



GROWTH DIFFERENCE BETWEEN EUROPE AND THE US IN THE NINETIES: CAUSES AND LIKELIHOOD OF PERSISTENCE

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European Forum
Working Paper 1/2002
Stanford University

November 15th, 2002

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Abstract: *This paper analyzes the differences between the US, where productivity accelerated in the nineties and Europe in which this was the case only in a subset of countries. While many factors played a role, we claim that differences in the investment into the long run determinants of growth and the characteristics of the US system of innovation played the key role. The four European countries with high growth and large investments in growth drivers are high wage economies with a comprehensive welfare state of the Northern European type. All faced a crisis in competitiveness in the eighties or nineties, they went for the double strategy to cut costs and to promote technology at the same time, yielding finally to growth of output, declining unemployment, and fiscal stability. Arguments for a continued lead of the US, as well as those favoring an upcoming decade of catching up of Europe are discussed, as are three unsolved US problems.*

The paper was written during my two term professorship at Stanford University in 2002. It was the agenda setting background paper for the "Conference on the future agenda for Economic Policy", October 24th –26th at Stanford University. I am grateful to the participants of the conference for intensive discussion, and to the European Forum and the Graduate School of Business for the invitation and for providing me with the necessary resources and a stimulating environment for teaching and research. The research on this project had started with the preparation of background reports, commissioned by the European Commission, DG Enterprise on the Competitiveness of European Manufacturing and of a joint paper with Michael Landesmann prepared for a Harvard Workshop on Transatlantic differences in April 2002.

Documents/ownpaper/background

1. The phenomenon to be explained and the plan of the paper

The focus of this paper is two observations in the nineties:

- the catching up in productivity of Europe vs. the US, which had lasted for most of the post-war period; has stopped in the nineties; if anything the productivity lead of the US increased contrary to the theoretical assumption and the empirical experience of catching up of the laggard
- productivity accelerated in the US in the second half of the 1990s reversing the often investigated trend of productivity slowdown; this did not happen for Europe (at least not in the majority of states and not the in the large ones)

Our main road of explanation for these phenomena is that

- (i) the difference in productivity and output growth is well in line with differences in the investment into those economic factors usually declared as determinants of growth in economic theory ("growth drivers"), and secondly
- (ii) that these factors and the characteristics of the US innovation system proved to be specifically important in a period in which a new general purpose technology (GPT, in this case information and communication technology, labeled as ICT) gained its decisive impact on the economy.

The following is the structure of this paper: Section 2 will present very the evidence, its caveats, and its relation to past trends. Section 3 presents our main explanation and demonstrates the empirical difference in growth drivers in the nineties. Section 4 discusses differences across European countries, and suggests that the characteristics of the successful European States may carve out a New European Model of a Reformed Welfare States (NEM-RWS), emphasizing on high productivity and encouraging rapid diffusion of new technologies. Section 5 lists other explanations for the empirical growth difference. Then we discuss the probability that the next decade will again show higher growth in the US (Section 6). Section 7 concludes.

2. Documenting the growth difference, its extent, its relation to past

In the nineties, real GDP as well as macro productivity increased faster in the United States than in Europe. The growth difference is rather large and robust, the productivity difference is smaller and depends on the indicators and data used. It is pervasive and robust for the second half of the nineties, for output per person and specifically for manufacturing. It is rather small for growth in Multi-Factor-Productivity (MFP) and for macro productivity per hour.

Real GDP is used as indicator on macro growth, real GDP per person employed is the base line indicator on "macro productivity". Real growth is 3.2 % p.a. in the USA in the nineties, but only 2.1 % in Europe, a difference of 1.1 % p.a. cumulating to a 15 % growth difference over the decade (see Table 2.1). This growth difference translated into a much smaller difference in growth of macro productivity, since employment increased by 0.4 % in Europe, but 1.4 % in the USA. Macro labor productivity thus rose by 1.8 % p.a. in the USA, which was a significant acceleration over the past decade, stopping the old trend of "productivity slowdown". Productivity increased by 1.7 % in Europe, which was less than in the eighties. This difference in productivity over the full decade is well within the range of statistical errors¹, what is important and robust is that the growth of productivity declined in Europe and increased in the USA.

¹ The numbers reported here are at the "low end" of the estimated differences in macro labor productivity for the nineties. The reason for this is that OECD data and EU data are diverging in some details and that Eurostat has recently revised GDP figures upwards as well for the first years of the decade, as well as for 1999 and 2000. McMorrow, Roeger (2001) report a difference of 0.35 % for the decade, Aiginger et al. (2001) a difference of 0.5 %, Scarpetta et al. (2000) a similar difference (if we sum up EU-countries in their calculations). However the robust facts are (i) a larger difference for the second half of the decade, (ii) the reversal of productivity from slowdown to acceleration for the US and (iii) the end of the long term catching up of Europe.

Table 2.1: Macro labor productivity decelerates in Europe

	Total economy				Manufacturing			
	Growth of real GDP		Labour productivity		Growth of output		Labour productivity	
	EU	USA	EU	USA	EU	USA	EU	USA
	Growth p.a. in %							
1970/1980	3.0	3.2	2.6	0.8	2.3	3.1	2.8	2.6
1980/1990	2.6	3.2	2.1	1.4	1.9	2.2	3.2	2.8
1990/2000	2.1	3.2	1.7	1.8	1.8	4.1	3.3	4.4
Acceleration 80s vs. 70s	-0.4	0.0	-0.6	0.5	-0.3	-0.9	0.4	0.2
Acceleration 90s vs. 80s	-0.5	0.0	-0.4	0.5	-0.2	1.9	0.2	1.6
1970/1975	2.9	2.7	2.7	0.9	1.7	1.6	2.2	2.7
1975/1980	3.1	3.7	2.6	0.7	2.8	4.7	3.4	2.5
1980/1985	1.9	3.1	2.3	1.6	0.7	2.0	3.4	3.1
1985/1990	3.3	3.2	1.8	1.1	3.2	2.4	2.9	2.6
1990/1995	1.6	2.4	2.1	1.4	0.7	2.9	3.8	3.6
1995/2000	2.6	4.1	1.3	2.3	2.9	5.2	2.8	5.2
Acceleration 2nd vs. 1st half of the 90s	1.0	1.7	-0.8	0.9	2.2	2.3	-1.1	1.6
Acceleration 1st half of the 90s vs. 2nd half of the 80s	-1.7	-0.9	0.2	0.2	-2.5	0.6	0.9	1.0

Remarks: Labor productivity is output per total employment.

Output of total economy = GDP at market prices 1995, output of manufacturing = production index.

Source: WIFO calculations using New Cronos for GDP and AMECO for manufacturing.

The real difference in macro productivity growth occurred in the second half of the nineties: Europe had continued to shed employment in the first half of the decade (by mirror image "enjoying" a higher productivity growth); in the second half Europe increased employment – fast relative to its relatively sluggish output growth. As a consequence productivity did decelerate in Europe by 0.8 % p.a. and accelerate by 0.9% in the USA. Thus the existing productivity gap to the USA widened.

We summarize these tendencies in two tentative stylized facts:

Stylized Fact No 1: After several decades of "productivity slowdown", macro labor productivity accelerated in the USA in the nineties relative to the eighties and seventies and in the second half relative to the first ("productivity rebound in the USA").

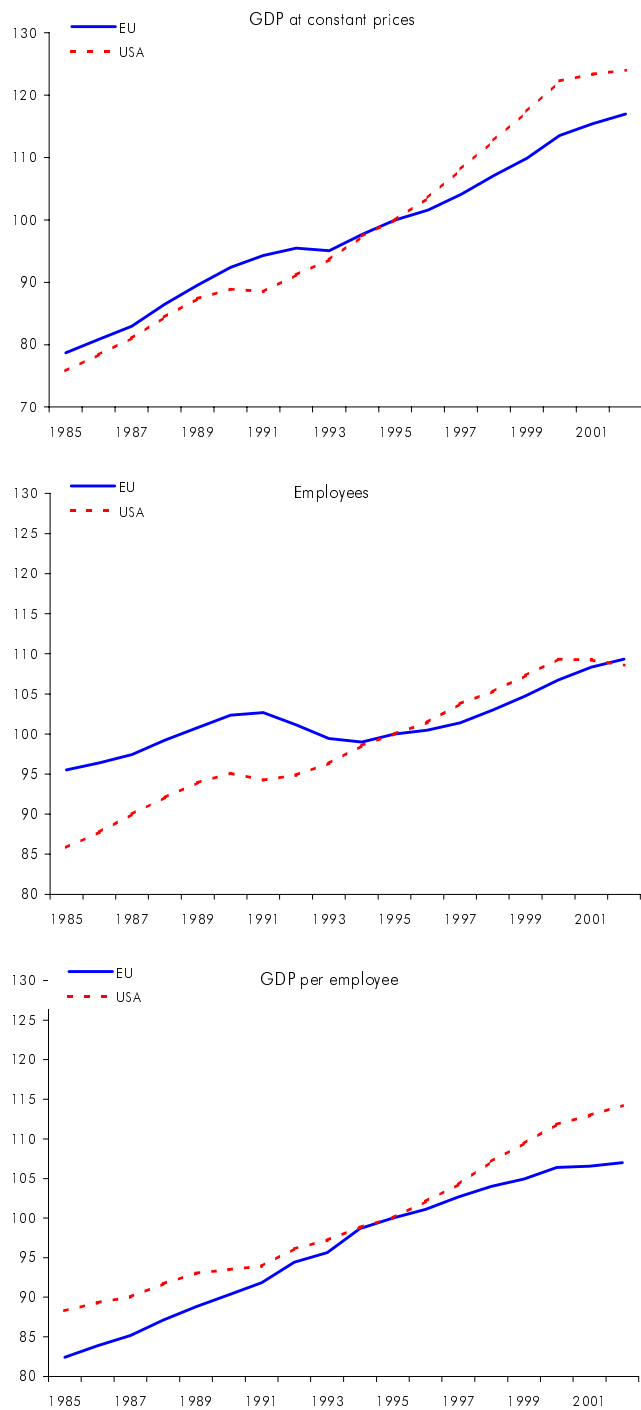
Stylized Fact No 2: European productivity had grown steadily faster than that in the USA up to the beginning of the nineties. However macro productivity growth decelerated in the nineties vs. the eighties in Europe and even in the second half vs. the first. The difference between USA and Europe became very visible in the second half of the nineties (1.3% in Europe relative to 2.3% in the USA), giving a cumulated difference in macro productivity growth of 5 % for the second half of the decade. The historic process of productivity catch up which was evident since the fifties had stalled or even reversed in the second half of the nineties ("End of catching up towards the leader").

Larger difference in manufacturing

In manufacturing these trends are even more visible. Output growth was 4.1 % p.a. in the USA and 1.8 % p.a. in Europe. The difference in productivity growth was smaller than growth difference, but still 4.4 % vs. 3.3 % p.a., accumulating to 16 % for the decade. The acceleration holds for manufacturing in the USA in its short term (2nd half vs. first) as well as medium-term version (nineties to eighties). In Europe productivity increase is stable: about 3 % in the eighties as well as in both halves of the nineties. This leads to a third stylized fact:

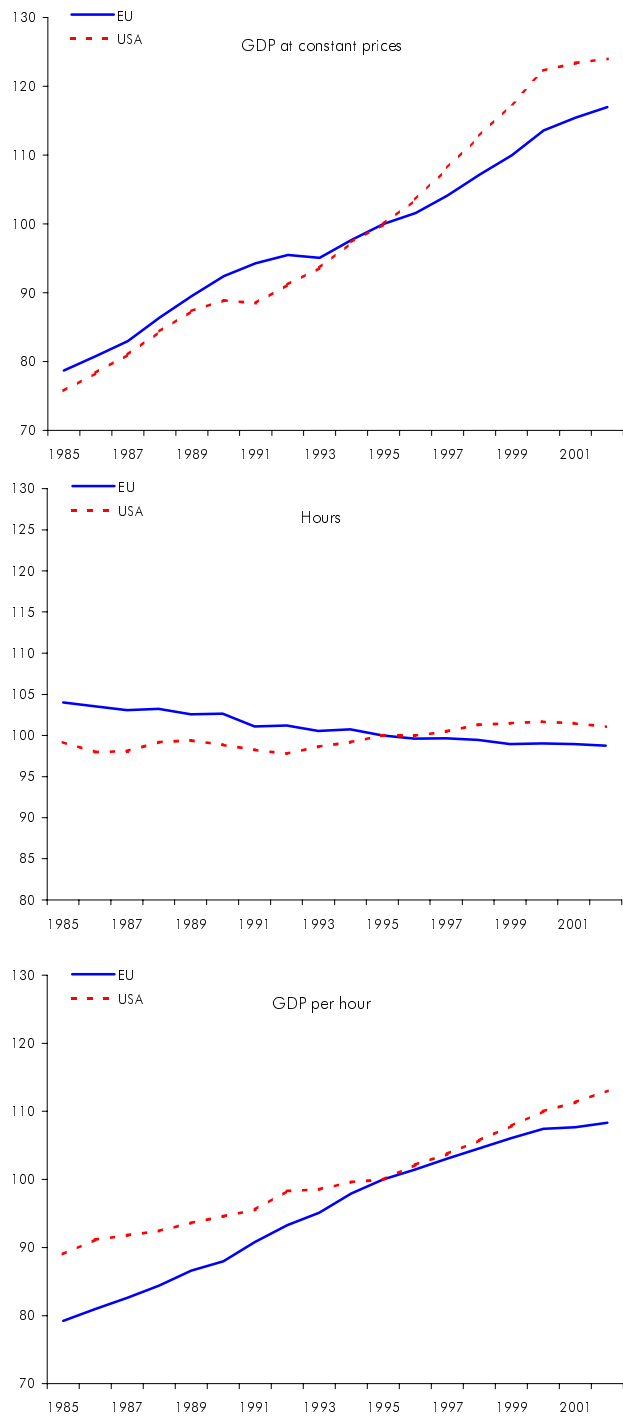
Stylized Fact No 3: Productivity acceleration is specifically strong for manufacturing in the short run (2nd half of the nineties vs. 1st half) as well as in the medium run (nineties vs. eighties). In Europe productivity growth remained surprisingly constant with about 3 % over the eighties, nineties and subperiods. This increased the existing productivity gap for manufacturing more strongly than for the total economy ("double acceleration in the USA versus stable productivity growth in Europe").

Figure 2.1: Long term productivity catch-up of Europe stops in the nineties



Source: WIFO calculations using New Cronos.

Figure 2.2: Real GDP per hour: smaller difference in level and dynamics
Real growth, hours worked and GDP per hour, 1995=100



Source: WIFO calculations using New Cronos.

Caveats from the statistical point of view

The difference in labor productivity growth as shown in the data for the USA and Europe seems to be relatively strong in the second half of the nineties and in manufacturing.

However there are caveat to be made:

- The difference is well documented only for a relative short period (5 years, 1995-2000)
- The difference in total factor productivity is miniscule and within the statistical error
- Per hour differences are smaller than per capita differences
- quality and purchasing power adjustments² can be and are done differently
- Cyclical and currency shocks had a deeper impact on Europe

The influence of these caveats is investigated in other papers (Aiginger, Landesmann, 2002), We continue that the evidence that the two main phenomena happened is convincing to us and only the extent can be discussed. And the most forceful argument is that data published in the downturn 20001/2002 from quarter to quarter extend the superior productivity performance of the US even during the bust of the ICT boom.

Table 2.2: Multi factor productivity growth: EU vs. USA

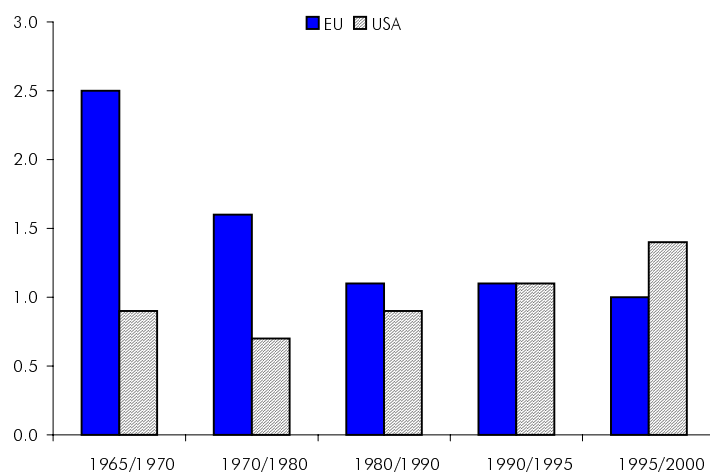
	EU OECD estimates	USA	EU EU estimates	USA
1965/1970			2.5	0.9
1970/1980			1.6	0.7
1980/1990	1.7	1.0	1.1	0.9
1990/2000 ¹⁾	1.3	1.4	1.2	1.3
1990/1995			1.1	1.1
1995/2000			1.0	1.4

¹ OECD estimates 1990/1998.

Source: OECD: Bassanini, Scarpetta, Visco, 2000; EU: McMorrow, Roeger, 2001, pp. 86 f.

² How difficult adjustments are and how sensitive they are to correction, is shown in the database of DG ECFIN AMECO, where the same data for the US in real terms were transformed according to PPP data differently in the April 2002 and in the November 2001 version, The data sets show the stability of the US lead in the later version and an increasing lead the earlier. We stick to the more plausible November version, but acknowledge that the reasons and differences have to be investigated.

Figure 2.3: Total factor productivity in the EU and in the USA



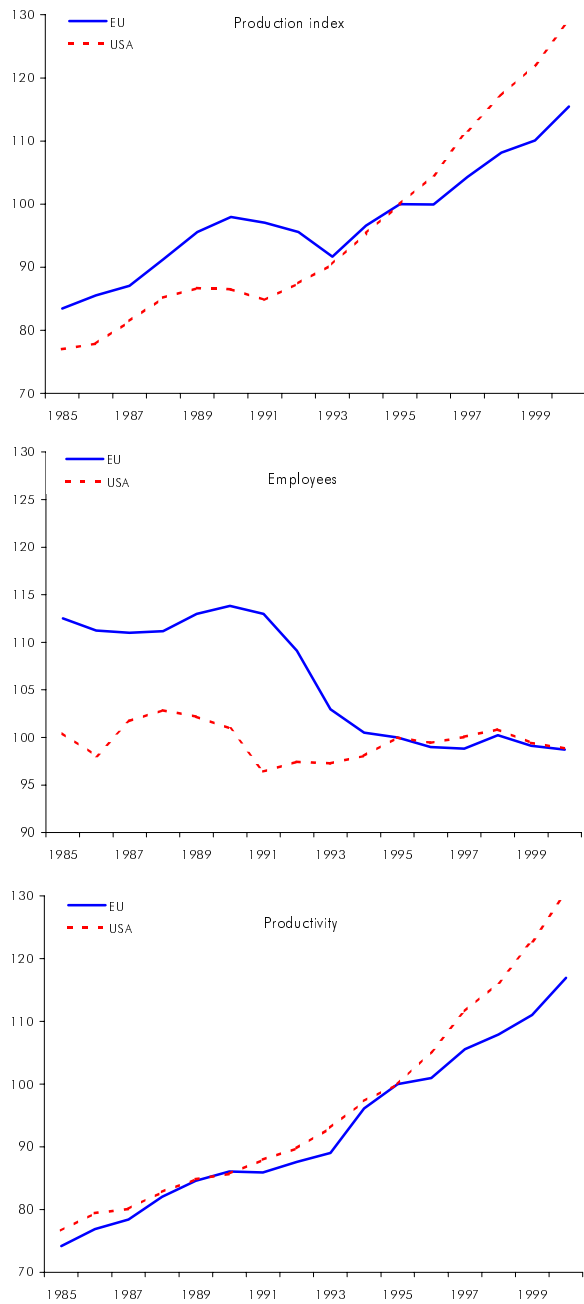
Source: OECD: Bassanini, Scarpetta, Visco, 2000; EU: McMorrow, Roeger, 2001, pp. 86 f.

Source: European Competitiveness Report 2001, Commission staff working document.

Box 2.1: Recent European studies on growth performance and its underlying forces

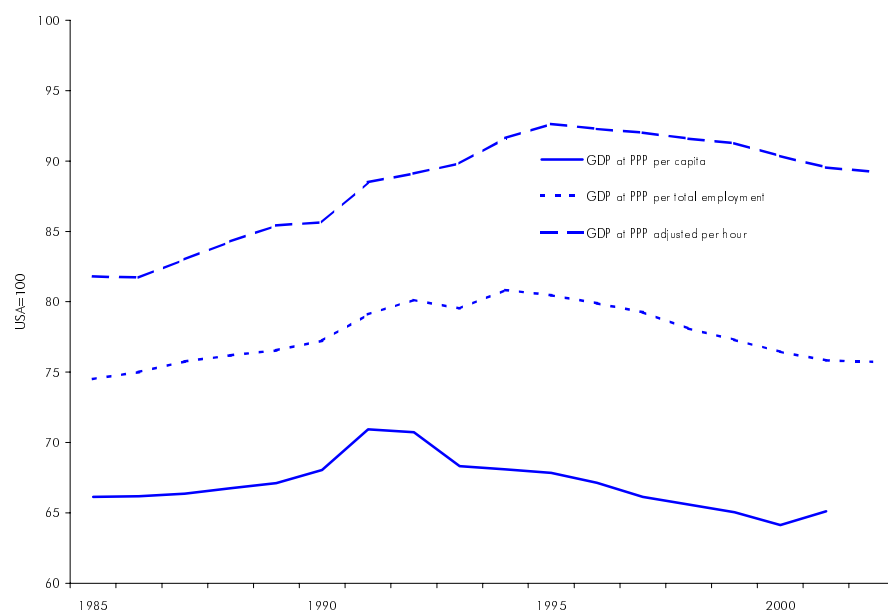
Author/Institution	Title	Scope	Additional features
Aiginger, K. et al., Enterprise DG, 2000	Europe's position in quality competition	Country shares in price or quality sensitive industries and in high/low price segments	Importance of quality competition for Europe
Aiginger, K. et al., Enterprise DG, 1999	Specialisation and (geographic) concentration of European manufacturing	Degree and change in specialisation and geographic concentration	Survey on trade theory, growth differences
Braunerhjelm, P. et al., CEPR, 2000	Integration and the Regions of Europe	Concentration and specialisation of regions	Policy impact on income differences agglomeration, catching up
Davies, St., Lyons, B., Oxford Press, 1990	Industrial organisation in the EU	Strategies of leading firms	Matrix on 300 leading firms
EU, EC/FIN European Economy 71/2000	The EU Economy, 2000 Review	Is there a new pattern of growth emerging?	Prospects and challenges for Europe
European Commission, 2001	The competitiveness of European industry 2001	Productivity and innovation	Increasing gap to USA; biotech
European Commission, 2000	The competitiveness of European industry 2000	Competition in quality	Service inputs, pharmaceuticals
European Commission, 1999	The competitiveness of European industry 1999	Adaptability and change	Intangible investment, Asian crisis
European Commission, 1998	The competitiveness of European industry 1998	Competitiveness in the triad	Taxonomies, small firms, multinationals
EUROSTAT, 1999	Panorama of European business	Main trends for in dustries	Overview on structure and performance
Ilzkovitz, F., Dierx, A., European Economy, 2000	European integration and the location of industries	Overview on studies concerning specialisation	Survey on liberalisation, growth differences
McMorrow, K., Roeger, W., European Commission, Economic papers no 150	Potential Output: Measurement Methods	New Economy effect on Potential Growth	Growth scenarios for the EU and the USA
OECD, 2001	The New Economy: beyond the hype, Final report on the OECD Growth Project	Explaining differences in growth performance of OECD countries	Policy conclusions
OECD, 2001	Growth Project, Draft Ministerial Paper	Explaining growth pattern	Specifically: ICT, Diffusion of technologies, human capital, firm creation
Peneder, M., Edward Elgar, 2001	Entrepreneurial competition and industrial location	Theoretical and empirical overview	Background for three taxonomies

Figure 2.4: USA forges ahead in productivity, specifically in manufacturing
Growth (production index), manufacturing employment and labor productivity, 1995=100



Source: WIFO calculations using New Cronos.

Figure 2.5: GDP per capita difference increases in the nineties



Source: WIFO calculations using AMECO.

Putting the nineties in the longer term perspective

If we put the nineties in the long run perspective, we can see three distinct periods for the relation of productivity of Europe vs. US. In per capita income (at PPP) Europe catches up continuously from 1960 to the mid seventies, after which there is a period over which the gap approximately stays constant up to 1993, and finally the period from 1993/94 on which GDP per capita diverges again. For GDP per worker, there are two periods: catching up to the nineties and then divergence, the catching up period shows convergence first at a greater and then at a smaller speed, as would be expected from a 'catching-up with the leader' model.

The most striking difference in the long run is the sharp increase in the employment ratio in the US, in contrast to its slight decrease in Europe. The employment rate, which had been lower in the US in the sixties, crossed the European rate in 1978. The new gap in favor of the US increased specifically between 1983 and 1993 from 4 to 10 points. A large part of the divergent behavior between GDP per capita and GDP per employee over this period was due to the much better utilization record of the potential labor force in the US. It was only after this extreme jump, that US productivity started to soar.

Explaining the development from the perspective of the new growth (convergence/divergence) literature, it looks as if Europe was on a path of 'conditional convergence' in per capita GDP up to the early nineties, followed by a period of divergence. 'Conditional' rather than 'absolute' convergence stems from systemic differences between 'leader' and 'follower' which prevents the latter from reaching the same GDP per capita level even in the very long-run. This can be due to a long-run differential in the effectiveness of use of one or more inputs (such as the lower degree of labor utilization in Europe) or to a maintained differential in the quality of inputs used or to a sustained differential in the capacity to innovate which yields a 'rent' component to the leader's income. We argue that all the above factors played a role in the US vs. Europe performance but with changing weights over different sub-periods. The weights can change either because the differentials themselves change in terms of systemic features or because in certain (external) circumstances one or the other factor is more decisive (such as the 'rent' component in periods when economies experience the impact of the introduction of a new 'general purpose technology' (GPT). The same approach can be used to explain temporary (rather than long run) periods of 'forging ahead' as was witnessed in the latter half of the 1990s.

3. The main reason: difference in growth drivers and innovation system

Our main hypothesis is that the USA concentrated in the first half of the nineties more on those factors determining long-term growth, while Europe's efforts were distracted by other policy priorities. These were combating the unemployment rate, liberalization of network industries, cutting budget deficits, eliminating national trade barriers within the European Union and towards transition countries. All these priorities had their own merits, but led to an under-emphasis of technological innovation and diffusion of such innovations in comparison to the US. We shall sharpen this view in a hypothesis, then we present empirical evidence on what we call "growth drivers". Afterwards we discuss complementary hypotheses to our main argument. The contribution of the economic structure, specifically of manufacturing is postponed to the next section.

Hypothesis 1: The USA had traditionally invested more in research and development and education. In the nineties it enjoyed and enhanced a first mover advantage in the upcoming ICT technology and continued to invest heavily in those factors, which determine the long, term growth. The potential output (or long term growth) of an advanced economy is determined in general by research, human capital and appropriation of new technologies (in other words supply side determinants dominate). In a period of radical innovations these factors constitute an even greater competitive advantage than in a period of small incremental innovations.

Growth drivers

Economic theory offers a wide range of explanations for factors determining long term growth. New growth theory and less formalized theories like evolutionary growth theory surprisingly converge insofar as they both point at human capital, research input and appropriation of new technologies for production and consumption as the main factors of long term growth.³ Each of these factors of long term growth itself is difficult to measure and has many dimensions. Aiginger et al. (2001) have developed a set of 16 indicators which try to pin down the investment of countries in these "growth drivers". For research these are partly input indicators, partly output indicators, for

³ For a survey see Hollenstein, Hutschenreiter (2001).

human capital the data set includes education expenditures, but also shares of workers with secondary and tertiary education. For ICT – the dominant technology in the nineties- indicators on ICT production shares and indicators on the use of ICT are available. Aiginger et al. (2001) investigates also the correlation between these indicators and productivity growth and find - though this relation is rather weak for some individual indicators – that this set of indicators together is robustly related to the growth of production and productivity (especially in manufacturing).

Comparing Europe as one area to the USA gives the result that the USA was leading in every one of the 16 growth drivers at the beginning of the nineties⁴. Research inputs in manufacturing and in total economy, but also research output were 30 % to 40 % lower in Europe. Education outlays and the share of secondary and tertiary education was lower to about the same extent. ICT indicators showed a large lead for the USA - again for expenditures as well as for the use of computers. As seen from this position the higher growth of output and productivity in the USA in the nineties could have been expected. What is surprising is that this perspective had not been taken at the start of the nineties. The beginning of the nineties had on the contrary been a period in which the USA was very anxious about losing competitiveness, specifically versus the fast growing economies in East Asia. It may be that specifically this competitive threat - which proved wrong, as could be seen with hindsight - had given the USA the energy to invest into the future⁵. Europe – though it discussed its sluggish growth under the heading of "Eurosclerosis" – did not feel such a threat of its position and did not increase its investment into the growth drivers.

One strand of the literature definitely tries to single out one factor for the growth difference between Europe and the USA. This is the literature on the impact of ICT on growth. While this literature itself is not without controversies, the main upshot is summarized in Leo (2001) and Aiginger (2001), insofar as ICT contributed in the 1990s about 0.9 % p.a. to growth in the USA

⁴ See Table 3.1 and Figure 3.1.

⁵ Additionally the USA improved its organization of manufacturing by learning from the Japanese mode of production specifically in the car industry.

but only 0.4 % to 0.5 % in Europe, resulting on a "growth penalty" of about one half of a percentage point for Europe's late start and less intensive use of this new technology.⁶

Table 3.1: Differences in determinants of long term growth (growth drivers): EU vs. USA

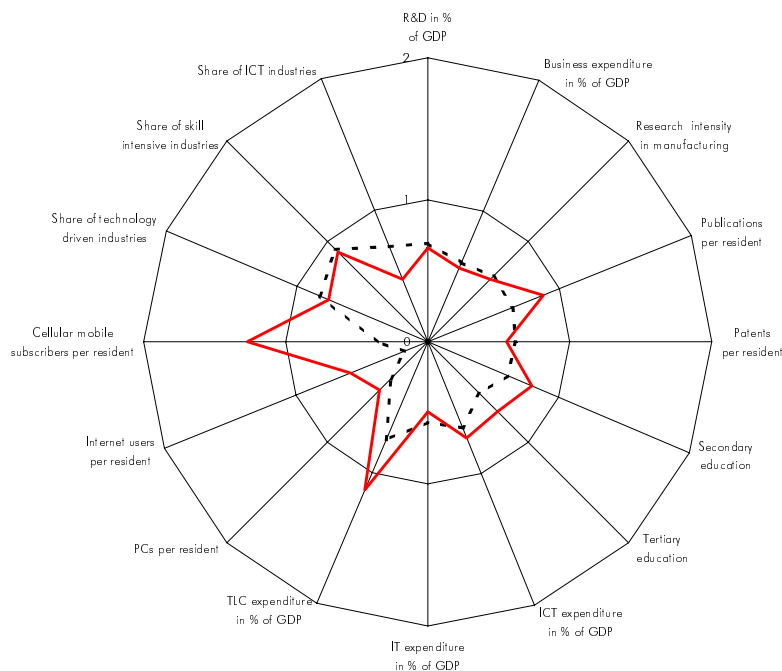
	Position of EU to USA		
	EU/ USA	EU/ USA	Absolute change
	First year	Last year	
Indicators on R&D: input and output			
Total expenditure on R&D in % of GDP 1992/98	0.693	0.661	-0.033
Business Enterprise Expenditure on R&D (BERD) in % of GDP 1992/98	0.606	0.564	-0.042
Research intensity in manufacturing 1990/98	0.652	0.623	-0.029
Publications per inhabitant 1992/99	0.646	0.878	0.232
Patents per resident 1990/97	0.617	0.554	-0.064
Indicators on education system: input and output			
Percentage of the population that has attained at least upper secondary education by age group (1998)	0.609	0.795	0.186
Percentage of the population that has attained at least tertiary education, by age group (1998)	0.514	0.694	0.181
Indicators on ICT: production and use			
ICT expenditure in % of GDP 1992/2000	0.654	0.731	0.077
Information technology (IT) expenditure in % of GDP 1992/2000	0.568	0.493	-0.075
Telecommunication (TLC) expenditure in % of GDP 1992/2000	0.749	1.135	0.385
PCs per inhabitant 1992/99	0.369	0.481	0.112
Internet users per inhabitant 1992/99	0.178	0.584	0.406
Cellular Mobile Subscribers per 100 capita 1992/99	0.356	1.271	0.914
Indicators on share of "progressive" industries (see Section 4)			
Share of technology driven industries in nominal value added 1990/98	0.826	0.757	-0.069
Share of skill intensive industries in nominal value added 1990/98	0.920	0.895	-0.025
Share of ICT industries in nominal value added 1990/98	0.723	0.475	-0.248

Remarks: First (last) year means that year in the nineties for which earliest (or latest) data are available (both are indicated after the name of the variable).

For percentage with secondary and tertiary education the older (45-54) and the younger (25-34) age groups are compared.

⁶ For seminal contributions see Jorgenson, Stiroh (2000), for a summary of the findings and the literature see Leo (2001), for a sceptical view on the contribution of ICT to growth see Gordon (1999, 2000). For a review on the very latest results, which tend to prove that the impact of ICT works via the ICT producing as well as the ICT using sectors see Stiroh (2001), who also supplies industry evidence. He also shows that technology is more important than cyclical factors.

Figure 3.1: Growth drivers in Europe vs. USA



Remark: Each indicator outside the unit circle shows a superior performance of Europe vs. the USA.

The message we take from the literature and own research

Hypothesis 2: ICT contributed about 1 percentage point to US growth of output and productivity in the nineties, but only about half a percentage in Europe. This gives a "growth penalty" of about half a percentage point for insufficient use or inadequate innovation in Europe for this sector alone. For biotechnology no such calculations exist.

During the nineties Europe has been able to narrow the gap towards the USA, however only for a few indicators and at a low speed. Europe has taken the lead in mobile phones per capita and for expenditures on telecommunications (TLC)⁷ relative to GDP. Europe is catching up with the USA significantly in publications, in secondary and tertiary education and in Internet and PC use (see Table 3.1 and Figure 3.1). The gap with respect to US figures widened in IT expenditures, in the share of ICT industries, technology driven industries, and skill intensive industries. Europe is not

⁷ This indicator shares with some other the problem that it measures input but not output.

catching up in patents. For research, the gap widened if we measure total expenditures relative to GDP.

The upshot of these tendencies is that Europe is leading according to two indicators instead of none at the start of the nineties. In the other 14 indicators, the USA has maintained its lead, and in none the margin is less than 10 %.

Hypothesis 3: Europe did not sufficiently catch up with the USA in terms of growth drivers over the nineties. This leads to the prediction that growth of output, growth of productivity and growth of potential output could still be higher in the USA over the next decade - maybe not to the extent of the nineties. Three European countries excel in growth drivers and started to enjoy higher growth in productivity. However, specifically the large European countries are lagging, thus biasing the European average downwards.

Why growth drivers may have mattered more in the nineties

The upshot of these tendencies is that Europe had been lagging to the USA in all "growth drivers" at the start of the nineties. However the lion's share of this lag had already existed in the seventies and eighties, in which US growth in productivity had been lower than Europe's. The main indisputable "new" difference to the eighties is the lead of the USA in ICT (and less easy to be measured – but qualitatively established⁸ - the US lead in biotech). There may be a difference in the structure of research, with a higher share in the military sector in the seventies and eighties⁹ in the US and a higher share of commercial research for a given total figure. Efforts to increase efficiency in the educational system and to increase college and university participation in the nineties¹⁰ add to this evaluation. And there is the empirical fact that the large European countries all decreased research relative to GDP between 1990 and 1999¹¹.

⁸ European Commission 2001.

⁹ There is evidence that public sources for R&D declined, while private investments increased strongly at least since the middle of the decade.

¹⁰ For an overview see the Economic Report of the President 2001, section 5.

¹¹ For Europe the ratio of R&D/GDP is slightly lower in 1999 than in 1990, for the US it is slightly higher (see table 3.8). However more important than this relatively small difference is that the lagging region did not catch up and that the US could shift resources from military research to civilian research.

There is certain plausibility that in a period of the emergence of a new general-purpose technology (GPT)

- It is important to be the first mover, and that
- In the first stage of the implementation of a new technology, in which many adaptations are to be done to make it operational, it is more important to have qualified people, large research communities and high level of research than in the later phase of diffusion when standardized products are available.
- Furthermore the close links between universities and firms is especially important, as is the availability of venture capital and an open attitude towards risk.

This may underline why a given advantage in the growth drivers and the defining elements of the US innovation systems may have been specifically important for the implementation of the ICT technology. We expect that these hard and soft facts of quantitative expenditures and qualitative elements of the innovation system respectively, are also important for the biotech technology.

4. Modification for countries and an upcoming New European Model

The distance between large countries and US increased

One of the reasons why Europe is not catching up in the nineties is the disappointing development of the large European economies, specifically Germany, France and the United Kingdom (see Table 4.1 and Figure 4.1)¹². These countries did not concentrate on investment in the growth drivers and their position deteriorated relative to the EU average as well as relative to the USA. All of them reduced their efforts in research and development in relation to GDP, they did not increase their investment in education enough to catch up with the US, and thirdly - with the possible exception of UK - do not belong to the leading ITC countries. The investments of the large European economies into the growth drivers, which were relative to other European countries high in the start of the decade, did not keep pace with those in the USA. Again with the partial exemption of the UK, which profited from early and radical liberalization and its trade with the USA, economic growth in the large countries is disappointing, and budget deficits are increasing again, putting Germany, France and Italy in conflict with the stability pact in 2002.

Catching up and partly forging ahead for group of four countries: S, SF, DK, NL

The picture is definitely better for some European countries.¹³ Sweden, Finland, Denmark and Netherlands - which we will call top four European countries - have improved their positions relative to the USA for thirteen out of 16 indicators (see Table 4.1). The leading European countries surpassed the USA in publications per inhabitant and internet users (in addition to mobile phones and telecom expenditures, where Europe as total entity is already ahead). The only areas where the top four European countries are not improving their relative positions are patents, the share of IT expenditures and the share of ICT industries in production.¹⁴

¹² The trends are somewhat less negative for UK, on the other hand including Italy as the fourth large country exacerbates the results.

¹³ Remember that the top five were determined at the beginning of the nineties; and that they vary according to the indicators.

¹⁴ The top four European countries are falling back marginally in their shares of skill intensive industries.

If we look at performance indicators (table 4.2), we see that the top 4 countries enjoyed 2.5 % annual growth in the nineties against 1.9 % of the large countries, and this difference increased during the nineties (due to the crisis 1993 in Sweden and Finland, and the slowdown of Germany at the end. Unemployment now is 5.3 % in the top countries, while it is 7.8 in the large countries (and in EU average), employment rate is 9 percentage point higher, the budget is in surplus by 3.2 % (2001) and has a deficit of 1.2 in the large countries in 2001 (and then hitting the 3 % ceiling in 3 of them in 2002. On the negative side only inflation is higher 2.4 % vs. 1.9 %. On the other hand we should not forget that the countries in the top group also are different. Netherlands and Denmark followed to a larger extent strategies to spread employment among a larger number of workers, by encouraging sabbaticals and part time work, this and various schemes to create subsidized employment or to increase training possibilities, decreased the productivity increase in these countries, so that the productivity for the total economy is only half a percentage higher than in the large countries. Productivity in manufacturing is however double as high, and Denmark and Netherlands tried in the last years, as unemployment had to decrease to 3 % and 2 % respectively, to rescind sabbaticals and to recall disabled into the workforce. And the level of productivity is in Denmark and the Netherlands among the highest in Europe (and per hour practically identical to the USA). We have finally to mention, that both countries face a threat to their consensus system, by right wing, anti immigration parties, being temporarily in resp. supporting the ruling government.

If we look for the common elements of the successful countries we will look at Sweden, Finland, Denmark and the Netherlands as a group, despite differences in timing and in the exact strategy they have applied.¹⁵

¹⁵ We do not include Ireland, despite its extraordinary growth, since it started from a low position and was able to use low cost techniques (low corporate taxes, massive regional subsidies, low wages) which are not feasible for countries defining the competitive edge.

Table 4.1: Large countries persistently behind, while top performers catch up with the USA

	Position of 4 large countries EU to USA			Position of leading 4 EU to USA		
	Large EU/ USA	Large EU/ USA	Absolute change	EU/ USA	EU/ USA	Absolute change
	First year	Last year		First year	Last year	
Indicators on R&D: input and output						
Total expenditure on R&D in % of GDP 1992/98	0.736	0.668	-0.068	0.827	0.964	0.137
Business Enterprise Expenditure on R&D (BERD) in % of GDP 1992/98	0.658	0.571	-0.087	0.686	0.862	0.176
Research intensity in manufacturing 1990/98	0.637	0.575	-0.062	0.611	0.748	0.137
Publications per inhabitant 1992/99	0.671	0.881	0.210	1.122	1.505	0.382
Patents per resident 1990/97	0.961	0.668	-0.294	0.837	0.756	-0.081
Indicators on education system: input and output						
Percentage of the population that has attained at least upper secondary education by age group (1998)	0.670	0.798	0.129	0.773	0.938	0.165
Percentage of the population that has attained at least tertiary education, by age group (1998)	0.500	0.618	0.118	0.716	0.840	0.124
Indicators on ICT: production and use						
ICT expenditure in % of GDP 1992/2000	0.665	0.709	0.044	0.733	0.795	0.063
Information technology (IT) expenditure in % of GDP 1992/2000	0.614	0.530	-0.084	0.715	0.662	-0.054
Telecommunication (TLC) expenditure in % of GDP 1992/2000	0.721	1.011	0.290	0.754	1.022	0.269
PCs per inhabitant 1992/99	0.388	0.490	0.102	0.548	0.767	0.219
Internet users per inhabitant 1992/99	0.136	0.551	0.415	0.655	1.196	0.541
Cellular Mobile Subscribers per 100 capita 1992/99	0.350	1.256	0.907	1.160	1.725	0.565
Indicators on share of "progressive" industries (see Section 4)						
Share of technology driven industries in nominal value added 1990/98	0.891	0.789	-0.103	0.586	0.674	0.087
Share of skill intensive industries in nominal value added 1990/98	0.986	0.944	-0.042	0.885	0.910	0.025
Share of ICT industries in nominal value added 1990/98	0.798	0.499	-0.299	0.731	0.698	-0.033

Remarks: First (last) year means that year in the nineties for which earliest (or latest) data are available (both are indicated after the name of the variable).

Large European countries: Germany, France, United Kingdom, Italy. Leading European countries: Sweden, Finland, Denmark, Netherlands.

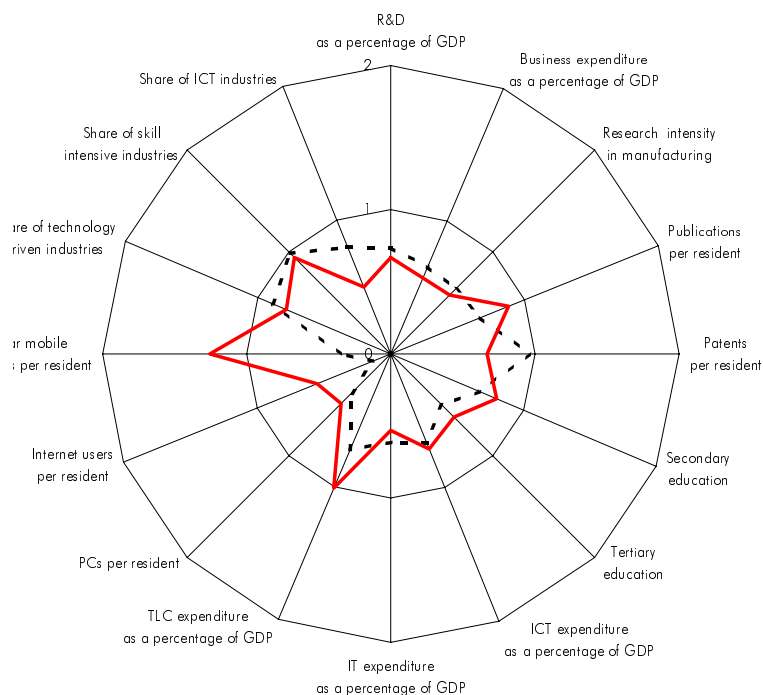
Table 4.2: Economic performance large European countries versus top four in growth drivers

	Production growth Total economy 1991-2001	Productivity growth Total economy 1991-2001	Production growth Manufacturing 1991-2001	Productivity growth Manufacturing 1991-2001	Inflation rate 2001	Unemployment rate 2000	Employment rate 2001	Taxes in % of GDP 2001	Government expenditures in % of GDP 2001
Germany	1.47	1.39	0.97	3.78	1.80	7.80	68.73	45.74	48.46
France	1.87	1.39	1.81	3.03	1.68	8.70	63.38	51.24	52.62
United Kingdom	2.67	2.07	1.32	2.65	1.77	5.10	71.58	41.00	40.12
Italy	1.61	1.50	1.44	2.09	2.20	9.50	58.91	46.21	47.68
Average of large countries	1.90	1.59	1.38	2.88	1.86	7.78	65.65	46.05	47.22
Weighted average	1.85	1.56	1.34	2.99	1.86	7.81	65.92	46.11	47.48
Sweden	2.00	2.38	3.89	5.21	2.34	5.20	75.65	62.26	57.44
Finland	2.89	2.99	6.05	6.15	1.77	9.20	66.52	54.25	49.38
Netherlands	2.76	0.89	1.70	2.42	3.34	2.30	76.22	45.63	45.38
Denmark	2.30	1.73	3.50	4.30	2.30	4.60	77.22	56.77	53.78
Average of top countries	2.49	2.00	3.79	4.52	2.44	5.33	73.90	54.73	51.50
Weighted average	2.52	1.68	3.12	3.91	2.71	4.32	74.94	52.70	50.26
EU	2.04	1.57	1.75	3.13	2.11	7.70	66.00	46.32	46.95
USA	3.44	1.67	4.05	4.39	1.44	4.74	74.46	33.03	32.58

Source: WIFO calculations based on AMECO (April 2002).

Budget deficit 2001: EU: -0.64% of GDP (surplus), large countries (unweighted) 1.17 % of GDP (deficit), top four: -3.23 % of GDP (surplus)

Figure 4.1: Growth drivers 4 large European countries vs. USA



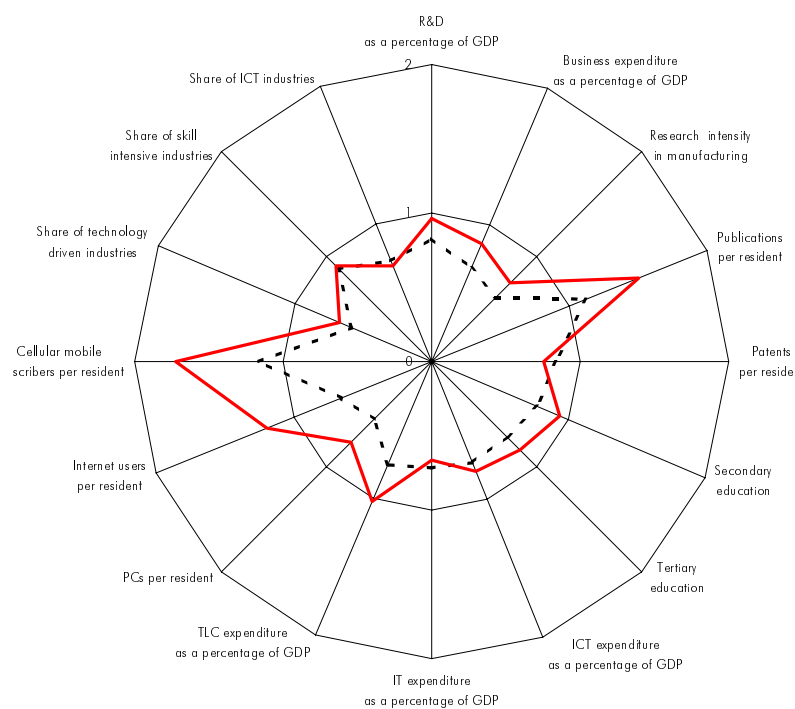
Large 4 countries: Germany, France, United Kingdom, Italy.

Remark: Each indicator outside the unit circle shows a superior performance of Europe vs. the USA.

Top 3: Sweden, Finland, Denmark.

Remark: Each indicator outside the unit circle shows a superior performance of the top 3 European countries vs. the USA.

Figure 4.2: Growth drivers Sweden, Finland and Denmark, Netherlands (top4) vs. USA



Top 4: Sweden, Finland, Denmark, Netherlands.

Remark: Each indicator outside the unit circle shows a superior performance of the top 3 European countries vs. the USA.

Towards a new European Model

Five years of successful growth – with large differences between the countries as to the indicators – may not be enough to speak of a successful model. But it is interesting to look tentatively what the successful countries have in common. We see at the first glance the following common elements in Sweden, Finland, Denmark and Netherlands:

- Smaller open economies, northern welfare states
- High costs, high taxes
- Determined to shape and enjoy information society
- Positive role for government in diffusion of GPT
- Combating the digital divide
- Tripartite consensual policy making
- Flexible labor, promotion of part time work
- Recurrent education, training, sabbaticals
- Egalitarian, inclusive approach
- Crisis in the early nineties (loss of competitiveness, breakdown of markets)

Looking deeper behind the policy strategies of these countries in the nineties, we conjecture that these northern type welfare states have experienced each a rather dramatic economic situation that the welfare state can be sustained only if it is reformed. The first pillar of the reform was

- To cut costs and to bring costs and productivity in balance again. Additionally all countries tried to reduce corporate tax rate, which itself had been below personal income tax. This was however only the necessary condition for success, not the sufficient one. Cost reduction, if the crisis is over, will prove unsustainable, since economies head for higher incomes again and people will forget restraints if the crisis is over.
- The second strategy element is to improve the incentive structure. Firms should know that people can be dismissed if this is absolutely necessary (but keep them in short run crises, since firm specific training and skills may be lost), but workers should have a high probability and

true assistance if they look for a new job. Policies increasing the flexibility of firms, while retaining security for people are labeled as flexicurity (flexibility plus security).

- The third and all-important strategy element was to increase the long-term growth path. All these countries invested into growth drivers and new technologies. Denmark went more a strategy of diffusion of ICT and of supporting successful clusters (IT bridge, medical sector), Finland and Netherlands increased the research expenditures dramatically, even in a period where total government expenditures were reduced, Sweden enforced production and diffusion of telecom to become No 1 in most ratings of implementation of the information society.

In contrast to the old Welfare model, the balance between costs and productivity has a high priority, despite the trough of 2001/2 the budgets in all four countries are balanced, the firms are more flexible with regard to the use of labor, workers get efficient assistance in finding a job, but replacement ratios are reduced, and benefits are conditional on search efforts. Summing up the New European Model of the Reformed Welfare State (NEM RWS) has three constitutive elements:

- social responsiveness
- openness
- efficiency and technology orientation

Synoptic Box: 4.1: Old Model versus New European Model of a Reformed Welfare State?

Old model of European Welfare

The new model of leading four countries

Welfare pillar

High value of security in existing jobs

No right to keep existing jobs

High replacement ratios

Right to get assistance to get a new job

(unemployed income/employment, pensions/incomes)

Training, requalification

Structural change in existing firms (often large firms)

Flexibility for firms and as a right for employees

Comprehensive coverage health, pensions, education

Coverage with personal obligations

Leisure, environment, equality positively valued in objective function

Willingness to work may depend on life cycle position

Policy pillar

Industrial policy for large firms

Efficiency and growth are absolutely necessary

Encouraging of cooperation or mergers

Fiscal orthodoxy, restraint is necessary

Subsidies for ailing firms

Research, education, new technologies are the basis

Enforce current strengths (cluster and regional policy) s)

Start ups, venture capital, services

Examples

Steel cartel

Part time work as a right in Netherlands

Shipbuilding subsidies

IT Bridge and medical cluster in Denmark

Textile/paper industry support

Telecom sectors and IT government in SF and S

5. Other – non growth driver related - explanations

Economic growth in the short and medium run depends on many more factors than those determining the long-term path.

Europe's efforts to create a Single Market and finally a common currency reduce transaction costs and consequently should boost growth. On the other hand, the nineties were dominated by the attempts of government to reduce budget deficits, which resulted in - at least the short run - losses in demand. Balancing the budget and decreasing debt/GDP ratios were necessary requirements to meet the Maastricht targets, which themselves were seen as requirements for creating the European Monetary Union¹⁶. This is an investment into the future and European integration has been a success story as such. However, the attempt to reduce government expenditures prevented also more courageous initiatives for increasing research and education and the enforcement of technology promotion. Three or rather four¹⁷ smaller countries successfully followed a double strategy, by reducing deficits and increasing investment into the growth drivers at the same time. The larger economies however concentrated on budget goals, in pursuing liberalization or in fighting unemployment by rather defensive measures (increasing the employment intensity of growth).

A further explanation refers to a more restrictive monetary policy in Europe, first by the leading central bank in Europe - the Deutsche Bundesbank - which gave a very high priority to stabilization and then by the European Central Bank, which had to build up a reputation for an anti inflationary stance, while the US Fed could stabilize the business cycle by a more expansionary and highly anticyclical monetary policy¹⁸. How cause and effect interacts can be shown that Europe

¹⁶ Looking at the budget deficits and surpluses in Figure 5.1 warns to give this explanation too large an importance, since the deficits developed pretty much in parallel. The difference is that the US could do this at a higher level of growth. The discretionary part of cutting the deficit is therefore smaller (though there were two big discretionary deals done, the omnibus act of 1993 and the budget program 1997 (see Report of the President 2001).

¹⁷ Netherlands is rather near to Sweden, Finland and Denmark according to many indicators on future growth. It has however intentionally reduced growth in macro productivity in a national consensus to reduce unemployment (among other instruments by spreading employment among more workers).

¹⁸ The importance of differences in the behavior of central banks for the disappointing performance of Europe is stressed in Schulmeister (2000), that of fiscal policy is analyzed in Marterbauer, Smithin (2000). See Schulmeister (2000) also for

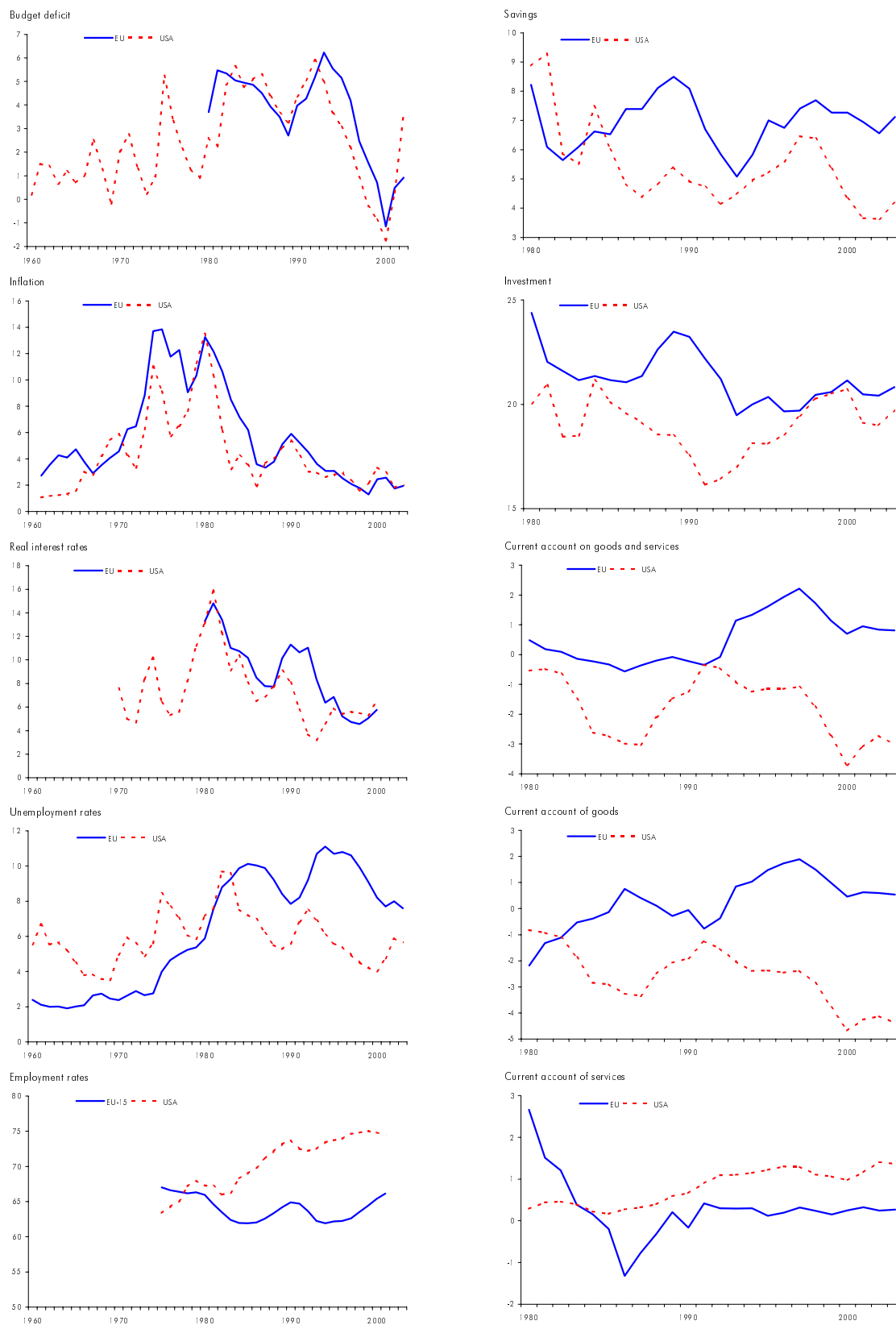
experiences a relatively high inflation rate for rather weak growth rates due to a lower potential output path. Thus a restrictive monetary policy inhibits growth on the one hand, while, on the other hand, a more restrictive monetary policy is necessary if potential output grows more slowly (and reputation of an anti inflationary stance has yet to be established).

A third demand side difference is that the USA experienced an unprecedentedly long uninterrupted growth cycle, while Europe suffered a recession in 1993. While a series of external shocks (Russian and Asian crises) were to some extent comparable, they did impact the USA and the European economies differently, indicating a greater robustness of the USA. Further, success feeds further success: as a result of the difference in the "growth cycle" it is plausible that part of the strong investments in the growth drivers was not a difference in behavior, but itself the consequence of generally higher investments induced by the more favorable demand growth. The expenditures on and application of new technologies in the USA were "biased upward" by an investment boom made possible by higher growth of output and earnings. These cumulative effects make it more difficult to determine which trends were the cause of higher growth in the USA and which originated in this higher growth. The fact that growth drivers were already higher at the beginning of the decade supports the view that the cyclical effect may not be the dominant one. Maybe Europe would have lowered its gap faster, if it experienced a similar period of consistently high growth as in the USA.

Hypothesis 4: European countries did abandon anticyclical fiscal and monetary policy in the nineties, while the USA – whose economists had initiated this policy shift – had returned to an active monetary policy and finally to fiscal stimuli. This was easier since budgets had turned into surplus (by two discretionary programs and by the strength of growth) and inflation did not rise even in a strong and long growth period (implying that NAIRU, if it exist, is lower in the USA).

the arguments that policy and demand side measures and a more systemic approach in the US explain the growth differences in US and Europe. Gordon 2002 takes technological progress as exogenous and starts the virtuous cycle in the USA with low inflation, which allowed the Fed to be non restrictive, leading to higher growth.

Figure 5.1: Budget deficit, inflation, interest rates, employment; Savings/investment and current account



Source: WIFO calculations using AMECO.

6. Will the next decade show the same US lead?

In trying to predict the next decade we should stay modest. Economists did not predict the productivity acceleration in the nineties. Solow proclaimed at that time, that productivity was seen everywhere but not in the computer industry, the USA was afraid that it had lost its leading position in manufacturing to Japan. Therefore we just list factors determining the relative position of Europe and the USA, which has changed since the nineties and those which persists. Finally we address US problems, which may become relevant in the next decade.

Arguments favoring catching up of Europe

- The restrictive effects of fiscal policy will become smaller: several European countries have balanced their budget, at least the structural one, if not the cyclical (in the trough of 2001/2). This is not true for Germany, France, Italy, and Portugal, but even in these countries structural reforms and budget cuts on the one hand and the softening of the stability pact will lead to a less restrictive fiscal policy as compared to the nineties.
- The restrictive effect of monetary policy becomes smaller: the EZB favors a prudent monetary policy with a high priority on inflation, but it is less restrictive than that of the Deutsche Bundesbank in the nineties. And the non-inflationary increase of unemployment could be lower due to reforms in the labor market, allowing a less restrictive policy for a given growth of output.
- Welfare reform is implemented and cost consciousness has risen: several countries started to tackle the pension problem, welfare costs were reduced and unfavorable incentive structures changed. The awareness that permissive policies cannot be later corrected via depreciation has increased cost consciousness.
- European advantage in the diffusion phase: the European innovation system with its reliance on skilled labor and small innovation seems more competitive in the diffusion phase of a new technology; improving quality stepwise is a European core capability.

- The difference in the growth drivers narrowed: while the USA have still a lead in most indicators, some country have caught up and is overtaking the USA, European average is slowly catching up, awareness has risen, and the Nice process monitors the way to a leading knowledge based economy.
- European enlargement and institutions: the shaping of new market, liberalization and the new rule of the Single Market will favor growth and competitiveness in the long run, some of these policies have short run costs of structural change and decreasing employment. The growth effect of European integration should eventually to be seen, and be accelerated by the rapid growth in the accession countries.

Arguments in favor of a continued US lead

- Higher level of research and efficiency persist: even if some European countries are catching up and differences in some growth drivers diminish, the differences in the level of most of these determinants persist, they refer to quantitative inputs and the monitoring of efficiency.
- New lead in biotech: while the lead in biotech of the USA may not be that large and while this technology may not spread into so many industry during the diffusion phase, the USA has a lead in the next GPT, and not lost all its lead in the last one.
- The industry structure remains more favorable in the USA: the share of technology intensive industries that of ICT industries is higher in the USA. The share of labor intensive industries is declining, but still higher in Europe. However, the European advantage in medium skilled industries and in upgrading quality in existing structures also persist (Aiginger, 2001). The importance of industrial structure for growth is investigated in Peneder (2000).
- Taxes, welfare, labor flexibility, burden of regulation may have become smaller, but differences persist. The same hold for creation of new firms, venture capital and the dynamics enabled by relative open labor market (and high rates of legal and illegal immigration).

Three major problems unsolved in the USA

- The US current account deficit hits at 5 % mark again: after closing the deficit in the early nineties, the current account deficit again explodes and raises the question of its sustainability (Mann, 2000, IMF, 2002). While economists in principle think such a large inequality is not sustainable, it proves to be, if foreign investors are glad to engage in direct investment or to buy long term bonds and stocks. Up to now a growing share of international investment went into the USA, yielding the current account deficit unimportant for the time being.
- Corporate Governance superiority lost: it had been "common knowledge" that the US accounting system, the monitoring forces of investment bankers, abundant research analysis, the SEC as watchdog, and a large community of critical investors altogether had lead to a superior system of corporate governance with a sound incentive structures. However naïve this opinion had been, to which degree the aftermath reforms of 2002 have solved the problem, how small the number of fraudulent firms had been, the idea of US superiority will never be common knowledge again. On the other hand up to now European stocks could not profit from this, and investment flows in 2002 are continued to balance the current account deficit.
- The US savings rate approaches zero: The US savings rate is at a level considered as unsustainable by many economists. If people should decide that capital gains are no reliable part and to increase the savings out of current income consumption will fall. Investment can be financed only by inflow of foreign capital or by government saving. The latest is no longer a very probably source of savings. Again the whole triangle current account deficit, low saving rate, influx of foreign capital has worked for a rather long time and may be sustainable if profits and (risk adjusted) stock returns are always a little bit higher than in other countries, but it is at least an element of instability, and regime changes seldom work gradually (increasing exports, increasing the savings rate, and reallocating investments of foreign investor all in parallel).

A forth factor whose effect and extent cannot be judged easily is the increase of security efforts. Direct expenditures remain to be low in relation to GDP (one or a few tenth of a percentage point), but security could play the role institution building and preoccupation with unemployment and

restructuring of Eastern Germany had in Europe in the nineties: to distract the attention of policy and firms from the really important drivers of economic growth.

If we try to make a forecast, despite of the impossibility to weight and sum up these different factors, the most likely development for me would be that the USA would increase output and productivity again faster than Europe. The difference between US and European growth may be smaller, since some of the reasons for the superior performance have changed. And if the risks will bite, nobody can predict whether the changes are gradually or cumulative, and whether they effect the country in which the changes originate is really more hit than countries towards which the turmoil expands via world trade and investment.

7. Summary

1. Europe's performance in the nineties and specifically in the second half of this decade was disappointing. Real growth of the economy (and specifically of manufacturing) and employment growth were lower in Europe than in the USA. Productivity growth accelerated in the USA (productivity rebound), but not in Europe. The secular productivity catching up of Europe towards the productivity leader US stopped in the nineties. If anything the distance between the USA and in Europe increased in the second half of the nineties (forging ahead of the leader). Europe's share in world trade decreased, the share of US exports increased. The trade balance however is in general positive for Europe, and (increasingly) negative for the US.
2. The extent of the productivity rebound and of the new phase of forging ahead of the USA depends on the choice of indicators (for output, inputs, productivity) and on several technicalities (quality adjustments of output and inputs), but the evidence looks convincing. The surprising US performance is more distinct for labor productivity than for total factor productivity, for manufacturing than for the total economy, for production per worker than per hour. However, the two main tendencies (rebound plus forging ahead) survive the use of many different sets of indicators, many methods of adjustments and can be seen on different levels of aggregation.

3. The different performance of the EU and the US in the nineties does not seem to be too surprising, if we look back at the situation with the benefit of hindsight: in all the expenditures, which are usually declared by new growth theory to be the determinants of long run productivity and output growth, the US was leading at the beginning of the nineties. Measuring human capital by education expenditures or by performance indicators, measuring research by input or output, and measuring the investment into the new general purpose technology ICT, all indicators revealed the US to be leading at the beginning of the nineties relative to Europe.
4. What seems to be surprising is that this perspective had not been the dominant view at that time. Recall that this was the time in which the US was most anxious to lose competitiveness primarily vis-a-vis Japan. The reason for not yet realizing the US lead versus Europe may have been an underestimation of the importance of ICT (recall the famous Solow statement that computers were seen everywhere but not in the productivity statistics) and that the higher expenditures of the US in education and research had been facts for a long time – without a striking consequence for relative productivity growth. Two explanations are possible: one is that the contribution to productivity of these inputs increased, via new tendering schemes, more civilian research, perfecting benchmarking for schools; the other is that the impact of the specific (already established) US system of innovation increased as a new general purpose technology entered the phase of economic rewards. The upshot of today's evaluation is that ICT has increased productivity by one percent per year in the US in the nineties as compared to half a percentage point in Europe. The maintained lead of the US in education expenditures and in research may have led to differences in the available 'knowledge' stocks which facilitated a faster rate of innovation and the more rapid diffusion of this new general purpose technology.
5. In assessing the reasons for the productivity rebound and forging ahead of the leader in the nineties, we emphasize the importance of "growth drivers". The US were leading quantitatively in expenditures on R&D and education, worked hard to increase the efficiency of expenditures in these areas. The importance of technology for the US lead is underlined if we look into

disaggregated data. Productivity increased fastest in technology driven industries, and US share in these industries is far higher than the European (see Aiginger, Landesmann, 2002).

6. Four European countries experience a successful development with regard to growth, employment and regaining fiscal stability. At the same time they were able to improve their position in the "growth drivers", so that we would expect future growth. These countries are Sweden, Finland, Denmark and the Netherlands, and they may constitute a New European Model of Reformed Welfare States. All put a great emphasis on information technology, either in production or in use or both. These are small countries, centered in the North of Europe, the economies are very open to world trade and competition. Economic policy is to a large degree consensual with an egalitarian touch in incomes and gender policy (they all have high labor force participation rates). All countries had a specific, determined and inclusive approach with explicit goals in technology policy. None is a low cost country, all have rather high taxes for consumers and partly on environment, but they shelter business from high taxes (low corporate tax rate). All these countries did face serious problems at some time in the eighties or at the beginning of the nineties (with fear of losing competitiveness). It is too early to speculate about a New European Model, combining excellence in technology with social inclusiveness, but it will be interesting to monitor the performance of these countries over the next decade.
7. We claim that technology and investment into intangibles is the main explanation for the productivity rebound and the forging ahead of the US. But these factors are not the whole story. The US used several elements of a low cost strategy at the beginning of the decade: a low currency, low wages specifically at the low end, low taxes. In Europe growth was decelerated by the attempts to reduce budget deficits and to discourage inflation (which was feared to rebound at extreme low growth rates), it was distracted from a prudent growth policy by the burden of unemployment, by building of institutions and the restructuring of the transition countries. Investment in growth drivers stagnated, specifically for large countries.
8. In assessing the development in the next decade, we have to be modest in what economists can predict about the long run. We therefore just present arguments in favor of a new period of

catching up of Europe, then the arguments for a persistence of the US lead, and then recall three unsolved problems and one distracting force for the US.

Arguments for European catching up:

- Restrictive effect of fiscal and monetary policy becomes smaller
- Welfare reforms have started, cost consciousness increased
- European advantage in diffusion face of ICT
- Growth driver difference has become smaller
- Benefits of integration and enlargement will materialize

The arguments for a continued US lead:

- Level of research and its efficiency still higher in US
- New US lead in biotech
- Progressive industry structure and better developed new services
- Taxes, labor flexibility, immigration, regulation favors cost competitiveness and creation of firms

The three unsolved US problems (plus one distracting force)

- High current account deficit
- Low savings rate
- Dependency on investment inflow (needing high profits and reliable corporate governance)

Apart from these issues, which existed for long and are closely related, but can become important if the flow of investment starts to change direction, we see the possibility that the security issue may distract the attention from focusing on growth drivers, as unemployment and institution building had done it in Europe in the nineties.

If forced to draw a forecast despite of the impossibility to weight and sum up these different factors, the most likely development for me would be that the US would increase output and productivity again faster than Europe. The difference between US and European growth may be smaller, since some of the reasons for the superior performance have changed. And if the risks will bite, nobody can predict whether the changes are gradually or cumulative, and whether they effect the country in which the changes originate more than the regions towards which the turmoil expands via world trade and investment.

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