



## The European Productivity Slowdown Causes and Implications

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### Abstract

In March 2000 in Lisbon, EU heads of state and government set the strategic goal 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. These commitments were confirmed at the Barcelona European Council, which agreed that investment in European R&D should be increased to 3% of GDP by 2010.

The move forward towards the Lisbon and Barcelona goals was, however, rather slow during the first three years of the Lisbon strategy. Growth in output and, notably, productivity has been dismal and little progress has been made towards reaching the R&D target. Evidence presented in a CEPS Working Document by Francesco Daveri and initially prepared under a study undertaken for the European Parliament suggests that the slowdown of productivity in the 1990s and early years of the present decade was more than just a business-cycle phenomenon. In fact, the slowdown of productivity growth seems to have been largely attributable to the inclusion in the labour market of groups with a comparatively low productivity.

The paper concludes that in the short term, up to 2010, the highly desirable increase in the labour force participation of women and the elderly is unlikely to be achieved without accepting that this expansion of employment will be accompanied by a temporary slow rise in productivity, as new groups have to go through a learning process and acquire the skills required in the information society. This makes efforts to raise the level of R&D and innovation towards the Barcelona target all the more compelling.

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### The Lisbon strategy: Main features

In March 2000 in Lisbon, EU Heads of State and Government set the strategic goal 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.

In the pursuit of excellence the EU should, according to the Lisbon conclusions, envisage a number of measures facilitating the shift towards an information society, stimulating R&D and the creation of SMEs, taking further measures to complete the internal market, ensuring sustainability of public finance, and modernising the European Social Model by strengthening education and training, developing an active employment policy and modernising social protection.

More precisely the European Council considered that the overall aim of the strategy should be to raise the employment rate from an average of 61% in 2000 to as close as possible to 70% by 2010 and to increase the number of women in employment from an average of 51% in 2000 to more than 60% in 2010.

As stated in the Lisbon conclusions, if “the measures set out...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”.

Since then the European Council has held Spring Summits specifically focused on evaluating the progress of the EU towards the achievement of the Lisbon goals. Thus, Heads of State and Government reviewed the progress towards the Lisbon goal at the Barcelona European Council in March 2002. At that Council meeting they agreed that investment in European research and development (R&D) must be

### Contents

Abstract .....	1
The Lisbon strategy: Main features .....	1
Towards the Lisbon and Barcelona goals? .....	2
Nature and causes of the productivity slowdown in the EU .....	3
Delayed diffusion of IT? .....	3
Underdevelopment of IT producing industries? .....	3
Other factors without direct connection to IT? .....	4
Some policy conclusions .....	5

increased to 3% of GDP by 2010, with at least two thirds of the total investment coming from the private sector. This goal should focus the attention of the Commission and Member States on the reforms necessary to deliver not only higher but also more productive business investment. To achieve this objective, the Commission in its recommendation for the 2002 Broad Economic Policy Guidelines (BEPGs) for the economic policies of the Member States and the Community called for better incentives for firms to invest in R&D while preserving sound fiscal policies

In September 2002, the Commission adopted a Communication 'More research for Europe: towards 3% of GDP' with recommendations for Member States, industry and other stakeholders for achieving the 3% objective. The Brussels European Council in March 2003 reinforced the Member States commitment to the Barcelona objective, and called for concrete action to attain the 3% target and for strengthening of the European Research and Innovation Area to the benefit of all in the enlarged EU.

In response to a request from the October 2003 European Council the Commission, furthermore, adopted a communication on "A European Initiative for Growth"<sup>1</sup>. The communication provided a "roadmap" for boosting investment in networks and knowledge already outlined in an interim report to the October European Council by:

- Moving ahead with the priority Trans-European transport projects requiring €220 billion investment by 2020.
- Accelerating the roll out of high-speed, broadband communications in all parts of the Union to meet the target of widespread access and use by 2005.
- Strengthening the Union's capacity to generate and use knowledge through specific action to boost investment in leading edge technologies from the use of hydrogen as a fuel to space technologies and their applications.

Specifically the Communication presented a "quick-start programme" mobilising around €60 billion investment in networks, broad-band communication and new technology between 2003 and 2010. On the whole the growth initiative thus seemed to favour boosting of *fixed* investment as the most appropriate way to "prime the economic pump" following, in this approach, the guidelines of conjunctural policies of the 1960s and 1970s.

At the Brussels European Council in March 2004 the Presidency Conclusions stated that the Union in March 2000 had set itself ambitious goals and that four years later, the picture was a mixed one. It argued that considerable progress had been made and reaffirmed that the process and goals remained valid. However, it also stressed that the pace of reform needed to be significantly stepped up if the 2010 targets were to be achieved and confirmed its. The European Council confirmed its commitment to demonstrating the political will to make this happen.

### Towards the Lisbon and Barcelona goals?

The move forward towards the Lisbon and Barcelona goals were in fact rather slow during the first three years of the Lisbon strategy. In fact, after a GDP growth of 2.7% per annum from 1995 to 2000 on average in EU15, economic growth slowed down to only 1.7% in 2001 and further to 1.1% and 0.8% in 2002 and 2003 respectively. Total employment, after an increase of 1.4% on average from 1995 to 2000, rose by 1.3% in 2001 but then stagnated in 2002 and rose by only 0.3% in 2003.<sup>2</sup> Labour productivity, which had risen by 1.3% on average from 1995 to 2000, rose by only 0.4% in 2001, 0.5% in 2002 and 0.6% in 2003.

An upturn in activity was manifest during the course of 2004 and both output and employment was expected to show faster expansion in 2004 and 2005. Nevertheless, even taking account of the more optimistic outlook, real GDP for EU15 is now estimated to show a rise of only 1.6% per annum between year 2000 and 2005 on average with employment up by 0.6% and labour productivity by 0.9% on average over this period.

The dismal growth and productivity performance of EU-15 over the first five years of the span of the Lisbon strategy represents a clear deterioration compared to the preceding five-year period and also contrasts sharply with that of the United States.

As seen in Table 1 for EU-15 the rate of growth of GDP on average from 2000 to 2005 is estimated to be more than one percentage point below that of the preceding five-year period. This slowdown was attributable partly to a 0.8 point slowdown of employment growth and partly to a 0.4 point slowdown of labour productivity growth. Between the two five-year periods economic growth also slowed down in the US, from 4.1% on average from 1995 to 2000 to only 2.6% on average from 2000 to 2005. However, in the United States productivity growth actually accelerated, from 2.1% per year on average from 1995 to 2000 to 2.3% on average from 2000 to 2005. Growth in employment in the US, on the other hand, is estimated to show a sharp slowdown between the two five-year periods, from 2% to 0.4%. This deterioration of the employment content of economic growth in the latter country has given rise to some concerns. However, the shake-out of labour took place mainly in year 2001 and 2002 and was followed by a return to faster growth in jobs albeit with maintained high productivity advancement.

However, given the EU's dismal growth and productivity performance during the first half of the period envisaged by the Lisbon strategy it is already apparent that only an unlikely GDP growth of around 4.5% per annum during the second five-year period would allow the EU to reach the declared target of 3% growth for the whole ten-year period on average. It is thus already in 2004 evident that the Union is in no position to reach the growth targets adopted in 2000 in Lisbon.

<sup>1</sup> COM(2003)690 final, 11.11.2003.

<sup>2</sup> Source: Spring 2004 forecasts by DG ECFIN.

Table 1. Growth, employment and productivity in EU, US and Japan (% change over previous, average over 1960 to 1990 and for five-year periods)

	1961-90	1995/1990	2000/1995	2005/2000
<i>A: GDP in real terms</i>				
EU-15	3.4	1.5	2.7	1.6
AC-10	:	:	4.1	3.3
EU-25	:	:	2.7	1.7
USA	3.5	2.5	4.1	2.6
Japan	6.1	1.5	1.4	1.7
<i>B: Labour productivity</i>				
EU-15	2.9	1.9	1.3	0.9
AC-10	:	:	3.8	3.4
EU-25	:	:	1.5	1.2
USA	1.5	1.3	2.1	2.3
Japan	5.1	0.8	1.4	2.0
<i>C: Employment (persons occupied)</i>				
EU-15	0.4	-0.4	1.4	0.6
AC-10	:	:	0.3	0.0
EU-25	:	:	1.2	0.5
USA	2	1.1	2	0.4
Japan	1	0.8	0	-0.3

Source: DG Economic and Financial Affairs, spring 2004 forecasts.

### Nature and causes of the productivity slowdown in the EU

In sharp contrast to trends during the period from 1960 to 1990, the EU-15 indeed appears to have entered a period with productivity growth distinctly below that of the US. Evidence presented in a CEPS Working Document by Francesco Daveri and initially prepared for a CEPS study on the Broad Economic Policy Guidelines for the European Parliament<sup>3</sup> suggests that a large part of this slowdown is attributable to a certain increase in the employment content of economic growth and, thus, to a slowdown of the process of capital deepening which characterised economic growth in the major EU countries during the years from 1960 to 1990.

In his paper, Daveri examines several possible explanations for the productivity slowdown:

- Delayed diffusion and use of Information Technology (IT) throughout the economy;
- Underdevelopment of the IT producing industries;
- Other factors without direct connection to IT.

#### *Delayed diffusion of IT?*

After a detailed examination of productivity growth (here measured as output per hour worked) in different branches of the economy grouped according to the intensity of their use of IT, Daveri concludes that delayed diffusion of IT may account for some 38% of the total growth-gap between

the US and the EU between the first and the second half of the 1990s. Daveri's estimate is considerably lower than those obtained by van Ark, Inklaar and McGuckin<sup>4</sup> essentially as the result of the application of a more narrow definition of IT-using industries. In fact, Daveri excludes from this group a number of traditional industries which feature below-average IT capital services share of value-added in both the US and the EU. Using this more narrow definition of IT-using industries, Daveri explains 0.65 percentage points of the total difference of 1.8 percentage points between the acceleration of productivity growth of 1.1 percentage points in the US and the slowdown of 0.7 in the EU. With a broader definition, van Ark et al. attributed 1.06 points to this effect.

#### *Underdevelopment of IT producing industries?*

Daveri then examines the alternative hypothesis, defended in a number of earlier studies, that the acceleration of productivity growth in the US was essentially attributable to the boosting of IT producing industries in general or within the manufacturing industries. However, the contribution of IT-producing industries to the productivity acceleration in the United States amounts, according to various more recent estimates, to only about one fifth of the overall acceleration of 1.1 percentage points.

In fact, as underlined by Daveri, in the EU the IT-producing branches during the five-year period from 1995 to 2000 accounted for 0.49 points of a total growth of labour productivity of 1.71% as against a contribution of

<sup>3</sup> F. Daveri (2004), *Why is there a Productivity Problem in Europe?*, CEPS Working Document No. 205, CEPS, Brussels, July.

<sup>4</sup> B. van Ark, R. Inklaar and R.H. McGuckin, *ICT and productivity in Europe and the United States: Where do the differences come from?*, CESifo Economic Studies, 3, 2003.

0.24 points of a total of 2.28% during the preceding five-year period. In the US, on the contrary, IT producers accounted for 0.68 points of a total rise of 2.25% in the second five-year period or comparatively less than the 0.43 points contribution to the growth of 1.1% in the first half of the 1990s. As underlined by a number of studies a statistical bias may be introduced due to the fact that the US and a few other countries adjust national accounting deflators for estimated quality changes for high-tech products. However, as stressed by Daveri, this effect can explain only a small fraction of the productivity gap between the US and the EU.

Daveri thus firmly refuses the hypothesis that underdevelopment of IT production can explain the productivity slowdown in the EU both in the absolute and as compared to the US.

#### *Other factors without direct connection to IT?*

Adopting then a broader perspective, Daveri shows that the productivity slowdown in EU-15 was in fact a widespread phenomenon, found in particular in non-durable manufacturing industries (slowdown of almost 2 percentage points between the two five-year periods) and other industries (slowdown of 1.1 points). Manufacturing of durable goods on the contrary showed only a modest slowdown of productivity growth (0.3 points) and market services even some acceleration (0.47 points).

In this respect the evolution in the EU contrasts with the patterns of productivity developments in the US. In fact, in the US non-durable manufacturing showed an even more pronounced slowdown of productivity but this shortfall was more than compensated by a huge productivity improvement in durable manufacturing and a pronounced but smaller rise in market services. In other US industries productivity growth actually decelerated between the two five-year periods.

Digging further into the data, Daveri then examines the

more precise nature of the productivity slowdown in the EU. By exploiting data for the four largest EU countries generated by the Groningen Growth and Development Center in the Netherlands and the National Institute for Economic and Social Research in the UK, he finds that a slowdown of capital deepening (that is, a slowdown in the increase in fixed capital per person employed or hour worked) explained a large part of the productivity slowdown.

In fact, for these four countries on average, labour productivity growth for the five-year period 1995 to 2000 amounted to just above 2% or about 0.3 points less than on average for the period from 1979 to 1995. During the latter period the increase in the IT capital stock per unit of employment accounted for 0.53 points or more than a quarter of the productivity increase. Non-IT capital in contrast accounted for only 0.25 points or much less than the 0.70 points on average during the preceding 26 years. The contribution of labour quality (increase in the level of education) also accounted for a small part (and falling) of the total productivity increase.

Thus, more than half of the overall productivity increase in the four EU countries during the five years 1995 to 2000 was attributable to the increase in the “residual factor”, generally termed “total factor productivity or TFP”, that is the part of the rise in labour productivity which is not due to either an increase in capital per unit employed nor the rise in the level of skills of the labour force. The contribution of TFP for these five years in fact amounted to 1.07 points or marginally higher than the 0.94 points on average for the years 1979 to 1995. The productivity increase in the EU moreover compares favourably with the 1.05 points contribution from TFP in the US over the same period. In fact, the remarkable feature on this comparison is not the poor EU productivity performance but rather the pronounced improvement in the US, from only 0.26 points on average during the years 1979 to 1995 to 1.05 on average from 1995 to 2000 (See Table 2).

*Table 2. Decomposing aggregate labour productivity growth, business sector*

<i>Business sector</i>	US		EU-4	
	1979-95	1995-00	1979-95	1995-00
Labour productivity growth	1.21	2.46	2.30	2.02
Contributions to labour productivity growth from:				
IT capital	.46	.86	.33	.53
Non-IT capital	.35	.43	.70	.25
TFP growth	.26	1.05	.94	1.07
Labour quality	.13	.13	.33	.18

Source: Daveri, op. cit.

As stressed by Daveri the European productivity slowdown is too recent for observers to be able to evaluate whether its nature is long or short term. In particular, there is a possibility that the declining growth contribution from capital deepening may not last. This may be the case if they are due to the labour market reforms enacted in many European countries in the 1990s. Certain studies in fact show that Europe’s labour market reforms in the second

part of the 1990s, although introduced in bits and pieces and often affecting the hiring and firing of temporary workers only, effectively encouraged the hiring of such, often unskilled, part-time workers.

As shown, in 1995-2002 employment and productivity grew at lower rates in the EU15 than in the US. However, in countries often taken as success stories in the European labour markets, such as Spain and the Netherlands,

employment grew at more than 2% per year, but labour productivity stagnated. In a country such as Greece, with buoyant productivity growth employment stagnated instead. The only exceptions on the positive side are Ireland and Finland, with Italy and Germany being the exceptions on the negative side.

There was thus a sharp turnaround in the pace of job creation in Europe after 1995. The growth rate of hours worked went from persistently negative growth rates of hours worked of about half a percentage point per year in the 1980s and almost 1.5 percentage points per year in the early 1990s to positive figures leading to increase the number of hours worked by 1% per year in the last few years. This is still slightly lower than in the US (where the growth rate of hours worked remained around 1.5% per year even in the productivity revival years before the current recession), but clearly indicates that the 1980s' chronic inability of the European economies to create jobs has been partly overcome.

In addition, the new entrants in the labour market, given their low human capital endowment, likely found themselves more easily employed in traditional industries. Hours increased by 2.3% per year in the market services industries in Europe (about the same as in the US). In the manufacturing industries, Europe's employment performance was less striking, for negative figures were still recorded in 1995-2001, at least for the growth of hours worked in non-durable goods manufacturing. Yet this compares with negative 2.6% per year in 1990-95 and negative 1.6% in the 1980s, and should thus be regarded, if anything, as a marked *improvement*. The same applies to durable manufacturing where the roughly zero growth in the number of hours worked definitely improves upon negative rates of growth of 3% or so in the first half of the 1990s and about negative 1.5% per year throughout the 1980s. Europe's employment outlook indeed dramatically changed in the last bit of the 1990s.

### Some policy conclusions

Altogether, thus, productivity growth in the EU has been somehow hampered by the entry of the unskilled workers in the labour market. This has possibly driven down the equilibrium capital-labour ratio. As long as this was simply the other side of the coin of the increased employment rate of the last five years (and possibly of the mismatch induced by the introduction of IT capital goods), the diminished capital deepening might just be transitional. If this is the case, Governments should perhaps not be overly pessimistic about Europe's prospects of reviving labour productivity growth.

This is not the only possible view of the facts, though. A simpler but pessimistic view would instead stress that the declining productivity growth in non-durable (and mature) manufacturing industries signals insufficient reallocation of workers away from that declining sector into newer, more dynamic, industries. This suggests that Governments have to do something, namely continue along the undertaken

path of market reform in the goods and labour markets, perhaps broadening their scope and enlarging their extent, in order to ease reallocation and raise efficiency.

It should also be recognised that achieving a durable acceleration in the growth of total factor productivity cannot be achieved by a "quick-start procedure" but would require increasing emphasis on enhancing the rate of innovation in the EU economy, of the level of education and skills of the labour force and of intellectual investment in general, very much in line with the recommendations formulated in the report of the "Sapir Group" published in the middle of 2003<sup>5</sup>.

The Sapir Report advocated measures in areas:

- creating an independent European Agency for Science and Research
- encouraging private sector R&D via tax credits
- re-focusing the structure of the – slim – EU budget away from agriculture into three separate growth, restructuring and funds. The growth fund would be the appropriate pool where to fund supranational R&D, training and educational projects.

Indeed, as stressed by Daveri, taking advantage and adopting the US technology was best for Europe after the end of WWII. At that time, Europe was distant enough from the technological frontier and thus large enough gains from learning-by-doing, imitating and buying technological advances generated elsewhere, notably in the US, could be achieved.

Yet 25 or 30 years of convergence have made such mechanisms no longer apt to further feed growth in the now advanced Europe. This makes producing innovations in Europe today all the more necessary. In particular, the goal of producing more innovation would probably be best served by allocating more funds for R&D and improving their efficiency of allocation but, first of all, stimulate business R&D. Consequently, raising R&D spending towards the goal of 3% adopted in Barcelona would appear to be the most promising route to raise the EU's innovation potential and productivity growth.

However, the consistency and credibility of EU policy making would probably gain by recognising that an improvement of the productivity performance is a long-term goal and that in the short run, up to 2010, the highly desirable increase in the labour force participation of females and the elderly could hardly be achieved without accepting that this expansion of employment would be accompanied by a temporary slow rise in productivity as new groups have to go through a learning process and acquire the skills required in the information society.

<sup>5</sup> A.P. Sapir, P. Aghion, G. Bertola, M. Hellwig, J. Pisany-Ferry, Rosati, J. Vinals, H. Wallace: *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, July 2003.

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