Time for a fresh start
But time is not on our side

A Comparison of European and US Economies Based on Time Distances

While it is advisable to put behind us the hubris of the initial Lisbon targets – "to become the most dynamic, most competitive economy by 2010 etc…", it remains prudent to continue to compare the development of the European economy with the most vibrant economy in the world. At present, that means the US. In economic terms, there is no better international benchmark for the European Union.

This document compares the EU to the US in terms of GDP, R&D, productivity and employment figures, but does so in terms of the time distances between the two regions. It addresses questions such as "When, in its development, did the US already achieve the current EU levels?" and "When, given recent trends, could the EU catch up with the US, and under what conditions of growth?"
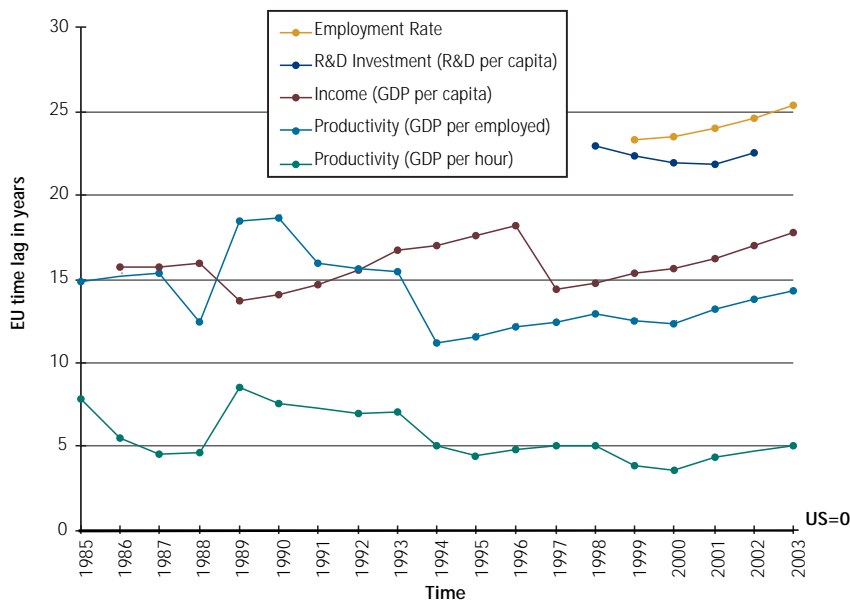
The results provide food for thought to all those concerned with European growth and employment.

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Looking back...

The graph below shows the development of the European Union's time-lag compared to the US since the mid 1980s. Despite some catching up for some indicators in the first part of the 1990s by the EU, the US has, for a number of years, been increasing its time lead for all indicators. This turning point - to the EU's disadvantage - came right after 2000.

Time distances in years between the EU and the US

Legend:
- Employment Rate
- R&D Investment (R&D per capita)
- Income (GDP per capita)
- Productivity (GDP per employed)
- Productivity (GDP per hour)

Y-axis: EU time lag in years (0 to 30)
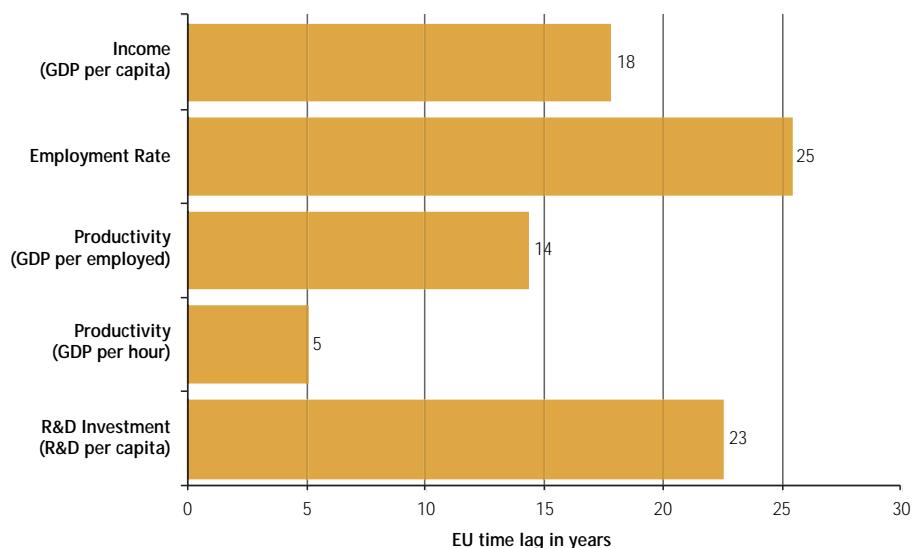X-axis: Time (1985 to 2003)
US=0

Now...

This results in the graph below, which shows the US time-lead compared to the EU in years at this point (based on 2002/2003 data, as the most recent comparable data).

- Our level of income[I] for 2003 (measured in GDP per capita) was already reached by the US in 1985
- Our employment level[II] for 2003 was already reached by the US in 1978
- Our productivity[III] for 2003 (measured in GDP per employed) was already reached by the US in 1989
- Our investment levels in R&D[IV] for 2002 (R&D per capita) was already reached by the US in 1979

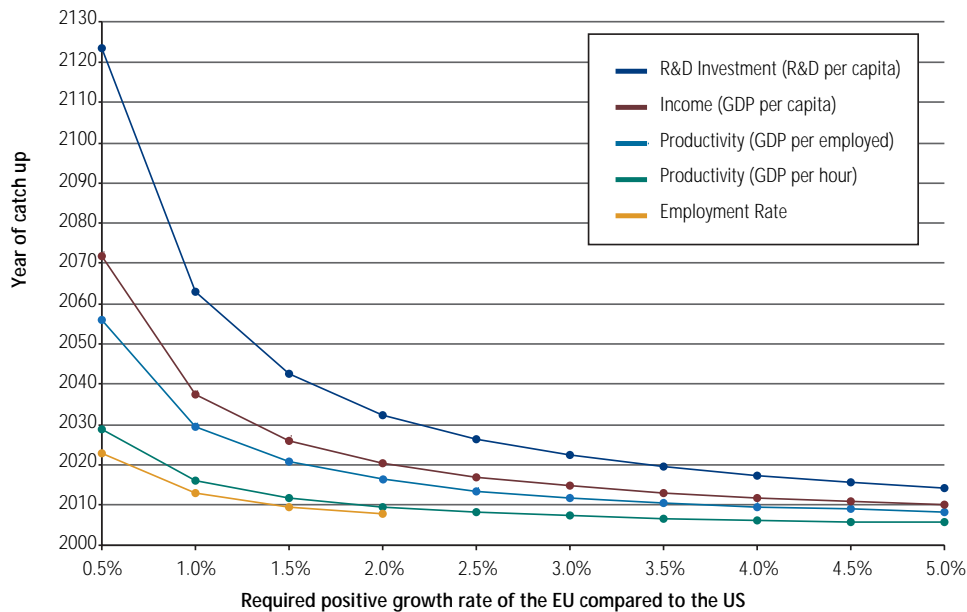## Time distances in years between the EU and the US

Bar chart data:
- Income (GDP per capita): 18
- Employment Rate: 25
- Productivity (GDP per employed): 14
- Productivity (GDP per hour): 5
- R&D Investment (R&D per capita): 23

X-axis: EU time lag in years (0 to 30)

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And looking to the future…

Years in which the EU will catch up with the US, under various assumptions

Chart legend:
- R&D Investment (R&D per capita)
- Income (GDP per capita)
- Productivity (GDP per employed)
- Productivity (GDP per hour)
- Employment Rate

Y-axis: Year of catch up
X-axis: Required positive growth rate of the EU compared to the US

If our productivity growth is 0.5% higher then in the US, it will still take until 2056 to catch up

This graph shows the time needed for convergence with the US for the range of various scenarios of higher growth rates in the EU than in the US. For instance, if the R&D per capita would grow in the US at 3% per year and in the EU at 4% per year (an example of 1% positive difference in the graph) the equalisation would only happen in 2064 (even at a 3% positive difference scenario it would only happen around 2022). For GDP per capita, if yearly growth would be 4% in EU and 2% in the US (at present the reverse might be closer to reality), the equalisation would happen only in 2020. It is worth remembering, however, that in the recent past the respective growth rates for these indicators have been mostly higher in the US. **In other words, even the worst scenarios above will only come about with a considerable EU improvement.**

Summary

Employment
- It will take the EU until 2023 to reach US levels of employment, and then only if EU employment growth will exceed that of the US by 0.5% p.a.
- Europe's employment level for 2003 was achieved by the US in 1978.

Research and Development
- It will take the EU until 2123 to reach US levels of R&D investment, and then only if EU investment will exceed that of the US by 0.5% p.a. (Note: Since 1995 the average growth for the US has exceeded the EU rate.)
- Europe's R&D investment for 2002 was achieved by the US in 1979.

Income
- It will take the EU until 2072 to reach US levels of income per capita, and then only if EU income growth will exceed that of the US by 0.5% p.a. (Note: Since 1997, the average US growth has been higher.)
- Europe's income for 2003 was achieved by the US in 1985.

Productivity
- It will take the EU until 2056 to reach US productivity rates per employed, and then only if EU productivity growth will exceed that of the US by 0.5% p.a. (Note: Since 1994, the average US growth has been higher.)
- Europe's level of productivity for 2003 was achieved by the US in 1989.

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About the time distance methodology

All findings presented in this publication are based on the use of a methodology called the "time distance measure". This methodology was developed by Professor Pavle Sicherl, Professor of Economics at the Ljubljana University and Founder of SICENTER (Socio-economic Indicators Center, www.sicenter.si), Ljubljana. All research for this publication was undertaken by him, on behalf of EUROCHAMBRES.

The special concept of time distance, S-time-distance, is a generic concept like static difference at a given point in time and the growth rate over time. It compares two time series in horizontal dimension for a given level of the indicator and calculates the difference in time when the two compared units attain the same level of the indicator. In our case it expresses the development gap between the EU and the US by looking how many years earlier a given level of an indicator for the EU was attained in the indicator time series for the US. In simple terms, two long-term time series e.g. for GDP per capita for the EU and US are compared in such a way that for any level of the EU one searches in the time series for the US in which year the same level was achieved and subtracts the two times involved (level for EU in 2003 equals level of the US in 1985, S-time-distance being 18 years as time lag for the EU or time lead for the US for that level of the indicator).

It is a very useful complementary tool for analysis and presentation of key indicators in a wide variety of substantive fields at macro and micro level. For instance, Nobel Prize winner Professor Clive Granger extended the S-time-distance measure to econometric forecasting as a criterion for evaluating forecasting models for leading and lagging indicators.

A similar perspective in terms of time is used to describe outcomes of alternative policy scenarios for the future in the third graph. The years when EU would catch up with the US under various assumptions are the results of multiplying the respective 2003 values of an indicator by the assumed growth rates for the EU and US and looking for the year when the assumed values for the EU at an assumed higher rate of growth than the US would become equal.

For reasons of availability of reliable and/or comparable data the comparison has only been done on the basis of data for the 15 Member States of the EU before May 2004. However, data clearly suggest that including the 10 new member countries in the comparison would further deteriorate Europe's position compared to the US for all four major indicators. A comparison with upcoming competitors like China and India has not been made for the same reasons of data reliability / comparability.

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