

**THE “LISBON GOAL” OF THE EU:
RHETORIC OR SUBSTANCE?**

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Abstract

Reviewing historical trends as well as key principles of trade theory and growth theory, this paper critically evaluates the Lisbon Goal of the EU and identifies potential pitfalls and shortcomings of the policy that might be pursued to achieve that goal. It argues that the policy initiative as such is valid, but the paradigm of international competitiveness is potentially misleading in this context. The focus should, instead, be on total factor productivity. Policies based on sectoral targeting, while potentially valid in principle, are quite dangerous in practice. Policies focusing across the board on institutions are more promising.

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Introduction

In March 2000 the European Union heads of state gathered in Lisbon to announce their joint 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.”

This has meanwhile become known as the “Lisbon Goal” of the EU. It is replete with positive terms, hence it was bound to meet broad political support, at least at the outset. Its support is also partly explained because it lacks precise interpretation. But the initiative did not stop with this vague announcement. Deriving from the “Goal”, the “Lisbon Strategy” specifies well over one hundred targets and sub-targets, partly quantitative with associated time schedules, as well as indicators to monitor the degree of achievement. Given the vagueness of the Lisbon Goal, it is not surprising that the Strategy does not include any theory, let alone formal modelling, to explicitly derive this extensive and detailed set of targets. Instead, the Lisbon Strategy simply appeals to common sense, more or less claiming that targets specified are all “self-evident” virtues and meeting them in entirety would pave the ground to meeting the Lisbon Goal. Typical examples of such targets are a rise in the general and female employment rate to 70 and 60 percent, respectively, and raising public and private spending on innovation to 3 percent of GDP, all by 2010.¹

The policies to be pursued in order to achieve the targets rely on the Community Method, although the Lisbon Process as such explicitly abstains from the EU legislative instruments of regulations and directives. Instead, the EU follows a new approach dubbed the “Open Method of Coordination”. The key ingredients of this method are general policy guidelines, policy recommendations and assessments and – above all – peer pressure from fellow member countries, fostered by detailed indicator-reporting.

A few years on, it had become clear that the Lisbon Strategy did not meet its aspirations. To avoid a “resting in peace destiny” of the whole initiative, the Council commissioned a mid-term review by a so-called High Level Group, chaired by the former Dutch Prime minister Wim Kok. The Group’s report should, it was hoped, help re-launch and invigorate the process half-way through the given time span. The review was submitted to the March 2005 Summit in Brussels. Although the “Kok Report” remains optimistic about the principal validity of the project, it calls for more political will and determination. In particular, it identifies a lack of “political ownership”.² The process has clearly lost momentum, and disillusionment is spreading, perhaps partly also as a spill-over from the ill-fated attempt at an EU constitution. It is hard to conceive of “Lisbon Mark 2”, though more focused and streamlined than the original initiative, as a self-starter.

A high level of determination on the part of EU institutions notwithstanding, moving from “self-evident” targets to specific policies has proven difficult during the past 5 years, and is likely to remain difficult in the remaining 5 years until 2010. Proposed policies often turn out to be controversial or simply do not deliver.

If a policy initiative fails to find “ownership”, even over a longer time horizon, then the usual suspects of vested interests and lack of incentives are probably not the sole cause. A more fundamental scrutiny of the underlying goal is warranted. This paper therefore critically evaluates the Lisbon Goal i) against the background of historical facts and recent trends, ii) against the background of relevant economic theory, and iii) in the context of possible policy actions within the fabric of common EU policies. I start off with a few critical remarks on the principal meaning of the Lisbon Goal. I shall argue that it should be interpreted as focusing on European productivity, as opposed to international competitiveness as such, which is a potentially misleading policy paradigm. This will be followed by a brief review of the long-run historic trend and more recent EU-US productivity comparisons. This puts the Lisbon initiative into historical perspective. I will then try to draw some relevant insights from growth theory, which is an obvious theoretical paradigm that one might turn to in an attempt to attach more precision to the Lisbon Goal. The final section will turn to the institutional dimension, again mainly identifying basic principles, but also focusing on the fabric of EU common policies.

The purpose of the paper is not to evaluate specific measures that the EU might undertake towards the Lisbon Goal, but instead to draw on fundamentals of economics to identify some general principles that should be borne in mind when framing a Lisbon Agenda, and which might also be helpful in explaining why the initiative seems to deliver only to a rather limited extent.

1 On the meaning of international competitiveness

The Lisbon Goal refers to international competitiveness. How should we define international competitiveness of a country, as opposed to a firm? An agreeable definition might be to measure competitiveness by a country’s ability to generate sustained economic well-being for its citizens, with a minimum degree of equity regarding personal or regional distribution of income and wealth. One might add a dynamic dimension in terms of the country’s ability to catch-up, in terms of well-being, to more advanced countries, or even to generate “frontier” advancement in terms of technology and economic opportunities. If this seems agreeable, perhaps also to the authors of the Lisbon Goal, one wonders if international competitiveness is the right word to use. In particular, there is very little in the way of international comparison that is involved in this definition.

Indeed, economists have often pointed out that international competitiveness is potentially misleading paradigm.³ Countries are not firms writ large, and their citizens' well-being has little to do with international contests for supremacy. Worse, pursuing international competitiveness may lead to wrongheaded policies, like creating national champions by interventionist industrial policies or merger policies with a nationalist touch, as recently observed in several instances in France and Germany. It may also nourish protectionist, or even mercantilist, policies towards international trade and factor flows, with a questionable relationship to *overall* domestic well-being as defined by normative trade theory. For instance, domestic welfare may well improve even if a country falls back in some competitiveness ranking, because this may go hand in hand with an improvement of its terms of trade. In a similar vein, if a country experiences a real appreciation, say in terms of its wage level relative to that of other countries, this need not reflect a loss in international competitiveness, as is often suggested in the literature and the press.⁴ It might just be the result of an increased world demand for its products, thus reflecting a terms of trade improvement. Or it might reflect a domestic productivity increase, which would be regarded as just the opposite of a loss in competitiveness.

A country's welfare is determined, first and foremost, by its *absolute level of productivity*, and not by some international competitiveness ranking as such. In a trading world, productivity is "magnified", in terms of its welfare potential, by international exchange according *comparative* advantage, adding the terms of trade as a second principal determinant of domestic well-being, and opening the distinct possibility of gaining from other countries' productivity enhancements. This seems fairly straightforward from the simple two-country trade model, but one should perhaps add an important caveat which is relevant in the many-country world. The terms of trade effect from foreign countries' productivity improvements may work against the domestic economy, if these occur in industries where the domestic country is a net exporter. This has recently been emphasized by Samuelson (2004) in the context of US outsourcing to India and China.⁵

Thus, the Lisbon Goal should be viewed as directed towards the level of European productivity, rather than the position of EU-countries in some elaborate index of international competitiveness. In addition it might be augmented by a concern about unfavorable terms of trade effects from foreign productivity improvements in industries where EU countries are net exporters.

But this begs the question of what, exactly, we mean by the productivity of a *country*, as opposed to a single *firm* or an individual *worker*? The answer follows from the role that a country plays in providing *institutions* for fruitful *interaction* between individual workers' abilities, and between different firms. In other words, given individual abilities, economic welfare importantly depends on well-functioning markets for goods and factors where such interaction takes

place. This includes labor markets, which are typically plagued by imperfections, and capital markets where savings are channelled into productive investment and capital accumulation. Moreover, of particular importance in the present context, it includes institutions relating to education and human capital formation, i.e., to the formation and enhancement of individual abilities. The criteria for good institutions are a clear identification and first-best correction of market imperfections, completeness of contracts, and awareness of incentive-problems, particularly where non-market mechanisms are used because of market failure. Good institutions are important not only in a static sense, in order to achieve a high level of welfare, given a country's level of technology, but also for countries to catch up to the technological frontier. In this regard, a speedy adaptation of institutions towards changing needs and openness towards new institutional arrangements is a further important criterion.⁶

These observations point to a meaningful interpretation of the Lisbon Goal and associated international competitiveness rankings, notwithstanding the above criticism. Indeed, one may perhaps say that the usual criticism against the notion of international competitiveness mainly derives from trade theory, while modern growth theory offers a more useful re-interpretation of this concept towards institutions and institutional change. In this sense, then, exercises like the "World Economic Forum Lisbon Review" may serve a useful purpose in providing benchmarks for countries' attempts at enhancing the quality of their institutions in all of the aforementioned dimensions.⁷ However, the Lisbon initiative, if based on such index rankings is fraught with methodological intricacies deriving from the multi-dimensional nature of the problem. More importantly, it faces the fundamental question of whether there is a single, well-defined best set of institutions that all countries should aim for. Is this optimum set of institutions found in the "US-model" that the EU should, therefore, simply try to emulate in its Lisbon Agenda? Or is there a promising, distinctly European alternative? And what is the significance and role of the European Union as a policy maker, as opposed to the member state governments? I shall return to these questions towards the end of the paper. In the next section, I want to take a brief quantitative look at US/EU productivity levels in recent history.

2 Falling behind and catching-up to the "American Frontier"

At the outset, it is worth looking at some numbers on European growth performance, particularly relative to the US, in order to obtain a sense of the impression under which policy makers may have been when meeting in Lisbon in the year 2000. In addition to recent developments, this section also looks at secular developments, in order to put the Lisbon Goal initiative into a broader historic perspective.

Starting with the first wave of economic globalization more than a century ago, one may identify three episodes of European economic development relative to the US. The first is the period from 1870 up to the end of World-War-II,

which marks a huge US lead in income per capita and productivity. The second is a period of European catching-up, starting at the end of World-War-II up to the mid 1990s. And finally, the past decade features a period of renewed US-lead over Europe, which seems to have been an almost traumatic experience for many European countries. Table 1 gives some key numbers, including Australian and Canadian values for comparison. The gap between Europe, defined as EU12, and the US in terms of real GDP per capita rose from 15 percent in 1870 to 30 percent by the year 1913. In terms of real GDP per hour worked (labor productivity), it rose from 29 to 39 percent during the same period. The two world wars did further blows to European per capita income relative to the US, increasing the income gap between the EU to almost 50 percent by the year 1950. European labor productivity fell back to a mere 56 percent of the US level. After World War II, Europe successfully embarked on a process of catching-up, increasing its income per capita up to 73 percent, and its labor productivity to 80 percent of US the level by 1990. By 1995, labor productivity of the EU12-countries had reached 95 percent of the US level. However, in 1995 the “American productivity locomotive departed”, and within eight years Europe lost one fifth of what it had caught up since 1950. Borrowing from Gordon (2004b), it is probably fair to say that it is primarily against this traumatic experience of “being left at the station” that the EU Heads of State issued their Lisbon statement in 2000.

Table 1: Long-run evolution of GDP per capita and GDP per hour worked relative to the US

It is worth taking a closer look at various post-war sub-periods. Four findings are worth emphasizing. A) A major part of European catching-up in terms of income per capita after World War II took place in the period up to the early seventies. Very little further progress took place thereafter. B) Catching-up was much more pronounced in terms of productivity than with income per capita, whereby the relative productivity increase stretch well into the early 90s. C) There are marked inter-country differences, the overall picture being one of “multi-speed Europe”, not a uniform performance of the EU. Looking at the country pattern in more detail, it is difficult to detect an overwhelming influence of the various rounds of EU enlargement. While in some cases, like Ireland, Spain and Portugal, there is evidence that EU membership has spurred growth, a general conclusion seems unwarranted.⁸ D) Finally, it is worth mentioning that GDP figures include income accruing to foreign capital owners. Hence, in cases where foreign direct investment is an important factor, GNP figures tell different stories. All four points are conveniently made, without further comments, by figures 1 through 3.⁹ Figure 1.a depicts real GDP per capita for the original EU6 and the three countries entering in 1973; figures 1.b and 1.c do the same for the southern enlargement in 1981 (Greece) and 1986 (Spain and Portugal), and

for the 4th enlargement in 1995. These figures clearly show points A) and C). Comparing them with figures 2.a through 2.c which focus on productivity highlights point B), while a comparison with figures 3.a through 3.c establishes a case in point for D), particularly regarding Ireland and Greece.

Figures 1.a - 1.c in panel form
Figures 2.a - 2.c in panel form
Figures 3.a - 3.c in panel form

Why did the impressive European productivity increase after World War II fail to show up in equal progress in terms of income per capita? The explanation lies in low employment rates and few hours worked per person employed. Income per capita, Y/N , can be decomposed into

$$Y/N \equiv (Y/H)(H/E)(E/N), \quad (1)$$

where H and E are the overall hours worked and number of employed persons, respectively. Indicating EU-US log-differences by $\Delta \log$, we have

$$\Delta \log(Y/N) \equiv \Delta \log(Y/H) + \Delta \log(H/E) + \Delta \log(E/N) \quad (2)$$

Notice that these are identities which do not tell us what drives what.¹⁰ The second half of the 20th century has seen a strong and more or less steady decline in both, the European employment rate, E/N , and the average hours worked, H/E , relative to the US. Figures 4.a and 4.b depict the decomposition of equation (2) for the EU6 and the EU15 for the years 1960 and 1973 up to 1997, again using the Maddison and GGDC data base. In the year 1960, both the EU6 and the group of EU15-countries still had a higher employment rate and a higher average number of hours worked than the US, mitigating the average income effect of the productivity gap.¹¹ Starting in 1973, however, a steady rise in EU relative productivity is dragged down by fewer working hours per capita, i.e., by relatively low employment rates E/N , and fewer hours worked per person employed H/E , thus keeping average income almost flat through time.

Lower European employment rates may be due to higher rates of unemployment, but it may also reflect lower labor force participation rates and lower rates of working age people. In turn, the difference in average hours per worker may be due to a bigger share of part-time work, or it may reflect fewer hours per full-time worker. In view of the Lisbon Strategy, a key question is whether the long-run decrease in hours worked per capita in Europe, in absolute terms or relative to the US (or, for that matter, any other country of reference), warrants policy action. An affirmative answer

requires that the decrease is involuntary (rationing) or, if voluntary, that it reflects distortions. In addition, it is fairly obvious that certain developments are simply beyond reasonable policy influence, such as for instance demographic change driving the share of working age people.

Figures 4.a - 4.b in panel form

Blanchard (2004) argues that the major source of the European post-World War II decline in average hours worked lies in a decrease in average working hours, which is, in turn, mainly driven by hours worked per full-time worker.¹² He goes on arguing that this is more likely to reflect voluntary choice than an increase in part-time work. But this seems questionable in view of the prevalence of work-time regulation in many EU countries. Indeed, such regulation may cut both ways, although the general presumption is that the overall involuntary effect of European labor market regulation in equation (2) is negative. But, arguably, the difference may to a large extent also reflect voluntary choice, which may either be explained by different preferences, or by distortions. Depending on the labor supply elasticity, European preferences may imply that a larger part of any productivity increase is “consumed” in the form of more leisure, i.e., with fewer hours worked and/or lower labor force participation, than in the US.

One should, however, bear in mind that other factors of influence play a role here as well. The prime suspect as regards distortions is the marginal tax rate on labor income, which distorts labor supply decisions. Available evidence does not allow even a vague decomposition of $\Delta \log(H/N)$ into a voluntary and an involuntary part, and a decomposition of the voluntary part into a preference-effect and a distortion-induced part.¹³ This surely is a severe problem with respect to some of the quantitative labor market targets of the Lisbon Strategy. However, it does not put the initiative as such in question. The truly worrying aspect of table 1 is that Europe has recently fallen back quite dramatically in its level of productivity, maintaining (or even slightly improving) its income level through relative *improvements* in labor market performance, measured in terms of H/N . The focus, therefore, must lie on Y/H , as already suggested by the previous section. Room for further improvements in labor market performance notwithstanding, labor productivity is where Europe seems to be losing ground.¹⁴ Labor productivity must be the prime focus also in view of the definition of international competitiveness offered in the preceding section. Voters’ disillusionment with Europe is arguably explained, whether justifiably or not, by a sense that the EU fails to deliver prosperity. Maintaining, or increasing, family income by means of more work alone will hardly be felt as delivering economic welfare.

However, a key problem with the Lisbon Goal and Strategy as an economic policy initiative that it relates to an economy (Europe) without any government as an economic policy maker. A major part of the relevant policies, indeed

virtually everything except market integration and monetary policy (which is conspicuously absent in the Lisbon Strategy), is bound to be national in nature. Hence the Open Method of Coordination. The underlying assumption, then, is that there are gains from pursuing productivity enhancing national policies in a coordinated way, as opposed to independent policy formation by national governments. However, these gains are likely to be small, and the expectations vis à vis Brussels should thus be limited to start with. Moreover, the strategy should be based on explicit theory of gains from policy coordination, in addition to a theory identifying the relevant (national) policies as such. I shall return to this issue in the final section of this paper which focuses on macroeconomic policies.

3 A closer look: the role of capital

The analysis up to this point leaves two important questions open. The first is whether an observed lead in US labor productivity over Europe at any point in time is due to a more intensive use of *non-labor inputs*, and, if so, what this implies for the ultimate goal of economic well-being. The second relates to whether some industries are more important than others for income and productivity gaps. I take these questions up in turn.

We should generally expect to see a rise in output per hour, even without any change in productivity, if the economy makes heavier use of non-labor inputs. As far as the ultimate goal of economic well-being is concerned, the question is whether these non-labor inputs involve disutility comparable to the disutility of labor. If they do not, then we may regard the associated increase in output per hour as a true increase in economic welfare. This may be the case for *land* and *natural resources*, where an increased utilization generates rents to land and resource owners.¹⁵ However, things are different for *capital* which in its broadest definition comprises all inputs that go back to past investment and, thus, forgone consumption. If observed output per hour increases because of a higher capital stock, this is a return to past investment and should not be treated on an equal footing with a rise in productivity. Indeed, the return may be lower than the user cost of capital, in which case the higher output per hour reflects overinvestment with a detrimental intertemporal effect on economic well-being, despite a rise in future incomes.

This is an important aspect that tends to be overlooked in policy initiatives aimed at growth and catching-up, like the Lisbon Goal. The measures undertaken may turn out to be quite impressive as regards investment and subsequent increases in income per capita, but if they introduce distortions into the savings-investment channel, then the outcome need not be an increase in economic well-being. A welfare increase follows only if the policies undertaken carefully correct pre-existing distortions that are responsible for underinvestment and a sub-optimally low capital stock to start with. Arguably, the Lisbon Strategy is less than satisfactory on this account.

While it is difficult to empirically detect over- or underinvestment and to pin down the associated capital market failure, the contribution of *capital deepening* to economic performance as such is relatively straightforward to compute. Turning to labor productivity Y/H , the first term in equation (1), and assuming a linearly homogeneous aggregate production $Y(K, H)$, we may write $Y/H = y(K/H)$ with $y' > 0$. Output per hour thus increases, with unchanged technology, or total factor productivity, if the capital intensity K/H increases. Allowing for changes in total factor productivity, and using θ_k to denote the elasticity of the function $y(\cdot)$, we may decompose any observed increase in output per hour according to

$$\hat{Y} - \hat{H} = \theta_k (\hat{K} - \hat{H}) + \hat{T}, \quad (3)$$

where a caret indicates a relative change between two points in time, and \hat{T} is the change in total factor productivity (TFP). In growth accounting exercises this is usually inferred as the residual from empirical observations of all other terms in the above equation. In a similar manner, figures 5.a through 5.c compare average annual growth rates in real GDP per capita, output per hour worked, and total factor productivity, respectively, for various periods. Figure 5.a once more reveals the significant European catching-up in terms of average incomes up to the early 70s, with relatively little further movement until the mid 90s, and yet another leap of the US from 1995 to 2003. Figure 5.b reveals that in terms of labor productivity, $\hat{Y} - \hat{H}$, Europe has outperformed the US, even after 1972, but only to fall back again in the second half of the 90s. Comparing this with TFP-growth, \hat{T} , in figure 5.c, we realize that in the period 1973-1985 European catching-up was indeed partly a result of capital deepening: $(\hat{Y} - \hat{H})_{US} - \hat{T}_{US} = 1.22 - 0.71 = 0.51$, whereas for the EU15 we have $(\hat{Y} - \hat{H})_E - \hat{T}_E = 2.25 - 1.12 = 1.13$. For the period 1986-1994 the effect of capital deepening for the US was 0.3, while for the EU15 it was 0.96. By way of contrast, in the recent lead by the US during 1995-2003 its capital deepening effect was 0.39, surpassing that of the EU15 which had fallen down to 0.32. Roughly similar comparisons hold for more narrow groups of EU-countries. Thus, from the early 70s to the mid 90s, EU countries did catch up to the US also in terms of TFP, but less than in terms of labor productivity, the difference being explained by *relative capital deepening*. In the recent decade, they fell back relative to the US both in terms of output per hour and TFP, with the TFP effect being aggravated by a lower capital deepening effect. The recent fall back in the late 90s is thus also a matter of relatively low investment and capital accumulation.¹⁶

Figures 5.a - 5.c in panel form

These figures mask considerable variation between individual years, particularly within the most recent decade, but also between different sectors of the economy. While the vagaries of individual years seem less important from our perspective, the *sectoral break down* surely is of great significance. This is the second open question mentioned above. Indeed, the Lisbon Goal declaration, in its emphasis on the *knowledge base* of the economy, explicitly recognizes potential asymmetries across sectors. This is best discussed in the context of modern growth theory in the subsequent chapter.¹⁷

4 Why catching-up might be hard

4.1 Two views on growth

Traditional growth theory argues that if a country has relatively low income per capita because it has a low capital stock per worker, K/H , then – ceteris paribus – it will automatically catch up because it boasts a high marginal productivity of capital. This channel operates through the term $\theta_k(\hat{K} - \hat{H})$ in equation (3) above. Moreover, traditional theory treats the second channel, \hat{T} , as an essentially exogenous force. In particular, there is nothing inherent in a technological improvement that would spark off further improvements and, thus, a *permanent* lead of one country over another in terms of *growth rates*. This theory does not offer any guidance as to whether the recent US lead is a one-time event, in which case the “US-locomotive” will eventually slow down, giving way to automatic catching-up by the rest of the world, or the beginning of a permanently different growth path. It might be, but we simply do not know, and traditional theory offers little help.

One might be tempted to conclude from this that there is very limited scope for a Lisbon Strategy. However, concluding *policy irrelevance* would be a gross misunderstanding. The absolute level of a country’s productivity still importantly hinges on the quality of its policy and its institutions, as indicated in section 1 above. In particular this conventional growth model does *not* hold that all countries would in the long-run converge to the same income levels, regardless of policy. But it contains very little in the way of explaining different long-run income levels across countries. Specifically, by completely ignoring all sectoral dimensions, it rules out the potential usefulness, or damage, that follows from good or bad policies of industrial targeting. In other words, it eschews all questions of static factor allocation. Indeed, it even minimizes the role of policy along the dynamic dimension by treating technological improvements as *exogenous*. To obtain insights for the Lisbon Strategy, we must obviously extend the growth-theoretic perspective. I shall return to issues of allocative efficiency below. I briefly want to first look at some insights that may be drawn from modern growth theory.

Modern growth theory adds more leverage to policies aimed at accumulation by departing from the assumption that accumulated factors (physical or human capital) are subject to the “law” of diminishing marginal productivity, which is responsible for automatic catching-up in the traditional view just mentioned. Accumulation may not only add to the capital stock of a constant returns to scale technology of production, as depicted in the above equations, but may in addition also enhance the knowledge stock of the economy. Knowledge in this context not only relates to production of goods, but also to the production of further knowledge and skills. The relevant mechanisms are *learning-by-doing-* and *spill-over-effects* from accumulation, with growth essentially “feeding on itself” and with the distinct possibility that accumulation may escape the “law” of diminishing returns. By modelling such external effects of accumulation, modern growth theory essentially moves technological improvements into the realm of *endogenous* variables.

If growth does feed on itself, and if we have a theory of the channels involved, this should prompt us to be more positive about the scope of a Lisbon Agenda as regards long-run growth potentials extending far beyond 2010. However, the message from modern growth theory is somewhat of a mixed blessing. On the one hand, knowing more about endogenous determinants of long-run growth should be helpful for well-guided growth-oriented policy initiatives. At the same time, however, the benign effect of diminishing returns and the associated element of *automatic* catching-up have become elusive under this paradigm. Convergence, even conditional convergence, can no longer be counted on and policy makers face the spectre of progressively increasing, rather than narrowing, international income gaps. There is a large body of literature on the lack of international convergence which substantiates this view. However, while the spectre of progressively falling back is a real danger for many developing countries, it seems somewhat remote for the EU. A few key observations are still worth being pointed out in the present context.

A crucial point relates to *international specialization* in the presence of several industries where the aforementioned channels of endogenous growth are differently important. Under these circumstances, some countries may find themselves specializing in the “wrong sectors”, if some exogenous “event”, or historical conditions, establish an initial advantage of some other countries in industries where learning-by-doing and knowledge-spill-overs are particularly important. As Lucas (1988) has shown, this may produce a specialization pattern with *progressive divergence* in aggregate growth performance. While this is a distinct theoretical possibility, one may wonder about its empirical relevance for the Lisbon Agenda. In any case, any further insight relies on identifying “pro-growth sectors”.

4.2 The role of information technology

It is often argued that *information technology* (IT) is a driving force behind the recent upsurge in US- relative to EU productivity performance. Table 2 therefore uses this criterion to look at productivity growth on a disaggregate level. It

gives percentage-point-differences in average annual labor productivity growth for three different half-decades. In view of the preceding subsection, it should be remembered when looking at this table that labor productivity growth may be driven by capital deepening. Moreover, economy-wide effects depend on how large these sectors are. Hence, the numbers in parentheses give the sectoral contribution to the overall difference in labor productivity growth, based on sectoral GDP-shares. Table 2 clearly suggests that the recent lead in US productivity has to do with US superiority in IT-sectors.¹⁸ The most pronounced and important US-lead relates to IT using services, which is basically retail and wholesale trade, as well as securities (see also Blanchard, 2004).

With such a clear message regarding the role of individual sectors of the economy, it is tempting to pursue a *sectoral-targeting-approach* for the Lisbon Strategy. This may take several forms, but would likely involve some form of public subsidization or active industrial policy, trying to influence the pattern of international specialization towards a larger share of “strategic” sectors where one hopes for significant learning effects and knowledge-spill-overs. But such a policy is not without potential pitfalls.

Table 2: EU15 and US labor productivity growth rates by ICT sector

First, if growth performance in the EU and the US is determined by a Lucas-type process, then such a policy may be very *expensive*. It would require reversing the pattern of specialization, such that the EU would reap the relevant learning effects through enhanced domestic production in the “right industries”, thus forgoing cheap imports from the US. Given international obligations and EU law on state aids, the ways to do this seem rather limited in the first place. But even if it can be done, perhaps in some hidden way, it seems highly questionable whether the long-run gain would justify the present costs that arise from an allocation which is statically inefficient.

Secondly, any activist policy of “picking winners” is very demanding in terms of required knowledge and information. In practice, it will always have to be carried out under incomplete information and uncertainty, thus running the risk of a “wrong pick”. Any preferential treatment of “expected winners” has an opportunity cost on the part of sectors that it discriminates against. Unfortunately these costs are often not “self-evident” and tend to be neglected or at least underestimated in political decision making. Industrial targeting policies are also susceptible to questionable *lobbying efforts*. Thus, there are several factors that cast doubt any attempt to pursue such policies in order to meet the Lisbon

Goal. From this perspective, it therefore seems appropriate that the Commission and the Council have abstained from incorporating sectoral targets in the Lisbon Strategy.

On a more fundamental level, what is the true advantage of *domestic* ICT-production over ICT-imports? The Lucas-model assumes that technological advancement takes place through disembodied learning which is strictly *national*. But knowledge spill-overs may be international in scope, and technological improvement may be embodied in tradable goods. In either case, domestic production is not essential for reaping the benefits. For instance, table 2 suggests a large potential for labor productivity growth in IT-*using* services, such as wholesale and retail trade. This has two implications. First and foremost, since these services themselves are largely nontradables, the Lucas-type story of progressive divergence caused by trade simply does not apply. Arguably, targeted policies may be easier to pursue, as they do not require “running up-hill” against temporary comparative disadvantage in trade. But they also make less sense, because the IT-products *used* are mostly tradable goods which need not be produced domestically. Indeed they should not, if the US has a comparative advantage in production, due to some favorable historical condition. Even if the direct learning effect is restricted to the foreign economy, causing progressive growth divergence, the lagging economy still benefits from a long run improvement of its terms of trade. If this effect is strong enough, welfare (as opposed production) may even increase more rapidly in the slow-growth economy than in the faster-growing economy.

A further fundamental point is that table 2 is backward-looking. There are clear indications that information technology has undergone at least part of the transformation from a largely *proprietary* technology to an *infrastructure* technology, as recently emphasized by Carr (2003). The defining characteristic of an infrastructure technology is that it offers more value when shared by many users. In contrast, a proprietary technology is characterized by isolated use, based on physical limitations, intellectual property rights, lack of standards etc. Table 2 may reflect a proprietary early phase of IT, but the Lisbon Strategy should be framed on the premise of IT as an infrastructure technology, and it should duly avoid falling into the overinvestment trap.

5 The role of institutions: commodity markets

Institutions are hard to quantify, but it is obvious that they should play a role also in the Lisbon Strategy. This general point is reinforced by recent academic literature on development and convergence, where economists have increasingly emphasized institutions as a key explanatory factor, in addition to geography, technology and trade.¹⁹ Although institutional failures of the kind usually identified in the literature on developing countries seem largely irrelevant for the EU-US comparison, the institutional dimension is nonetheless important for the Lisbon process. Moreover, national

institutions are arguably more important than EU institutions. Again, due to limited space, I can do no more than identifying a few general principles. These are related to commodity markets, labor markets, and to monetary and fiscal policy.

The discussion revolving around the Lisbon Strategy is replete with lamentation about institutional rigidities on European *labor markets*. I shall argue below that some of this is stereotype and seems overdone. In addition, the debate to some extent suffers from an unwarranted “backseat-role” of institutional rigidities on *commodity markets*. This is particularly important here, since “Brussels” plays a much larger role for commodity markets than for labor markets, where institutions are still largely shaped on the national level. There is ample evidence that commodity market institutions have a huge potential for productivity growth. For instance, in several large studies by the McKinsey Global Institute on the fundamental determinants of (changes in) productivity in various parts of the world, one of the principle insights was that undistorted competition on commodity markets is a key factor. In a summary of the overall findings, Lewis notes:

“Most economic analysis ends up attributing most of the differences in economic performance to differences in labor and capital markets. *This conclusion is incorrect. Differences in competition in product markets are much more important.*”²⁰

In the specific European context, it is widely acknowledged that the EU’s “Single Market” initiative has been vital for institutional progress in terms of a) the degree of competition,²¹ b) deregulation and liberalization of monopolies, c) control of mergers, d) restriction of state aids, and – to a lesser extent – e) privatization. Although member states could have pursued these reforms on their own, the EU has certainly been important in fostering beneficial coordination, as well as a vehicle of peer pressure and policy delegation to deal with domestic political pressure. As a result, the degree of European product market regulation has fallen over the past decade, although by most standard measures it continues to be above the US level (see Blanchard, 2004). Recent literature has also pointed out that there is an intimate relationship between the degree of competition on product markets and labor market performance. Hence, any attempt on the part of the EU to increase deregulation and competition on European goods markets are likely to also improve European labor market performance, even if labor market institutions as such remain under national discretion and are not improved directly.²²

Further commodity market deregulation thus certainly deserves a prominent place in the Lisbon Strategy. In quantitative terms, the potential seems quite promising. For example, a recent study by Bayoumi et al. (2004) concludes from a simulation exercise, based on a calibrated general equilibrium model, that the joint effect of raising the degree of

competition on commodity and factor markets in the Euro area to the US level would be a boost in European output by as much as 12.5 percent, reducing the present income per capita gap by as much as 50 percent.

However, some of this discussion seems to eschew a question that is often on policy-makers' minds: Will productivity increases show up in job growth and, ultimately, higher income per capita? Or will they have the opposite effect of lower employment to meet a stationary level of demand? The question could even be stated in reverse: Might incentives to achieve productivity increases be undermined by an anticipated lack of sufficient commodity demand?²³ In my view, some of the discussion is one-sided in that it focuses on supply, and does not pay sufficient attention to demand. Given labor market institutions, employment will be determined by *equilibrium* on commodity markets, and thus by supply *and demand* conditions. Aggregate demand, particularly in the short run, is importantly influenced by macroeconomic policies. As emphasized above, such policies are conspicuously absent in the Lisbon Strategy. The next subsection argues that this is an unfortunate, if understandable, omission.

6 Do macroeconomic policies play a role?

Equations (1) and (2) above take an *ex-post* perspective. The following equation turns to an *ex-ante* perspective by rearranging equation (1), and by introducing demand for commodities produced domestically. After some manipulation, we arrive at the following equilibrium condition:

$$\varepsilon(\cdot, I_\varepsilon) = d(\cdot, I_d) / [\pi(\cdot, I_\pi) \lambda(\cdot, I_\lambda)] \quad (4)$$

Notice that, as an equilibrium condition, this equation does not suggest any causality. It presupposes that we have some theory on determinants of the employment ratio $\varepsilon \equiv E/N = \varepsilon(\cdot, I_\varepsilon)$, with I_ε representing a shift parameter capturing labor market institutions. For the present purpose, we need not know any details of what this theory might look like. By complete analogy, the equation invokes some theory explaining the number of hours worked per employee, $\lambda \equiv H/E = \lambda(\cdot, I_\lambda)$, as well as a theory on what determines labor productivity, $\pi \equiv Y/H = \pi(\cdot, I_\pi)$, and aggregate demand for domestic goods, $d(\cdot, I_d)$. The key point highlighted by equation (4) is that income per capita is the outcome of a complex adjustment process where – except for the simplest cases – determinants other than productivity are important factors, including in particular aggregate demand.

The above equation does not, as such, say anything about the specific variable(s) that may adjust in the equilibrating process. One may, accordingly, entertain vastly different interpretations. The equation is perhaps best understood by first looking at extreme cases. For instance, *Ricardian* general equilibrium theory would simply set $\varepsilon = 1$ and $\lambda = 1$, or

more generally just treat them as constants. Moreover, it would then set demand equal to supply to conclude that income per capita, *in terms of domestic goods*, is determined by labor productivity. *Neoclassical growth theory* of the *closed* economy would essentially lead to the same result, adding that labor productivity is determined by the capital stock relative to labor input, $\pi = y(K/H)$. By specifying how capital is accumulated through time, it then also arrives at an explanation of income per capita through time. It should be noticed that expressing income in terms of domestic goods is important if there is trade. In particular, trade according to comparative advantage will boost real income in terms of utility (a consumption basket) beyond productivity. Ricardian or neoclassical theory of the small *open* economy, say for the two-goods-case, would treat demand as perfectly elastic at given world-market prices for goods. Hence, *real* income per capita, whether expressed in terms of some arbitrary numéraire or in terms of the composite consumption bundle (i.e., unit of welfare), also depends on the terms of trade. We would thus have to introduce the terms of trade as an exogenous determinant (in addition to the given state of technology) in $\pi(\cdot, I_\pi)$. It is important to recognize that this line of reasoning assumes flexible prices (wage rate, capital rental) on perfectly competitive factor markets. For a *large* economy, an additional condition arises for equilibrium on commodity markets.²⁴

In the present context, however, all of these simple cases are not particularly interesting to look at. They rely on Say's Law in simply equating demand with income. The same holds true, implicitly at least, for many of the policy oriented discussions about product market competition and productivity. For instance, the findings in Lewis (2004) would imply that deregulation of commodity markets have a direct effect on productivity, which in the above equation would operate through an "institutional shift" I_π . This same effect might also involve a rise in demand, for instance through lower mark-ups, as in Bayoumi et al. (2004). In either case, Say's Law is needed for this to show up in higher income per capita. By analogy, institutional reform on labor markets might operate through shifts in I_ε and I_λ . Maintaining some equilibrating process on factor markets, and invoking Say's Law for commodity markets, the likely outcome would be a rise in income per capita. One should add the caveat that, depending on preferences (for leisure and consumption), a rise in productivity π might partly "consumed" in the form of an *endogenous* reduction in ε and/or λ , as argued above. All of these arguments do not allow for any independent theory of demand to play a role in the equilibrating process. Hence, they also minimize – a priori – the role of macroeconomic policy and institutions.

This view of equilibrium on commodity markets seems overly sanguine, not only for Europe. It is too much of a supply-side story, eschewing potentially important problems stemming from the demand side. Productivity increases are often subject to profit-oriented decision-making, and innovation typically has an intertemporal dimension. We should,

therefore, view $d(\cdot, I_d)$ in equation (4) above as *expected* demand, where invoking Say's Law may seem questionable. Moreover, while product market deregulation is an important prerequisite for flexible goods prices, there are many reasons for *limited price flexibility* even in perfectly deregulated commodity markets. From modern macroeconomics we know that, under a variety of conditions, macroeconomic policy, in particular the rate of inflation, is important for how well the price system works as an equilibrating mechanism for condition (4) above. Both, a very high and a very low rate of inflation may in this sense be harmful. A further channel through which monetary policy has an influence on demand d is, of course, the interest rate. Accordingly, monetary policy is likely to be important for whether a certain productivity increase fully feeds into a rise in income per capita. If *anticipated* demand $d(\cdot, I_d)$ falls short of the increased output potential, higher productivity may partly evaporate into deteriorating labor market performance ε and/or λ , with constant – indeed even with perfect – labor market institutions I_ε and I_λ . In one way or another, international coordination games may arise where some form of an “Open Method of Coordination” might prove beneficial. But a promising Lisbon Strategy needs more explicit theory about such coordination gains (see also above). I shall not pursue this any further in the present paper. Instead, I want to draw attention to the role of macroeconomic policy which, as I have already mentioned, is kept at a safe distance in the Lisbon Strategy.

On a general level, it seems obvious enough that the equilibrating processes behind equation (4) above will, in many instances, be influenced by macroeconomic policy. It is probably fair to say that US monetary policy has recently taken a somewhat more pragmatic stance regarding aggregate demand, particularly with a view on the stock market and the housing market, than the European Central Bank (ECB), which has more or less exclusively been concerned about price stability. The specific conditions of the European Monetary Union, with a new currency and new institutions, have arguably imposed constraints on policy options. Specifically, it was precisely during when the US “productivity locomotive” has departed that the ECB has faced the need to establish credibility, an issue that the US-Fed in no way needed to bother about. This is quite independent on the oft-quoted question of whether the “one size fits all” restriction for European monetary policy has been more binding in Europe than in the US. The answer there depends on the amount of real divergence and heterogeneity within the currency area, and also on the availability of other macro-policies to address regional disparities. In this regard, it is difficult to deny that the European Stability and Growth Pact may, in some cases at least, (has) impose(d) a binding restriction. All of this is not intended to advocate old-fashioned policies of aggregate demand management. But it is difficult to argue, a priori, that macroeconomic policies should be entirely irrelevant for the Lisbon Goal. As a consequence, such policies should also not be kept “at a safe distance” from the associated Strategy.

Without going into details, we may just list a few of the relevant questions. First, to what extent should monetary policy take into account the level of aggregate demand in its interest rate decisions? What is the desired, or tolerable, level of inflation, in view of the need for flexible prices as an important factor in the equilibrating process behind equation (4), and also in view of the desired divergence in real interest rates across countries within the Euro area? What, precisely, are the international spill-overs from public deficits within the Euro area, and what is the appropriate institutional arrangement of internalization? Can such spill-overs be reduced by means of country-specific risk premia on capital markets? Does an administratively controlled procedure of internalization, like the Stability and Growth Pact, undermine due treatment of country-specific risks from unsustainable public budget positions via government-specific risk premia? What is the appropriate institutional framework for internalizing the external effects (if any) from one country's unsustainable fiscal policy on other countries of the same currency area? It should, of course, be emphasized that even with some binding restriction like the Stability and Growth Pact in place, fiscal policy still has discretion in several areas that qualify as potentially important institutional factors in equation (4) above. However, as with labor market institutions, the scope for EU-actions, at least based on existing treaties, seems rather limited. Hence, I do not pursue these further in this article.²⁵

7 Labor markets

It is certainly true that unionization, as well as unemployment insurance and employment protection, introduce more rigidities in Europe than are present in the US. Rigidities appear in the form of limited labor mobility, both across sectors and regions, and a low degree of wage flexibility and high wage compression. The facts seem clear and hardly disputable, but in my view the interpretation and conclusions to be drawn are far from clear-cut. First, equation (4) makes clear that labor market institutions play a crucial role for macroeconomic performance and, thus, *equilibrium* income per capita, even if they are not overly important for productivity π as such, as argued by Lewis (2004). Blanchard (2004) offers two competing interpretations for European labor market institutions, one focusing on struggle for rents, the other on market imperfections relating to unemployment risk. Most people would probably agree that rigidities resulting from claims on rents serve no useful purpose for the economy at large and should, therefore, be dismantled. Luckily, these rigidities are the ones most likely to be softened or removed indirectly through deregulation and increased competition on commodity markets. In particular, if this reduces rents for firms, it also reduces the incentives for labor market institutions, like labor unions, that engage in struggles to obtain a share of these rents.

If the correct interpretation is one of social insurance correcting risk-related market failure, as for instance suggested by Agell (2002), then the key question is whether this may be achieved with lower rigidity, and thus higher efficiency and

better macroeconomic performance. Again, I cannot go into detail, but one would be hard-pressed to argue in the negative for European countries as a whole. Much has been achieved in recent reforms already, and more is in the making. On the other hand, it would seem no less obvious that there is room for a distinctly European way. Emulating US-like institutions is far too simple a strategy for labor markets in the Lisbon Strategy. For instance, the evidence presented by Freeman (2002) does not support the view that, based on economic performance, one should expect a long-run convergence of labor market institutions towards the US model. Instead, he envisages different forms of capitalisms that different countries may pursue, based on their preferences towards risk in addition to economic performance.

It is important, however, go beyond vaguely alluding to *some* difference in preferences. In particular, the preferences in question are likely to be *endogenous*. An explanation for the European preference for more equity and less individual risk is presented in Alesina and Glaeser (2004) who stress two factors. The first is that US political structures are older than Europe's, where the past century has witnessed turbulent struggles that have often resulted in wholly new structures. The second is the larger racial diversity within the US than within Europe.

8 Conclusions

The Lisbon Goal declaration is usually seen against the background of European backwardness relative to the US. A closer inspection of historical facts and trends reveals a mixed picture. Europe has enjoyed a remarkable catching-up in terms of productivity, at least up until the mid 1990s. Its relative poverty in terms of income per capita is due to lower labor force participation and, in particular, fewer hours worked per person employed. It is not at all clear that this must be interpreted as an entirely involuntary phenomenon, or as the result of distortions due to social security and taxation. More worryingly, however, the recent decade has witnessed a renewed fall-back vis-à-vis the US also in terms of productivity, both labor productivity and total factor productivity. Hence, a policy initiative of the sort undertaken by the EU Heads of State in Lisbon, does seem to have some justification.

Taken literally, however, the Lisbon Goal does not seem to make much sense. In stressing international competitiveness, it even has a potential for ill-guided policies. Moreover, even if we read productivity for international competitiveness, it might still result in an industrial-targeting approach, which carries certain dangers and potential pitfalls. While there is strong evidence that certain sectors, particularly IT-producing and IT-using sectors, are instrumental for achieving high productivity, active industrial policy towards these sectors does not guarantee success in moving towards, or even meeting the Lisbon Goal. It is difficult to identify the nature of the dynamic externality that

would justify and guide such a policy. Moreover, such policies still involve a temporary cost in terms of static inefficiency, particularly in a world with many industries and international trade. Even if something like the Lisbon Goal should eventually be met, there is probably no way to judge if it was worth the cost. The Lisbon Goal should not be mistaken as an axiomatic justification of any policy that will eventually turn out to have contributed to meet the Goal. Although industrial targeting does not so far loom large in the Lisbon Strategy, policy makers may still eventually be tempted to pursue such an approach, because the costs are widely spread, while the beneficiaries are usually small groups, particularly firms. And small groups, or individual firms, are also more likely to engage in lobbying than the larger group of those bearing the cost. The danger of policies with questionable benefits for EU economies at large is obvious.

By way of contrast, a Lisbon Strategy with an *institutional orientation* seems more promising. Unfortunately, however, it is less attractive politically, as it may impose painful change on small groups of organized interest, while the benefits are more widely spread. On the positive side, it does not suffer from a delicate trade-off between short-run efficiency cost against long-run dynamic advantages. And it does not require picking single industries as promising “winners”, which is very demanding on information.

Lastly, one should not forget about the limited scope of influence and power that the EU as such has in the policy areas that seem natural candidates for a well-guided Lisbon Strategy. In large part, the “gains from Brussels” are restricted to gains from coordination, i.e., from pursuing policies that are open to national governments anyway, but to pursue them in a coordinated way. In addition to spill-over effects emphasized by conventional theory of policy coordination, this includes issues of policy delegation and peer pressure as vehicles to overcome domestic political constraints. The gains may, thus, not be so small after all, but the Lisbon Strategy could probably benefit from being more explicit about the specific conditions underlying and determining such gains.

Notes

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¹ A survey of the targets is found in Directorate-General for Economic and Financial Affairs (2005).

² The report is entitled „Facing the Challenge: The Lisbon strategy for growth and employment” and is available at http://europa.eu.int/comm/lisbon_strategy/index_en.html

³ See Krugman (1994). It is somewhat of an irony that Krugman’s 10-year old criticism has been expressed in the context of a similar EU initiative, the “White Paper on growth, competitiveness, and employment” of the then president of the European Commission, Jaques Delors. See also Krugman (1996).

⁴ See Llewellyn (1996).

⁵ Samuelson points out a theoretical possibility, the empirical relevance of which is open to question; see the criticism by Bhagwati, Panagariya, and Srinivasan (2004).

⁶ Modern growth theory emphasizes that moving up to the technological frontier may require quite far-reaching changes in institutions; see Acemoglu, Aghion and Zilibotti (2002).

⁷ See in particular Blanke, Paua, and Sala-i-Martin (2004) and Porter (2004).

⁸ On the “outlier-performance” of individual EU-countries, see also Broadbent et al. (2004) and Daly (2004). More details on the interrelationship between EU expansion and EU growth can be found in Deardorff and Stern (2002).

⁹ All calculations rely on figures adjusted for purchasing-power parity, at constant prices, from Maddison (2001, 2003), and from the Groningen Growth and Development Centre (GGDC, <http://www.ggdc.net/>). Similar messages also follow from Aiginger and Landesmann (2002).

¹⁰ In section 6, I shall move from the identity to an equilibrium condition. Empirically, one typically observes a high negative correlation between labor productivity and the employment rate, largely due to labor hoarding over the business cycle. This poses problems for a correct estimation of the labor productivity which I shall not dwell upon at this stage.

¹¹ Notice that the differences involved are far from being “small”, hence when comparing with the magnitudes evidenced by table 1 the log-differences depicted in figures 4 should not be equated with percentage differences.

¹² This is also corroborated by the findings of the so-called “Sapir Report”; see Sapir et al. (2004). In addition, the US features more favourable demographic change than Europe.

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- ¹³ Blanchard ventures the conclusion that “*a large part ... reflects a decrease in hours worked per full-time worker, a choice that is likely to be made voluntarily by workers*”. As regards the determinants of this choice, he reads the evidence “*as suggesting an effect of taxes, but with the larger role left for preferences.*”
- ¹⁴ See also Pisani-Ferry (2005).
- ¹⁵ In an intertemporal perspective, there is, of course, the possibility of over-utilization of natural resources that are in fixed supply. Notice the emphasis on *sustained* economic well-being in my definition of international competitiveness above.
- ¹⁶ It is worth pointing out at this stage that the spectacular growth of China and India which surpasses that of the US by a wide margin, is also due to significant capital deepening, in addition to institutional factors (see below). Indeed, for China the pace of capital deepening itself seems unsustainable. Estimates of TFP growth in China are roughly comparable to those for the US. Hence, such spectacular catching-up of emerging market economies notwithstanding, interpreting the Lisbon Goal, in broad terms at least, against the backdrop of the “US-benchmark” appears justified.
- ¹⁷ See Pisani-Ferry (2005) for a discussion of the coordination aspect as such.
- ¹⁸ Further details can be found, for instance, in McGiven (2002) and in van Ark, Inklaar, and McGuckin (2003).
- ¹⁹ See, for instance, Acemoglu (2003), Rodrik and Subramanian (2003), and Sachs (2003).
- ²⁰ See Lewis (2004, p.13), italics original; see also Blanchard (2004).
- ²¹ It is perhaps worth pointing out the distinction between “international competitiveness”, a notion that I have criticized above, and the “degree of competition”.
- ²² See, for instance, Blanchard (2004), as well and the literature mentioned there.
- ²³ This question underlies the hypothesis ventured by Blanchard (2004) in explaining why potential productivity increases may not have been exploited to the full extent.
- ²⁴ We have stressed in section 2 above that *foreign* productivity increases importantly influence the terms of trade, with a significant potential of positive spill-overs on domestic real income *in terms of units of welfare*.
- ²⁵ Obvious examples are the level and specific form of expenditure on education and research, as well as the incentive-structure inherent in the tax system. On the role of social expenditure, see Lindert (2004).

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Tables

**Table 1: Long-run evolution of GDP per capita
and GDP per hour worked relative to the US**

	WEC12/USA		Australia/USA		Canada/USA	
	GDP per cap.	GDP per hour	GDP per cap.	GDP per hour	GDP per cap.	GDP per hour
1870	0.85	0.71	1.49	1.54	0.69	0.76
1913	0.70	0.61	1.08	1.07	0.84	0.87
1950	0.52	0.44	0.78	0.76	0.78	0.82
1990	0.73	0.80	0.73	0.74	0.82	0.78
1995	0.73	0.95
2003	0.77	0.85

Note: WEC12 is EU12. All values are relative to the US.

Source: Per capita from Maddison (2003) and own calculations from the EUROSTAT-AMECO data base, per hour from Gordon (2004b).

**Table 2: EU15 and US labor productivity growth rates
by ICT sector**

Industries	productivity growth rates in %						GDP-share	
	1979 - 1990		1990 - 1995		1995 - 2001		2000	
	EU	US	EU	US	EU	US	EU	US
Total economy	2.2	1.3	2.3	1.1	1.7	2.2	100	100
	(0.99)		(1.19)		(-0.54)			
ICT producing	7.2	8.7	5.9	8.1	7.5	10.0	5.9	7.3
	(-0.13)		(-0.25)		(-0.45)			
manufacturing	12.5	16.6	8.4	16.1	11.9	23.7	1.6	2.6
	(-0.31)		(-0.29)		(-0.60)			
services	4.4	2.4	4.8	2.4	5.9	1.8	4.3	4.7
	(0.08)		(0.04)		(0.15)			
ICT using	2.2	1.2	2.0	1.2	1.9	4.7	27.0	30.6
	(0.38)		(0.44)		(-0.61)			
manufacturing	2.4	0.5	2.4	-0.6	1.8	0.4	5.9	4.3
	(0.19)		(0.18)		(0.14)			
services	2.1	1.4	1.8	1.6	1.8	5.3	21.1	26.3
	(0.19)		(0.26)		(-0.75)			
Non-ICT	1.8	0.5	2.1	0.3	1.0	-0.2	67.1	62.1
	(0.73)		(0.99)		(0.44)			
manufacturing	3.0	2.1	3.6	2.7	1.6	0.3	11.9	9.3
	(0.27)		(0.01)		(0.24)			
services	0.6	-0.2	1.2	-0.5	0.5	-0.3	44.7	43.0
	(0.41)		(0.88)		(0.32)			
other	3.4	2.0	3.2	1.2	2.1	0.7	10.5	9.8
	(0.06)		(0.10)		(-0.11)			

Note: Values in parentheses underneath give the contributions of industries to the aggregate EU15 – US differences in labor productivity growth.

Source: Growth rates from O'Mahony and van Ark (2003), GDP-shares from van Ark, Inklaar, and McGuckin (2003)

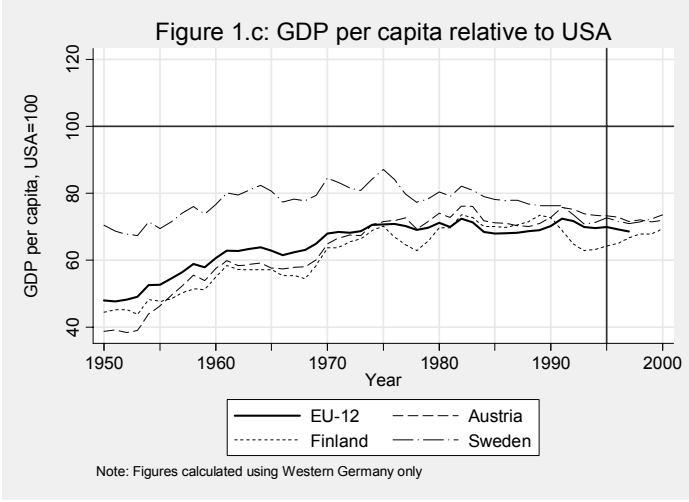
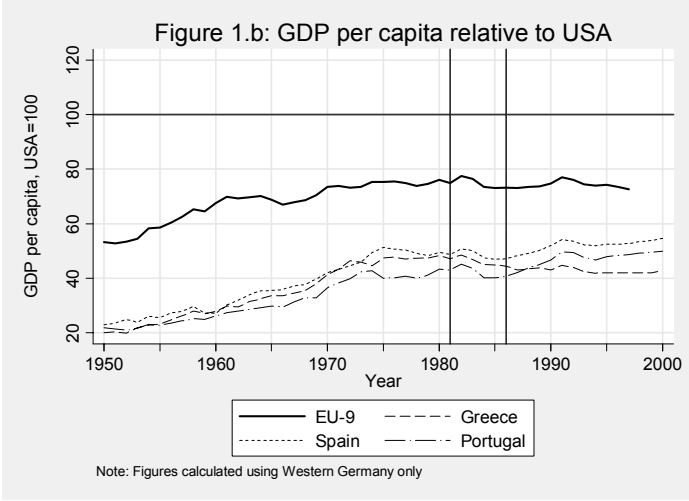
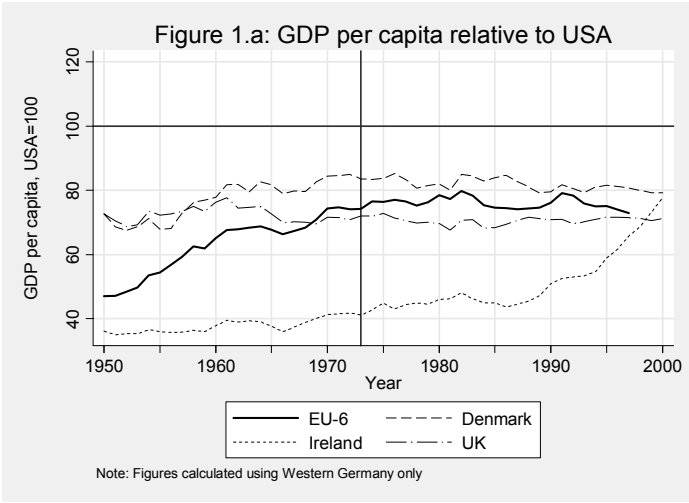


Fig. 1: GDP per capita relative to the US for various EU countries: 1950-2000

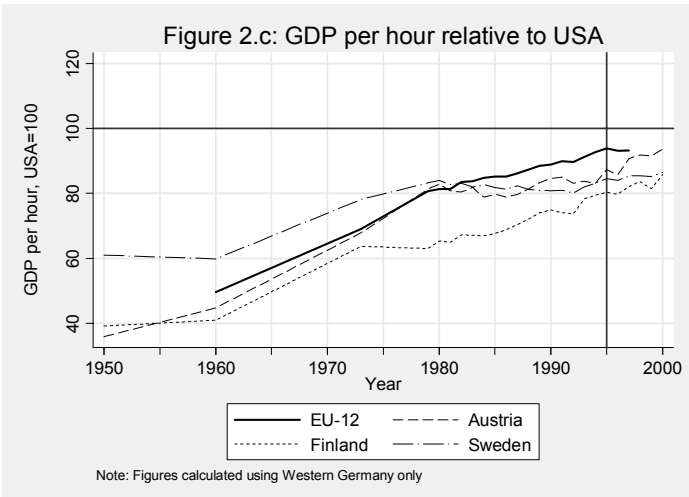
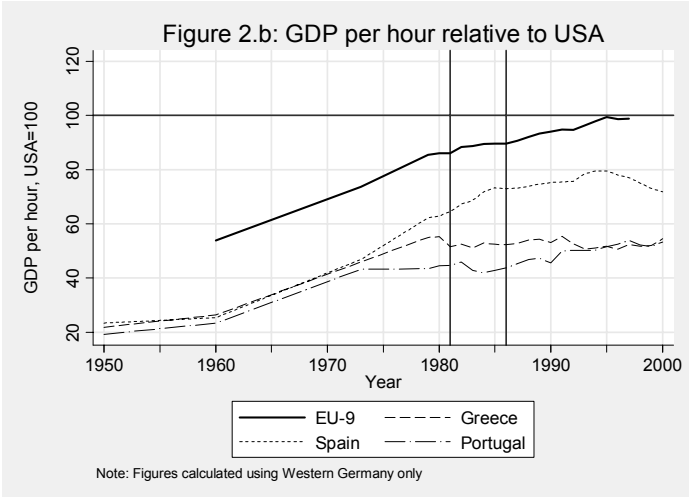
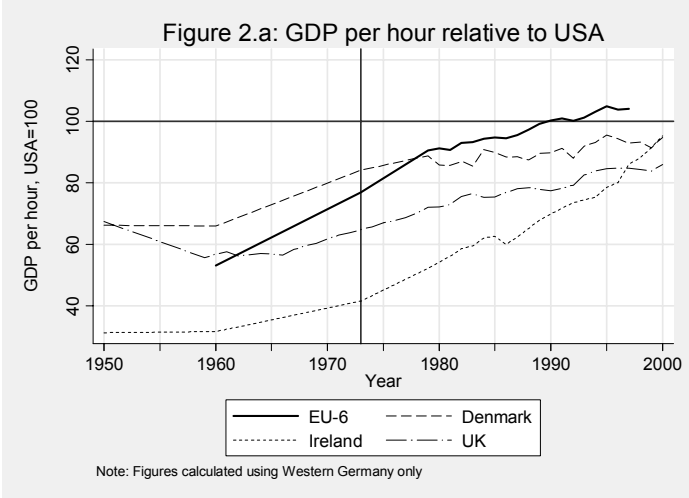


Fig. 2: GDP per hour worked relative to the US for various EU countries: 1950-2000

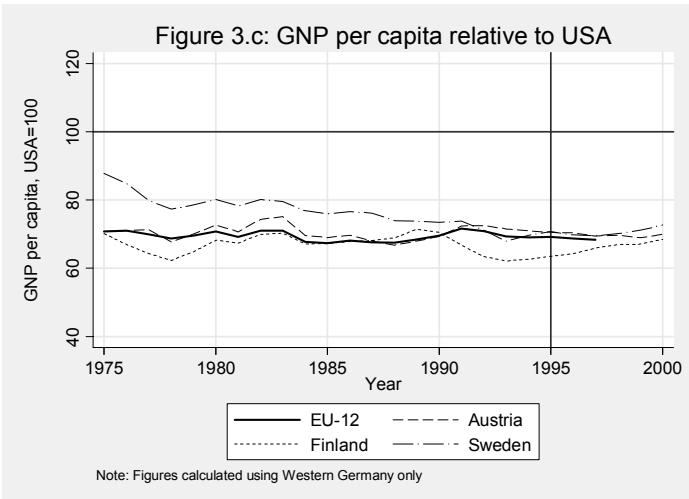
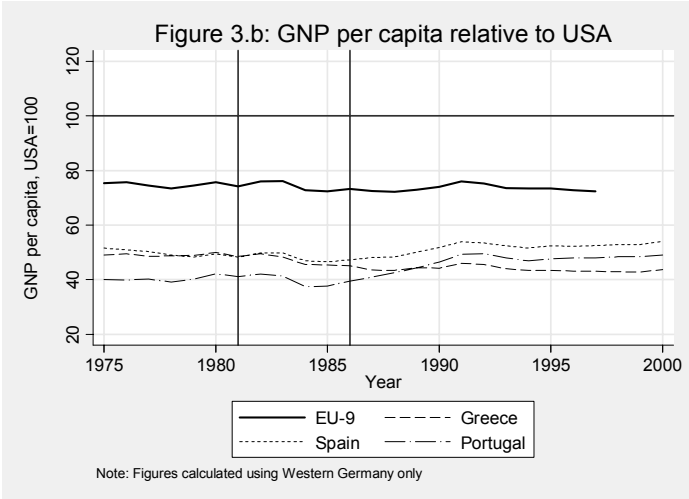
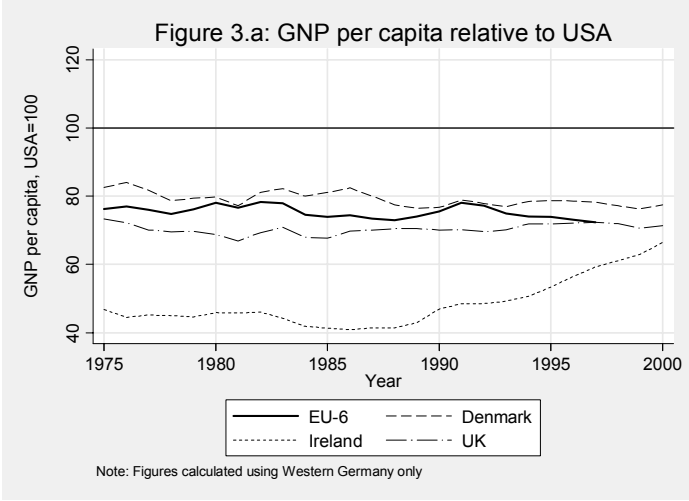


Fig. 3: GNP per capita relative to the US for various EU countries: 1950-2000

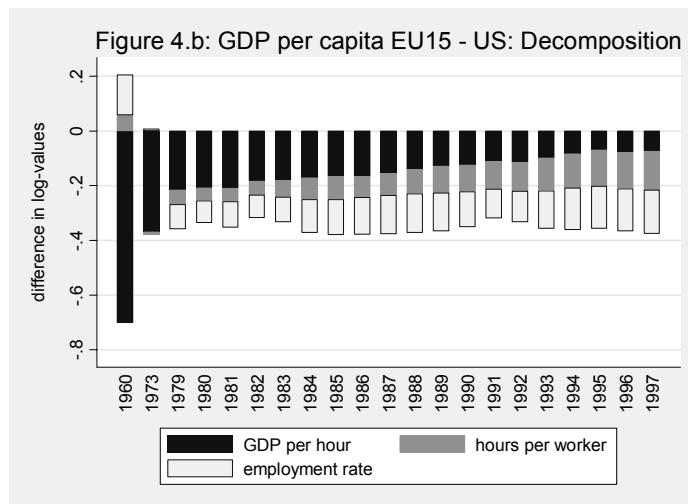
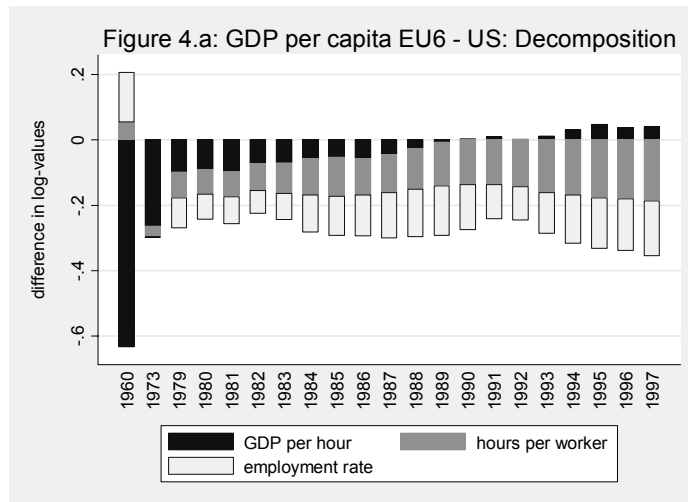


Fig. 4: Decomposition of growth in GDP per capita US vs. EU: 1960-1997

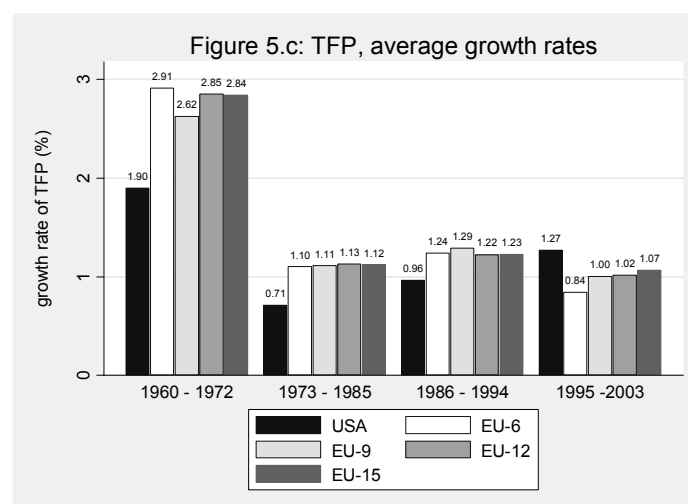
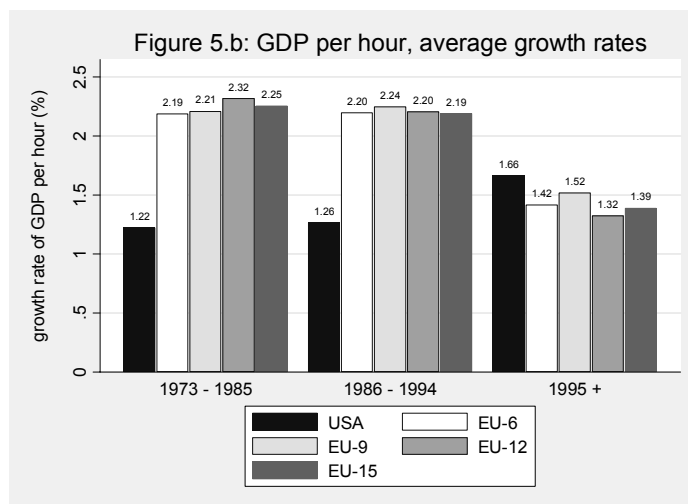
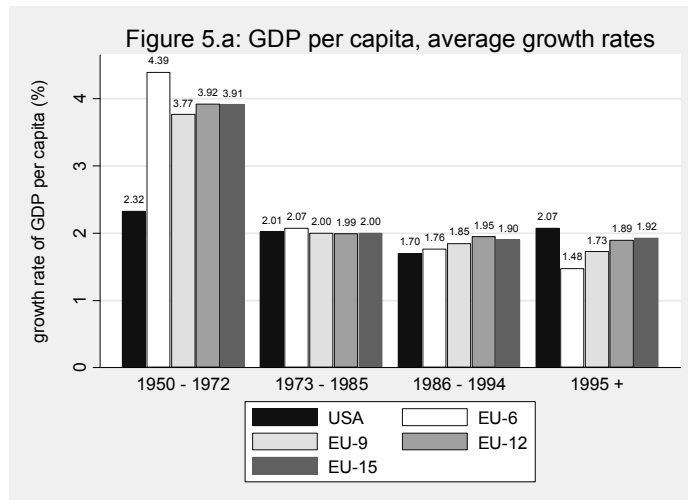


Fig. 5: Growth rates for GDP per capita, GDP per hour and TFP