member States, mainly due to the increase in unemployment. 55 million, i.e. 15 % of the total population face this risk and with more than half of whom face this risk permanently.
- In the environmental sphere, Member States performance is generally inadequate.

The previous list shows that not much progress towards reaching the targets set out in Lisbon can be seen. To put it in other words: nearly all indicators have shown a deteriorating performance during the relevant years! In its actual report the European Commission emphasises that it is up to the Member States to commit more firmly to pursuing the reforms defined since the Lisbon Council. Nearly all indicators show that Europe does not approach but instead moves further away from the Lisbon targets. Nevertheless, the European Commission has not given up and has defined three strategic domains that are crucial for growth and where the most important delays have been identified:

- Improving investment in knowledge and networks, by implementing the ‘Growth Initiative’, all the while giving greater priority to the level and quality of investment in research, education and training;
- Strengthening the competitiveness of European enterprises, by applying better regulation – particularly for the industrial sector.
- Finally, promoting active ageing by encouraging older workers to remain in the work force and through a modernisation of educational systems for lifelong learning, of work organisation, and of prevention and health care systems.

4.1.2 The mid-term review of the Lisbon process - the Kok-Report

After four years' implementation of the Lisbon strategy, the European Council and the European Commission decided to prepare a mid-term review at the spring European Council in March 2005. Accordingly, the European Commission, in line with the conclusions of the spring 2004 European Council, set up a High-Level Group of Independent Experts chaired by Wim Kok to decide upon the content of the review. The group submitted its report to the European Commission on 3th of November 2004.

⁷ For a detailed discussion of the directives for the realisation of the internal market see section 6.

The report is a sober and realistic one without excessive replication of already well known phrases. Halfway to 2010 the report draws a, "... very mixed picture of the process" and emphasised that "... much needs to be done in order to prevent Lisbon from becoming a synonym for missed objectives and failed promises."

The report put its focus very clearly on the enabling role of the Member States and the impression that the so called 'Lisbon-process' can not end on a single date, or, in case the targets are not reached, new targets must be found.

"... but the European Union and its Member States have clearly themselves contributed to slow progress by failing to act on much of the Lisbon strategy with sufficient urgency. This disappointing delivery is due to an overloaded agenda, poor coordination and conflicting priorities. Still, a key issue has been the lack of determined political action. ... The process will never end on a single date, rather it will be subject to continual renewal, reappraisal and recommitment." (Kok-Report p. 6 ff.)

The Lisbon strategy has to be seen in a wide context consisting of internal (the greying of Europe) and external challenges (international competition, rapid growth of the Chinese economy, etc.), the challenge of enlargement and, last but not least, the challenge to remain both open and socially cohesive. If Europe wants to preserve and improve its social model it has to adapt it.

"The Lisbon strategy is not an attempt to become a copy-cat of the US – far from it. Lisbon is about achieving Europe's vision of what it wants to be and what it wants to keep in the light of increasing global competition, an ageing population and the enlargement. It has the broad ambition of solidarity with the needy, now and in the future. To realise this ambition, Europe needs more growth and more people in work." (Kok-Report p. 12)

The problem leading to the stagnating and disappointing progress is one of European political governance *per se*, i.e. the 'dangerous liaison' between Member States and the European level, which is not particularly goal-oriented and enables, despite lip services, the protection of positions decided at the Member State level. The EU is trapped in this deceptive construction because in many policy areas relevant for growth, the EU cannot act at all or not without the explicit consent of the Member States. The European policy is based on 'good-will coordination'.

"The problem is, however, that the Lisbon strategy has become too broad to be understood as a interconnected narrative. Lisbon is about everything and thus about nothing. Everybody is responsible and thus no one." (Kok-Report p. 16)

The report defines five broad priority areas of policy where the European Union and individual Member States need to make progress to help ensure economic dynamism within individual states and the vigour of the whole European economy from which each member state benefits. The task of the Member States is ...

"... to develop national policies in each Member State, supported by an appropriate European-wide framework, that address a particular Member State's concerns and then to act in a more concerted and determined way." (Kok-Report p. 7)

The five broad priority areas of policy are (Kok-Report p. 6):

- The knowledge society: increasing Europe's attractiveness for researchers and scientist, making R&D a top priority and promoting the use of information and communication technologies;

- The internal market: completion of the internal market for the free movement of goods and capital, and urgent action to create a single market for services;
- The business climate: reducing the total administrative burden; improving the quality of legislation; facilitating the rapid start-up of new enterprises; and creating an environment more supportive to businesses;
- The labour market: rapid delivery on the recommendations of the European Employment Taskforce; developing strategies for lifelong learning and active ageing; and underpinning partnerships for growth and employment;
- Environmental sustainability: spreading eco-innovations and building leadership in eco-industry, pursuing policies which lead to long-term and sustained improvements in productivity through eco-efficiency.

4.2. THE 3 % - TARGET OF BARCELONA

Two years after the Lisbon Council in 2000, Heads of State and Government agreed on another ‘ambitious but realistic’ (EC 2002) goal. At the European Council in Barcelona (2002) they agreed that investment in European research and development (R&D) must be increased with the aim of approaching 3 % of GDP by 2010 (up from 1.9 % in 2000). They also called for an increase of the level of business funding, which should rise from its current level of 56 % to two-thirds of total R&D investment, a proportion already achieved in the US and in some European countries. The R&D investment strategy set at the Barcelona summit arises from the recognition that strengthening Europe’s R&D base is essential in realising the Lisbon goals.

However, as with other targets, the US was used as the principal reference point. It was the ‘massive and growing gap of R&D investment between the EU and its major competitors, first and foremost the United States’ (EC 2002) which makes an increase of R&D expenditure necessary. Although the Barcelona target is an objective for the European Union as a whole, a number of Member States had set specific national R&D targets (see Table 8).

Table 8: R&D targets

R&D intensity	
3 % till 2010	Belgium, Denmark, Germany, Finland ¹ , France, Ireland, Netherlands ² , Austria, Sweden ¹ , Slovenia
1.5 % - 2 % till 2006 or 2010	Estonia ³ , Italy ³ , Lithuania ³ , Poland ³ , Hungary ³ , Spain ⁴ , Greece, Latvia, Czech Republic, Portugal
below 1.5 % or no quantitative target	Malta, Cyprus, United Kingdom

¹ already above 3 % - Finland: 3.5 % till 2003; Sweden: hold the quota

² within the top-five of the EU member countries

³ till 2006

⁴ till 2007

Source: European Commission

Some countries like Finland or Sweden already exhibit R&D quotas of more than 3 % of GDP. A further increase in R&D expenditure may be questionable, primarily because of the

falling marginal utility of an increase of the R&D input. That's why Sweden has decided not to increase the R&D quota but instead to hold it stable.

Although the Barcelona target is a pure input-target with all the well known disadvantages of such an indicator it has increased public (and policy) awareness of the importance of 'investive' public and private expenditures even under the conditions of a rather restrictive Growth and Stability Pact. Sapir et al. (2003) have offered suggestions regarding, on the one hand, how to handle this trade-off between the Growth and Stability Pact, and on the other hand, the necessity to increase R&D related expenditure to meet the Barcelona targets:

“We would thus find merit in offering member countries incentives to give priority to growth-enhancing spending items and in taking into account additional public spending on education, research and innovation in the evaluation of efforts made towards reaching a close-to-balance position. This is particularly important for countries which do not yet satisfy the close-to-balance requirement of the Stability and Growth Pact and must therefore reduce their structural budget deficit in the coming years. For these countries, we thus suggest that during the next five years, supplementary spending on growth-enhancing categories be taken into account in the planned reduction of the structural budget deficit.” (Sapir et al. 2003; p. 157)

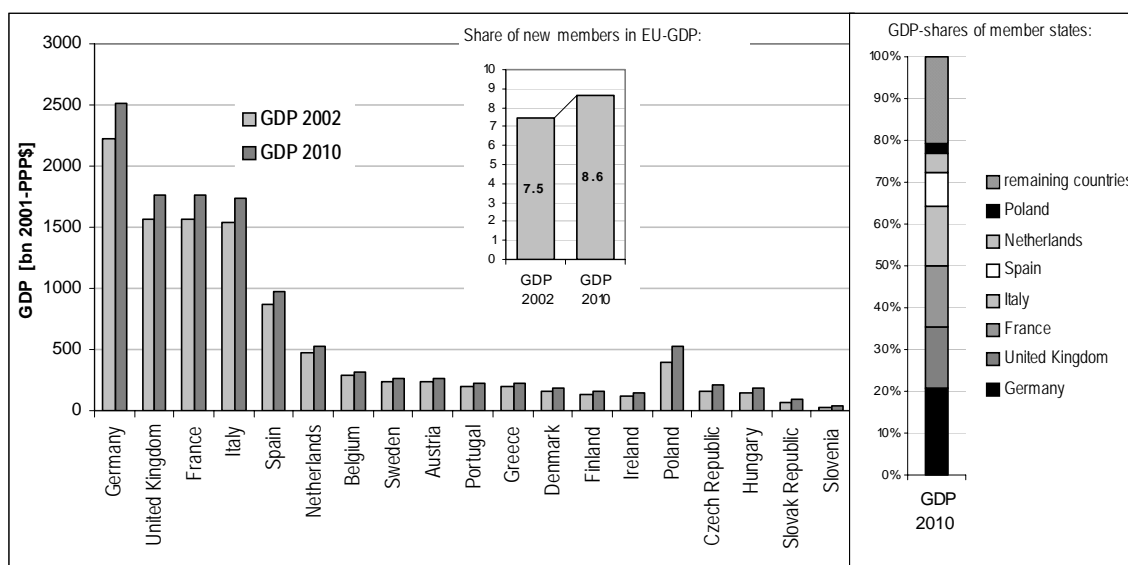
Seen from an economic point of view R&D is a necessary but not sufficient source of economic growth (OECD 2003a). R&D is one factor among many which has an impact on the long-run growth performance of a country, i.e. the investment in physical and human capital, administrative regulations concerning start-up, regulations of the factor markets, access to venture capital or a sound macro policy to mention only a few of them.⁸ Hence, the Barcelona target can only be seen as a part of the Lisbon strategy where the advancement of these issues is on the agenda.

4.2.1 What does the 3 %-target mean?

Foremost, it means that the achievement of a (every) target defined at the European level is largely determined by the big players (see Schibany and Streicher 2003). Although 10 countries have recently become full Member States of the EU and the population of the EU has grown by one fifth, the GDP of the European Union has increased only by 9 %; the average GDP per capita of the new member countries is less than half of the EU-average. Nevertheless, it can be assumed that GDP growth rates of the new Member States will be above average until 2010. Figure 10 shows, under the assumption of GDP growth rates of 3.5 % p.a. for the new member countries and 1.5 % p.a. for the old Member States (EU-14), and the forecasts for 2010 of the EU-19 (the existing EU-14 and the five largest new member countries).

⁸ The example of Japan shows that a high R&D intensity does not automatically into a high-growth performance.

Figure 10: GDP growth rates EU-19, 2002-2010



Source: Schibany and Streicher 2003, OECD data, own calculations

Under these assumptions, the share of the new Member States in the EU-19-GDP will increase by 1 % point in 2010, compared to their share in 2002, to still below 10 %. Three countries will account for half and the biggest 5 countries cover almost three fourth of the EU-GDP: Germany, UK, France, Italy and Spain. It is thus obvious that the big countries have a strong influence on EU averages, and hence the average R&D intensity for the EU.

The following Figure 11 depicts the Gross Expenditure of R&D (GERD) as a percentage of GDP for the period 1990-2002. In the course of the 1990's, the average R&D intensity of the EU has actually *fallen*, whereas at the start of the decade, R&D expenditure amounted to 1.94 % of GDP. By 2000 it was down to 1.88 %, although this is admittedly somewhat higher than the 1.80 % present in the mid-1990's. This slightly U-shaped pattern is not an exclusive characteristic of the EU: the USA and Japan exhibit similar 'troughs', yet on a higher level⁹.

Against this background the developments in Finland and Sweden are even more impressive. Contrary to the trend in the EU, these two countries witnessed the largest growth rates in R&D intensity in the 1990's and reached the highest R&D intensity of the EU (or, for that matter, all of the OECD countries). Nevertheless, new member countries like Slovenia and the Czech Republic exhibit R&D intensities of 1.5 % and 1.3 %, respectively. These values are above the R&D intensities of some 'older' Member States. For example, Greece's R&D intensity of 0.67 % places it at the bottom of the EU countries, even taking into account the 5 candidate countries.

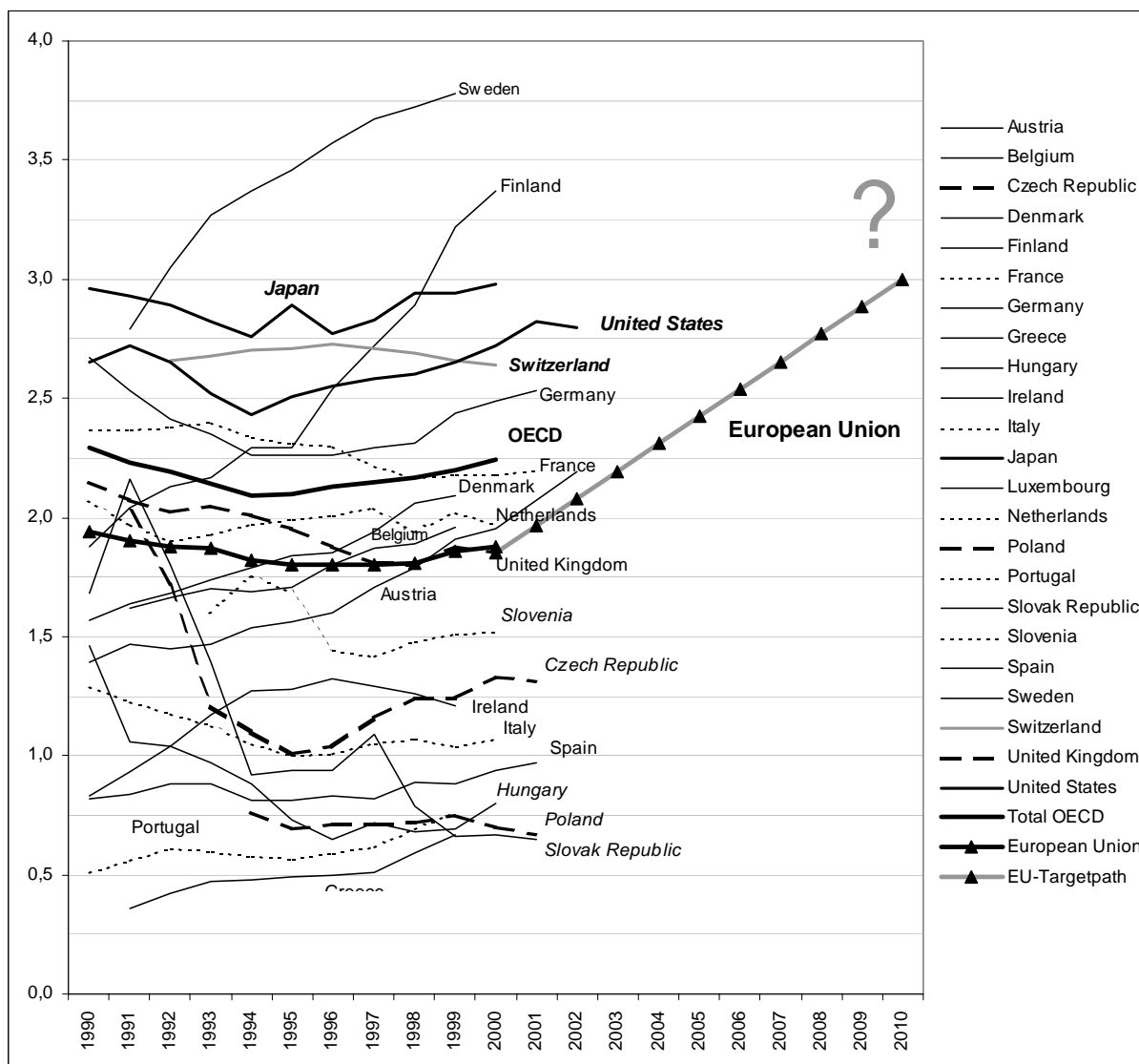
At the beginning of the new decade the R&D intensity of the EU (including the candidate countries) was 1.8 %; by the end of the decade, the Barcelona target calls for an R&D intensity of 3 %. It is obvious that the new member countries will not help, because their current

⁹ This pattern is not reflected in the Swiss R&D intensity during the 1990's: it reached a peak in 1996 with a GERD intensity of 2.7 % and decreased in the second half to 2.6 %.

R&D intensities are below the EU-average. However, due to the small share in GDP, their negative effect on the overall R&D intensity will be minor.¹⁰

But even for the EU-14, an extrapolation of the trend in R&D intensities emphasizes the need for increased R&D spending in order to meet the proposed target of 3 %.

Figure 11: GERD as a percentage of GDP, 11990-2002



Source: Schibany and Streicher (2003), OECD, own calculations

In Schibany and Streicher (2003) some scenarios are calculated for the 3 %-target. Based on the growth rates mentioned before, the R&D expenditures will have to grow more than the R&D intensities. In order to achieve the 3 % target, R&D expenditures would have to nearly double (more precisely, they would have to grow by 92 %), which means for the EU-19 as a whole, an annual increase of 7.5 %. This is more than four times the assumed rate for GDP growth of 1.8 % (in real terms).¹¹

¹⁰ Despite markedly lower research intensities (the 2001-average for the 5 new members is 0.87 %, against 1.88 % for the EU-14).

¹¹ The assumed 1.5 % for the old and 3.5 % for the new EU Member States imply average GDP growth rates of 1.8 %.

4.2.2 The two-third target

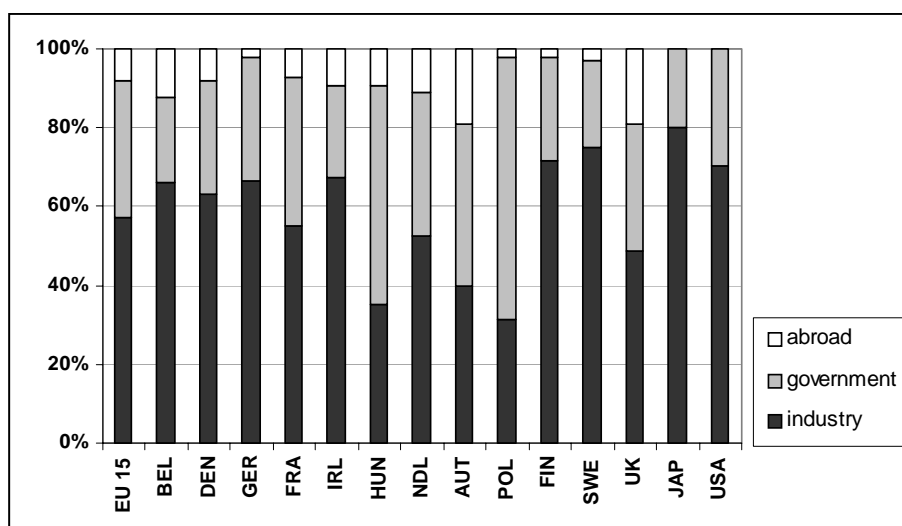
Apart from the proposed R&D intensity of 3 %, the Barcelona accord set a goal for the composition of research funding. This second target called for an increase of industry's share in R&D funding which should rise from its current level of 56 % to two-thirds of the total R&D investment (EC 2002).

On the level of individual member countries three different sources of R&D funding can be distinguished:

- Industrial sector
- Government
- Abroad

According to the latest figures, the average share of industry in research financing is 56 % for the European Union, well below the values for the US, Japan and the European high-flyers Finland and Sweden (see Figure 12).

Figure 12: R&D expenditure by source of funds; 2001



Source: Eurostat, OECD, own calculations

The EU has slightly expanded its share of industry from 52 % in 1991 to 56 % in 2001, although some countries experienced quite diverse developments. In Austria, for example, the share fell from 52 to nearly 40 %. In Finland it now amounts to 70 %, up from 56 % at the beginning of the 1990's.

The share of industry in financing R&D: Finland and Sweden¹²

In **Finland** the steep rise in research intensity (between 1990 and 2001 from 1.9 to 3.4 % of GDP) was financed almost entirely by industry which expanded its share from 56 to 70 % and which currently pays for research to the tune of 2.4 % of GDP (1991: 1.15 %). Within the industrial sector, however, it is essentially one company which is responsible for this development: Nokia increased its research expenditures more than fourfold from 0.3 to 1.1 % of GDP (almost one third of all Finnish R&D expenditures; see Ali-Yrkkö, Jyrki and Raine Hermans 2002).

¹² Data source: OECD (2002a), Ali-Yrkkö, Jyrki and Raine Hermans (2002), OECD (2002b)

Similarly, a high degree of concentration on just a few company can explain the case of **Sweden** as well, where 65 % of all R&D expenditures is concentrated in 20 firms, half of all expenditures by the industrial sector are financed by just 10 companies and 20 % of firms hold approximately 80 % of all patents.

Although impressive, the high concentration of research activities on just a few companies certainly entails considerable risk.

Nevertheless, it can be stated that the target for the industrial sector's share seems to be compatible with a trend originating around the middle of the last decade: a simple trend extrapolation of the development since 1990 (see Schibany and Streicher 2003 for more details) results in a 59 % share in 2010, which rises to 63 % if the trend is computed on the basis of the last 3 available years – not too far from the target's 67 % requirement.

However, the preceding analysis raises an important issue, which also bears on the question of consistency in the formulation of targets: what exactly is meant with the 'industrial sector' whose share in R&D financing is to be increased from the current 56 to 67 % by 2010? It should be stated that, at the level of individual Member States, R&D funding from abroad matters. It can, for example, be used as an indicator of the competitiveness of a R&D location. Additionally, it matters if the headquarter of a large firm in the member country X decides to invest in the member country Y and not in member country Z (it matters especially for country Y). But at the level of the EU, where performance is contrasted with the US, things are different. As long as the R&D funding is invested within an European country a differentiation between Member States does not make sense. Thus, one can conclude that the funding source 'abroad' can to a certain extent (excluding the R&D funding coming from a non-European country like the US or funding from Framework Programs, which also fall into the category 'abroad') be attributed to the industrial sector.

To use Austria as an example, the share of industry in financing R&D fell from 52 to 39 % between 1990 and 2000, while at the same time the share of research financed from abroad exploded to 20 % in 2000, up from just 3 % in 1990. Who, then, are the foreigners who pay the bill for a fifth of Austrian research? On the one hand, it is the European Research Programs financing 1.3 % of research expenditures in Austria, equivalent to about 7 % of total foreign funds^{13,14}. The rest consists basically of foreign firms¹⁵. In other words, it is the share of *domestic* industry which fell to 39 %; the share of industry in an institutional sense probably has even risen, assuming that by far the biggest share of foreign funds is attributable to the industrial sector, from $(52+3) = 55$ % in 1990 to $(39+20) = 59$ % in 2002.

For the EU, the respective values are $(52.4 + 5.6) = 58$ % in 1990 and $(55.8 + 7.1) = 62.9$ % in 2002.

The 67 % share of industry is already a reality (or nearly so); if it hadn't been the share of *domestic industry*, which the European Commission, in formulating this target, has obviously

¹³ Data for 1998; source: Statistik Austria (2002)

¹⁴ Strictly speaking, the EU research programmes are not exactly 'financed by abroad': it is contributions by the Member States which are redistributed by the Commission. As such, at least part of this fund is really 'domestically financed'.

¹⁵ Although a sizeable share of total foreign research finance is concentrated on just a few international companies.

had in mind, as it explicitly mentioned the 56 % as the ‘current level’. In the light of another EU target, the *Ever Closer Union*, a distinction between foreign and domestic firms seems a bit anachronistic.

4.2.3 A final remark on the Barcelona target

Quantitative targets for the European Union as a whole can be a problem for many reasons. For instance, just three countries, Germany, United Kingdom and France, produce half of the EU output. This share increases to 75 % when Italy and Spain are taken into account. Therefore, it is this group of countries that ‘make or break’ any EU-wide target. Small countries exert almost no influence.

Therefore, it wouldn’t make sense to wholly disregard the national level in setting R&D targets. This is especially true as, by taking into account existing structural peculiarities, the attainability of national targets could more easily be ensured.

Another issue is the remarkable concentration of R&D expenditure in the business sector. Nokia finances 1/3 of all R&D expenditures in Finland and Ericsson covers about 2/5 of all R&D expenditures in Sweden. A comparable high concentration rate will be found in Austria once Siemens Austria (including maybe the VA-tech) finances about 1/5 of all R&D expenditures. Thus the business part of the R&D quota in these (and other) countries is mostly determined by a handful of very large companies, which have their own autonomous R&D strategies and investment plans. The public contribution to their R&D expenditures is minor with no significant impact. These observations make the 3 % target even more questionable. If the main part of the R&D quota is determined by a handful of big companies, with which the influence and impact of the public sector is rather limited, then policy makers should be advised to look past a quantitative target, which can hardly be influenced by policy measures, to other targets.

But the good will of policy goes further. It was decided that the business sector should finance two thirds of the additional investment. When policy makers decide that the business sector should bear additional R&D investments, the fundamentals of economics have been left behind. The private sector consists of individual enterprises, with every single enterprise investing in additional R&D if and only if the expected returns on this investment exceed costs. It can therefore be safely assumed that these kind of business decisions depend on many endogenous and exogenous factors, among them changes in demand for firms’ output, sector specific developments, etc. Only to a small degree does it depend on agreements of the European Council or the wishes of the European Commission. Good intentions of policy makers can therefore easily turn out to be ineffective. Beside ‘getting the fundamentals right’, policy does have an important role in creating adequate framework conditions to foster innovation led growth.

4.3. WHAT MAKES THE DIFFERENCE IN R&D INTENSITY BETWEEN THE US AND THE EU?

Figure 12 showed, that two thirds of the Gross Domestic Expenditure on R&D (GERD) in the US are financed by the industrial sector (EU: 56 %) and 27 % is financed by the government

(EU: 34 %).¹⁶ Traditionally, it has been a major challenge for governments to maintain the level of R&D funding necessary to fuel R&D conducted mainly by the higher education and government sector. The government, then, has the task to enrich the knowledge base of the economy.

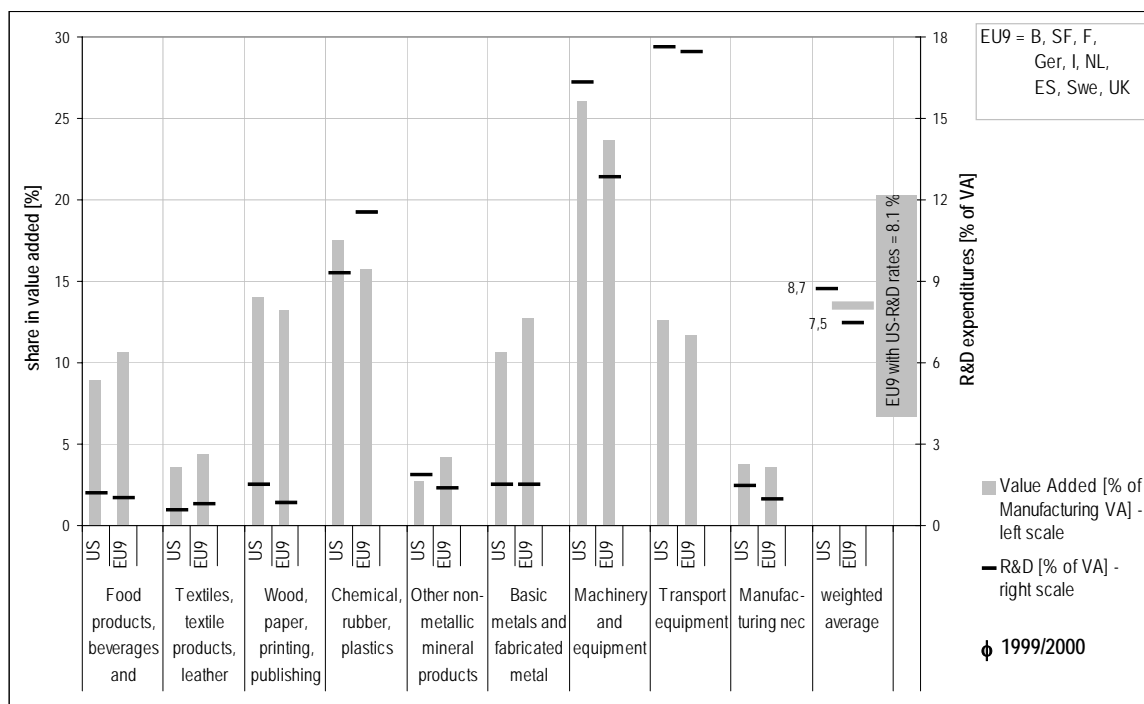
Independent of the source of financing, the R&D activities executed by the industrial sector are essential for the innovative output and competitive dynamics of a country. The fundamental characteristic of industrial sector R&D is that they are ultimately innovative and profit-oriented for the purpose of increasing the competitiveness of the firm.

Industries differ typically in their relative efforts to produce and absorb knowledge that can be measured by R&D intensity, i.e. by share of R&D expenditure in value added. Usually, the R&D efforts of an industry depend on the types of products and the (related) characteristics of the productive technique. Technically sophisticated and knowledge-intensive products are expected to have R&D-intensive production methods with high R&D expenditure and human capital efforts. Additionally, differences exist between the manufacturing and the service sector.

Figure 13 shows R&D intensities across industries in the manufacturing sector in the EU-9 (Belgium, Finland, France, Germany, Italy, Netherlands, Spain, Sweden and UK) and the US. In addition, it presents the share of industries in value added of the total manufacturing sector. The figure shows that the difference in R&D intensity in the manufacturing sector between the EU and the US is not very obvious. The share in value added does not vary significantly between the EU and US. However, a higher variation of R&D intensities can be seen within the sector, such as the US having a high R&D intensity in machinery and electronic equipment and transport equipment. In 1999/2000 the weighted average in R&D intensity in the EU was 7.5 %, which was lower than in the US with 8.7 % of value added, yielding a difference of 1.2 percentage points. A shift-share analysis shows that half of the difference can be explained by structural factors and half of the difference by different R&D intensities. On this basis one can conclude that it is not the manufacturing sector which contributes to the difference in R&D intensities between the EU and US

¹⁶ The missing share to 100 % is financed by the source 'other national sources' in the US

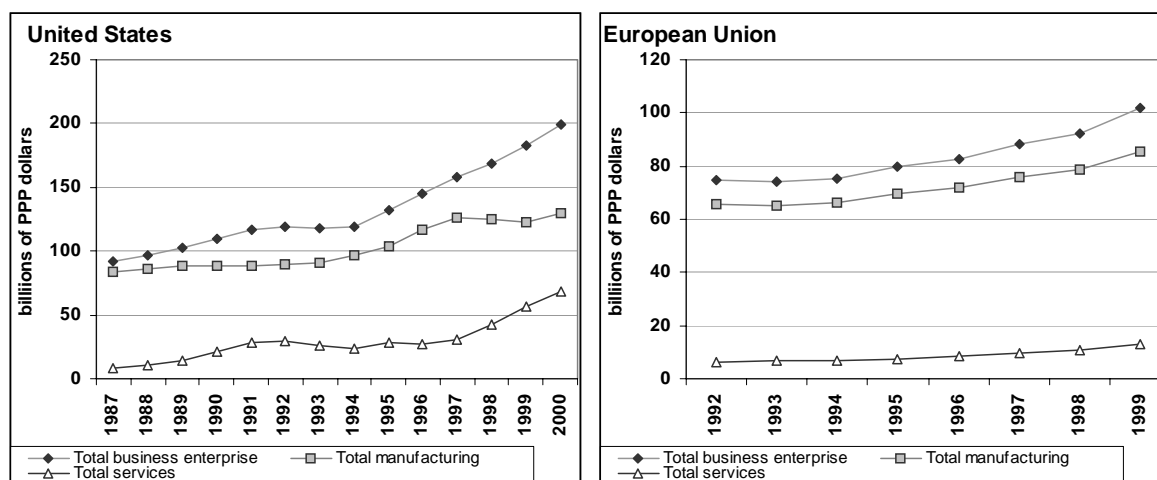
Figure 13: R&D intensities across manufacturing – EU-9 and US



Source: OECD (STAN-database), own calculations

The picture changes when one examines the service sector. The most recent data for the late 1990's and 2000 show a reemergence of the US service sector as a key performer of industrial R&D (Figure 14). A turnaround that began slowly in 1997 was followed by large increases each year thereafter. The service sector's share of total R&D in the US was less than 19 % in 1996, but rose to 34 % by 2000. In the EU the service-sector R&D has also steadily increased each year and accounted for 13 % of total EU industrial R&D in 1999. However, the US service sector invests more than 57 billion PPP-dollar in R&D compared with 13 billion PPP-dollar in the EU. This, in itself, suggests a significant difference between these two economic blocks. Figure 14 shows the development until the end of the 1990's. Since the year 2000 the development of the R&D system in the US is quite different and any comparison with the EU should be made with caution.

Figure 14: Industrial R&D performance by sector in current PPP \$



Source: OECD, ANBERD, Science & Engineering Indicators 2004

4.3.1 Defence research makes the difference

Since 2001 the R&D system in the US as a whole and specifically the role of the federal government has changed dramatically. The American Association for the Advancement of Science (AAAS) has summarized the status-quo in the US as follows:

“Record-breaking federal budget deficits, high-priority spending increases for homeland security and national defence, and restraints on domestic spending to bring down future deficits are combining to squeeze the federal investment in non-defence, non-homeland security R&D.” (AAAS August Status Report on R&D in Fiscal Year 2005 Appropriations)

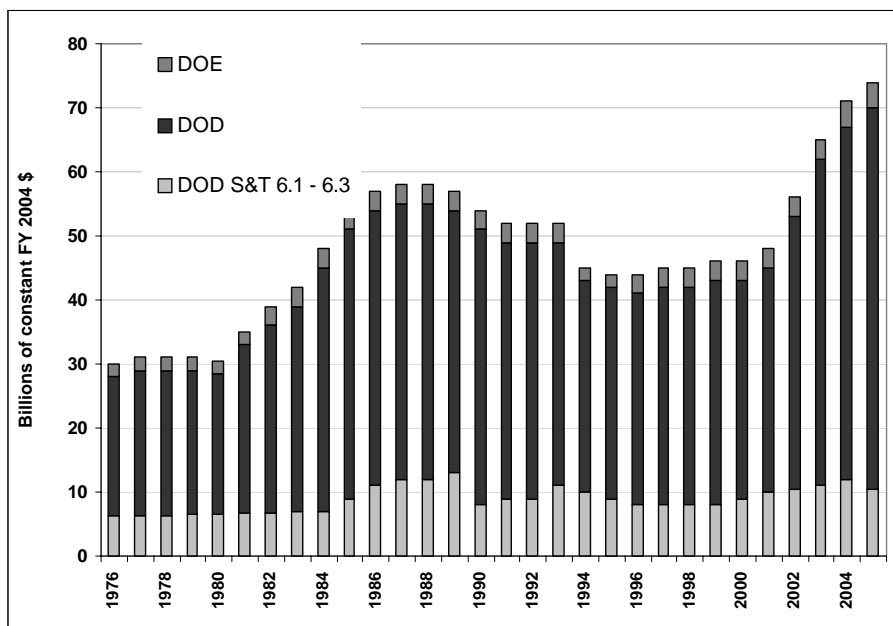
The focus on defence and homeland security since 2001 results in large increases for defence R&D, and steep cuts for R&D in support of other national missions. The House of Representatives has drafted fiscal year (FY) 2005 budget bills that would keep the federal investment in non-defence, non-homeland security R&D flat funded next year. Excluding a modest increase for biomedical research in the National Institutes of Health (NIH), non-defence R&D would decline 2.1 % under the latest House plans.

Defence R&D has benefited strongly from the high priority assigned to national defence. According to the budget bills for the FY 2005 defence R&D would rise 4.9 billion \$ or 7.0 % to **75.1 billion \$** for a record total driven largely by substantial boosts to defence-related development activities in Department of Defence (DOD) and Department of Homeland Security (DHS).¹⁷ After several years of near-parity between defence and non-defence R&D around the turn of the century, defence R&D would continue to expand to 57.2 % of total federal R&D. It should also be pointed out that the multifaceted targets of defence R&D has changed. In its first term, the Clinton administration sought to use ‘dual-use’ funding to enhance US industrial competitiveness. The Technology Reinvestment Project (TRP) passed by Congress in 1992 was the largest and most high profile of these programs. The TRP was seen by the DOD as a way of integrating its military technology base with that of the commercial sector through support for the development and exploitation of dual-use technology. However, beginning in 1995, the Republicans controlled Congress began to roll-back dual-use programs because of concerns that they were diverting scarce DOD R&D resources away from their primary mission of national defence. Under the Bush Administration, the needs of the defence mission define US defence R&D priorities rather than the idea of enhancing US commercial industrial competitiveness *per se* (James 2004).

Looking closer at defence R&D, Figure 15 shows that weapon system development has been at the root of all enormous increases in the past few years. The DOD budget is divided into the DOD’s Science and Technology (S&T) base activities (budget categories 6.1 to 6.3) which are more research oriented and, although they are supported by the DOD, are not necessarily expected to lead to specific weapon systems. These research oriented S&T activities comprising basic and applied research and technology development account for little more than 15 % of total DOD R&D spending. However, the huge part of the DOD R&D goes to weapons development activities. These categories cover advanced development work, mostly performed by industrial firms on specific weapon systems. Thus, development, testing and evaluation of weapon systems represent by far the largest share of the budget – almost 85 %.

¹⁷ 25 % of the estimated total R&D investment of 300 billion \$ in 2004.

Figure 15: Trends in US Defence R&D, 1976-2005

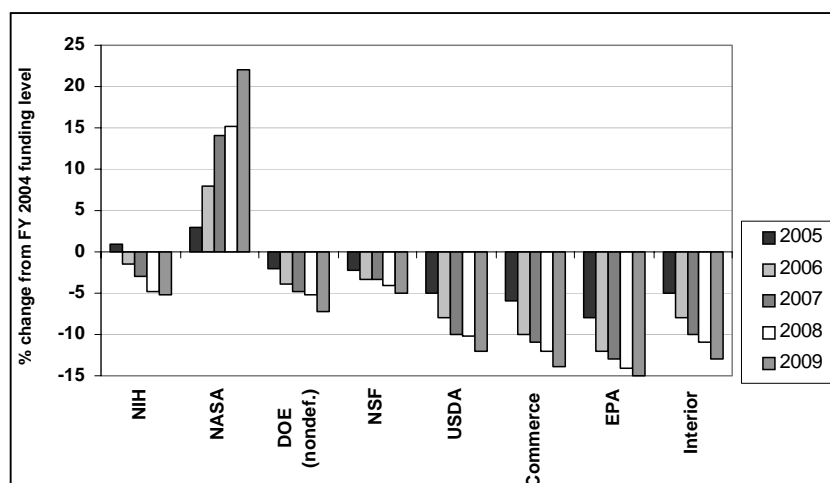


Source: AAAS 2004, DOE: Department of Energy, DOD: Department of Defence

It is good to remember that the US administration decided to spend 75 billion \$ for military purposes in FY 2005. Germany (the largest EU country), in comparison, has gross expenditure on R&D (including the industrial and the public sector) of about 50 billion €. The total budget of the European Framework Program is about 17 billion € over a period of 4 years.

In order to afford this huge increase in defence-related activities the Bush administration included, in the FY 2005 budget proposal, a decline in non-defence R&D funding. Given this, 9 out of the 12 largest R&D funding agencies would see their budgets fall in real terms. The National Science Foundation (NSF) would be forced to cut research and related activities, which funds most of the NSF's R&D activities, by 2.3 % or 100 million \$ (from 4.25 to 4.15 billion \$). NASA is in store for large increases over the next few years, but only for space exploring programs. Other NASA funding areas see their R&D funding decline. According to the AAAS projections based on the budget plans of the Bush Administration for the period 2005-2009 other agencies would see more dramatic reductions in their R&D portfolios: The DOE's Office of Science would see its R&D portfolio decline by about 9 % after inflation, US Department of Agriculture R&D would fall 11.3 %, Commerce R&D would fall 13.6 %, R&D in the US Geological Survey would fall 13.2 %, and EPA's R&D portfolio would plummet 15 % over the next 5 years (see Figure 16).

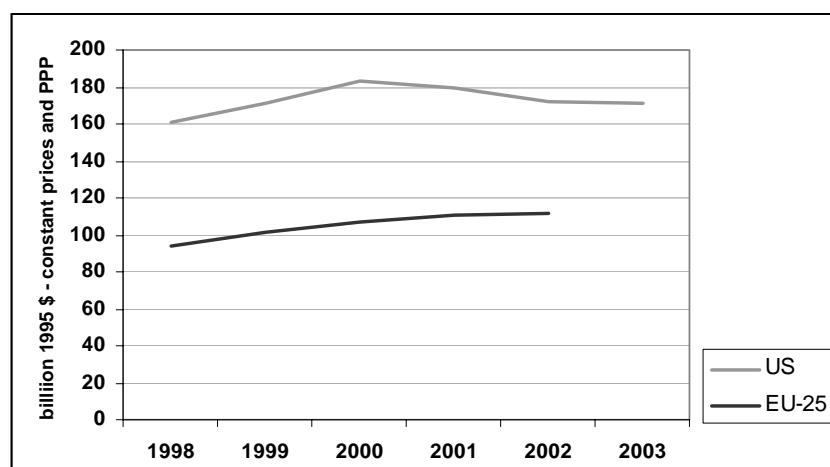
Figure 16: Projected Nondefence R&D in the President's Budget, FY 2004-09



Source: AAAS analysis

Moreover, the US industry has invested less in R&D recently, since its peak in 2000. According to AAAS (2004) the number of companies forecasting reduced spending is rising significantly. Although the economy shows signs of recovery, lagging consumer confidence, large predicted federal deficit and almost certain reduction in support for non-defence research fuels conservative action by industrial management.

Figure 17: Business enterprise R&D (BERD) – EU and US



Source: OECD (MSTI)

The US example shows very well that sound public finances are beneficial to R&D investment. The record budget deficit in the US as a result of large tax cuts¹⁸ has made other choices necessary to get the budget back in balance. Only in the area of domestic discretionary spending, out of which nearly all R&D funding agencies get their budgets, do lawmakers advocate some fiscal restraint. Europeans have the opportunity to learn from this valuable lesson. A more binding budget constraint with clear restrictions of deficit financing underlines the need for prudent public expenditure policies. Governments need to ensure that public R&D spending does not crowd-out more productive private sector investment. Shifting public spending

¹⁸ The federal government is expected to take less than 16 % of the US GDP in tax revenues in 2004, down sharply from nearly 21 % just four years ago in 2000.

towards areas such as the defence industry with no long-term commercial utility has no positive spill-over effects on private investments. Moreover, most of the defence-related investment goes into big firms with research activities in the civil as well as military sector. A massive short-term increase in military investment is only possible with a shift of internal R&D resources from the civil into the military field which leads to a certain crowding out effect within these firms. This can have the negative effects on competitiveness of these firms on technology markets.

4.3.2 Concluding remarks

It is hard to find the optimal R&D quota for a country and even harder to find it for the European Union. R&D investments are first of all determined by the existing technological and scientific structure of specialisation. Thus, countries with specialisation in medium or low-tech sectors, although with a highly efficient production and international competitive products, will have a lower R&D quota than countries with a high share of high-tech production. However, structural change (*Strukturwandel*) takes time. Finland can be seen as an exception and is not very appropriate for generalisation. When defining a ‘Barcelona target’ one has to keep the structural conditions in mind – more than additional money. If additional R&D investment is not absorbable by the existing human and industrial resources it has the effect to increase only the salaries of the R&D personnel, thus a minor social return from this investment. Moreover, investing in R&D is not only a matter of money. The emphasis of the Barcelona target for R&D could be misplaced, as the question is not so much one of increasing the level but rather of enhancing the efficiency of R&D. This would mean achieving, perhaps, the same output with less input.

5 Enhancing growth – the Sapir Report

With the Sapir-Report (Sapir et al. 2003) the growth debate returned to Europe. On behalf of the European Commission a high-level group of independent experts (under the chair of A. Sapir) was asked, “... to review the entire system of EU economic policies and to propose a strategy for delivering faster growth together with stability and cohesion in the enlarged Union.” (Sapir et al. 2003, p.i). While macroeconomic stability has considerably improved during the 1990’s and a strong emphasis on cohesion has been preserved, the EU system has failed to deliver a satisfactory growth performance. In order to maintain stability and cohesion, as well as preserve the European social model, higher GDP growth is necessary.

What makes the Sapir-Report so valuable is the fact that it does not offer a ‘quick fix’. Above all, the authors were well aware that a generation of growth and development cannot be easily ‘designed’, let alone predicted. Long-run growth is a highly complicated process where markets, government policies but also economic institutions interact in so many ways that many national or regional eccentricities may emerge. This is the greatest virtue of the report: a long-run growth strategy for the EU has to be developed with the entire economic system of the EU in mind. Despite the richness of analytical work and analysis the report shows its limits. For instance, the focus of the report and the recommendations are entirely on the EU level of policy and governance, a minor contributor to the present growth slowdown. A larger problem is to be found at the Member State level (see Pelkmans and Casey 2004). Although the analysis recognises the huge gap between what Member States say (often in an EU context as well) and what they do or fail to do, the policy options are virtually silent concerning national strategies for growth.

5.1. GROWTH POLICY IN A NEW CONTEXT

During the ‘*trente glorieuses*’, the 30 years between 1945 and 1975, Europe witnessed an unprecedented period of growth, stability and social cohesion. The post-war reconstruction created an economic and social environment, which ensured that the three sides of the magic triangle operated in a mutually-reinforcing manner. Stability and especially the growth performance ensured that the welfare state remained fairly manageable. Although it has risen considerably over the years, the share of total government expenditure in GDP in the EU-15 was still a relatively modest 36 % in 1970 (it was 46 % in 2000).

Things changed with the two oil shocks in the 1970s. Since then three profound and interconnected processes transformed the socio-economic environment across Europe and the world, namely, demographic patterns, technological breakthroughs and globalisation. The combination of slow growth and high unemployment resulted in increased demands for social protection with severe consequences for public finances. According to the ‘Sapir-Report’, Europe has been ‘stuck in a negative spiral’ since the mid-1980’s. Lower GDP growth and employment rates meant increasing public expenditures, which required increasing public revenue, which in turn implied higher social contributions (these increased by nearly five points of GDP between 1970 and 1985) and higher direct taxes (with an increase of nearly three points

of GDP between 1970 and 1985). Among other things, this reduced the incentive to work and to invest, hence further reducing the prospects for output and employment growth. Thus, in order to preserve the costly European social model a higher GDP growth is required with an adaptation to the new-socio economic environment. The shocks, as in the 1980's, were long-lasting and the European system seemed politically unable to reform itself and to establish a new social contract aimed at increasing growth and preserving social welfare. Four challenges were outlined in the Sapir-Report, emphasising that growth should be high on the political agenda.

First are demographic trends. Europe's population aged considerably after 1960, much of which is owed to declining population growth. Between 1960 and 2000, the average dependency ratio (defined as the number of persons aged 60+ years per 100 persons aged 15-59 years) for the EU-15 rose from 26 to 35. At the same time, the dependency ratio for the US remained almost constant at around 25. The underlying factors for the contrasting situation were differences in fertility and migration rates.

Second, are technological trends, which have greatly changed the workplace in Europe. The diffusion of ICT has led to skill-biased technological change and reduced the demand for unskilled workers resulting in deterioration in the labour market for unskilled workers during the 1980's and 1990's.

Third, the Sapir-Report shows that the EU can grow secularly if it exploits well, and becomes more flexible towards globalisation. The EU will need a permanent capacity to change in a globalising world economy, in which trade in goods and services will further intensify and foreign direct investment, human resources, information and knowledge, new ideas, and finance will tend to respond even more actively to opportunities and incentives. A refusal to accept or spearhead change will not only throttle the long-run growth rate, as such growth is the result of structural change, but, sooner or later, it risks being amplified by the relative unattractiveness of investment or R&D in Europe.

Fourth, for the next two or three decades the new Member States will require (sustained) catch-up growth. Both the incumbents and the new members have to prepare themselves for enlargement in terms of necessary institutional changes and policy adjustments in order to ensure that enlargement will increase prosperity, which, in turn is a win-win strategy for the EU as a whole.

European politicians are perhaps finally becoming alarmed by the slow performance of the European economy. Great confusion caused by a myriad of contributions and coordination 'processes' without a universal approach, has plagued any solution to the slowdown. All coordination processes are meant to be relevant for economic growth and most subject matters typically fall under the competences of the Member States (although positive effects are expected from working together). This resulted in the 'open method of coordination'; created at the Lisbon Council with the aim that Member States could develop a sense of 'shared ownership' in order to devise a credible growth strategy.¹⁹ But it remains that the central problem of

¹⁹ 'Implementing this strategy (*to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion*) will be achieved by improving the existing processes, introducing a **new open method of coordination** at all levels, coupled with a stronger guiding and coordinating role for the European Council to ensure more coherent strategic direction and effective moni-

Europe's lacklustre economic performance is to be found at the level of governments of the Member States, and is dependant upon what Member States do and fail to do. As is already evident in other policy areas, such as the S&T policy, it is becoming more and more evident that the 'open method of coordination' is not a panacea for badly needed policy reform within the Member States (not to mention the economic coordination for raising the long-term growth rate in the EU). There are many reasons why such coordination fails to work, but what is clear is that there is a lack of 'hard' powers anywhere in the coordination processes. It is characteristic even within the Lisbon process, that not all directives linked to the internal market (where the EU should have some bite) would be transposed by the Member States (the average transposition rate for these directives is only 58 %).²⁰ Regarding pure instances of 'open coordination' the experience to date has been disappointing.

Achieving a higher economic growth path for the European Union is a complex exercise which should include a good mix of economic coordination and policy competition (within the regulatory boundaries of the internal market). When this 'open coordination' phase is not working the EU seems caught between too little centralisation and the costly and unattractive alternative of greater centralisation, which brings with it problems of legitimacy and the challenges of responding to local diversity and consensual problem-solving. The Sapir-Report view that the EU might be forced into what they call 'corner solution' corresponds to this (see also Pelkmans and Casey 2004). Member States, first and foremost, control the process and as any kind of growth strategy must be accepted and implemented at the level of domestic politics. In this respect (and according to the mandate of the Sapir-Report) it was the most crucial piece which was left out of the report: the major culprit in the failure of European growth is to be found at the Member State level.

5.2. THE RECOMMENDATIONS

The Sapir-Report sees that the context for growth has realistically changed. In the post-war period growth and catching-up with the US could largely be achieved through factor accumulation and imitation. But, once European countries began to approach the technology frontier, and with the occurrence of new technological revolutions in ICT, it became clear that innovation at the frontier has now become the 'main engine of growth'. This has in turn required new organisational forms, less vertically integrated firms, greater mobility both intra- and inter-firm, greater flexibility of labour markets, a greater reliance of market finance, and a higher demand for both R&D and higher education. However, the report admits that the necessary changes to economic institutions and organisations have yet to occur on large scale in Europe.

The recommendations of the Sapir-Report are the following:

toring of progress. A meeting of the European Council to be held every Spring will define the relevant mandates and ensure that they are followed up.' (Lisbon European Council, 23. and 24 March 2000, Presidency conclusions).

²⁰ See chapter 4.1.1 of this study

5.2.1 Make the Single Market more dynamic

The Sapir-Report correctly makes this recommendation its first priority by suggesting that, “a dynamic Single Market is the keystone to Europe’s economic growth.” While much progress has been achieved in goods markets, integration in services and in network industries remains very limited. A truly dynamic Single Market requires not only more integration, but also better regulation to facilitate entry by new players or the development of risk-capital. The problem, however, is to get the Member States to act according to this insight. The state of the internal market for services, subject to free movement demonstrates the very opposite: local rules and far-reaching discretion by all kinds of authorities, if not violation of mutual recognition, throttle cross-border initiatives and the competitive rivalry of dynamism. The slow liberalisation of network industries and the agonising problems inherent in the EU patent, to mention only a few of them, form a brake on potential growth.

The specific recommendations are the following:

The implementation of the Single Market can be tested on the effects on new *entry* from start-ups and from firms not previously present in a sector. Any product market regulation should therefore be examined for its effects on innovation and new entry. Here the report shows diplomatic skills in terms of excessive emphasis on consultations in the Brussels circuits. Regulators should not be captured by what are euphemistically called ‘stakeholders’.

“To frame regulations appropriately with entry in mind requires an understanding of market structure and dynamics. Regulators therefore need to have access to the requisite expertise and can not solely rely on industry inputs alone since these by definition reflect the interest of the incumbents.”
(Sapir-Report 2003)

The emphasis on innovation and new entry is carried over to *competition policy* by ensuring, that market-opening does in practice lead to the achievement of potential gain.

“Thus, when defining markets and assessing dominance, market dynamics and potential competition, in particular the potential for competition from the newly-innovating needs to be taken into account. At the same time, the role of research and development in opening up competition ... needs to be considered.” (Sapir-Report 2003)

The Sapir-Report backs the *Risk Capital Action Plan* and *Financial Services Action Plans* by supporting the accelerated implementation of both of these actions rather than bringing forward new recommendations in these areas.

Labour mobility is a valuable input for growth and entrepreneurship. Concerning the intra-EU mobility the Sapir-Report sees the main obstacles ‘in terms of the non-transferability or non-compatibility of acquired rights in terms of basic provisions for health, pensions and unemployment need to be removed’. Additionally, Europe needs a positive attitude towards immigration from third countries.

5.2.2 Boosting investment in knowledge

Europe invests too little and inefficiently in higher education and research. The Sapir-Report takes harsh view of European practices while offering suggestions concerning the leading criteria for an increase in public spending on higher education and research: (i) neither member state governments nor the EU should try to pick winners and adopt this sort of top-down

approach, (ii) public support for industrial R&D should be based on clearly articulated public needs and avoid convert subsidisation of individual enterprises.

Within the European *education systems* the reforms have to be profound and mobility as well as competition must become well-accepted principles. The EU can play a role in encouraging a more international outlook among institutions of higher education and special attention should be given to promoting excellence at the postgraduate level as well as to favouring the emergence in Europe of top graduate schools or departments.

In terms of *R&D* the Sapir-Report goes into the heart of the European research system: the leading principle of the system was the *juste retour* principle (getting out what one has paid in) which leads to a dispersion of funds in a ‘sprinkler principle’ (a little for everybody) without prioritisation and without proper evaluation. This represents the well known ‘15+1’ situation. R&D is an important input for growth and sustainable development and hence a driver of growth at the national level. Additionally, it is an indicator for the attractiveness of R&D locations for multinational firms (*Standortwettbewerb*). Thus, a clear-cut interface between national and EU R&D policy can hardly be achieved through coordination of national policies, but instead through the creation of an independent European Agency for Science and Research (EASR). This should be done according to the model of the US National Science Foundation, which has built up an enviable reputation both for independence and rigour in its appraisal processes based on peer review.

In terms of the lack of private investment in R&D the Sapir-Report advocates *tax credits* as the single most efficient instrument to stimulate investment in R&D or innovation, especially by small start-up firms.

5.2.3 Improving EMU’s macroeconomic policy framework

Now that the economic and monetary union and the single currency have delivered price stability it is time to consolidate this achievement. Thus, a proper macroeconomic framework does not represent a true growth policy, although its absence may hamper growth significantly. For this, the manner in which macroeconomic policy is set should be adjusted and improved. The monetary and fiscal policy framework of EMU should be made more symmetric over the phases of the cycle. The Sapir-Report firmly rejects that the Stability and Growth Pact would somehow become an anti-growth package. The report makes several suggestions for a more effective implementation of the Growth and Stability Pact, which includes among others, the suggestion for a higher degree of country differentiations by taking into account both explicit and implicit public liabilities in the assessment of national budgetary positions.

5.2.4 Convergence and restructuring in an enlarged EU

The Sapir-Report envisages an overhaul of the EU funds. It advocates a convergence fund and a restructuring fund. The convergence fund should only be allocated to (low-income) countries, not regions. The arguments for this approach are convincing (see Pelkmans et al. 2004). Richer countries having one ‘poor’ region obtain transfers due to *juste retour* considerations, the effectiveness of transfers is reduced by a lack of concentration and money is needlessly pumped around causing a lot of cohesion bureaucracy for no good reason. In the EU-15 a focus on countries rather than regions would immediately avoid some 40 % of transfers. Due

to the experience of the new members during their period of economic transition, showing that the quality of the institutions is a key precondition for growth in low-income countries, institution building should be the highest priority.

5.2.5 Effective EU governance

The Sapir-Report advocates that the EU should have more power to oversee the correct application of Single Market rules. Independent EU bodies should be created in certain specific areas, while more authority could be devolved to decentralised, but coordinated, systems of authorities operating within the same legal norms. However, clear-cut solutions are rarely politically feasible on the sensitive interface between EU level and that of the Member States. But the Sapir-Report doubts that relying on the ‘open method of coordination’ alone, i.e. by issuing guidelines, indicators, agreeing benchmarks, and comparing performance, would be sufficient to implement a growth strategy. Each attempt at coordination without the use of financial incentives remains soft and lacks the necessary bite. Thus, more effective methods should be used in those policy areas where there is a rationale for stronger EU involvement. Infrastructure, labour mobility and higher education are good examples for direct EU responsibility.

5.2.6 Mobilising the EU budget

“As it stands today, the EU budget is a historical relict. Expenditures, revenues, and procedures are all inconsistent with the present and future state of EU integration,” suggests the Sapir-Report. Moreover, the EU budget is relatively small, and half continues to be spent supporting a sector whose economic significance is declining. In the end, little is used to provide economic or non-economic public goods. Despite its small size the EU budget is also highly politicised. The Sapir-Report suggests that the allocation of money should respect the principle of ‘one fund for one goal’. It proposes the EU budget should, in the future, consist of merely of three funds:

The Growth Fund should be destined for those projects that would make the greatest contribution to the EU growth project. It should cover, in particular, three areas of spending which have been identified as the most efficient and relevant growth engines at the EU level: R&D and innovation, education and training, and infrastructure spending (all of which to serve as a ‘catalyst’ for national expenditures). However, the creation of such a fund is only meaningful if a convincing framework for the EU/national interface can be set up and implemented.

The Convergence Fund was discussed before and should be allocated to low-income countries and used for two purposes: institution building and investment in human and physical capital.

The Restructuring Fund, also discussed above, implies ‘a very sizeable reduction in the amount devoted to agriculture’. The fund is aimed at facilitating the process of resource allocation due to deeper and wider economic integration of the EU area and should be available, with no restrictions, to all workers adversely affected by change, irrespective of their country of residence or their sector of activity.

6 It's the Internal Market, stupid

The intention to create a fully integrated European internal market has a history of nearly two decades. In 1985 the European Commission issued a white paper, articulating a plan for achieving the integrated internal market by 1992. Realizing that the harmonization of rules and regulations would be difficult, the principle of 'mutual recognition' was implemented: if a product is lawfully manufactured and marketed in one member state, there is no reason why it should not be sold freely throughout the community. By 1992 the border controls for goods were eliminated.

The Treaty on European Union States is based on the "*principle of an open market economy with free competition*". European competition policy comes into play when trade between Member States is affected, i.e. when it has a community dimension. In practice this gives a very broad scope for the European Commission to intervene. Additionally, the poor performance since the Lisbon council has put the political awareness more on competition policy: whilst important progress has been achieved in terms of market integration since the creation of the internal market, many economic sectors in Europe remain fragmented and are characterised by weak competition and persistently high prices that harm industries and consumers alike.

Although the previous sections of this report indicated some scepticism concerning the comparison of the EU with the US, one lesson can be learned from the US performance of the last years: vigorous competition in an environment supportive of business is a key driver of productivity growth and further competitiveness. All sectors in the US with the highest productivity growth since the mid 1990's exhibit a high competition intensity. This led to the assumption that a weak productivity performance in Europe is caused (as a chief factor beside many other factors) by insufficient competition intensity and distortions.

A system of well functioning markets is an effective mechanism for achieving an efficient allocation of resources. The liberalised **telecommunication sector** in the EU is a good example which illustrates the benefits of competitive forces in relation with appropriate regulation. According to McKinsey (2002), in both France and Germany labour productivity in the telecommunication industry grew dramatically during the 90's, rising at a compound annual rate of 17.7 % in France and 19.4 % in Germany. The US, meanwhile, lagged behind with just 9.4 %. This meant that the two European countries narrowed the gap existing between them and the US over the decade, with Germany actually overtaking the US in 2000. This dramatic catch-up was mainly due to the liberalisation of fixed-line markets and much faster productivity growth in mobile services. In fixed-line services, market liberalisation and the privatisation of national incumbents increased competitive intensity and shareholder pressure. This led to the incumbents shedding excess labour and cutting call tariffs. Traffic increased with a smaller workforce, hence the increase of labour productivity. But what was the cause of the lower productivity in the US?

As McKinsey (2002) has pointed out, it was not determined by the lack of a common technology standard. Rather, the key factor is, despite similar penetration rates, that more than 50

mobile providers serve fewer than 200,000 customers each in the US, while in France and Germany, where there are in total only three and four providers respectively, each provider serves an average of 10 million customers. This is a direct result of regional licence auctions in the US. Although competitive forces are at work and consolidation has started in the US, the legacy of this regulatory approach continues to have a negative effect on productivity.

6.1. COMPETITION DRIVES PRODUCTIVITY GROWTH

Competition puts pressure on firms to innovate and to reorganise their business activities in order to continuously improve their cost structure and reap productivity gains. Sector specific studies show, that over time, competition leads to the introduction of improved products and processes, weeding out inefficient firms and reallocating productive resources from retreating or failing firms to new entrants or more efficient competitors.

The findings of recent studies on gains from competition can be summarized as follows:

“From a long-run perspective, one can see that gains from competition-enhancing regulatory reform are likely to exceed the static gains observed in the short run since firms will continue to innovate in ways they would not have under (inappropriate, A.Sch.) regulation.” (Ahn 2002)

Thus, the link between product market competition and productivity growth is positive and robust with various kinds of competition-enhancing policies (see the example of the telecommunication sector) confirming the welfare gains. The empirical evidence suggests that the likelihood of innovation is higher among firms in competitive industries, leading to the policy conclusion that effective competition between firms in the enlarged internal market is thus the principal factor behind increased innovation and growth in productivity. A ‘pro-active competition policy’ (EC 2004b) should therefore be one of the key elements of a successful strategy to reinvigorate the sluggish Lisbon strategy.

In its sector specific studies for France and Germany, McKinsey (2002) shows quite illustratively that some sectors are still characterised by weak competition and high fragmentation, or to put it in other words, how deregulation and growing competition intensity enhanced productivity growth.

Road freight for example was traditionally a highly protected and regulated sector in Europe with price regulations and market access restrictions. Since the pace and scale of liberalisation in some countries (like France and Germany) are similar today to those in the US, the labour productivity in these two countries has increased as well. From a level of about 60 % of the US level in 1992 the labour productivity in the French and German road freight sector grew by a remarkable 5 % annually. Thus, France and Germany reduced the gap with the US to about 85 % in 2000. This strong growth was primarily fuelled by the deregulation of market access and tariffs as well as by an increase in demand for cross-border shipments brought about by the European Single Market.

Automotive manufacturing has also been transformed. This sector was, at the beginning of the 1990’s, dominated by the Japanese car manufactures, which were 30 % more productive and gaining market share against German imports in the US. The gradual removal of import quotas for Japanese cars, in combination with stagnating western European markets, became

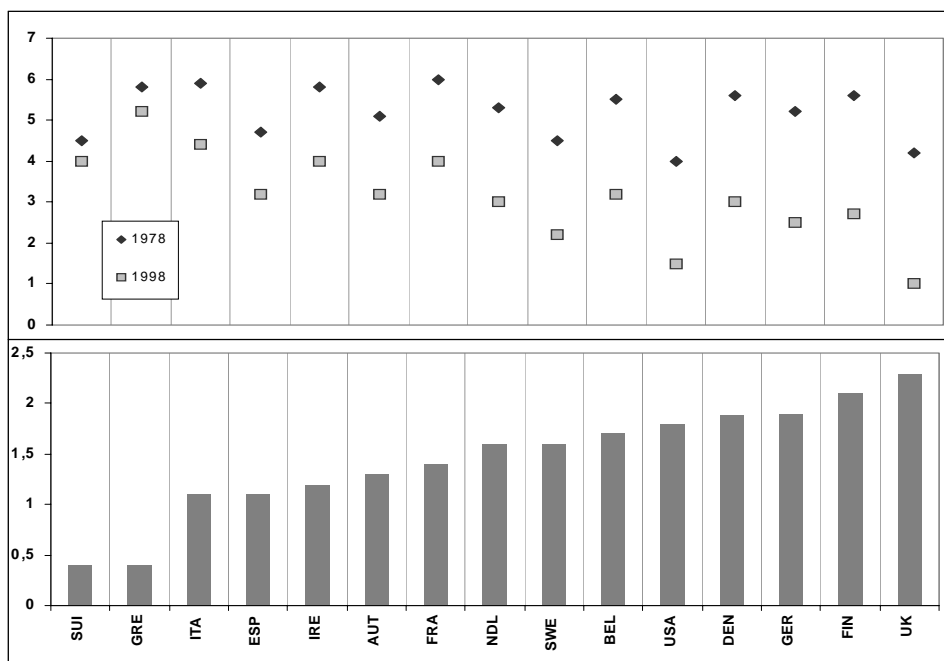
serious threat to the profitability of French car manufactures. The French automotive industry had to react, and boosting productivity became the goal of industry leaders. As a consequence, labour productivity in the French automotive industry grew annually at 15 % from 1996 to 1999. This high productivity growth was triggered by two main factors: first, the partial privatization of Renault and change in management through lean manufacturing techniques, reduced administrative tasks, etc. This helped to improve its processes and its product quality at the same time. The second factor was the lifting of the quotas for Japanese car imports to France, which led first to financial deficits and a crisis at Renault, and then to a successful reorganisation.

The McKinsey studies cover a number of other sectors as well, from mobile telephones to electricity generation and distribution, to retail banking. In most of these sectors, deregulation (or appropriate regulation as in the case of telecom) appears to have had important effects on the behaviour of firms, the degree of competition, and the level of productivity.

Nicoletti shows in his well known studies (Nicoletti 2001, 2003) that differences in competitive pressures have played an important role in explaining the variation in economic performance across OECD countries. He also indicates that product market reforms that enhance competition will have positive effects on employment performance. Although reforms to enhance product market competition will tend to reduce unemployment and boost employment in the long term, there could be significant short-term adjustment problems. It is therefore important that deregulation on product markets has implications for reforms in the labour market.

A recent study by Nicoletti et al. (2001) found a significant effect of regulatory reforms on the employment rate in the business sector (excluding agriculture) even after controlling for the impact of various labour market indicators and the public-sector employment rate. The study applied a time-varying indicator or the regulatory stance in seven network industries (gas, electricity, post, telecommunication, and passenger air transport, railways and road freight) from 1978 to 1998 to represent the evolution of the general regulatory framework in individual countries. Although the speed of progress varied, substantial regulatory reforms were implemented in all OECD countries, resulting in an increase in employment rates by an average of 1.5 to 2.5 percentage points where reforms have been pursued most vigorously (see Figure 18). The study also shows that there is significant scope in most of the analysed countries for additional gains in employment via product market reforms.

Figure 18: Product market liberalisation and labour market performance



Source: Nicoletti (2003, 2001); The regulatory stance is measured by a synthetic indicator ranging between 0 (least restrictive) and 6 (most restrictive)

As the utility sector or telecom sector in the US (there are well know examples from other countries) showed, the building of a competitive market environment does not mean a simple, banal privatisation of formerly protected sectors. Policy makers are responsible for providing a regulatory environment that delivers the right conditions in which the companies with the highest productivity succeed. Providing the right regulatory framework is thus a difficult and complex task, requiring smart regulatory solutions accompanied by privatisation programs. This is especially tricky in network-based sectors with very high fixed costs (electricity grid, railroad infrastructures, telecommunications ...). It is also tricky where smart regulation has to guarantee that third-party access is possible and incentives to increase productivity are guaranteed.

Two determinants are thus essential for a competitive environment:

- Open market access: in many sectors, access to the domestic market for new or foreign competitors is still limited by regulatory barriers (import tariffs and quotas, state owned monopolies, zoning laws, etc.). Additionally, new firms often make innovations at the frontier and must be protected from anti-competitive attempts by incumbents to exclude them from the market.
- Level playing field for competition on quality and prices: if regulation leads to the preferential treatment of a subset of (less efficient) market players, it hinders competition on quality and prices. In some sectors this type of regulation still exists through fixed price lists or a preferential treatment of a subset of market players. Thus more efficient companies are prevented from offering lower prices or better services/products.

Hence, a regulatory framework must be conducive to the creation of business opportunities and the challenging of existing established positions. Within this general framework the specific business conditions are of particular importance, and start-ups, especially, do not have

the capacity to deal with very complex regulatory regimes. Since *time-to-market* is an essential aspect of competitiveness and innovation the time cost involved to set up a company very often is associated with administrative burdens. In high-technology markets and sectors with rapid change a large portion of profit is made in the first months of commercialisation. Delays because of administrative burdens are likely to depress the returns on innovations and are thus not very market friendly.

6.2. THE LIMITED ROLE OF BRUSSELS

European competition policy so far is based on a Community legislative framework essentially provided by the EC Treaty (Articles 81 to 90). On the basis of this body of law, competition policy focuses on four main areas of action (see EC 2000a):

The **elimination of agreements which restrict competition and of abuses of a dominant position** (e.g. price-fixing agreements between competitors). The European Commission can prohibit such agreements and can impose fees up to 10 % of the worldwide turnover. In each of the last three years, the European Commission has dealt on average with over 400 cases concerning agreements restricting competition. Recognizing the abuse of a dominant position is rather complex. For example, holding a dominant position is not wrong in itself, this is the result of the firm's own effectiveness. However, if the firm uses its power to stifle competition, this is an anti-competitive practice which constitutes abuse. And when is such behaviour in practice? When its economic power enables the firm to operate on the market without taking the reaction of its competitors into account!

The **control of mergers** between firms (e.g. a merger between two large groups which results in their domination of the market). Mergers and acquisitions with a turnover of the involved companies in excess of 250 million Euros have to be notified to the Commission for its approval before they are put into effect. Mergers below this threshold can be carried out by the authorities of the Member States under their own legislation.

The **liberalisation of monopolistic economic sectors** (e.g. telecommunication, energy, transport). The opening-up of the telecommunication sector to competition is the best example of the success of the liberalisation process. In other monopoly sectors the process of opening up to competition is under way, aiming to lower barriers to entry in all regulated sectors while strengthening the benefits to consumers.

The monitoring of **state aid** (e.g. the prohibition of a state grant designed to keep a loss-making firm in business even though it has no prospect of recovery). State aid measures can be a serious barrier to competition and impede the creation of a level playing field in the internal market. Subsidies which are not used to address market failure (like R&D, training, innovation or venture capital investments) but instead to subsidize industries are inefficient and can lead to significant market distortions.

Beginning when 10 new Member States joined the EU (1st of May 2004) a new regulatory framework entered into force with a stronger focus on a 'pro-active competition policy' (EC 2004b). This should improve the regulatory framework for competition and remove barriers to entry and impediments for effective competition. The state aid policy should be, especially,

subject to reform with the purpose of eliminating harmful state aid, while leaving the Member States with more flexibility to adopt horizontal measures.

As was mentioned above, European competition policy comes only into play when trade between Member States is affected. For example, a price-fixing agreement between bakers in a given town will not have any impact on community market, and European law is therefore not applicable to this kind of situation. Such agreement would probably be covered by domestic law in order to counter anti-competitive practices. In practice, the European Commission has the power to deal with competition-relevant issues, which gives Brussels a wide scope to intervene. But in some (or most) cases this power is shared with the Member States own competition authorities and law courts.

Today it is a well know fact that a competitive and open internal market provides the best guarantee for European companies to increase their efficiency and innovative potential. Competition is thus the key ingredient for competitiveness and economic growth. Additionally, the realisation of the internal market is one of the main targets and lies at the heart of the European integration process. The verdict from the high-level group of the Kok-report (Kok 2004) must therefore be a slap on the face of all those national policy makers who see themselves at the forefront of the European integration. The ‘Kok-report’ sees a ‘*lack of commitment and political will*’ leading to the agreements in Brussels, and a lack of commitment when it comes to implementing those measures at national levels.

“Largely because of a wide range of legal and administrative barriers, Europe remains fragmented into separate national markets. Many of these markets are effectively closed for business to potential competitors based elsewhere in what should be a single market. As a result prices are too high, productivity growth is too low and levels of intra-EU trade in services are lower than a decade ago. This situation has to change and it has to change now.” (Kok-Report 2004, p. 25)

Hence, the oil for the engine of competition comes from the Member States.

6.3. THE ENABLING ROLE OF THE MEMBER STATES

To agree on measures for the completion of the internal market is a good thing. No summit meeting concludes without recognising the importance for a properly functioning internal market for health and competitiveness of the European economy. But the internal market is not self-created, able to deliver benefits automatically. Laws have to be adopted, transposed into national law and enforced. These tasks are the primary responsibility of the Member States. If the tasks are not carried out effectively and if economic interests of national interest groups try to delay the transposition, the internal market’s contribution to Europe’s growth and competitiveness is limited. However, the political will for the realisation of the internal market seems to be rather limited in some countries, thus leading to comments with very clear-cut positions:

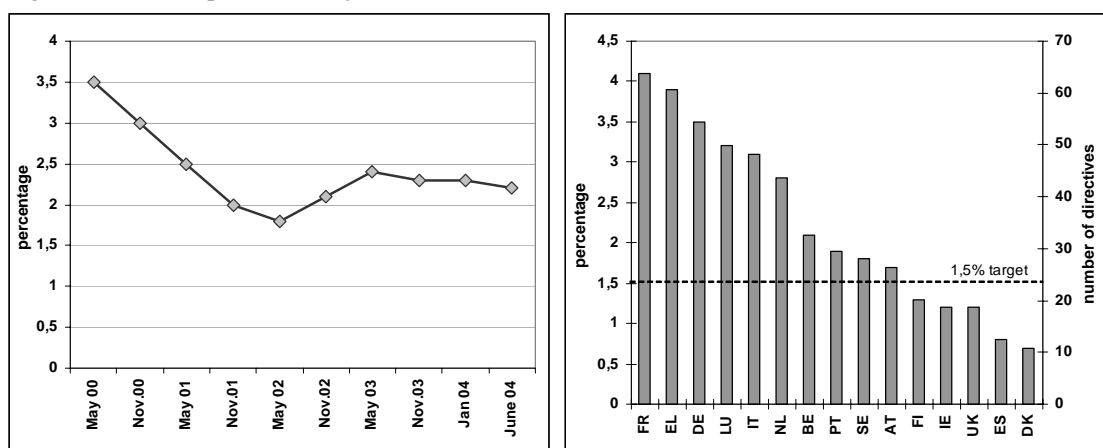
“These directives and the deadlines for their transposition are agreed by Member States at European level. There is therefore no excuse for the fact that EU-15 Member States have been persistently late in transposing them.” (EC 2004c).

“In spite of the European Council’s repeated calls for zero tolerance for excessive delays in transposition, this remains a huge problem. Every directive that is late in being implemented by a Member State reduces the competitiveness of the entire Union; there is no excuse for this and it

must no longer be tolerated. Furthermore, in too many cases, implementing legislation is not in line with the original directive or is excessively complex. This negates the benefits intended to stem from a single set of rules and often places unnecessary burdens on business. In both cases, the repeat offenders know who they are” (Kok-Report 2004, p. 24)

The realisation of the internal market is due to the transposition of about 1,535 directives and 429 regulations, as defined by the EC Treaty.²¹ With few exemptions, Member States are failing to implement a large number of key internal market directives into national law before the deadline, which they themselves have agreed upon, is up. As was pointed out by the actual ‘Internal Market Scoreboard – July 2004’ (EC 2004c) the transposition deficit for internal market directives is 2.2 %. This means that as many as 134, or 9 %, of internal market directives have not been transposed into national law in all the EU-15 Member States, despite having passed the deadline (see Figure 19). This is indeed far from the 1.5 % target set by the European Councils.

Figure 19: Transposition deficit (EU and Member States)



Source: EC 2004; The transposition deficit shows the percentage of internal market directives not yet communicated as having been transposed, in relation to the total number of internal market directives which should have been transposed by the deadline.

Given that the common internal market is crucial for competitiveness, the process since 2002 has fallen further behind. For the period from 2003 to 2004 the transposition deficits of some Member States (with France as the most prominent one) even increased instead of diminished.

The Scoreboard gives some examples for late transpositions of some of the key directives.

Table 9: Key directives whose transposition is late

Directive	Not yet transposed by:
1998/44: Legal protection of biotechnological inventions	BE, DE, FR, IT, LU, NL, AT
1999/44: Sale of consumer goods and associated guarantees	BE, FR
2001/18: Release into the environment of genetically modified organisms	BE, DE, EL, FR, NL, AT, FI
2001/19: Recognition of professional qualifications (amendment)	BE, DE, EL, FR, AT, SE
2001/29: Copyright and related rights in the information society	BE, ES, FR, NL, PT, FI, SE
2002/39: Competition of Community postal services	FR
2001/12: 1 st Railway Package	DE, EL, SE, UK
2001/17: Reorganisation and winding-up of insurance undertakings	BE, FR, SE, UK

²¹ The list of directives and the Member State transposition scoreboard are available at the ‘Internal Market’ website: http://europa.eu.int/comm/internal_market/score/index_en.htm

2002/19-20-21-22: Electronic communication networks

BE, DE, EL, FR, LU, NL

2002/77 : Competition in the markets for electronic communications

DE, EL, FR, LU, NL

2003/48 : Taxation of savings income in the form of interest payments

DK, EL, FR, IT, LU

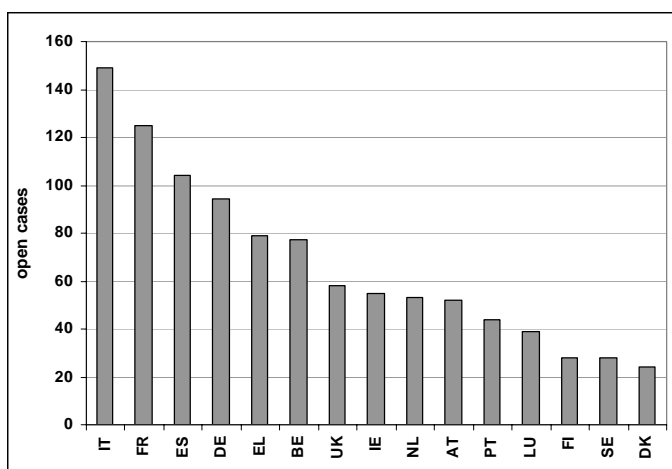
Source: EC (2004)

Infringements

The Internal Market Scoreboard also highlighted the fact that when directives are not applied correctly in practice by member states, the EU takes action. When the European Commission considers that internal market rules are not properly applied, it takes infringement action against the member state in question. Of course, “every infringement is one too many” (EC 2004c); they are costly and can take a long time to resolve. The Internal Market Strategy 2003-2006 (EC 2004d) therefore called on Member States to reduce the number of infringements against them by 50 % by 2006.

Although, on average, the number of cases has managed to decrease slowly, some countries (France, Denmark or Luxembourg) have seen the number of infringement cases against them increasing since May 2003. Italy alone has almost as many cases against it as Denmark, Sweden, Finland, Luxembourg and Portugal combined. The Scoreboard also mentioned Austria, which improved its record significantly having now 17 fewer cases than a year ago.

Figure 20: Open infringement cases as at 1 May 2004



Source: EC 2004

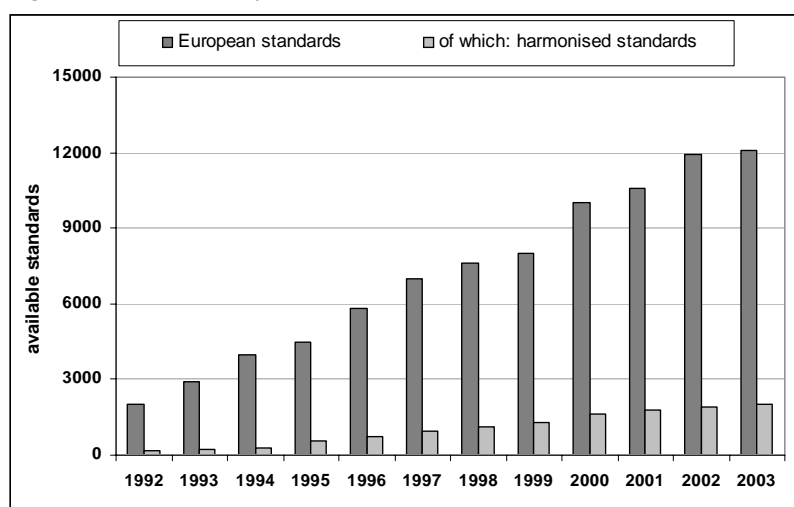
Standards

Standards play the important role of reducing barriers to both trade and the completion of the internal market. They play a vital role in ensuring that the internal market works in practice, so that a product complying with a European standard can circulate more freely in the EU. This leads to efficiency gains for companies, and a significant reduction in the cost of doing business. The idea is that once a European standard is agreed upon and has been transposed by national standards organisations, it replaces the 25 or more (some member countries have in addition country-specific standards, i.e. standards of the *Länder*) different national standards in the Member States.

The number of European standards has increased greatly over the past 10 years (see Figure 21). However, around 80 % of standardisation now takes place at European, rather than national level. They cover a wide range of goods, from machinery to mobile phones, from toys to construction products, and from lift devices to medical devices.

As the Internal Market Scoreboard 2004 has pointed out, the vast majority of European standards are developed at the request of industry. Still, standards are also developed to implement the EU ‘new approach’ legislation, under which the European legislation is limited controlling the essential requirements, mainly health and safety issues, needed to ensure free movements of goods throughout the EU. The task of drawing up standards is entrusted to the European Standards Organisations (ESO)²², where products get their conformity with the corresponding essential requirements and thus their ‘entry tickets’ to the European market.

Figure 21: Number of available standards



Source: EC 2004

Once a European standard has been adopted by one of the ESOS, it is up to the national standards organisations to implement them at the national level. They do so by transposing them as national standards, either by publishing an identical text or by endorsing them. National standards organisations must also repeal any existing national standards that conflict with European standards. Nevertheless, as is shown in Figure 21, the transposition rate does not grow to the same extent as the number of available standards at the European level. The different existing standard regimes can lead to problems for industry. For instance, it is more costly and cumbersome to act on European level when a patchwork of different national standards exists.

Price convergence

Price differences are a good indicator of economic integration and market performance. In a fully integrated, competitive and efficient market, the free circulation of goods and services should ensure that prices paid by consumers do not vary greatly from country to country. Certainly not all products are tradable, but a large percentage of them are. The higher the trade

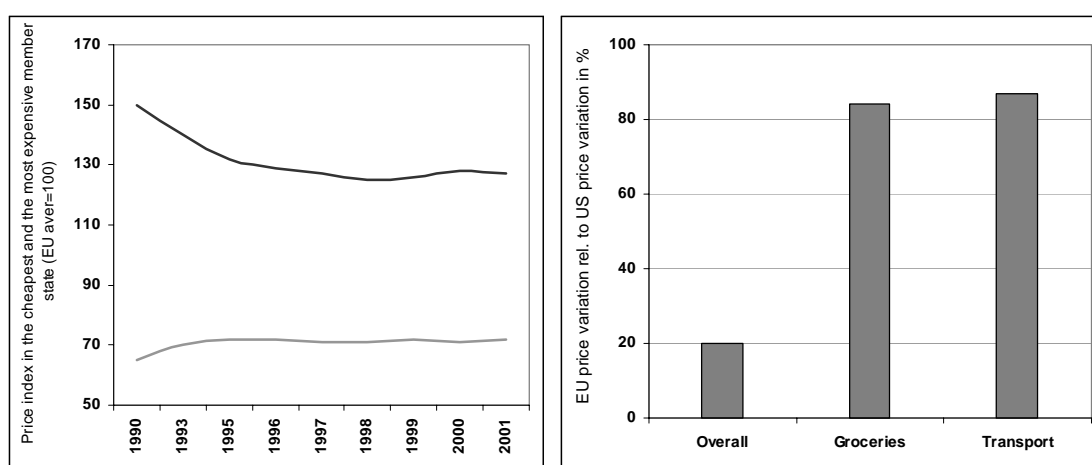
²² Namely the European Committee for Standardisation (CEN), the European Telecommunications Standardisations Institute (ETSI), and the European Committee for Electro-technical Standardisation (CENELEC).

intensity between Member States the faster the price convergence, because of the simple reason that more trade makes price differences harder to sustain.

In order to assess the extent to which prices are indeed converging in the internal market, the European Commission has recently conducted an exercise to monitor the price convergence of a wide range of branded and non-branded products consumed by households across 14 of the 15 EU- Member States for the period between 2000 and 2003.²³

Nevertheless, the picture is particularly worrying when viewed in comparison with the other big single market in the world, namely, the US market. Price variations in the US in 1998 were considerably less than in the EU (see Figure 22), and as EU price convergence has stopped before 1998, this gap has not narrowed.

Figure 22: Price convergence and divergence



Source: EC (2004c)

At the level of specific products, which have a large degree of consumer recognition throughout the EU, the price variations are quite astonishing. One would expect that, because the brand name ensures certain product homogeneity, prices of these products in the different Member States should be very similar. Table 10 shows that this is not the case and that prices vary considerably between Member States.

Table 10: Highest and lowest supermarket prices of branded products (excl. VAT)

		Lowest		Highest	
Coca Cola	Spain	79	Finland	145	
Red Bull	Austria	79	Finland	134	
Fanta	Spain	70	Finland	148	
Evian	France	62	Finland	204	
Twix	Belgium	74	Denmark	131	
Nescafe Instant Coffee	Greece	64	Austria	137	
Kellogg's Cornflakes	United Kingdom	75	France	144	
Uncle Ben's Rice	Finland	81	United Kingdom	161	
Barilla Dry Pasta	Italy	55	Ireland	114	
Ajax Cleaner	Italy	76	Sweden	174	
Nivea Face Care Cream	Spain	75	Portugal	174	

²³ For a detailed description of the approach and methodological issues see EC 2004c.

Gillette Disposable Razors	Belgium	79	Finland	131
Pampers	United Kingdom	63	Ireland	164

Source: EC 2004, DG Internal Market based on AC Nielsen

While there may be reasons why some products are cheapest in some member countries (such as Red Bull in Austria or Barilla in Italy), there is no obvious systematic pattern to differences on prices between Member States. According to the calculations of the European Commission the differences in prices are even greater for non-branded products. However, taking the US as a model of a good single market, it seems clear that there is still room for convergence in prices within Europe.

6.3.1 Concluding remarks

“Facilitating free movement of persons, goods, services and capital in an area without internal frontiers is a crucial mechanism that generates economic growth. ... Sustainable economic growth has always been associated with market opening and strong growth in trade.” (Kok-Report 2004, p. 23).

Beside the general economic truth of that statement, it highlights a basic issue for European integration, going to the heart of the idea of how to build a level playing field within Europe. But the political good-will of the economic integration process includes a piece of anachronism as well: with pride and self-confidence the European Council set itself, in Lisbon in 2000, the, “strategic goal to become the most dynamic and competitive knowledge-based economy in the world.” Now the anachronism lies in the fact that the EU had not yet reached the position that would have allowed it to create the basics for competition within the Union, i.e. an open and competitive internal market with the same *rules of the game* for all Member States. How is it possible that one of the biggest economic blocks of the world set itself the goal to become the most competitive economy in the world without first realising a competitive framework within the block?

The efforts and attempts to complete the internal market in goods, or even to create one in services, have stalled within recent years. The major culprit in this failure to create an area without internal frontiers is to be found at the member state level. Either because of the pressure groups have led to this failure, or the internal market program is unfairly considered yesterday’s business and does not receive the priority it should. The Kok-Report (2004) has pointed out the fatal error in this approach and referred to the enormous scope as a tool for further market integration and greater economic gains for both consumers and enterprises. Higher competition in product markets increases average real wages and is likely to decrease unemployment. Still, an increase in competition always goes hand in hand with elimination of national monopoly power and protected markets. The reason why national pressure groups often oppose products market deregulation is well known: those who loose know they are losing, while the gains (e.g. lower prices) are more diffuse. The effects of liberalisation are direct and not equally distributed across the board, while the benefit is a general welfare effect that may be much less salient.

7 The driver of growth

Getting the fundamentals right and having framework conditions favourable for non-biased competition is the middle way towards better growth performance. The realisation of the internal market is thus one of the prerequisites for competition and for the ability of (new) companies to create valuable goods and services. The major incentive for innovation is the possibility that the benefits coming from the innovation can be internalised and absorbed by the innovating company.

Innovation has become a multi-faceted phenomenon with different dimensions and characteristics. The novelty that is essential to innovation may arise in several ways; from the type of inventions or radical innovations to innovations which may proceed as a series of small steps (incremental innovations) as enterprises find ways to update their products and processes. In addition to the term technological innovation, other types of innovation like organisational innovation, business model innovations or presentational innovations reflect the recognition that new ways of organising work in areas such as workforce management, distribution, finance, manufacturing etc. can have a positive influence on competitiveness. In order to make innovation work the market mechanism must also work. Enterprises are spurred to innovate by pressures and challenges, notably competition and the desire to create new market space. The development and diffusion of innovative products, services and processes through the economy is, therefore, critical to productivity and economic growth.

It would go beyond the scope of the present study to analyse different aspects of innovation in more detail. However, the existing literature can be summarised as follows: (i) innovation matters, (ii) it has to happen in a competitive context and (iii) innovation is a main driver of economic growth.

7.1. A QUICK REFRESHER COURSE IN EUROPEAN INNOVATION POLICY

Being aware of the importance of innovation the European Union has set its target in its typical, exaggerated, manner:

“Achieving an innovation performance that makes the European Union a world reference for innovation ...” (EC 2003).

However, innovation has not always played such an eminent role in Europe. The long post-war expansion was mainly built on the basis of the generalisation of an already mature technological trajectory. Europe was catching up with the US both through investment and factor accumulation, and through imitation of leading-edge technologies (Sapir et al. 2003). Standardised, mass market products that could be made with long production runs brought significant economies of scale, resulting in an industrial structure dominated by large firms.

The post-war system came under attack because the patterns of both consumption and production had shifted in favour of different types of products requiring a different form of industrial organisation. Higher educational standards and changing consumer preferences led to greater demand for less standardised, and more customised products. Growth was no longer driven by

volume, but by composition. The macro-effects of this shift in consumption are reflected in the growth of the service sector as well as changing composition of demand for both goods and services. Between 1980 and 2000, the share of services in the EU economy increased by 13 percentage points to 70 %.

“Contrary to the post-war period where growth and catching-up with the US could largely be achieved through factor accumulation and imitation, once European countries had moved closer to the technology frontier and also with the occurrence of new technological revolutions in communication and information, innovation at the frontier has become the main engine of growth.” (Sapir et al. 2003)

This important role of innovation for growth and welfare calls for complementary changes and new forms in economic institutions and organisations. A greater mobility and flexibility of labour markets, a greater reliance on market finance, and a higher demand for both R&D and higher education are examples for these challenges.

The European innovation policy started in 1995 with the Green Paper on Innovation based on a broad consultation with Member States, industry and others. In the meanwhile several action plans, communications and council conclusions have put the focus on the important role of innovation by repeating time by time more of the same correct issues (Table 11). The differences between the first (1996) and the second (2004) action plan for innovation are thus marginal.

Table 11: A quick history of European innovation-action-plans

1995	Green Paper on Innovation
1996	<p>First Action Plan for Innovation</p> <p>A detailed set of objectives for co-ordinated action by the Commission and Member States, addressing three issues:</p> <ul style="list-style-type: none"> • fostering an innovation culture • creating an environment conducive to innovation • orienting research to innovation <p>The Commission undertook to act on exchange of information and best practice, the promotion of innovation in Framework Programme research, and EU competition and patent law. It urged Member States to act on administrative simplification, taxation and incentives, and education, training and the mobility of scientific personnel.</p>
1998	<p>Communication on implementation of the Innovation Action Plan</p> <p>Progress report that reviews the priorities:</p> <ul style="list-style-type: none"> • protection of intellectual property • financing innovation • the regulatory framework and administrative simplification • education and training • gearing research towards innovation • strengthened overall co-ordination
1998	Risk capital Action Plan
2000	<p>Communication ‘Innovation in a knowledge-driven economy’</p> <p>Responding to the goals set by the Lisbon Council, the Commission defined a timetable for concrete progress towards five innovation-related objectives:</p> <ul style="list-style-type: none"> • coherence of innovation policies • a regulatory framework conducive to innovation

- encourage creation and growth of innovative enterprises
 - improve key interfaces in the innovation system
 - a society open to innovation
- 2001** Commission communication on state aid and risk capital
- 2002** Communication ‘Productivity: The Key to Competitiveness of European Economies and Enterprises’
- 2003** Communication “Innovation policy: updating the Union’s approach in the context of the Lisbon strategy”
 Communication ‘Investing in Research : An Action Plan for Europe ("3 % Target")
 European Initiative for Growth: Investing in Networks and Knowledge for Growth and Jobs
 Communication ‘Some Key Issues in Europe’s Competitiveness – Towards an Integrated Approach’
- 2004** ‘Innovate for a competitive Europe – A new action plan for Europe’ (2.4.2004) – consultation paper
 Communication ‘Innovate for a Competitive Europe: A Commission Action Plan on Innovation’ (COM(2004)draft version

Source: European Commission, http://europa.eu.int/comm/enterprise/innovation/consultation/eu_landmarks.htm

The scope of the actual preliminary action plan (consultation paper; 2.4.2004) is as broad as the first action plan in 1996 and addresses (as a good action plan should do) the main issues that enforce or hamper innovation in European enterprises:

- It emphasises the importance of both technological and non-technological innovation, including new business concepts, organisational or presentational innovation and the fostering and professionalisation of such innovation skills.
- It targets all sectors, including services and traditional sectors as well as high-tech. Innovation needs to become a feature of all enterprises, not only of a few.
- It also takes account of the all-embracing nature of innovation – leading to ridiculous titles like ‘innovate everywhere’.

The draft version of the communication differ in several aspects from the consultation paper and includes mainly the description of innovation related services and initiatives on the European level. Thus the emphasis of the Commission’s Innovation Action Plan is mainly on promoting networking among innovators and providing neutral information that facilitates the use of new technologies and access to finance. These are genuinely activities which could be placed on the European level and where coordination could create an economic value added. But the communication also includes a paragraph worth mentioning:

“It is worth noting that nine out of ten enterprises that introduced innovative products or processes did not receive public support for this. Not surprisingly, the group of successful innovators confirmed that they regularly benefit from public support, indicating that this group of enterprises are more aware of government efforts to support innovation. To which extent public support is contributing to the innovativeness of enterprises is difficult to say, due to a widespread lack of impact assessment. However, the results to the Innobarometer 2004 suggest that among the 10 % of enterprises having received a public assistance for their innovative projects, 72 % have considered this public assistance as non-crucial.” (COM(2004), draft version, p. 11).

The cited paragraph leads to the issue of ‘policy governance’. To what extent should policy influence the innovation capabilities and behaviour of firms on a local, regional, national, EU

or even global level? What are the current challenges and how far should policy go? One of the main tasks was already mentioned in the previous section (see section 6), which is that effective competition between firms in the internal market can be seen as one of the key elements of a successful innovation policy. This would support the competitive process and would induce firms to engage in competitive and innovative behaviour.

Other policy interventions should be led by the recognition of market failure which may inhibit private investment in R&D and innovation giving rise to slowdown in productivity and competitiveness. The following chapters are genuinely considered to be part of a growth-enhancing innovation policy.

7.1.1 Human resources

As an economy gets closer to the educational frontier, the greater the importance of higher education becomes. Wealth does not come from the production of material goods alone, but from the production, transformation and exploitation of knowledge. Especially in the context of the increasing role played by the service sector in economic activity, knowledge is of fundamental and strategic importance for innovation. These are well known arguments for the success of innovations.

Policy comes into play where the focus is laid on the basic requirements of an innovation-driven economy: the growing premium for college graduates over all other educational levels lead to employment of unskilled workers in low skilled service jobs instead of as blue-collar workers on the assembly line. Still, the relative pay of these jobs is falling further and further behind those of the better educated. As a consequence, the argument that innovation creates jobs has to go further: jobs currently being created as a result of innovation are not low-paying but high-paying jobs. Because these jobs require a higher level of education, those without the requisite skills are shut out from the benefits.

Table 12: Educational attainment of the population aged 25-64 years (% , 2002)

	Lower secondary	Upper secondary and post-secondary	Tertiary	aver. years of schooling
Austria	22	62	14	11.3
Belgium	21	33	28	11.2
Denmark	20	52	28	13.3
Finland	25	42	33	12.4
France	18	40	24	10.9
Germany	15	60	23	13.4
Greece	10	34	19	10.5
Ireland	18	35	26	12.7
Italy	33	36	10	9.4
Luxembourg	15	43	19	12.9
Netherlands	22	42	25	13.5
Portugal	13	11	9	8.0
Spain	26	17	24	10.3
Sweden	10	49	33	12.4
United Kingdom	16	56	27	12.7
USA	8	49	38	12.7

Source: OECD 'Education at a Glance 2004'

Educational attainment of the population (see Table 12) is a commonly used proxy for the stock of ‘human capital’, that is, the skills available in the population and labour force. The skills of their staff are fundamental to enterprises’ capacity to obtain knowledge and to use it to innovate. Innovation and R&D activities are ipso facto human-capital intensive activities. Concerning the Lisbon-process, the human resources policy has to go beyond the actual and short-term requirement of industry. In this sense, short-term and flexible supply of the highly-educated can be met through specific vocational schools and immigration.

Policy should also be aware of the importance of the demand side of innovations. For instance, when demand for labour shifts in favour of the higher educated, both employment and relative wages also shift in their favour. A rise in wage inequality is therefore to be expected under these conditions. If the supply of highly-educated labour increases in response to this situation, then this rise in wage inequality will be attenuated.

A well-educated and well-trained population with high aggregate income is thus important for the economic well-being of countries and individuals. It stimulates demand for the industry’s products and creates an environment that facilitates the rapid diffusion of innovative products, services and processes. One need not look past the telecommunications industry, which has clearly shown the benefits of this coherence.

7.1.2 Finance for innovation

When asking for the central problems faced by enterprises who are trying to carry out innovations, and the factors that prevent enterprises from innovating, the answers are usually the same: among all factors, innovation costs appear to be the most often cited reason, followed by the lack of appropriate sources of finance, and excessive perceived economic risks. These three factors are interrelated – innovation is *per definitionem* costly and involves risk. But it is also widely recognised that innovations offer externalities resulting in a possible underinvestment (from the public viewpoint) and some public support may be justified. The extent of such support has to be assessed in the light of the circumstances, including the risk assumed by private capital. Public assistance in financing innovations should therefore be focussed on market failure. Where there is market failure, public support should not be limited to one specific issue, but instead the appropriate measure and support should be determined in the light of all circumstances and should cover many aspects (including the business’s stage of development and size, the type of innovation project, sector etc.).

Within this context start-ups and new technology based firms play an essential role for economic development and structural change. Seed capital funds and venture capital are important for innovation financing in the risky business of high-tech investments where future cash flows are uncertain. However, high-tech investments are particularly likely to be affected by capital market imperfection and thus provide an excellent example for market failure and the necessity of appropriate public support:

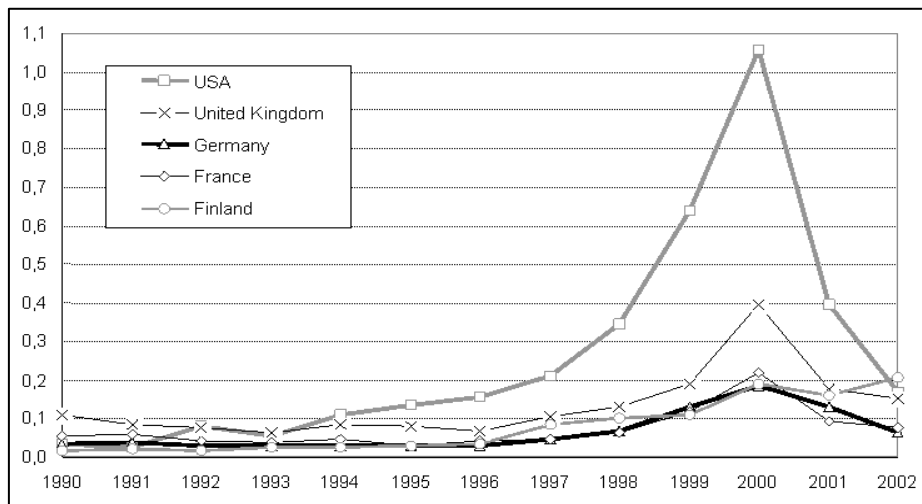
- The returns to high-tech investments are skewed and highly uncertain;
- Substantial information asymmetries are likely to exist between firms and potential investors. Because high-tech investments are difficult to evaluate and frequently embody new knowledge, insiders will have much better information than outsiders about the prospects of the firm’s investment;

- High-tech investments often have limited collateral value. R&D investment, which is predominantly salary payments, has little salvage value in the event of failure. Furthermore, physical investment designed to embody R&D results are likely to be firm specific, and therefore may have little collateral value.

Therefore, venture capital has to be mobilised in order to meet the needs for such firms, with the potential for high returns coming with high risk. Along with business angels they represent the most important source of finance for high-tech start ups. As was emphasised by the European Commission (EC 2003), regulatory obstacles should be removed from cross-border venture capital operations, private-public partnerships in seed investment should be increased, as well as the exit possibilities for all venture investments through large liquid stock markets (EC 1998).

However, the public sector should be aware of the anti-cyclical role of public investments. In 1999 and 2000 there was an oversupply of venture capital leading to a significant decrease of private VC in the second half of 2000, i.e. after the bubble burst (see Figure 23).

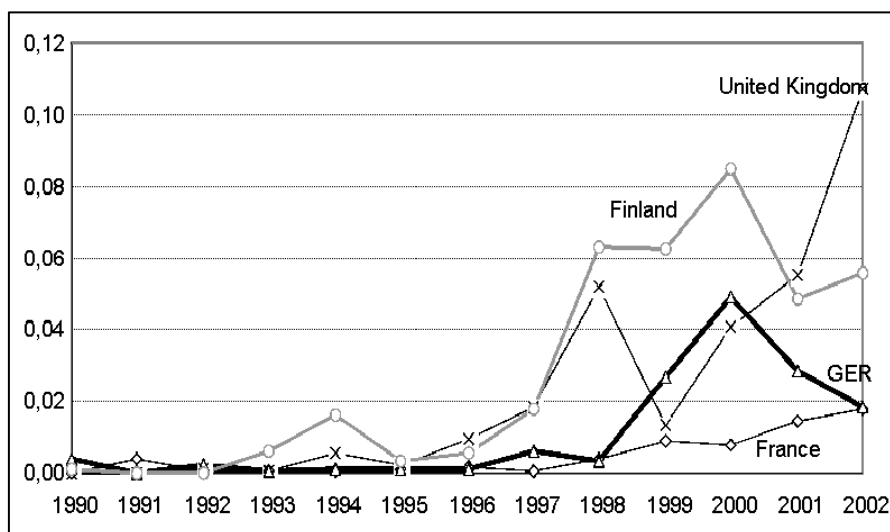
Figure 23: Volume of total VC-investments by country (% of GDP), 1990-2002



Source: EVCA, Rammer et al. (2004)

In 2001 and 2002, in most countries, the private VC-investments decreased leading to different reactions in the public sector. In Germany the public investment in private equity and venture capital funds was related to the private investments which resulted in a cyclical decrease of public investment. The public sector in France and the United Kingdom, meanwhile, compensated the reduction of private capital through anti-cyclical measures. Finland was able to hold its high level constant and had in 2002 the same level as in 1998 (see Figure 24).

Figure 24: Public contribution to VC-investments (in % of GDP), 1990-2002



Source: EVCA, Rammer et al. (2004)

All the mentioned countries aim for the same target, i.e. to increase the early-stage investment, although they follow different approaches. In Germany the public sector acted as a co-investor to private investments resulting in a coupling between private and public investment. In France and the United Kingdom the public investment compensated for the reduction in private funds. This had a stabilising effect on the total investment in the early-stage and the growth phase.

However, the focus of public investment should be kept on the provision of early-stage financing, a crucial phase in the beginning of a new company, where an invention is transferred into an innovation process that is often too early for most private VC-investments. In order to guarantee sufficient funding for subsequent phases the framework conditions should be favourable for general funds investing in a mix of investment stage situations.

8 Conclusions

The present study aimed at shedding some light on the implications of the “Lisbon Process”, i.e. the EU’s commitment to becoming, by 2010, “the most dynamic and competitive knowledge-based economy in the world.” The need for this quick fix at Lisbon was caused by the growth rates of the US economy over the past years, which reinforced pervasive gloom about continental Europe’s economic future. Europe has been watching the US high-tech boom of the late 1990’s and its associated productivity revival closely.

The study suggests extending the comparison with the US to a longer period. Over the five year period, 1995-2000, the US briefly caught up to the European rate of productivity growth. However, viewed over any longer period, the US productivity growth rate lagged behind. Thus, the stronger performance of America’s GDP figure is mainly due to population growth. During the period between 1992 and 2002 the US experienced far higher population growth (+1.2 % vs. +0.3 %) with an even higher growth differential in the population cohort aged 15-64 years, which is the economically active group. It seems to be one of the strengths of the American economy that it is able to accommodate itself much more easily to changes on the supply side, i.e. changes in population. One of the reasons why the income gap (GDP per capita) has not narrowed over the last 30 years is that, over time, Europeans have used some of the increase in productivity to expand their leisure rather their incomes. Thus the working hours per employee decreased in Europe over the period between 1992 and 2002.

While the US economic performance in the last few years was a source of pride on the western side of the Atlantic the European policymakers are fretting aloud about structural rigidities, slow growth and excessive budget deficits. In contrast, American policy makers love to boast about America’s economic success while disregarding the importance of its economic imbalances.

At first glance, the post-1995 productivity growth revival in the US and the acceleration in the growth of Information and Communication Technology (ICT) investment occurred at the same time. This would seem to imply that the revival has a single source – ICT investment – achieved both through its production and use. Recent studies show that the contribution of ICT to average labour productivity has been exaggerated, indicating that a set of non-ICT investments and organizational innovation had a central role in the productivity growth revival of the late 1990’s. This led to a high intensity of competition in those sectors which in turn contributed significantly to aggregate productivity growth. Hence, Europe’s troubles lie elsewhere and cannot be solved by purchasing more computers.

The Lisbon process tries to meet the challenges, i.e. improving economic growth and increasing employment, by creating a framework for a comprehensive, interdependent and self-reinforcing series of reforms. But, in order to prevent the Lisbon process from becoming a synonym for missed objectives and failed promises, the Member States are called to interpret and implement the goals within individual national contexts. However, the mid-term review shows that there has not been much progress towards reaching these targets. The Member States have failed so far in implementing the measures on which they agreed in Brussels. The

implementation of good ideas created at the European level tends to end at the point where national interests and pressure groups often oppose product market deregulations or the transposition of EU directives – for well known reasons: those who loose know they are losing, while the gains (e.g. lower prices) are more diffuse. The effects of liberalisation are direct and not equally distributed across the board, while the benefits are expressed in a general welfare effect that may be much less salient.

The realisation of the internal market is one of the key elements of European integration. Although the study indicated some scepticism concerning the comparison of the EU with the US, one lesson can be learned from the US performance of the last years: vigorous competition is a key driver of productivity growth and further competitiveness. All sectors in the US with the highest productivity growth since the mid 1990s exhibit a high competition intensity. In Europe the willingness to agree on measures for the completion of the internal market is high. No summit meeting concludes without recognising the importance of a properly functioning internal market for health and competitiveness of the European economy. But the internal market is not self-created, able to deliver benefits automatically. Laws have to be adopted, transposed into national law and enforced. These tasks are the primary responsibility of the Member States. Regarding these difficulties and delays in realising the internal market in Europe, the goals of Lisbon include a piece of anachronism: while the EU defined the goal to become the most competitive economy in world in 2010 the EU had not yet reached the position that would have allowed creation of the basic requirements for competition within the Union, i.e. an open and competitive internal market with the same *rules of the game* for all Member States.

The awareness of the important role of research and development for enhancing competitiveness in Europe has increased within the policy spectrum. But the aim of approaching a R&D-quota of 3 % in 2010, with a significant increase in the level of business funding, is a good-will prophecy rather than a sound policy measure. This because the achievement of a target defined at the European level is largely determined by the big Member States – the largest three countries alone produce half of the EU output. Moreover, the business element of the R&D quota, in most countries with a high R&D-intensity, is determined by a handful of very large companies, which follow their own autonomous R&D strategies. Thus, the influence of policy measures is rather limited. This, specifically, makes the second part of the Barcelona target (2/3 of the expenditure should be financed by the industry) appear even more questionable. The private sector consists of individual enterprises, with every single enterprise investing in additional R&D if and only if the expected returns on this investment exceed costs. It can therefore be safely assumed that these kinds of business decisions depend on many endogenous and exogenous factors, among them changes in demand for firms' output, sector specific developments, competition intensity etc. Only to a small degree does it depend on agreements of the European Council or the wishes of the European Commission. Good intentions of policy makers can therefore easily turn out to be ineffective.

The very popular comparison with the US regarding R&D-intensity should be made carefully. The study shows that in the manufacturing sector the weighted average in R&D intensity in the EU (7.5 % of value added) was 1.2 percentage points lower than in the US (8.7 % of value added). This difference is small. But the picture changes when one examines the service sec-

tor, which shows that, in the late 1990's, the US reemerged as a key performer in business R&D. The service sector's share of total R&D rose to 34 % in the US, while it accounted for only 13 % of total R&D in Europe. Considering the fact that the service sector contributes nearly 75 % to total gross value added in modern economies, the productivity and growth performance in this sector has a huge impact on rising living standards.

However, the comparison with the US finds its limit when it comes to R&D for military purposes: the US administration decided to spend 75 billion \$ for defence R&D in 2005 which is about 54 % of total public R&D spending. The huge part of this public money goes to weapons development activities. Germany (as the largest EU country), in comparison, has gross expenditure on R&D (including the industrial and the public sector) of about 50 billion €. The total budget of the 5th European Framework Programme is about 17 billion € over a period of 4 years.

Finally, the study considers - after 'getting the fundamentals right' - innovation as the main driver of economic growth and shows that a growth-enhancing innovations policy should be led by the recognition of market failure which may inhibit private investment in R&D and innovation.

9 References

- Ahn, S. (2002), 'Competition, Innovation and Productivity Growth: A Review of Theory and Evidence', Economics Department Working Paper No. 317, OECD, Paris.
- Ali-Yrkkö, J., R. Hermans (2002), 'Nokia in the Finnish Innovation System', Discussion Paper no. 811, ETLA, Helsinki
- Baverez, N. (2003), 'La France qui tombe; Un constat clinique du déclin Français', Perrin, Paris.
- Blanchard, O. (2004), 'The economic future of Europe', NBER Working Paper 10310.
- Duhamel, A. (2003), 'Le Désarroi Français', Plon, Paris.
- European Commission (2002), 'More Research for Europe. Towards 3 % of GDP', COM (2002) 499 final.
- European Commission (2004), 'Internal Market Scoreboard', July 2004, 13
- European Commission (1998), 'Risk Capita: A key to Job Creation in the European Union', SEC(1998) 522.
- European Commission (2000a), 'Competition policy in Europe and the citizen', Luxembourg.
- European Commission (2000b), 'Towards a European research area', COM (2000) 6.
- European Commission (2000c), 'Making reality of the European Research Area: Guidelines for EU research activities', COM (2000) 612 final.
- European Commission (2003), 'Investing in research: an action plan for Europe', COM(2003) 226 final.
- European Commission (2004a), 'Report from the Commission to the Spring European Council', COM (2004), 29 final/2.
- European Commission (2004b), 'A pro-active Competition Policy for a Competitive Europe', COM(2004) 293 final.
- European Commission (2004c), 'Report on the implementation of the Internal Market Strategy (2003-2006)', COM(2004) 22 final.
- Foster, L., J. Haltiwanger, C.J. Krizan (2002), 'The Link between Aggregate and Micro Productivity Growth: Evidence from Retail Trade', NBER Working Paper 9120.
- Gordon, R. (1998), 'Foundations of the Goldilocks Economy: Supply Shocks and the Time-Varying NAIRU', *Brookings Papers on Economic Activity*, 29 (2): 297-333.
- Gordon, R. (2003), 'High-Tech Innovation and Productivity Growth: Does Supply Create its own Demand?', NBER Working Paper 9437.
- Gordon, R. (2004), 'Two centuries of Economic Growth: Europe Chasing the American Frontier', NBER Working Paper 10662.
- Gordon, R.. (2002), 'Technology and Economic Performance in the American Economy', NBER Working Paper 8771.
- James, A. (2004), 'US Defence R&D Spending: An Analysis of the Impacts', PREST, Manchester.
- Jorgenson, D.W. (2001), 'Information Technology and the US Economy', *American Economic Review* 91(1): 1-32.

- Jorgenson, D.W. (2002), *Economic Growth in the Information Age: Econometrics*, Vol. 3, Cambridge MA: MIT Press.
- Jorgenson, D.W., K.J. Stiroh (2000), 'Raising the Speed Limit: US Economic Growth in the Information Age', *Brookings Papers on Economic Activity* 31(1): 125-211.
- Jorgenson, D.W., M.S. Ho, K.J. Stiroh (2003), 'Lessons for Europe from the US Growth Resurgence', mimeo, Harvard University.
- Kok, W. et al. (2004), 'Facing the challenges. The Lisbon strategy for growth and employment', Report from the High Level Group chaired by Wim Kok.
- Lewis, W.W. (2004), *The Power of Productivity. Wealth, Poverty, and the Threat to Global Stability*, Chicago.
- McKinsey (2002), 'Reaching higher productivity growth in France and Germany', McKinsey Global Institute.
- Nicoletti, G., A. Bassanini, J. Ekkehard, P. Santiago, P. Swaim (2001), 'Product and Labour Market Interactions in OECD countries', Economics Department Working Paper No. 312, OECD, Paris.
- Nicoletti, G., S. Scarpetta (2003), 'Regulation, Productivity and Growth: OECD Evidence', Economics Department Working Papers, No. 347, OECD, Paris.
- O'Mahony, B. Van Ark (ed.) (2003), *EU productivity and competitiveness: An industry perspective*, European Commission, Luxembourg.
- OECD (2001), *The new economy beyond the hype. The OECD growth project*, Paris.
- OECD (2002a), *Measuring the Information Economy*, Paris.
- OECD (2002b), 'Targeting R&D', DSTI/STP/TIP(2002)16, Paris.
- OECD (2003), *Science, Technology and Industry Scoreboard*, Paris.
- OECD (2003a), *The Sources of Economic Growth in OECD Countries*, Paris.
- OECD (2004), 'Product market competition and Economic performance in the United States', ECO/WKP(2004)21.
- OECD (2004a), *Economic Outlook No. 75*, Paris.
- Oliner, S.D., D.E. Sichel (2000), 'The Resurgence of Growth in the Late 1990's: Is Information Technology the Story?', *Journal of Economic Perspectives* 14(Fall): 3-22.
- Oliner, S.D., D.E. Sichel (2002), 'Information Technology and Productivity: Where Are We Now and Where Are We Going?', *Atlanta Federal Reserve Bank Review* (forthcoming).
- Pelkmans, J., J.P. Casey (2004), 'Can Europe deliver Growth? The Sapir Report and beyond', CEPS Policy Brief No. 45.
- Rammer, CH., W. Polt, J. Egel, G. Licht, A. Schibany (2004), 'Internationale Trends der Forschungs- und Innovationspolitik – Fällt Deutschland zurück?', ZEW Wirtschaftsanalyse Band 73, Nomos, Baden-Baden.
- Rodrik, D. (2003), 'Growth Strategies', NBER Working Paper No. 10050.
- Sapir, A. et al. (2003), *An Agenda for a Growing Europe. Making the EU Economic System Deliver. Report of an Independent High-Level Study Group established on the initiative of the President of the European Commission.*
- Schibany, A., G. Streicher (2003), 'Aiming high – an Assessment of the Barcelona Targets', InTeReg Working Paper No. 06-2003, Joanneum Research.
- Sinn, H.W. (2003), 'Der kranke Mann Europas. Diagnosis and Therapy of a *Kathedersozialist*', Lecture Series 'Deutsche Rede', 15. November 2003, Schloss Neuhardenberg.

- Sinn, H.W. (2004), 'Ist Deutschland noch zu retten?', Econ, München.
- Triplett, J.E., B. Bosworth (2003), 'Productivity Measurement: Issues in Service Industries: "Baumol's Disease" has been Cured', FRBNY Economic Policy Review.
- Van Ark, B., R. Inklaar, R. Mc Guckin (2002), 'Changing Gear. Productivity, ICT and Services: Europe and the United States', Research Memorandum GD-60, Groningen Growth and Development Centre.
- Walterskirchen, E. (2004), 'Austria's Position in the International Quest for Structural Adjustment', WIFO, Austrian Economic Quarterly 2/2004.
- World Economic Forum (2004), *The Lisbon Review 2004. An Assessment of Policies and Reforms in Europe*, Geneva.

InTeReg Research Report Series

The Research Report Series seeks to disseminate the results of research conducted within the Institute of Technology and Regional Policy of Joanneum Research to the broad academic community and other interested parties. Since much of the research is ongoing, the authors welcome comments from readers.

Electronic copies of the Research Report Series can be found at: <http://www.joanneum.at/rtg/rp>.

For further questions, please contact interreg@joanneum.at.

© 2005, JOANNEUM RESEARCH Forschungsgesellschaft mbH – All rights reserved.