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PRODUCTIVITY, GROWTH POTENTIAL AND MONETARY POLICY IN EMU

by

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Productivity, growth potential and monetary policy in EMU

Is there a change in trend growth?

December 18, 2006

Hourly labour productivity in 2005 was 9.1% lower in the euro area than in the US. Even more, the large difference in labour input led to GDP per capita in the euro area in 2005 being 27.6% lower than in the US. Over the past 10 years the gap to the US widened much more in terms of labour productivity than in terms of GDP per capita because labour input per capita rose more quickly in the euro area because unemployment rates fell.

Total GDP can be raised by boosting labour productivity, by working more hours per employee, by raising the participation rate or by increasing the total population. While population growth will continue to slow in the euro area, some progress has been made over the past 10 years in raising labour input per capita. To raise labour productivity, attention has to turn to other factors: education, competition, innovation, specialisation etc.

While modest advances in these areas are likely over the coming years, this will probably not raise GDP growth in the euro area significantly. Progress is needed just to prevent a decline in GDP growth stemming from deteriorating demographics. Rather than being between 2% and 2.5% as still widely estimated, it is more likely that trend growth already today is slightly below 2% and will remain there for the foreseeable future.

If trend GDP growth turns out lower than expected, the growth rate of money supply will have to be adjusted downward as well. The current 4.5% reference value set by the ECB assumes trend growth of 2 to 2.5%. Lower trend growth may in the short run – if partly unexpected – lead to higher CPI inflation and therefore to higher central bank interest rates. In the long run, however, neutral central bank rates will have to be lower in line with the lower growth potential.

The increase in euro area GDP growth and productivity this year is unlikely to reflect more than a cyclical rebound given that it went hand in hand with a significant rise in euro area capacity utilisation from 81% in Q4 2005 to 83.9% in Q4 this year – the fastest increase in any one-year period since 1995.

Looking at the evidence over the past four years it is difficult to clearly identify any change in trend productivity growth. Since 2002 the trend in core inflation and in changes of the GDP deflator has been slightly downward and profits have risen. This points to a rise in trend growth. However, actual GDP growth was much lower than expected, averaging just 1.4% over 2003 to 2005.

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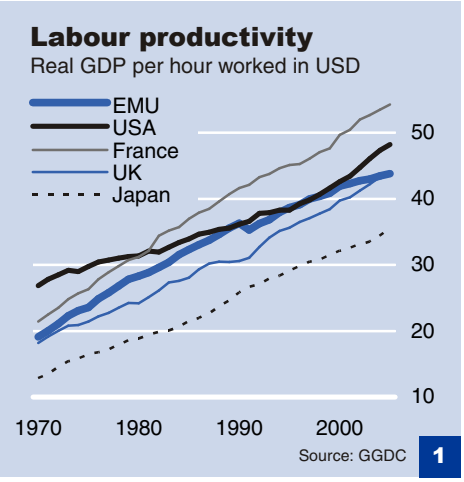
1. EMU productivity in a global context



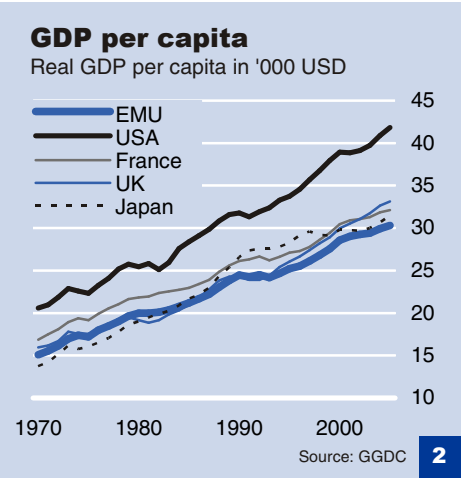
Before discussing the reasons for different trajectories of productivity and the link between productivity and monetary policy it is crucial to carefully define terms and to look at the past development of productivity.

1.1 Productivity defined

The term "productivity" is usually used as an abbreviation for labour productivity, which is defined as real GDP per hour worked. If working hours are not available – particularly in emerging markets – labour productivity is sometimes also measured by real GDP per worker. It is also possible to calculate capital productivity, defined as real GDP per unit of physical capital employed.

Labour productivity is linked to total GDP according to this identity, showing that GDP can be split into the elements labour productivity, hours per employee, the participation rate and the total population size:

$$GDP \equiv \frac{GDP}{hour} \cdot \frac{hours}{employee} \cdot \frac{employees}{population} \cdot population$$



Different questions may require the use of different elements of this identity: For example, labour productivity is important for determining the hourly remuneration of those people who are employed. GDP per capita is the most relevant proxy for the average material well-being and the economic success of societies, while overall GDP growth is most relevant for issues relating to the conduct of monetary policy. Given that there are natural upper limits to hours worked and participation rates, productivity is the principal source of improvement in living standards in the long run.

The identity shown above underlines that total GDP can be raised by boosting labour productivity, by working more hours per employee, by raising the participation rate or by increasing the total population. The current low participation rates and short hours worked in the euro area offer a large upside potential for labour input for several years. Labour productivity can be boosted by working fewer hours per employee (to prevent exhaustion) or by making the least productive workers exit employment. While these measures would boost productivity, they would lead to lower GDP.

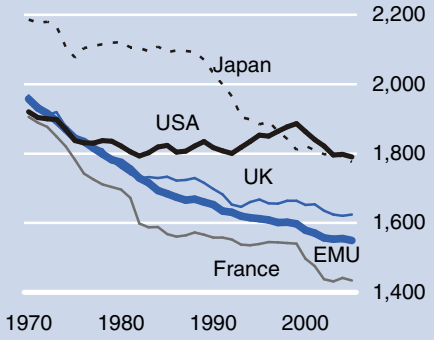
In addition, productivity is a highly cyclical variable: In the early phase of an economic upswing additional demand is filled by making incumbent employees work harder – output per hour rises. As the upswing matures, hours per employee rise (overtime) and companies hire more workers. In this second phase GDP continues to rise, but productivity does not improve as fast as in the early phase. The rise in euro area productivity in 2006 mostly stems from the impulses in the early phase of a cyclical upswing.

1.2 History of productivity differences

Past developments differ markedly across countries

Over the past decade, different countries have chosen different combinations of the four ingredients of GDP shown in the equation above – both in terms of levels and in terms of changes over time. Differences are likely to remain visible going forward. Data from the

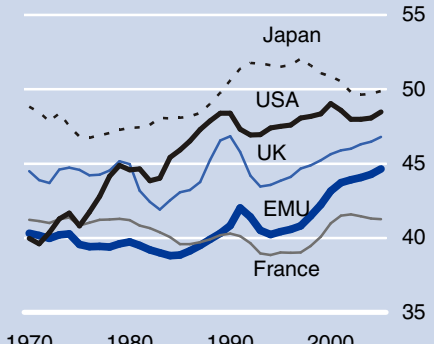
Hours worked per employee



Source: GGDC **3**

EMU employment rate up

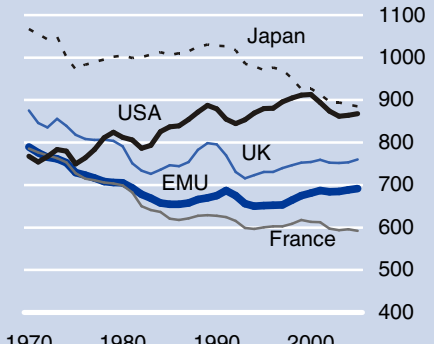
Employment as % of population



Source: GGDC **4**

Hours worked diverged

Total hours worked per capita



Source: GGDC **5**

Groningen Growth and Development Centre [1] show that hourly labour productivity in the euro area in 2005 was 9.1% lower than in the US. Back in 1995 the euro area had been ahead by 1%, as chart 1 illustrates.[2] Over the past 10 years productivity has risen by 13.2% in the euro area, but 25.8% in the US. The often quoted data for the US non-farm business sector even show a rise of 32.2% over the same period, but they exclude the government sector – no comparable data are available for Europe. Productivity in the UK is now almost at par with the euro area level, while it had been 12% lower in 1991. Japan's productivity level today is 19% lower than that of the euro area. Across the euro area, the level of productivity is particularly high in Luxemburg, France and Ireland, while it is lowest in Portugal, Greece and Spain.[3]

To explain overall GDP or GDP per capita one also has to take the differences in labour input into account. GDP per capita in the euro area in 2005 was 27.6% lower than in the USA – in 1995 the difference had been 25.2%. The main reason for this large difference is that labour input per capita was 20% lower in the euro area than in the US in 2005. For decades the number of hours worked per employee has been on a downward trend in the euro area as chart 3 shows. This contrasts with the US, where hours per employee have been roughly flat since the mid-1970s with the exception of the new economy boom in the late 1990s. The second big difference between the euro area and the US is the development of employment rates. In the US, 40% of the population were in employment in the early 1970s, but this share rose to 48% in 2005, as chart 4 shows. By contrast, employment rates were flat in the euro area between the early 1970s and the mid-1990s. Only since the late 1990s have employment rates risen in the euro area, driven mostly by Spain and Ireland.

Compared with the UK, GDP per capita in the euro area in 2005 was 8.6% lower. Compared with Japan it was 3.7% lower despite productivity being much lower in Japan – again differences in labour input per capita explain the euro area's low ranking. Across the euro area, countries with an above average level of GDP per capita in 2005 were Luxemburg, Ireland, the Netherlands and Austria, while Portugal and Greece were well below average. Over the past 10 years the fastest growth rates in GDP per capita were achieved in Ireland, Greece, Luxemburg and Spain, which all showed increases of more than twice the area-wide average of 20%. Interestingly, the strength in Spanish GDP growth over the past decade went hand in hand with stagnating labour productivity. Spain was able to significantly reduce its unemployment rate from almost 20% in early 1994 to 8.4% in October 2006.

1.3 Productivity and export success

Sometimes high productivity (level or growth) is seen as the most important determinant for a country's success on global markets. However, many other ingredients explain the growth rates of exports, the development of trade balances and the gain or loss of export market shares. Most importantly, productivity is a real

[1] www.ggdc.net , September 2006 database. The data are adjusted for differences in price levels across countries. Euro area averages were calculated by DBR.

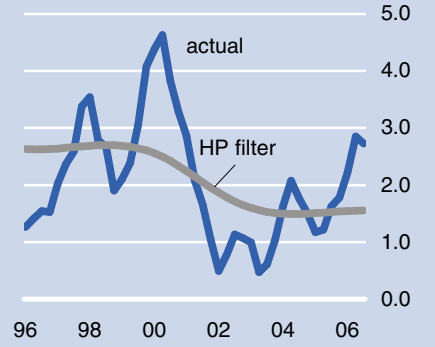
[2] Comparisons of real GDP across countries remain fraught with measurement issues. For example, different countries use different ways to deflate nominal values (hedonic methods), treat software investment differently and include the shadow economy to a different extent.

[3] A comprehensive survey of labour productivity in the euro area at the country and sectoral levels can be found in the ECB's Occasional Paper No. 53, October 2006.

concept (i.e. units produced per hour), but prices of these products are equally important. For example, China's labour productivity is still rather low, but its low prices allowed it to raise exports by around 30% in each of the last three years. Domestic wage and price inflation in relation to productivity changes are relevant here as well as exchange rate developments. In addition, the product mix, quality, marketing efforts etc. all play a role in determining a country's export success. Furthermore, the strong process of globalisation implies that exports change even if there is no change in relative productivities or relative prices across countries.

2. The growth potential of EMU

Euro area GDP growth
% yoy



Sources: Eurostat, DBR calculations 6

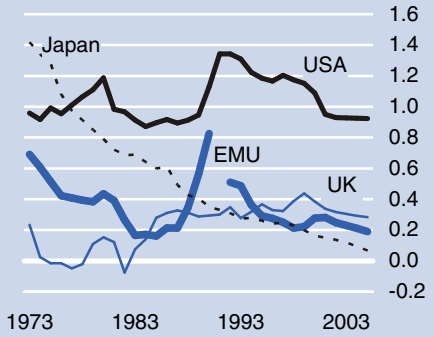
As mentioned above, the most relevant variable for monetary policy in the productivity-growth realm is the growth rate of GDP. There are many different ways to model or forecast the trend rate of GDP growth. A very simplistic way would be to use the average growth between two cyclical peaks. Between the bubble quarter of early 2000 and the third quarter of 2006 (27 quarters) euro area growth has averaged 1.9%. Slightly more sophisticated are filter methods such as the Hodrick-Prescott filter, although they suffer from the end-point problem. In Q3 2006, the standard HP filter on quarterly data estimates trend growth in the euro area at 1.6% yoy, down from around 2.7% in the late 1990s (see chart 6).

However, these simple time series methods cannot possibly model the complicated underlying process of economic growth. It is therefore necessary to take a structured and systematic look at the different elements of overall GDP. Growth accounting methods have been used to split actual growth into the contributions from labour, capital and total factor productivity, but these methods have recently come under severe criticism as they just estimate the national accounts income identity.

A more useful starting point for analysing the euro area's trend growth would be to split GDP into labour input and labour productivity as indicated in the equation above.

2.1 Raising labour input

Population growth rates
% yoy



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Labour input is determined by population growth, labour participation rates and hours per employee as outlined above. As is well known, population growth in the euro area is far below that of the US (chart 7). Over the past three years the euro area population has grown by 0.2%, while it has risen by 0.9% in the US. The attractiveness for immigrants plays an important role here and it is up to European societies to decide whether they want to attract more immigrants – and keep more Europeans here. Given the low birth rates in the past decades it is likely that area-wide population growth will slow further going forward. In the next decade the population will even begin to shrink.

As mentioned above, the euro area has achieved some success in recent years in raising employment rates. Despite the decline in hours worked per employee – driven by the trend towards part-time employment – hours worked per capita rose by 6% in the past 10 years, with particularly strong gains in Spain (41%) and Ireland. US hours per capita fell slightly. Here again, policymakers and societies have to decide where to go next. The still low level of employment of older workers and the still high unemployment rate indicate considerable upside potential for hours worked in the euro area.

Given policymakers' commitment to change, it is likely that hours per capita will continue to rise over the coming years. However, this may partly depress labour productivity since now people with below-average productivity will be integrated back into the workforce.

2.2 Raising labour productivity

Education, competition, innovation

Since raising labour productivity by laying off the least productive workers is no longer an option on an economy-wide basis in light of the social costs involved, attention has to turn to other factors: education, competition, innovation, specialisation etc. A large amount of research has been conducted on these areas in recent years, so a short summary should suffice here.

Large differences in education policies across Europe

Education is one of the most important variables to explain differences in incomes across individuals and across countries. Some European countries (e.g. Spain, Finland) have made great progress over the past decades, which is now paying off in the form of higher incomes. Other countries have seen stagnation in the education sectors, in particular the largest EMU member, Germany. Overall, much more can be done to boost education across Europe, but any policy change today will take time to become visible in higher incomes.

Entry and exit should be promoted

A second area with room for progress in Europe is competition. Easy entry of new, productive companies and exit of old, unproductive companies leads to an increase in overall productivity although the entry by foreign companies process is not comfortable for those on the losing side. Entry by foreign companies may come either via exports to Europe or via setting up plants in Europe. Either way, threat of entry would force more incumbents to apply the best available technologies to ensure their survival. Europe has been lagging the US in the usage of information and communication technologies (ICT) in retail, wholesale and financial intermediation auxiliaries – sectors that are not subject to as much foreign competition as for example the car industry. The benefits of competition also apply to the labour market.

Innovation-friendly culture needed

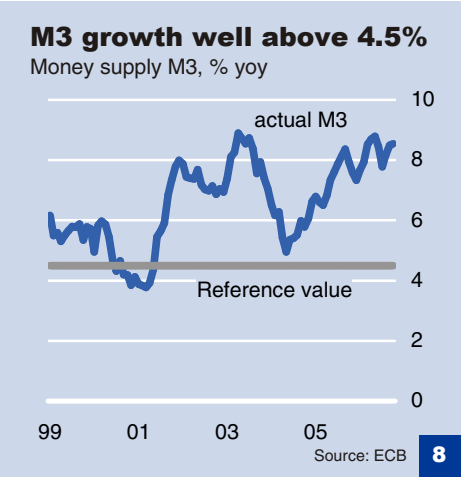
Innovation is another crucial area for Europeans to raise productivity. An innovation-friendly culture (re: biotechnology), respect for entrepreneurs, flexibility, and acceptance of failure as part of the search process are all elements of a successful innovation system that might require some change in Europe. Some countries are also far away from the goal of spending 3% of GDP on research and development.

Capital deepening can only go so far

In addition, a further way towards higher labour productivity would be to equip workers with additional physical capital. However, history shows that the capital stock tends to increase at the same pace as GDP, keeping the ratio between GDP and the capital stock – average capital productivity – constant. Some countries in the euro area have tried to boost the capital stock more than proportionally and had to realize that the return on capital fell, making this an unprofitable strategy.

Summary: Trend growth slightly below 2%

Overall, while some progress in these areas is likely over the coming years, it will probably not raise area-wide GDP growth significantly. In fact, progress is needed here simply to prevent a decline in GDP growth stemming from deteriorating demographics. Rather than being between 2% and 2.5% as still widely estimated, it is more likely that trend growth already today is slightly below 2% and will remain there for the foreseeable future barring major increases in participation rates.



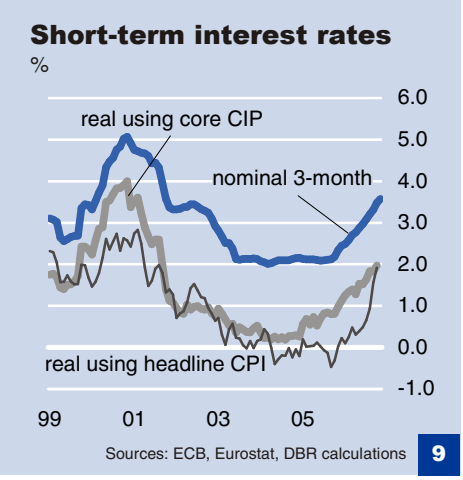
3. Productivity and monetary policy

The main issue of this briefing paper is how all this affects the conduct of monetary policy. To simplify the analysis, the focus will be on a decline in trend GDP growth relative to the 2% to 2.5% benchmark, in line with the experience of the past five years. The case of an increase would show results of the opposite sign.

3.1 GDP growth and money supply growth

When it last formally reviewed its reference value for monetary growth in December 2001, the ECB reconfirmed its estimate for trend potential output growth of 2-2 ½%. Together with the definition of price stability of below 2% (the "close to" was added only in 2003) and the trend decline in M3 velocity of ½ -1% per annum this led to the reference value for M3 growth of 4 ½%. Any decline in trend GDP growth should translate into a decline in this reference value all else remaining constant. Back in late 2001 the review was done with an eye at a potential upward revision in line with actual GDP growth having averaged more than 2 ½% in the preceding years. More economic activity would require a higher money supply. The low GDP growth of the past five years and the moderate outlook sketched above, however, suggests that – if anything – the reference value should be lowered today. In addition, actual money supply growth has even exceeded the 4 ½% reference value by a considerable margin since 2001, as chart 8 shows. This also implies that a considerable overhang of money supply has accumulated by now, which would first have to be reduced by higher GDP growth before an increase in the reference value would come on the agenda.

3.2 GDP growth and ECB interest rates

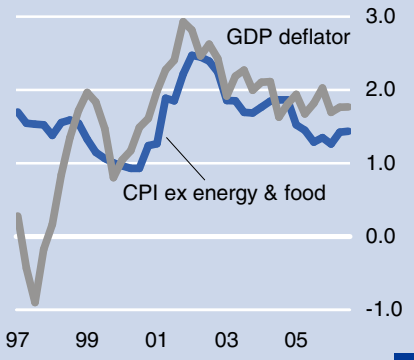


While the implications for monetary targets are straightforward, the effect of a change in trend GDP growth on central bank interest rates is not easy to analyse.[4] It is even harder to exactly detect whether there indeed has been a decline in an economy's trend growth at all, given the many other factors that are at work over the short to medium term. The heavy cyclicality of labour productivity makes it hard to detect a trend increase, so it is helpful to look at an array of indicators to get a consistent picture of developments.

If trend growth declines because of a decline in productivity growth, then actual GDP growth should decline as well. In this case capacity utilisation would not change. Unit labour cost inflation may turn out higher than expected because wages may have been set in the previous period and output is not rising fast enough to justify that wage gain. Companies may try to pass these higher unit labour costs on to consumers, thereby creating higher CPI inflation rates. Alternatively, companies could take some or all of the cost increase on their margins and accept lower profits. In the next round companies would try to reduce wage inflation to bring it back into line with productivity growth and they may reduce employment. If the effect of the first round had been higher inflation then the central bank would probably increase interest rates. Only once companies and workers have settled on the new, lower path of productivity and wage changes would the central bank also reduce its neutral interest in line with the idea of the Taylor rule. In a world without

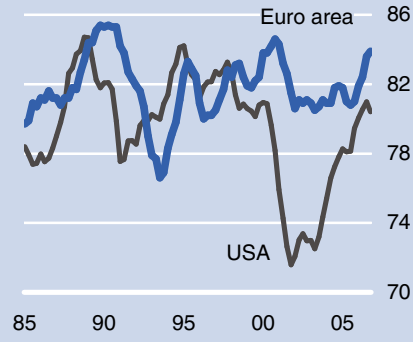
[4] Blinder and Reis (2005) in "Understanding the Greenspan Standard" illustrate how difficult it was to detect the rise in US trend productivity in a timely manner.

Core inflation has declined
% yoy



Source: Eurostat **10**

Capacity utilisation
Manufacturing, in %



Source: Federal Reserve, European Commission **11**

significant frictions, the long-run result would be lower GDP growth, lower nominal and real interest rates, lower growth of nominal and real wages, but stable inflation, employment, capacity utilisation and profits.

The increase in euro area GDP growth and productivity this year is unlikely to reflect more than a cyclical rebound given that it went hand in hand with a significant rise in euro area capacity utilisation from 81% in Q4 2005 to 83.9% in Q4 this year – the fastest increase in any one-year period since 1995.

Looking at the evidence over the past four years it is difficult to identify any change in trend productivity growth. Since 2002 the trend in core inflation and in changes of the GDP deflator has been slightly downward (chart 10). Likewise, profits have been on the way up since 2003 and capacity utilization did not change much until late last year. These observations seem to be consistent with an increase in trend GDP growth. However, actual GDP growth was much lower than expected, averaging just 1.4% over 2003 to 2005, which points to a decline in trend growth.

To make sense of these conflicting observations one has to look at other developments in the euro area as well. With the help of the stronger bargaining power afforded to them by globalisation, companies in some euro area countries cut wages more than would have been necessary to keep inflation and profit rates constant over the past years. Profits rose, inflation fell and GDP growth slowed. These factors could set the stage for a virtuos circle. But are there enough Schumpeterian entrepreneurs in Europe to seize the opportunity?

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