

EUROPEAN CENTRAL BANK

*Transmission embargo until 5.30 p.m. ECB time (CET)  
on Friday, 20 January 2006*

“Growth performance, labour productivity and  
structural reforms in the euro area”

Speech by Jean-Claude Trichet  
President of the European Central Bank

Student forum  
at the University of Hohenheim

Stuttgart, 20 January 2006-02-03

Check against delivery

**European Central Bank**

*Directorate Communications- Press and Information Division*

Kaiserstrasse 29, D-60311 Frankfurt am Main

Tel.: 0049 69 1344 8304, Fax: 0049 69 1344 7404

Internet: [http:// www.ecb.int](http://www.ecb.int)

**Reproduction is permitted provided that the source is acknowledged.**

Ladies and gentlemen,

I am grateful to the organisers of this event [Global Panel] for inviting me here today and allowing me to share with you my views on some important issues for the euro area economy. The topic of my speech – the long-term growth performance of the euro area – is an issue that is of major importance for our continent for it commands not only its prosperity but also its relative influence in a global economy which is experiencing major structural changes. In my talk today I will explain what the main driving forces behind growth are, and in particular the role played by productivity growth. Allow me to suggest that while the role of ‘genius’ in enhancing productivity is undeniable, as Gottlieb Daimler and Robert Bosch demonstrated so well in this city, we should not be complacent and wait for it to happen. Maybe it is appropriate in this context to recall the words of another great inventor, Thomas Alva Edison: “Genius is 1% inspiration and 99% perspiration”. From my perspective, not being complacent means remembering that sound macroeconomic policies, pro-competition product market regulations and well-functioning labour markets provide a favourable environment for productivity growth.

I will structure my remarks as follows. First, I will present an assessment of the growth performance of the euro area. Second, I will focus on productivity developments in the euro area since the mid-1990s. Third, I will explain the role of economic policies in promoting productivity growth. Finally, I will conclude by explaining where, in my opinion, responsibilities for fostering growth and prosperity in the euro area lie.

### **Growth performance of the euro area**

There is evidence of increasing disparities in growth between developed countries. Before the 1990s there was a catching-up process, with the lower GDP per capita economies growing faster than the richer economies, but this pattern is less clear in more recent data.

Let’s compare growth in the US and the euro area. From 1960 up until the late 1970s average real output per capita growth was higher in the countries that now make up the euro area; in the 1980s it was roughly the same, but by the mid-1990s it was lower. Actually, euro area GDP per capita growth was approximately 5% during the 1960s and 1970s, around 2% from 1980 to the mid 1990s and has been 1.7% on average since the mid 1990s. In contrast, in the US GDP per capita growth was around 3% from 1960 to 1980, 2% during the 1980s up until the mid 1990s, and 2.2% in the recent period 1995-2004. Because of these diverse patterns, the level of euro area real output per capita relative to the US, which was gradually catching up

and had reached a relative value of almost 90% in the early 1980s, started to decline and in recent years has stood at around 70%.

Another way to look at GDP per capita growth is to break it down into the respective contributions from changes in age structure, labour utilisation and labour productivity. An ageing population did not play a major role in explaining growth disparities between the US and the euro area during the 1990s, but the picture looks different for both the euro area and the US in the years ahead: contributions to growth in GDP per capita expected from changes in the age structure are projected to be negative. Labour utilisation, which depends on factors such as average hours worked, the unemployment rate and the participation rate – that is the percentage of the working age population who are employed or actively seeking employment – can explain a significant part of the disparities in growth. For example, average hours worked have been declining during most of the past 40 years in the euro area, although less so in the recent decade. By contrast, although they declined until the late 1980s in the US, they have remained broadly unchanged since then. According to OECD data, average hours worked per year in the euro area declined from about 1940 in 1970 to about 1550 in 2004. In the US average hours worked per year declined from about 1935 in 1970 to about 1830 in 1982 and then stabilised around 1860 up to 2000. In 2004 they were about 1825. Moreover, the unemployment rate remains significantly higher in the euro area than in the US, despite a clear improvement in the last decade. By contrast, the participation rate has been rising more strongly in the euro area than in the US since the 1990s, but from a significantly lower level of participation in the euro area in the mid-1990s<sup>1</sup>.

Broadly speaking, labour productivity growth was growing faster in the euro area than in the US from the early 1950s until the mid-1990s. This catching-up process was very much in line with standard economic textbook theory. However, it's a pattern that has gone into reverse since the mid-1990s. Labour productivity growth (per hour worked) was 2.4% in the euro area from 1981 to 1990 compared to just 1.5% in the US. However, during the period 1996 to 2004 productivity came down to 1.3% in the euro area while it recorded a value of 2.5% in the US.

This rise in the US may partly reflect cyclical factors, but the apparent resilience of US productivity growth during the recent downturn and the significant further pick-up over the last two years tends to support the widespread view that the mid-1990s saw a structural improvement in US productivity growth.

---

<sup>1</sup> The participation rate is estimated by the European Commission at about 72% in the euro area and about 76% in the US in 2004.

I should perhaps add that downward trends in productivity growth are observed for the euro area, irrespective of whether productivity is measured per person employed, or per hour worked. However, it is worth noting that due to the trend decline in average hours worked in the euro area (in contrast to stable hours in the US), the productivity growth gap with the US has become more marked in terms of employed persons than in terms of hours worked.

In sum, the growth differential between the euro area and the US since the mid-1990s reflects a more intensive use of labour and higher labour productivity. It is important to note that there is a limit to how much labour utilisation can grow, and hence this factor cannot explain growth differentials between countries over long periods of time. In the long run, the main source of growth differentials between countries is due to differences in labour productivity. Productivity growth is therefore the key factor in long-term economic growth.<sup>2</sup> Given the striking recent divergence in productivity growth between the euro area and the US, it's worth considering productivity developments since the mid-1990s in greater detail.

### **Productivity developments since the mid-1990s**

The decline in euro area labour productivity growth since the mid-1990s can be discussed in terms of its main immediate sources, i.e. total factor productivity (TFP) growth, changes in labour quality and capital deepening. Although the decomposition of labour productivity is subject to significant measurement uncertainty, there is robust evidence that slower productivity growth in the euro area since the mid-1990s reflects both lower growth in TFP and less capital deepening.

TFP, sometimes called multi-factor productivity or the Solow residual, is often associated with the theoretical concept of technological progress or, as I said earlier, the contribution from science and technology. However, in practise TFP captures progress not only in technology but also in improvements in organisation and in the quality of capital, so that it is not possible to exclusively associate its evolution with purely technological advances. In fact, it was recognised long ago that, de facto, TFP is a catch-all term for all factors – except for the amount of labour and capital – and could thus be interpreted as a symbolic measure of the complexity of a growth process that is still to be fully elucidated.<sup>3</sup>

---

<sup>2</sup> See, for example, A. Musso and T. Westermann (2005), "Assessing Potential Output Growth in the Euro Area", *ECB Occasional Paper Series*, No 22, January 2005.

<sup>3</sup> Abramovitz, M (1956): "Resource and Output Trends in the United States since 1870", *American Economic Review*, Vol. 46, No 2, pp. 5-23.

Capital deepening is the increase in capital intensity, which is the amount of capital per unit of labour input. During the period 1996 to 2004 the contribution to growth from capital deepening in the euro area was 0.5 percentage points, while it used to be 0.9 in the early 1990s. These developments therefore account for a large part of the slowdown in aggregate labour productivity growth. Unfortunately, not much empirical work is available to allow us to draw a clear picture of the main factors behind these developments. However, it can be argued that one of the main factors driving lower capital deepening in the euro area appears to have been strong employment growth, as estimates of capital services<sup>4</sup> growth only show signs of a minor deterioration during the 1990s. Sustained wage moderation and continued progress with labour market reforms are likely to have contributed to these developments, leading firms to shift to more labour-intensive production following earlier substitution policies in favour of capital during the 1980s and early 1990s.<sup>5</sup> In addition to the transitory impact on productivity via lower capital deepening, policies designed to increase the employment of low-skilled workers may have depressed average labour quality growth. Available evidence provides some support for the view that labour quality increased more moderately in recent years than in the first half of the 1990s.<sup>6</sup>

The decomposition of labour productivity growth per hour worked at the sectoral level sheds more light on the different developments in labour productivity growth in the euro area and the US. In particular, it helps identify those sectors in the euro area where the short-run link between strong employment and low productivity growth was particularly marked. Recent economic studies have highlighted the role of the information and communication technology (ICT) revolution in explaining the acceleration of productivity growth in the US in the mid-1990s.<sup>7</sup> Economic history has shown that great inventions have been the catalyst for long periods of rapid growth. Think of the steam engine in the late 18<sup>th</sup> century, of electricity in the late 19<sup>th</sup> century or of the internal combustion engine developed by Gottlieb Daimler in the 1880s. Similarly we are currently experiencing the ICT revolution. The cost of computing and of communicating information has dramatically fallen down. We are by way of consequence the witnesses of an extremely profound change of the economy in the domain of the production of goods as well as services. The full

---

<sup>4</sup> Jorgenson and Griliches (1967) suggested that growth in capital input is best measured by capital service flows. This method applies weights given by the shares of each asset type in the value of property compensation. Jorgenson, D. W. and Z. Griliches (1967): "The explanation of productivity change", *Review of Economic Studies*, Vol. 34, pp. 249-283.

<sup>5</sup> See, for example, A. Musso and T. Westermann (2005), "Assessing Potential Output Growth in the Euro Area", *ECB Occasional Paper Series*, No 22, January 2005

<sup>6</sup> See ECB Monthly Bulletin box "Developments in euro area labour quality and their implications for labour productivity growth" in the October 2005 issue.

<sup>7</sup> See, for example, Jorgenson, D. W. and K. J. Stiroh (2000): "Raising the speed limit: US economic growth in the information age", *Brookings Papers on Economic Activity*, vol. 1, pp. 125-211.

body of the civil society is itself dramatically transformed by PCs and by the internet which is rapidly meshing cultures, spreading news and information to all corners of the world. This suggests that, for our economic analysis, we should distinguish between sectors according to their intensity of use of ICT. A typical breakdown is between ICT-producing, ICT-using, and other industries which are labelled as 'non-ICT'.<sup>8</sup> Once more, it will be interesting to compare developments in the euro area with those in the US. There may be good reasons to believe that the ICT revolution started to materialize in the US, but as for the euro area, and despite all the computers around us, growth statistics does not show evidence of it to the same extent. In Europe the Solow's paradox is still present when it has vanished in the USA.

Following this ICT taxonomy, the main features of sectoral productivity contributions can be summarised as follows. First, a significant deceleration in hourly labour productivity in non-ICT sectors from the early 1990s explains most of the decline in euro area aggregate labour productivity growth. The deceleration in labour productivity in the non-ICT sectors seems primarily related to strong employment growth, which reduced the pace of capital deepening.

Second, productivity developments in the ICT-producing sectors were relatively strong in the euro area in recent years, and even slightly outperformed the US in the segment of ICT-producing services (software, computer and communication services). The contribution to labour productivity growth of the ICT-producing sectors was 0.15 percentage points in the euro area during the period 1990 to 1995 and it increased to approximately 0.3 percentage points in between 1996 and 2002. As an interesting comparison, the contribution from the ICT-producing services was 0.22 percentage points in the US during the period 1996 and 2002. This is consistent with a positive technological shock also occurring in the euro area ICT-producing sector, which led to higher labour productivity and higher employment growth. However, this sector represents a smaller share of the economy in the euro area than in the US, which implies that positive developments had a more limited impact on aggregate productivity in the euro area. The output share of the ICT producing sector was 5.3% in the euro area during the period 1996 to 2002, while it was 7.0% in the US during that same period.

Third, the ICT-using sectors in the euro area failed to experience the strong acceleration in labour productivity observed in the US in recent years. In particular, key ICT-using services, such as retail, wholesale and financial services, saw broadly

---

<sup>8</sup> Examples of ICT-producing sectors include 'Office machinery' and 'Telecommunication equipment' in manufacturing and 'Communications' and 'Computer and related activities' in services. Examples of ICT-using sectors include 'Mechanical engineering' and 'Clothing' in manufacturing and 'Retail trade' and 'Financial intermediation' in services. Examples of non-ICT sectors include 'Food, drink and tobacco' and 'Chemicals' in manufacturing and 'Hotels and catering' and 'Education' in services.

stable, or slightly lower, productivity growth in recent years in the euro area. Its contribution to labour productivity growth had been 0.36 percentage points during the period 1990 to 1995 and came down to 0.28 percentage points during 1996-2002. Productivity growth in this sector surged considerably in the US, from a contribution of 0.36 percentage points in the period 1990 to 1995 to 1.32 during 1996 to 2002. This accounts for much of the difference in aggregate productivity growth between the euro area and the US, of around 1 percentage point, between 1996 and 2002. The lack of spill-over effects of ICT beyond the ICT-producing sector suggests either a slow diffusion of new technologies in the euro area or an absence of re-engineering of the production process to effectively take advantage of the opportunities offered by ICT.

Overall, the main reasons for diverging trends in labour productivity growth between the euro area and the US in recent years seem to be twofold. First, weaker productivity growth in the euro area non-ICT sector was explained by stronger low-skilled employment growth not being matched by equivalent capital deepening. Second, there was lower productivity growth in ICT-using sector in the euro area compared with the US.

This analysis provides a detailed description of the different components that add up to labour productivity growth, namely TFP growth, capital deepening and labour quality growth. It also offers a useful 'medical report' but no explanation of the causes that lie behind productivity growth. Can we identify the reasons for the different evolution of capital intensity in the US and in the euro area? Can we explain why ICT-using sectors are less productive in the euro area? Allow me to turn now to these issues.

### **Macroeconomic stability, innovation policies and well-functioning markets**

Most growth theories suggest that TFP growth depends on innovation, research and development spending and technology diffusion. At this point we may ask ourselves if we should sit back and wait for the 'genius' or if there are ways of encouraging innovation. Empirical studies have advanced several economic factors that are likely to play a key role in fostering innovative investments. These factors are:

- 1) good education and research subsidy systems,
- 2) well-functioning product and labour markets,
- 3) well-developed financial systems, and

#### 4) macroeconomic stability.

The balance in a majority of empirical studies seems to confirm the positive link between education and productivity.<sup>9</sup> The impact of education on growth may be related to its direct link with innovation, and also with its indirect link, as adopting new technologies is easier with a highly educated labour force. Additionally, better education and training helps to minimise mismatches in the labour market and allows for a smoother reallocation of workers between sectors and firms.<sup>10</sup>

In addition, it is clear that establishing competitive, efficient and well-functioning markets is another prerequisite for medium to long-term growth.<sup>11</sup> Lack of competition in product markets harms productivity trends by limiting production efficiency and by reducing the incentive to innovate. In the EU, some progress has been made in this regard. For example, most network industries, like telecommunications and air transport, are now fully or largely open to competition. And the reforms do pay off: the remarkable labour productivity growth performance in network industries in Europe over the last ten years provides a perfect example of the positive impact on labour productivity growth of easing regulations and fostering competition.

Well-functioning labour markets are also extremely important in fostering high economic growth. Economic policies that discourage the effective reallocation of labour should be avoided. There is empirical evidence that shows how labour market policies affect innovation activity. The combined effect of hiring and firing costs and the type of industrial relations regime have an impact on in-house training incentives.<sup>12</sup> In particular, employment protection legislation may have a particularly strong negative impact in industries subject to rapid technological change, when the impact on traditional industries is less damaging. Many observers have indicated that the slow diffusion of new technologies in the euro area may be related to barriers to competition and innovation, as well as stringent labour and product market regulations, in particular in the services sectors of the economy.

Apart from their impact on innovation, labour market regulations may also affect participation rates – a point that is sometimes overlooked. The divergent pattern displayed by labour utilisation in the US and in Europe has prompted some economists to suggest the existence of a ‘European model’ and a ‘US model’,

---

<sup>9</sup> See J. Temple (2001): “Growth effects of education and social capital in the OECD countries”. OECD Economic Studies, No. 33, pp. 57-101.

<sup>10</sup> See G. Schwerdt and J. Turunen (2005): “Growth in euro area labour quality”, ECB Working Paper Series, No 575, January 2006.

<sup>11</sup> For a further extension of this topic see European Commission (2004), “The link between product market reforms and productivity: direct and indirect impacts”, *the EU Economy: 2004 Review*.

<sup>12</sup> OECD (2003): *The Sources of Economic Growth in OECD Countries*. OECD, Paris.

related to the trade-off between labour use and productivity.<sup>13</sup> In their view, lower levels of GDP per capita growth in Europe reflect European preferences for more leisure. There is no doubt that we are lucky to live in a peaceful and culturally diverse environment, and therefore we have very good reasons to value our leisure time. However, we should bear in mind that lower participation rates are not necessarily simply associated with our personal preferences but are also triggered by our legal and regulatory environment, our tax systems and our social institutions. This may, for example, explain the low participation rates of women in Europe. Measures aimed at reconciling motherhood with professional life, such as maternity leave, may raise participation rates, and the use of flexible forms of work may also provide a further incentive.<sup>14</sup>

The empirical literature has also found evidence showing that economic growth is linked with the degree of development and structure of the financial system.<sup>15</sup> Well-developed financial systems help to channel resources towards the most rewarding activities and therefore encourage the most efficient allocation of capital. In recent years we have also found that the financial structure is also important. Most euro area countries have sophisticated banking systems, but their equity markets are less developed. It is an empirical fact that high-risk capital investments have been much larger in countries like the US, with a more developed venture capital market, than in other countries. Riskier, these investments involve high-tech projects with potentially high returns and speed up the overall structural transformation of the economy triggered by science and technology.

A sound macroeconomic policy setting is also the key to sustainable long-term growth. In particular, recent studies have emphasised the benefits of maintaining low and stable inflation and preventing unsustainable deficits and debts. Empirical evidence confirms the highly damaging effect of inflation on long-term growth, even with moderate rates of inflation. Recent analysis suggests that higher average inflation harms growth and welfare, whereas higher inflation volatility has a harmful impact on welfare and is likely to negatively affect growth.<sup>16</sup> There is also empirical evidence showing that unsustainable public deficits damage growth by crowding

---

<sup>13</sup> See Blanchard, O. (2004): "The economic future of Europe", *The Journal of Economic Perspectives*, vol. 18, pp. 3-26; and also Gordon, R. J. (2004): "Two centuries of economic growth: Europe chasing the American frontier", CEPR Discussion Paper, No. 4415.

<sup>14</sup> See, for example, Genre, V., R. Gomez-Salvador and A. Lamo (2005): "European Women: Why do(n't) they work", ECB Working Paper Series, No 454, March 2005

<sup>15</sup> HIS (2004): "The significance of capital markets for dynamic economies in Europe. A comparative empirical study by the Institute for Advance Studies (IHS, 2004)

<sup>16</sup> See Camba-Mendez, G.; J. A. Garcia and D. Rodriguez-Palenzuela (2003): "Relevant economic issues concerning the optimal rate of inflation". In O. Issing (ed) *Background Studies for the ECB's Evaluation of its Monetary Policy Strategy*, European Central Bank, Frankfurt am Main, 2003.

out private investment.<sup>17</sup> Lack of fiscal discipline can also jeopardise the efficacy of monetary policy and lead to higher risk premia in interest rates, which in turn may have a negative impact on investment.

There is a wide consensus that policies geared towards structural reforms enhancing these economic factors fostering innovative investments will benefit long-term productivity growth. A number of European policy initiatives and recommendations – largely in the framework of the Lisbon strategy – to promote productivity growth in the euro area have already been put forward by expert groups, including the recommendations in the Sapir report of July 2003 and the more recent Kok report of November 2004. A number of these recommendations are reflected also in the recent mid-term review of the Lisbon agenda.

In particular, one key priority identified in the mid-term review is to promote “knowledge and innovation for growth”, which includes a number of recommendations concerning human capital. These recommendations go in the right direction. For example, the Lisbon strategy sets a target for R&D spending of 3% of GDP by 2010, two-thirds of which should come from the private sector. In 2003, overall expenditure stood at 1.9% of GDP for the euro area. By contrast, the US spends 2.8% of GDP on research and development. Other broad policy measures include more and better education and training.

All Member States agree on the diagnosis regarding our structural impediments in Europe. There is also a consensus on which reforms should be implemented in the various countries, based in particular on successful experiences already carried out in some Member States. The issue now at stake is how to implement these reforms, which requires careful efforts in terms of communication in order to explain to the citizens why and how such reforms would contribute to higher economic growth and more job creations.

\*

\* \*

Let me conclude. When looking at the necessary structural reforms in Europe there is a key word in my eyes. And this key word is “flexibility”. Why?

We are now leaving in a global economy called to change extremely rapidly under three largely unprecedented phenomena. First the remarkable pace of present progress in science and technology, and not only in ICT technologies but on a very

---

<sup>17</sup> See A. Rzonca and P. Cizkowicz (2005) ‘Non-Keynesian effects of fiscal contraction in new Member States’, ECB Working Paper no. 519, and also A. Fatas, J. von Hagen, A. Hughes Hallett, R. Strauch and A. Sibert (2003) ‘Stability and Growth in Europe: Towards a Better Pact’. London: CEPR/ZEI, Monitoring European Integration 13.

large front including bio and nano technologies and materials science. Second the unprecedented very large scale taking off of the emerging economies, and not only India and China but also the full body of the emerging world and the economies in transition from centrally planned systems. And third, the equally unprecedented phenomenon of economic globalisation, and not only globalisation of trade and finance but also the global immediate sharing of issues and ideas, of problems and possible solutions, what I would call a brand new conceptual globalisation.

In this new global economy we all are deemed to change extremely rapidly. I would say that the opportunity cost of not being sufficiently flexible has considerably increased. The differences that we see on both sides of the Atlantic as regards labour productivity progress are one illustration of this opportunity cost. The maximum speed of changes that are theoretically possible and socially acceptable in any given economy gives a measure of the speed of productivity progress that are under reach and therefore the speed of economic growth and the level of prosperity. There are also other illustrations of this opportunity cost of being less flexible: the lack of resilience in periods of shocks and crises. This is a powerful additional reason to call for structural reforms fostering flexibility: shocks and crises are to be expected periodically to the extent that they might be the counterparts of the extraordinary chances and opportunities we are presently experiencing at a global level.

Thank you very much for your attention.