Ignazio Visco: €-coin and the growth outlook for the euro area

Presentation by Mr Ignazio Visco, Deputy Director General of the Bank of Italy, of the new Banca d'Italia-CEPR "Eurocoin" indicator at the CEPR meeting on "After a volatile summer, where do we stand? €-coin and the growth outlook for the euro area", London, 20 September 2007.

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1. Nature and history of the project

In the eight years since the launch of the Economic and Monetary Union great efforts have been devoted to support the implementation of the common monetary policy. European and national statistical institutions, academia and, naturally, the ECB and national central banks have all worked to provide more timely and reliable data, new instruments of analysis and a deeper knowledge of the euro-area economy. Today, we can base our policy decisions and forecasts on a firmer understanding of the **functioning of the euro-area economy as a whole**. Thanks to the steady progress in improving the timeliness of publications and the reliability of the statistics, our ability to monitor economic developments has also improved.

The Bank of Italy – building on a long tradition of research in macroeconomic forecasting and short-term analysis – contributed actively to the development of innovative tools able to meet these new challenges. Soon after the launch of the EMU, Lucrezia Reichlin, now Director of Research at the ECB (and then CEPR program codirector for International Economics), coordinated a pioneering research project at the Bank of Italy which led to the construction of a new indicator of macroeconomic conditions in the euro area as a whole. This new indicator was called **Eurocoin**, as it is a "coincident" indicator, i.e. an indicator of current economic conditions. This was the first real-time synthetic indicator of the euro-area economy not based solely on survey data. Built on innovative statistical methods applied to a large data set comprising a variety of statistics related to real, monetary and financial phenomena, it constituted a step forward with respect to traditional indices and provided a timely and broadly based assessment of the economic outlook. Unlike other indicators, **Eurocoin** is "linked" to GDP growth: each month it gives a quantitative assessment of the conjunctural situation in terms of quarterly GDP growth in the euro area.

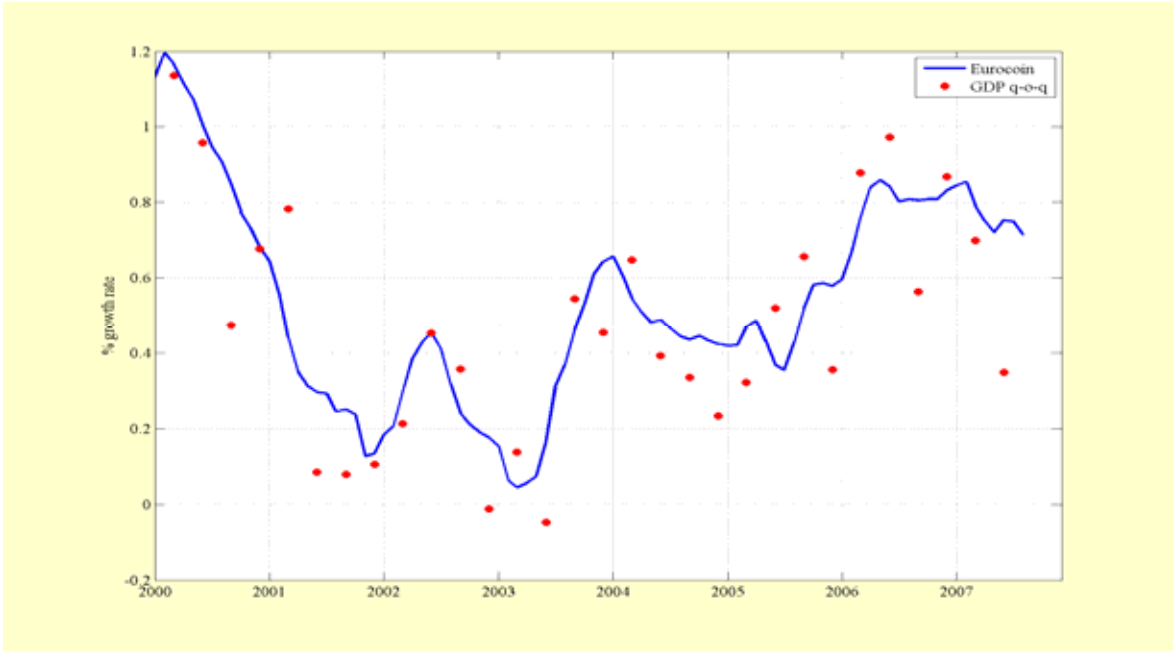
Since 2002 CEPR has hosted the monthly releases of the indicator on its website. The indicator has been closely monitored ever since, and though its overall performance was satisfactory on the whole, a few problems did emerge. On the basis of this experience and further analytical work, after five years, Eurocoin underwent a substantial overhaul in the Bank of Italy's Research Department. After a period of continuous scrutiny and testing, we are now ready to publish a new version. This **new indicator, €-coin,** is what I am presenting today. We believe that it is a useful tool for the research community and for policy makers, as well as for market participants and watchers (see Figure 1).

In my talk, I will first briefly summarize the **basic ideas** behind it. I will then describe the **value added** of this indicator, show how €-coin can be used for **real-time monitoring** of the euro-area economy, and **compare its performance** with that of other commonly used indices, focussing on the advantages of using a large dataset. Finally, I will briefly discuss what we can learn about **recent economic developments** by looking at the behaviour of €-coin over the last few months.

As a last remark I would like to stress the reason why I believe it is important for us to share our indicator with market participants and watchers, and the research community at large. Obviously a central bank is a public institution and making public the results of research that uses considerable resources adds to the available information and provides a "public good". Furthermore, as Luigi Einaudi, former Governor of the Bank of Italy and President of the Italian Republic, once said, we need "to know in order to be able to

deliberate". We believe that sharing this knowledge helps in forming a **common understanding** of how our market economy is performing, and in making informed decisions, at both the policy and the market level.

Figure 1: The new €-coin indicator



2. €-coin: its value added in monitoring the economy

In Figure 1 we can see €-coin and the quarterly GDP growth figures as we now know them (notice that they are not available at the time €-coin is produced).

With respect to the previous version the **main improvements** of €-coin are:

i) a more timely signal (at the end of each month we now have an estimate of the underlying GDP growth for that month);

ii) lower volatility (a smoother indicator and therefore easier to interpret);

iii) a continuous monitoring technique for the data used in the construction of the indicator.

These improvements are grounded first of all in a reassessment of the **dataset**, which now comprises more timely series, a larger amount of international data and is subject to close monitoring every month, to ensure the indicator is always based on the best available data. Secondly, a new method of extracting the common relevant information from the data has been used. This will become clearer when I briefly describe the ideas underlying this aggregate indicator, which attempts to synthesize the information contained in about 200 elementary series.

For a detailed description of the methods used, the tests conducted and the results obtained, I refer to the recent **paper** by Filippo Altissimo, Riccardo Cristadoro, Mario Forni, Marco Lippi and Giovanni Veronese, "New Eurocoin: Tracking economic growth in real time" (CEPR, Discussion Paper No. 5633, April 2006, revised June 2007, and Banca d'Italia, Temi di Discussione No. 631, June 2007). Together with Lucrezia Reichlin, I wish to thank these economists for having devoted so much of their time and knowledge to this project.

We can conclude this introduction by noting that €-coin appears to **track** the underlying trend cycle movements of GDP growth in the euro area remarkably well. But more on this later.

2.1 Monitoring the economy: GDP

Let us now turn to what inspired and motivated the construction of €-coin. Ideally, we would like to assess the state of the economy and its outlook using **GDP growth**, the most comprehensive measure of economic activity. However:

i) GDP is published only quarterly and with a rather long delay;

ii) it is subject to revisions;

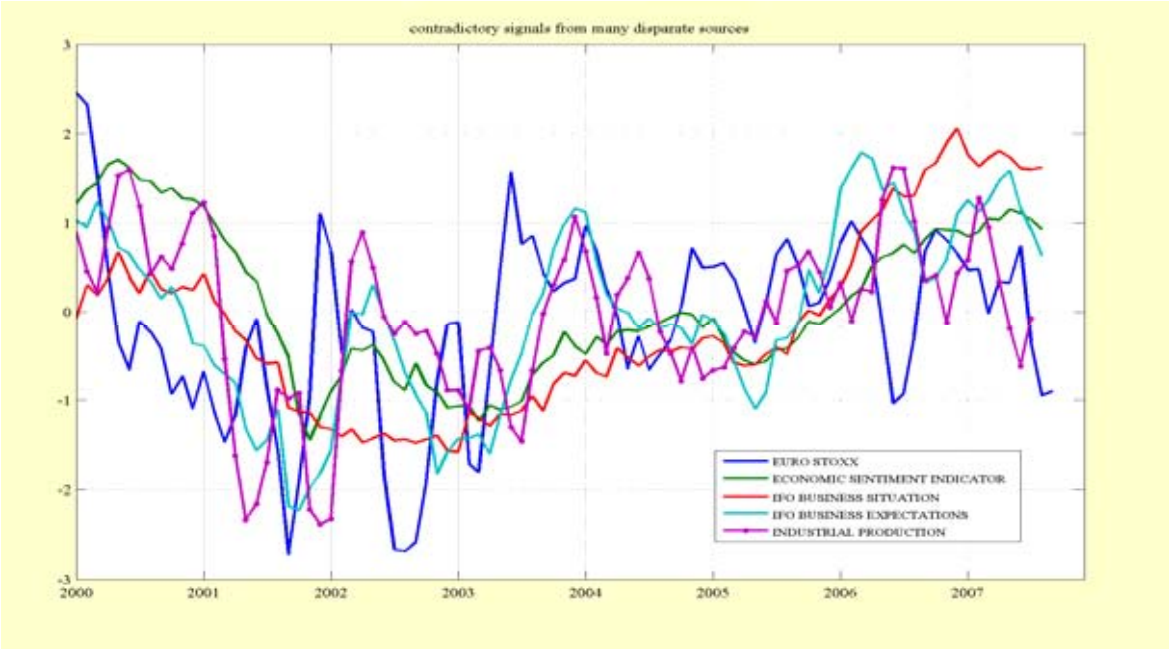
iii) most importantly, it is affected by measurement errors and substantial short-run volatility.

These factors reduce the potential of GDP releases for gauging the **current situation**. In fact, I would argue that for short-run policy analysis and decision we are often especially interested in "signal extraction", that is in removing the "noise" from an estimate of the underlying conditions of the economy. We know that the first quarterly GDP releases are always provisional and that at times important revisions are in order. And, at times, a preliminary but timely and sufficiently robust estimate of what is known as the "trend-cycle" component of the aggregate measure may be especially useful.

2.2 Monitoring the economy: higher frequency data

Of course, we do not rely solely on GDP. Our **economic outlook** is constantly updated by monitoring the inflow of other economic and financial data. Euro-area and national surveys, industrial production and demand indicators are all important pieces of this constantly changing information set. Compared with GDP, these data are more timely and are available at a higher frequency. It is not obvious, though, how to combine potentially contradictory signals coming from so many disparate sources and how to translate these signals into a quantitative assessment of the state of the economy such as that provided by GDP growth (see Figure 2). At the end of the day, "economy watchers" and forecasters rely on their judgment to perform this "*weighting* task".

Figure 2: High frequency indicators



At this point **two questions** naturally arise

i) what is the relationship between **monitoring the economy** and **forecasting**?

ii) what do we mean here by **judgment**?

In my opinion, forecasting macroeconomic variables for policy purposes requires a framework that helps to make causal dynamic relationships explicit. We can perhaps call this a **"structural" model**. What we are doing here is a different kind of forecasting, which can perhaps be more properly called "**nowcasting**". In fact:

i) Structural models are typically built on quarterly variables (though respected annual and monthly "structural" models certainly exist) with a projection horizon of several quarters, often years. It is an acknowledged problem that at the start of the forecasting period we have a wealth of information that is not (yet) captured by quarterly variables, owing both to the publication delays of the national accounts statistics and to the very nature of the information (surveys of consumer confidence, producer intentions, market sentiment, stock market prices, export and import data, and so forth). A satisfactory assessment of the current state of the economy is therefore not only an important element with which to judge the forecasts but also a necessary ingredient of a forecasting exercise, providing the best guess for the "**starting condition**".

ii) Tools like €-coin are designed to perform this task by extracting, through formal quantitative methods, the information contained in a large dataset. **Pooling** higher frequency information to obtain an estimate of GDP growth in the current quarter well ahead of official releases can thus be seen as **complementary to forecasting**. By their nature, indicators based on a large set of monthly or weekly data exploit the information contained in the cross section. In general, however, they are ill-suited to forecasting the variable of interest beyond a very short horizon (i.e. nowcasting, or at most, I would say, one quarter ahead).

I believe, with others, that the construction, utilization, evaluation and revision of models for economic forecasting and policy making is a complex "organic social process", a process in which **subjective judgment** often plays an important role. In fact:

i) Judgment is often a catchword for a rather complicated **mixture** of experience, use of formal models, statistical tests and intuition. Part of this process can be made more **transparent** and more rigorous by applying appropriate statistical techniques.

ii) Another part of the process, though, is inherently subjective and remains fundamental in deciding which models are really relevant and how results should be interpreted. Judgment is also used in the case of €-coin, for instance in **selecting** and **revising** the set of elementary indicators or in deciding the degree of **smoothing** that the final indicator should have relative to the quarterly GDP figures.

iii) It is important, however, in the case we are considering to **communicate** the reasoning behind the various choices made, both at the methodological level (for instance with the help of technical papers), and at the practical level (making use of appropriate information channels). This is what is being done and will continue to be done in the case of €-coin.

2.3 Monitoring the economy: €-coin in a nutshell

The basic ideas behind €-coin are straightforward. What one would like to have is a **comprehensive measure** of economic activity, like GDP growth, but a measure that is **not affected by temporary noise**, that is **promptly available** and that is **updated at a higher frequency** (say each month) so that it incorporates relevant news without much delay. This is exactly what €-coin delivers.

The starting point is the collection of a **wide range of data**, such as surveys, bond rates, stock market prices or industrial production indices. The information that is relevant to estimate GDP growth is then squeezed out of this large set of monthly and daily statistics and summarized in a few variables, or "**common factors**". Through them we can obtain a monthly estimate of the euro-area GDP rate of growth.

The method is based on the tendency of macroeconomic data to move together when observed over a sufficiently long time span. This phenomenon implies that, apart from idiosyncratic vagaries, macroeconomic variables are guided by "common" driving forces or a "common" set of few fundamental shocks. These **driving forces or shocks** can be captured – under very mild assumptions – by a (small) set of common factors computed in the following way:

i) **pool** all the series;

ii) find the (linear) **combination** that captures the greatest part of the trend-cycle movements of these series;

iii) regroup the series having "taken out" the first linear combination and **search again** for the best (second) linear combination defined as above, and so on;

iv) choose the number of common factors that, put together in a proper way, provide a sufficient measure of the **underlying process** characterizing the evolution of aggregate demand (for further details, see **the paper** by Altissimo et al.).

This process can be thought of as a sequence of "cleverly" taken weighted averages of the data, where each average in the sequence is the one that best explains the **co-movement** of the data at business cycle periodicities given the averages already taken.

But how should we read €-coin? €-coin appears to be a very good predictor of **current** quarterly economic growth. Its aim, however, is to capture the underlying growth momentum in the euro area so that departures of €-coin from actual GDP figures should therefore be seen as transitory and could be interpreted as an over- or under-estimation of actual (underlying) growth rates by official GDP data.

2.4 Monitoring the economy: €-coin in real time

The task of €-coin is to **monitor in real time** the euro-area economy. Let's then see how it has performed in the recent past. In doing so, its **track record** will also be compared with that of other well known and widely used indicators.

Figures 3a-3d are frames taken from a **real time animation**. In Figure 3a we are positioning ourselves at the end of 2003. In the **upper panel** you see the €-coin indicator and the quarterly growth rate of GDP. In the **lower panel** you see the Ifo business climate, the PMI manufacturing climate, the euro-area industrial production index and, again, the GDP quarterly growth rate.

The animation **mimics** the following: we repeatedly ask ourselves what is our "current" assessment of the true growth momentum in the euro area and month after month we watch what would have been the answer given by €-coin and by the other indicators (one should bear in mind that €-coin also uses the information contained in these competitors, so we are certainly not claiming they are unimportant).

Since there is no clear way of translating survey data or the IP index movements into q-o-q GDP growth, they were appropriately **rescaled**. I would like to direct your attention to two episodes:

i) what happened in **2004** (see Figure 3b)**;**

ii) the **most recent upturn** that started in 2005 (see Figure 3c-3d).

Figure 3a: Situation at the end of 2003

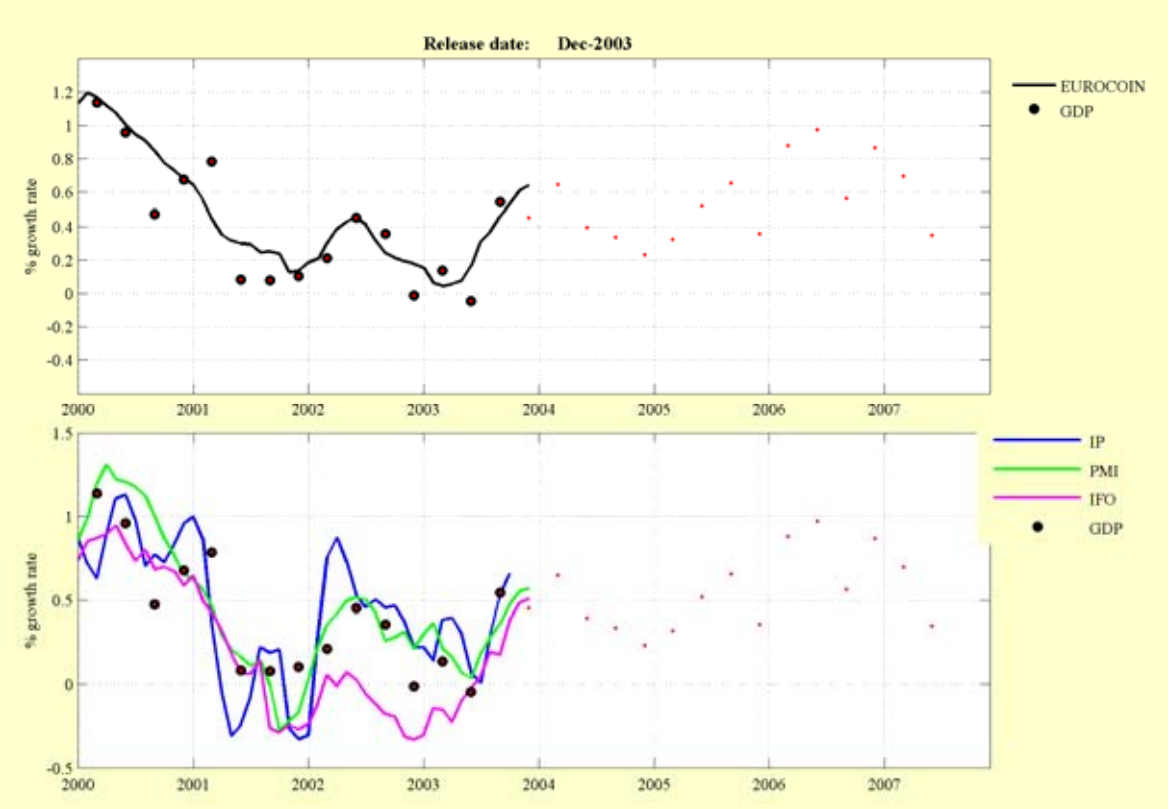


Figure 3b: Situation at the end of 2004

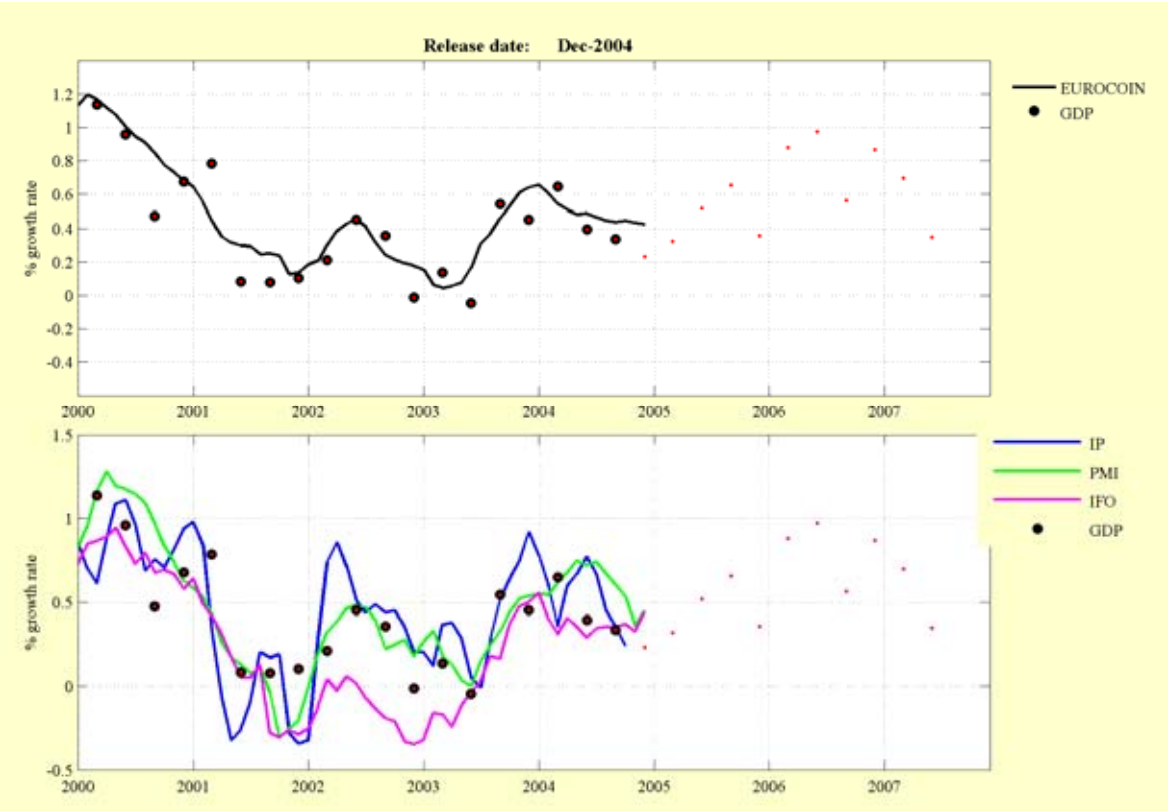


Figure 3c: Situation in summer 2005

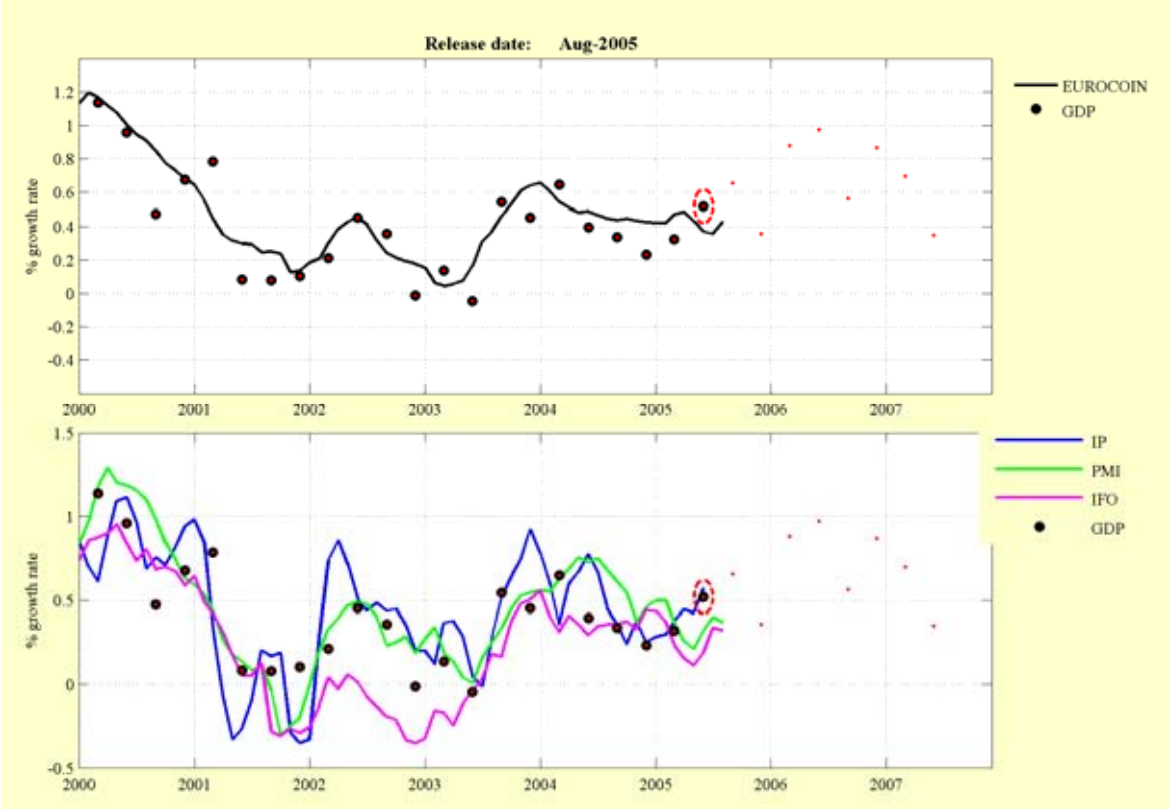
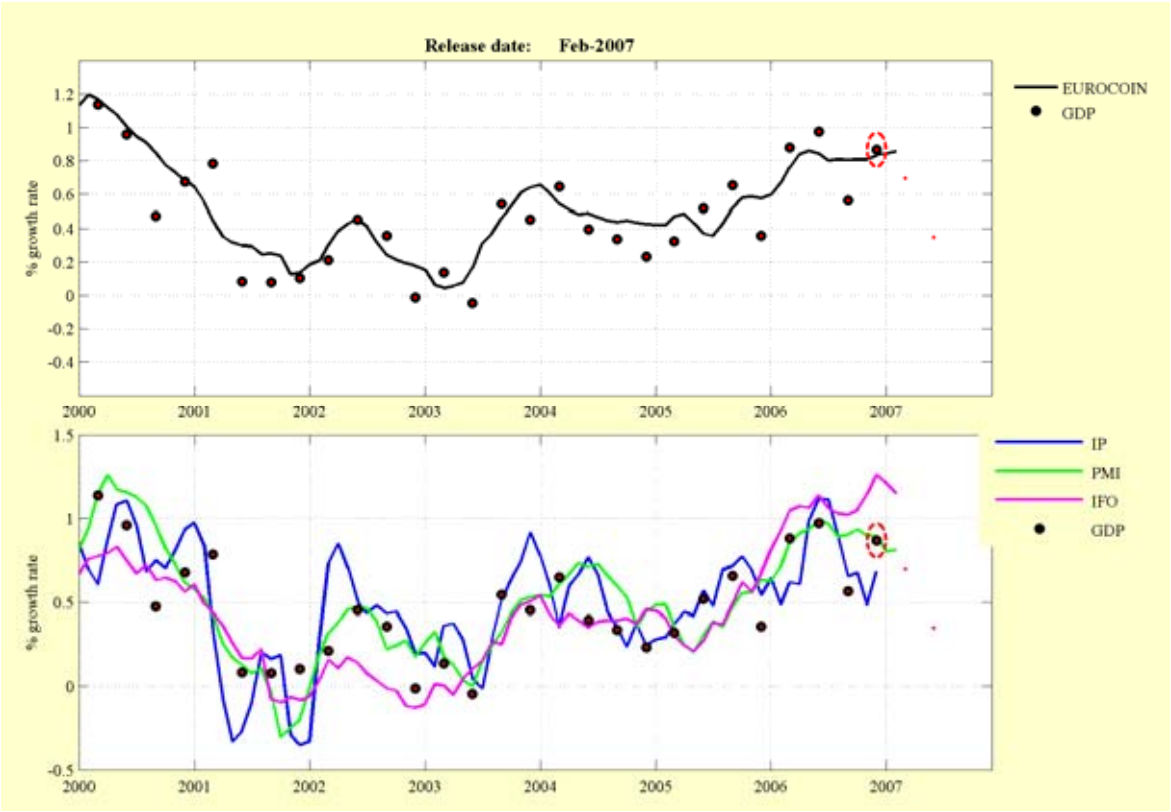


Figure 3d: Situation in February 2007



The case of 2004 is particularly interesting because throughout 2004 many economy watchers, basing their judgment on traditional indicators, repeatedly announced a **pick-up** in economic activity in the euro area. As it turned out, the signals derived from such indicators were misleading and the recovery in GDP growth did not materialise. Note in particular how the PMI, that will turn out to perform well in the 2005-06 period, wrongly signalled an acceleration in activity for the first few months of 2004. As you see, relying on €-coin would have suggested a more bearish conclusion.

In particular, while at any point in time one can always find an indicator that closely follows GDP developments, it is not the case that this happens **consistently** through time for any **single** (elementary) indicator. On the other hand €-coin has always performed remarkably well in terms of tracking growth.

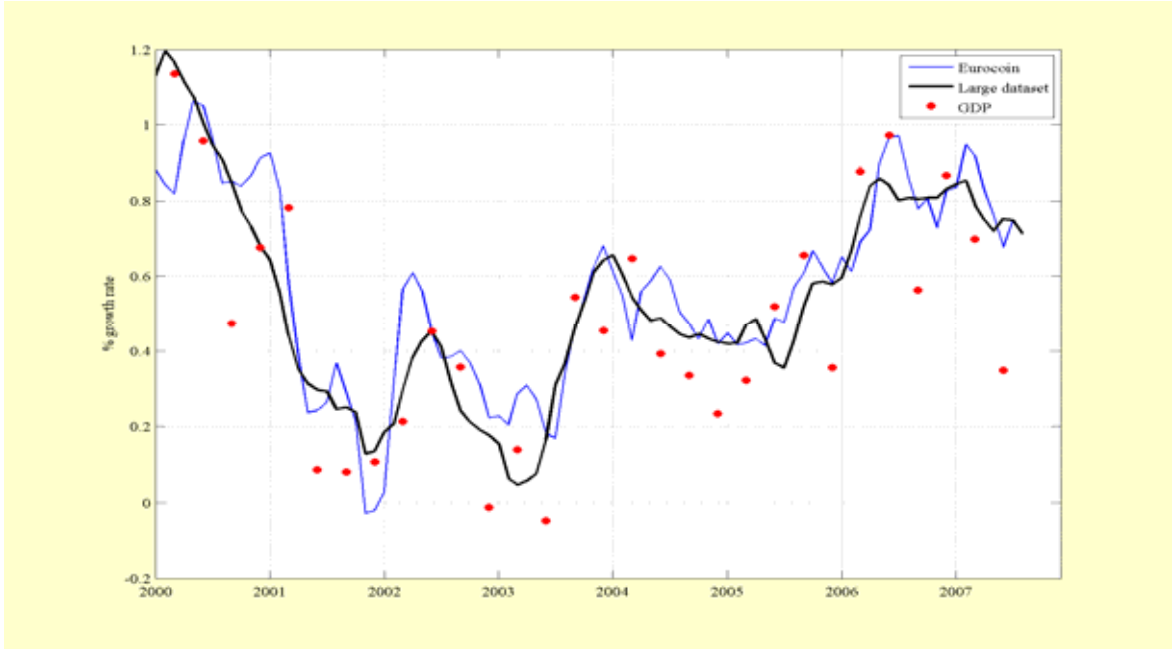
In the Spring of 2005 the signs of a pick-up started to become evident and this time the acceleration in economic activity was also **signalled** by €-coin. As you can see, though, moving forward in 2005-06 other indicators show more episodes of what we would call a "**false signal**" and a tendency either to overshoot or to undershoot GDP.

3. On the use of a large dataset

One might wonder what is the advantage of basing our judgment and hence our indicator on a broad range of statistics. We can answer this question in various ways: as we have seen, even focussing just on survey indicators leaves one with the doubt as to which one is the most reliable when faced with possibly contradictory signals. But in order to prove the case today, I will illustrate **two advantages** of using many series combined together.

First, €-coin is an improvement on equally refined methods of constructing a monthly indicator that relies on a **limited** number of series. One can try different combinations of "cherry picked" series and propose a favourite index, the result will not change: indicators based on a small set of elementary series, even if they are well known and widely used, invariably produce much **poorer** results in terms of smoothness and reliability than those obtained by carefully constructing the "common factors" as is done with €-coin (see Figure 4).

Figure 4: "Cherry picking"



The second advantage of using many series in a formal way to construct €-coin is the possibility of assessing **in continuous time** the impact of the news contained in any of these series on the indicator.

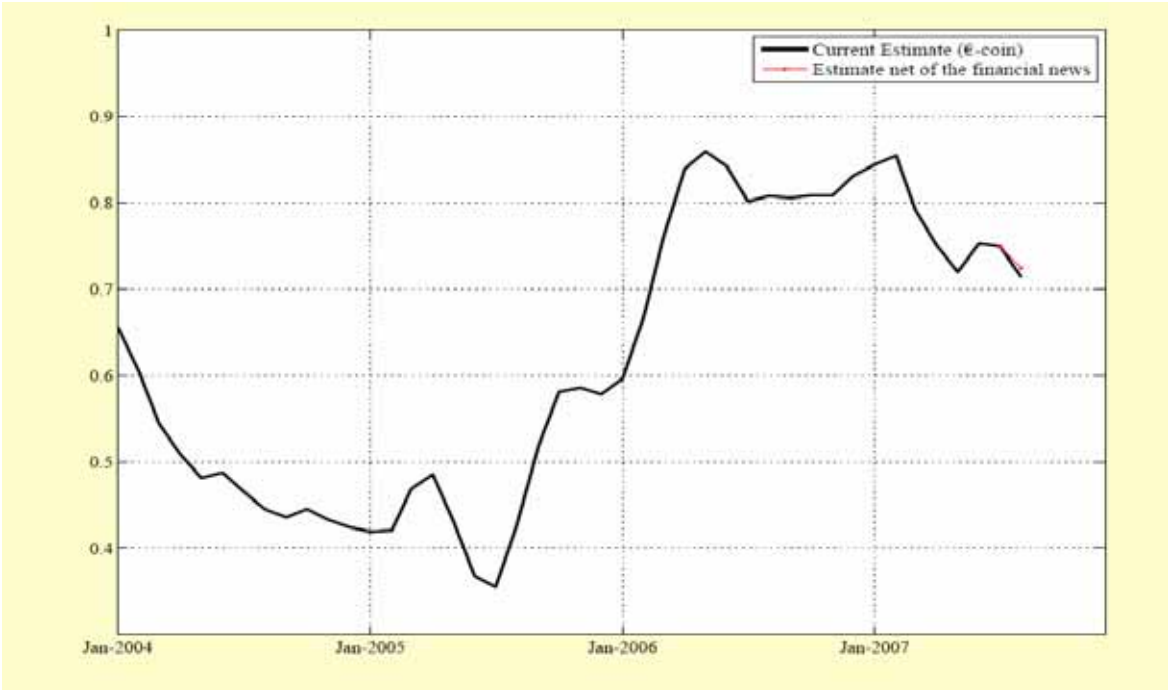
This can best be seen by referring to a real episode, such as, for **example,** the **recent turmoil** in monetary and financial markets and the surge in uncertainty it has produced. Since most forecasts are typically derived from quarterly macro-econometric models, they are still necessarily based on information gathered to a very large extent ahead of the recent financial crisis. Recent news are typically incorporated in a judgmental way and can usually be reflected in the forecast only as "downside risks", and even then only rarely with probabilities clearly spelled-out, for instance with the help of a fan-chart.

With the information at hand, almost all forecasters have suggested in the last few weeks that the short-term economic outlook for the euro area remains broadly in line with the picture we had before the Summer, i.e. the cyclical expansion will continue in the second half of 2007 at a pace only slightly lower than what was expected in the Spring. However, an issue worth investigating could be whether the **initial conditions** underlying these projections have changed or not, perhaps reflecting effects from the recent financial developments.

What information does €-coin contain in this respect? First of all it confirms the overall **positive outlook** pointing to an underlying growth rate still between 2.5 and 3 per cent for the euro area as a whole. The modest increase in June and July, that interrupted a weakening trend that started in the first half of the year, was followed in August by a return to a lower growth rate. However, the underlying growth is still higher than what was observed until the first quarter of 2006.

To assess the impact of the August news on the state of the euro-area economy, we compared the estimate of €-coin obtained at the end of August with an **alternative estimate** obtained assuming that we had no August data concerning survey expectations and financial markets, thus replacing the actual data with their forecasts, as it is the case for those components of €-coin that are not yet available when the estimate is finalized (at the end of the month; see Figure 5).

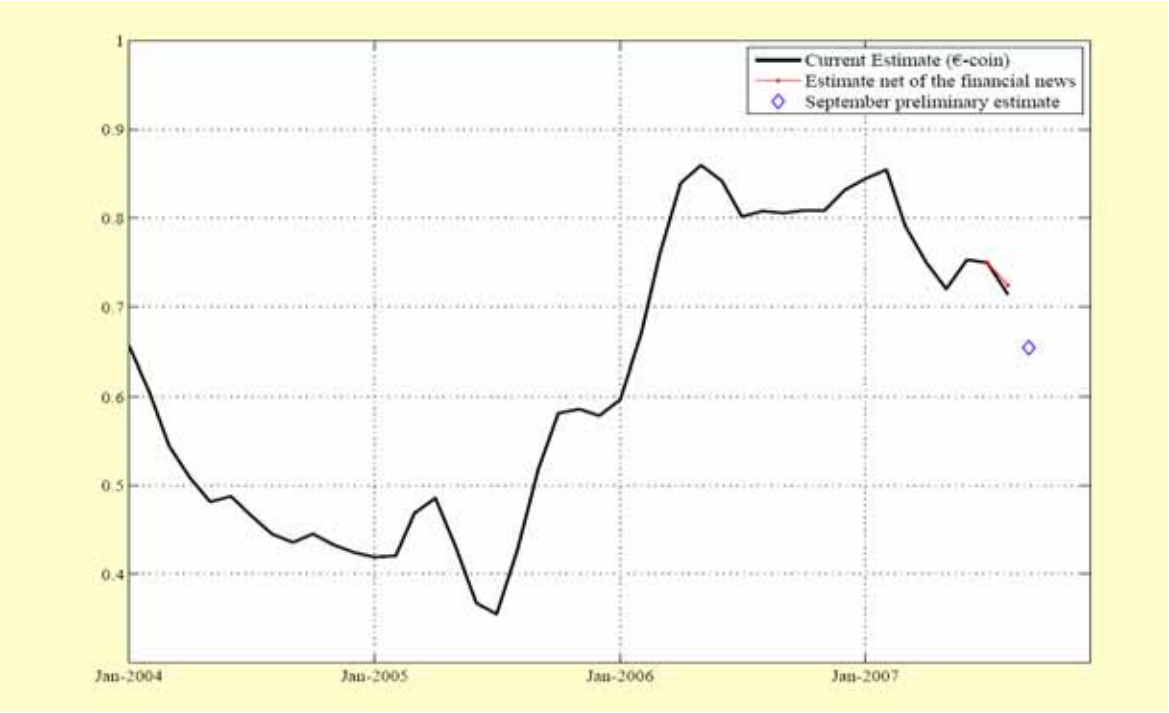
Figure 5: The August "surprise"



The result shows that with respect to the trends implicit in financial and survey data up to July, the actual turnout in **August** implied only a **minor downward revision**. It is still too early to draw definite conclusions but the fall is **very modest** indeed. While it cannot be excluded that the impact of the August financial turmoil will have only limited repercussions on the underlying macroeconomic conditions of the euro area, it should be noted, on the one hand, that its effects may take time to be fully passed through the economy and, on the other hand, that the turmoil and liquidity strains in the money markets are not over yet. So, a better picture will only be gained with the September and later releases of €-coin.

As for **September**, a **very preliminary** estimate that does not yet incorporate the information contained in survey data (available only in the second half of the month) points to a **further moderation** of the underlying rate of growth of GDP (see Figure 6). Note however that the indicator still points to an economic expansion close to potential and above the levels reached at the beginning of 2005.

Figure 6: The September "(VERY) preliminary" update



4. The way ahead

To conclude, the €-coin indicator will be published at the end of each month on the CEPR (eurocoin.cepr.org) and Bank of Italy (eurocoin.bancaditalia.it) websites. The web pages will contain a **graph** and a **table** with the most recent releases of the indicator and a **short comment** on the interpretation of the signal (note that past releases are treated as "final estimates" and will not be updated). When there are interesting events, the indicator will be further analysed by breaking it into its **main determinants** (surveys, financial variables and so forth) thus adding some insight in terms of the driving forces of underlying growth. The website will also host a page of invited comments, critiques and suggestions. Links will be provided to related literature and background papers.