

MACROECONOMIC DIVERGENCES BETWEEN EURO AREA COUNTRIES: SIZE, CAUSES  
AND IMPLICATIONS

## Macroeconomic divergences between euro area countries: size, causes and implications

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### Introduction

In recent years, economic activity in the euro area has grown at a modest rate: average growth between 2001 and 2005 was barely 1.4%, only just over half the rate recorded in the United States during the same period. However, this scant buoyancy of activity was not common to all Member States. Some countries, such as Greece, Spain and, in particular, Ireland, grew at well above the average rate for the area as a whole, while in other countries, such as Germany, Portugal and Italy, growth was very slack. These differences have led to some debate regarding the impact of the single monetary policy on discrepancies in the tempo of economic activity in the various euro area countries and on the difficulties that this heterogeneity may pose for the conduct of monetary policy by the ECB. This debate bears some relation to the discussions of the 1980s and early 1990s regarding the importance of the loss of stabilising economic policy instruments for the member countries of a monetary union.

This article attempts to analyse this problem using the evidence available on the size and origin of cross-country economic divergences within the euro area. In particular, the contribution of the absence of national monetary and exchange rate policies to the dispersion of growth and inflation rates is assessed and its normative implications are considered. Thus, Section two describes the degree of similarity between the behaviour of the national business cycles. Section three explores the differences in the degree of exposure to the various types of shock and in their transmission mechanisms within each national economy. Section four examines the influence of the monetary union on the observed discrepancies. Finally, Section five sets out the main conclusions.

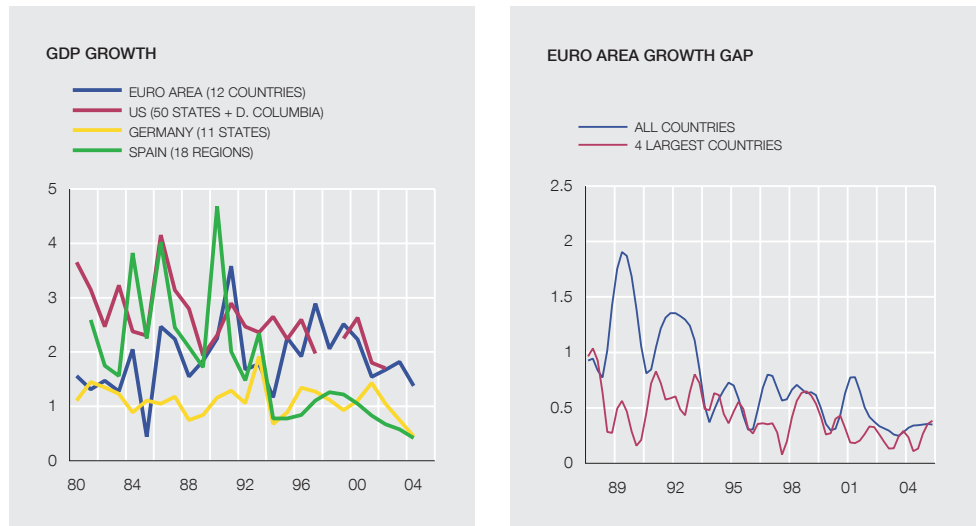
### The size of the divergences

A simple way of illustrating the size of the macroeconomic discrepancies is to analyse the dispersion of key variables. Chart 1 presents the standard deviation of the GDP growth of the 12 countries of the area and of the 4 largest ones and compares it with similar statistics obtained for other monetary unions. The chart shows that the degree of dispersion of activity across euro area countries is currently lower than at the beginning of the 1990s. In addition, this dispersion is only moderately higher than that existing between the regions of Spain and between the German states and, most notably, it is not systematically higher than in the United States.

The estimated dispersion of the GDP growth rates may stem from both trend and cyclical factors. From the viewpoint of the conduct of monetary policy, to the extent that the trend elements of GDP, associated with low frequency structural developments, are less relevant, it is desirable to examine conveniently filtered measures of economic activity. For this purpose, Chart 1 also shows the dispersion of the output gaps of the 12 euro area countries and of the 4 largest ones. These dispersions are seen to be much smaller currently than in the 1990s, although the progress is concentrated in the years prior to the introduction of the euro in 1999. In fact, since then the divergence indicator has remained relatively stable, which may have frustrated certain expectations that the euro area would rapidly increase the cyclical synchronicity of the Member States. However, the relative stability of the cyclical divergences since the

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1. The article is a summary of the Occasional Paper No. 0504 by the same authors entitled *Cross-country macroeconomic heterogeneity in EMU* prepared for the ECB Central Banking Seminar held in Frankfurt on 13 July 2005.



SOURCES: ECB and Banco de España.

a. Unweighted standard deviation

creation of the euro area at relatively low levels has dispelled fears that the lesser availability of domestic stabilisation instruments might tend to exacerbate the discrepancies and so prejudice the exercise of the common monetary policy.

To analyse the degree of co-movement between the business cycle fluctuations in the Member States in greater detail, Chart 2 shows the correlation between each country's cycle and that of the euro area. With the exception of Finland, this correlation is generally very high (around 80%) which, in principle, may appear consistent with the existence of a common European cycle, as some authors have maintained [Artis et al. (1997) and Mansour (2003)]. However, the results of Camacho, Pérez-Quirós and Sáiz (2004), which formally reject the hypothesis of the existence of a common cycle, would appear to be more realistic, although they do identify notable similarities in the business cycles of the Member States. Moreover, it is inferred from the same analysis that the monetary and exchange rate policies implemented in each country are not among the factors that explain the cyclical leads and lags.

### ***What causes the divergences?***

Macroeconomic divergences are typically a result of the differing degree of exposure of national economies to a certain type of shock or of uneven transmission of these shocks to the economy as a whole, as a consequence of the idiosyncrasy of macroeconomic adjustment mechanisms. The relevance of these two types of factor needs to be analysed separately.

#### **EXPOSURE TO SHOCKS**

Following the literature on economic integration, four main types of shock should be highlighted. These relate to external demand, oil prices, sectoral developments and asset prices.

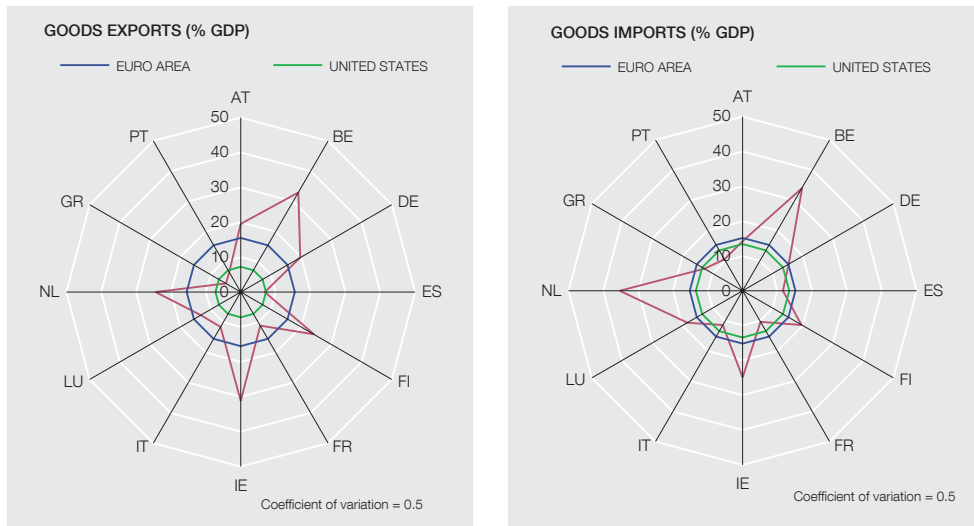
The sensitivity of the economy of the euro area and of that of each of its Member States to a change in world trade depends largely on their degree of openness, as measured by their trade with the rest of the world relative to their domestic economic activity. Chart 3 shows that there is a significant dispersion in exports and imports, vis-à-vis the rest of the world, as a percentage of GDP, which indicates that the responses of national economies to developments in the external environment of the euro area are likely to differ. In particular, Greece, Portugal, Spain, Italy and France display a below average exposure, while that of Germany,



SOURCE: Banco de España.

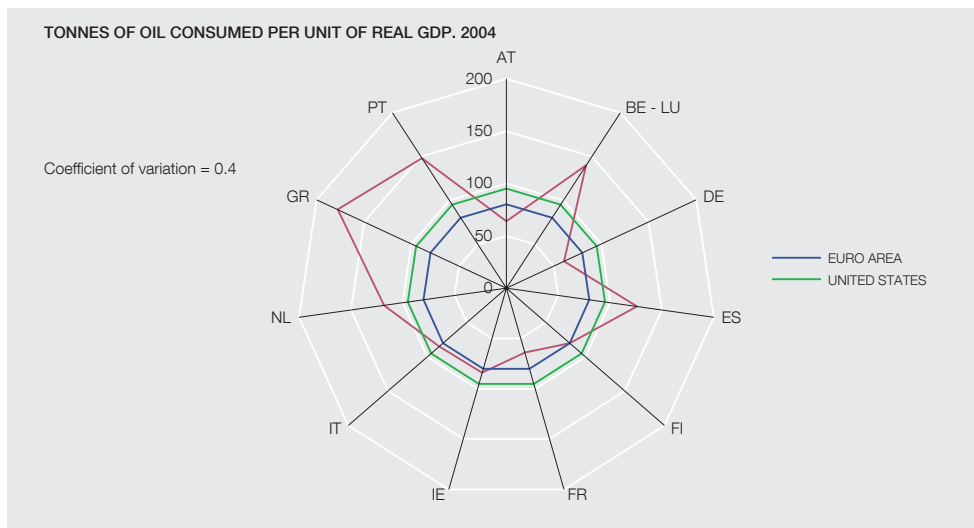
Belgium, Finland, Ireland and the Netherlands is above average. Cabrero, Chuliá and Millaruelo (2004) analyse this phenomenon in depth and find that the differences also extend to the composition of exports by product and geographical area.

The exposure of each country to oil prices is likely to be strongly correlated with the intensity of oil use in production. Chart 4 shows that this measure is similar in the three largest countries, but that the oil dependency ratios of Greece, Portugal and Belgium and, to a lesser extent, Spain are significantly higher than average.



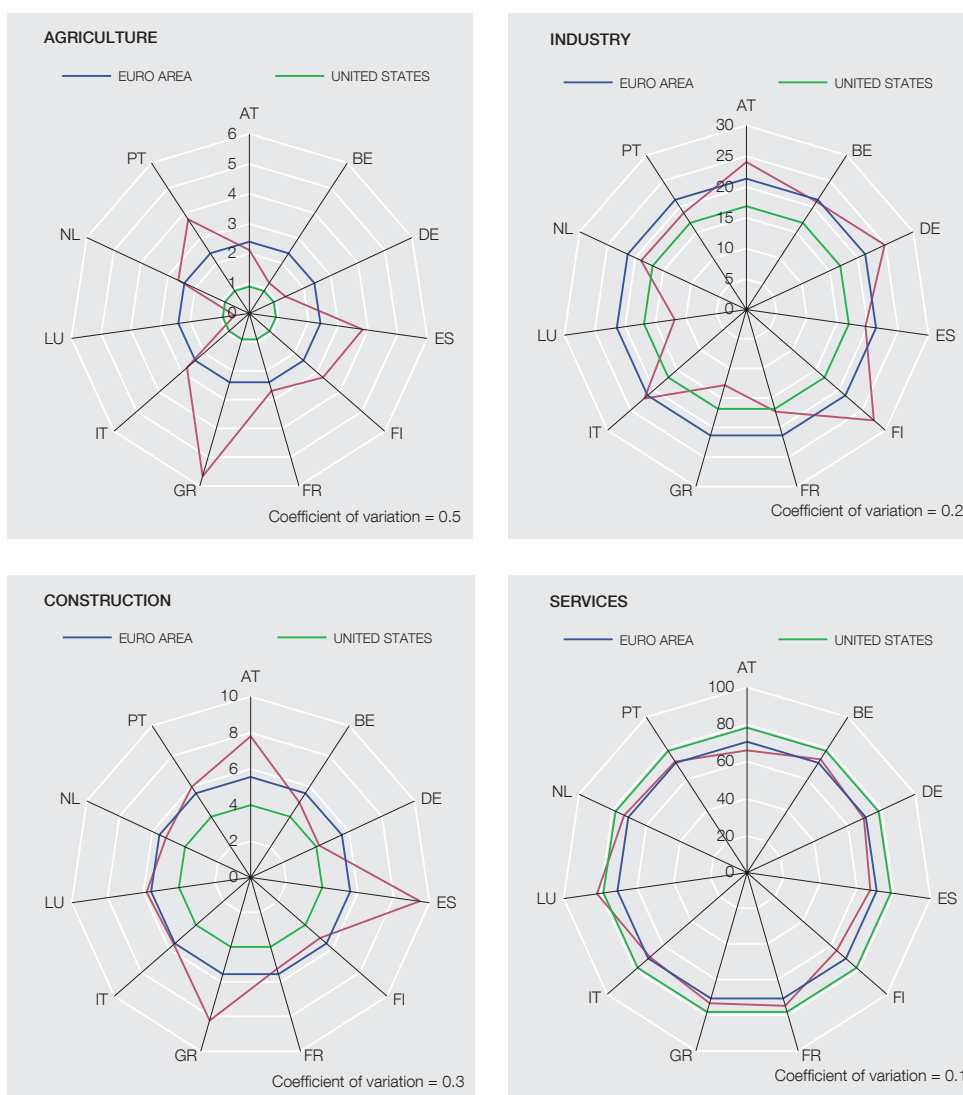
SOURCES: Eutostat and US Census Bureau.

## EXPOSURE TO OIL PRICES



SOURCES: British Petroleum, European Commission and IMF.

To assess the differences in the exposure of each country to sectoral shocks, Chart 5 shows the composition of the productive structures according to the distribution of the value added of each national economy between the four largest sectors and Chart 6 according to the degree of technological intensity of industrial production. Chart 5 suggests that the exposure of euro area countries to sectoral shocks is not very different. Services represent a similar share of GDP (close to 70%) in all of them, which is less than the 80% level they almost reach in the United States; industrial activity accounts for around 20% in most of the Member States; the share of agriculture is very low, accounting for 1% to 5%, while construction ranges from 4% to 8%, which is higher than in the United States in both cases. In terms of technological intensity of industrial production there are more marked discrepancies, although in most countries there is a relatively diversified structure, in which the percentage of high-technology industries is lower in almost all the member countries than in the United States. Thus, the exposure to sectoral shocks does not generally seem to be an especially significant source of macroeconomic discrepancies.



SOURCES: Eurostat and OECD.

Finally, to try to assess the sensitivity of the euro area countries to changes in asset prices, Chart 7 shows the weight of market instruments in household assets and in the liabilities of non-financial corporations. A high degree of intermediation of financial flows is seen in all countries. In fact, non-negotiable instruments represent more than 30% of the financial assets of households in all countries except Italy and the Netherlands, where they still exceed the proportion in the United States. Loans, meanwhile, typically make up between 30% and 40% of the liabilities of non-financial corporations in euro area countries, as against 17% in the United States. The exposure to changes in house prices is probably somewhat more variable than that to financial asset prices. As seen in Table 1, although residential investment as a percentage of GDP is not far from the euro area average in most countries, the ratio of owner-occupied to total housing varies significantly, which probably means a different sensitivity of investment and consumption decisions to changes in property values.

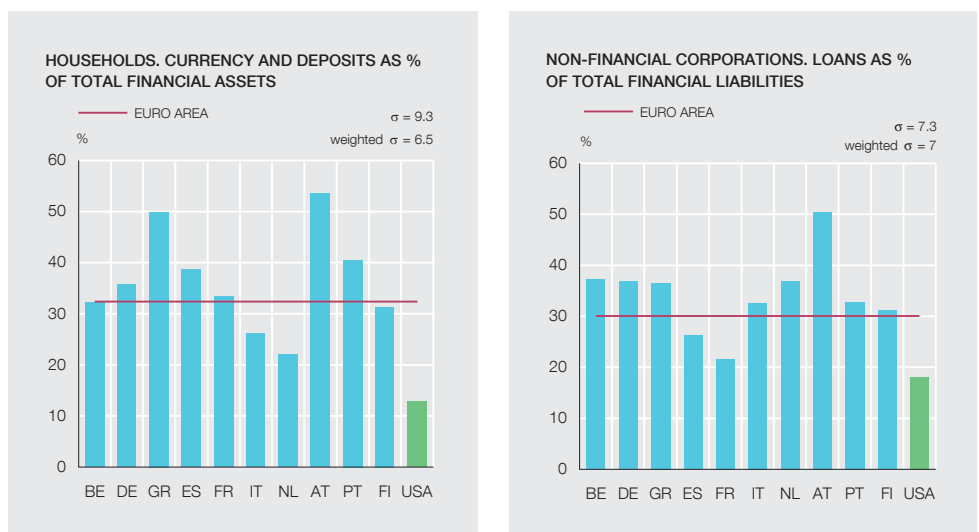
Accordingly, from a purely descriptive perspective, like that of this section, there do not seem to be significant discrepancies in the exposure of the countries to sectoral shocks and to financial asset prices. However, with regard to the impact of developments in the external environment, the disparities seem larger.



SOURCES: SBSplus of Eurostat and Banco de España.

a. The data for Ireland are for 2001.

FINANCIAL ACCOUNTS. 2004



SOURCES: Eurostat and Federal Reserve.

	Weight of housing investment in GDP	Percentage of owner-occupied housing
	2004	2002
Euro area	5.9	60.0
Belgium	4.1	69.8
Germany	6.6	42.6
Greece	5.4	74.0
Spain	7.3	84.3
France	5.1	56.1
Ireland	7.3	77.4
Italy	5.8	72.8
Luxembourg	2.9	71.8
Netherlands	5.9	54.2
Austria	4.6	57.3
Portugal	6.2	75.7
Finland	5.1	58.0
United States	4.5	68.3

SOURCES: Eurostat and US Census Bureau.

#### TRANSMISSION MECHANISMS

A second source of cyclical discrepancies between the Member States arises from possible differences in their economies' mechanisms of adjustment to different types of shock. Although the Monetary Transmission Mechanism (MTM) is possibly the most relevant from the point of view of a central bank, it is also worth reviewing the available evidence on the functioning of labour and product markets, since these are essential to determine the way in which the relevant developments in the international or domestic arena ultimately affect activity and prices.

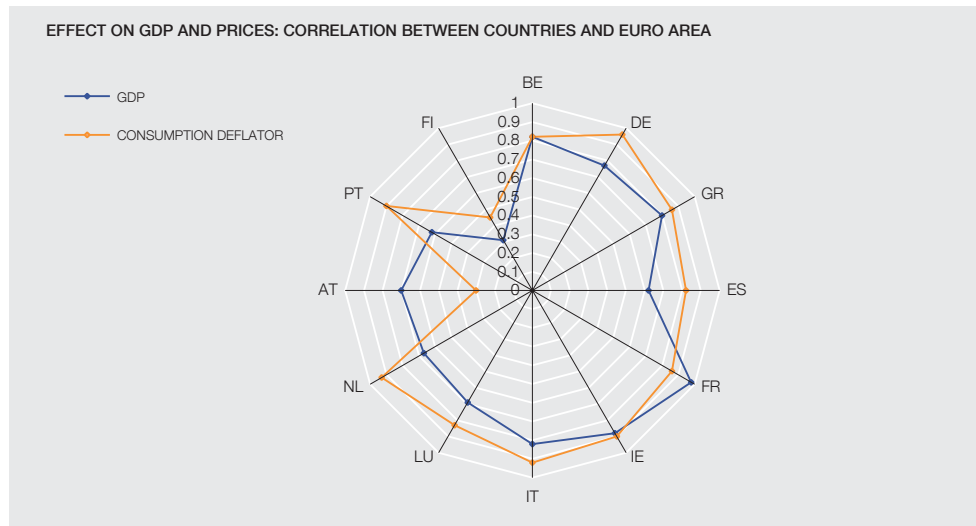
Starting with monetary policy transmission, according to a recent exercise carried out in the Eurosystem [see van Els, Locarno, Morgan and Villette (2001) and Berben, Locarno, Morgan and Vallés (2004)], the overall response of GDP and prices to an interest rate movement is relatively similar in all the euro area countries, perhaps with the exception of Finland and Austria (see Chart 8). However, the relative importance of the different transmission channels, such as the substitution effect, the cost-of-capital channel and the exchange-rate channel, varies notably. These discrepancies are found to result from various features of a structural nature. For example the degree of labour-market protection seems to be positively correlated with the size of the substitution channel and, naturally, the degree of openness with that of the exchange-rate channel.

However, it is the differences in financial structures that go furthest in explaining the dispersion of the various effects of interest rate changes. The results of the network of Eurosystem transmission mechanism researchers [summarised in Angeloni, Kashyap, Mojon and Terlizzese (2002)], show that the importance of transmission channels that operate through the balance sheet positions of banks, households and corporations is high in some countries (like Italy, France, Germany and Belgium), while it seems to be much less relevant in others (such as Finland, Spain and Luxembourg). This suggests that the way in which the effect of interest rates on economic activity depends on the financial situation of agents varies significantly from country to country.

The evidence recently provided by the OECD<sup>2</sup>, set out in Table 2, enables the differences in each economy's wealth effects to be calibrated. The table shows the marginal propen-

2. See P. Catte, N. Girouard, R. Price and C. André (2004).





SOURCE: Berben R.-P. Berben, A. Locarno, J. Morgan and J. Valles (2004).

sity to consume out of financial and housing wealth for various developed countries. These propensities are generally higher in the United States, the United Kingdom and Canada than in the euro area countries, where they are low and relatively similar, except in the Netherlands. In this country, the real effects of wealth changes are very pronounced on account of households' large holdings of financial assets and of the widespread use, unlike in other Member States, of mortgage equity withdrawal to finance private consumption.

As regards the functioning of product markets, Chart 9 summarises the relative position of the euro area countries according to a qualitative indicator of the scope of regulation constructed by the OECD<sup>3</sup>. As can be seen, the degree of market flexibility in most euro area countries in 2003 was around the OECD average, being less than in the Anglo-Saxon countries and higher than in other European countries outside the euro area. This information can be completed with evidence available on the degree of price flexibility in the various countries, based on the results obtained recently by a network of Eurosystem researchers<sup>4</sup>. The frequency of price changes in the euro area countries was found to range from 13% to 23% per month, well below the level in the United States. The sectoral pattern of frequency of price changes is also similar across the Member States, the services sector being the most rigid sector and the energy sector the most flexible.

The degree of heterogeneity in the labour market appears to be greater however. Chart 10 shows, as a synthetic indicator of labour market efficiency, the cyclically adjusted employment rate, also calculated by Brandt, Burniaux and Duval (2005). According to this standard indicator, almost all the euro area countries had rates below the OECD average, although the range was relatively wide, extending from 55% in Italy to 75% in the Netherlands. For its part, the evidence available on the degree of wage rigidity also shows significant heterogeneity within the euro area, in the case of both nominal and real flexibility indicators<sup>5</sup>.

Accordingly, a significant part of the economies' mechanisms of adjustment to different types of shock seems to be relatively homogeneous, as shown by the analysis available on the

3. See N. Brandt, J. M. Burniaux and R. Duval (2005). 4. The results can be seen in E. Dhyne, L. J. Álvarez et al. (2005). 5. See Dickens et al. (2005).

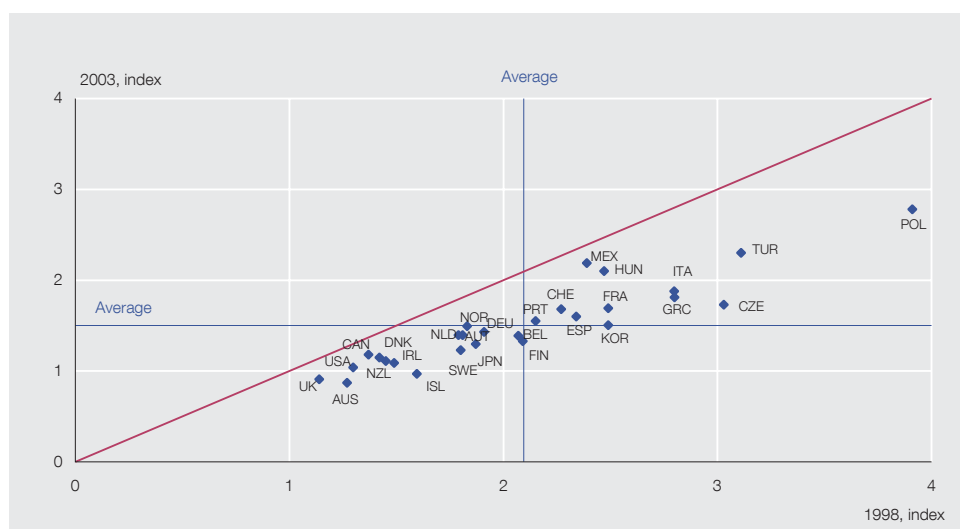
ESTIMATION OF MARGINAL PROPENSITIES TO CONSUME OUT OF HOUSING AND FINANCIAL WEALTH

	Short-term		Long-term	
	Housing	Financial	Housing	Financial
Germany	...	0.01	...	0.02
France	...	...	...	0.02
Italy	...	0.01	0.01	0.01
Spain	0.01	...	0.02	0.02
Netherlands	0.02	...	0.08	0.06
United States	...	0.02	0.05	0.03
Japan	0.01	...	0.01	0.07
United Kingdom	0.08	0.03	0.07	0.04
Canada	0.03	0.03	0.06	0.04
Australia	0.02	...	0.07	0.03

SOURCE: OECD.

CHANGES IN MARKET REGULATION, 1998 - 2003

CHART 9



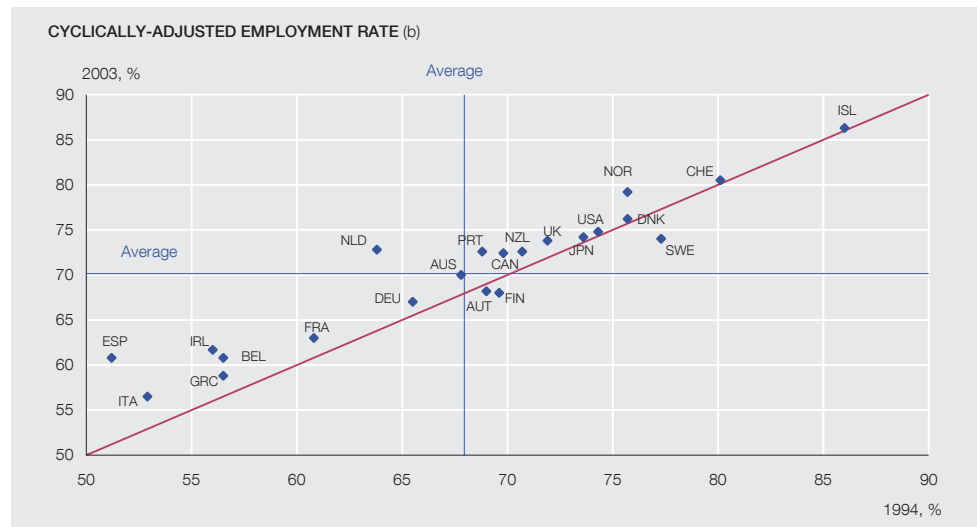
SOURCE: Brandt N., J.M. Burniaux and R. Duval (2005).

similarity of the real effects of changes in interest rates and wealth, the comparative studies of product market efficiency and the evidence on price rigidity. There are, however, certain differences arising mainly from the uneven relative importance of monetary transmission channels, which is attributable to the diversity of financial structures and to other idiosyncratic institutional features, and from the functioning of the labour market.

**The relevance of monetary policy**

In order to draw normative conclusions from the analysis of macroeconomic divergences in the euro area, it is necessary to study not only their size and source, but the extent to which the absence of domestic monetary stabilisation instruments contributes to reducing the stability of the national economies. For this purpose, two simple exercises have been carried out to see the effects of common and idiosyncratic shocks on the dynamics of the national economies using a conventional macro-econometric model, namely NIGEM<sup>6</sup>.

6. The National Institute Global Macroeconomic Model, built by the London National Institute of Economic and Social Research.



SOURCE: Brandt N., J.M. Burniaux and R. Duval (2005).

- a. The data for Ireland and Luxembourg are for 2002.  
 b. Estimated using Hodrick-Prescott filter.

The first exercise examines whether, given a common shock, the application of national monetary policies might have reduced the dispersion of GDP and inflation. For this purpose, three shocks are considered, namely increases in oil prices, in external demand and in government consumption in all countries. The effects on GDP and on the consumption deflator are obtained for the euro area countries for each shock, under two different monetary regimes: i) each country has autonomy to set interest rates in accordance with a rule defined in terms of domestic variables and bilateral exchange rates are endogenously determined on the basis of an interest-rate parity condition, and ii) monetary union, in which the exchange rates are irrevocably fixed and interest rates are determined for the area as a whole in accordance with a single rule defined in terms of aggregate variables. These simulations enable the dispersion of the GDP and inflation effects under an autonomous policy regime and under a monetary union to be compared (see Table 3).

The results show that under both regimes the dispersion generated by common shocks is moderate, except in the case of the oil price increase. The heterogeneity in the response to this shock seems attributable both to the different degree of energy dependence and, above all, to differences in the functioning of national labour markets, which generate discrepancies in the behaviour of employment and wages that eventually affect activity and prices. These results are in line with those obtained by, among others, Giannone and Reichlin (2005), Angeloni and Ehrmann (2004) and López-Salido, Restoy and Vallés (2005) on the relatively small importance of common shocks as a factor explaining the persistent differences in growth and inflation across euro area countries.

The simulations also show that the absence of monetary and exchange rate policy has an ambiguous effect on the dispersion of the macroeconomic variables considered. The domestic rules help to moderate the discrepancies in the behaviour of GDP in the face of an oil price and external demand shock, but not in that of an aggregate demand shock. On the other hand, the behaviour of prices is, in all cases, more heterogeneous under the policy autonomy regime than under the monetary union. The reason lies in the behaviour of the bilateral exchange rate, which in the model displays fluctuations that do not always help to stabilise GDP

COEFFICIENTS OF VARIATION (CVs) (a)	GDP		Private consumption deflator	
	MONETARY UNION	AUTONOMY	MONETARY UNION	AUTONOMY
	CURRENT SHOCKS			
Increase in oil prices				
<i>Unweighted CV</i>	-0.90	-0.58	0.41	0.50
<i>Weighted CV</i>	-0.67	-0.44	0.52	0.61
Increase in external demand				
<i>Unweighted CV</i>	0.27	0.21	0.57	0.61
<i>Weighted CV</i>	0.21	0.15	0.60	0.67
Increase in government consumption in all euro area countries				
<i>Unweighted CV</i>	0.33	0.37	0.46	0.57
<i>Weighted CV</i>	0.39	0.43	0.53	0.65

SOURCE: Banco de España.

a. Unweighted and weighted coefficients of variation of the percentage deviation from baseline after three years for the five largest euro area countries.

and generally tend to increase price variability. It should be noted that this is a very simplified exercise that depends on the specification of the particular model used. Indeed, it is likely that monetary policy rules could be designed that would help stabilise the economy more than the simple Taylor rule incorporated in NIGEM. In any case, the exercise illustrates (in line with other results in the academic literature) that EMU is unlikely to contribute to a significant reduction in the stability of national economies when they face common shocks.

The second exercise focuses on the analysis of the effects of specific shocks on particular economies. The impact on GDP and prices of an increase in government consumption in a large country (Germany) and in a medium-sized one (Spain) is compared under the two monetary policy regimes considered in the first exercise: policy autonomy and monetary union. As seen in Table 4, the differences in GDP and in interest rates between the baseline scenario and the scenario incorporating the specific shock are moderate in Germany under both regimes, and relatively large in Spain. The effects on inflation are small in both countries, since the exchange rate movements tend to offset the effect of demand on prices. In any case, the results suggest that, in a monetary union, certain idiosyncratic shocks can be expected to involve a significantly higher variability of economic conditions than would be observed with monetary policy under domestic control.

## Conclusions

Using the statistical information available, recent literature and some simulations, this article has illustrated some empirical regularities in the discrepancies across euro area countries. Specifically, it has been noted that the euro area countries display some significant discrepancies in terms of economic developments, exposure to shocks and adjustment mechanisms. However, these prove to be compatible with a disparity in national growth rates that is not systematically greater than that observed across states within the United States and with a very high cross-country correlation in the cyclical component of GDP, despite the structural differences between the Member States. Also, the evidence suggests that the existing cyclical disparities appear to be more a consequence of asymmetric shocks than of differences between the mechanisms that propagate common shocks. Finally, although EMU seems to have had a modest impact on the response of the national economies to common shocks, it may have had a greater influence on their capacity to absorb their own idiosyncratic shocks.

PERCENTAGE DEVIATION FROM BASELINE AFTER THREE YEARS						
SHOCK	GDP		Private consumption deflator		Short-term interest rates	
	MONETARY UNION	AUTONOMY	MONETARY UNION	AUTONOMY	MONETARY UNION	AUTONOMY
1% OF GDP INCREASE IN GOVERNMENT CONSUMPTION IN GERMANY						
Effect on:						
Germany	<b>0.23</b>	<b>0.09</b>	<b>0.22</b>	<b>0.21</b>	<b>0.12</b>	<b>0.19</b>
France	-0.01	0.01	0.02	0.00	0.12	0.01
Italy	0.02	0.01	0.05	0.03	0.12	0.03
Spain	0.01	0.02	0.03	0.02	0.12	0.03
Euro area (b)	0.09	0.04	0.10	0.09	0.12	0.08
1% OF GDP INCREASE IN GOVERNMENT CONSUMPTION IN SPAIN						
Effect on:						
Germany	<b>0.01</b>	<b>0.00</b>	<b>0.02</b>	<b>0.02</b>	<b>0.08</b>	<b>0.01</b>
France	0.01	0.00	0.01	0.00	0.08	0.01
Italy	0.02	0.00	0.02	0.02	0.08	0.02
Spain	<b>0.66</b>	<b>0.35</b>	<b>0.27</b>	<b>0.30</b>	<b>0.08</b>	<b>0.45</b>
Euro area (b)	0.09	0.04	0.05	0.05	0.08	0.06

SOURCE: Banco de España.

a. a. A backward-looking exchange rate determination rule is used. For example, in the case of Germany, the rule is:  $\log(\text{gerx}(t)) = \log(\text{gerx}(t-1)) + 0,25 \cdot \log((100 + \text{ger3m}(t-1)) / (100 + \text{usr3m}(t-1)))$ , where  $\text{gerx}$  is the exchange rate expressed in units of national currency per US dollar,  $\text{ger3m}$  is the three-month interest rate in Germany and  $\text{usr3m}$  is the three-month interest rate in the US.

b. GDP-weighted average of the five largest euro area countries.

Thus, progress towards greater cyclical synchronicity of the euro-area economies seems to be a desirable objective more than an indispensable requirement for the proper functioning of EMU. In any case, given the evidence on the source of the discrepancies, any increase in the degree of similarity of developments in the national economies will not stem so much from increases in the homogeneity of structures or adjustment mechanisms, but from the achievement of sufficient flexibility in each to enable the destabilising effects of specific shocks to be minimised. EMU does not therefore alter the objectives of any reforming agenda which, irrespective of the monetary regime in force, attempts to improve the general efficiency of the economy. The inability to control interest rates and the exchange rate merely increases the priority that should be given to removing the obstacles that prevent flexible price and wage adjustment and the swift reallocation of resources between firms and sectors.

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