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## **DG INTERNAL POLICIES OF THE UNION**

- Directorate A -

ECONOMIC AND SCIENTIFIC POLICY

POLICY DEPARTMENT

### **MONETARY DIALOGUE DECEMBER 2006**

#### **Summary of Monetary Experts' Panel Briefing Papers**

The following summary presents the topics of the briefing paper followed by brief bullet points on the main messages and answers of the experts to the questions asked:

##### **1. Productivity, Growth Potential and Monetary Policy in EMU**

Productivity is a word often used to explain both European (export) successes in certain sectors on the one hand, and European failure to reach US levels of productivity on the other. Europe is a global leader in a number of (high-technology) products and many countries have achieved and maintained significant export growth. Regarding the difference to the US, the EU had almost closed the productivity gap with the US in 1995. After that, however, the gap widened, having again narrowed somewhat in recent years. US productivity growth has been slowing steadily for more than two years. Simultaneously, the evidence has strengthened that large parts of Europe are experiencing a renaissance. Productivity growth per worker in the business sector, (which grew by 0.7% on average from 1999 to 2005 based on OECD estimates), has increased to 2.0% (annualised rate) in the first half 2006. President Trichet recently stated that productivity remains a major policy concern and told the ECON Committee in the October Dialogue that growth remains solid due to the increased business efficiency.

*What are the main drivers and explanatory factors behind productivity in general and the EU difference with the US in particular? How does this influence growth potential and how can it be measured? Have there been any changes in the recent past?*

The experts' answers on these questions have shown a variety of solutions. While some focused on the role of labour productivity and presented means to enhance potential in that respect through deregulation and economic reforms (e.g. Eijffinger, Sibert), or working longer hours and expanding the participation rates on the labour market (Walter), others concentrated on issues such as investment and capital accumulation (e.g. Fitoussi, Horn). While some considered the problem in Europe a largely cyclical one that could be solved with more activist monetary policy (Horn), others argued that monetary policy should never be concerned with productivity and growth but only inflation (Wyplosz).

##### **Sylvester Eijffinger – Deregulations are key**

- Total factor productivity (TFP) is the main key to stronger growth; it increases with the number of innovations in the market. TFP in Europe is determined largely by the stock of skilled human capital and the economic and political institutions governing the production process. Concentrating on the latter, product and labour market deregulations are key to sustainable growth in Europe.

- Understanding the link between product & labour market deregulation and growth is important. Product market regulations (e.g. degree of privatization, level of competition) and labour market regulation (represented by the intensity of employment protection legislation) have a high correlation coefficient with each other (0.65), indicating that the intensities of the two regulations tend to move together. Showing the causality from deregulation to economic growth empirically is somewhat more difficult. However, it can be shown that changes towards deregulation induce higher growth.

### **Jean-Paul Fitoussi – Investment and capital accumulation have been underestimated**

- The current debate in Europe with regard to productivity concentrates excessively on the labour market. Although measures to increase participation and employment rates in Europe are desirable as the difference to the US is remarkable, excessive concentration on labour market reforms is likely to have negative social implications.
- Investment and capital accumulation are underestimated in their effect on productivity. Looking back as far as 1960, one can observe a high positive correlation between productivity growth and public and private investment. The high correlation with investment is also true for trend growth (OECD measure for potential growth). In the past 15 years, the US (and the UK) have had significantly higher levels of private investment than e.g. Germany and Italy.
- The SGP in the EU is restrictive as it negatively affects the ability of large EU countries to invest. The golden rule should be a better fiscal rule to allow for more investment and capital accumulation.

### **Gustav Horn – More active stabilization by monetary policy needed**

- The recent productivity gap between Europe and the US is mainly due to cyclical factors (e.g. resource utilization, investment), rather than non-cyclical factors (such as technological change and innovation). Monetary policy should therefore stabilise the economy more actively.
- The calculation of potential growth is difficult and unreliable. Different methods deliver similar results at a given point in time, but these results do not hold over time rather they change very rapidly. Therefore, potential output is not a very useful yardstick for monetary policy.

### **Anne Sibert – Economic reforms aimed at ease of doing business will deliver**

- EU-15 labour productivity growth over the period 1995-2004 varied starkly across countries. The average European setback to the US in TFP growth is mainly due to differences in TFP growth in the non-ICT sector (mainly explained by the adoption of ICT processes and innovative ways of doing business). In general, it is hypothesized that a less-rigid institutional environment in the US fostered a quicker adjustment process after the ICT revolution.
- Economic reforms that make it easier to open and close businesses, hire and fire workers, import and export goods, deal with licenses and taxes and enforce contracts would raise TFP growth.

### **Norbert Walter – Current productivity surge in Europe little more than cyclical rebound**

- Hourly labour productivity in 2005 was 9.1% lower in the euro area than in the US. The labour input to GDP in Europe is 27.6% lower than the US. Over the past 10 years the gap to the US widened more in terms of labour productivity than in terms of GDP because labour input per capita rose more quickly in the euro area than in the US as unemployment rates fell.
- This year's increases in GDP and productivity in the euro area are unlikely to reflect more than a cyclical rebound.
- Total GDP can be raised by boosting labour productivity, by increasing working hours per employee, by raising the participation rate or by increasing the total population. In order to raise labour productivity, special attention must be given to education, competition, innovation and specialization. The evidence over the past 4 years is too unclear to identify a change in trend productivity growth. Demographic developments are the biggest threat to success in attempts to raise growth potential.

### **Charles Wyplosz – Productivity divorce with the US may be good news in disguise**

- A comparison of standards of living in Europe and the US shows that Europe has not caught up and is increasingly falling behind. There has been a productivity divorce between the US and Europe since the mid 90s.
- In the first instance, Europe has been slow to take full advantage of ICT in comparison to the US and this explains much of the increase in productivity growth in the US. Secondly, in recent years most European countries have reduced labour taxes and labour market restrictions. The result has been the

hiring of unskilled workers previously not employed. A by-product has been a reduction in the average skill of workers, hence a decline in labour productivity, further aggravating the productivity divorce.

- The 2006 Nobel laureate Edmund Phelps demonstrated that central banks should not be concerned with growth or productivity as they cannot influence their long-term evolution, but rather solely with inflation.

## **2. High growth rates of monetary aggregates and low inflation**

Under its monetary policy strategy, the ECB monitors various monetary indicators, with the aggregate M3 playing the dominant role. Extracting useful policy information from M3 alone is difficult. For the past five years or so, M3 growth has mostly substantially exceeded the ECB's reference value.

We have not observed concomitant effects of these rates on inflation rates as high as could have been expected in theory. Consider two interpretations of the scenario from the academic and policy debate: the first one would argue that inflation is primarily driven by relative growth rates of money and real output, in which will still experience higher repercussions on inflation rates sooner or later. Supporters of this view could also find it easier to support the recent rate increases of the ECB. The second view argues that inflation is primarily driven by inflation expectations and that inflation expectations remain low in the euro area due to the ECB, a highly credible institution. In this view, the link between inflation and money growth is weak as long as central bank credibility is strong.

*Where does the high liquidity in money stem from and to what extent are the sources of this traceable? Which risks arise from prevailing high liquidity to price stability and to sustainable economic growth in the euro area?*

All experts stated that the present high liquidity comes from high credit growth, mainly to the private sector. Further decomposition of its sources is, however, difficult to undertake. The present situation of high M3 growth is also different from the situation between 2001 and 2004 since then ample liquidity could be explained by portfolio shifts to more liquid assets (often part of M3), mostly induced by uncertainty on the market. On the policy implications of continued high growth of M3 there is some divergence. While most believe that the ECB is right to hold onto the M3 as a reference and the present situation does bear considerable inflationary risks (Patat, Krämer, Schwartz) others believe that the ECB has set its reference value wrongly and is therefore “overconcerned” with non-existent inflation risks and “underconcerned” with low growth (Podkaminer).

### **Guillermo de la Dehesa – ECB should fuse two pillars into one to avoid confusion**

- There is no contradiction between high liquidity and low inflation. Empirical evidence shows that the growth of money is not correlated with inflation in the short or even medium term. Moreover, any long term correlation between money and inflation does not necessarily mean that there is a clear causal relationship between the two. Moreover, the effect of money on inflation tends to be less relevant in low inflation countries or when inflation expectations are low or well anchored (as both are in the euro area).

- Based on previous evidence, most leading central banks have abandoned money growth targets and have switched to inflation targeting in the last two decades. Nevertheless, this does not mean that money has no role to play in monetary policy, e.g. by assessing asset prices and threats to financial stability.

- The ECB should try fuse both pillars of its strategy into one in order to avoid introducing more confusion about its monetary policy decisions which are supposedly based on the prominence of one over the other.

### **Jörg Krämer – Inflation risks from ample liquidity not be underestimated**

- Two recent sub-periods are of importance to understand the link between money and inflation: 2001 to mid-2004 was characterized by high uncertainty (such as falling equity prices, a US recession or terrorist attacks) causing euro area residents to shift funds from risky assets into more liquid ones (often part of M3). This would, however, not signal inflationary risks.

- Since mid-2004 strong growth of money supply has primarily been driven by strong credit growth in the private sector. Empirical evidence suggests that this excess liquidity represents inflationary risks – both for goods/services prices and asset prices. In this respect, the ECB has been right to normalize its key interest rate.

- Credibility and low inflation expectations will not last forever: if the ECB brings too much liquidity into circulation, then sometime in the future euro zone residents will start to question the reputation of the ECB. In this respect, the prominent role of money in ECB decision-making is right and a precondition for low inflation expectations which in turn are important to keep inflation in check.

#### **Jean-Pierre Patat – Higher inflation could be expected in the beginning of 2007**

- Inflation is ultimately a monetary phenomenon. In the long term, money affects inflation with an approximate lag of two years due to nominal and expectational rigidities. During the 70s and 80s, monetary aggregates were in wide use. During the 90s, financial liberalization and innovations induced profound instability in money demand and the link between monetary trend and output became unstable. As a result, central banks have paid decreasing attention to monetary aggregates.

- The ECB has rightly given a prominent role to money in its strategy, with a quantitative reference value for the growth of M3. Recent observation of the adjusted M3 shows a marked acceleration of monetary growth during the past two years with a prominent role of credit in this expansion. Inflation forecasts of the ECB for 2007 mention average rates of 1.9 to 2.9%. An inflation rate of 2.9% would be in line with a surge of M3 growth, and according to the lags in expectations, this level of inflation could be observed right from the beginning of 2007.

- A crucial factor of the transmission mechanism of strong monetary growth on prices will be the credibility of monetary policy. The ECB has great credibility which would probably be weakened if the ECB abandoned the M3 aggregate in its strategy as that could lead to misleading interpretations.

#### **Leon Podkaminer – ECB reference for M3 growth is mis-specified and wrong**

- The dynamics of the money stock is currently determined by the dynamics of credit to the private sector. The composition of the private sector's borrowing is carefully monitored, but the determinants of the credit volume are subject to controversy and are still not really traceable.

- The ECB has been considered credible because its actions are easy to predict. However, under weak real growth (and high unemployment) low inflation in the euro area is not an impressive achievement.

- Practice has disproved the informational value of the ECB 'reference value' of M3 growth at 4.5% quite radically. An average 2% inflation rate proved consistent with M3 rising by about 7.5%. Liquidity in the euro area is considered *high* only because the ECB set its 'reference value' for growth in M3 arbitrarily *low*. The fact that M3 generally grows much faster than 4.5% serves to support the ECB's over-restrictive policy. The ECB is over-reacting to the perceived signs of rising inflation/real growth speedup and under-reacting to the symptoms of falling inflation/real growth slowdown.

#### **Pedro Schwartz – Money still matters**

- Even if the relationship between money supply and inflation has become unstable, it is undisputed that money supply has a direct causal influence on nominal GDP and asset prices. Monetary aggregates are to be understood as sign-posts rather than triggers of monetary policy, and as such they remain crucially important. Monetary policy needs a proper anchor in the long-run, and money supply plays this role.

- The ECB is right in maintaining its present two-pillar policy as it appropriately balances monetary developments (long term) with “real” economic developments (short-term) in terms of risks to price-stability. The monitoring of monetary aggregates also remains necessary as price stability alone is not a sufficient condition to avoid financial instability.

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# **Productivity, Growth Potential and Monetary Policy in EMU**

*Briefing Paper for the Monetary Dialogue of December 2006 by the Committee on Economic and Monetary Affairs of the European Parliament with the President of the European Central Bank*

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## **Executive Summary**

Productivity is a word often used to explain both European (export) successes in certain sectors on the one hand, and European failure to reach US levels of productivity on the other. Europe is a global leader in a number of (high-technology) products and many countries have achieved and maintained significant export growth. How can this observation be reconciled with frequent allegations of low productivity in Europe? As to the difference to the US, in 1995, the EU had almost closed the productivity gap with the US. After that, however, the gap widened, having again narrowed a little bit in recent years. US productivity growth has been slowing steadily for more than two years. Simultaneously, the evidence has strengthened that large parts of Europe are experiencing a renaissance. How important is productivity to explain differences in growth between the two regions, or are there other factors at work? This Briefing Paper focuses on labor and product market deregulations as fundamental elements in the passage from an investment to an innovation-based economy. The approach undertaken is prominently empirical. First, we have discussed product and labor market regulations in Anglo-Saxon and European countries. Second, we have shown the correlation between product and labor market regulations. Finally, the last section of the paper was dedicated to proving the relationship between product and labor (de)regulation and economic growth. The approach has been a little unconventional, given that we have used the IMD Competitiveness Index as a proxy for the regulatory friendliness of a given country. Our empirical results have appeared to be very promising and we hope that future research with more precise data and sharper estimation techniques might be possible in the future.



## Introduction

The purpose of this Briefing Paper is to discuss productivity, growth potential and monetary policy in Economic and Monetary Union (EMU) in Europe vis-à-vis the United States (US). Productivity is a word often used to explain both European (export) successes in certain sectors on the one hand, and European failure to reach US levels of productivity on the other. Europe is a global leader in a number of (high-technology) products and many countries have achieved and maintained significant export growth. How can this observation be reconciled with frequent allegations of low productivity in Europe? As to the difference to the US, in 1995, the European Union (EU) had almost closed the productivity gap with the US. After that, however, the gap widened, having again narrowed a little bit in recent years. US productivity growth has been slowing steadily for more than two years. Simultaneously, the evidence has strengthened that large parts of Europe are experiencing a renaissance. How important is productivity to explain differences in growth between the two regions, or are there other factors at work? Economic growth has always been at the center of any medium and long-run economic model. Unfortunately most of the factors driving it were assumed to be out of policymakers' control: demographic growth, natural endowments, capital accumulation and other exogenous forces. Since the beginning of the twenty-first century, on the other hand, more and more attention has been paid to the effect of political institutions on long-run growth. A common characteristic of modern frameworks is that they identify a non-constant relationship between growth and its drivers: according to the different developmental stages, different factors are responsible for maintaining a high and sustainable level of growth. All the theoretical and empirical frameworks recognize that structural growth is strictly associated to Total Factor Productivity (TFP) growth. TFP growth increases with the number and size of innovations introduced in the market. The implication is that, ultimately, economic growth rests on two pillars:

1. The stock of *skilled human capital*, which guarantees an innovative and effective research output.
2. A set of *economic and political institutions*, which create the appropriate incentives for the agents to innovate and introduce the new technologies in the market.

This Briefing Paper focuses on the *second* of the pillars described above and out of the many economic and political institutions we have decided to focus the attention on *product and labor market deregulations*. Two are the reasons: first, because we believe it is the most important element in the passage from an investment to an innovation-based economy; secondly, because the two markets are strictly interrelated and analyzing them independently would not allow for a clear understanding of the subject at hand.

The approach undertaken is prominently empirical. After a very brief description of the regulatory levels of product and labor markets on the two sides of the Atlantic, we conclude with an independent study on the accuracy of the IMD competitiveness index in predicting the overall economic performance of countries close to the technological frontier.<sup>1</sup>

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<sup>1</sup> The empirical part of this Briefing Paper is heavily based on: S. Eijffinger and A. Rossi (2006), Structural Reforms and Growth: Product and Labor Market Deregulations, *CEPR Discussion Paper*, No. 5988.

## **Structural reforms and growth: product and labor market deregulations in Europe**

Issing (2006) lists three sets of factors as possible determinants of inflation and output growth differentials. The first includes *structural factors*, such as differences among countries in productivity trends, in the degree of openness and exposition to foreign shocks, in the financial structure, and in the degree of rigidities in goods and labor markets. A key role is played by the dynamics of unit labour costs. Interestingly, however, the compensation per employee component has proved to be more important than labor productivity. The second set includes *cyclical factors*. Differentials can arise from asymmetric shocks hitting specific economies or from asymmetric responses to common shocks. In the euro area, common shocks account for the bulk of business cycle fluctuations. Moreover, co-movement of economic activity has increased since 1999, suggesting relatively similar propagation mechanisms. Finally, country-specific shocks have small level effects on output but generate large and persistent effects on output growth differentials (see also Chapter 5 in De Haan, Eijffinger and Waller, 2005). The third set includes *policy-related factors*. Inflation and output differentials can be induced by misaligned national structural or fiscal policies. It is also sometimes argued that in a currency union characterized by inflation differentials, a single monetary policy can act in a destabilizing way by strengthening inflation and output growth differentials. Issing (2006) states that in EMU there are stabilizing channels that counteract the effect of potentially diverse real interest rates. The first is a competitiveness channel: a country with lower than average inflation and higher than average real interest rates due to weak demand experiences an increase in competitiveness and in the demand of its goods, hence counteracting the initial effect of higher real interest rates. Recent research at the ECB suggests that in the euro area the real interest rate effect is stronger in the short run, while the competitiveness effect builds up slowly but prevails over the long term. The second stabilizing channel is provided by risk sharing. Within EMU capital and credit market integration enables to mitigate the effect of country-specific shocks on consumption through international diversification. This is a key mechanism that can counteract the differential welfare impact of asymmetries among members of a currency union. In the euro area, the share of idiosyncratic shocks smoothed through capital and credit markets is substantially lower than in the US. Nonetheless, it has been increasing since the early 1990s. National economic policies are according to Issing (2006) better instruments to enhance the ability of individual countries to respond to economic shocks and to divergences. Structural reforms in labor markets contribute to ensure a smooth adjustment to shocks or changing economic conditions. In this respect, the creation of EMU has fostered to some extent capital mobility by increasing cross-border flows, although further integration is warranted also to mitigate the effects of asymmetric shocks on consumption. On the contrary, labor mobility remains low between countries and regions, as well as between sectors and professions. It is important to enhance labor flexibility at the national and regional level, given the existence of differences in languages and cultures that inhibit mobility across countries. Structural policies should also aim at improving the efficiency of the price setting mechanism to reduce the persistence of inflation divergence.

## **Product and labor market regulations in Anglo-Saxon and European countries**

*Product market regulation* is usually referred to as a combination of numerous elements, usually related to the degree of privatization and level of competition in a given economy. Following intuition, the more privatized and the higher the level of competition in a given market, the more it is considered deregulated.

The eighties were characterized by wide regulatory divergences across countries. For example, 20-30 per cent of non-agricultural GDP of Europe, Ireland and New Zealand was produced by state-owned enterprises. The same figure for US, Japan and Switzerland oscillated around 1 and 10 per cent. Between 1984 and 1998 most of the Anglo-Saxon countries like New Zealand, United Kingdom (UK) and Australia went through a very strong process of privatization, while continental Europe, with the exception of Portugal, did not go through such a radical transformation. In the last fifteen years under consideration, the different starting points were still reflected at the end of the period. In fact, most of the Anglo-Saxon countries were already at an “advantage” compared to continental Europe and those that were not, like Ireland and New Zealand, managed to deregulate very quickly. The most recent comprehensive assessment of product market regulation is the one conducted by Nicoletti, Scarpetta and Boyland (2000). The authors identify three patterns of product-market regulation. The first group/cluster includes mostly Continental European countries. They are characterized by relatively liberal policies as far as international trade and international investments are concerned, but pursue a more interventionist and restrictive approach regarding state control and barriers to entrepreneurship (also called inward policies). The second group comprises Anglo-Saxon countries that have a more hands-off approach in both in-ward and out-ward oriented policies. Finally the third group is composed of relatively heterogeneous countries. Norway and Greece have very strict regulatory frameworks both inward and outward. Italy is very restrictive at home, but very open to the international markets. The opposite is for Canada.

Given that labor is the main input for the production of goods and services, *labor market regulation* is also certainly a key element to be considered by policymakers. Labor markets are directly and indirectly affected by a large number of regulations. Here we will only consider one aspect of it, i.e. Employment Protection Legislation (EPL). The reason is that it is a very good proxy for the overall level of labor markets regulation. Furthermore, it was not possible to obtain studies embracing organically all the aspects that constitute labor market regulations, like unemployment benefits and levels of minimum wage. By EPL, it is usually meant restrictions on firing such as severance payments, mandatory notice periods, administrative procedures and delays. According to the EU’s Broad Economic Policy guidelines, Member states are invited to “review employment contract regulations and, where appropriate, related costs, with the aim of promoting more jobs and striking a proper balance between flexibility and security”<sup>2</sup>

Recent studies show that Anglo-Saxon countries like UK, US, Ireland and Canada have very liberal markets on both temporary and long-term contracts. The markets are very strictly regulated in continental Europe with countries like Italy, Germany and France having very high employment protection legislation levels in both types of contracts. Other countries like Sweden and the Netherlands score very well in temporary and

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<sup>2</sup> Council Recommendation. 21<sup>st</sup> June 2002.

relatively badly in long-term ones. Almost half of the countries enacted EPL reforms in the 8 year time-span under consideration. Apart from France, which increased the overall level of protection, all the other countries worked in the other direction. Greater attention was given to temporary contracts, most likely because of the laxer political constraints compared to the reforms that touch long-term ones. The reason stands in the fact that unions are sustained and financed by the employed workers, which are mainly under permanent working contracts: in order to provide companies for some degree of flexibility in their hiring and laying off schemes, each state had to reform the sectors of the labor market that were less defended by lobbies. Even though not optimal, this approach usually led to some benefits from an efficiency point of view. On the other hand, countries like Italy, with very strong restrictions on permanent contracts and relatively low on temporary have now a divided labor market: the young workforce is under temporary contracts while the elderly are under very safe employment conditions, with the obvious social tensions that result from it. The hope is that in the future it will be possible to diminish the EPL levels on long-term contracts all over the EU.

### **The correlation between product and labor market regulations**

The correlation between the two variables is very important in this context as highlighted above. Unfortunately, due to the aforementioned lack of data, we are not able to conduct a study on the correlation of product and labor market institutions over time. A study demonstrating the direction of causality between the two is impossible for the same reason. Following the example of Nicoletti, Scarpetta and Boylaud (2000) we report below the bivariate correlation between product and labor market regulations in 1998 for 21 OECD countries. Given the non-existence of indices representing the overall level of labor market regulation, following Boeri et al. and Nicoletti et al. (2000) we have decided to proxy it through the degree of EPL. The relationship is represented in the scatterplot below. The correlation coefficient “ $\rho$ ” is 0,658387, which demonstrates a relatively strong bi-variate correlation. The relationship shown below has two very important implications. First, it proves that the insignificant relationship between Product Market Regulation and Unemployment/Employment can be attributed not only to a lack of explanatory power of the first on the latter, but to multi-collinearity with labor market regulation. Second, Figure 1 empirically validates one of the main findings that Blanchard and Giavazzi (2003) developed theoretically: i.e. that a decrease in product market regulation naturally leads to (causes) a decrease in labor market regulation. The theoretical framework, but, is only partially demonstrated. In fact, we are not able to show the direction of causality entailed by the model, but only the fact the two variables move together. The final section of this Briefing Paper is dedicated to probably the most important relationship that policymakers care about, i.e. the one between product and labor market regulation and economic growth.

## Product Market Regulation and Employment Protection Legislation

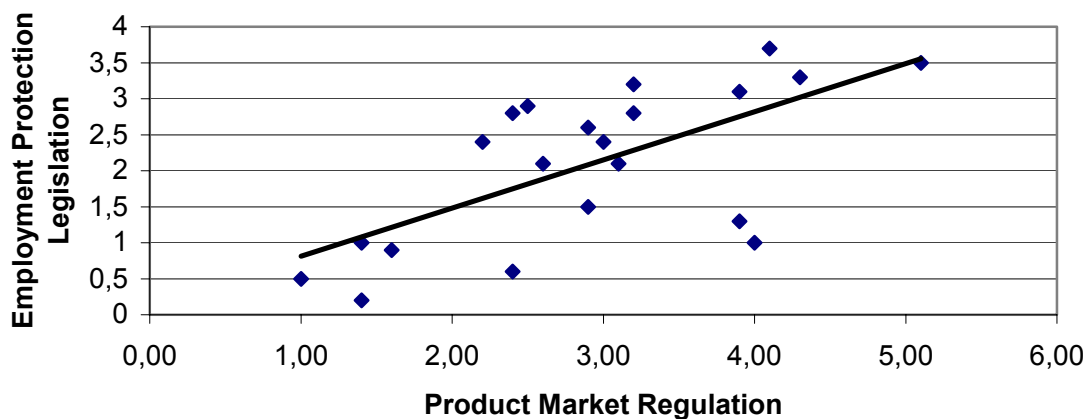


Figure 1: Product market regulation and employment protection legislation (1998)

### Economic growth and product and labor market deregulations

Unfortunately, there is a serious lack of data concerning the assessment of product and labor market regulation. It was not possible to find any database that contained both measures for a sufficient number of years. As explained above, product market regulation has been analytically assessed from 1978 until 1998 at intervals of 4-5 years by Nicoletti et al. (2001). On the other hand, labor market regulation or any of its components (EPL, minimum wages, unemployment benefits) were never assessed in an organic way for a sufficient number of years. The closer the literature has gone to this topic is the paper by Nicoletti and Scarpetta (2003), who study the relationship between product market regulation and productivity growth. This paper proves that productivity is increased by reforms promoting private governance and competition. Both privatization and entry liberalization are estimated to have a positive impact on productivity in all sectors. In manufacturing the second is particularly influential, because regulation limiting entry hinders the adoption of existing technologies, possibly by reducing competitive pressures, technology spillovers and the entry of new high-tech firms. The authors take these findings as a powerful interpretation of the observed recent differences in growth patterns across OECD countries, in particular between large Continental European economies and the United States. Strict product market regulations—and lack of regulatory reforms—are likely to underlie the relatively poorer productivity performance of some European countries, especially in those industries where Europe has accumulated a technology gap (e.g. ICT-related industries). These insights are certainly powerful, but two elements leave us dissatisfied with the study at hand. First, it focuses on productivity growth and not GDP per capita growth: although very close to each other, the two variables are not always equal and, for our purpose, a study using GDP per capita growth would be preferable. Secondly, it does not show the effects of labor market regulation on economic growth. To achieve a better understanding of the subject at hand, we present here two

studies. The first is a cross-section analysis where we regress GDP per capita against the levels of product and labor market regulation in 2003. The second study is a bit less straightforward: we take the *IMD Competitiveness Index* as a proxy for product and labor market regulation and we conduct a panel data study trying to determine if changes in the regulatory environment determine differences in GDP per capita growth figures.

Given the aforementioned lack of data, we have decided to run a cross-section study for the year 2003. We regress nominal GDP per capita against indicators of product and labor market regulation for 28 OECD countries according to different model specifications. As the two sectors tend to have similar regulatory levels across countries, this results in a strong multicollinearity. In order to overcome this problem, we tried to use different proxies for product and labor market regulation. For the first we used alternatively the aggregate indicator of product market regulation developed by Nicoletti et al. (2000), “state control”, “barriers to entrepreneurship” and “barriers to trade and investments”. For the second we used alternatively the degree of “EPL”, “strictness on individual dismissals” and “collective bargaining coverage”. Unfortunately our efforts to exclude multicollinearity did not lead to any valuable result. The level of labor market regulation is significantly negatively correlated to the level of GDP per capita when used alone in the regression equation. It is instead insignificant when inserted along product market regulation and vice-versa. We certainly cannot be satisfied by these results, but the high correlation between the variables at hand makes it impossible to estimate their individual effect on GDP per capita levels. To understand the effects of product and labor market regulation we now adopt a different strategy. We use a nation’s competitiveness level, as assessed by the *IMD Competitiveness Index*, as an instrumental variable for both product and labor market regulation.

### **Economic growth and the *IMD Competitiveness Index***

As a first step, it is fundamental to describe the methodology used by *IMD* in building the *Competitiveness Index*. The annual competitiveness rankings are composed of four sub-categories: economic performance, government efficiency, business efficiency and infrastructure. For these sub-categories there are 83, 77, 69 and 94 individual criteria, respectively. The categories themselves are further broken down for a total of twenty sub-factors. Each of the twenty sub-factors receives an equal weight of 5 per cent, irrespective of the number of criteria composing it. To give each of these elements a score, the *IMD* uses hard and soft data. The former receives a weight of two thirds and the latter accounts for the rest. The soft data originates from the so-called annual executive opinion survey. The survey is an in-depth 112-point questionnaire sent to business executives and economic experts. The empirical model to be proposed analyses the statistical relationships between the national economic performances and the composite *IMD Competitiveness Index*. A panel data model is used. Data were collected for 46 different countries, which include industrialized, developing and least developed countries. A list of the countries is given in Figure 2 below. In the analysis we use the entire set of countries. However, we also conducted our analysis separating the sample into industrialized and developing countries. Our findings were unaffected and therefore not reported here. The *IMD Competitiveness Index* was taken for ten consecutive years

(1995-2004). Because the overall IMD index is an aggregation of separate, but complementary sub-components (i.e. Economic Factors, Government Efficiency, Business Efficiency, Infrastructures), it was our intention to analyze their individual effect on economic welfare and identify which would be the most important factor in driving economic growth. This analysis was not possible because the building blocks of the overall index have changed over time. It was possible to have consistent sub-indices only for the years (2000-2004), which was considered too little of a time span.

Australia	Finland	Israel	Philippines	Taiwan
Austria	France	Italy	Poland	Thailand
Belgium	Germany	Japan	Portugal	Turkey
Brazil	Greece	Korea	Russia	United Kingdom
Canada	Hong Kong	Luxembourg	Singapore	USA
Chile	Hungary	Malaysia	South Africa	Venezuela
China Mainland	Iceland	Mexico	Spain	
Colombia	India	Netherlands	Sweden	
Czech Republic	Indonesia	New Zealand	Switzerland	

Figure 2: List of countries included in the panel data regression.

“GDP per capita growth” was used as independent variable. The *Penn World Table* database was used for the period 1950-2000. IMF data were used to integrate the successive four years. The business cycle is stripped out of the real GDP per capita growth data by using the Hodrick-Prescott filter. This is done to obtain the structural growth rates, which serve as a proxy for potential economic growth of the countries in question. To have a ‘clean’ measure of it, the real growth rate data is smoothed over the period 1950-2004, even though the index data is limited to the period 1996-2004. Thus, only the part of the smoothed data, which lies within the period 1995-2004, is used. The independent variable is the “change in the absolute competitive rank from one year to the next”. The changes are calculated in such a way, that an improvement in rank (i.e. a change in rank from 14 to 12) is represented by a positive number (i.e. +2). Thus, we expect to have a positive coefficient for the changes in ranks. Further on, we included lags of the changes in rankings. More precisely, they have been lagged by one, two and three periods. Simply, an improvement or decrease of competitiveness might not show up immediately in the data. It might need time to manifest itself. Country-specific and time-specific fixed effects were used. Here is the model specification adopted:

$$\Delta GDP_{it} = \alpha + \beta_1 \Delta INDEX_{it} + \beta_2 \Delta INDEX_{it-1} + \beta_3 \Delta INDEX_{it-2} + \beta_4 \Delta INDEX_{it-3} + \varepsilon_{it} \quad (3.7)$$

Where  $\Delta GDP$  is the real growth rate per capita adjusted by the Hodrick-Prescott Filter  $\Delta INDEX$  is the change in competitiveness ranking, constructed as explained above and  $\Delta INDEX\_XLAG$  is the index change lagged by X periods.

In Figure 3 below are reported the estimation results. The coefficient for  $\Delta INDEX$  is significant up to the second lag, indicating a strong relationship between the ranking in the IMD Competitiveness Index and economic growth. Although the proxy used did not contain product and labor market regulation only, with this study we have shown the

close relationship between economic growth and the friendliness of the regulatory environment. We have tried to use separate proxies for product and labor market regulation to show their independent effects on economic growth, but either they were not available for a sufficient time-span and number of countries or they were so imprecise to result insignificant. To conclude, the results of this study should be taken only as preliminary. Future research attempts should be aimed at showing the independent effects of product and labor market regulation on economic growth across countries over time. It is important to have an empirical quantification of the two to better direct future policy-making and enact reforms to maximize structural growth.

Dependent Variable: GDP per capita Growth adjusted by the Hodrick-Prescott filter

Total pool (balanced) observations: 276

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	2.741264	0.030920	88.65790	0.0000
$\Delta$ INDEX	0.036429	0.010445	3.487617	0.0006
$\Delta$ INDEX_1LAG	0.032011	0.010419	3.072315	0.0024
$\Delta$ INDEX_2LAG	0.023600	0.010309	2.289319	0.0230
$\Delta$ INDEX_3LAG	0.014842	0.010291	1.442304	0.1506
Fixed Effects (Country-specific)				
Fixed Effects (time-specific)				
R-squared	0.918993	F-statistic	46.42904	
Adjusted R-squared	0.899200	Prob(F-statistic)	0.000000	
Durbin-Watson stat	1.677949			

*Figure 3: Panel data regression relating GDP per capita growth figures adjusted by the Hodrick-Prescott Filter to yearly changes in the IMD Competitiveness Index( country-specific and time-specific fixed effects).*

### Some conclusions

The purpose of this Briefing Paper was a deeper understanding of the relationship between economic growth and product and labor market (de)regulation. Although most of the economists believe in the positive effects of deregulation, the empirical estimations did not always prove to be completely satisfactory. First, we have discussed product and labor market regulations in Anglo-Saxon and European countries. Second, we have shown the correlation between product and labor market regulations. Finally, the last section of the paper was dedicated to proving the relationship between product and labor (de)regulation and economic growth. The approach has been a little unconventional, given that we have used the IMD Competitiveness Index as a proxy for the regulatory friendliness of a given country. Our empirical results have appeared to be very promising and we hope that future research with more precise data and sharper estimation techniques might be possible in the future.



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# European Parliament

## COMMITTEE FOR ECONOMIC AND MONETARY AFFAIRS

Briefing paper

December 2006

### Productivity, Growth Potential and Monetary Policy in the EMU

Jean-Paul Fitoussi

#### *Executive summary*

*The reversal in the trend of productivity growth between the US and the UK on one side, and the main countries of continental Europe on the other, appears with great evidence from the data. The current debate focuses on differences in labour market performance, which should account for the growth and productivity divergence. While some measures aimed at increasing the participation and employment rates in the EU are certainly desirable, excessive precariousness of the labour market would have deep social implications, and should be subject to democratic approval.*

*Furthermore, one striking aspect of the debate on productivity growth is the moderate emphasis given to investment and capital accumulation. By looking back to the late 1960s, one can observe a striking positive correlation between productivity growth and both private and public investment. If we consider the inherently long term features of investment, the data also show a positive correlation between investment and trend growth (the OECD measure for potential growth).*

*The correlation between investment, productivity, and potential growth, should be better understood and investigated than what is done in the current debate. By doing that, we should also reassess policy in terms of its capacity to provide a favourable environment for capital accumulation. In this respect, the self complacency of policy makers in the EU may appear excessive. The Stability and Growth Pact has seriously affected the capacity of large European countries to invest (the comparison with the golden rule of the UK is in this respect telling), and when assessed with respect to the growth performance of the Euro zone, the monetary policy of the ECB seems less accommodating than usually believed. Excessive interest rates may contribute to explain investment stagnation in the past decade, especially when seen in comparison with the US*

## Introduction

In the past decade, the growth rate of productivity and of GDP in the Euro zone have lagged behind the ones of the US. This is a recent phenomenon, though, because most of the post-war period has been characterized by a catching up of productivity and income by the European countries. Figure 1 shows a general measure of productivity -Real GDP over employment-, for the US and for the largest countries of the European Union<sup>1</sup>. We can observe that the productivity of the US was substantially larger than all European countries in 1965. Figure 2 shows the yearly percentage increases in the two sub periods 1965-1990 and 1992-2005, emphasizing the change that happened in the last decade.

We can notice that while the US is the only country that experienced an increase in the growth rate of productivity (almost doubled), all the European countries experienced a reduction, particularly sharp for the countries like Spain and Italy, that because of their initial backwardness, had progressed most in the preceding decades. It is also worth mentioning that while decreasing, the growth rate of productivity in the UK remained slightly larger than in the US. In fact, relative to the early 1990s, the UK has the most productive economy of our sample.

## The Causes of the Anglo-Saxon Predominance

The current debate on growth and productivity only focuses on the latest period, and it revolves around the question of how the European countries can get out of their ‘soft growth trap’. The ECB (e.g., the October 2006 Bulletin) summarizes the debate by identifying a number of factors that can explain why the US and the UK grow faster than the larger continental economies, and experience higher productivity growth. The elements that are evoked are well known in the literature:<sup>2</sup>

- a) A substantially larger (almost 10 percentage points) employment rate in the US
- b) Longer hours worked in the US. This has triggered a debate, not settled yet, on whether the difference in labour supply depends on a different

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<sup>1</sup> I normalized at 1992=100 for essentially two reasons. First, to mark the structural break that appears in the early 1990s (in particular with the Maastricht Treaty). Second, to partially neutralize the discontinuity in the data introduced by the German reunification. A more careful assessment of the German data also justify my choice below to eliminate the year 1991 from my subsamples.

<sup>2</sup> See e.g. *How to Elevate the potential growth rate of Europe*, speech by Jean-Claude Trichet, President of the ECB, Berlin 16 October 2006.

preference for leisure, or on different revenue incentives (i.e., excessive tax burden in the European countries).

- c) The US experienced a larger (around twice as much) investment in ICT than Europe. ICT is widely recognized as a major determinant of recent productivity growth.

The third element, in particular, may help to explain why the increase of employment has not triggered a slowdown of productivity growth in the US.

This diagnosis is robustly supported by data, and largely shareable. What is less convincing is the recommended therapy, which focuses exclusively on the effort to make product and (mainly) labour markets more flexible.

Some of the currently debated measures are certainly necessary and useful, and their implementation only depends on the overall impact on public finances. It is for example the case of a reduction in the tax wedge. Other measures, nevertheless, - like the incentives for part time or the reduction of labour protection – need to be carefully weighed. For these measures, the increased flexibility of the labour market may come at the price of an increased precariousness of labour, a result that would change the organization of our society, and as such needs to be the explicit outcome of a democratic and political process rather than a technocratic choice. Furthermore, the future costs for social security would need to be carefully evaluated, as precariousness would most probably be associated with lower capacity to provide social contributions.

To sum up, the effort to make the labour markets more flexible has to be encouraged, but carefully drafted in order to avoid a deep modification of our societies, that would be unwarranted unless explicitly subject to a democratic choice.

## **Investment and Productivity**

Two things in the debate about productivity appear puzzling; the first is the already mentioned exclusive focus on the recent comparison between the US and European countries. The second is the secondary importance attributed to the role of investment, which is often mentioned but never really studied, especially in what concern the positive implications of economic policy. The minor role attributed to investment is particularly at odd with the emphasis that economic theory (even at the textbook level) puts on the link between capital accumulation, productivity and potential growth.

These two odd features of the debate are deeply intertwined, because by extending the comparison to the decades preceding 1990, the explanatory power of institutional labour market differences fades away. The US was already relatively more flexible, but its productivity performance at the time was lower than the European's. It is then necessary to

go back to the role of investment, to make sense of the differences in growth and productivity. Figures 3 and 4 show the yearly average increase in capital stock, for the private and public sector respectively, divided once again in the two sub samples 1965-1990 and 1992-2005<sup>3</sup>.

The first one shows that European countries experienced much larger private investment than the US in the previous sub period. In the second period, nevertheless, in the framework of a generalized drop of investment rates, the US and the UK limited the reduction; in the past 15 years, their average private net investment rate was larger than the one of Germany and Italy. Figure 4 shows the average rate of Government Gross Fixed Capital Formation. The similarity with figure 2 is in fact quite striking, as the only countries that experienced an increase in public investment, since 2002 (the US and the UK), are also the ones that increased most their productivity. It is worth mentioning that steep decrease in public investment for European countries coincides with the run up to the Euro, which in many countries implied a tightening of monetary and fiscal policy. As was to be expected, this tightening hit harder expenditure items like investment, which were less “visible”, without significantly affecting politically sensitive items like current spending. With this in mind, the dramatic increase of public investment in the United Kingdom becomes an indirect proof of the appropriateness of the golden rule of public finances, which regulates public expenditure net of investment. In the UK the soundness of public finances was assured without harming investment, and hence guaranteeing the continuing increase of productivity and potential output. By contrast, the countries subject to the strict constraints of the Maastricht Treaty, and then of the Stability and Growth Pact, seem to have relied on drastic reductions in the rate of increase of public investment, that may help to explain the stagnation in productivity growth.

The relationship between investment and productivity can be summarized as in figure 5, where the increase in productivity is mapped against investment (each country has two points per series, corresponding to the two sub-periods). It can be seen that the relationship is positive for both private and public investment.

### **Investment and Potential Output.**

Investment is a both a short and long run phenomenon. The short run effect on aggregate demand is well known. But an equally important role of investment is that it builds the future capital stock of the economy. It is through this channel, if any, that it has

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<sup>3</sup> Because of data availability, we were able to obtain net investment for the private sector, but gross investment for the public sector (for which the OECD does not provide data on the capital stock).

effects on the long run potential of the economy. But these effects are by definition delayed, as investment takes time to become productive capital. To emphasize the long run features of investment I first took five years averages (1960-65, 1965-70, and so on). Then I plotted them against potential output growth (as calculated by the OECD), in the following period, in order to capture the delayed effect of capacity construction building. I added Japan to the six other countries, because of its long stagnation. Figures 7 and 8 plot the correlation, for the total of the countries, and for each of them separately. We can observe a robust positive correlation between investment and delayed potential output growth, that furthermore is replicated for almost all countries taken individually (the only exception is Spain, for which nevertheless we only have 5 points).

These correlations are of course only suggestive, but they underline the need to better investigate the role of investment in the determination of productivity, and not to focus as is too often the case, only on labour market rigidities.

### **Policy Implications**

What precedes confirms the initial educated guess, that there is more than labour market rigidities to explain the differences in potential growth that we observed in the past 15 years. Investment, both public and private, seems to play a very important role. But if we shift the emphasis to investment, then we need to look at the determinants of it, among which policy plays a crucial role. I already pointed out above the striking difference in terms of actual and potential growth between the UK, which followed a fiscal rule that preserves public investment, and the large continental countries that were bound by the Stability Pact.

But also monetary policy is an important determinant of investment. The emphasis on price stabilization in this respect is usually justified by two main arguments. The first is that a stable macroeconomic environment keeps the risk down and hence is favourable to investment. The second argument is that at any rate, the main determinant of investment behaviour is the flexibility of labour and goods markets; as a consequence, the key to increased competitiveness is the implementation of structural reforms.

Nevertheless, comparing the recent history of the US and the EU, we can tell a rather different story, in which monetary policy, investment and its long term effects on productivity play a central role. In the first half of the 1990s real interest rates were much

higher in Europe than in the US<sup>4</sup>, and that was a major determinant in the difference of private investment rates<sup>5</sup> in the two zones, that continued all along the 1990s. The high investment rates (among other things in R&D) had the effect of increasing the stock of both physical and human capital in the US. As a consequence of the different stock of capital, the period of relatively high growth that Europe experienced between 1997 and 2000 was particularly rich in employment, but productivity did not increase substantially. It was a “productivityless” recovery! On the other hand, in the US, the productivity component of growth was relatively more important than job creation. In fact, it was only the exceptional growth rate that allowed the US to create jobs in a period of exploding labour productivity.

The early 2000s, give us further indications of the link between growth, investment and productivity. Investment dropped significantly in the US, after the boom of the late 1990s; the recovery after the short recession of 2000-2001 was mainly due to resilient consumer spending. Nevertheless, productivity continued to increase, and as a consequence, the US is experiencing a period of “jobless growth”. This allows concluding that the long term effect of investment on productivity is crucial, as the current productivity increase clearly build on past investment.

This perspective on the recent macroeconomic developments in the US and in Europe highlights - in disagreement with the ECB - the role that the budgetary and monetary tightening experienced in the EU since the early 1990s have played to depress investment, and hence productivity growth.

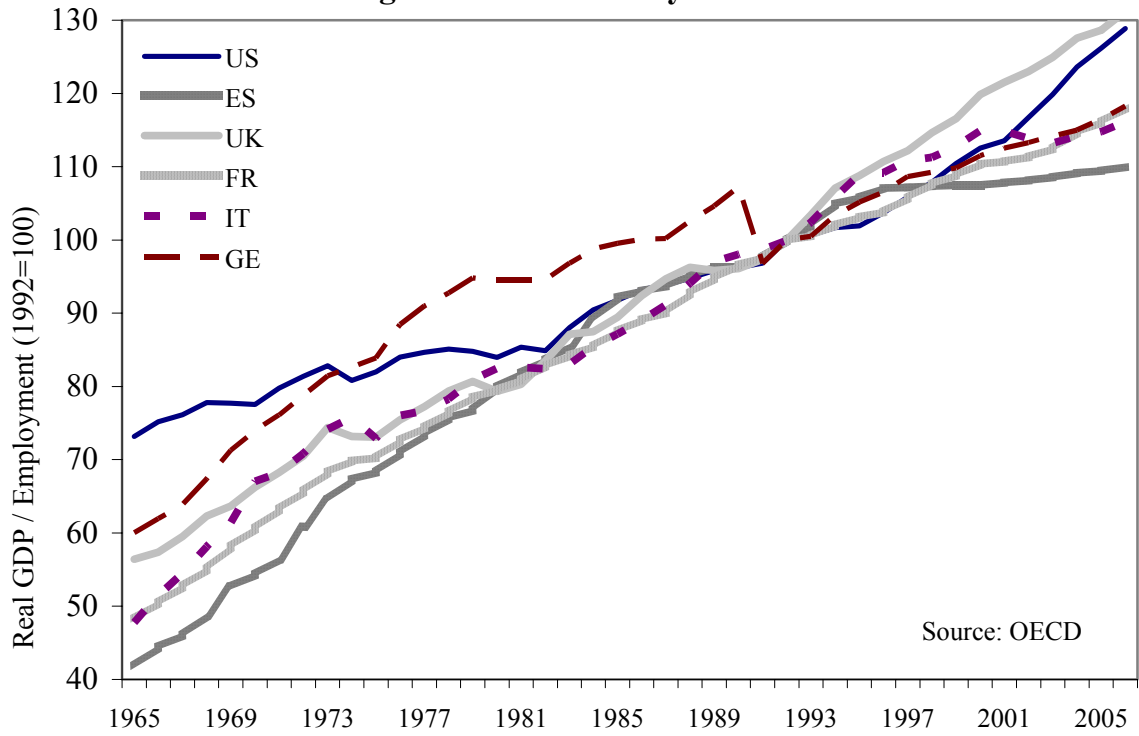
Increasing productivity and potential growth necessarily requires strong investment, both public and private, in order to build the necessary human and physical capital stock. Crucial to this increase in investment is a friendly environment, in which policy necessarily plays a role, as the experience of the US clearly shows.

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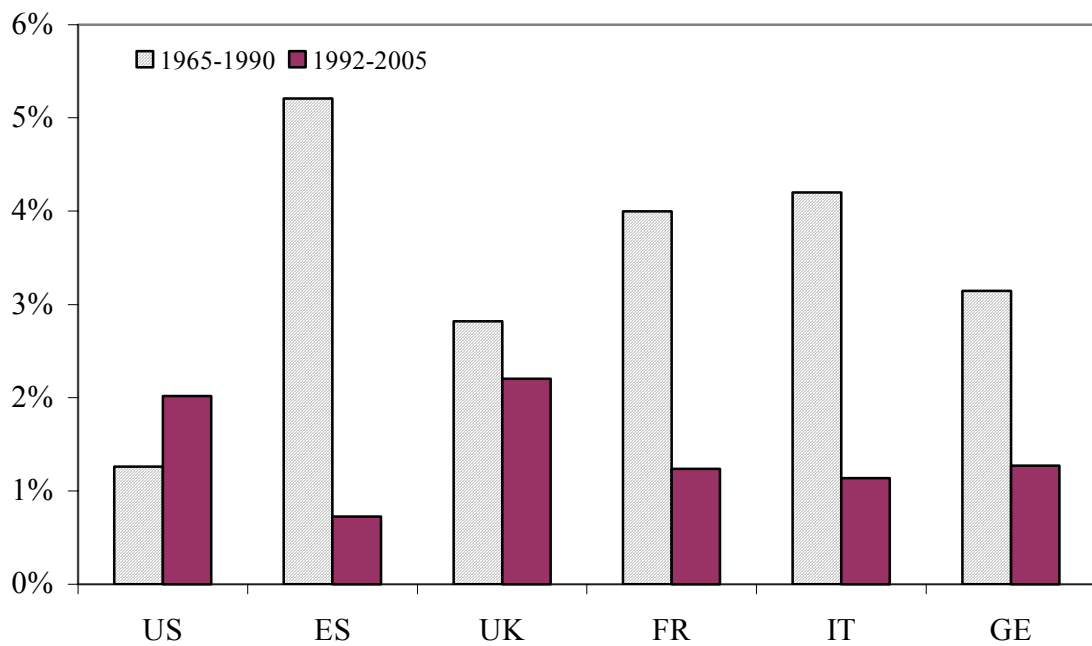
<sup>4</sup> From 1990 to 1996 the short term nominal rate in the US was below 5%, while it was at around 8% in the European countries, while inflation was more or less the same.

<sup>5</sup> As I mentioned already, the insufficient private investment was accompanied by a decrease of public investment due to the budgetary restrictions implied by the run up to the Euro.

**Figure 1 - Productivity Index**

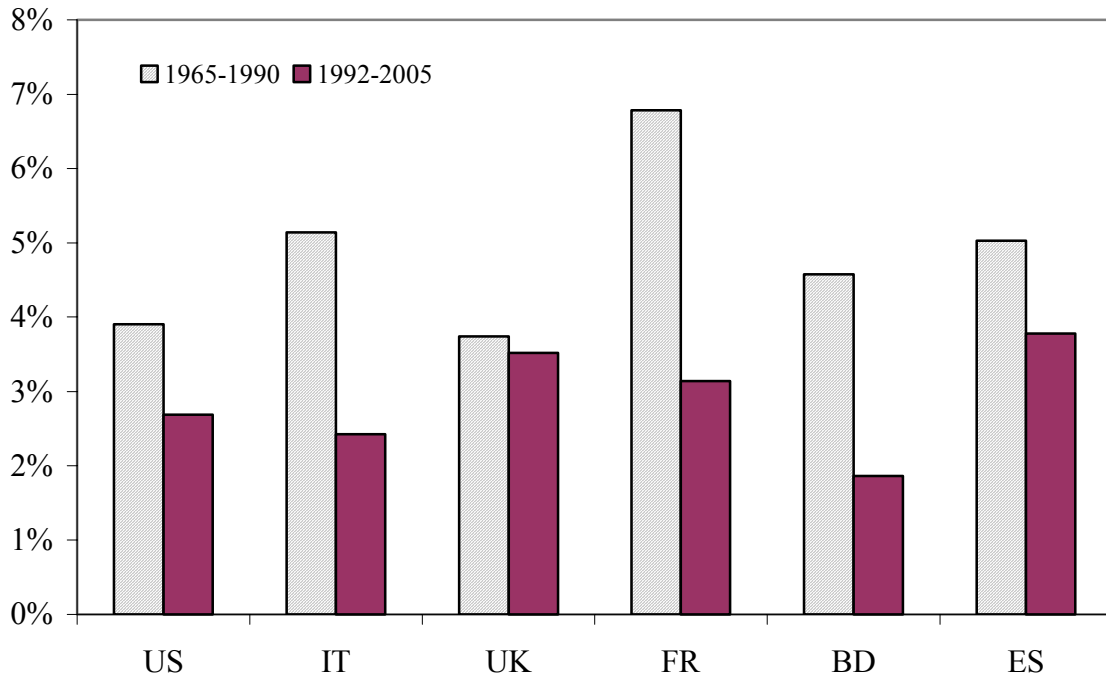


**Figure 2 - Yearly Average Increase in Productivity**



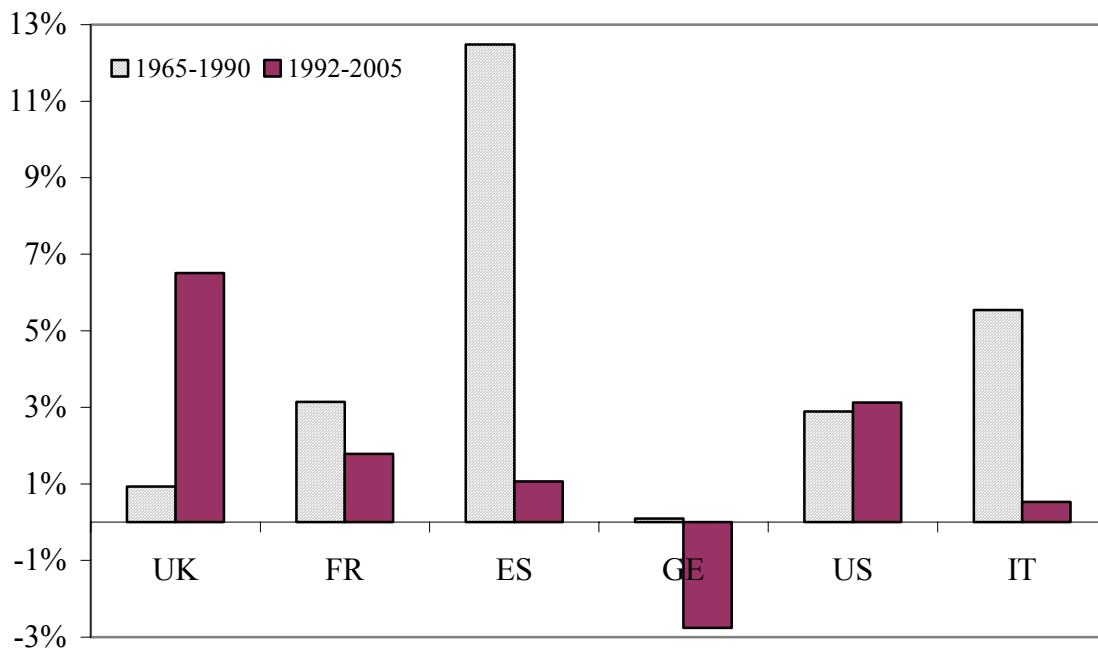


**Figure 3 - Yearly Average Increase in Private Capital Stock**



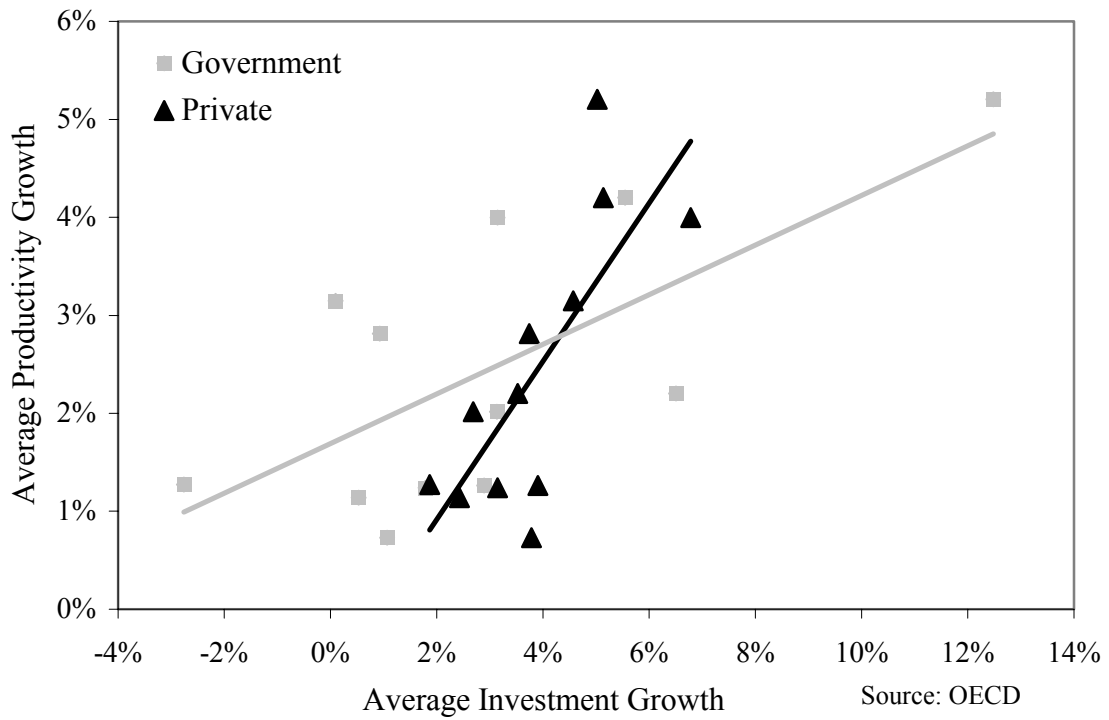
Source: OECD

**Figure 4 - Yearly Average Government Gross Fixed Capital Formation**

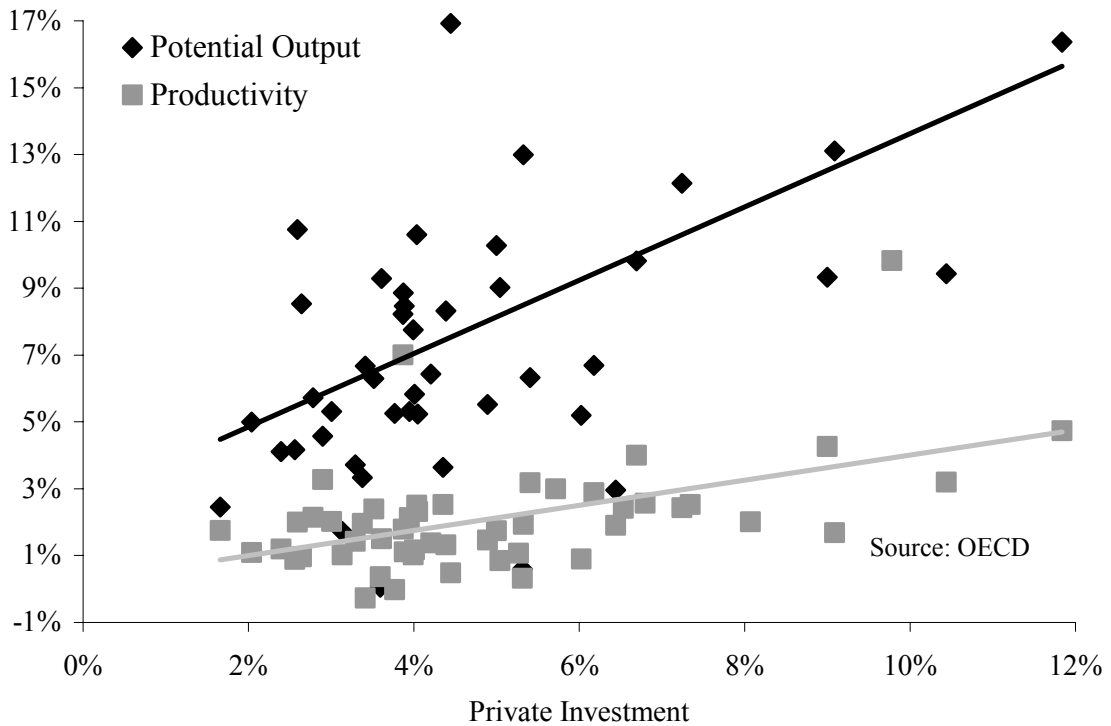


Source: OECD

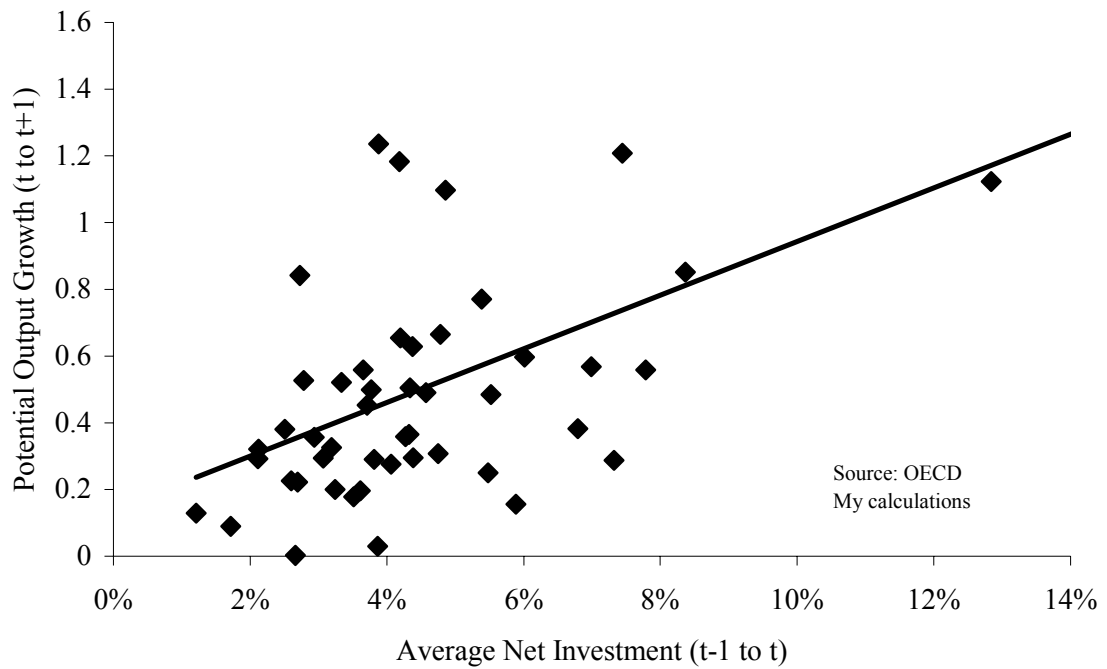
**Figure 5 - Investment and Productivity**



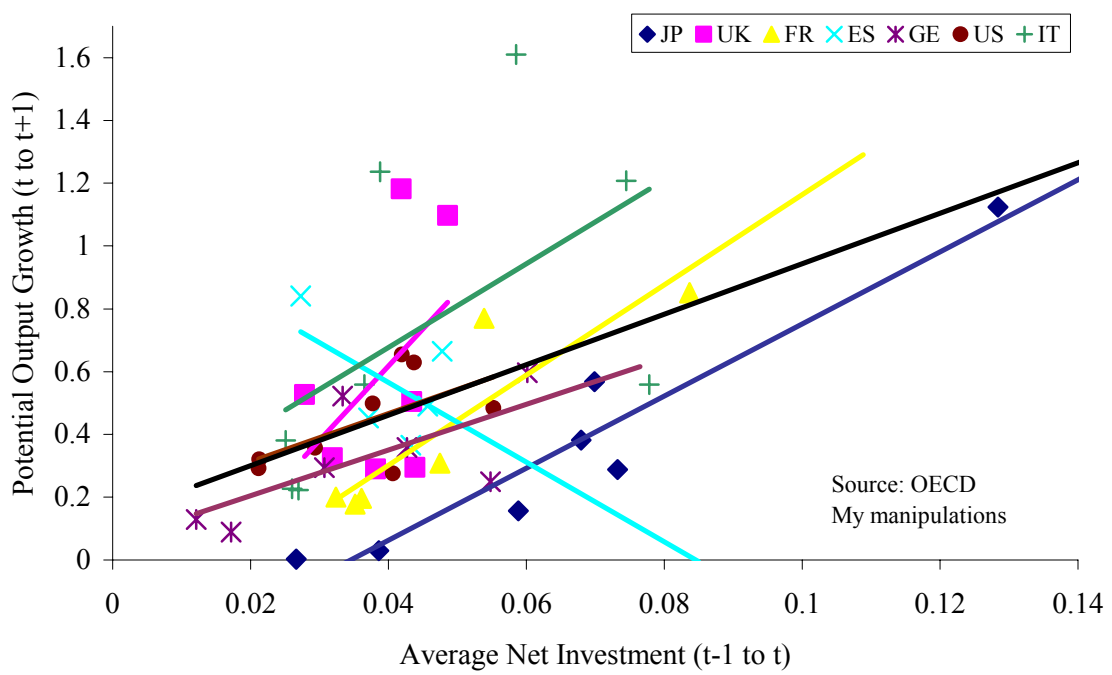
**Figure 6 - Investment, Productivity and Potential Output**



**Figure 7 - Investment and Potential Output Growth**



**Figure 8 - Investment and Potential Output Growth**



# BRIEFING PAPER

## Productivity, Growth Potential and Monetary Policy in EMU

by

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## **Executive Summary**

The paper outlines the importance of productivity and potential output developments for monetary policy. In a first step the recent productivity gap between the US and the Euro area is analysed. It is argued that it is mainly due to cyclical factors. The conclusion for monetary policy is to stabilise the economy more actively.

The computation of potential output proves very difficult and unreliable. Different methods deliver similar results at a given point of time, but results for a given period are highly unstable over time. What was considered a recession in Germany in 2001 from a 2001 perspective is a boom from the perspective of 2005. These changes cast doubt whether presently used potential output figures are a useful yardstick for monetary policy. The recommendation is to use more reliable measures in a pragmatic manner.

## Introduction

Productivity developments as well as growth potential is a key variable for monetary policy. The former has to be taken into account for inflation forecast directly. The latter is also included in inflation forecasts when the output gap is assessed. Furthermore it is important when computing an appropriate reference value for monetary aggregates.

Inflation is strongly influenced by unit labour costs. This is defined as wages per hour in relation to productivity per hour. There is a quite stable relation to inflation. Therefore the ECB has to check carefully whether wage movements are in line with productivity movements such that the inflation target is preserved. This means that nominal wages should not grow more than 2 percentage points stronger than productivity. If that is the case there is no inflationary danger resulting from excessive wage movements. As a matter of fact any change in productivity trends is therefore important for inflation forecasts. A slow down that is not accompanied by an appropriate wage moderation, must lead to a stricter monetary course whereas any acceleration with resilient wage movements should lead to a softer monetary stance.

A similar reasoning applies production potential. There is a relation between productivity growth trend and production potential. An increase of productivity trend growth leads to a higher potential growth, since with a given potential employment, potential output then rises. Appropriately any decline leads to a lower potential growth path. Production potential is used to for a twofold purpose. Firstly is used to calculate the output gap by subtracting it from actual output. If the output gap is negative, not all production possibilities are used. The economy is in a state of underutilization of its resources. In such a situation one would expect that prices increase only moderately such that no inflationary dangers occur. On the other hand if the output gap is positive, the economy is overheated possibly showing higher inflation. Therefore the output gap and also potential output are part of a proper inflation forecast as it is in fact provided by the ECB. Secondly, potential output is used to calculate the reference value for the monetary pillar of the ECB monetary policy strategy. This is based on the idea that monetary growth should be in line with trend change of money velocity and potential growth. If that is the

case there would be no monetary overhang to create inflation since the available liquidity is used to finance growth. Any decline in potential output growth with an unchanged money growth would lead to excess liquidity that may induce inflationary developments. On this relation some doubts have been cast recently. Since monetary growth has exceeded the reference meanwhile for several years without triggering inflation, its stability is questioned.

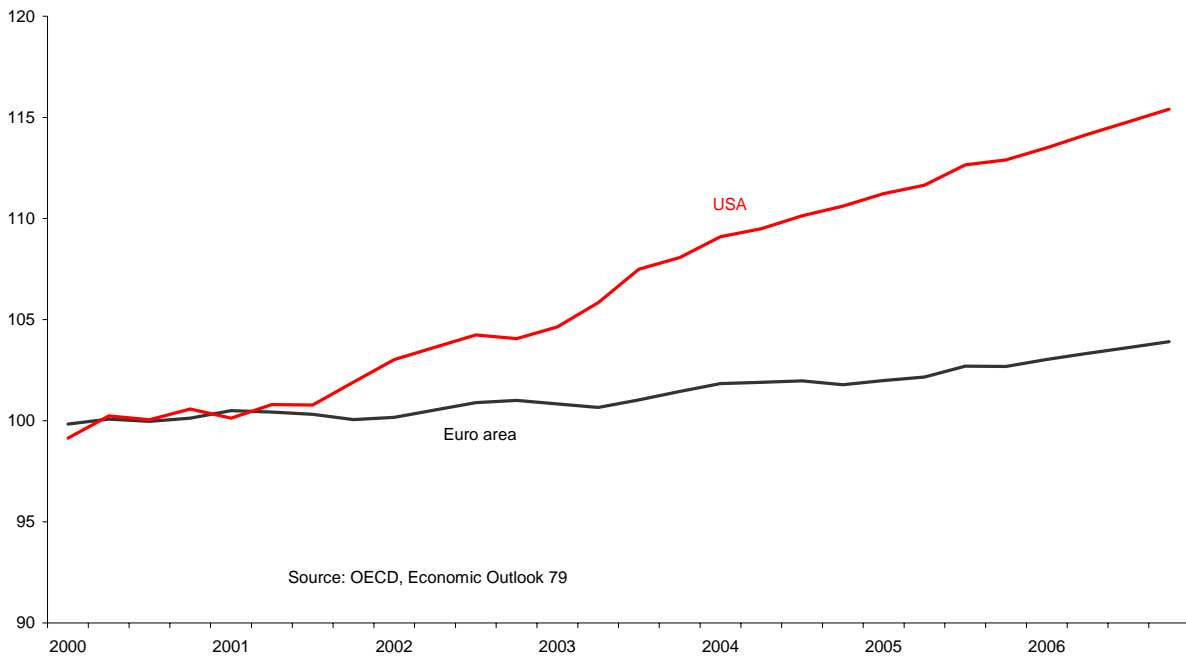
There is a fundamental difference between productivity growth and potential output with respect to measurement. While the former can be easily calculated from observable economic variables, the latter is basically unobservable. As will be shown later on, sophisticated statistical and econometrical procedures are used to solve this problem. But nevertheless both variables play a major role for the ECB's monetary policy.

### **The Euro-area Productivity Backlash**

Productivity developments are determined by cyclical as well as non cyclical factors. The former reflect the impact of the business cycle on productivity. If economic activity is very strong, firms will use their resources very intensively. That means they will exploit any chance to increase their productivity. Furthermore in a booming economy, investment tends to be very dynamic, too. Higher investment also leads e.g. by the introduction of new machines and technology to higher productivity. On the other hand, if the economy is slack, firms tend to resiliently adjust capacities leading to lower productivity. Weak investments enhance this process.

The non cyclical components of productivity developments are technical change and innovation in general. These spur productivity as has been shown e.g. for IT technologies. These new technologies have been spread on a global level. Hence they should account for too high differences between the US and the Euro area. Especially they should not account for growing differences. If the Euro area is, what is sometimes assumed, lagging behind the US in the application of new technologies, the catch -up process should rather lead to decreasing differences. But a look on the figures for the last six years shows that the difference is not closing but widening.

Productivity Gap USA - Euroarea



The figures present the time series of labour productivity development (as index 2000 =100) since 2000. Whilst during the first half of 2000 economic activity was buoyant in the US as well as in the Euro area, production stalled in the second half, and 2001 there was a recession on both sides of the Atlantic.

During this phase productivity in both areas was more or less stagnating. The gap widened when in 2002 the recovery in the US started. Especially in 2004 and 2005 when the US showed already relatively high growth rates whereas the recovery in the Euro area lagged well behind, the US productivity in the US was growing much faster. These observations indicate that the recent widening of the gap may be mainly due to cyclical reasons. There should be a turnaround, as soon as growth in the Euro area is at least as strong as in the US. With some luck, that could be the case already in 2006.

These considerations reveal that the main causality may not just run from productivity to growth but there is rather some interdependency. However, this only applies if there are no systematic costs differences especially with respect to wages. Real wages should



basically move in line with productivity. A high productivity growth then leads to higher wages increasing real incomes. Thus productivity is the source of real income rises that in turn may spur growth and productivity again.

The implications of this reasoning for monetary policy is that a monetary policy that is devoted to foster growth will at the same time stimulate productivity. So there is no better policy for productivity than a monetary policy that ensures a steady growth process. This implies that as in the US a monetary policy must clearly stabilise economic developments at times of recessions and of booms.

### **The Manifold of Potential Growth Calculations**

Whereas measurement problems do not play any significant role with respect to productivity, these are a major cause of concern when dealing with potential growth issues. Problems start already at the theoretical level of definition.

Potential output is the sustainable level of real (inflation-adjusted) GDP. It is constrained due to limited natural resources (population, raw materials), institutional factors (e.g. on labour markets) and the factor endowment (especially the capital stock and human capital). A given level of output is sustainable if it does not generate inflationary or deflationary tendencies. Arthur M. Okun, who coined the term potential output in 1962, defined it as the level production at full employment, the latter according to Okun referring to the degree of utilisation of the factors of production that does not cause inflationary pressure.

The theoretical difficulties of unambiguously defining potential output are due to divergent opinions about the persistency of output gaps and the possible endogeneity of potential output, both of which arise from different assumptions about the inherent stability of the economy. From a Keynesian perspective the effectiveness of endogenous mechanisms that return the economy to equilibrium is uncertain at best. Long-lasting negative output gaps are thus a likely occurrence and entail the danger of hysteretic (long –lasting) effects causing potential output to adjust to the GDP rather than vice

versa. In contrast, monetarists and proponents of new classical theory hold the view that the rational behaviour of economic agents rapidly corrects disequilibria and that potential output is unaffected by economic downswings and upswings. New Keynesians occupy a position somewhere in between. Economic policy advice differs in accordance with these divergent views. Whereas Keynesians tend to favour active macroeconomic stabilisation policies and regard macroeconomic policy as a necessary adjunct to structural reform, monetarists and new classical theorists view macro policy as more or less superfluous, argue strongly for rule-based policies, and consider structural reforms to be the key to higher economic growth.

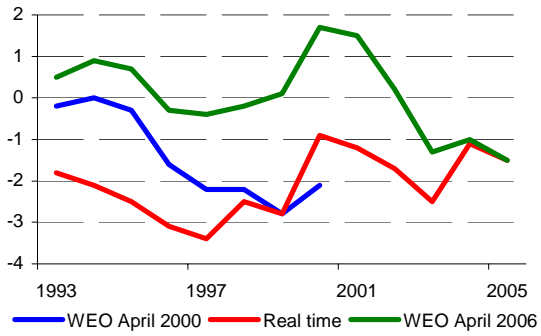
Methods to empirically estimate potential output can be categorised into three groups: first, purely statistical methods (e.g. Hodrick-Prescott filter and Rotemberg filter); second, methods that determine potential output primarily on statistical grounds but make use of the interaction between certain economic variables (semi-structural methods, eg. multivariate Hodrick-Prescott filter and multivariate Kalman filter); and third, methods that determine potential output on the basis of economic factors (structural methods, e.g. production function approach). Only structural methods make possible a distinction between different theoretical approaches. They are also better suited for projections and simulations exercises, especially in the case of changes in the structural or macroeconomic environment at the end of the observation period. They are superior to univariate methods because they provide an economic explanation of movements in potential output.

In practice, however, estimates based on production functions are to a large extent based on univariate methods, especially the Hodrick-Prescott filter, to estimate the potential values of the individual components of the production function. It is therefore not surprising that the estimates of potential output of different institutions are quite similar and actually more similar than are the estimates of each organization for a specific year at different points in time. In the case of the International Monetary Fund (IMF) this difference can be exemplified best using the years 1999 and 2001.

IMF estimates at different points in time<sup>1</sup>

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Output gap in % of potential output

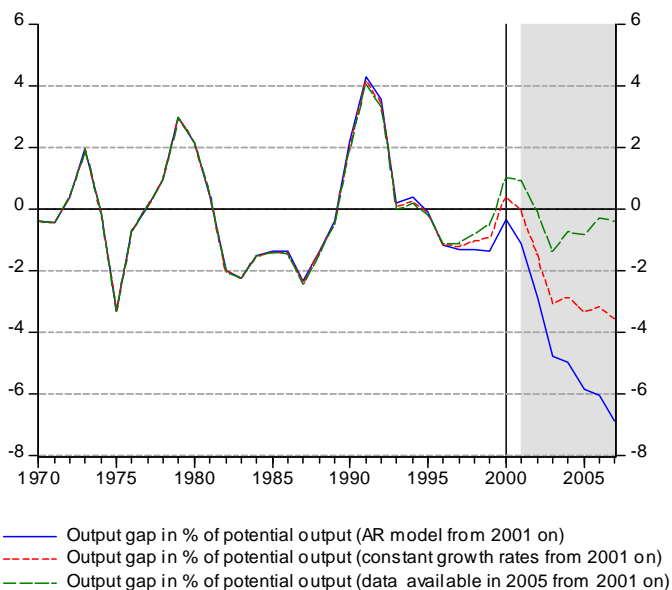
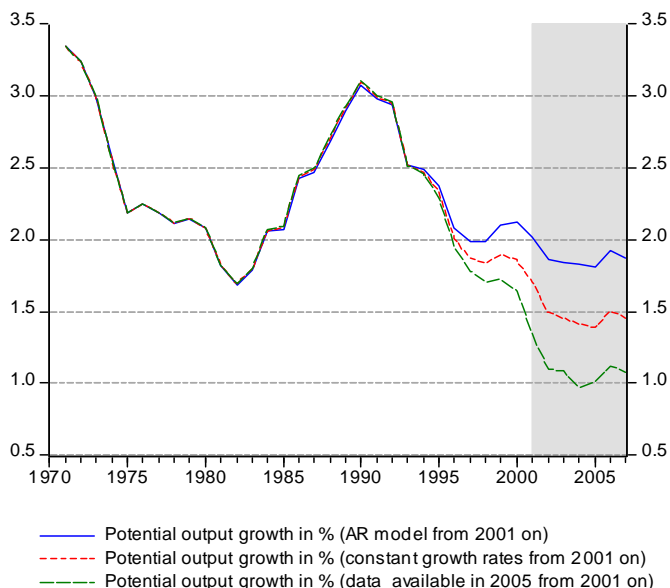


<sup>1</sup> Real time is the output gap estimate for the year preceding the publication year

Sources: International Monetary Fund, World Economic Outlook, spring issues 1994 to 2006.

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## Output gaps and potential growth in artificial real time



In the spring 2000 the IMF estimated Germany's output gap in 1999 to be -2.8 %; in the spring of 2006 the IMF puts the output gap in 1999 at +0.1 %: this is not only a difference of almost 3 percentage points but also a change from negative to positive. The real-time estimate of Germany's output gap in 2001, i.e. the estimate in the spring of 2001, was -1.2 %; from today's perspective (spring 2006) the IMF estimates the output

gap in 2001 to have been 1.5 % and thus markedly positive. An equally stark picture emerges when looking at the figures provided by the EU Commission and the OECD. Revisions in this magnitude invalidate the use of measures of output gaps and potential output growth as indicators for economic policy. To illustrate the problem we calculate Germany's output gap for 2005 on the basis of the rate of potential growth that the IMF estimated in spring 2000 for period from 1992 to 2001, that is 2.1 %. According to this calculation the output gap in 2005 would have exceeded 8 %. The frequent and large potential output revisions are largely due to the econometric methods used for estimating potential output, in particular the endpoint problem and forecast mistakes.

The ultimate lack of knowledge about the precise values of potential output makes it extremely problematic to use this theoretically compelling concept as a basis for economic policy advice. This is particularly so for monetary policy. It is possible to identify factors that positively affect potential output, as for example, the investment ratio. But no estimate of potential output can be claimed to be accurate or precise, so that several different estimates have to be used as policy indicators. But even that does not solve the fundamental problems given the fact that the estimates for a given period vary significantly over time. This, however, vastly complicates fiscal planning and the use of monetary policy rules, such as the Taylor rule. Policy makers cannot rely on actual figures presented since they may change the following period. The bottom line is that potential output as measured by the methods presently available cannot be considered as a yardstick for economic policy theory. Given the difficulties involved in robustly estimating potential output, economic policy makers need to learn to pursue their policy objectives without reference to this variable. Pragmatism should prevail. In the face of a benign inflation outlook and high unemployment economic policy should strive to test the limits of potential output and to set in motion a virtuous cycle of a decreasing NAIRU, a rising participation rate, higher productivity growth and an improvement in fiscal balances.



# Labour Productivity Growth in the European Union<sup>1</sup>

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December 2007

## Executive Summary

- Labour productivity is defined as output divided by hours worked and it increases as a result total factor productivity growth or an increase in the capital – labour ratio.
- The labour productivity gap between the United States and the EU-15 was nearly closed by 1995. Since then, however, there has been a sharp turnaround, with labour productivity growing faster in the United States than in the EU-15.
- An increase in the EU-15 capital – labour ratio, possibly brought about by restrictive labour market practices in Europe, played an important role in EU – 15 labour productivity growth during the period 1980 – 1985.
- EU-15 labour productivity growth over the period 1995 – 2004 varied across countries. Ireland, Finland, Greece and Sweden experienced higher labour productivity growth than did the United States, while Spain had no labour productivity growth during this period.
- Differences in labour productivity growth across the EU-15 countries during the period 1995 – 2004 were primarily due to differences in total factor productivity growth, rather than to differences in the growth of the capital – labour ratio. In Italy and Spain, total factor productivity growth was negative during this period.
- Differences in total factor productivity growth across the EU-15 countries during the period 1995 – 2004 were mainly due to differences in total factor productivity growth in the non-ICT sector. The difference between total factor productivity growth in the non-ICT sector in the United States and in the EU-15 was primarily due to a difference in total factor productivity growth rates in ICT-using industries. It is hypothesized that a less rigid institutional environment in the United States fostered a quicker adjustment process after the ICT revolution.
- Economic reforms that make it easier to open and close businesses, hire and fire workers, import and export goods, deal with licenses and taxes and enforce contracts would raise total factor productivity growth.

<sup>1</sup> Briefing paper for the Committee on Economic and Monetary Affairs (ECON) of the European Parliament for the quarterly dialogue with the President of the European Central Bank.

## 1. Labour Productivity

Assume that time- $t$  output ( $Y_t$ ) is a function of the time- $t$  capital stock ( $K_t$ ) and time- $t$  hours worked ( $L_t$ ) and that it also depends on the amount of “knowledge” or “technology” in the economy. These assumptions can be captured by writing output as

$$Y_t = A_t F(K_t, L_t), \quad (1.1)$$

where  $F$  is the production function and the variable  $A_t$  captures the knowledge or technology in the economy and is referred to as *total factor productivity*.<sup>2</sup>

It is typically assumed that  $F$  is a Cobb-Douglas production function so that equation (1.1) can be written as:

$$Y_t = A_t (K_t)^{1-\alpha} (L_t)^\alpha, \quad \alpha \in (0,1). \quad (1.2)$$

The Cobb-Douglas production function exhibits constant returns to scale and is probably not an unreasonable approximation of actual production functions. It has the property that labour’s share of output is constant and equal to the parameter  $\alpha$ . For the European Union and the United States,  $\alpha$  is roughly equal to 2/3.

Dividing by both sides of equation (1.2) by hours worked yields labour productivity:

$$y_t \equiv Y_t / L_t = A_t (k_t)^{1-\alpha}, \quad (1.3)$$

where  $k_t \equiv K_t / L_t$  is the capital-labour ratio, or the capital stock divided by hours worked. Thus, labour productivity depends on total factor productivity and the capital-labour ratio. Equation (1.3) implies

$$\hat{y}_t = (1-\alpha)\hat{k}_t + \hat{A}_t, \quad (1.4)$$

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<sup>2</sup> More generally the term  $A_t$  is the residual part of output that cannot be explained by the use of capital and labour. It is affected by such things as government spending and natural disasters.



where a “^” over a variable denotes a percentage rate of change. Equation (1.4) says that the percentage change in labour productivity is equal to about 1/3 multiplied by the percentage change in the capital-labour ratio plus the percentage change in total factor productivity. The percentage change in the capital-labour ratio is often referred to as *capital deepening*. Thus, equation (1.4) says that labour may become more productive either because of technological advances or because the ratio of capital to labour has increased.

## 2. Recent Labour Productivity Growth in Europe and the United States

**Table 1. Average Annual Change in Labour Productivity**

	1980 – 1995	1995 - 2004
United States	1.41	2.53
EU - 15	2.34	1.46

Source: Gordon and Dew-Becker (2005).

In 1979, labour productivity in the 15 pre-enlargement members of the European Union was only 77 percent of US labour productivity. As a result of faster labour productivity growth in Europe than in the United States – shown in Table 1, the gap was nearly closed by 1995.<sup>3</sup> In that year EU-15 labour productivity was 94 percent of US labour productivity and in some EU member countries, such as France, labour productivity was higher than in the United States. Since, 1995, however there has been a sharp turnaround, with labour productivity growing faster in the United

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<sup>3</sup> Much of the data in the cited papers comes from the Groningen Growth and Development Centre.

States than in Europe. By 2004, labour productivity in the EU–15 had fallen to 85 percent of labour productivity in the United States.<sup>4,5</sup>

### *3. Explaining European Labour Productivity Growth in the Period 1980 – 95.*

What caused labour productivity to grow so fast in Europe in the period 1980 – 95? In Section 1 it was shown that a rise in productivity growth can be due either to an increase in the growth in total factor productivity or to a rise in capital deepening. During the period 1980 – 95, the latter phenomenon played an important role: capital deepening increased by 1.18 percent in the EU–15, compared with only .82 percent in the United States. It has been hypothesized that restrictive labour market practices in Europe – high minimum wages and restrictions on hiring and firing – made the cost of labour in Europe artificially high, generating unemployment. Meanwhile, flexible labour markets in the United States kept the average US wage relatively low and boosted employment by fostering the creation of low-skilled jobs.<sup>6</sup> European “technology” did not catch up with that in the United States; instead, it appears that distortionary labour market practices in Europe increased the capital – labour ratio in the United States relative to that in Europe, accounting for a third of the apparent catch up.

### *4. Explaining Dampened Labour Productivity Growth in Europe in the Period 1995 - 2004*

What caused it labour productivity growth to sputter in Europe while it increased rapidly in the United States during the period 1995 – 2004? The prevailing view is that the growth in US productivity during the period is due to technological innovations in semiconductor manufacturing which led to the information and

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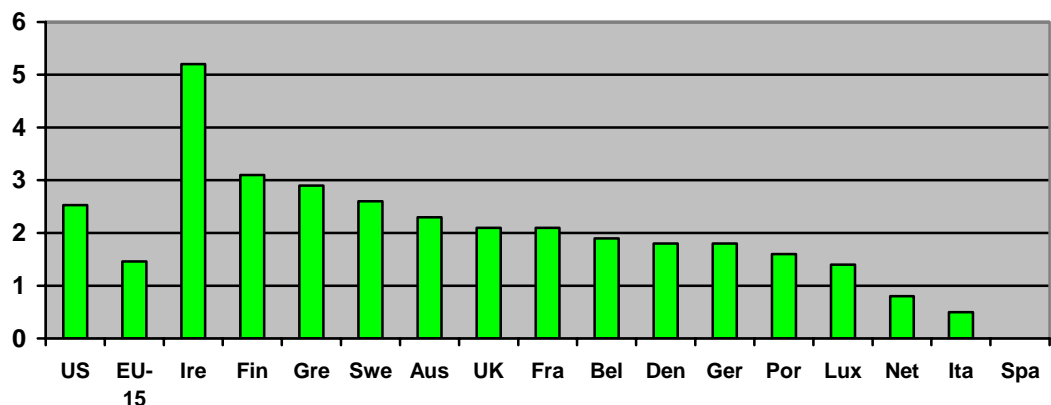
<sup>4</sup> There has been a recent pick up in European productivity growth, but this may be a cyclical phenomenon. See Gomez-Salvadore et al (2006).

<sup>5</sup> The same decline is found if labour productivity is measured as output per person employed rather than as output per hour worked. See Gomez-Salvadore et al (2006).

<sup>6</sup> Gordon and Dew-Becker (2005) elaborate: ‘... grocery baggers, bus boys, parking lot attendants, and an urban industry in what Americans call “valet parking”’.

communication technology (ICT) revolution.<sup>7</sup> Relatively unregulated product markets and flexible labour markets permitted a rapid restructuring of the US economy and the most efficient use of ICT in other industries. (See, for example, van Ark (2006).)

**Figure 1. Labour Productivity Growth: 1995 - 2004**



Source: Gordon and Dew-Becker (2005)

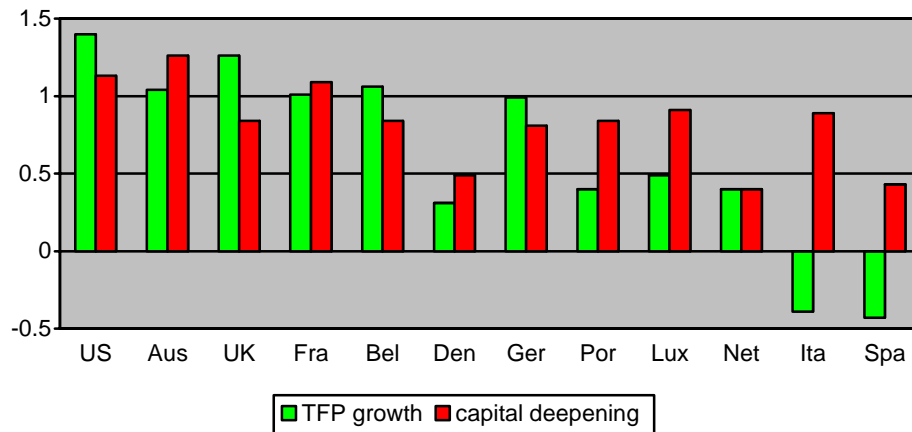
The slow down in European productivity growth is less straightforward. Not only was EU-15 productivity growth slow relative to the productivity growth in the United States, it was slow relative to productivity growth in Australia, Canada and Japan.<sup>8</sup> The slowdown was not uniform, however. As is seen in Figure 1, some countries (Ireland, Finland, Greece and Sweden) continued to experience faster labour productivity growth than did the United States, while others experienced much slower labour productivity growth; one country, Spain, experienced no labour productivity growth at all.<sup>9</sup>

<sup>7</sup> See Anderson and Klieson (2006).

<sup>8</sup> Van Ark (2006).

<sup>9</sup> The high labour-productivity growth in Greece is due to a catching-up process.

**Figure 3. Sources of Labour Productivity Growth: 1995-2004**

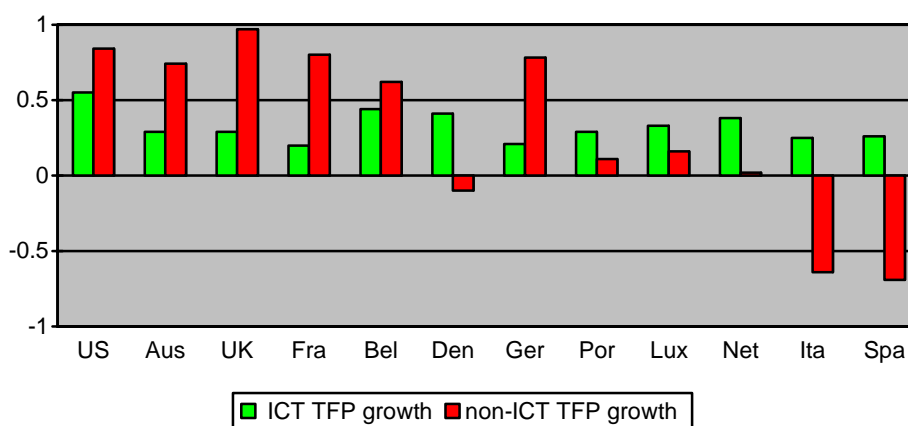


Source: Gordon and Dew-Becker (2005)

What caused the low EU-15 labour productivity growth outside of Ireland, Finland, Greece and Sweden? Figure 3 depicts the two components of labour productivity growth, total factor productivity (TFP) growth and capital deepening. Capital deepening was lower in Europe than in the United States, apparently as a result of wage moderation and labour market reform in Europe.<sup>10</sup> Total factor productivity growth is more variable across countries than is capital deepening. It was higher in Austria than in the United States. Total factor productivity growth in the UK, France, Belgium and Germany was not too dissimilar to total factor productivity growth in the United States. In Italy and Spain, however, it was negative.

<sup>10</sup> See Gomez-Salavadore (2006).

**Figure 4. Sources of TFP Growth: 1995-2004**



Source: Gordon and Dew-Becker (2005)

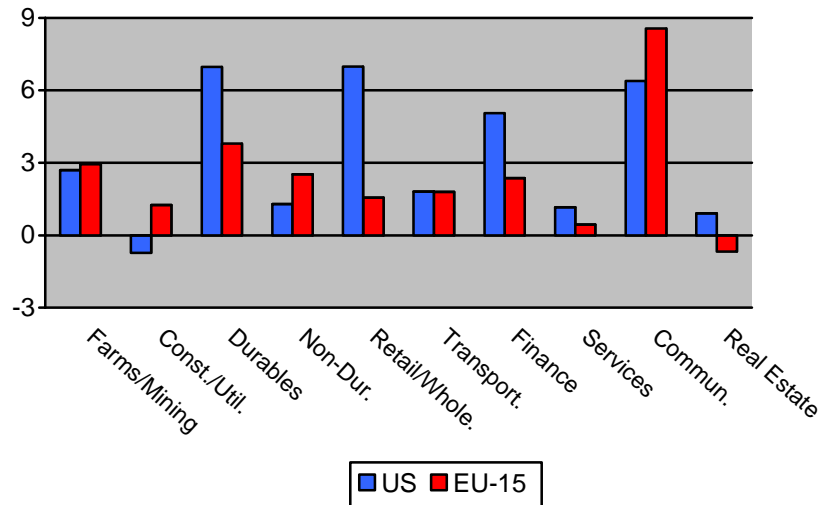
Figure 4 splits total factor productivity growth into two parts: growth in the ICT sector and growth in other sectors. It is seen that there is little variation in total factor productivity growth in the ICT sector, but significant variation in total factor productivity growth in the non-ICT sector.

Where is this difference in non-ICT total factor productivity growth coming from? Figure 5 depicts non-ICT total factor productivity growth for the United States and the EU-15 by sectors. The deviation is particularly large in the ICT-using industries: retail and wholesale and finance. US retailing, for example, was transformed from a low-technology sector to a highly ICT-intensive sector; this has not occurred to the same extent in the EU-15.

ICT-using industries in the United States did not become more productive by simply investing in ICT technology. Instead, these investments were combined with significant changes in the way that these industries did business.<sup>11</sup> Thus, it appears to have been a combination of flexibility and innovativeness that allowed for the increase in US ICT-using factor productivity growth.

<sup>11</sup> See Kroszner (2006).

**Figure 5. Labour Productivity Growth by Industry**



Source: Gordon and Dew-Becker (2005)

### 5. Policy and Productivity

Rigid labour and product markets, poorly functioning credit markets, high costs of starting and closing businesses, and restrictions on land use and business hours hampered adjustment in many European economies and led to dampened total factor productivity growth. Countries with high total factor productivity growth tend to be countries where it is easy to do business. The World Bank ranks the United States, Ireland, Sweden and Finland 3<sup>rd</sup>, 10<sup>th</sup>, 13<sup>th</sup> and 14<sup>th</sup>, respectively, in its 2007 Ease of Doing Business Index. In contrast, Spain ranks 39<sup>th</sup> and Italy ranks 82<sup>nd</sup>. In comparison with the United States, it is far more difficult, costly and time consuming to start a new business in Italy; it is more costly and time consuming to deal with licenses; it takes longer and costs more to register property; it is more expensive to and takes longer to trade across borders; it is more costly to close a business; it takes over four times as long to enforce a contract; it is more difficult to hire and fire workers and hours are more rigid.

Monetary policy can play little positive role in enhancing total factor productivity growth. The appropriate response in countries where distortions reduce total factor productivity growth is economic reform that increases flexibility.

#### 6. *Measuring Potential Growth*

Using the Cobb-Douglas production function approach of equation (1.2), it is assumed that potential output ( $Y_t^p$ ) is a function of the capital stock and potential hours worked ( $L_t^p$ ) and that it also depends on the amount of “knowledge” or “technology” in the economy:<sup>12</sup>

$$Y_t^p = A_t (K_t^p)^{1-\alpha} (L_t^p)^\alpha, \quad \alpha \in (0,1). \quad (6.1)$$

Equation (6.1) implies that

$$\hat{Y}_t^p = (1-\alpha)\hat{K}_t^p + \alpha\hat{L}_t^p + \hat{A}_t^L. \quad (6.2)$$

With  $\alpha$  equalling about two-thirds, equation (5.2) says that potential percentage growth in output is equal to one-third times the percentage growth in the capital stock plus two-thirds times the percentage growth in potential hours worked plus the percentage change in total factor productivity. Thus, forecasting potential output growth entails forecasting the growth in the potential capital stock, the growth in potential hours worked and the growth in total factor productivity.

Forecasting the growth of the capital stock is relatively straightforward as the contribution of capital to growth changes little over time in the US or the EU.<sup>13</sup> The growth in “potential” hours worked is both difficult to define and difficult to forecast. It is frequently defined as the growth in hours worked that is consistent with stable inflation. In this case, forecasting the change in hours worked entails forecasting both

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<sup>12</sup> In July 2002 ECOFIN endorsed the use the production function approach as a reference method for the calculation of output gaps when assessing the stability and convergence programmes for EU member states. See Denis et al (2006).

<sup>13</sup> See Denis et al (2006).

the growth in the working age population and the labour force participation rate to find an estimate of the growth in the available labour force. Then the change in the unemployment rate that is consistent with non-accelerating inflation is found and the change in employment. Finally, hours worked must be forecasted to find the change in hours worked. Forecasting total factor productivity growth presents a challenge. For short-run changes to be used for output gap computations, it may be sufficient to use past trends to forecast future growth.

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# Productivity, growth potential and monetary policy in EMU

December 11, 2006

Is there a change in trend growth?

## Executive Summary

**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.

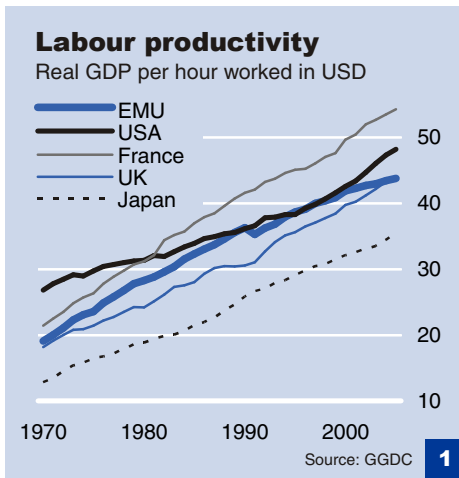
**Looking at the evidence over the past four years it is difficult to clearly identify any change in trend productivity growth.** Since 2002 the trend in core inflation and in changes of the GDP deflator has been slightly downward and profits have risen. This points to a rise in trend growth. However, 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



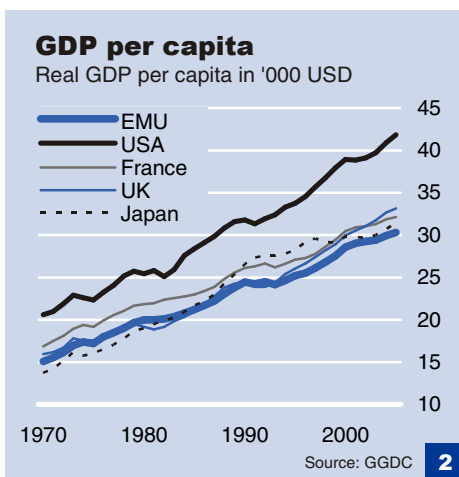
Before discussing the reasons for different trajectories of productivity and the link between productivity and monetary policy it is crucial to carefully define terms and to look at the past development of productivity.

### 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.

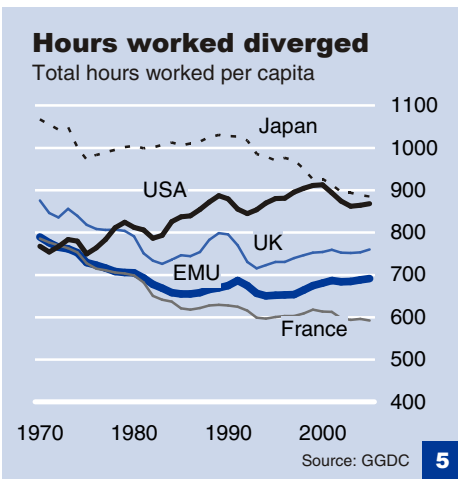
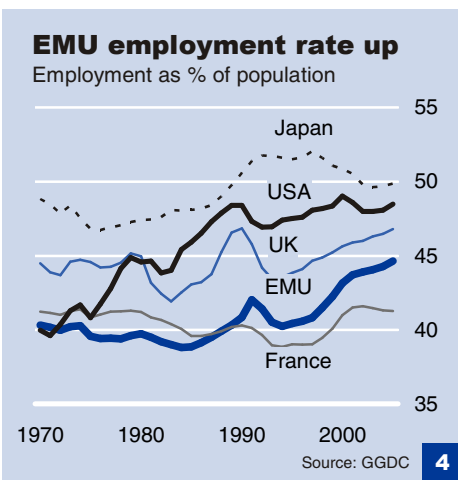
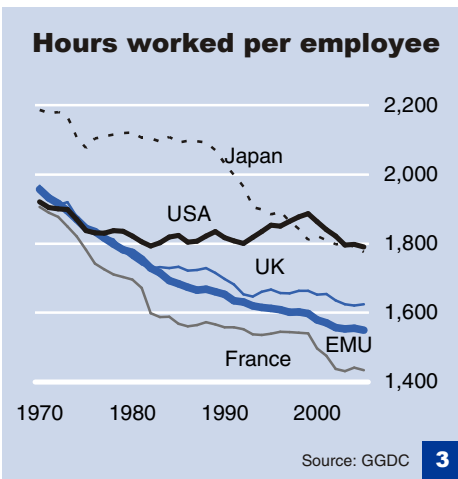
The identity shown above underlines that total GDP can be raised by boosting labour productivity, by working more hours per employee, by raising the participation rate or by increasing the total population. The current low participation rates and short hours worked in the euro area offer a large upside 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

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

**Past developments differ markedly across countries**



Groningen Growth and Development Centre<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup>

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

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

<sup>2</sup> 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.

<sup>3</sup> 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

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.

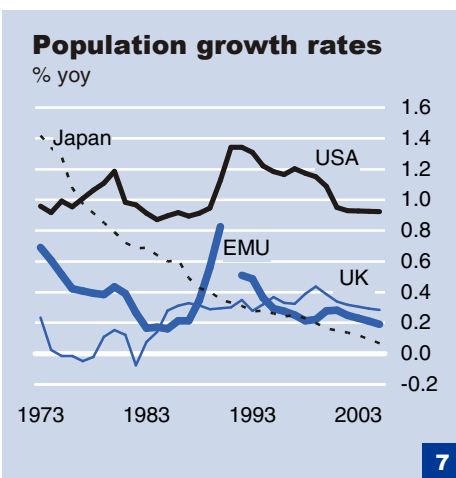


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### 2.1 Raising labour input

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.



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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%

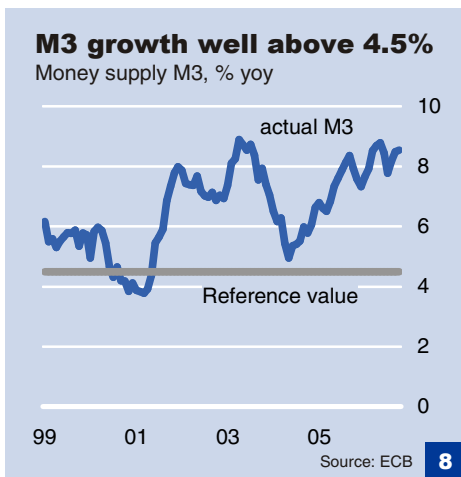
Overall, while some progress in these areas is likely over the coming years, it will probably not raise area-wide GDP growth significantly. In fact, progress is needed here simply to prevent a decline in GDP growth stemming from deteriorating demographics. Rather than being between 2% and 2.5% as still 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.

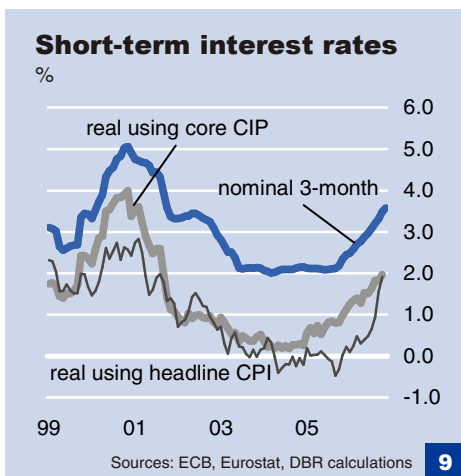


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#### 3.2 GDP growth and ECB interest rates

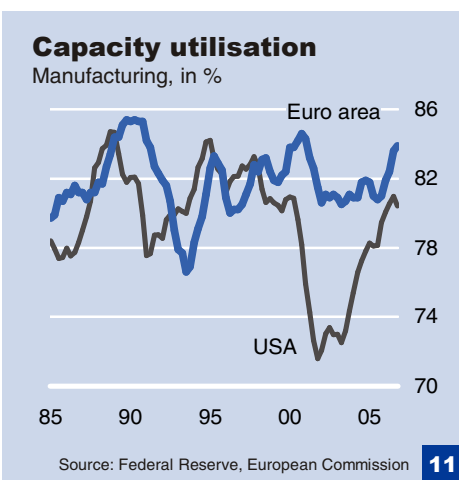
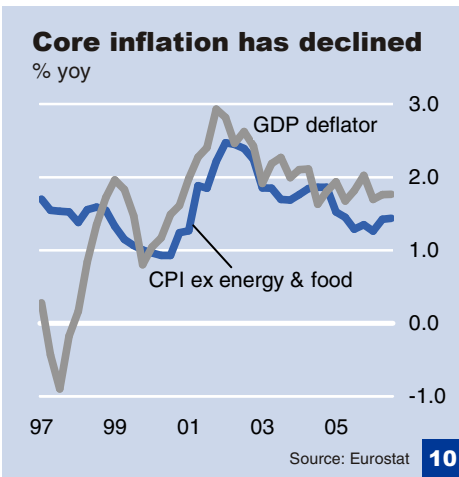
While the implications for monetary targets are straightforward, the effect of a change in trend GDP growth on central bank interest rates is not easy to analyse.<sup>4</sup> It is even harder to exactly detect whether there indeed has been a decline in an economy’s trend growth at all, given the many other factors that are at work over the short to medium term. The heavy cyclical nature 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



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<sup>4</sup> 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.



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 virtuous circle. But are there enough Schumpeterian entrepreneurs in Europe to seize the opportunity?

Norbert Walter (+49 69 910-31810, [norbert.walter@db.com](mailto:norbert.walter@db.com))

**BRIEFING NOTES TO THE  
COMMITTEE FOR ECONOMIC AND MONETARY AFFAIRS  
OF THE EUROPEAN PARLIAMENT**

Charles Wyplosz  
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Fourth Quarter 2006

**PRODUCTIVITY GROWTH IN EUROPE AND THE US**

**Executive Summary**

A comparison of standards of living in Europe and the US shows that Europe has not caught up and is increasingly falling behind. Looking at productivity, over 1960-90 Europe has caught up with the US but, since the mid-1990s has lost ground. Drawing on recent work by Dew-Becker and Gordon, this note argues that the recent setback could be good news in disguise.

The note first attempts to clarify a number of misconceptions regarding the sources of productivity growth. 'Fundamental' productivity growth is the result of technological progress and capital accumulation. 'Artificial' productivity growth occurs as the result of increases in labour costs – direct and indirect, including restrictive labour market institutions – when firms substitute capital for labour.

The traditional view of Europe's post-war growth and catch-up with the US is based on the 'fundamental' productivity growth mechanism. The recent 'productivity divorce' requires a different interpretation. The interpretation convincingly provided by Dew-Becker and Gordon suggests that there has been more to catch-up than 'fundamental' productivity growth.

There are three possible interpretation of the productivity divorce. The first one has been abundantly described. The US has not just taken the lead in developing the new information and communication technology (ICT), it has also massively taken advantage of it, especially in the services and retail sectors. Europe, on the other had, has been slow to take full advantage of ICT. The second interpretation involves a detailed analysis of each lagging country, focusing in each case on particular sectors. The third one notes that most European countries have reduced labour taxes and labour market restrictions. The result has been the hiring of unskilled workers previously not employed. A by-product has been a reduction in the average skill of the workforce, hence a decline in labour productivity.

The first interpretation explains partly the productivity divorce, namely the take of productivity growth in the US. It does not explain the decline of productivity growth in Europe. Thus the third interpretation is needed to gain a better account of the productivity divorce. The second interpretation does not match the fact that the slowdown of productivity growth is widespread, affecting most, if not all, sectors. The third interpretation also suggests that the European catch-up in the 1980s has been partly artificial, the result of skilled workers replacing unskilled ones.

Finally, the recent attribution of the Nobel Prize to Edmund Phelps reminds that the central banks cannot have any role in the long-run evolution of productivity. Phelps has shown, and subsequent research has abundantly confirmed, that central banks should deal with inflation, not growth or unemployment.



## 1. Clarifying the discussion

As far as standards of living are concerned, there is hardly a more important issue than productivity. Yet, discussions about productivity are often confusing. The two main sources of confusion are the link between income and productivity on the one hand and, on the other hand, the sources of change in productivity.

### *Definitions*

Standards of living are conventionally measured as income per capita. Income is usually defined as GDP, i.e. recorded value added creation, which ignores unrecorded activities (mostly black market and home production).

The definition of productivity is more difficult because there is more than one valid concept. We deal here with ‘apparent’ labour productivity, which is output per hour of work. (The word ‘apparent’, dropped in what follows, refers to the fact that this is a broad evaluation of what happens physically at the production level.) This measure tells us how much is produced, on average, with one hour of work. Production is measured by GDP again. Indeed incomes are generated by value added. Some value added is paid out as salaries, the rest is kept by firms and go to their owners (capital).

The other definition is total factor productivity, which combines labour and capital productivity. It is a more encompassing measure. This note only deals with labour productivity because it is easier to understand, because its measures are more widely available and because what follows applies to both measures.

### *Standards of living and labour productivity*

With these definitions at hand, we can clarify the first source of confusion. Income is measured per capita while productivity is measured by hours of effective work. The distinction between the two should be clear: not everyone is employed and, moreover, an employed person can work many or few hours. As a result we have the following decomposition:<sup>1</sup>

$$\begin{array}{ccccccc} \text{Growth rate of} & & \text{Growth rate of} & & \text{Growth rate of} & & \text{Growth rate of} \\ \text{income per capita} & = & \text{labour} & + & \text{hours worked} & + & \text{employment} \\ & & \text{productivity} & & \text{per employee} & & \text{ratio} \end{array}$$

This decomposition makes it clear that rising productivity is not enough to ensure an increase in income per capita (or living standards). If, at the same time as productivity rises, fewer people work (a decline on the employment ratio) and/or people work fewer hours, we can observe rising labour productivity and declining living standards.

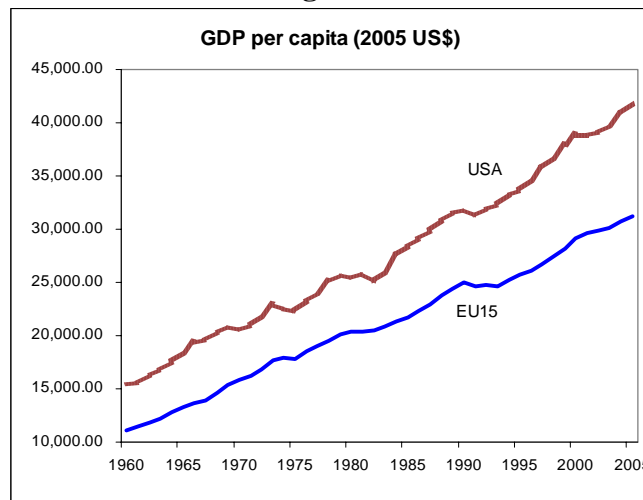
Figure 1 shows the evolution of GDP per capita (evaluated in 2005 US \$) in the EU15 and the US since 1960. The gap has never really been narrowed, it has in fact

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<sup>1</sup> If  $Y$  is GDP,  $H$  is total number of hours worked,  $E$  is total number of people employed and  $N$  is population size, income per capita is  $Y/N$  and productivity is  $Y/H$ . Then we have  $\frac{Y}{N} = \frac{Y}{H} \frac{H}{E} \frac{E}{N}$ . Note that  $E/N$  is the employment ratio and  $H/E$  is average hours worked per person employed.

increased. The first increase came in 1991 as a result of German unification. More worrisome is the gradual widening since the mid 1990s.

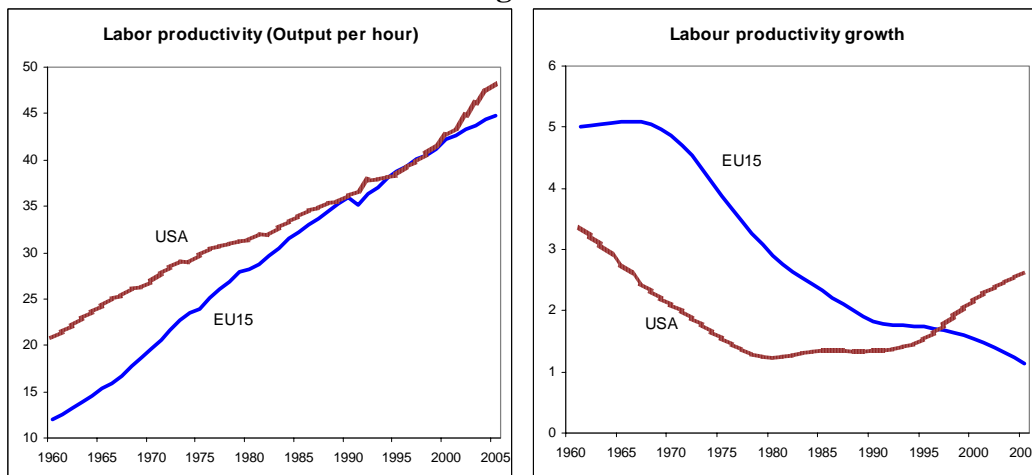
**Figure 1**



Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, September 2006, <http://www.ggdc.net>

How much of this is due to productivity? Figure 2, which displays productivity (also evaluated in 2005 US \$), provides the answer. Until the mid-1990s, Europe has been catching up with the US (left-hand chart). Yet, since 1960, productivity growth has been steadily declining in Europe while it has first declined and then risen in the US. The bad news for Europe is therefore the ‘productivity divorce that emerges in the mid-1990s. Over 1960-1995, the lack of convergence can be traced back to fewer hours worked per person. Both the employment ratio and the number of hours per employee have declined in Europe while the employment ratio has been rising in the US with smaller reductions in hours worked, as Figure 3 shows. Since the mid-1990s, as we will see later, the impact of Europe’s productivity growth falling behind that of the US has been mitigated by the evolution of the use of labour.

**Figure 2**



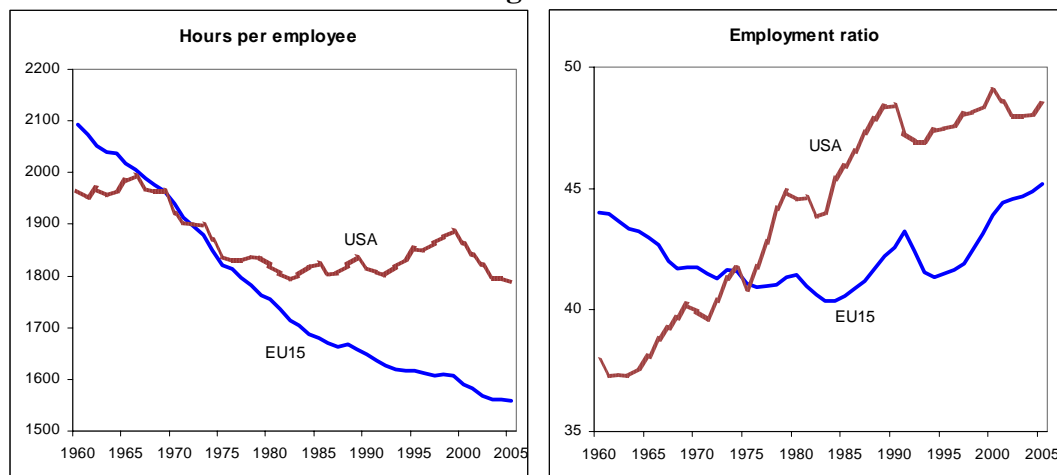
Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, September 2006, <http://www.ggdc.net>

## 2. Labour productivity

The second source of confusion lies in interpreting the reasons why labour productivity changes. Looking at Figure 2, one is tempted to see the closing-down of the productivity gap as the result of the ‘great catch-up’: following wartime devastation, Europe has restored prosperity by gradually raising its production capacities. Under this interpretation, the mission was successfully accomplished by the mid-1990s. This is somehow late. In addition, something bad happened then. What could that be? Explaining the evolution of the last decade will force us to reconsider – partly – the catch-up hypothesis.

Looking at the last decade, Figure 3 indicates that the decline of hours per employee has slowed in Europe, just it fell in the US after a long period of stability. Similarly the employment ratio has sharply risen in Europe while it has remained stable in the US. Thus the deterioration of European living standards relatively to those in the US (see Figure 1) since the mid-1990s is not due to a lesser use of the labour force, quite to the contrary. It is entirely due to the poor productivity performance in Europe while US productivity has accelerated, as the right-hand side chart in Figure 2 clearly shows.

Figure 3



Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, September 2006, <http://www.ggdc.net>

The catch-up hypothesis does not explain the reversal in productivity trends in Europe and the US. The reasons for this new, positive development are not yet fully elucidated. Dew-Becker and Gordon (2006), the most recent and authoritative analysis of the question, argues that the most plausible explanation is that labour market conditions have improved in Europe. Indeed, since the mid-1990s, many countries have reduced labour taxes and reformed their labour markets. This could explain why the total number of hours worked has increased. Does it also explain the deteriorating performance of labour productivity? According to Dew-Becker and Gordon, this more extensive of the workforce has mostly concerned previously not-working people, many of whom are low-skilled. On average, the overall workforce

has become less skilled. Since the late 1990s, exactly the opposite has occurred in the US, thus raising the average quality of the workforce. This would well explain at least part of the ‘productivity divorce’ revealed by Figure 2.

If this is true, it would also cast some doubt that the ‘great catch-up’ is the only interpretation of the ‘productivity meet-up’ that characterized the period 1960-1990. At least part of the story would run as follows. Rising labour taxes and increasingly more restrictive labour market arrangements during this period have forced firms to hire skilled workers. This upgrading of the workforce has raised labour productivity in Europe but it is, in Dew-Becker and Gordon’s words, “largely artificial, not fundamental”.

### **3. Three sources of productivity growth**

This interpretation brings up a key source of confusion. It concerns the question of what makes labour productivity grow. The catch-up view points to two ‘fundamental’ sources of growth. The first one is technological advances. Technology, some of which is embodied in a more knowledgeable workforce, is indeed a key driver of rising living standards since the industrial revolution. The second source of growth is capital accumulation, meaning more productive equipment – some of which is also more productive thanks to technological progress.

The catch-up hypothesis relies on these two ‘fundamental’ sources of growth. By 1945, as a result of the war, much of European capital had been either destroyed or had become obsolete for lack of investment during the conflict. In addition, European had already been distanced by the US in R&D. Over the next quarter century, Europe rebuilt its productive capital base. It also adopted US technology, upgrading its own R&D capacities. By the 1980s, it had caught up and growth slowed down on both accounts: no more need to accumulate capital faster than the US and it changed its status from adopter to co-producer of leading-edge technology, which takes from time than adoption.

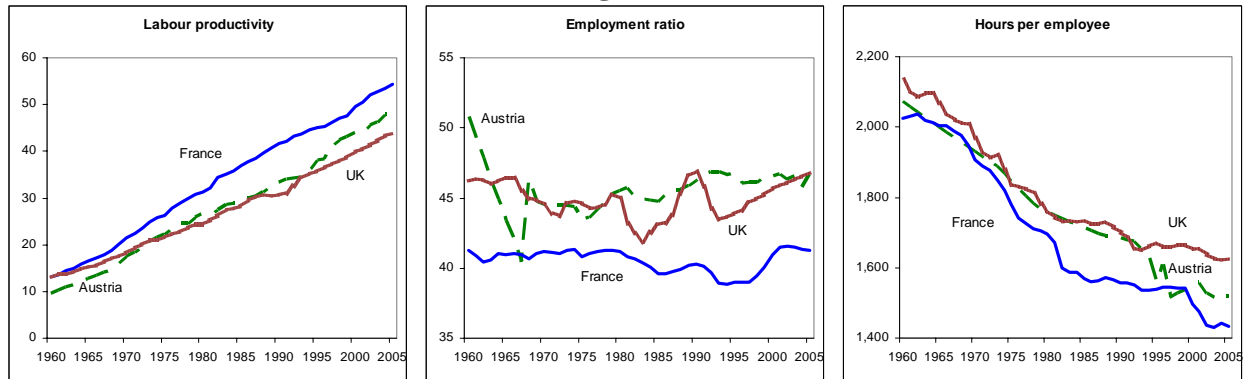
While the two ‘fundamental’ sources of growth played a major, and well documented role in Europe’s fast labour productivity increase,<sup>2</sup> there is a third, ‘artificial’ source of growth. The two first sources imply that causality runs as follows: technological change and capital accumulation raise labour productivity, which allows firms to boost wages. Put differently, when they are paid for by productivity gains, higher wages do not translate into higher labour costs. A different causality can set in, however. Rising labour costs force firms to raise labour productivity. To do so, firms have two margins of reaction. They accumulate capital faster, in effect replacing costly workers with relatively cheaper machines, and they replace unskilled with skilled workers whose are individually more productive. This reversal of causality implies that ‘artificial’ productivity gains are not driven by technology and normal capital accumulation.

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<sup>2</sup> It also played a role in the recent successes of Ireland and Finland, as well as in earlier successes of Spain and Portugal. It is currently propelling the new EU Member States.

How relevant is this third source of productivity growth? Some supporting evidence is provided by Figure 4. Among the European countries, France is arguably where labour taxes and labour market restrictions are heaviest, with the UK is at the other end of the spectrum. As expected, France has lower employment ratio and number of hours worked but higher labour productivity. Austria has long been close to the UK, until the early 2000s when hours worked declined and productivity started to rise. Thus France's high labour productivity is of the 'artificial' kind.

**Figure 4**



Source: Groningen Growth and Development Centre and the Conference Board, Total Economy Database, September 2006, <http://www.ggdc.net>

#### 4. A more microeconomic story?

An alternative view of the 'productivity divorce' has been popular over the recent years. It has been found that much of the US productivity miracle has been linked to the adoption of ICT (information and communication technology) in services and retail sectors, while Europe has trailed behind. This view is not seriously challenged, but is only part of the story. (It also leaves open the question why Europe has been slow in developing and adopting this technology.)

More generally, a number of studies have endeavoured to explain low productivity growth in a number of European countries by looking at particular sectors and many of them are quite popular. Dew-Becker and Gordon (2006) provide a detailed sectoral study of individual countries. While the ICT-adoption interpretation survives and thus explains some of the 'productivity divorce', they convincingly show that all sectors performed poorly in countries that have exhibited the worst performance in terms of living standards. Their conclusion is that "Europe has faltered across the board", not just in few sectors.

#### 5. Optimism?

There is a silver lining in the view that the poor recent labour productivity performance is a consequence of lower labour taxes and various measures that enhance the use of labour. To start with, it means that Europe's famous under-utilisation of its labour resources – and therefore its high unemployment rate – is now being cured. This is undoubtedly good news. Indeed, a key objective of the Luxembourg strategy is to raise unemployment ratios. It is good to see that it is happening, if not in all countries, at least in some of them.

The other good news has not materialized yet. Currently, we see a slowdown in productivity gains because more low-skilled workers find jobs. As firms adapt to this

change and invest in equipment that makes better use of these workers, we should see this ‘fundamental’ source of growth produce its effects. It takes several years for capital to accumulate but the process is most likely under way. In addition, a more intensive use of previously idle labour means that the same productivity gains translate into a faster rise in living standards. When this happens, Europe will be catching up again.

## **6. What role for the ECB?**

On 10 December this year in Stockholm, Edmund Phelps has been handed in the Nobel Prize in Economics. The award has been awarded in recognition for work that he carried out in the early 1960s. The key finding is that “the long-run rate of unemployment is not affected by inflation but only determined by the functioning of the labour market. It follows that stabilization policy can only dampen short-term fluctuations in unemployment. Phelps showed how the possibilities of stabilization policy in the future depend on today's policy decisions: low inflation today leads to expectations of low inflation also in the future, thereby facilitating future policy making.” (Citation of the Royal Swedish Academy of Sciences).

Forty years of intensive research have confirmed this discovery. This is why, nowadays, all central banks are required to deliver low inflation and to eschew any attempt at dealing with unemployment in particular, and growth or productivity more generally. There just is no link between productivity and monetary policy. The implication is clear: Europe’s productivity performance is unrelated to past and present monetary policies and the ECB should not be asked to deal with this problem. Should it try, it would fail, even if it could provide a temporary boost.

## **Reference**

Dew-Becker, Ian and Robert J. Gordon (2006) “The Slowdown in European Productivity Growth: A Tale of Tigers, Tortoises and Textbook Labor Economics”, Northwestern University.

**BRIEFING PAPER TO THE ECONOMIC AND MONETARY COMMITTEE  
EUROPEAN PARLIAMENT  
MONETARY DIALOGUE WITH THE PRESIDENT OF THE ECB  
DECEMBER 2006**

**Guillermo de la Dehesa**

**Chairman of the CEPR, Centre for Economic Policy Research, in London  
and of the OBCE, Observatorio del Banco Central Europeo, in Madrid**

## **HIGH GROWTH RATES OF MONEY AND LOW INFLATION IS THERE A CONTRADICTION?**

### **Executive Summary**

The answer is “no”, for the following reasons: First, contrary to some solid theoretical arguments, most available empirical evidence shows that the growth of money is not correlated with inflation in the short or even medium term (which is the ECB inflation target) and that it is, somehow, in the long run. Thus, inflation can still be low even if money aggregates have been growing faster than output for sometime. Moreover, long run correlation among money and inflation does not necessarily mean that there is a clear causal relationship among the two, because there are many other factors which can also affect inflation in the short and medium term (transitory nominal and real shocks, like oil shocks) and in the long term as well (institutional factors, like increasing globalization and deregulation, nominal rigidities in wages or prices or technological developments and innovation in financial products). This is the reason why, when some correlation was found, it was quite blurred and imprecise. Therefore, in economics, a theory can be contrasted by empirical evidence with different or even opposite results depending on the time lag.

Second, according to the relevant monetary theory and empirical evidence, money growth can affect output in the short and medium term, but only the price level in the long term, because money tends to be neutral to output in the long run while keep being positively correlated with inflation.

Third, the effect of money on inflation tends to be even less relevant in low inflation countries or when inflation expectations are low or well anchored (as are both in the Euro Area). Inflation expectations tend to be low when not expected by market agents, either because of their credibility in the central bank or their own rational behaviour or conduct or because there are major changes in the monetary transmission mechanism due to financial innovation or technological developments or even all of them at the same time.

Based on the previous evidences, most leading central banks have abandoned, in the last two decades, money growth targets and have switched to inflation targeting. Nevertheless, this does not mean that money cannot still play a role in monetary policy. First, money and credit growth may affect asset price inflation, which in turn may produce boom and busts in economic activity, which may affect the financial stability of the system and thus price stability as well. The present situation of high world liquidity chasing hard assets (whether real state, energy, commodities or corporate assets) is a clear example. Second, monetary aggregates, when properly analysed and used, can also provide incremental information about the inflation outlook in the medium term even in the case they are not used as targets or even as reference values. Third, The ECB should try to use money and credit aggregates information in the same pillar than economic factors by fusing both pillars into one, to avoid introducing more confusion about its monetary policy decisions, which tend to be supposedly based on the prominence of one over the other.



## HIGH RATES OF MONEY GROWTH AND LOW INFLATION

The recent ECB Monetary Conference about the role of money in the conduct of monetary policy has shown what it was to be expected, that the monetary academic world has compelling evidence about the lack of role of money as a determinant of inflation in the short or medium term and sometimes even in the long run. This large evidence and their own unsatisfactory experience with those aggregates, has made most leading central banks to slowly abandon monetary aggregate targets and adopt inflation targeting which, until now, has proved to be more effective and reliable than monetary targeting. Such is the case of the Bank of England, New Zealand, Australia, Canada, Sweden, Japan, South Africa and Brazil among others.

The ECB modelled its monetary policy strategy to that of the Deutsche Bundesbank and rightly so, as it needed from the start to gain high reputation and credibility and the latter was the central bank in continental Europe with the highest credibility in the world, thanks to having accumulated the longest history of price stability. But at that moment, monetary targeting was already not an option, given the high uncertainty about the demand of money in the Euro Area (EA). Thus, the decision to go to some weighted average of inflation targeting and monetary targeting was a sensible and pragmatic choice (Buiter, 2006).

Moreover, money growth targets were chosen in the sixties by most central banks because the quantity theory of money had been revived by Friedman (1956) becoming the new paradigm and because money growth targets had many advantages: they were easily observable and controllable by the central banks than inflation, they reacted more quickly and decisively than inflation, deviation from monetary targets were more easily perceived by financial markets making the central bank more accountable and money demand was supposed to be less unreliable and more stable at the Euro Area (EA) level than at the national level, given the high substitutability among EA assets.

In spite of all these advantages, in the last decade and a half, the link between money growth and inflation has become increasingly imprecise and blurred and the combination of low inflation, financial deregulation and innovation has been eroding the stability of monetary targets, making it progressively difficult for central banks to use money growth as a target.

Some monetary policy research started to show new evidence about these shortcomings in the second half of the 1990s. The large increase in financial deregulation and innovation was producing increasing changes in money demand eroding the link between money growth and inflation (Teles and Uhlig, 1996). Even the stability of money demand at the European level was found to be more of a mirage created by the law of large numbers than a reality given that it has not passed the test of the so-called "Lucas critique". (Lucas, 1976) European-wide aggregates were washing out country-specific idiosyncrasies and could render money demand less stable and reliable (Arnold and de Vries, 1998 and 1999). The introduction of Euro notes and coins tended

to change, even more, money demand behaviour (Scacciavillani and Sobczak, 2001)

Although the Bundesbank was very successful in keeping inflation under control for some decades, new evidence appeared (Bernanke and Mihov, 1997) showing that it missed its monetary targets very often. Between 1979 and 1997, it did miss them eleven times out of nineteen therefore its success was probably due to something more than to its money growth targeting. Thus both authors asked to themselves: Was then the Bundesbank, in reality, an inflation targeter?

Other research pointed out to the fact that is that there was no systematic relationship between monthly variations of M3 and central bank money (defined as the sum of bank deposits with the ECB and bank notes in circulation), which the ECB tries to influence directly through its refinancing operations. Moreover, the correlation between the stocks of central bank money and M3 appears to be very loose even over longer periods of time. This outcome contradicted textbook assumptions of a fixed money multiplier and pointed to the importance of the banking system in generating money growth. Therefore, manipulations of the stock of central bank money through refinancing operations would not help to bring M3 growth closer to its reference value. Rather, the ECB needed to use interest rate changes to influence money creation in the banking sector as well as real GDP and the portfolio preferences for liquid funds, which really determine the money demand (Mayer, 2000).

Moreover, M3 reference value was not been well measured. Using the same model of estimation of a stable function of the demand for M3 (that is, using an error-correction model, ECM) published by the ECB (Coenen and Vega, 1999), it was found that the money growth target of M3 compatible with a stable function of money demand was around 6%, instead of 4.5% (Dolado, 2000). At the same conclusion arrived other economists. Both higher potential GDP growth (due to a larger labour input growth and capital stock growth) and lower velocity of money (due to an increasing preference for liquidity, thanks to low inflation) increased the M3 compatible reference value up to 6.25% (Mayer and Walton, 2000), therefore, when the ECB justified the 0.50 p.p. increase in interest rates on the basis of M3 growing 6.1% 1.6 p.p. above the reference value, its decision was not well founded. The opposite happened when its decision in May 10 2001 to lower interest rates 0.25 p.p. was based on the perception that M3 was not a risk to price stability, because its Governing Council had probably realised that M3 was not being measured correctly and the reference value was not so relevant. This is the reason why the ECB had to revise the statistics behind the evolution of M3 in May and revise them again at the end of 2001.

The same happened before to most central banks that were using money growth targeting. They had to be continuously changing the measurement of M3, due to financial deregulation and innovation, until they decided to move to inflation targeting because it proved to be more efficient. Moreover, even a situation of a stable money demand function did not imply that monetary targeting was advisable or that the money growth indicator was a good predictor of future inflation (Rudebusch and Svensson, 1998). There was no evidence

that current money growth helped to predict future inflation in the Euro Area because there was no information in money growth that was not already available in other indicators (Trecroci and Vega, 2000) and (Gerlach and Svensson, 1999).

Finally, the two pillars seemed to stand next to each other with little apparent connection and the ECB related to one or the other to justify interest rate changes. Such a strategy led to confusion, the reason being that interest rate changes affect variables in both pillars. Thus, it would be wrong for the ECB to set interest rates with a view to specifically address M3 growth since an interest rate increase affects not only M3 growth but also economic activity. It would make only sense when strong M3 growth is associated with above potential economic growth which was not the case in the Euro Area, where inflation has been dominated by supply shocks (higher oil prices, due to heavy European oil dependency, higher food prices, due to serious health problems, and labour market rigidities and not by demand pressures.

Thus, the two pillars are interconnected and should be seen in conjunction. Although there are no signs of instability of the demand for money in the very long run, the short-term demand for money tends to be very unstable, inducing money growth to fluctuate substantially and over significant periods of time around its inflation neutral level without creating inflation. A reaction of monetary policy to these fluctuations could destabilise the economy (Mayer).

More recent evidence by some of the academics who prepared papers or were discussants at the ECB Conference in Frankfurt in November 6, 2006, insisted in the same issues and made very clear that:

"Money demand is no longer seen as the framework for monetary policy analysis... Conducting a rich monetary analysis is thus not contingent on the stability or otherwise of any single specification of money demand for a particular monetary aggregate"... (Fischer, Lenza, Pill and Reichlin, 2006)

"The rapid pace of financial innovation in the United States has been an important reason for the instability of the relationships between monetary aggregates and other macroeconomic variables: Forecast errors for money growth are often significant and the empirical relationship between money growth and variables such as inflation and nominal output growth has continued to be unstable", (Bernanke, 2006)

"As a matter of logic, monetary aggregates become irrelevant and uninformative for the design and prediction of monetary policy whenever the central bank uses the interest rate as an instrument of monetary policy, as in the case practically everywhere" and..."monetary policy can be effectively conducted to control price and output developments without any use or reference to monetary aggregates", (Woodford, 2006)

"A stable money demand relationship does not imply that monetary indicators are useful in assessing the risks to price stability ... and... money

demand instability has only made things worse.. but it has facilitated the downgrading of monetary indicators"... or ... "there is no evidence of a single episode in which interest rate decisions were made in accordance with the signals of monetary analysis, but against the evidence coming from the economic pillar (especially, consumer confidence)" (Galí, 2006).

Given this diverging views between most academics and some central bankers, the ECB Vice President, Lucas Papademos, who, as Ben Bernanke, is both an academic and a central banker, tried in his speech to achieve a consensus view for the Conference by including the following points:

First, that economic theory supports, both at the microeconomic level and the macroeconomic level, the view that money is the fundamental determinant of the price level over the medium and long term, and that money and its counterparts (notably credit) play a key role in the transmission of the effects of monetary policy to the economy.

Second, that today this theoretical consensus framework for monetary analysis is a synthesis that combines New Classical models of Lucas, real business cycle models of Kydland and Prescott, forward looking rational expectations models, nominal rigidities Neo Keynesian models, as those of Phelps, Calvo, Fischer and Taylor and "financial friction" models with wealth effects, asset price variations and credit and liquidity constraints.

Third, that the main problem today is that this major role of money developed in these models and apparently obvious by looking to reality, cannot be captured at all, or in a reliable manner, by empirical evidence tests conducted through econometric models. This apparent paradox could be due to several factors: to a low rate of inflation environment, to the fact that these models cannot be invariant over time to the central bank strategy, to technology advances, to financial innovation or to changes in preferences as a result of demographic shifts or to changes in the monetary transmission mechanisms.

Fourth, that, nevertheless, it still can be achieved incremental information at the ECB monetary analysis by employing a variety of tools in a manner that is mechanical but that it combines judgment and analytical rigor in reaching money-based assessments of the risks to price stability. By also developing new empirical research which could help to find better results about the role of money in inflation, such as using VARs of vector auto-regressions and, finally, by recent new econometric research, which develops a "state of the art" dynamic stochastic general equilibrium model for the Euro Area economy, based in more solid micro-foundations, which may one day find out enough evidence about the role of money in predicting inflation in the medium run.

Fifth, that when these tools will be well developed and perfected, it would be possible to merge the two pillars of the ECB analysis into a single one, in which money will continue still to play a prominent role in guiding monetary policy decision making.

This idea of merging the two pillars was initially proposed by Svensson (2000), when he pointed out that a combination of the first and second pillar would be a good decision, given that all the information in the monetary aggregates, which have implication for future inflation, should be combined with other relevant information such as the output gap estimates, cost and wage developments, international developments, exchange rate developments and private inflation expectations, in order to construct more reliable inflation forecasts, make monetary policy decisions less confusing and easier to explain to the markets and thus, gain more credibility both with markets and with academics.

Sixth, that, by contrast, there is ample empirical evidence about the role of excessive growth of money and especially of credit in developing asset bubbles and that excessive liquidity growth can be associated with asset price boom episodes followed by post-boom recessions, therefore, affecting financial stability. A very narrow focus of monetary policy on price stability in the short run might pose risks to price stability in the long term, if the potential consequences of financial stability for long term price developments are overlooked. Thus, there is no conflict between the conduct of a monetary policy focused on the preservation of price stability over the medium and long term, and the safeguarding of financial stability, they should be mutually reinforcing.

Finally, that it is also worth keeping in mind the implications of the rapidly changing global economy, which is affected not only by productivity developments related to technological advances and the process of globalization but also by financial innovation and increasing complexity of financial instruments. All these factors have a bearing on the dynamics of the inflationary process and the evolution and information content of monetary and credit aggregates.

The ECB President Jean Claude Trichet, in his final remarks at the closing of the Monetary Conference, was much more cautious and he recognized that:

First, the initial choice of strategy by the ECB was a natural continuation of previous best practice, while, at the same time, incorporating new insights from economic theory and the experience of other central banks. That initial decision has been essential to the high credibility that the ECB has enjoyed since its inception as it was explained by Issing (2006).

Second, that there were many good reasons to recognize explicitly the monetary nature of inflation and by assigning an important role to money in the formulation of monetary policy decisions, both aimed at the maintenance of price stability.

Third, that new state of the art macroeconomic models being developed at the ECB were eventually going to better reflect the role of money and credit aggregates in such a framework, so that monetary analysis be used to monitor and possibly offset macroeconomic risks which are not related to price stability at shorter horizons, but which may nevertheless have important consequences

for maintaining price stability over the medium and long term, like risks to financial stability.

Fourth, that the present practical challenge of conducting monetary analysis requires the adoption and employment of practical and fully operational tools. Thus, the careful analysis of monetary developments in real time is helping the ECB to shape its assessment of the economic situation and of the associated risks to price stability in order to better identify the nature of shocks impacting the Euro Area economy.

Fifth, that it is particularly important to present the monetary analysis to the markets and the public in a manner that serves to stabilize private sector long-term inflation expectations by clearly signalling the ECB alertness with respect to risks to price stability at longer horizons, by being very transparent in order to enhance the effectiveness of monetary policy and by communicating very clearly its policy objective.

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# High growth rates of monetary aggregates and low inflation

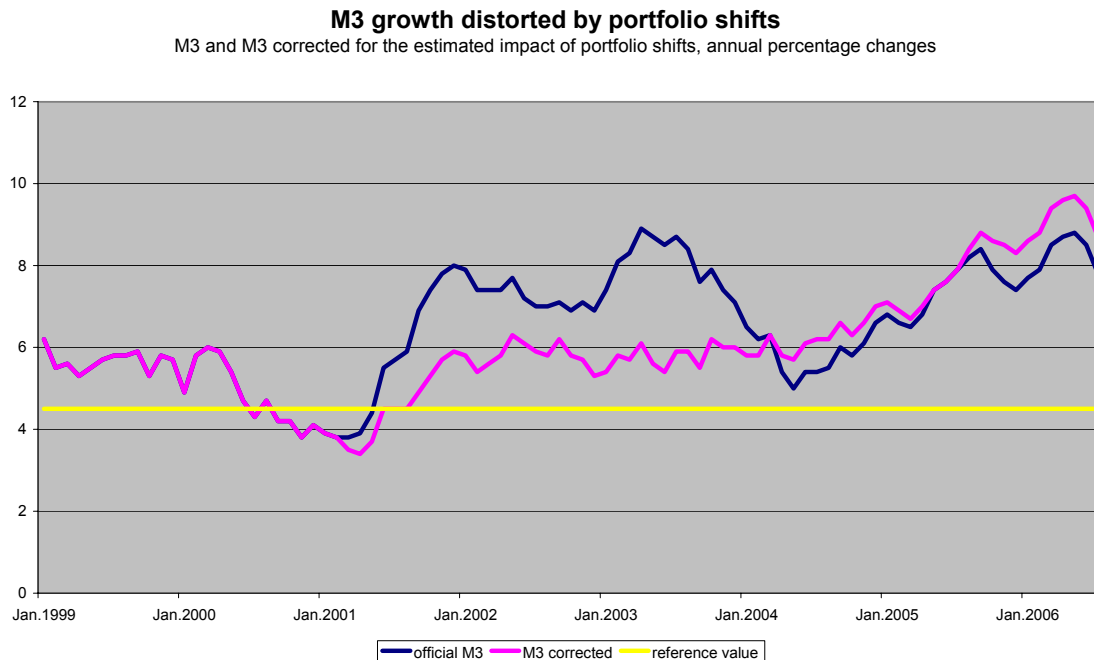
By Dr. Jörg Krämer, Chief Economist, Commerzbank AG

## Executive Summary

Since the middle of 2004 strong growth of money supply M3 has no longer been driven by unusually high uncertainties such as falling equity prices, a US recession or terrorists' attacks. Instead, excess liquidity has been caused primarily by strong credit growth. Empirical evidence suggests that this excess liquidity represents inflationary risks – both for goods/services prices and asset prices. Insofar, the ECB has been right to normalize its key interest rate.

## I. Sources of high liquidity

Since the middle of 2001, money supply M3 has grown significantly in excess of the 4.5% reference value set by the ECB (**chart 1**).



- Chart 1 -

To explain this creation of excess liquidity it is useful to distinguish two sub-periods.

1. Middle of 2001 to middle of 2004: This period was characterized by high economic and financial uncertainty. In late 2000, the equity markets started to tumble after indices had risen to unsustainable levels in 1999 and 2000. The EuroStoxx 50 fell by about 60% from the peak to the trough (spring 2003). This also took a toll on the economy, especially on capital expenditure, which had risen to excessive levels during the equity market boom. As a consequence of the worldwide financial uncertainty, the US economy slid into recession in 2001. The euro-zone economy barely grew in this period. The uncertainty was further increased by the terrorists' attacks on Sept 11, 2001.

This unusually high uncertainty caused euro-area residents (private households and non-financial firms) to shift their funds out of risky assets such as equities into less risky assets which are often part of M3 and which thus boosted the official M3 growth rates. This does not signal inflationary risks, as this part of liquidity will not normally be used for the purchase of goods or services. Instead, these portfolio shifts are usually reversed once the period of high uncertainty is over.

The ECB has corrected money supply M3 for the estimated impact of such portfolio shifts. It should of course be borne in mind that such corrections are difficult to make; different methods lead to significantly different numerical results. Money supply M3 corrected by the ECB for the impact of portfolio shifts suggests that about two thirds of excess liquidity can be explained by portfolio shifts (**chart 1**). In other words: Portfolio shifts cannot fully explain why excess liquidity rose above the 4.5% rate between the middle of 2001 and the middle of 2004. This is also a consequence of a monetary policy which was quite expansionary. In this respect, the ECB cannot fully hide behind the portfolio shifts.

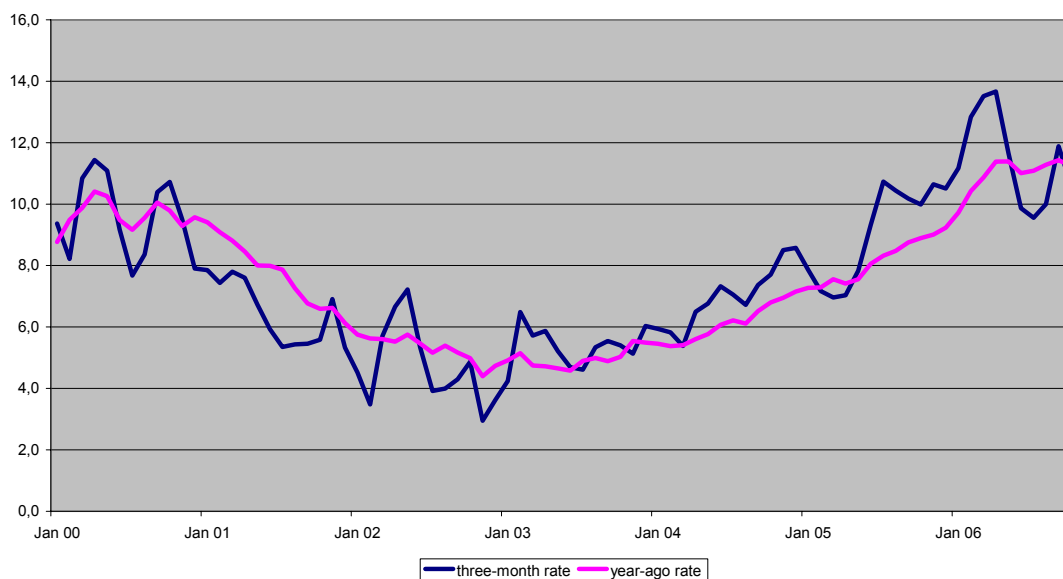
2. Middle of 2004 until present: The period starting in the middle of 2004 was characterized by a decline of uncertainty. The increase in equity prices which had started in spring 2003 proved to be not only a bounce back after the previous stock market collapse. Instead, equity prices have risen quite steadily since then. Moreover, the US economy has been growing quite rapidly since the middle of 2003.

The decline in uncertainty should have caused euro-zone residents to unwind the portfolio shifts which had boosted M3 between the middle of 2001 and the middle of 2004. This indeed happened as the official M3 figures grew by less than M3 corrected for the estimated impact of portfolio shifts (**chart 1**). However, the undershooting of M3 relative to M3 corrected has been far smaller than the overshooting between the middle of 2001 and the middle of 2004. This suggests that euro-zone residents unwound only a small part of the portfolio shifts. This raised questions about the correction method used by the ECB. The ECB's method could well have attributed too much of the excess liquidity problem to portfolio shifts.

Another reason to worry is the fact that money supply growth has been driven by a more rapid rise in lending to the private sector since the middle of 2004 (**chart 2**). Since early 2005 lending momentum has risen by double-digit rates. This is consistent with the observation that the more liquid components of M3 have shown increased dynamism. The ECB is thus right to stress that the monetary analysis points to significant upside risks for price stability.

### Strong lending momentum since 2005

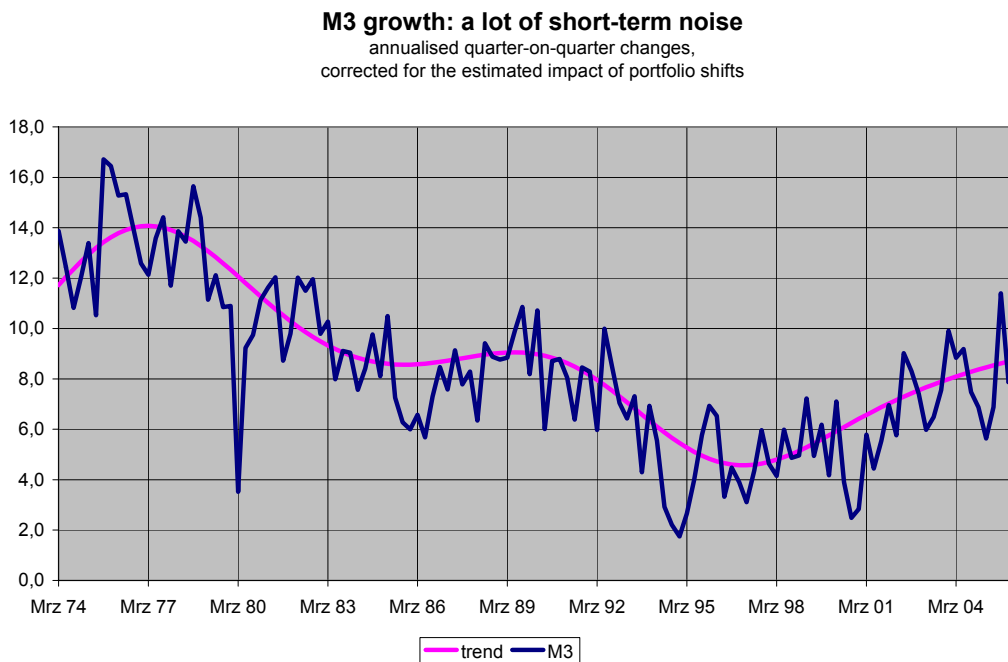
lending to the private sector, various annualized rates in per cent



- Chart 2 -

## II. Does money matter for inflation?

If we think that the recent increase in liquidity signals inflationary risks for the future, then we will have to assume that there is a stable relationship between money supply M3 and prices. However, this relationship holds only in the long-run. Therefore, monetary policy makers have to adjust money supply figures for short-term fluctuations. **Chart 3** demonstrates that a huge part of the movement in the growth rate of M3 is caused by short-term volatility.

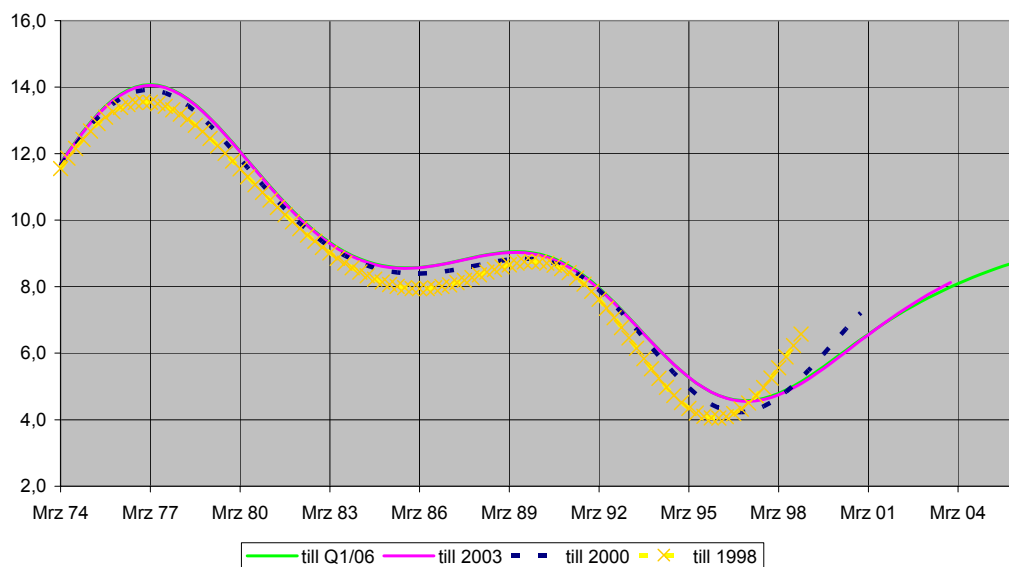


- Chart 3 -

However, adjusting M3 growth rates for short- and medium-term fluctuations involves an estimate of the underlying trend which is not very reliable. **Chart 4** shows that the underlying trend estimated by such statistical filter methods (Christiano-Fitzgerald band-pass filter) changes significantly if additional data are released and taken into account. For example, the initial estimate of M3 growth (based on data up to 1998) suggests a trend growth rate of almost 7% for spring 1998. However, the final estimate (based on data up to Q1 2006) suggests 5% for spring 1998. This is a difference of 2 percentage points which is a lot compared to the 4.5% reference value set by the ECB for M3 growth.

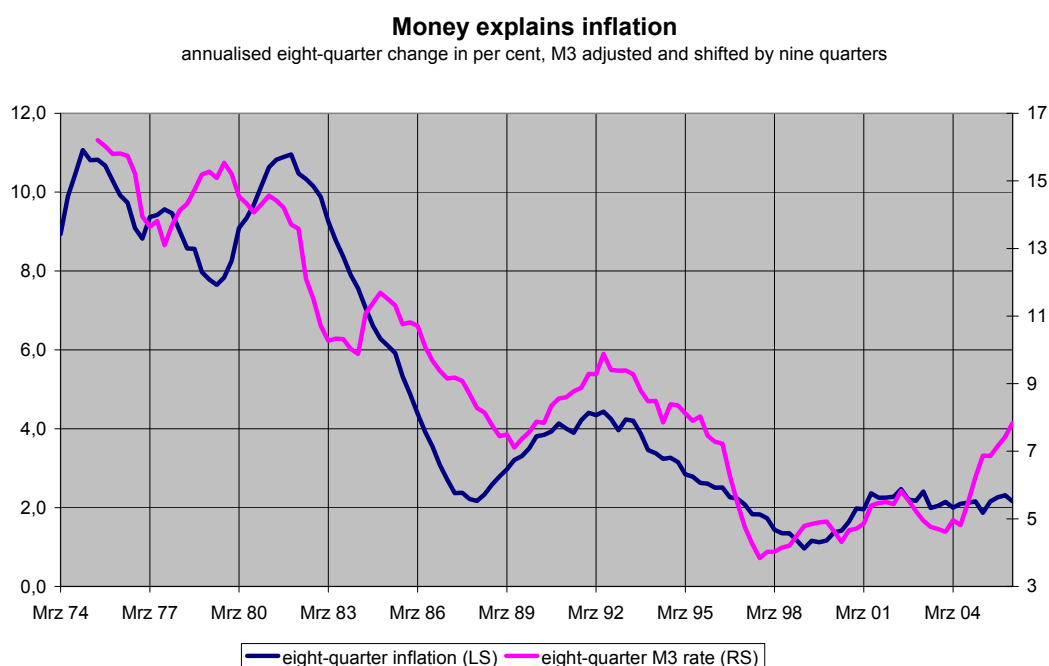
**Underlying trend of M3 growth: difficult to determine at the end of the sample**

annualised quarter-on-quarter changes,  
corrected for the estimated impact of portfolio shifts



- Chart 4 -

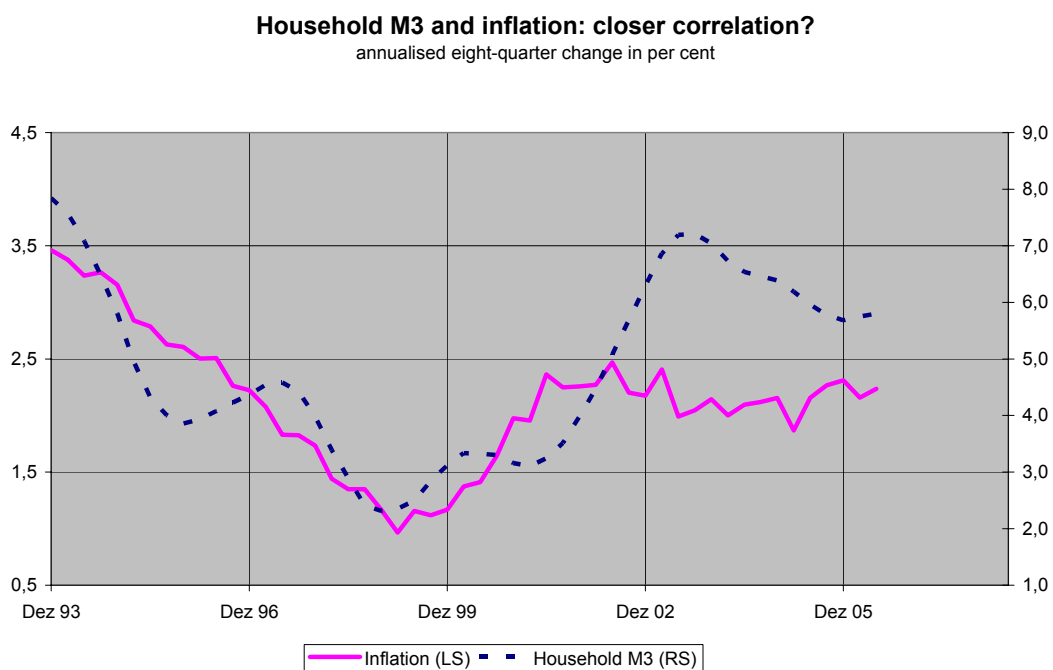
To avoid this problem money supply and prices should be adjusted not by statistical filters but simply by averages which get not revised if the sample is enlarged. We adjust money and prices for short-term volatility by calculating the annualized change of money and prices over eight quarters. With the help of this adjustment method, it becomes apparent that changes in money supply can explain changes in prices (i.e. inflation) on average nine quarters ahead (**chart 5**). Even if not M3 is taken, but M3 adjusted for portfolio shifts, then the analysis suggests accelerating inflationary risks: The trend growth rate of M3 points to inflation rising to 4%, significantly above the ECB's definition of price stability of close to, but below 2%.



- Chart 5 -

Sceptics might argue that money supply M3 is not held only by consumers but also by non-financial corporations (i.e. firms which are not banks) and that their holdings are less relevant for consumer price inflation. In its September 2006 monthly bulletin, the ECB indeed wrote that the long-term relationship between M3 holdings by private households and consumer prices may be closer than between overall M3 and consumer prices.

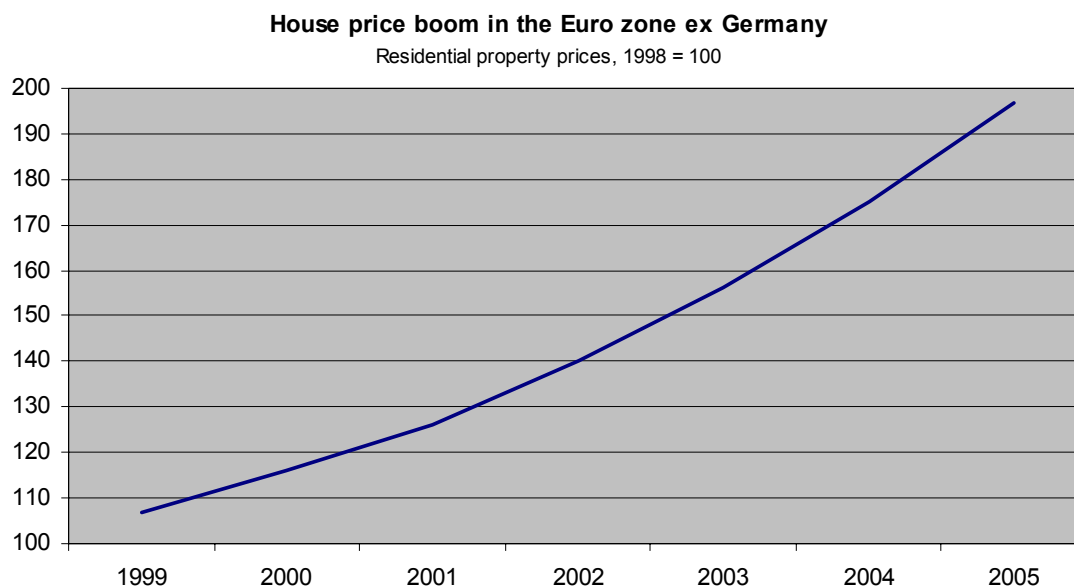
While we do not want to give an answer to this question, the graph indeed suggests that the long-term correlation between M3 holdings by private households and consumer prices is not bad (**chart 6**). It also reveals upside risks to inflation – even though M3 holdings by households overshoot overall M3 by a lesser extent.



- Chart 6 -

However, this does not necessarily mean less inflation. Excess liquidity can cause not only rises in the prices of goods and services (“traditional” inflation) but also asset price inflation. The ECB concentrates on “traditional” inflation. But it can not afford to ignore asset price inflation which is already visible in the euro zone.

- Excluding Germany, euro-zone house prices have risen by 45% since the creation of the EMU (**chart 7**). This is nearly as strong as house price inflation in the 2<sup>nd</sup> half of the eighties, when Japan experienced its house price bubble. The house price boom in the euro-zone can lead to problems in the future, as a correction in house prices could lead to insolvencies of private house builders and potential bad loan problems for banks.

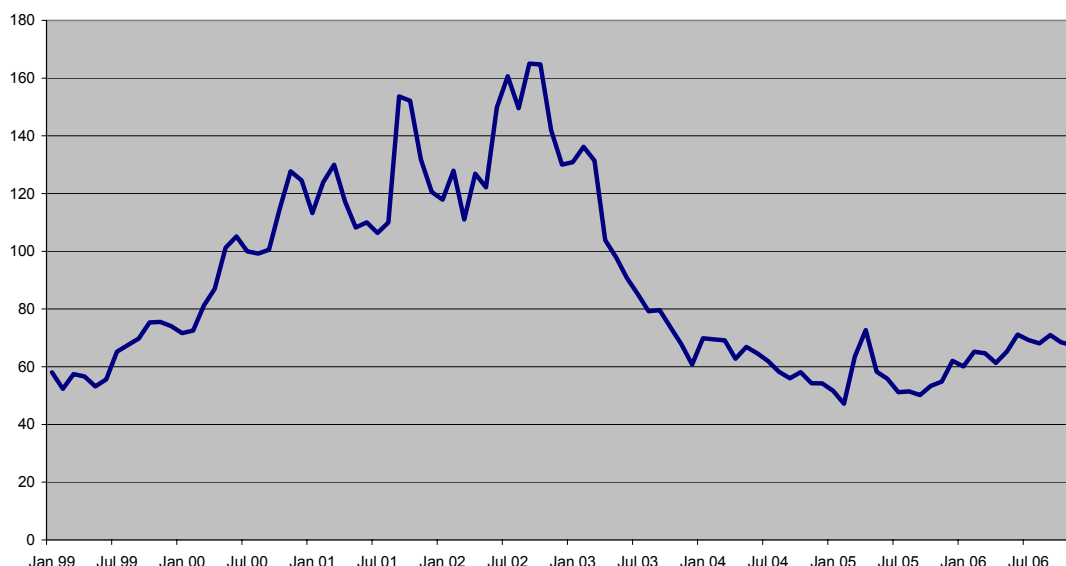


- Chart 7 -



- Yield spreads of corporate bonds over government bonds remain at a very tight level (**chart 8**). This may cause investors to take positions which later turn out to be too risky and may lead to instabilities in financial markets. Furthermore, artificially low risk premia make investment in machinery appear to look profitable. If these investments turn out not to be profitable, firms may cut back investment in the future, which would lead to weak economic growth or even a recession. The US recession following the bursting of the equity market bubble in 2000 was mainly caused by falling investment, which had reached record highs during the equity market boom of the second half of the nineties.

**Corporate bonds offer little pick-up in yield over government bonds**  
 MSCI Euro Credit Non-Financial Corporate Spread, end-of-month figures in basis points



- Chart 8 -

Whether excess liquidity inflates goods/services prices or asset prices – the consequences for the economy are unwelcome. Therefore, the ECB’s decision to give money a prominent role in its decision-making process and to normalize the interest rate level was absolutely right.

### **III. Do low inflation expectations cause low inflation forever?**

Some observers say that inflation is merely driven by inflation expectations, which remain low due to the high credibility of the ECB.

The logic of this argument is totally right. However, the credibility of the ECB is not exogenous. If the ECB brings too much liquidity into circulation, then somewhere in the future euro-zone residents will start to question the reputation of the ECB. In this respect, the prominent role of money is one precondition for low inflation expectations which in turn are important to keep inflation in check.

# **High growth rate of monetary aggregates and low inflation**

**Jean-Pierre Patat**

## **Executive summary**

It is now generally accepted in the economic profession that inflation is ultimately a monetary phenomenon. In the long term, money affects inflation with an approximate lag of two years due to nominal and expectational rigidities.

During the 70's and the 80's this analysis framework led to control the supply of money via the monetary aggregates. During the 90's, financial liberalization and innovations induced profound instability in money demand. The link between monetary trend and output (V) became unstable. As a result, central banks have paid decreasing attention to monetary aggregates.

Nevertheless, the ECB has given a prominent role to money in its strategy, with a quantitative reference value (which is not a target) for the growth of a broad monetary aggregate M3. As the growth of M3 has since 1999 almost permanently exceeded the reference value of 4,5% without any apparent alarming rate of inflation observed, economists have criticized this and have called into question the role of monetary aggregates expansion in the inflationary process.

In fact, a large part of the high growth of M3 has been due to important portfolio shifts which did not reflect any inflationist anticipation but mainly, as a result of increasing uncertainty since the end of 2001, some reluctance to invest in long term assets. So, an M3 series adjusted for the estimated impact of the portfolio shift, showed a relatively modest acceleration until 2004, more in line with the moderate strengthening of inflation since 2002.

Recent observation of the adjusted M3 shows a marked acceleration of monetary growth during (approximately) the past two years with a prominent role of credit in this expansion, while portfolio allocation behaviour has normalised.

Inflation forecasts of the ECB for 2007 mention average rates of 1.9 to 2.9%. An inflation rate of 2.9% would be in line with a surge of M3 growth, and according to the lags in expectations, this level of inflation could be observed right from the beginning of 2007 as we

have already observed a strengthening of economic growth rate up to capacity. Of course, the evolution of the exchange rate and of the prices of imported goods could affect this scenario.

A crucial factor of the transmission mechanism of strong monetary growth on prices will be the credibility of monetary policy.

The ECB has great credibility in price stability as shown in the evolution of the yield curve in parallel with successive increases of central bank rates.

This credibility would probably be weakened if the ECB abandoned the M3 aggregate in its monetary strategy as that could lead to misleading interpretations.

Interest rate policy is an element of this credibility as growth of money supply, by increasing real balances, leads to inflationary pressures if real interest rates remain low.

Surge in real-estate prices, with the risk of speculative bubble is further a consequence of strong money supply via banks lending at low rates. Although housing prices are only partly reflected in the HICP, they are an important factor of inflationary expectations and it is crucial that the successive rises of the central bank tender rate be reflected in the banks lending conditions in order to moderate demand and allow a soft landing of the market.

1) It is now generally accepted in economics circles that inflation is ultimately a monetary phenomenon. This assertion cannot be considered as a total agreement with the Milton Friedman affirmation according to which: "inflation is always and everywhere a monetary phenomenon". Indeed, the further back we look historically, cumulatively the correlation between money, growth and inflation is greater.

Correlation is not causation. To deepen the role of money it is important to assess the central role of expectations which cause more or less long lags into the process by which changes in money stock lead to changes in inflation. So, an unexpected increase in the money supply reduces the real interest rate if the expectations are slow to adjust. This raises expenditures. If prices and wages are also slow to adjust to higher demand, there is, in the short term, more supply of output. However, when the pressures on capacity in the economy rise, workers ask for higher wages to reflect increased demand hence both wages and prices increase. So, in the short term, money affects real variables, and in the long term inflation, with an approximate lag of two years, which accords with most historical observations.

Of course, inflation can have non-monetary original causes, by example a sharp increase in imported goods, but this inflation cannot last or strengthen without a rising money growth.

This analysis framework is the cornerstone of the strategy of all those who are in charge of monetary policy: a lot of declarations of central bankers in Europe, Japan and the US confirm the fact that price stability needs a medium term outlook.

During the 70's and the 80's, this view led logically to control the supply of money, that is to say monetary aggregates which became central to the conduct of monetary policy. Monetary aggregates are the "thing" of which central banks are supposed particularly skilled for measuring and adapting their limits and their composition to changes in the financial field. . According to a relatively stable relationship between the growth of M1( notes, coins and overnight deposits), and then of M3 (M1+ time and saving deposits, and short term bonds issued by financial institutions), i.e.. the velocity of money (cf infra), most of central banks publicly announced targets for the growth of monetary aggregates which were considered as good "forward looking" instruments and so, being suitable for the crucial ability of a central banker to correctly anticipate inflationary risks.

If we consider this evolution since the beginning of the 90's, it is evident that the attention paid by central banks to monetary aggregates has declined.

It can be considered as rather paradoxical that as price stability has become recognized as the main objective of central banks and monetary policy, less and less attention was paid to the movements in the quantity of money, i.e.. monetary aggregates.

The most spectacular evolution in this issue has been observed in the US where the Fed (which was a pioneer in the use of monetary aggregates as strategic intermediary objectives) was relieved of the statutory requirement, imposed in 1978, to report twice a year on its targets ranges for the growth of monetary aggregates.

Indeed, during the 90's, financial innovations, creations and developments increased dramatically. This movement has particularly affected a lot of products which were supposed to reconcile the traditional preference of savers for liquid and non-risky instruments (which is the initial definition of money) and their appetite for high returns more easily obtained with marketable investments. So the traditional border line between money (financial assets very liquid and without any risks on the invested capital) and non-monetary instruments (mainly the marketable investments) has weakened, and central banks included in the broader monetary aggregates (M3) financial instruments which can be called as “bat” instruments, as, according to the general financial framework and the expectations of the holder, they can be considered as money (i.e.. likely to feed into the demand on the good and services market) or as with stable saving assets: mutual funds shares, short term marketable bonds are the more emblematic examples of this new financial and monetary field.

New financial products and new behavior of the economic agents, but also financial liberalization and changes in the technology of payments and settlements, induce and encourage frequent and volatile shifts in the demand of supposed monetary and non-monetary financial assets. In other words, the links between the respective evolutions of money stock and the variations of economic output (or GDP at current prices), i.e.. the velocity of money, have become very unstable and unpredictable at short-medium term. As a result, central banks have paid decreasing attention to monetary aggregates as intermediate indicators and a forward looking instrument of their policy stance. This radical change has occurred after many attempts to adapt aggregates to changes in the financial field: narrow aggregate M1 which was the money stock of the Keynes and Friedman reasoning was abandoned. Even the broad aggregate M3, including the most representative “bat” financial products did not, in many circumstances respond to the attempts by central banks to manage monetary policy.

”We didn’t abandon monetary aggregates, they abandoned us” said a governor of the Bank of Canada.

Does that mean that central banks don't believe anymore in the links between money and prices? Not at all! However, the difficulties in correctly measuring the money stock lead monetary authorities to set an interest rate for supplying an appropriate quantity of money to economic agents.

3) When the Eurosystem became responsible for monetary policy in the Euro-area in June 1998, it elaborated a technical framework consisting of two "pillars", organizing the information and analysis underlying policy decisions and the forward looking assessment of the economic situation.

The first pillar of the Eurosystem and ECB strategy is a prominent role for money. In a lot of its documents, the ECB explains very clearly that there is remarkable empirical evidence for a stable long-run relationship between price level and money measured by a broad aggregate.

Accordingly, the ECB adopted a quantitative "reference" value of 4,5% for the growth of the broad monetary aggregate M3. This reference value embodies the definition of price stability as an increase in the HICP below 2%, a medium term assumption regarding potential output growth, i.e.. 2-2,5%, and a supposed decline of the velocity of money of ½-1% per annum.

The reference value is not a monetary target as the ECB states, which explains that deviations of M3 growth have to be very closely analyzed to extract pertinent information and recognizes that there are currently a lot of reasons for non-mechanical responses to these deviations:

- a) structural changes in the velocity of money;
- b) changes in the structure of banking and financial system (which by themselves affect velocity);
- c) special factors caused by institutional changes (by example modifications to the tax treatment of income or capital gains on financial assets).

In other words, the ECB, like the other central banks doesn't manage its monetary policy in trying to directly control money but rather to set interest rates as the determinant factor for supplying an adapted quantity of money. However, unlike most other central banks, it publicly assesses the variations of money stock and gives economic agents its estimate of what would be the appropriate growth of the quantity of money.

The ECB also closely analyses other financial and monetary variables in the first pillar:

- a) developments in the components of M3;
- b) changes in credit extended to the private sector.

In addition, it appears that the ECB pays as much if not more attention to the second pillar as to the first. The second pillar includes a large range of other economic variables, some of them, productivity, salaries, unit labor costs, inflation indexed bond yields (which can give useful information on inflation expectations) being absolutely crucial for prices developments assessments.

In spite of this very pragmatic approach, the attention paid by the ECB to the growth of a monetary aggregate has been generally considered by most analysts and economists as a regrettable (if not ridiculous) attachment to an old fashioned monetary policy concept, and the institution has been qualified as “monetarist”, which is not regarded as a compliment in Europe, especially in some countries (France!)

**4)** Critics against the supposed “monetarist” approach of the ECB were greatly enhanced by the fact that, since 1999, the growth of M3 has almost permanently exceeded the reference value of 4,5% without any apparent alarming rate of inflation to be observed.

The trend of M3 was about 5,5% in 1999. Since 2001, a sharp surge has been observed, and, except in the middle of 2004, M3 growth has been up to 7% and sometimes (it is the recent case) up to 8%.

During the same period, inflation was not flat: the HCPI which was slightly below 1% at the beginning of 1999, increased progressively and has remained between 2 and 2,5%, since the beginning of 2002, slightly above the 2% quantitative definition of price stability of the ECB. One can argue that the limits of an acceptable inflation have changed with globalisation and that it seems very doubtful the levels of the 70's and the 80's come back. One could observe that in a very competitive world, 2% inflation is a good limit (it is also a guarantee of purchasing power for modest employees as the need to preserve competitiveness implies a strict monitoring of unit labor costs) , 3% a worrying situation and higher levels signs of a heavy loss of competitiveness. In that sense, one cannot say that there is a total disconnection between the growth rates of M3 and inflation and that the inflationary risk has become a myth.



Anyway, the relatively modest strengthening of the inflation rate during the last five years seems by far not in line with the important gap between the trend of M3 and the reference value of 4,5% that the ECB did not modify. As the most recent inflation figures show a decrease below 2% (1,6% in September), many economists and analysts have some questions on the significance and the impact of the M3 growth of 8% (and sometimes more) which has been observed since the mid 2005.

Some partial responses to these questions have been given by the ECB itself in its regular monetary analyses.

5) Money has many origins, summarized in the concept of “counterparts” of the money stock. These counterparts are: credits extended by monetary institutions (mainly the banks) by far the most important, net monetary position vis a vis the non residents (or put more simply, the net inflows and outflows from and toward outside) and changes in non-monetary liabilities of the banking system. The two first counterparts represent the financing or money supply, with active involvement of financial institutions. The third counterpart can be considered as representative of the money demand of non-financial economic agents: indeed, money issued by banks in granting credits and buying foreign currencies fuels the production and exchange cycle and ultimately benefit to the income and cash of economic agents who are not the same as those who benefit from money supply (credit is issued at 50/50 for firms and households and money is held at 80/20% by households and firms). Households and firms hold money for a variety of purposes: to finance regular expenditures ( transactions demand), to bridge the period between unsynchronized payments inflows and outflows (precautionary demand), and as an asset in terms of a saving vehicle (speculative demand). The latest demand is not correlated with incomes and transactions and is mostly concerned with the choice between holding money and holding alternative assets. According to the general economic and financial framework, situation of the stock market and expectations, economic agents will adjust the composition of their financial assets, holding more or less money and investing more or less in non-monetary assets, long term bonds, stocks and insurance products. Insofar as the counterparts of these portfolio choices are monetary institutions, they are reflected in the non-monetary liabilities of the banking system.

One can argue that whatever the counterpart may be, a surge in money growth is worrying. In fact, considering the demand for money or portfolios choices, it is important to assess the motivations of these choices. If they are caused by pessimistic expectations on future inflation

and the strong willingness to reduce stable saving and be more liquid it is clear that the monetary authorities must pay attention to these behaviors.

Insofar as, at least until mid 2004, the non-monetary liabilities of the banking system, i.e. the portfolio choices of economic agents have played an important role in the growth of M3, the ECB, analyzing the motivation of these choices, concluded that they did not reflect any inflationist anticipation but mainly, as the result of rising uncertainty since the end of 2001( 11 of September, bursting of the so-called internet bubble etc.), some reluctance to invest in long-term assets (particularly in the stock market) and a temporary preference for more liquid assets. These portfolio shifts benefited mainly money market funds, share/units and short-term monetary institutions` debt securities, which are, at least in theory, more typically used as saving vehicles than for transactions.

As a result, the central bank has constructed an M3 series adjusted for the estimated impact of the portfolio shifts. Using this series shows a relatively modest acceleration of the growth of the aggregate, from an average rate of 5-5,5% in 1999-2000 to an average rate of 6% in 2001/2003, much more in line with the moderate strengthening of the trend of inflation.

6) If portfolio shifts into monetary assets, this clearly constitutes an important source of M3 growth, via a stronger money demand; between 2001 and mid 2003, it appears that, according to the estimations of the ECB, portfolio allocation behaviors normalized from mid-2003 to 2004, were neutral in 2004 and until mid-2005, and have resumed over recent months.

Since approximately mid 2005, the global source of the M3 expansion has been money supply via credit granted by monetary institutions, especially credits to the private sector. The annual growth rate of these credits has increased to more than 11% in 2006 from 9,5% in December 2005 and 7,1% in December 2004. If we refer to the ECB bulletin, M3 growth, adjusted for the estimated impact of the portfolio shifts is now slightly up the growth of the non adjusted aggregate, which means that, other things equal, portfolio shifts have a negative impact on the variation of the money demand .

According to this analysis it can be assumed that the “adjusted” M3 growth has surged from 6% in 2002-2003-2004 to more than 8% to day.

Another source of concern is the fact that the narrow aggregate M1 has been, until mid 2006, the main contributor to M3 growth (when during the period 2001/2003, marketable short-term

assets were preferred by economic agents (cf supra). Currency in circulation continued to grow at a high rate, but mainly because of a strong demand by non-residents (estimations suggest that between 10 and 20% of the euro banknotes in circulation reflect demand from outside the euro-area). In spite of this, overnight deposits have shown continued strong growth since 2003 with an annual rate of growth up to 9% up to June 2006. Low interest rates in reducing the opportunity cost of holding money have been at the origin of this strong preference for assets on which interest is low and even equal to zero in some countries. In recent months, in line with the rises of the ECB rate, M1 expansion declined to 7%. Nevertheless an important buffer stock of totally liquid assets remains held by economic agents, especially by households.

To conclude, observation of the adjusted M3 shows a marked acceleration of monetary growth approximately during the two last years, of which credit has a prominent role in this expansion. According to a supposed time lag of about two years between monetary trends and price level, one may seriously ask if the present situation is not a potential source of future inflation.

7) Inflation: ECB forecasts for 2007 mention an average rise of 1.9 to 2.9%. That means that the central bank considers that there are as many reasons for the money expansion to provoke surge in inflation as for the incidence of this expansion to be weakened by a lot of factors.

An inflation of 2,9%, which is a high level in the current globalised economy, would be in line with the surge in M3 growth. According to a more or less long time lag in expectations, such an acceleration could be observed right from the beginning of 2007, as, moreover, the President of the ECB predicts (but he is perhaps reasoning with the “base effect”: as inflation was flat during the first months of 2006, annual rates of the first months of 2007 could be rather high).

In any case and according to the transmission mechanism of an unexpected money growth, economic agents real money holdings have increased which is a stimulating factor for expenditures on items such as investment and consumer durables, we may observe a strengthening of economic growth in the Euro-area, but prices and wages have been slow to adjust until now because of the nominal rigidities. However pressures on capacity (which are relatively weak in the Euro-area) can create some tensions on the labor market and skilled

workers would demand higher wages. Claims for wages can be encouraged in Germany by the effect on consumer prices of the VAT increase. Thus, after an increase in output determined by real factors, the increase in money supply would be reflected in the price level.

There is a serious probability that this scenario will occur: the 8% increase in the money stock, almost twice the nominal GDP growth is not due to portfolio shifts, as it was the case in 2001-2003 (which means that the velocity of money is not declining), but to an annual growth rate of bank credits to private sector of 12%. Such a situation of strong liquidity cannot be neutral on the economy.

Of course, external factors may affect this scenario:

- An important factor for inflation is the evolution of the exchange rate. In 2006, the euro exchange rate vis a vis the dollar has contributed to a relative disinflation. Such a situation could last in 2006. According to some economists evaluations, a 10% appreciation of the euro would be neutral on economic growth as the negative impact on exports is balanced by a positive effect of the lower prices of imports, but would reduce inflation by about 0,2 points of the HIPC.

- The evolution of the oil price could have a moderating effect on inflation, if the Brent crude remains at the current level.

- Finally, the strong worldwide competition could incite German firms to absorb almost the totality of the VAT rise of which the impact on the HIPC would be weakened.

**8)** A crucial factor in the transmission mechanism on prices of strong monetary growth is the credibility of the monetary policy.

This credibility has been strengthened in most industrialized countries by the independence of the central bank which had a strong influence on expectations and is probably one of the reasons (with globalisation) of the relatively moderate rate of inflation (in comparison with the rates of the 70's and the 80's) and of the fact that surges in price level when they occur don't exceed one or two points of the HIPC. The so called "mad cow" crisis, strong rises in food prices, oil, raw material were absorbed without any "explosion" of the index in the Euro-area.

The ECB is sometimes criticized for its supposed almost exclusive preoccupation with inflation. These critics constitute a proof of the exceptional credibility of the institution in price stability.

One of the most remarkable signs of this credibility has been the evolution of the yield curve in parallel with the rise of the ECB rates since the end of 2005. As the central bank raised the short term rates by 150 basis points, the 10 years government bond rates increased by less than 50 basis points (while this moderate reaction cannot be explained, like in the US, by massive investments of the great Asiatic central banks).

One can assume that this credibility would not be reinforced, if not weakened, if the ECB abandoned the M3 aggregate as a prominent index in its first pillar. In spite of criticisms of analysts and economists, this approach, although relatively original in present practices of central banking, is coherent with the decisive role of money in inflation, a role about which all central banks totally agree, even if many of them don't make reference to it anymore. The abandonment of M3 could lead to misleading interpretations: that the monetary transmission mechanism of quantities is neglected; that there can be a permanent and effective trade off between inflation and output and employment, which some analysts and economists wrongly believe is the Federal Reserve strategy; that monetary policy can be discussed in terms of real rather than monetary variables and, consequently, be used to fine tune short-run economic movements. Finally and to be more basic, after seven years of monitoring monetary aggregates and a lot of studies and articles for explaining its variations, its abandonment would be rather incomprehensible for markets and could severely affect the credibility of the institution in the price stability field. An abandonment or a sharp modification of the reference value would probably be also damaging due to the uncertainty on the money velocity.

Interest rate policy is an element of credibility. Increase in money supply by strengthening real balances of the economic agents lead to inflationary behaviors, especially if real interest rates remain low. In that circumstances a rising interest rate is the logical response, even if the impact of this action is not, by far, rapid, as in the Euro-area, most of credits to households are granted at fixed term, unlike in US where the majority of credits are indexed on the rates of the central bank (which means that the effect of the monetary policy is more immediate than in the euro-area).

9) It is important that we do not finish this discussion paper without mentioning the fact that some price increases are partly reflected in the HICP and that the ECB has these in mind in its monetary policy assessments. Real estate prices are included in the HICP via the cost of new house building, which, by far, does not reflect the whole evolution of the market and the risk of speculative bubble in some countries of the Euro-area, France, Spain. Surges in real estate

prices are a consequence of strong money supply via banks credits at very low rates. Unlike money stock expansion, these credits have a relatively rapid impact on the real estate market, and consequently, on the price levels. At the same time, the potential wealth of real estate owners is improving, which can later encourage further expanses. So the surge in the real estate price, even if it modestly affects the HIPC evolution is an important factor of inflationary expectations.

In raising successively its tender rate since the end of 2005, from 2% to 3.5%, the ECB aims to moderate housing credit demand of households and allow a soft landing of the market. The impact of this action is for the moment relatively weak because of the concurrence on housing credits on which banks reduce margins for keeping market shares.

Other asset prices, not at all included in the HICP can create concern, such as stock prices. Their current evolution cannot be considered as exuberantly buoyant but their significant and quasi-permanent rise since two years is an other prove of the exceptional abundance of liquidity in the economy.

Some economists consider that central banks would pay more attention to real estate and stock prices than to the HIPC as they consider that the inflationary risk has disappeared. One can contest this later opinion which neglected the idea that a 2% inflation can be considered as weak and easily bearable by households but can cause losses in purchasing power for modest incomes as all producers are now closely and severely monitoring labor costs. The question of the involvement of the central banks in the monitoring of stock prices and in the prevention of bubbles is a "real" question.

Money matters. The role of money in price level and its embodiment in the quantity theory of money can seem old fashioned but its broad shape was admitted by all economists, from J.M Keynes to M. Friedman.

The financial field has changed since J.B.Say, J.M.Keynes and even since M.Friedman. Therefore, many analysts believe that money is no longer important, as its statistical representation has become difficult.

# High Growth Rates of Monetary Aggregates and Low Inflation

by Leon Podkaminer

## Summary

The ECB reference value for the growth rate of M3 has been fixed, since December 1998, at 4.5% p.a. Possibly, this reflected a belief that having M3 rising at 4.5% is consistent with low inflation. Practice has disproved the informational value of the ECB 'reference value' quite radically. An average 2% inflation rate proved consistent with M3 rising by about 7.5%.

The dynamics of the money stock is determined by the dynamics of credit to the private sector. The composition (sectoral as well as temporal) of the private sector's borrowing is carefully monitored, but the determinants of the credit volume are subject to controversy.

The non-existence of any reliable relation between the rate of monetary growth and inflation observed in the euro area is not exceptional. In the second half of the 1970s and throughout the 1980s, the monetary policy of many countries, including the USA, chased targets for monetary aggregates – in general, unsuccessfully. Contrary to the monetarist ideas, inflation has not, in general, been a direct function of the quantity of money. Extracting useful information from M3 alone is difficult, but extracting useful information from other monetary aggregates is likely to be even less productive.

Allowing for growth of real output does not make the 'reference value' any more relevant. From the standpoint of that value, the *observed* inflation and the real growth have *both* been too low.

A supposition that money growth translates more reliably into inflation when the central bank credibility is low is a hypothesis which, if true, would imply that the ECB does need to be concerned with M3 growth provided it acts credibly. The ECB has been considered credible because its actions are easy to predict. However, under weak real growth (and high unemployment) low inflation in the euro area is not an impressive achievement – especially bearing in mind that the area is characterized by strong growth in labour productivity, weak growth in wages and thus stagnant unit labour costs.

It must be clear that liquidity in the euro area is considered *high* only because the ECB set its 'reference value' for growth in M3 arbitrarily *low*. Should a much higher value have been chosen (e.g. 7.5%), the liquidity level would have been considered more or less right. Should a value of e.g. 10% have been set, liquidity would have been judged as too low.

The fact that actual M3 generally grows much faster than 4.5% serves to support the ECB's over-restrictive policy. Such a policy, and not the liquidity rising at this rate or that, is the major risk to satisfactory and sustainable economic growth in the euro area. The ECB's 'monetary cross-checking' almost invariably ends in warnings about *'upside risks to price stability over the medium to longer run, due to continued strong monetary and credit growth in an environment of ample liquidity'*. Accumulating money stock is thus identified with a growing potential for high inflation likely to break out in some unidentified future (but possibly quite soon). This interpretation of monetary dynamics supports the ECB's over-reacting to the perceived signs of rising inflation/real growth speedup (and its under-reacting to the symptoms of falling inflation/real growth slowdown). It also supports the ECB's perceiving signs of inflation when there are hardly any.

*'Under its monetary policy strategy, the ECB monitors various monetary indicators, with the aggregate M3 playing the dominant role. Extracting useful information from M3 alone is difficult. For the past 5 years or so, M3 growth has mostly substantially exceeded the ECB's reference value. Where does the high liquidity stem from and to what extent are the sources [of] this traceable?'*

**Extracting useful information from M3 alone is difficult. Extracting useful information from other monetary aggregates is likely to be even less productive**

The broad money (M3) aggregate is defined as the sum of (1) currency in circulation and the value of overnight deposits; (2) the value of other short-term deposits; and (3) the value of marketable instruments (i.e. various securities with a maturity of up to two years issued by the monetary financial institutions, i.e. banks). Deposits (overnight and short-term, combined) currently constitute close to 80% of M3. The share of households' deposits (in all deposits included in M3) is currently close to 60%. The composition of the deposits (by maturity and sectoral origin) is highly volatile, reflecting various factors (both economic as well as 'psychological'). Extracting useful (for whatever purpose) information from the data on individual components of M3 seems even more difficult than extracting useful information from M3 alone. Individual components of M3 tend to be strongly, if intricately, interrelated.<sup>1</sup> Due to this, separate analyses of the dynamics of individual components are unlikely to produce useful conclusions.

Attempts at gaining some better understanding (of inflation) through examination of the components of M3 rather than of the aggregate M3 itself are likely to be utterly futile. Historically, M3 (and other 'higher-order aggregates' such as M4, M5, etc.) were considered only AFTER the finer sub-aggregates (such as e.g. M0, M1, M2) essentially proved of no relevance for the task of predicting/controlling inflation.

In the euro area the dynamics of the aggregate M3 (and of other monetary aggregates) is determined primarily by the dynamics of credit to the private sector. Credit extended to the private sector (consisting of such diverse sub-sectors as households, non-financial corporations, insurance companies and pension funds as well as other non-monetary financial intermediaries) is the dominant counterpart of M3. Commercial banks' lending to the private sector and, simultaneously, the private sector's willingness to borrow from banks, are the ultimate sources of M3 (or liquidity). The composition (sectoral as well as temporal) of the private sector's borrowing is of course carefully monitored. In this sense the sources of money are perfectly traceable. Thus, for example, the share of households in total loans outstanding is at present close to 50%, the share of the non-financial corporate sector about 42%, etc. Of course, there is a lot of research, empirical as well as speculative, on factors determining some components of lending to the private sector. It would be however presumptuous to claim that our knowledge on this subject is anything but fragmentary, provisional – and subject to controversy. In this sense the ultimate real sources of flows of credit to the private sector, and hence of the money stock, are still not traceable. However, some broad consensus seems to have formed over the past 15-20 or so years – on one specific issue. According to this there is hardly a link connecting inflation to the measured dynamics of the money stock (such as e.g. M3).

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<sup>1</sup> For instance, sometimes a rise in currency in circulation may reflect nothing but the liquidation of e.g. a part of short-term deposits.



*'At the same time, we have not observed effects of these rates [of M3 growth] on inflation rates as high as in theory have been expected.'*

### **Monetarism revived ?**

The ECB reference value for the growth rate of M3 has been fixed, since December 1998, at 4.5% per annum. I do not know how this specific number came about. Possibly, it reflected a belief that having M3 rising at 4.5% is somehow consistent with low inflation, e.g. running at less than 2% p.a. (which is elsewhere singled out as the ECB's upper limit of bearable inflation).

Practice has disproved the informational value of the ECB 'reference value' quite radically. An average inflation rate of about 2% p.a. has proved to be consistent with M3 rising at a much higher speed almost all along (except for a couple of closing months of 2000 and at the beginning of 2001<sup>2</sup>). More specifically, M3 rising *on average* by about 7.5% p.a. (since end-2000) has not generated any visible *excess* inflation.

Now, the question is why should one expect the expansion of M3 at a rate that is much higher than 4.5% to generate inflation much higher than 2% ? Which theory does support such an expectation ? A possible answer might be that it is the monetarist theory (in its modern/classical form, as formulated by Milton Friedman) which is being contradicted here. But this answer is actually incorrect. Although Friedman believed (at least initially) in the existence of a causal link between money stock and the price level, he soberly refrained from speculations about the proper numerical value of the ratio between these two items. The monetary policy rule he advocated stipulated for a steady expansion of the money stock (M0 or M1) at *some* fixed rate ('k-percent rule'), without any regard for cyclical variations in output or inflation (and thus without any regard for the central bankers' perceptions of forthcoming inflation or real growth prospects). Friedman did not postulate a steady 4.5% monetary growth. But this is not to say that the euro area experience supports some version of the monetarist theory specified with a 7.5% money growth rate rather than with a 4.5% 'reference value'. The *actual* growth rate of M3 has been highly unstable – without this having been reflected in inflation, which has been not only low, but also remarkably stable.

The non-existence of any statistically reliable relation between the rate of monetary growth and inflation observed in the euro area is not exceptional at all. In the second half of the 1970s and throughout the 1980s the monetary policy of many countries, including the USA, chased targets for monetary aggregates– in general, unsuccessfully. Inflation and the quantity of money moved their own ways. Contrary to the monetarist ideas, inflation has not, in general, been a direct function of the quantity of money (however measured). Of course, inflation can be directly related to the stock of money in very special circumstances, such as during hyperinflation, or under metallic money, as was the case until the Modern Age.

The negative experience with monetary targeting has been responsible for the current popularity of inflation targeting. Even the FED, which formally is not on inflation targeting, stopped caring about monetary aggregates. Professor F. Mishkin, an erstwhile FED Board member, aptly described the circumstances of the FED's giving up monetary targeting: 'We didn't abandon the monetary targets: the targets abandoned us.'

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<sup>2</sup> The ECB interest rates reached record levels at that time, precipitating a strong – and most probably unnecessary – real growth slowdown which lasted until the second quarter of 2004.

*'Consider two interpretations ... the first one would argue that inflation is primarily driven by relative growth rates of money and real output, in which we simply will experience higher repercussions on inflation rates sooner or later. Supporters of this view could also find it easier to support the recent rate increases of the ECB.'*

### **Allowing for growth of real output does not make the 'reference value' any more relevant**

The reference value of 4.5% for the nominal growth in money stock, combined with inflation of about 2%, implies M3 growing by about 2.5% p.a. *in real terms*. Arguably, the architects of the ECB may have believed that M3 expanding at such a rate would be leaving enough room for the real output growing, on average, by roughly 3% p.a. in the longer run. (The Maastricht debt/GDP and fiscal debt/GDP criteria – 60% and 3% respectively – are consistent with the GDP growing by 5% in nominal terms, or 3% in real terms, under a 2% inflation.) In other words, an approximate equality of real growth rates of both output and M3 may have been the underlying assumption. This assumption, quite extreme in its own right, proved false empirically. Real GDP in the euro area has been rising, on average, by only about 1.4% p.a. (since 2000). This is much less than 3% – and of course much less than 5.5% (which would be consistent with the *actual* growth of nominal M3). Thus, the 'reference value' for M3 implies real growth that is by far too high compared with reality. All in all, the practical relevance of the 4.5% 'reference value' is problematic, to express it kindly. From the standpoint of that value, the *observed* inflation and the real growth have *both* been too low.

Is it of course possible to argue that sooner or later the price level will catch up with the stock of money (and hence that inflation will sooner or later accelerate to make up for the 'abnormally low' rates in the past). However, I cannot see why – and how – this outcome should ever materialize. An eventual convergence of the price level to a level consistent with an 'over-inflated' money stock is hard to justify even if one invokes a naive quantity theory of money. As is well known, the quantity equation:

$$PQ = MV$$

(with P standing for the price level, Q for the real output level, M for the money stock and V for the so-called income velocity of money) must be *eventually* satisfied. Now, with given 'excessive' M (and V equal roughly 1, as seems to have been implicitly assumed at the ECB), the formal satisfaction of the equation may well imply a rise in real output – and not necessarily a rise in the price level.

But a word of warning is perhaps in order here. The quantity equation is *always* satisfied – no matter what values M, P, and Q assume. The satisfaction is guaranteed because the velocity parameter does not have an independent existence of its own (being *defined* as the ratio  $PQ/M$ ). Thus, even if M is indeed 'over-inflated' relative to Q and P, the equation is satisfied through an adjustment in the velocity V – without any 'expected', or necessary, adjustments in the price or output levels.

*'The second view argues that inflation is primarily driven by inflation expectations, and that inflation expectations remain low in the euro area due to a highly credible institution, the ECB. In this view, the link between inflation and money growth is weak as long as central bank credibility is strong.'*

**The link between inflation and money growth is at best weak irrespective of central bank credibility. Low inflation in the euro area is due primarily to low growth in unit labour costs under anaemic real growth**

As already discussed, the link between money growth and inflation is at best weak, generally. This is why chasing monetary aggregates, as advocated by monetarism 30 or so years ago, was abandoned world-wide. Actually the ECB seems to be the only remaining major central bank to be haunted by a sort of nostalgic trust in an obsolete – and discredited – doctrine.

A supposition that money growth translates more reliably into inflation when the central bank credibility is low is a hypothesis – and probably a novel hypothesis. If true, that hypothesis would imply that the ECB does need to be concerned about M3 growth any longer – provided it acts credibly.

The ECB has generally been considered credible because its actions are rather easy to predict. It can be trusted to react rather promptly and determinedly to the perceived symptoms of rising inflation/real growth speedup – and yet rather slowly and indecisively to symptoms of falling inflation/real growth slowdown. It is this characteristic *asymmetry* in the ECB responses which seems to be contributing to the euro area's falling behind the USA, the United Kingdom, Sweden etc. in terms of real growth.

Under generally weak real growth (and comparatively high unemployment levels) the relatively low inflation in the euro area is not a particularly impressive achievement, especially bearing in mind that the area is characterized by very strong growth in labour productivity, fairly weak growth in wages and, consequently, stagnant (or falling) unit labour costs. Certainly, under such conditions, not only does actual inflation tend to be low; it is also rational, in such circumstances, to expect inflation to remain quite low.

*'Which risks do arise from the prevailing high liquidity to price stability and to sustainable economic growth in the euro area?'*

**'High liquidity' serves to justify generally over-restrictive ECB policy**

First, it must be clear that liquidity in the euro area is considered *high* only because the ECB set its 'reference value' for growth in M3 arbitrarily *low*. Should a much higher value have been chosen (e.g. 7.5%), the liquidity level would have been considered more or less right. Should a value of e.g. 10% have been set, liquidity would have been judged as too low.

Second, the fact that actual M3 generally grows much faster than 4.5% serves to support the ECB's generally over-restrictive policy. Such a policy, and not the liquidity rising at this rate or that, is the major risk to satisfactory and sustainable economic growth in the euro area. The ECB's 'monetary cross-checking' almost invariably ends in warnings about *'upside risks to price stability over the medium to longer run, due to continued strong monetary and credit growth in an environment of ample liquidity'*. Accumulating money stock is thus identified with a growing potential for high inflation likely to break out in some unidentified future (but

possibly quite soon). This interpretation of monetary dynamics supports the ECB's over-reacting to the signs of rising inflation/real growth speedup (and its under-reacting to the symptoms of falling inflation/real growth slowdown). It also supports the ECB's perceiving signs of inflation when there are hardly any.

It is perhaps worth noting that when – on a single occasion, in late 2000/early 2001 – the M3 growth *under-performed* (rising at rates lower than 4.5%), the ECB continued to raise its interest rates (until they reached record levels) all the same. It is of course hard to generalize from such a single event. Nonetheless, the fact that M3 growth was ignored when it could suggest a possibility of *deflation* only strengthens the impression that the priorities of the ECB are not well-balanced.

### **Concluding remarks**

In the euro area the expanding money stock primarily reflects expanding credit to the private sector. In so far as the latter finances expansion (and/or efficiency enhancement) of the stock of fixed productive capital, it normally lays the foundations for future prosperity: rising potential productivity and output. Because productivity and output gains lower inflationary pressures, expanding credit and money stock should be viewed as conducive to lower rather than rising inflation. Of course, a rising money stock may sometimes reflect an expansion of credit fuelling e.g. an excessive rise in consumption, or asset bubbles. This may create problems over excessive levels of debts in some segments of the private sector (and their solvency). It is therefore fully legitimate for the ECB – and for any other central bank – to monitor monetary developments. But this should be primarily motivated by concerns over financial stability, not over inflation.

**Monetary Dialogue with the President of the European Central Bank  
20 December 2006**

**HIGH GROWTH RATES OF MONETARY AGGREGATES AND  
LOW INFLATION**

Briefing paper by Prof. Pedro Schwartz<sup>1</sup>

**The problem**

For the past five years, M3 growth has mostly exceeded the ECB's reference value by a substantial margin. However the effects of such expanded money supply on consumer inflation have not been as high as could in theory have been expected. Has this high M3 growth led to a consistent expansion of liquidity in the euro area over the whole period from 1999 to 2006? What prices if any have been affected by such liquidity creation as there may have been? Is a rebound in consumer price inflation to be expected in the future and a tighter monetary policy called for? Would the increase in interest rates implied by such a tighter monetary nip Euro zone economic growth in the bud?

**Back to basics**

The answers to the above questions crucially depend on what we make of the functional relationship or causal arrow between money supply, liquidity growth, consumer price inflation, asset prices, and real growth. The theory defining the strength and direction of the arrow is much disputed. So we must go back to basics.

One connection cannot be disputed in view of the historical evidence: money supply has a direct causal influence on nominal GDP and asset prices. The much lamented Milton Friedman wrote his last paper on the connection between exogenous M2, variously expanded, and nominal Y (2005). In his intelligent statistician mode, he analysed three episodes in monetary history with different outcomes depending on post-slump central bank policy: the US in the 'thirties, Japan in the 'eighties and the US again in the 'nineties. These economies showed a different evolution in stock market prices and nominal GDP after a crash, depending on the severity or leniency of monetary policy. He took this to be a natural experiment indicating a clear connection between money supply, on the one hand, and nominal GDP and asset prices, on the other. Money matters.

The next basic and well established reality is that one cannot systematically separate price level effects from real growth effects within nominal GDP changes stemming from monetary expansions, unless it is in the long run. The effect of monetary tightening (or loosening) on short term growth is not a stable function, depending as it does on inflationary expectations in the general public, that are driven by central bank history and possibly perception of slack in the economy. The Lucas critique is

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devastating here. Central bank fine-tuning of the economy is impossible. The reason why politicians and public opinion in general demand such fine tuning and criticise the ECB for not trying it has been perceptively discussed in Goodhart (2006) but must be left for another day.

A third well established connection is that a misguided monetary policy can throw a spanner in the works of the real economy. When we say that ‘inflation is a monetary phenomenon’ (Issing 2006), as indeed it is, we must mean that monetary policy cannot increase the rate of real economic growth in the long run. A central banker must keep in mind that such an attempt will bring about higher inflation and probably reduce the growth rate. Sustained real growth is mainly to be explained by endogenous technological advance (Romer, 1990). In consequence, a central banker must not try to pump real growth with a loose monetary policy.

A central banker, however, must be prudent and must try to keep to a long term anti-inflationary policy without being too rigid or mechanic. Good judgment is of the essence. Unexpected persistent shocks can trigger portfolio shifts and suddenly change the velocity of money. Such shocks affect the transmission mechanism or banking multiplier, as one may wish to call it, and can take a modern financial system into a spin, given the leverage now applied to by the continuous surge of new financial instruments. Hence the need for the ECB to be flexible without giving the market the impression of having forgotten its remit of keeping consumer price inflation at bay.

### **Two pillar policy**

It is a fact that, especially since mid 2001, there has been a permanent gap between the announced *reference value* of M3 (4.5% inter-annual rate of money growth)<sup>1</sup> and the recorded growth rate of M3. Until very recently, inflation forecasts by ECB staff seemed to take no account of it and neither was there any perceivable effect on ECB interest rate policy.

At the time, this apparent contradiction in the ECB strategy was seen by some market analysts as a symptom of weakness of the basic pillar of the ECB monetary framework, and a potential source of loss of credibility. Far from reducing, the deviation of M3 growth in relation to the *reference value* grew. Since the ECB appeared not to respond to such gaps, the information provided by the first monetary pillar was taken by some market analysts as useless, if not misleading (see Svensson, 1999). This “monetary gap” forced the ECB frequently to explain the true role of money as a long term indicator of inflationary pressures.

In order to avoid misunderstandings, the ECB decided to stress the difference between the ECB *two pillar strategy* and the *monetary target strategy* successfully used by Bundesbank previously to the creation of the euro. On the one hand, the ECB decided to stop publishing the *reference value* of M3 on yearly basis. But, on the other hand, aware of the crucial importance of a well-established and transparent monetary strategy in successfully anchoring market expectations, the ECB underlined the role of money supply in the creation of correct inflation expectations. It thus reasserted the role of money in policy-making but reduced its role in the ECB public statements. The aim was to clarify the use of the monetary aggregates as sign-posts rather than as triggers of monetary policy (ECB, 2003) and reinforce the need to do an overall analysis of the two pillars to avoid the unwanted and excessive focus placed on the money deviations (Issing, 2006).

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<sup>1</sup> See for the underlying hypotheses of this figure ECB (1998 b).

## The danger of focussing too hard on either pillar

The two pillar policy is therefore well taken. The *monetary pillar* (or first pillar) provides essential information in forecasting the genuine *long term* monetary nature of inflation, and the *economic analyses* (or second pillar) provides information on the *short term* inflation dynamics. Both types of information have to be taken into account in assessing a *medium-term-oriented* price stability monetary policy. The monetary pillar is focused mainly on the long term and the economic analysis of the second pillar tries to deal with the short term.

However, the long term is made of many short terms; hence it is important that the data taken into account in the second pillar do not run contrary to the remit of the ECB of keeping consumer price inflation around 2 per cent. I have always found the obsession with the ‘output gap’ difficult to explain. It is clearly based on a non-monetary explanation of inflation, harking back to chapter 21 of Keynes (1936). Inflation there is explained by the difference between aggregate demand and aggregate supply: when  $D$  is smaller than  $S$ , increases in money supply will lead to fuller employment of resources and not to price hikes; in the converse case (i.e., when the output gap has disappeared) increases in  $M_S$  will push the price level up.

I understand that a central banker will grab hold of any statistic to try and guess what the economy will do in the short run. But there is no systematic relation between unemployment of resources and being able to expand the money supply without affecting the price level. As Goodhart (2006) points out,

prior to 1990 Japan had been growing rapidly, around 4 per cent per annum, with no signs of excessive inflation. Following the bust of the asset bubble then, growth fell to about 1 per cent per annum over the next 15 years; but this did not result in ever-accelerating deflation and/or continuously rising unemployment. (pg. 770)

So I do not really understand the fears expressed by and generally by European public opinion that a steadfast anti-inflationary policy by the ECB could stop Eurozone growth in its tracks. Or, as Goodhart surprisingly puts it,

that any (premature) withdrawal of monetary ease could prevent a firm recovery [of the European economy] taking place. (pg. 765)

Given that money after all is a veil, albeit a “fluttering veil” (Yeager, 1997), the second pillar should be there to monitor possible portfolio shifts due to persistent shocks. Listening to neo-Keynesians may induce the central banker try and fine-tune the real economy, thus undermining the strategic aim of controlling inflation.

## Two different episodes of M3 deviation

Now to the point. The questions asked at the beginning of this briefing paper can only be answered with a close examination of the data taken into account in the first pillar, namely, in studying the long term effects of different kinds of money supply episodes on inflation.

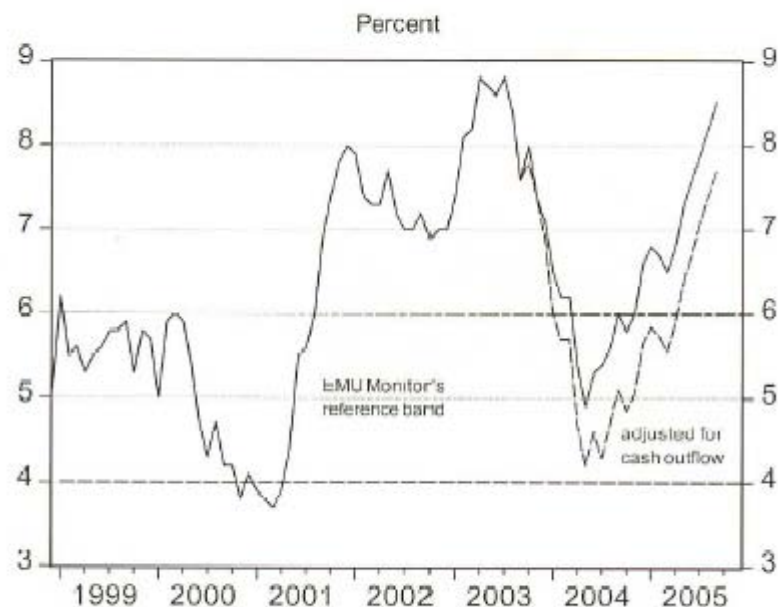
There have been two main episodes of high deviation of M3 rate of growth from its *reference* medium-term price stability value: (2001-2003 and 2004- 2006). Following Goodhart (2006) and Fischer et. al. (2006), there are important differences between both situations:

- 1) Regarding the first period (2001-2003), these were years of high instability in financial markets resulting from the high technology stock crisis. This turn of affairs I would never call a bubble. It was the realisation that the IT global market forecasts proved excessively optimistic or, rather, in advance of their time; and that some of the products and services supplied were not those that the

public eventually showed it wanted. The crisis brought about a general run to liquidity and, thus, a sudden shift in portfolio structure. This led to a high demand for liquidity that showed up in a notable increase in M3.

The crucial distinguishing feature of this period was that, while M3 grew rapidly, bank lending declined sharply. This was taken as a symptom of demand for money curbing shifting outwards in response to financial market volatility or political and institutional uncertainty surrounding the September 11 terrorist attacks. This rush for liquidity need not show up in a higher inflation in the future. In consequence, the ECB did not take that “monetary gap” into account and maintained its policy of cutting interest rates further. (Goodhart, 2006) The danger of this policy was that, lulled by low inflation forecasts, the ECB paid too little attention, in the form of ‘bubble’ in the property market and the Stock Exchanges. The Bank rightly noted that it was not within its remit to control asset prices but the danger implicit in this development was compounded by the hair-brained expansive policy of the Federal Reserve.

Figure 1: Money supply



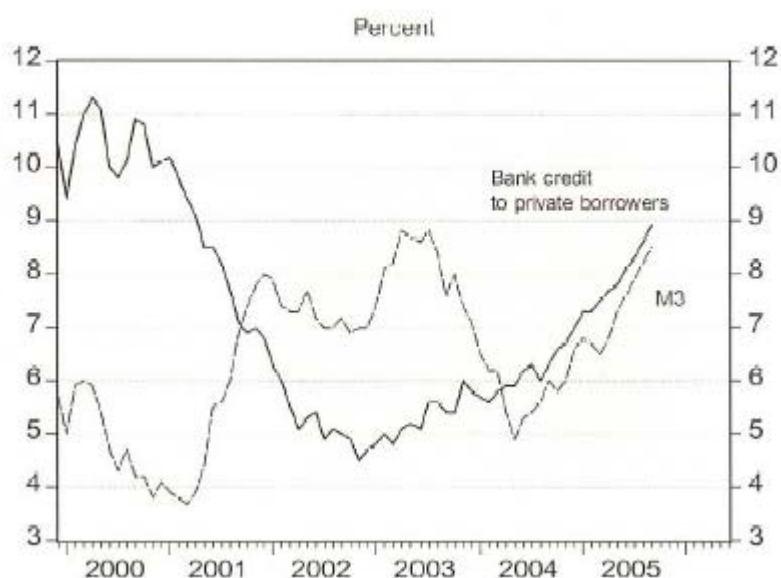
SOURCE: Goodhart, Charles A.E., "The ECB and the Conduct of Monetary Policy: Goodhart's Law and Lessons from the Euro Area". *Journal of Common Market Studies*, Vol. 44, No. 4, pp. 757-778, November 2006 Available at SSRN: <http://ssrn.com/abstract=935725> or DOI: [10.1111/j.1468-5965.2006.00661.x](https://doi.org/10.1111/j.1468-5965.2006.00661.x)

- 2) The situation in the second period (2004-2006) is quite different. There is also an excess of M3 rate of growth in relation to the reference value, but the nature of this excess of growth is not so “exceptional” or temporary, and needs another type of policy reaction. In this case, the growth of both M3 and the corrected M3<sup>1</sup> follow a common upward path with bank credit to private borrowers. They

<sup>1</sup> Also, as Fischer et. al. explained in (2006), the ECB has been developing and improving its *quarterly monetary assessment* with the use of a *corrected M3* based on improved statistics of its components. This corrected M3 also takes changing institutional factors and short term shocks into account. All this has improved long term inflation forecasts based on money supply figures and permitted a better understanding of the information provided by the monetary pillar.



Figure 4: M3 and bank lending in the Eurozone



all pose serious inflationary dangers in the long run and require the proper policy response, i.e., tightening monetary policy. This is exactly what the ECB should be doing and is doing.

### Why money still matters in monetary-policy-making

Firstly, money growth not only has practical and valuable implications in designing monetary policy, but also has direct long term implications in the financial markets (see Hildebrandt, 2006). Excess liquidity, even in our current low inflation scenario, may result in financial instability; with unwanted effects on price stability and output growth. There has been in the last years a growing line of research that sets that price stability is not a sufficient condition to avoid financial instability (See White, W. 2006). In our view, a myopic price-stability-policy can produce unsustainable high growth of liquidity in growing economies and, therefore, can hide the origin of over-investment episodes (or excess demand for stocks and real estate) that may result in financial crises. This the euro area, where a growing output is compatible with declining consumer prices and thus, resulting in a low inflation scenario. In the absence of the proper monetary analysis, if monetary policy only focused on prices or inflation expectations, an excessive money growth may take place when no Central Bank reaction is called for. In this regard, to pay explicit attention to money growth is a useful way to monitor unsustainable rates of growth of money and, thus, reduce the risks of that unwanted financial instability in the future.

Secondly, taking money as a pillar of policy places the proper emphasis on the need to anchor monetary policy on the long run. Far from the current paradigm in academia in favour of new *active* rules (Clarida, et. al. 1999) that advocates interventions of central banks to achieve price stability *and* output stability, a neo-monetarist view expressly links monetary policy-making with the desired long run price stability target; giving the ECB no other target but the one included in its statutes as the primary goal, to wit price stability. In sum, monetary assessment as a pillar of monetary policy reinforces the engagement of the ECB with its primary goal, helps to clarify its

monetary policy and avoids the misguided use of monetary policy as policy tool for stabilising or even expanding the economy.

Madrid, December 11<sup>th</sup>, 2006

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