

CHAPTER 21

ICT AND COMPETITIVENESS: WHAT PROSPECTS FOR THE LISBON STRATEGY?

SUSANNE MUNDSCHENK¹

ABSTRACT

At the Lisbon Summit in March 2000, Europe's heads of state declared their ambition to make the European Union "the most competitive and dynamic knowledge-based economy in the world by 2010". The underlying assumption of the Lisbon Agenda is that an increased role for ICT will improve the overall economic performance in terms of competitiveness - measured by the level of productivity - and employment. This chapter argues that this assumption is flawed on a number of grounds, both on theoretical and practical grounds.

¹ Susanne Mundschenk is a director of Eurointelligence Advisors, an internet-based economic commentary and analysis company.

21.1 Introduction

At the Lisbon Summit in March 2000, Europe's heads of state declared their ambition to make the European Union "the most competitive and dynamic knowledge-based economy in the world by 2010, capable of sustainable economic growth, with more and better jobs and greater social cohesion".¹ This broad objective includes an increase in the employment rate from an average of 63 per cent in the EU25 to an average of 70 per cent by 2010, which will require an EU average annual real growth rate of three per cent, considerably higher than the average of 2.1 per cent over the past ten years. To achieve it, the heads of state adopted the *Lisbon Strategy*, a far-reaching agenda combining short-term political initiatives and medium and long-term economic reforms. The Lisbon objective is that EU member states should implement policies that increase the standard of living of their citizens in order to enable the EU to reach and even surpass US levels (Ilzkovitz and Dierx, 2006).

Information and Communication Technology (ICT) is one of the key mechanisms for implementing the Lisbon strategy. Many EU member states have established National Information Society Action Plans. Accession countries developed their own action plans to increase internet access, backed by the EU Commission with the e-Europe Plus initiative. While these strategies often have goals other than promoting economic activity – such as the need to strengthen social cohesion – a key policy question is what impact the adoption of ICT has on the economy and in particular on productivity and employment.

The underlying assumption is that an increased role for ICT will improve the overall economic performance in terms of competitiveness - measured by the level of productivity - and employment. This assessment draws from the experience in the US, especially since 1995, where economic growth was accompanied by high sectoral productivity gains that have been interpreted as being largely a result of the successful adoption of ICT. Compared with the US, productivity growth in the EU started to fall behind the US for the first time since the mid-nineties. Van Ark et al. (2003) argued that this is particularly due to a substantial acceleration in the ICT-using sectors in the US unmatched by the EU. Thus, the productivity slowdown in the EU could be reversed or at least put to a halt if national governments target the ICT deficiency in the relevant sectors.

There are three categories of ICT policies under the Lisbon Strategy: (1) policies that focus on the production of ICT technologies with the declared objective of increasing ICT research spending to match the US; (2) policies that aim to improve and broaden access to ICT and (3) policies that focus on the use of ICT with the intention of increasing efficiency and product innovation.

Can ICT help to achieve the Lisbon targets? How does Europe compare to the United States and how does Ireland compare to other EU member states? These are the questions we will address in this study. We find that there is no clear relationship between the role of ICT and productivity performance that is valid for all EU countries. For the European Union as a whole the analysis presented raises significant doubts that ICT can become an instrument to achieve the Lisbon Agenda, whether we look at ICT capital spending or the share of ICT-intensive sectors in the economy.

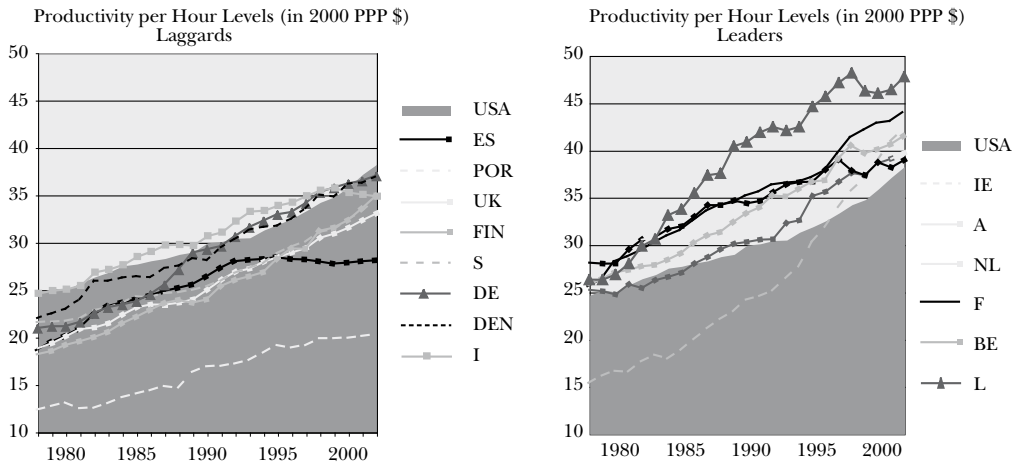
21.2 Comparison within Member States

At the level of the member states, a more diverse picture emerges. Comparing the labour productivity performance over the past two decades shows that Luxembourg and Ireland had the most remarkable productivity performance. Together with France, the Netherlands, Belgium and Austria – these countries were more competitive than the US for most of the time.

What is notable is that if we look at four ICT indicators defined by the Lisbon Strategy (namely ICT expenditure, communication expenditure, broadband penetration and ecommerce via internet) we find that success in productivity terms does not seem to be strongly linked to meeting the four ICT indicators as identified by the EU. Ireland has the highest percentage of turnover created through e-commerce but spends much less on ICT or communication measured as percentage of GDP than ten other EU-15 countries. The United Kingdom seems to be the most consistent country in the sense that though it is part of the leading countries in all categories where data is available, it is not a leading country in terms of overall productivity performance. The ten new member countries invest heavily in communication and will certainly benefit from a new vintage of infrastructure investments, but whether all of these new entrants will also succeed in translating higher spending into higher competitive performance against other states is less clear. Other factors, such as Research and Development (R&D) and human capital as well as market institutions will be important factors in this process.

21.3 The Linkage between ICT Expenditure and Productivity Growth

The assumption that investment in ICT can raise the overall economic performance of a region draws from the experience of the US, especially since 1995 where strong economic growth was accompanied by high sectoral productivity gains. When it comes to growth in productivity and employment, the majority of EU member states performed better with respect to the latter. In 2003, six countries had already achieved the Lisbon target of a 70 per cent employment rate. Measuring competitiveness in terms of productivity per hour, eight EU countries had similar or higher levels of productivity than the US but the EU itself is only at 93.4 per cent of US level. Assuming that the US will continue to grow by an average productivity rate of 1.5 per cent per annum, the EU would need an average annual productivity growth rate of more than 2.5 per cent if the EU were to reach the Lisbon objective by 2010. Six years after the launch of the Lisbon strategy, it seems unlikely that the EU will achieve its goal.

Figure 21.1: Productivity per Hour: Laggards and Leaders


Source: Groningen Growth and Development Centre and OECD.

Are there reasons why we might not find a positive relationship between ICT and higher productivity growth? There are three possible explanations for the absence of a link between the two.

The first explanation is specifically related to the effectiveness of higher ICT research spending. Commissioner Viviane Reding proposed to increase public and private research spending in ICT by 80 per cent in order to match the US.² However, if the better productivity performance of the US is due to its comparative advantage in the production of high technology (Roeger, 2001), then there is no point in trying to replicate the US if other countries can benefit from technological spillovers. It would then be wiser to spend more R&D in the technologically leading country (the US), and to increase the absorption capacity of those countries that are lagging behind. This would suggest that parts of the money spend on the implementation of the ICT action plans of the Lisbon Strategy would be better spent in Silicon Valley or at IT centres in India and to focus on comparative advantages in the EU instead. The policy task for the EU is then reduced to whether Europe uses ICT efficiently enough to benefit from dissemination of ICT.

The second explanation occurs if ICT is not the cause but a symptom of the innovation process. This is the case when other innovation input factors such as R&D and human capital are crucial for the success of ICT. It would then be worth reflecting on whether the Euro spend on ICT would not be better spent on education or R&D in sectors that promises a higher comparative advantage and a higher return in terms of economic growth. Private economic actors would then add any ICT they needed to complement these other inputs.

The third explanation is that the absence of any measured impact of ICT on productivity is purely a failing of data, where measurement errors especially in the service sector can misestimate the impact of ICT on productivity. Robert Solow was famously quoted saying that "there are computers everywhere, except in the statistics". But the direction of the bias is not clear, nor is it clear whether there are significant differences between the US and the EU that explain the different performance of the two economies.

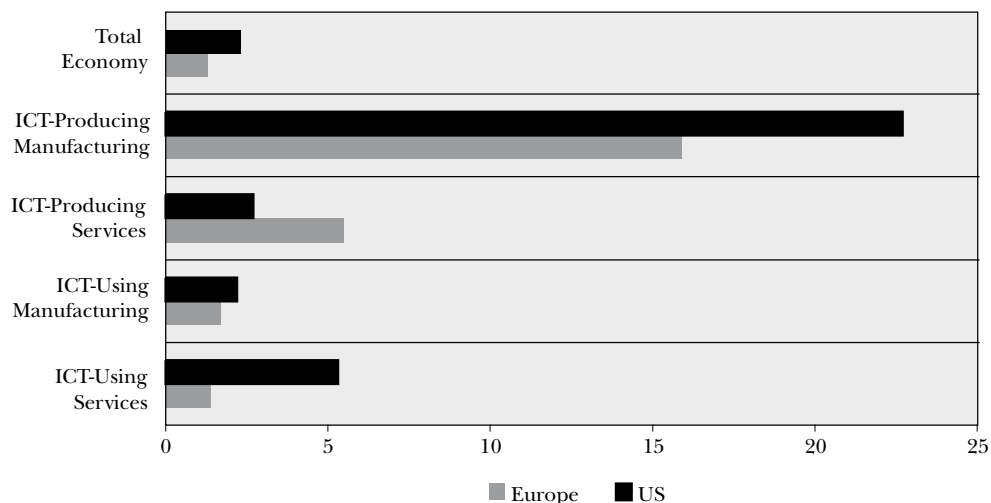
21.4 Decomposing the EU – US Productivity Gap

The US has outperformed the EU in terms of aggregate economy-wide economic growth from 1996 to 2002. Figure 21.2 shows the average growth rates of real productivity per employee for ICT intensive sectors in the EU15 and the US over the period 1996-2002.³ The sectors are categorised as ICT-producing and ICT-using industries and within each of these two categories a breakdown is made between manufacturing and services. As can be seen from the graph, the reason for the difference in performance between the two regions can be explained primarily by two economic sectors – ICT-producing manufacturing and ICT-using services.

In the 1996-2002 period aggregate productivity in the EU15 had been falling despite strong productivity gains in the ICT-producing sector. At the same time the upsurge in US aggregate labour productivity was reflected in high productivity gains especially in the ICT-producing manufacturing and ICT-using service sectors.

ICT-producing manufacturing productivity growth has always been stronger in the US than in Europe, while growth in ICT-using services increased markedly in the US since 1996 while stagnating in the EU15. This is the period when the US started to outperform the EU in terms of productivity growth. ICT-using services are financial intermediation; wholesale trade; retail trade; machinery renting; R&D; legal, technical and advertising services. They are showing outstanding productivity growth, especially in the first three service industries. They are the second most important sector in the US with 26 per cent (EU 23 per cent) of total value added and 23 per cent (EU 21 per cent) of total employment.

Figure 21.2: Productivity Growth: Europe and US, 1996-2002



Source: Groningen Growth and Development Centre.

Total Factor Productivity (TFP) in sectors that use ICT intensively has also risen in the second half of the 1990s for the US and it has been argued that this is a sign of a more productive use of ICT. Also, as a general purpose technology, ICT is expected to spill over towards other sectors. Thus, the contribution of the ICT-producing sector to the TFP of the whole economy should be positive.

Another way of examining differential productivity performance at the aggregate level is by means of growth accounting exercises. Rather than examining the influence of ICT by comparing industries based on their ICT production/usage patterns, it tries to compare the level of ICT expenditures and their likely impact on economic performance. This methodology returns a similar result. Investment in ICT capital makes a significant contribution towards TFP growth in sectors that use ICT intensively. TFP growth is what the European Union needs in order to fulfill the Lisbon Agenda. Increases in TFP are productivity improvement without job losses. Thus, growth in TFP is consistent with both objectives of the Lisbon Strategy, namely higher growth and employment.

Table 21.1 reports the value added per hour worked for the European Union and the US and its contributions. For the EU4 (Germany, France, Netherlands and the UK) the growth rate of value-added per man hour declined continuously to 1.37 per cent for 1995-2001, which is nearly one percentage point lower than for the 1980-1990 period. It shows that since 1980, ICT investment has always been stronger in the US than in Europe. The positive productivity growth gap in 1995-2001 is more than 50 per cent due to higher contributions by IT capital deepening. The second half of the 1990s also shows a sharp rise in TFP for the US and a sharp decline for the EU.

Table 21.1: Growth Accounting for the European Union and the US

European Union (EU4)	1980-1989	1990-1995	1996-2001
Average labour productivity	2.28	2.43	1.37
Contribution of capital deepening	1.16	1.30	0.90
Information technology	0.34	0.29	0.42
Non-information technology	0.82	1.01	0.48
Total factor productivity	1.12	1.14	0.46
United States			
Average labour productivity	1.46	1.19	1.85
Contribution of capital deepening	0.71	0.58	1.05
Information technology	0.52	0.40	0.72
Non-information technology	0.19	0.19	0.32
Total factor productivity	0.75	0.61	0.80
US-EU difference			
Average labour productivity	-0.82	-1.24	0.48
Contribution of capital deepening	-0.45	-0.71	0.14
Information technology	0.18	0.11	0.30
Non-information technology	-0.63	-0.82	-0.16
Total factor productivity	-0.37	-0.53	0.34

Source: Van Ark, Timmer and Ypma (2003). EU4 consists of France, Germany, the Netherlands and the UK.

Why has ICT benefited the US and not the EU? The first point to note is that the ICT producing manufacturing sector and ICT using services sector are entirely separate sectors with weak links between them. The success of the US ICT-using services industries reflects a greater absorptive capacity on their part than their European partners, and certainly did not require as a pre-requisite that the US be a leader in ICT producing goods. As such, while the US may have a comparative advantage in ICT production, this does not translate automatically into a comparative advantage in the ICT using sector. In wholesale and retail trade, the two sectors with the highest productivity growth, higher economies of scale and higher competition benefited the US compared to the still fragmented and highly regulated service sector in Europe. Employment protection as well as product market regulations significantly reduce the effectiveness of ICT investment in the EU.

Another explanation is that the adoption of general purpose technologies such as ICT requires a lengthy learning period with temporarily lower productivity before the boom. The US has undergone this process in the 1980s and early 1990s while many European countries are still in the process. There is however no convincing reason for this assumption given that ICT is considered as a global good with international externalities. There may be delays in adaptation but it is hard to imagine that ICT investment benefits should show up after more than 15 years, even in the EU.

Another factor mentioned above as to why Europe and US performance may have diverged relates to other input factors such as R&D and human capital, which are crucial for the success of ICT. What is notable from an analysis of the data, however, is that the three ICT service sectors that were found to explain the latest acceleration in the US - financial intermediation, wholesale and retail trade - do not have substantial spending on R&D, or are not typified by an intensity of highly skilled workers, although financial intermediation might be the exception to this.

Finally, there is a possibility that while ICT has had a significant impact on the economy, the statistical measures do not account for them. Business services are likely to provide indirect productivity effects that are not accounted for in the service sector. Innovation and diffusion of knowledge passes through their client relationship and creates positive productivity gains even if the service sector itself is stagnant. ICT investment requires complementary investment in organisational change and retraining. Since those expenditures are classified as intermediate consumption under conventional national accounting systems, they get netted out of the final GDP although it is in fact investment and should be included in GDP. As long as the Lisbon Agenda ultimate goal is to increase the GDP per capita from current 70 per cent of US level, we might not see ICT to be part of this strategy.

21.5 Conclusions

At the Lisbon Summit in March 2000, Europe's heads of state declared their ambition to make the European Union "the most competitive and dynamic knowledge-based economy in the world by 2010, capable of sustainable economic growth, with more and better jobs and greater social cohesion". The underlying assumption of the Lisbon Agenda is that an increased role for ICT will improve the overall economic performance in terms of competitiveness - measured by the level of productivity - and employment. This chapter has argued that this assumption is flawed on a number of grounds, both on theoretical and practical grounds.

In theoretic terms, increasing ICT expenditure will not necessarily result in improved productivity. If the better productivity performance of the US is due to its comparative advantage in the production of high technology then trying to replicate the US is sub-optimal as long as other countries can benefit from technological spillovers of inventions discovered by US research. Further, if ICT is not the cause but a symptom of innovation process, then EU governments should be investing more in complementary inputs such as education and R&D.

In practical terms, the four ICT indicators as identified by the EU in the Lisbon Strategy (namely ICT expenditure, communication expenditure, broadband penetration and ecommerce via internet) do not seem to be strongly linked to success in productivity terms. Furthermore, the success of the US ICT-using services industries reflects a greater absorptive capacity on their part than their European partners. Employment protection and product market regulations in the EU significantly reduce the effectiveness of ICT investment.

Notes

- 1 The full text (Presidency Conclusions, Lisbon European Council, 23 and 24 March 2000) can be downloaded from: www.europa.eu.int/comm/off/index/_en.htm.
- 2 Viviane Reding, Member of the European Commission responsible for Information Society and Media. Press release on the occasion of the launch of the initiative European Information Society 2010, Brussels, 1 June 2005.
- 3 The data is derived from the 60-Industry Database from the Groningen Growth and Development Centre.

References

Van Ark, B. and O'Mahony, M. (2003), "EU Productivity and Competitiveness: An Industry Perspective, Can Europe Resume the Catching up Process?" DG Enterprise, Luxembourg, European Commission.

Van Ark, B., Trimmer, M. and Ypma, G. (2003), "IT in the European Union: Driving Productivity Convergence?", *CGDC Research Memorandum*, University of Groningen, Netherlands.

Ilzkovitz, F. and Dierx, A. (2006), "Economic Growth in Europe: Pursuing the Lisbon Strategy" in: Mundschenk, S., Traistaru, I., Stierle, M. and Stierle-von Schütz, U. (eds.): *Competitiveness and Growth in Europe, Lessons and Policy Implications for the Lisbon Strategy*, Edward Elgar.

Roeger, W. (2001), "The Contribution of Information and Communication Technologies to Growth in Europe and the US: A Macroeconomic Analysis"; *Economic Papers*, No. 147, January 2001, European Commission, Brussels.