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**How Problematic are
Internal Euro Area Differences?**

**NILS BJÖRKSTEN
and
MIIKA SYRJÄNEN**

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EUROPEAN UNIVERSITY INSTITUTE, FLORENCE

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FOR ADVANCED STUDIES**

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Internal Euro Area Differences?**

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Abstract*

After a period of convergence in the early and mid 1990s, the euro area economies have started to diverge. As a consequence, the common monetary policy is becoming increasingly ill-suited for a number of countries. This paper studies the extent and severity of the recent divergences, and discusses the capacity of exposed countries to compensate for locally inappropriate monetary conditions through other policy channels. Two tools are developed for monitoring intra-euro area developments: a "convergence barometer" monitors divergences, and a Taylor rule based "monetary thermometer" compares the common monetary policy to benchmark optimal policy for individual countries. A main conclusion is that policymakers at the euro area level should be concerned about divergences, since automatic stabilisers alone may not be enough to restore a healthy equilibrium to "outlier" countries.

Keywords: Euro, EMU, divergence, Taylor rule.

* Views expressed in this paper are our own, and do not necessarily reflect the views of the Bank of Finland. Assistance from Perttu Tuomi is gratefully acknowledged. We have also benefited from discussions with Anne Brunila, Pentti Pikkarainen, Tuomas Saarenheimo, Timo Hämäläinen and seminar participants at the Bank of Finland. Any remaining errors and/or omissions are our own.

Non-technical Summary

Evidence suggests that after a period of convergence in the early and mid 1990s, the euro area economies have started diverging. Two main consequences of this are, first, that euro area aggregate statistics are misleading and need to be supplemented by additional data in order for sensible policymaking to take place; second, the common monetary policy is becoming increasingly ill-suited for a number of countries.

It should be kept in mind that Euro-area member countries agreed to the structures of a common currency in part for economic reasons: these arrangements are expected to place member countries on superior growth and development paths as compared with alternative structures. In the event that this hope is not satisfactorily realised, and politically unsustainable situations occur in labour markets or elsewhere, there may eventually be a debate about disengaging, which in turn would put the entire project into crisis. While we do not expect this to take place, we do believe that EMU stands to perform better long term if policymakers put careful thought into some of the ways in which it might potentially unravel.

The challenge is therefore to prevent unacceptable economic difficulties from arising or at least persisting in any part of the euro area. For this reason, due regard should be paid to significant regional divergences from the euro area averages; outliers do matter disproportionately, even when their weights in the euro area averages are very small. How big can member country divergences become before they present a problem? The answer is: not very big, if labour markets are rigid and fiscal policy is constrained, thus restricting the adjustment process of the national economy to monetary and other imbalances.

It should be emphasised that differences are always to be expected within a common currency area, and need not cause serious discomfort so long as effective mechanisms exist to compensate for the imbalances. An even-handed assessment of the desirability of a common monetary policy must also take due account of the benefits, which are outside the scope of this paper but have been clearly established elsewhere.

This paper studies empirically the extent and severity of the recent divergences, and assesses the capacity of exposed countries to compensate for nationally suboptimal monetary conditions through other policy channels. To improve monitoring of intra-euro area developments, we develop two new tools. First, a "convergence barometer" monitors imbalances within the euro area in critical policy dimensions including unemployment, inflation, debt, and fiscal balances. This point-in-time analysis establishes the scale and nature of several

important differences across euro area countries. Second, a Taylor rule based "monetary thermometer" compares the common monetary policy to benchmark optimal policy for individual countries, thus enabling us to see what the "optimal" level of interest rates would be if the entire euro area were to look like Germany, or Italy, or Ireland, etc.

The Taylor rule analysis suggests a very wide dispersion of economic conditions across the euro area. At the extremes, Germany's economic situation would call for lower interest rates along the lines of 1.6 per cent, whereas Ireland would benefit from significant tightening and interest rates around 7 per cent. Several robustness tests on the Taylor rule confirm these results as regards the extent of dispersion and the rank ordering of the countries according to the need for monetary tightening/loosening.

The Taylor rule cannot, however, give as complete a picture as we need for policy-making purposes, because it omits from its benchmark calculations the role of exchange rates. To the extent that the euro exchange rate remains at a sustained low level, the effect is highly expansionary on small open economies with considerable trade outside of the euro area. A consideration of the trade statistics of euro area countries strengthens further concerns that some countries, such as Ireland, are in danger of overheating.

In order to shed light on the question of euro area enlargement to include some of the "outs" countries, we calculate Taylor Rule benchmark optimal interest rates for the UK, Greece and Denmark as well. All three countries would benefit from a tighter euro area monetary stance than is currently the case. It should be noted, however, that the sheer size of the UK economy will have a significant effect on the euro area averages upon which monetary policy decisions are based. While the UK at present is at a different stage of the business cycle than Germany, France and Italy, it is by no means an outlier with respect to the constellation of different economic states prevailing in the euro area. Consequently, the accession of the UK to the euro area would have a stabilising effect on EMU, which would benefit the UK in the same way as it would benefit many of the smaller and faster growing euro area countries. This perspective is worth taking note of in the UK domestic debate on whether or not to join the euro area.

To assess the capacity of economies to adjust to a common monetary policy that is locally suboptimal in varying degrees, an assessment is also made of the relative flexibility of both fiscal policy and of labour markets across the different euro area economies. The euro area countries are ranked in terms of the relative inflexibility of their labour markets; France and Finland are among the least flexible, Ireland among the most flexible. This result suggests that as

compared with France or Finland, a country such as Ireland can afford larger differences between locally optimal interest rates and the interest rates determined by the common monetary policy.

A main conclusion of the paper is that policymakers at the euro area level should be concerned about divergences, since automatic stabilisers alone may not be enough to restore a healthy equilibrium to potential "outlier" countries. The framework and tools developed in this paper are readily adaptable to other cases of common currency areas.

1. Introduction

Differences in economic developments in euro area countries are making area-wide statistics difficult to interpret. In recent months, attention has focused on the divergence of business cycles between the euro core and periphery, and at times even within the core. The implications of these developments are still unclear. With rapid and wide-ranging structural adjustments taking place, even country-specific statistics have become misleading. At the same time, there is an alarming knowledge gap regarding developments at disaggregated levels, given the difficult and ongoing process of harmonisation of statistics in Europe. Individual governments should be concerned, as the automatic adjustment mechanisms of labour and product markets are clearly being tested earlier and more severely than had initially been anticipated.

Should the European Central Bank (ECB) also be concerned? Monetary policy can no longer address imbalances that emerge within the euro area. Why, then, is it important for monetary authorities to monitor internal divergences? There are two important reasons. First, the presence of diverging internal trends can complicate decision-making. In order to prescribe an appropriate mix of policy measures, such weighted averages which underlie policy decisions could usefully be supplemented with more disaggregated statistics.

Second, as several observers have pointed out, the Economic and Monetary Union (EMU) can be brought into crisis if one individual member state starts a serious internal political debate about leaving¹. This would represent a worst-case scenario, in which a country retrospectively considers the lack of a national monetary instrument prohibitively costly and the current arrangements politically unsustainable. Euro-area countries agreed to the structures of a common currency in part for economic reasons; these arrangements are expected to place member countries on superior growth and development paths as compared with alternative structures. In the event that this hope is not satisfactorily realised, there may be a debate about disengaging. While we do not expect this to take place, we do believe that EMU stands to perform better long term if the ECB and others put careful thought into some of the ways in which it might possibly encounter crises.

¹ The risks of this are played up in Buiter (1999) and Calomiris (1999), fairly neutrally presented in Calmfors et al (1996), Obstfeld (1998) and Sims (1998), and played down in Wyplosz (1999) and Eichengreen (1998b). The overall relevance of this question was recently highlighted by market reactions to public comments of former Italian Prime Minister Romano Prodi, who was interpreted as suggesting that Italy may exit the euro arrangement if economic conditions do not develop favourably.

The challenge is therefore to prevent unacceptable economic difficulties from arising or at least persisting in any part of the euro area. For this reason, due regard should be paid to significant regional divergences from the euro area averages: outliers do matter disproportionately, even when their weights in the euro area averages are very small. How big can member country divergences become before they present a problem? The answer is: not very big, if labour markets are rigid and fiscal policy is constrained, thus restricting the adjustment process of the national economy to monetary and other imbalances.

Euro-area monetary policy is not able to respond to regional imbalances without compromising its primary objective of price stability, which is out of the question for reasons that have been well-established in numerous debates. Fiscal adjustment is currently restricted by the stability and growth pact (SGP). Adherence to the SGP is seen as crucial in order to avoid an inflationary bias in the euro area – without the SGP, individual governments have an incentive to have an overly loose fiscal policy since the cost of monetary tightening would be shared². Structural adjustment, whereby imbalances are resolved over time by real sector adjustments in labour and product markets, is a slow process. Indeed, one of the greatest concerns of economic observers has consistently been that the generally poor functioning of European labour markets will cause most economies (and especially peripheral ones) considerable suffering at one time or another under a common monetary policy. Several studies over the past decade have documented the scope for policy to improve labour market and regulatory institutions, with a view to increasing speed and flexibility of structural adjustment³. Nevertheless, progress has been and is expected to remain slower than is desirable⁴.

This paper examines more closely the current status of economic divergences within the euro area, concluding that they are significant and do not appear to be diminishing. The remainder of this paper is structured as follows. Section 2 presents the evidence so far on diverging trends, and develops a “divergence barometer” as a tool to monitor imbalances within the euro area. Section 3 evaluates the appropriateness of monetary policy, using Taylor rule evidence. A “monetary thermometer” is developed as a tool to compare monetary-related strains on member economies. Section 4 assesses the flexibility of labour markets and the constraints imposed by the stability and growth pact. Section 5 concludes and proposes directions for further work.

² There are other good reasons for the Pact as well, such as the desire to avoid public defaults that would spill into contagious debt crises (see Eichengreen and Wyplosz 1998).

³ See e.g. CEPR (1991), OECD (1994), Coe and Snower (1997), Sims (1998) and Cecchetti (1999).

⁴ See e.g. IMF (1999), European Commission (1998), OECD (1998, 1999a,b).

2. Diverging Trends: The Evidence

Does the empirical evidence on economic convergence so far give reason for optimism? Between 1992 and 1997, economic policy in most EU states was geared toward convergence and closer integration, with the benchmark being to satisfy the Maastricht requirements for EMU entry. Subsequent evidence suggests that after 1997, however, convergence has stopped and may be reversing⁵. One plausible reason for this is that after qualifying for membership in EMU, attention of national policymakers has turned from convergence to other pressing issues, such as unemployment.

Figure 1 plots inflation developments in the Euro area in the two years since mid-1997. While the weighted average of harmonised headline inflation rates has gradually declined, the spread has grown between the maximum and minimum inflation rates observed in individual member countries. The same trend also exists in the variance in inflation rates (not shown), which has grown considerably during the same period.

Figure 1. HICP Inflation Rates in the Euro Area

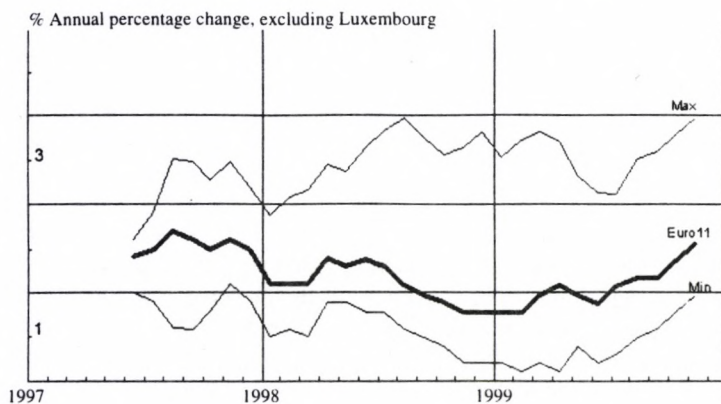
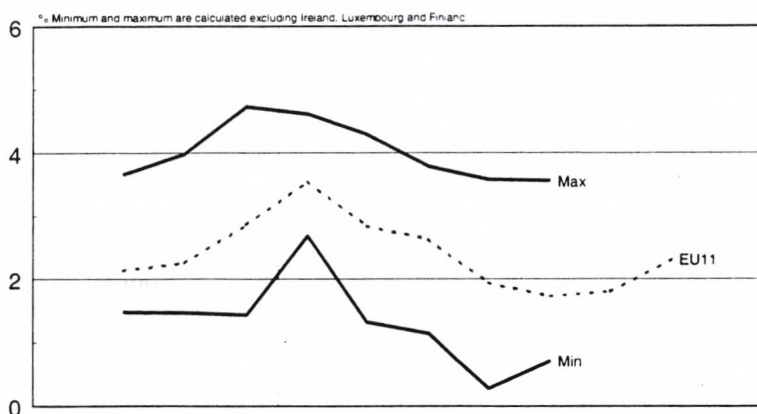


Figure 2 plots GDP growth statistics, also since mid-1997. The overall decline in growth masks the extremely strong performances of Ireland, which throughout the time period has by far grown much faster than all other euro area countries, and Finland, which has likewise outperformed all others but Ireland. With or without these two outliers, it is not clear that any convergence has been taking

⁵ Wyplosz (1999) argues that the Maastricht targets focus too much on convergence towards a 1980s style culture of monetary stability anyway, and are not enough to ensure a successful currency union in a world of unexpected shocks and high unemployment.

place across the euro area in the GDP growth patterns of individual member countries.

Figure 2. GDP Growth



Looking ahead, relative growth forecasts in the euro area show some interesting patterns. Table 1 compares realised and forecast member country per capita GDP levels and growth rates across the euro area for the years 1998-2000. These comparisons are easy to make, since the countries now share a common currency. The benchmark point of reference is the Euro-11 as a whole, which has been defined as 100 for each year. Thus, numbers that are higher than 100 indicate countries that are wealthier than the euro area average. Numbers that grow larger each year indicate forecast growth levels that are faster than the euro area average.

Table 1. Index of Euro Area per capita GDP

	1998	1999	2000
Euro11	100,0	100,0	100,0
Austria	118,2	118,9	119,6
Belgium	110,6	110,2	109,8
Finland	110,6	111,7	112,6
France	110,1	109,2	108,9
Germany	117,7	116,5	116,4
Ireland	99,5	107,3	115,9
Italy	89,9	89,8	89,7
Luxembourg	183,8	184,0	185,5
Netherlands	108,6	109,2	109,3
Portugal	48,5	50,0	50,9
Spain	63,6	64,6	65,4

Data source: Eurostat, NewCronos

By and large, the relative gainers are mostly small and on the euro area periphery, whereas the relative losers are mostly larger and closer to the core. Both groups include both richer and poorer countries. While all this may be coincidental due to the short time span of observation, a plausible explanation is that small peripheral countries have benefited the most from increased price stability and lower perceived susceptibility to shocks, which has thus increased confidence to consume and invest. If so, this can be regarded as a one-off effect that illustrates a direct benefit of having become a part of the euro area.

Explaining divergences in growth and inflation is difficult to do reliably. Some may be cyclical, as economies grow rapidly and approach a danger zone for overheating. Some may also be due to an economic development catching-up process following closer integration. In the latter case, differences may be of a longer-term structural nature, and will require a different type of policy attention. For policymakers, it is therefore important to separate between the two effects.

Recent divergences in growth are likely due mostly to desynchronised business cycles (Italy and Germany slowing down, Ireland, Spain and Portugal accelerating, and Finland continuing its return to trend growth following an exceptionally severe recession). Inflation differences are also likely to have a substantial cyclical component, besides a structural component associated with an economic catching-up process of relatively poorer countries.

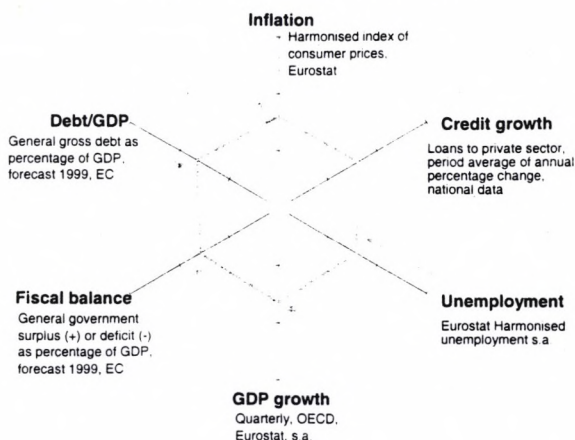
While it has been debated whether the euro area should or should not strive to have a common business cycle, this discussion is rather academic. Business cycle divergences are temporary and by nature self-reversing, so that a euro area wide monetary policy will not systematically be either too tight or too loose for any individual country. Therefore, so long as the cyclical swings can be contained within acceptable bounds, the problem will eventually disappear. Only extraordinary swings will probably require policy intervention beyond what is provided by automatic stabilisers. The crucial question is: what are the maximum acceptable bounds that can be tolerated for deviations from the euro area averages?

Convergence Barometer

When discussing economic divergences within a currency area, merely monitoring inflation and growth figures is not enough to obtain a comprehensive understanding of the overall macroeconomic situation and thereby also the resulting priorities for economic policy locally. In order to better present the individual situation of various euro area countries *vis-à-vis* the euro area average, we construct a "convergence barometer". The barometer is so named

because it condenses into one diagram a large amount of information by which to assess both the current status, and the likely future direction of economic developments. The barometer in Figure 3 displays in one diagram the current relative state of any euro area member economy in six key dimensions: inflation, unemployment, GDP growth, expansion of domestic credit, fiscal balance, and debt to GDP.

Figure 3. Convergence Barometer



The arrows show the more desirable direction of deviations from the euro area average, which is to fall within the hexagon of euro area averages. In the graphical presentation, the scales have been reversed for GDP growth and fiscal balance, in order to simplify the visual intuition. As regards credit growth, the appropriateness of above-average or below-average levels needs to be assessed in conjunction with inflation and other statistics. As always when dealing with common currency areas, it should be kept in mind that very large deviations even in positive directions can be reason for concern.

Data in the barometer (see Figure 4) corresponds to the single most recent observation that was available at the time of writing. For inflation, we use the 08/99 observation of Eurostat's harmonised index of consumer prices. For unemployment, we use the seasonally adjusted monthly Eurostat defined harmonised employment figure⁶, as reported in both OECD's Main Economic

⁶ Eurostat has developed a benchmark employment series which merges 6 quarterly labour force surveys, three annual labour force surveys, three national accounts series, one registration data series and one microcensus. Eventually, it is hoped that this monster can be replaced by a well-designed quarterly labour force survey that is run in all member states.

Indicators and the OECD Hot File. Key Economic Indicators⁷. Debt figures refer to forecast 1999 general gross debt as a per cent of GDP, as reported by the European Commission on 19 March 1999 -- figures were originally received from member states and adjusted for comparability by Eurostat. Fiscal balances refer to March 1999 forecasts by the EC of the general government surplus (+) or deficit (-). Credit growth refers to the year on year increase in credit to the private sector, as reported in a compilation from national sources.

With regard to the choice of indicators, inflation, growth, unemployment, fiscal balance and debt figures all correspond to direct and indirect objectives of economic policymakers. Expansion of domestic credit can, in conjunction with inflation and growth figures, also provide insight into the direction of economic developments and eventually the sustainability of policy.

The choice of indicators also reflects our current use of the barometer, which is to present a general overview of divergences in broad areas that are of central concern to policymakers. If we wanted to investigate related questions in more detail, the appropriate dimensions would be different. For example, if we consider the question of cyclical vs. trend divergences, our choice of indicators would reflect dimensions where cyclical and structural components of unemployment, inflation and GDP growth were more clearly delineated⁸. Fiscal balance would be retained as a primarily cyclically influenced variable and debt/GDP as a primarily structural variable. Likewise, if we were to seek a more detailed understanding of divergences in inflation, we would use multiple subcategories of inflation instead of only HICP.

Figure 4 shows the point-in-time maximum and minimum divergences within the euro area which correspond to the latest observations for the barometer's variables. Barometer pictures for each of the eleven member countries are given in Annex 1.

Several interesting patterns emerge from this exercise. First, it seems clear that several countries with high unemployment also have high gross

⁷ The standardised unemployment rates for the EU countries are the Comparable unemployment rates produced by the Statistical Office of the European Communities (Eurostat). The standardised unemployment rates give the numbers of unemployed persons as a percentage of the civilian labour force. The definition of unemployment conforms with the definition adopted by the 13th Conference of Labour Statisticians (generally referred as the ILO guidelines). The same is true for the definition of labour force, with the exception that Eurostat uses estimates which are based only on labour force surveys covering private households.

⁸ This would be an important subject for study in order to advice on specific policy measures to address imbalances, since temporary and persistent problems should be matched with temporary and permanent solutions, respectively.

debt/GDP ratios and/or weak fiscal balances, effectively limiting room for fiscal policy measures. Likewise, high local inflation (and thus lower real interest rates on euro markets) correlate with higher growth of credit aggregates, suggesting at least the potential for the formation of an economic bubble if lending standards are not kept tight enough. The correlation matrix of all of the barometer variables, across all of the euro area countries, is given in Table 2.

Figure 4. Euro Area Convergence Barometer
Weighted euro area average, minimum and maximum values

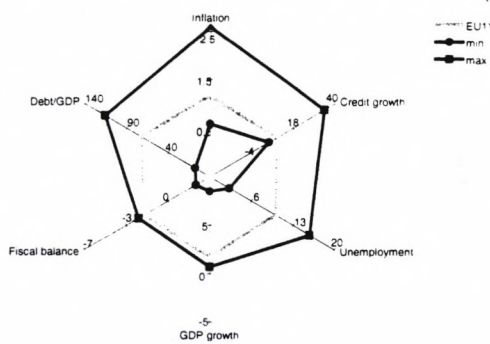


Table 2. Correlation Matrix of Barometer Variables

	Infl	Unemp	Credit	GDP	Fiscal	Debt
Inflation	1					
Unemployment	0,10	1				
Credit growth	0,65	-0,44	1			
GDP growth	0,57	-0,30	0,82	1		
Fiscal balance	0,33	-0,21	0,57	0,73	1	
Debt/GDP	-0,03	0,45	-0,59	-0,64	-0,54	1

In conclusion, there are plenty of divergences within the euro area. We developed the barometer as a tool to keep track of several interrelated variables in a compact form, and to compare them with euro area averages. Given the differences that exist, it would be surprising if the same monetary policy suited all individual member countries equally well. A closer examination of this issue is the subject of Section 3.

3. Assessing the Relative Appropriateness of Monetary Policy

On the face of it, one might expect that a common monetary policy would cause economic strains in those member countries that deviate the most from the averages on which monetary policy is based. The seriousness of those strains depend on two things: (i) how big the deviations are and (ii) the flexibility of other economic adjustment mechanisms besides monetary policy, such as fiscal policy and labour/product markets. These strains would be in addition to already existing imbalances caused by shocks or other factors.

The existence of divergences within the euro area, documented above, therefore begs the following question: does the common monetary policy of the ECB lead to or compound difficulties in some parts of the common currency area? Might any of those difficulties become severe enough to warrant euro area wide attention⁹?

Monetary Thermometer

One way to answer these questions is to look at a benchmark for monetary policy, which makes possible comparisons between "ideal" policy stances for the euro area average versus individual member countries. Below, we have incorporated one such benchmark into an indicator which we call the "monetary thermometer", because it tries to determine whether the economy is too "hot" or too "cold" for the current euro area monetary policy stance. An economy that is too hot risks overheating because monetary policy is too loose for local conditions, while the reverse is true for an economy that is too cold.

The particular benchmark that we use is based on the work of John B. Taylor, who has proposed a simple monetary rule that has received a great deal of attention¹⁰. While it is widely acknowledged that neither the European Central Bank nor the United States Federal Reserve could consider giving up discretionary authority over monetary policy given the ongoing turbulence and uncertainty of global macroeconomic developments¹¹, the so-called Taylor rule

⁹ This is a narrower version of the more general question: "can economic imbalances become large enough to warrant euro area wide policymaker attention, regardless of the appropriateness or inappropriateness of monetary conditions?"

¹⁰ See Taylor (1993). A literature review of the Taylor rule is contained in Peura (1999).

¹¹ Since the Taylor rule is reactive in nature (as opposed to proactive), its effective use is sensitive to the reliability of data that is available at the time that decisions need to be made. This currently implies serious data difficulties, especially in Europe, as preliminary statistics often undergo significant revision after they are first released. It is still too early to accurately assess the susceptibility to revision of the new European System of Accounting (ESA 95) national accounts data. A. Orphanides of the United States Federal Reserve has pointed out

constitutes a widely accepted benchmark for monetary policy. As such, it has value as one of several tools for analysis.

A Taylor rule is a very simple formulation by which monetary authorities adjust the short term interest rate in response to two factors only: inflation deviations from a target level, and the size of the output gap. A constant term indicates what level of the short-term interest rate is consistent with full employment.

Taylor's original formulation was:

$$r = p + 0.5y + 0.5(p-2) + 2$$

where,

- r is the short interest rate controlled by monetary authorities,
- p is the rate of inflation over the previous four quarters,
- y is the per cent deviation of real GDP from a target.

From the formulation above, it can be seen that Taylor assumed the target level of inflation to be 2 per cent, and the economy's equilibrium long run real rate of interest to also be 2 per cent. Thus, when inflation is stable at 2 per cent and the economy is operating at its potential, nominal interest rates should be 4 per cent. In empirical tests, the Taylor rule has been found to track actual monetary policy surprisingly well from the late 1980s until the present, both in the United States and in several large European countries.

While Taylor rules have been calculated for some individual countries in the euro area, the history of EMU is too short for a meaningful policy comparison to be made between benchmark and actual policy¹². Nonetheless, it is a straightforward exercise to calculate a benchmark "optimal" monetary policy for a euro area under a variety of different macroeconomic characteristics. Euro area monetary policy is a function of the developments in each of the individual member countries, weighted by country size. Therefore, by adjusting the weights of various countries in the euro area average, benchmark "optimal" policy can be calculated for each of the individual euro area countries.

that under such circumstances, one might expect the Taylor rule to perform better with ex post data analysis than with actual policymaking.

¹² Gerlach and Schnabel (1999) have nonetheless demonstrated that average interest rates in the EMU countries have, during the 1990s, generally moved very closely with average output gaps and inflation as suggested by the Taylor rule.

We have done this, using the original form of Taylor's rule with the sole change being that the target inflation rate was assumed to be 1 per cent¹³. Data for inflation averages the past 12 months' observations of Eurostat's harmonised index of consumer prices (HICP), the last observation being 8/99. Estimated output gaps are from OECD's Economic Outlook 66, December 1999. The results show the extent to which current euro area policy deviates from what the benchmark optimal policy would be, were the entire euro area to look like Germany, or Italy, or Ireland, etc. This information is useful in illustrating the relative strain on fiscal and structural policy in different countries as they compensate for the burden of a common monetary policy that is not fully geared to local conditions. Thus, the larger the difference between actual (euro 11) and benchmark monetary policy in Ireland, for example, the greater the strains will be on fiscal and structural adjustment mechanisms of the Irish economy to restore the economy to a long-term sustainable growth path.

Using the OECD figure for the euro area aggregate output gap, the thermometer (see Figure 5) suggests that optimal euro area short interest rates should be 2.4, which was very close to the setting up until the (pre-emptive) 0.5 percentage point increase in November to 3 per cent. The divergences are in some cases quite large, with Ireland, Portugal and the Netherlands apparently at greatest risk for overheating and Germany at the greatest risk for enduring a downturn. Among non-euro area countries considering joining the EMU, the prevailing monetary policy would be far too loose for Greece, the UK and Denmark, although the economic weight of these countries would probably affect the weighted averages by enough to raise the euro area interest rate somewhat.

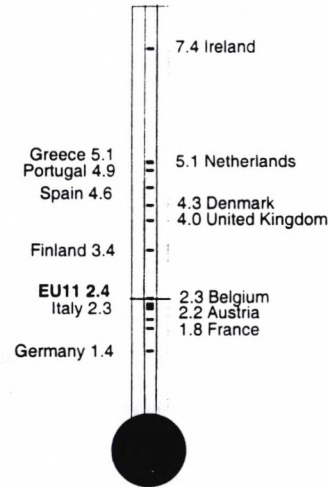
It should be emphasised that differences are always to be expected within a common currency area, and need not cause serious discomfort so long as effective mechanisms exist to compensate for the imbalances. Any balanced assessment of the desirability of a common monetary policy must also take due account of the benefits, which are outside the scope of this paper but have been clearly established elsewhere.

For comparison, we have calculated a monetary barometer for the year 2000 as well, using forecast values for inflation (from the EC) and output gaps

¹³ The ECB has the stated intermediate objective of keeping inflation "below two per cent". While a specific target figure has not been stated, it seemed logical that for the purposes of a benchmark Taylor rule, we should use a rate lower than 2 per cent. We chose 1 per cent because this is the mid-point of the implicit 0-2 target range for inflation, and is a level that current inflation seems to be converging to (see Figure 1). Changing the inflation target causes only a linear shift in the thermometer, so the dispersion remains the same (see Annex 2).

(from the OECD). The year 2000 barometer is depicted in Figure 6. for the euro area countries.

Figure 5. Monetary Thermometer



Data sources: Eurostat, OECD

Figure 6. 2000 Forecast

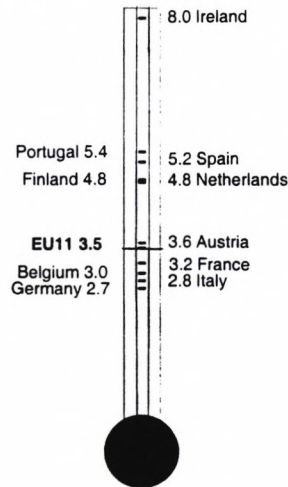


Figure 6 shows a surprising amount of convergence among most of the current members of the euro area¹⁴. If this forecast is realised, however, it still implies an extreme outlier status for Ireland, although the situation is somewhat alleviated by a rise in euro area interest rates to just over 3 per cent.

How useful and robust is this tool for analysis? The Taylor rule has been critically reviewed on several counts, which are surveyed below:

- Are the policy response parameters the right size? Taylor's original formulation weights policy response at 1.5 to inflation and 0.5 to output gaps. Simulations by economists using a variety of models have suggested that these parameters are too low: a more efficient rule would have higher parameters for both inflation and output gaps¹⁵. If this is true, then the divergences within the euro area become even more worrying (see Annex 2). Nonetheless, it has also been counter-argued (Smets, 1998) that when there is serious uncertainty about the values of the deviations, responses should probably be more muted¹⁶. This would apply more strongly to the output gap variable, since its measurement is more controversial than inflation.
- How reliable are the estimates of potential GDP and the long-run equilibrium real interest rate? Three points are worth noting in this regard. First, the monetary thermometer constructed in this paper is concerned with the differences between countries' benchmark interest rates, not their actual levels. Using different estimates of output gaps tends to shift the thermometer's scale by a slight amount, but the differences persist (see Annex 2). Second, estimates of output gaps and equilibrium "neutral" interest rates are essential to formulating monetary policy under any circumstance; if these are incorrectly estimated to begin with, monetary policy is unlikely to be further misled by looking at a Taylor rule benchmark. Finally, the efficiency of the Taylor rule is reduced when the variables are poorly estimated, but the rule itself remains inherently stable; under a Taylor rule,

¹⁴ This forecast convergence in inflation rates and output gaps may need to be taken with a grain of salt. In the immediate aftermath of the introduction of the euro, one might expect (i) greater forecasting uncertainty associated with structural changes in the euro area economies, and (ii) considerable political pressure on international organisations to, when in doubt, emphasise convergence/downplay any tendencies for divergence.

¹⁵ A good review of these tests is contained in Taylor (1998), who acknowledges uncertainty about the appropriate size of coefficients and proposes that the benchmark rule be supplemented with a portfolio of other rules, including Taylor rules with higher and lower coefficients.

¹⁶ One implication is that in the limit, if there is no confidence at all in the measured size of the output gap, the policy response to measured output gap changes should be zero.

monetary policy cannot spiral out of control even under the most extreme conditions.

- How robust is the Taylor rule to different models of the economy? Simulations have shown that the simplest form of the Taylor rule is surprisingly robust to a variety of different models of the economy, more so than the more complex versions of the rule (see Taylor 1998). Robustness to model/regime changes is a highly desirable property under the circumstances we now face in Europe. This was an important reason why we chose to construct the monetary thermometer using the simplest version of the rule.
- Why not use forecast inflation instead of current and past values? Setting aside the question of how to choose between competing forecasts, we observe that in the end, all forecasts are still based on current and past data. Along with Taylor, we justify the explicit use of already observed values for reasons of clarity/transparency. Taking an average of inflation over several periods is also useful because it smoothes short-term fluctuations.

Exchange Rate Fluctuations

The Taylor rule still leaves out movements in exchange rates and in monetary aggregates. In view of the public attention that has surrounded the recent exchange rate developments of the Euro, the impact of such fluctuations may be worth examining more closely. While it has been pointed out that the euro area as a whole is not enormously dependent on external trade, individual member countries are. Table 3 below examines the importance to individual member countries of trade with countries external to the euro area. The first data column shows the total exposure of each country (imports and exports to/from countries outside of the euro area) as a proportion of GDP. The second data column shows the proportion of exports + imports which each country had with the non euro area in 1998.

The impact of exchange rate fluctuations on the real economies of individual member countries varies widely depending on the exposures of the economies to trade outside the euro area. A country for which trade constitutes a small part of GDP, and which trades mostly with other countries within the euro area, is unlikely to be affected by large swings in the dollar-euro exchange rate. Nonetheless, from Table 3, we can see that the fast-growing economies of Finland and Ireland are highly exposed to currency movements, since both engage in a great deal of trade with countries that are not in the euro area. A sustained depreciation of the euro may therefore dramatically increase domestic competitiveness in these countries as well as import some inflation from abroad.

Belgium/Luxembourg and the Netherlands also figure prominently, although their vulnerability to exchange rate fluctuations may be overstated since the proportion of transit trade is substantially greater.

If Ireland and Finland are already in danger of overheating, as suggested by the monetary thermometer, then sustained weakness of the Euro would surely be an unwelcome development. This would serve to further increase the pressures on labour markets and other adjustment mechanisms to compensate for a monetary policy that is too loose for local conditions.

Table 3. Non Euro Area (NEA) Trade 1998

	NEA trade / GDP	NEA trade / Total trade
	%	%
Ireland	85	64
Bel/Lux	50	39
Netherlands	48	45
Finland	39	65
Germany	26	55
Austria	22	37
Italy	20	52
France	20	47
Portugal	19	33
Spain	17	41

Data source: Eurostat, NewCronos

In conclusion, many differences exist within the euro area, which are in turn reflected in different “benchmark optimal” monetary conditions. Are these differences large enough to be meaningful? The barometer and thermometer cannot answer this question. For this, we need a better assessment of the flexibility of available adjustment mechanisms. This is the subject of Section 4.

4. Capacity for Fiscal Adjustment and Labour Market Flexibility

It can be argued that for the most part, the reasons underlying economic divergences are beside the point. The very fact that divergences have grown underlines the importance of alternative economic adjustment channels besides monetary policy. To the extent that institutions of financial markets, labour markets and fiscal policy are flexible enough to effectively compensate for less-than-optimal monetary policy from the point of view of an individual country, there is little problem. In this respect, the problem of diverging business cycles within a monetary union is very similar to the problem of asymmetric shocks.

In their detail, both fiscal and structural reform are extraordinarily difficult to map out. There is considerable path dependency in policy design, and policymakers are not starting from a clean slate. What can effectively be

achieved today depends a great deal on what has been done in the past. For this reason, we will not attempt to propose specific reform measures in this paper: detailed and comprehensive studies have been made elsewhere and are now under consideration by member country governments.

There are, however, several indicators of institutional rigidities in fiscal policy and labour markets. While our analysis is far from conclusive, it provides at least some indication of the relative effectiveness of adjustment channels in different euro area countries, and is thereby useful to identify and focus attention on key areas of concern.

Fiscal Flexibility

In the case of fiscal policy, we have run a very simple simulation whereby we computed the risk of different euro area countries exceeding the three per cent stability and growth pact deficit limits in 1999.

The method we used involves three steps. First, we assumed that budget deficits are only a function of changes in GDP growth – nothing else. In other words, if GDP growth were to remain unchanged, the budget deficit would also remain unchanged from year to year. Second, we subtracted forecast GDP growth in 1999 from growth in 1998 in order to determine what the expected GDP change will be. Finally, we multiplied this GDP change by EC-estimated coefficients for deficit sensitivity to obtain a forecast impact on 1999 budget deficits. We repeated the exercise to obtain forecast budget deficits for the year 2000.

Table 4 tabulates the results. The data indicate potential problems for France, but none of the other countries exceed the critical 3 per cent SGP constraint.

Aside from the risks facing France, the conclusions we draw from this exercise are by and large optimistic. Continuing the exercise into the year 2000, none of the other countries ran up against the SGP deficit limit. None of the other countries reach the limit even if GDP growth were to drop by more than one half percentage point from currently forecast levels. Thus, for most of the countries that the thermometer identifies as suffering from a locally inappropriate monetary policy, the fiscal mechanisms are probably sufficiently robust to avoid problems with the stability and growth pact 3 per cent deficit limit for now.

Table 4. Forecast Fiscal Balances

	GDP ¹			Sensitivity of budget balances to GDP ²	Forecast Fiscal Balances ³		
	1998	1999 ⁴	2000 ⁴		1998	1999 ⁵	2000 ⁵
Portugal	4.0	3.2	3.3	0.5	-2.3	-2.7	-2.7
Italy	1.4	1.6	2.3	0.5	-2.7	-2.6	-2.3
France	3.2	2.3	2.7	0.5	-2.9	-3.4	-3.2
Germany	2.8	1.7	2.4	0.5	-2.1	-2.7	-2.3
Belgium	2.9	1.9	2.5	0.6	-1.3	-1.9	-1.5
Spain	3.8	3.3	3.5	0.6	-1.8	-2.1	-2.0
Netherlands	3.7	2.3	2.7	0.8	-0.9	-2.0	-1.7
Ireland	11.9	9.3	8.6	0.5	2.3	1.0	0.6
Austria	3.3	2.3	2.7	0.5	-2.1	-2.6	-2.4
Finland	5.3	3.7	3.9	0.6	1.0	0.0	0.2

Data source: EC

¹ Gross domestic product, real percentage change on preceding year.

² EC estimates, 1995

³ General government net lending (+) or borrowing (-) as percentage of GDP.

⁴ 1999 and 2000 forecasts of III-1999.

⁵ Authors' calculations.

This nonetheless abstracts from effects of structural issues such as ageing populations, as well as any extraordinary measures that governments may have at their disposal. The analysis also abstracts from risks that may result from overheating of economies. In our view, such risks are considerable in some countries, and there may be very little room for complacency even if budgetary processes are in principle good.

A striking feature is that the budget elasticities to GDP (Table 4, column 4) are so similar across the euro area countries. This suggests that, all else equal, the countries at greatest risk of exceeding the SGP 3 per cent deficit constraint are those which (i) are already close to this constraint and (ii) expect growth to slow down. There is very little difference across euro area countries in terms of relative flexibility of fiscal policy.

Labour Market Flexibility

Academics, research institutes, interest groups, national authorities, international organisations, etc have already studied labour markets in the euro area very extensively¹⁷. While there is a heated debate regarding the nature, sequence and timetable of policy measures, an overwhelming consensus exists that labour markets should become more flexible.

In assessing the capacity of individual countries to respond to economic shocks and pressures, it is also useful to have a rough assessment of the *relative*

¹⁷ Informative studies include Coe and Snower (1997), European Commission (1998), and OECD (1994, 1999a).

flexibility of labour markets across the euro area¹⁸. One way to do this is to rank countries in terms of different labour market rigidity indicators. Table 5 does this, using as indicators net replacement rates, tax wedges, employers' social security contributions and long-term unemployment. An overall rank (in the last column) is obtained by naively summing the ranks of countries for each of the four indicators. The ranking exercise suggests that labour markets in France and Finland are the most inflexible; by comparison, Ireland, Luxembourg and Portugal have the most flexible labour markets.

Table 5. Indicators of Labour Market Rigidities

Net replacement rate ¹		Total tax wedge ²		Employer's social security contributions ³		Long-term unemployment rate ⁴		Overall inflexibility ⁵	
FI	103	FI	50.3	IT	31.7	SP	9.4	France	1
LU	91	IT	48.3	FR	30.2	IT	8.3	Finland	2
FR	84	BE	48.2	BE	25.8	BE	5.4	Belgium	3
NL	82	FR	45.4	SP	23.5	FR	5.0	Italy	4
GE	80	NL	39.9	FI	20.5	GE	4.9	Spain	5
PT	77	AT	37.3	AT	19.6	IE	4.4	Germany	6
BE	72	GE	35.0	PT	19.2	FI	3.2	Netherlands	7
AT	69	SP	33.5	GE	16.8	PT	2.1	Austria	8
SP	67	PT	30.9	LU	11.7	NL	1.9	Portugal	9
IE	64	IE	29.9	IE	10.7	AT	1.3	Luxembourg	10
IT	11	LU	22.7	NL	7.6	LU	0.9	Ireland	11

Sources: Long-term unemployment is from the EC, the rest of the data is from the OECD.

Notes:¹ Per cent of the average earnings of a production worker, in the 12th month of unemployment benefit receipt, for a couple with two children, dependent spouse. Data is from 1997.

² Per cent of gross labour costs for average production workers. Includes income taxes, employer and employee social security contributions, but not indirect taxes and cash transfers. Tax rates refer to one-earner couples with two children, and take into account standard tax reliefs. Data is from 1996.

³ Per cent of gross labour costs for average production workers. Data is from 1996.

⁴ Unemployment duration is greater than one year. Data is from 1998.

⁵ Obtained by adding the ranks of each country in each of the four indicators.

There are at least three serious limitations to this type of exercise. First, the overall inflexibility ranking places an equal weight on each of the four indicators, without considering interactions or co-movements between indicators. Second, the choice of indicators is debatable¹⁹. Third, the rankings do not consider how small or large the difference is between countries, even

¹⁸ This does not take away from the fact that all EU countries may be experiencing a gradual increase in labour market flexibility as cross-border labour mobility increases, at least for skilled workers. Current labour market adjustment via cross-border (and even internal) migration is very low, however, and is expected to increase only very slowly. For a discussion of this, see Eichengreen (1998c) and OECD (1999b).

¹⁹ For example, employers' social security contributions (column 3) is already included as a component in the total tax wedge (column 2).

though large differences should matter much more than small ones. In summary, a different ranking might result from adding more indicators, considering slightly different indicators or weighting the current indicators in a different way. Nonetheless, the sole purpose of the exercise is to provide one indication of relative labour market inflexibility across the euro area, and Table 5 should be viewed with this in mind.

Figure 7. Unemployment Rates since 1970

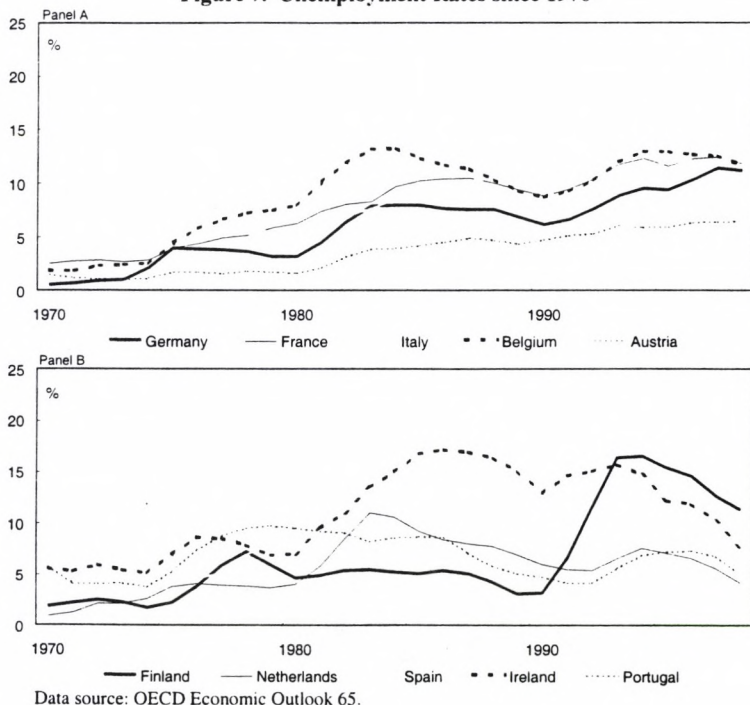


Figure 7 shows the different developments that have taken place in two groups of euro area countries. Figure 7 panel A shows countries that have seen a slow but steady increase in unemployment rates. These include the three largest countries (Germany, France and Italy), which together make up close to 70 per cent of the euro area weighted average. Except for Belgium, there has been very little volatility in the series. Panel B shows rapidly growing countries that have consequently in recent years experienced substantial declines in their unemployment rates. With the exceptions of Spain and Finland, unemployment rates are now below 7-8 per cent.

This 7-8 per cent level is important for reasons relating to the effective functioning of labour market institutions. In all countries, receiving unemployment benefits is contingent on the applicant actively looking for work. This job search requirement is in practice much easier to enforce when unemployment is low; usually there is not a great shortage of jobs and labour offices have better opportunities to monitor the individual cases of job-seekers who fail to successfully find jobs. When the unemployment rate rises much above 7-8 per cent, the job search requirement becomes much harder to enforce, leading to greater incidence of abuse of the system and labour market offices that are much less effective in implementing policy.

In summary, there is not a great deal of evidence to suggest that the euro area economies by and large have efficient mechanisms at their disposal which will allow them to adapt to diverging economic developments and occasional asymmetric shocks of moderate size. Fortunately, the 3 per cent fiscal deficit limit imposed by the stability pact is still probably not unduly tight, so there exists a window of opportunity to take effective reform measures. While labour markets are showing increasing signs of flexibility in half of the euro area countries, these are primarily the smaller ones representing only a small fraction of the euro area weighted average. In terms of relative capacities of labour markets to adapt, there remains a wide divergence.

The absence of an imminent crisis is not a good reason for complacency; serious longer term structural issues, such as ageing populations, will still require response measures. Moreover, there remains the potential for large external shocks from America, Japan or emerging markets, as well as the formidable challenge of smoothly integrating the accession countries to the EU. In any event, more flexibly functioning markets lead to faster and less disruptive adaptation to changes in the economic environment, of which there will probably be many more as Europe continues to integrate more closely.

5. Concluding Remarks

The divergences between euro area economies have the potential to become a serious issue, and should therefore be carefully monitored. While a common monetary policy cannot by itself respond to divergences in individual countries, the "outlier" countries are still important for two reasons. First, their existence complicates policymaking, thereby calling for additional, more disaggregated statistics to supplement the area-wide weighted averages. Second, and in a worst case scenario, unless due attention is paid to the extremes, one or more countries may eventually suffer a political crisis over the costs of remaining in the common currency area.

In the medium term therefore, until fiscal and structural (labour and product market) adjustment mechanisms have become more flexible, and until financial integration has had time to deepen further, it may be desirable to pay close attention to divergences of internal economic developments. While the European Central Bank is under normal circumstances concerned only with euro-area aggregate developments in setting monetary policy, it also has a stake in preventing crises which might compromise the integrity of the system. Therefore, it cannot remain completely outside of the debate on limiting downside risks for individual euro-area countries that find themselves subjected either to asymmetric shocks or a sufficiently severe cyclical swing that is out of synchronisation with the rest of the euro area.

In the event of a crisis, fiscal policy can theoretically be made more expansive. One way would be for the EU could be given greater leeway to tax member country citizens and transfer funds to depressed areas. This implies a greater political integration than most countries at present would be prepared to accept, and is therefore unlikely to happen for many years (Haaparanta and Peisa 1997, Eichengreen 1998a). Alternatively, an exception can be made to the SGP, but this would have the equally unacceptable consequence of compromising the integrity and credibility of the pact in the first place. At present, the safeguard clauses of the pact are generally seen as sufficiently flexible to accommodate all but the most improbable circumstances, thus giving member countries additional leeway when necessary to cope with domestic economic problems.

The risks to the system deriving from excessive divergences are perhaps the greatest in the first five years, after which institutional structures will have had more time to adapt and automatic stabilisers, including with regard to labour markets, will become more effective. Nonetheless, the challenges of ageing populations and the slow speed at which budgetary reforms have historically taken place makes clear that the margin for complacency is limited even in the medium term.

One reasonable step that could be taken to strengthen the system would be to further improve surveillance. In particular, indicators should be put into place to monitor divergences in economic developments within the euro zone, so that appropriate steps can be taken in time to contain adverse developments and possibly deter a crisis. The nature of these "appropriate steps" will require further discussion both at political and economic levels, and are outside of the scope of this paper.

With regard to improved surveillance tools, we have two proposals. First, with regard to country comparisons, a "convergence barometer" is developed

which simultaneously illustrates divergences in six more or less interdependent dimensions. Second, in order to assess strains on real sector adjustment mechanisms, we propose a Taylor rule based "monetary thermometer". This would provide a benchmark for how much actual monetary policy deviates from what would be the optimal if the entire Euro area economy were to look exactly like that of an individual member state.

While little time has passed so far since the introduction of the euro, the effectiveness of policy measures in the euro area will become easier to assess as more data becomes available. In the meantime, much work remains to be done in assessing and enhancing the capacity of real economic adjustment channels to respond not only to asymmetric shocks but also to trend and cyclical divergences within the common currency area.

Directions for Further Research

There are at least two logical extensions to this paper. First, a more thorough assessment is needed of the current capacity of economies to adjust by themselves to economic imbalances, including a common monetary policy that may be too loose or too tight for local conditions. Related to this work is the development of alternative mechanisms for euro area wide intervention to support stabilisation in member countries which are unable to return to a sustainable growth path on their own accord.

The second and more straightforward extension is to apply the framework above to the EU enlargement debate, where the challenge for the ECB is to ensure the smooth transition of applicant countries into the EMU. Versions of the convergence barometer and monetary thermometer could be developed which would facilitate surveillance of countries which are currently on an accession track to the EU, and consequently expected to eventually join the euro area.

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References

Begg, David, Francesco Giavazzi, Jurgen von Hagen and Charles Wyplosz (1997) *EMU, Getting the End-game Right*, CEPR, London.

Buiter, Willem (1999) "Alice in Euroland". *Journal of Common Market Studies*, forthcoming.

Buti, Marco and Andre Sapir (eds.) (1998) *Economic Policy in EMU, a study by the European Commission Services*, Oxford University Press, New York.

Calmfors, Lars *et al.* (1996) "Sverige och EMU". *Statens Offentliga Utredningar*, 158, Stockholm.

Calomiris, Charles W. (1998) "The Collapse of the European Monetary Union". *Mimeo*.

Cecchetti, Stephen G. (1999) "Legal Structure, Financial Structure and the Monetary Policy Transmission Mechanism", *Mimeo*.

CEPR (1991) *The Making of Monetary Union*, London.

Coe, David T. and Dennis J. Snower (1997) "Policy Complementarities: The Case for Fundamental Labour Market Reform", *IMF Staff Papers*, vol. 44, no. 1, pp. 1-35.

Eichengreen, Barry (1998a) "EMU: The Road Ahead", *Mimeo*, February.

Eichengreen, Barry (1998b) "Will EMU Work?", *Mimeo*, April.

Eichengreen, Barry (1998c) "European Monetary Unification: A Tour d'Horizon", *Mimeo*, August.

Eichengreen, Barry and Charles Wyplosz (1998) "The Stability Pact: More than a Minor Nuisance?", *Economic Policy*, 26, pp. 65-114.

European Commission (1999) "Employment in Europe 1998", Luxembourg [based on COM (1998) 666 final]

Feldstein, Martin (1999) "The Euro Risk", *Time Magazine*, 25 January.

Frankel, Jeffrey and Rose, Andrew (1997) "The Endogeneity of the Optimum Currency Area Criteria", *Mimeo*, 24 September.

Gerlach, Stefan and Gert Schnabel (1999) "The Taylor Rule and Interest Rates in the EMU Area: A Note". BIS Working Papers, No. 73.

Haaparanta, Pertti and Paavo Peisa (1997) "Talouden Rakenne ja Häiriöt", *Valtioneuvoston kanslian julkaisusarja*, 1997/21, Helsinki.

IMF (1999) *World Economic Outlook*.

Obstfeld, Maurice (1998) "EMU: Ready, or Not?", *Mimeo*.

OECD (1994) *Jobs Study*, Paris.

OECD (1998) "The OECD Jobs Strategy: Progress Report on Implementation of Country-Specific Recommendations", Economics Department Working Papers, no. 196.

OECD (1999a) "The OECD Jobs Strategy: Assessing Performance and Policy", ECO/CPE/WP1(99)2.

OECD (1999b) *EMU Facts Challenges and Policies*, Paris.

Peura, Tapio (1999) "Rahapolitiikan säännöt: katsaus kirjallisuuteen", Bank of Finland Discussion Papers 15/99.

Sims, Christopher A. (1998) "The Precarious Fiscal Foundations of EMU", *Mimeo*.

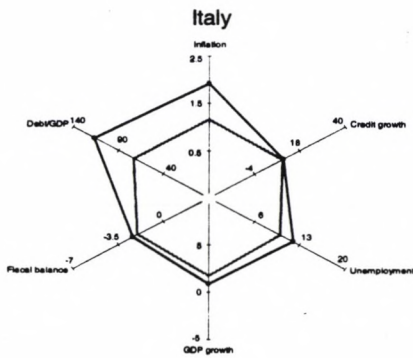
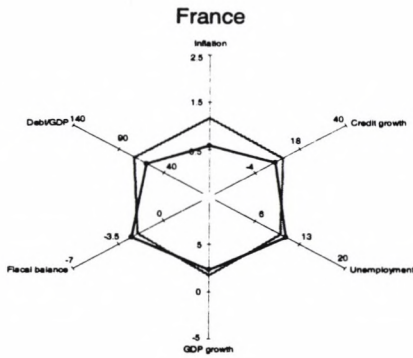
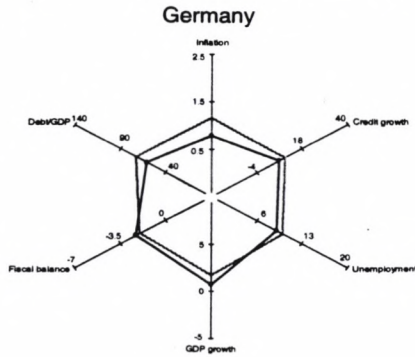
Smets, Frank (1998) "Output Gap Uncertainty: Does It Matter for the Taylor Rule?", BIS Working Papers, No. 60.

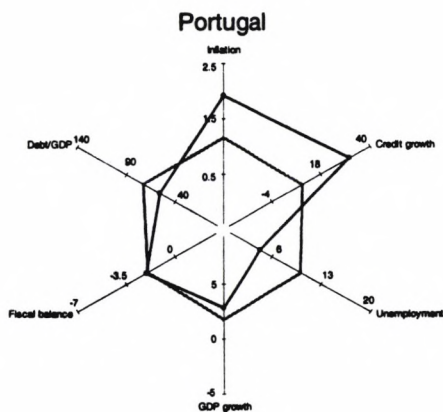
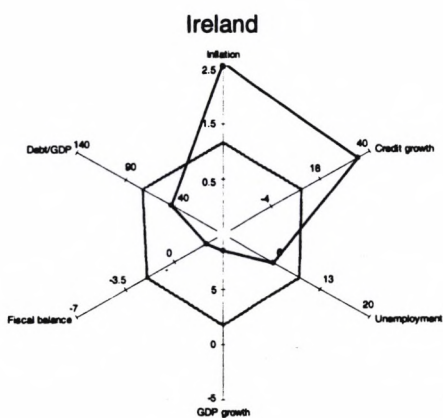
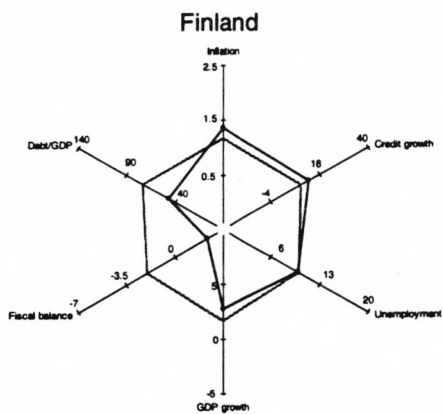
Taylor, John B (1993) "Discretion versus policy rules in practice", Carnegie-Rochester Conference Series on Public Policy, 39, pp. 195-214.

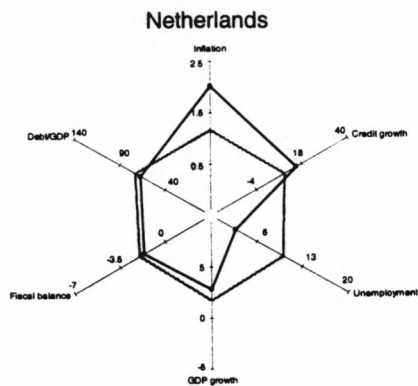
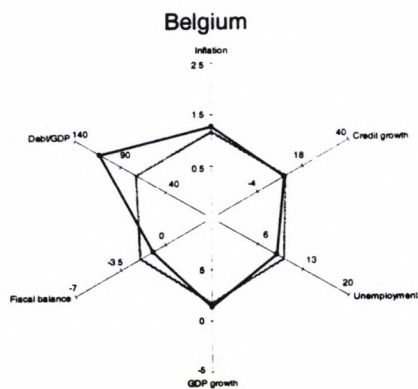
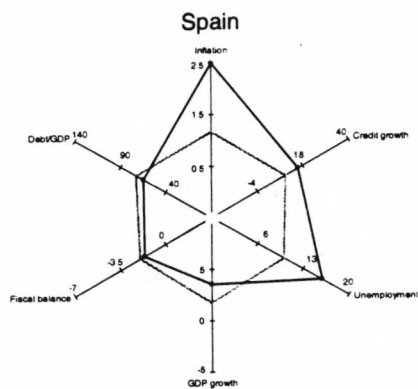
Taylor, John B (1998) "The Robustness and Efficiency of Monetary Policy Rules as Guidelines for Interest Rate Setting by the European Central Bank", Seminar Paper No. 649, Institute for International Economic Studies, Stockholm University.

Wyplosz, Charles (1999) "Economic Policy Co-ordination in EMU: Strategies and Institutions", *Mimeo*.

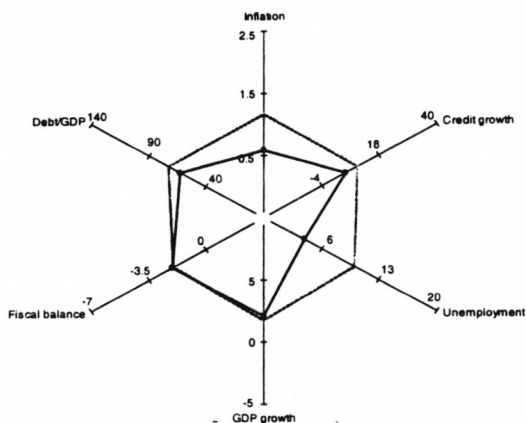
Annex 1. Convergence Barometers for Each Euro Area Country



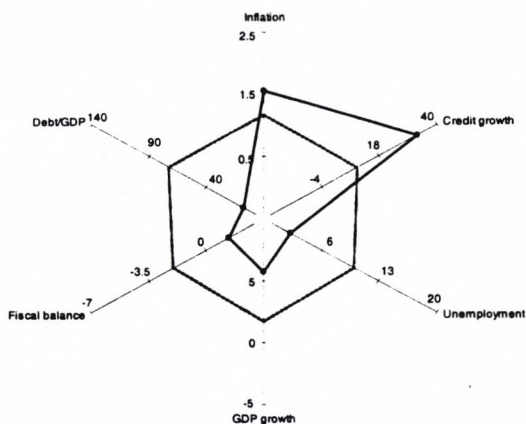




Austria



Luxembourg



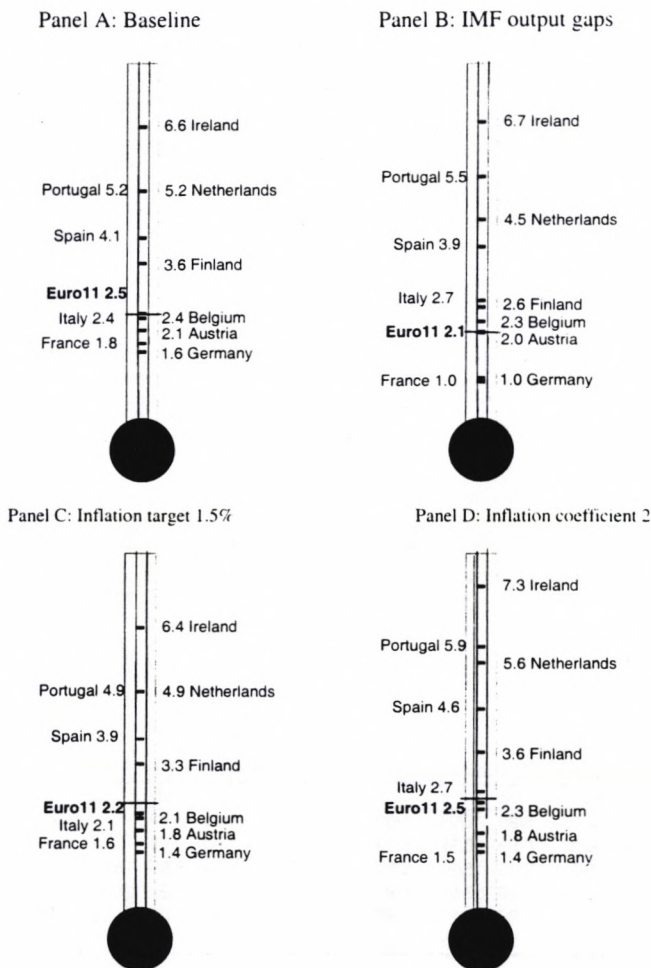
Data Note: The dates of the latest observations are as indicated below.

	EU11	BE	DE	ES	FR	IE	IT	LU	NL	AT	PT	FI
Inflation	8/99	8/99	8/99	8/99	8/99	8/99	8/99	8/99	8/99	8/99	8/99	8/99
Unemployment	8/99	8/99	8/99	8/99	8/99	5/99	4/99	8/99	5/99	8/99	8/99	8/99
Credit growth	5/99	5/99	5/99	5/99	5/99	5/99	5/99	5/99	5/99	5/99	5/99	5/99
GDP growth	q2-99	q1-99	q2-99	q1-99	q2-99	98	q2-99	98	q2-99	q1-99	q4-98	q2-99
Fiscal balance	99	99	99	99	99	99	99	99	99	99	99	99
Debt/GDP	99	99	99	99	99	99	99	99	99	99	99	99

Annex 2. Testing Monetary Thermometer Robustness

To assess the robustness of the monetary thermometer, we conducted a series of sensitivity tests in July 1999 using a different data source, changing the target level of inflation and the coefficient attributed to inflation changes. The results are reported in Figure A2.1, panels A-D. Note that the baseline data in Panel A reflects the situation in the summer of 1999, rather than the updated data in Figure 5 of the text.

Figure A2.1. Monetary Thermometer Sensitivity Test Results.



Panel A is the baseline thermometer as reported in the text, but with data available in July 1999. The source of the output gap estimates is the OECD, the assumed target level for inflation is 1.0 per cent, the coefficient of response to inflation changes is 1.5 and the target level of inflation is 1.0 per cent annually.

Panel B shows the thermometer with all the same baseline assumptions, but using the IMF estimates for the output gap. Compared with the OECD, the IMF is more pessimistic about output gaps, implying that on average the euro area countries are further below their level of potential output, with this holding particularly true for the large countries France and Germany. As a consequence, using the IMF figures in the Taylor rule gives us a lower benchmark optimal level of interest rates for the euro area as a whole: 2.1 per cent as opposed to 2.5²⁰. The range of benchmark optimal interest rates is greater, indicating that using IMF figures, the euro area divergences are even more worrying.

Panel C shows the baseline thermometer where the target level of inflation is a higher 1.5 per cent, instead of 1 per cent. This shifts the entire scale of the thermometer down by 0.25 percentage points, but there is no change at all in the range or the relative ranking of the countries.

Panel D shows the baseline thermometer where the inflation coefficient has been raised by 0.5 percentage points to 2. This form of the Taylor rule therefore responds slightly more strongly to changes in inflation. This obviously accentuates further the differences between the countries in terms of which interest level is benchmark optimal under different locally prevailing inflation circumstances.

The conclusion of the sensitivity tests is that the monetary thermometer is impressively robust. In each of the tests, the order of the countries is virtually identical, with no change at all at either the top or the bottom. We are therefore quite confident in saying that, given prevailing country differences, Ireland, Portugal, the Netherlands and Spain would benefit from tighter monetary conditions while France and Germany would benefit from the reverse.

²⁰ Unlike the OECD, the IMF does not calculate an output gap figure for the euro area as a whole. The figure we used was derived by weighting the individual country output gaps using the same weights that eurostat uses in calculating euro area aggregate inflation.



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