

THE EFFECTS OF EMU ON THE SPANISH BUSINESS CYCLE

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Abstract This paper presents an analysis of the changes that EMU will introduce in national business cycles and applies it to the case of Spain. We study the effects on the volatility of business cycles and the extent to which the process of monetary unification will lead to an increase in the synchronization of European economies. The paper starts by recognizing the risks involved in the restraints imposed on stabilization tools by the transfer of monetary policy to the ECB and the limits on fiscal deficits set by the Stability Pact. However, the empirical evidence indicates that other factors, such as the increase in trade integration and the coordination of economic policies, will possibly outweigh those risks. We conclude that EMU will probably bring more symmetry and less volatility to national business cycles in Europe.

1.- INTRODUCTION

The introduction of a single currency in January 1999 will change the macroeconomic environment in which European economies operate. The elimination of exchange rate risk might lead to changes in the pattern of international and intra-European trade. At the same time, the irreversible transfer of power to a single European central bank will hamper the response of monetary policy to nation-specific economic evolutions. The ceiling on budget deficits, set by the Growth and Stability Pact, might seriously limit the ability of governments to stabilize output fluctuations. All these elements are likely to influence the characteristics of European national business cycles. This paper analyzes these expected changes with an emphasis on how the Spanish business cycle will be affected by EMU.

Our empirical analysis is limited by our ability to predict the future working of the European single currency area using historical data generated under very different macroeconomic environments. The ‘Lucas critique’ applies here with all its strength, as we are facing an almost perfect example of a switch in macroeconomic regime. However, despite the fact that most of the evidence we present is subject to this criticism, we still believe that looking at historical data must be the starting point for any valid prediction of what EMU will represent for European economies.

We seek answers to questions such as: has the European business cycle become more or less synchronized as a result of trade integration? Is there any evidence that governments who frequently have had deficits well above 3% have managed to better control their business cycles? Answers to these questions might help us predicting the consequences of some of the steps that European economies are about to undertake starting January 1999.

The paper is organized as follows. Section 2 reviews the theoretical arguments on why EMU might have an impact on national business cycles. Section 3 presents the empirical evidence and Section 4 concludes.

2 WHAT CHANGES WITH EMU?

What are the main sources of changes for national business cycles with the creation of a single currency? Before answering this question we need to define what are the characteristics of business cycles we are concerned with as there are many different ways of characterizing the business cycle. Most of the variables involved in these characterizations are likely to be affected by the change in the environment brought up by EMU. Understanding all those implications is beyond the scope of this project and, as a result, we take here a modest approach by trying to understand how a few basic features of the business cycle might be affected.

Our analysis only deals with real variables. Although the behavior of nominal variables (inflation, interest rates) is an important component of the description of national business cycles, in a monetary union, the regional (national in the case of EMU) behavior of these variables becomes practically irrelevant. As a result, we focus our attention on mainly two issues. First, the volatility of nation-specific fluctuations. Second, the synchronization of Spanish and European business cycles. These two issues are probably the most important source of concern for countries that are joining EMU. How can countries deal with nation-specific shocks in the absence of exchange rates and when fiscal policy is limited by the Stability Pact? The lack of alternative mechanisms of adjustment (flexible prices and wages, a fiscal federation or a mobile labor force) has created the fear that nation-specific shocks might lead to deep recessions with important political and social consequences.

When we look at the changes introduced by EMU we will make a distinction between the possible changes in the productive structure of the economy and the

effects on the way economic policy will be conducted. Also, when we talk about changes in economic policy we want to separate between changes in the nature of policy shocks (e.g. monetary policy shocks) and changes in the tools available to policy makers.¹

2.1 EXCHANGE RATES, TRADE AND SPECIALIZATION

Most macroeconomic models generally distinguish between real shocks and policy shocks as sources of business cycles. Real shocks are generally associated to unpredictable changes in technology or productivity.² To what extent can EMU change the nature of real shocks? It will as long as the disappearance of exchange rates causes a significant geographical reallocation of European industries.

There is a vast literature that has explored the effects of exchange rate systems and trade integration on the location of industries and, as a result, on the patterns of trade. The theoretical literature is inconclusive. Although it is accepted that the introduction of a single currency will increase the level of trade among country members, there are two possible directions in which trade integration can affect business cycles. First, models where trade is based on comparative advantage or agglomeration effects at the industry level predict that trade will induce an increase in the degree of specialization among European countries. The US, a more integrated economic area with a larger degree of industry geographical concentration than Europe, has been used as an example of what might lie ahead for European countries. If European countries, because of an increase in industry specialization, were to become as specialized as US regions, then industry specific shocks might change the nature of national business cycles. Under the assumption that industry specific shocks are an important source of fluctuations in economic activity, we would expect an increase in the volatility of national business cycles under EMU.³

An alternative view is that trade integration does not need to lead to an increase in the amplitude of national business cycles. There are three arguments that have been put forward to support this claim. First, it might be that geographical specialization increases as a result of EMU but it is unclear why it will

¹ The distinction between what constitutes a policy shock and what constitutes a policy response to an exogenous shock, although theoretically well defined, is very difficult to establish empirically. We will come back to this point several times during our empirical analysis.

² In an open economy we can also talk about terms of trade shocks that capture the transmission of foreign shocks.

³ See Eichengreen (1990) or Krugman (1993).

take place at a national level. For example, in the case of large countries increased specialization could take place at the regional level and the reallocation of industries might not exactly correspond to national borders.⁴ A second argument is that increased integration will lead to more synchronized business cycles because of trade linkages across countries. This will be specially true if intra-industry trade accounts for most trade and if fluctuations are demand driven.⁵ And the final third argument is that economic integration can increase the spread of productivity shocks across countries (Coe and Helpman (1995)) and, thus, correlate the sources of business cycles. If these three arguments are correct, the introduction of a single currency will make national business cycles more synchronized and will result in less asymmetries at the national level.

From a theoretical point of view it is impossible to discern which of the two views is correct. Are European countries going to evolve towards the US model with increased specialization at the national level and more pronounced business cycles? Or, on the contrary, are deeper trade linkages going to increase the synchronization of the national business cycles? In Section 3 we will see which of these two theories can better explain the recent evolution of EU economies.

2.2 A NEW FRAMEWORK FOR MONETARY POLICY

The creation of a single currency sets a new framework for monetary policy. The transfer of national monetary policies to the European Central Bank will have consequences on the way monetary policy will react to shocks in European economies. At the same time, as long as monetary policy is a source of disturbances to the economy, the transfer of power to a pan-European institution might have effects on the nature of nominal shocks at the national level.

How will this affect the behavior of European economies? From a theoretical point of view the arguments are complex and the answer depends not only on many assumptions about the nature of shocks experienced by European economies but also on the benchmark against which we want to compare the new environment. One possibility is to compare EMU with an scenario of full monetary independence by the Bank of Spain. A second possibility is to compare it with the preceding scenario, one where the Bank of Spain sets its monetary policy in order to maintain a certain commitment regarding the nominal exchange rate

⁴ See for example De Nardis, Goglio and Malgarini (1996).

⁵ See Frankel and Rose (1998).

Peseta/D-Mark. To see how this distinction is important, let's look at a simple model.⁶

Let's think about a currency area between two countries (Germany and Spain). The central bank attempts to minimize a loss function

$$\mathcal{L} = (wy_g + (1 - w)y_s)^2$$

where y are deviations of output from its desired level and w represents the weight of Germany in the ECB objective function. The relation between the interest rate (R) and output in both economies is represented by a function

$$y_i = -\gamma R + \epsilon_i$$

where $i = g, s$ where ϵ is an exogenous country-specific shock to which central banks react. Under these assumptions, the optimal interest rate set by the ECB is equal to

$$R = \frac{w\epsilon_g + (1 - w)\epsilon_s}{\gamma}$$

and the volatility of Spanish output (measured as the variance of y) is

$$\sigma^2(y_s) = w^2\sigma^2(\epsilon_g) + w^2\sigma^2(\epsilon_s) - 2w^2\sigma(\epsilon_g, \epsilon_s)$$

where $\sigma(\epsilon_g, \epsilon_s)$ is the covariance between German and Spanish shocks. What would be the volatility of Spanish output under a different regime? In a situation where the Bank of Spain is 100% independent of the Bundesbank, the volatility of output would be zero. Of course, this is under the unrealistic assumptions that German business cycles are not transmitted to the Spanish economy and that there are no exogenous monetary policy shocks. Under a regime where the Bundesbank is only concerned with German output and the Bank of Spain mimics German monetary policy (equivalent to $w = 1$ above), the volatility would be

$$\sigma^2(y_s) = \sigma^2(\epsilon_g) + \sigma^2(\epsilon_s) - 2\sigma(\epsilon_g, \epsilon_s)$$

If we compare the two volatilities we can see that the volatility of Spanish GDP under this tight EMS regime will always be larger than the volatility under

⁶ This model is borrowed from Dornbusch, Favero and Giavazzi (1998). They include a detailed discussion on the arguments presented here.

the EMU regime. The reason is that, under EMU, Spanish shocks have some consideration in the objective function of the ECB. Of course, the superiority of the EMU regime over the EMS regime rests on several unrealistic assumptions. For example, if in the EMS regime we allowed the Bank of Spain to accommodate some of the Spanish shocks, then it would be ambiguous which of the two regimes is superior.⁷

Overall, the lesson from this example is threefold. First, to assess how *different* monetary policy will be under EMU we need to define an alternative benchmark of comparison. Second, there is no doubt that under EMU nation-specific considerations will be weighted together with other 10 countries in a general objective function. As a result, in the presence of asymmetries, nation-specific shocks will cause a more pronounced business cycle under the EMU regime than under a regime with monetary independence. Third, if monetary policy is itself a source of business cycles, a prediction of how the ECB will differ in this respect from the regime of 11 national banks is needed.

Clearly, predictions about some of these matters will be, to a large extent, speculative. In Section 3.3 we will attempt to use available empirical evidence to shed light on some of these arguments.

2.3 A NEW FRAMEWORK FOR FISCAL POLICY

In the absence of exchange rates and monetary policy, fiscal policy has been signaled as the only tool available to policy makers in order to mitigate the effects of nation-specific shocks. Under the Stability Pact, there will be, however, limits on budget deficits. In this section we review the logic of fiscal policy in a monetary union and the likely costs of setting a cap on budget deficits.

Fiscal policy can stabilize income fluctuations via countercyclical budget balances. When income fluctuates, consumers can isolate themselves from transitory fluctuations using savings as a buffer. In the absence of market imperfections, there is no role for the government to stabilize consumers' income. If consumers are unable to use financial markets to borrow against their future income, the government could help consumers to smooth consumption by running countercyclical budgets. On the revenue side, progressive taxation and procyclical transfers makes disposable income less volatile than pre-tax income. This allows credit-constrained

⁷ Other ways of complicating the model would be to add alternative sources of shocks, such as money demand shocks, or to add asymmetries by making the transmission of monetary policy (γ) country specific. In any of these cases, the results would not be as clear cut as in the case above.

individuals to smooth their consumption. These policies are, in many cases, the result of automatic stabilizers and not the result of active discretionary policies.

What is the reaction of consumers to automatic stabilizers through tax and transfer schemes? In a Ricardian world, such policies have no effects on output or welfare as consumers foresee the implications in terms of future tax payments. There is no effect on consumer's wealth and saving offsets the changes in disposable income. The welfare effects (assuming no distortionary taxes) are zero. In the case where Ricardian equivalence fails, the previous statement does not hold. In the presence of liquidity constraints, consumption depends on disposable income and the welfare effects depend on the ability of fiscal policy to smooth consumption to an extent that consumers are willing to but unable to. If Ricardian equivalence fails because consumers do not internalize the future tax implications of current deficits ("future generations will pay for them"), then intertemporal transfers can be considered a form of insurance across generations.⁸

In EMU, national budgets will be the ones that will play the stabilization role described above in order to smooth national fluctuations. We should not forget that one element of fiscal policy that will be absent but that is normally present in a monetary union is the insurance provided by a federal budget. Regions that belong to a political unit generally benefit from risk sharing provided by a common budget. In the case of EMU, the EU budget will not play that role as its size is small and it does not have proper built-in insurance mechanisms. However, if consumers are liquidity constrained, countercyclical budgets can, to a certain extent, provide insurance that can serve as a substitute for a fiscal federation.⁹

What we described in the paragraphs above are the effects of fiscal stabilization policies on disposable income. What about the effects on output fluctuations? The traditional keynesian-cross model of most macroeconomics textbooks predicts that not only disposable income but also output will be smoother in the presence of automatic stabilizers. However, more refined general equilibrium models of the business cycle are ambiguous about the effects of automatic stabilizers. For example, Gali (1994) shows how automatic stabilizers can, under certain assumptions, destabilize output.

⁸ See Bayoumi and Masson (1998) for some empirical evidence on the different effects of insurance and stabilization policies.

⁹ See Bayoumi and Masson (1998). The arguments about the benefits of a fiscal federation have been extensively discussed in the literature and we will not develop them here. See, for example, von Hagen (1982), Sachs and Sala-i-Martin (1991) or Fatás (1998).

How does fiscal policy change with EMU? Although there could be very important implications on the way monetary policy and fiscal policy will interact in the new environment, our focus here will be the limits set by the Stability Pact. There is no question that those limits restrain the ability of fiscal policy to smooth output fluctuation. What is still open to debate is their economic significance. Can a successful fiscal policy be built under the assumption that budget deficits will never be constrained by the 3% ceiling? This is an empirical question that we will face in Section 3.4 when we look at the effectiveness and characteristics of fiscal policy in European countries.

3 EMPIRICAL EVIDENCE

In this section we use historical data from European economies to assess how EMU will affect certain key features of the Spanish business cycle. We start by a broad description of a few indicators of the Spanish business cycle and how they have changed over time before we quantify each of the arguments made in the previous section.

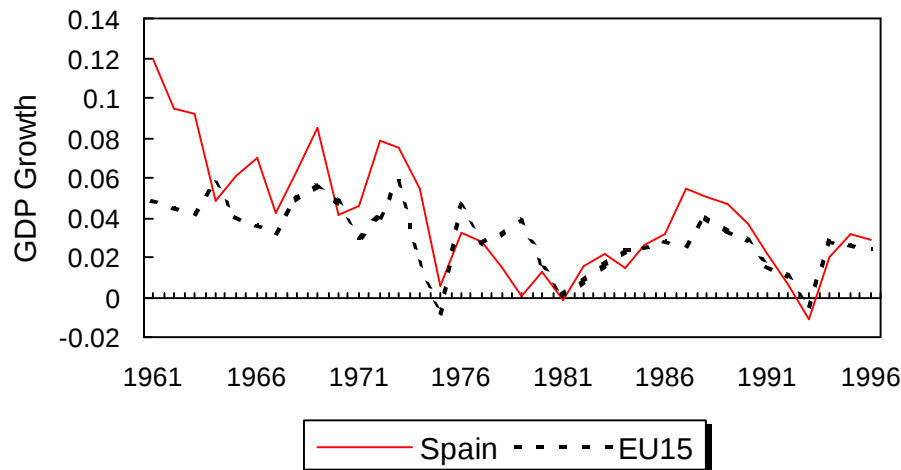
As outlined in the introduction, using historical data to predict what business cycles will look like under EMU can only provide a rough picture of the changes to be introduced by the new environment. The introduction of a single currency creates a new regime that significantly differs previous historical experiences. There are, however, a few similarities between what European economies have gone through in the last decades and the sort of changes that will result from EMU. The continuous process of trade integration can help us understand how business cycles change when trade increases and the discipline imposed by the EMS is a step in the direction of a single European monetary policy. For all these reasons, we make extensive use of the comparison between different periods in our sample to see how some of those changes affected the Spanish business cycle and we extrapolate from them the future behavior under EMU. To perform this exercise, there are no exact dates in which to break the sample. We will use 1979 as the start of the EMS (which also coincides with the mid-point of our sample) and 1985 which is a year that is identified as the beginning of a credible EMS (and is close enough to the entry of Spain in the EC).¹⁰

¹⁰ Clearly, 1979, the start of the EMS, does not have any significant implications for the Spanish economy. However, given the limited number of years that Spain has been a member of the EMS, looking at the general properties of European business cycles before and after 1979 can help us understand the implications of exchange rate commitments, even if Spain was not part of them.

3.1 SPANISH AND EUROPEAN BUSINESS CYCLES

Figure 1 presents GDP growth rates for Spain and the European Union during the period 1961-1997.¹¹

Figure 1. Spanish and EU Business Cycle



There are two features that stand out from this graph. First, over this sample, Spanish GDP is more volatile than EU GDP. This is also true if we compare it with business cycles for individual EU countries. Table 1 reports the standard deviation of GDP growth for a sample of OECD economies and for the aggregate of the EU15.¹² Spain has one of the highest volatilities among European countries. Interestingly, the second column of Table 1 shows how Spanish GDP has become significantly less volatile in the second part of the sample. This is a trend shared by most of the other EU economies.

A second feature that is evident from Figure 1 is that the Spanish business cycle has become more synchronized with the EU business cycle. Indeed, as Table 2 makes clear, the correlation between Spain and most European economies has increased in the second half of the sample. The increase is remarkable if one compares the pre-1979 period with the post-1985 period. In fact, the numbers for the last part of the sample (a correlation of 0.88) signal a level of integration

¹¹ Most of the analysis presented in this paper makes use of annual data. Source: OECD Economic Outlook. When quarterly data was available, we have checked whether the results significantly differ from those of annual data. If they do, we make it explicit in the paper.

¹² Source: OECD Economic Outlook.

Table 1. Volatility of Business Cycle

Country	1961-97	1979-97
Spain	2.99	1.74
Germany	2.13	1.82
France	1.94	1.29
Italy	2.35	1.54
Netherlands	2.04	1.41
Belgium	2.18	1.70
UK	2.06	2.16
Ireland	2.35	2.64
Denmark	2.41	1.59
Greece	3.46	1.57
Portugal	3.10	2.10
US	2.19	1.94
Canada	2.35	2.32
Japan	3.40	1.59
Australia	2.09	2.05
Norway	1.65	1.78
N.Zealand	3.75	2.40
Sweden	2.07	1.75
Finland	3.13	3.44
Switzerland	2.60	1.62
Austria	1.83	1.33
EU15	1.66	1.22
Volatility measured as standard deviation of GDP growth		

between the Spanish and European economies which is as high, if not higher, than the synchronization we observe among regions within any European country.¹³

The features described above are also present in other macroeconomic variables. For example, if one looks at the correlation of consumption growth rates between Spain and several European countries, we see a similar pattern of increased synchronization (Table 3).¹⁴ A pattern that is not present if we use the US as an example of a non-EU economy.

The picture that emerges from the above tables is one where the process of integration of Spain with its European partners has been accompanied by a significant increase in the level of synchronization of business cycles. We now explore the implications of these results in light of the theoretical arguments of Section 2.

¹³ See Fatás (1997) for an analysis of regional data.

¹⁴ Source: OECD Economic Outlook.

Table 2. Correlation with Spanish Business Cycle

Country	GDP Growth Rates			
	1961-97	1961-79	1979-97	1985-97
Germany	0.54	0.39	0.44	0.49
France	0.80	0.69	0.66	0.84
Italy	0.70	0.52	0.41	0.87
Netherlands	0.48	0.22	0.50	0.45
Belgium	0.71	0.59	0.62	0.80
UK	0.34	0.20	0.47	0.44
Ireland	0.08	-0.04	0.28	0.18
Denmark	0.34	0.27	-0.04	-0.18
Greece	0.58	0.32	0.31	0.40
Portugal	0.56	0.32	0.53	0.90
US	0.34	0.26	0.14	0.22
Canada	0.48	0.38	0.13	0.32
Japan	0.70	0.53	0.50	0.78
Australia	0.19	0.03	0.01	0.12
Norway	0.13	-0.05	-0.32	-0.50
N.Zealand	0.31	0.55	-0.40	-0.40
Sweden	0.60	0.44	0.46	0.73
Finland	0.45	0.41	0.26	0.52
Switzerland	0.67	0.67	0.41	0.71
Austria	0.62	0.40	0.39	0.56
EU15	0.74	0.54	0.68	0.88

3.2 TRADE AND SYNCHRONIZATION OF BUSINESS CYCLES

Based on our previous analysis we now study the extent to which trade integration might be responsible for the increased synchronization of European economies. Our approach will consist on seeking answers to two broad questions. Does exchange rate stability increase trade? Does increased trade lead to an increase in the synchronization of business cycles?

The empirical literature on the connection between exchange rate volatility and trade provides disappointing results. In most cases there is no evidence of any relationship between exchange rate volatility and trade. There are a few papers that show a positive effect of exchange rate volatility on trade but their estimates are very small and they predict little increases in trade as a result of a reduction in the volatility of exchange rates.¹⁵

A more optimistic result comes from the recent literature on intranational economics that studies economic phenomena within countries to extrapolate about

¹⁵ Kenen and Rodrik (1986) or Frankel and Wei (1993).

Table 3. Correlation with Spanish Business Cycle

Consumption Growth Rates				
Country	1961-97	1961-79	1979-97	1985-97
Germany	0.57	0.15	0.66	0.57
France	0.70	0.48	0.58	0.81
Italy	0.74	0.57	0.52	0.94
Netherlands	0.58	0.17	0.65	0.44
Belgium	0.67	0.35	0.65	0.72
UK	0.21	0.18	0.40	0.34
Ireland	0.23	-0.12	0.45	0.24
Denmark	0.26	0.27	-0.11	-0.50
Greece	0.62	0.23	0.50	0.62
Portugal	0.46	0.36	0.56	0.59
US	0.33	0.19	0.10	0.07
Canada	0.49	0.19	0.32	0.40
Japan	0.71	0.50	0.52	0.83
Australia	0.33	0.22	0.15	0.17
Norway	0.17	0.17	-0.22	-0.34
N.Zealand	0.20	0.60	-0.29	-0.36
Sweden	0.72	0.63	0.63	0.66
Finland	0.50	0.43	0.30	0.53
Switzerland	0.71	0.62	0.57	0.80
Austria	0.64	0.44	0.49	0.69

the importance of national borders, trade barriers or exchange rates. There is a strong agreement in this literature that national borders and exchange rates matter for trade integration. The results are, however, inconclusive about the exact contribution of exchange rates. Engel and Rogers (1996) or McCallum (1995) show that, after controlling for relevant economics factors (e.g. distance or income), trade between Canadian provinces is much higher than trade between Canadian provinces and US states. It is however difficult to conclude from their estimates how much of this effect is due to the existence of exchange rates.

One way of guessing the impact that the disappearance of exchange rates will have on the level of intra-European trade is to look at the evolution of trade in response to the stability associated to the membership to the European Union and the European Monetary System.¹⁶ The evidence supports the notion that exchange rate stability encourages trade. Spain stands out as one of the countries which has most increased its trade with European partners. While in 1982 only

¹⁶ Under the assumption that the EMS has provided an environment characterized by stable exchange rates.

50% of Spanish manufacturing imports were coming from the EU12, ten years later, in 1992, already 66% of those originated in a EU12 country. More generally, in terms of bilateral trade, Table 4 shows presents evidence on the large increase in the integration of Spain with its main European trade partners.¹⁷

Table 4. Bilateral Trade Intensity

Country	1976-85	1985-93
Portugal	1.66	3.78
Italy	1.94	3.31
Germany	1.85	3.05
Austria	0.47	0.74
Belgium	0.88	1.38
France	3.63	5.13
UK	1.90	2.65
Netherlands	1.08	1.50
Ireland	0.43	0.51
Denmark	0.52	0.61
Sweden	0.80	0.93
Norway	0.33	0.38
Japan	0.72	0.81
Finland	0.49	0.53
Canada	0.24	0.24
Greece	0.42	0.39
N.Zealand	0.12	0.10
Switzerland	1.25	1.00
US	1.61	1.26
Australia	0.33	0.25
Measured as bilateral trade as % of total trade		

Of course, the remarkable increase in trade between Spain and EU countries cannot be simply attributed to the stability brought by the EMS. Specially in the case of Spain, the opening of its economy that resulted from membership into the EC in 1986 is responsible for a large part of the increase in trade. It is probably natural to predict a further increase in bilateral trade intensity as a result of EMU, but it is almost impossible to estimate how large the effect will be. It is also true that the numbers show larger increases in trade for those members of the EU who have also been regular members of the EMS but there are not enough

¹⁷ Bilateral trade intensity in Table 4 is measured as the sum of bilateral exports and imports divided by total exports and imports. All data used in this section is from Frankel and Rose (1998). We would like to thank Andy Rose for making this data available.

degree of freedoms to offer an accurate estimate of the independent contribution of exchange rate stability to the process of integration.

The second issue that needs to be addressed is the impact of an increase in trade on the Spanish business cycle. Here we are only concerned with the change in the degree of synchronization between the Spanish and European business cycle. As argued in Section 2, theoretical arguments are inconclusive about the direction in which the relation between trade and synchronization of business cycles goes. Recent empirical studies provide support for the notion that trade leads to higher business cycle correlations. Frankel and Rose (1998) present panel estimates on the relationship between bilateral trade and the correlation of business cycles. Roughly, they run regressions of the type

$$\rho_{ij,t} = \alpha + \beta w_{ij,t} + \epsilon_{ij,t}$$

where $\rho_{ij,t}$ is the correlation between country i and country j over the time period t and $w_{ij,t}$ is a measure of trade intensity between the two countries over the same period of time. Using different measures of both the correlation of business cycles and the intensity of bilateral trade, they always find strong support for the notion that more trade leads to synchronization of business cycles.

Table 5 replicates the basic result of their paper. Our sample includes 21 countries, during the period 1959 to 1993, which we split into four sub-periods.¹⁸ For each sub-period we calculate the average bilateral trade intensity between any pair of countries as well as the correlation between their business cycles.¹⁹ The maximum size of the sample is 821. We also look at two sub-samples, one where we select all pairs where one of the trade partners is Spain (79 observations) and a second one where we only select pairs where both partners were members of the EU during the period when the observation was made (84 observations). We present both the OLS and IV estimates (where distance and dummies for adjacency and common language are used as instruments for bilateral trade).

The estimates present a consistent picture. More trade leads to higher correlation of business cycles. In the case of Spain, and to a lesser extent in the EU, the difference between the OLS estimates and the IV estimates originates in the

¹⁸ The sub-periods are 1959Q1 to 1967Q3; 1967Q4 to 1976Q2; 1976Q3 to 1985Q1; and 1985Q2 to 1993Q4. See Frankel and Rose (1988) for a detailed description of the data and the original sources.

¹⁹ This is calculated as the correlation of quarterly GDP growth rates.

Table 5. Trade and Business Cycles

Sample	OLS	IV
All (N=821)	3.15 (0.43)	10.68 (2.40)
Spain (N=79)	12.92 (3.59)	6.89 (26.81)
EU (N=84)	4.92 (0.96)	8.98 (10.4)
Standard errors in parentheses		
See text for details		

bad performance of the trade instruments in the first stage of the procedure.

If we look carefully at the economic significance of these numbers for the case of Spain we can easily see that the slope of the regressions underestimates the large increase in correlations during the last part of the sample. For example, bilateral trade between Spain and France increased in the last two periods from 3.63 to 5.13 (see Table 4). According to the estimates of Table 5, that increase should raise the correlation between the Spanish and French business cycle by a number between 0.10 and 0.18 percentage points. In reality, the correlation increased from 0.33 to 0.86 (almost 5 times what the regression indicates). There are two ways of reading these numbers. One is that there is a structural break in the sample. The second one is that during the last part of the sample, business cycles have become more correlated mainly because of factors that are not directly related to the observed increase in trade. Monetary policy and the EMS is one of the possible factors. Indeed, if a dummy variable is included in the regression for all countries which were members of the EMS during the last part of the sample, the variable is highly significant and the size of the coefficient is above 0.3.

3.3 MONETARY POLICY

Our analysis of Section 2.2 revealed the difficulties of predicting how changes in monetary policy under EMU will affect the business cycle. If there is any aspect in which EMU represents a change in regime, this is monetary policy. Many of the key variables relevant for monetary policy (e.g. money demand) will probably change as a result of the introduction of a new currency. Also, the fact that the historical experience of exchange rate arrangements in European economies is full with failed attempts to build a credible EMS and continuous exchange rate crises,

makes it very difficult to use this information to predict the consequences of the disappearance of exchange rates. For all these reasons, our goal of this section is modest, namely to put together a few findings on the recent experience of Spain and EU countries that can shed some light on the possible changes introduced by EMU.

As argued in Section 2.2, once monetary policy is integrated into a single European central bank, nation-specific shocks will be aggregated to produce an index of economic conditions that will be part of the decision-making process on European interest rates. It seems to be natural to assume that this transformation will increase the volatility of national business cycles. However, for this to be true, it must be the case that independent monetary and exchange rate policies are effective and that, indeed, national central banks have been making appropriate use of those policies in the past. The empirical evidence casts some doubts on these two facts.

There are several broad attempts in the empirical literature to estimate the impact of exchange rate regimes on business cycles. In most cases, there is no evidence that either fixed or flexible systems exhibit any superiority in terms of the volatility of real variables. See for example Baxter and Stockman (1989). The evidence of European economies also supports this claim. As displayed in Table 1, there is no evidence that membership to the EMS has had any negative effect on output volatility. Indeed, the evidence seems to indicate that the contrary is true. Business cycles have become less volatile as the EMS has gained credibility. And those countries that have been able to take more advantage of that credibility and stability (for example Spain or Portugal) exhibit the largest reductions in the the volatility of their business cycles.²⁰ .

Related to the previous argument is our finding that European economies have significantly become more correlated in the last decade. If the argument that fixed exchange rates limits the ability of monetary policy to smooth national business cycles were true, we would not have expected the increase in synchronization observed in European economies after 1985. Moreover, this increase in synchronization cannot be fully accounted by the increase in trade. As shown in Section 3.2, increased trade cannot explain a large part of the increase in correlations between the Spanish economy and its European partners after 1985.

²⁰ There are not enough degree of freedoms to do a formal test, but the evidence is clearly against the idea that the EMS has increased the volatility of national business cycles

Coordination of monetary policies is a very plausible candidate to explain that residual. Although, once again, it is difficult to provide a formal test of this hypothesis, the available evidence suggests that coordination of monetary policies has led to more synchronized business cycles. It is, thus, natural to assume that this trend will continue under EMU.

There is a second issue that arises with EMU, asymmetries in the response to changes in interest rates. Will all economies respond in the same way to changes in interest rates? If some European economies are more interest-rate sensitive than others, changes in interest rates by the ECB in response to European-wide economic conditions, might cause wide cross-country differences in output responses.²¹

The evidence on asymmetries in the transmission of monetary policy is hard to gather and the results in the literature are inconclusive. One of the most comprehensive recent studies by Dornbusch, Favero and Giavazzi (1998) finds cross-country differences in several dimensions of the transmission of monetary policies (interest-rate elasticity, balance sheet structures of companies and households or the response of bank lending rates to changes in central bank interest rates). However, in most cases, the differences are not statistically significant and inconsistent.²² Interestingly, in the case of Spain, most indicators suggest that the Spanish economy exhibits a low response to interest rates changes. Moreover, the response of the Spanish economy is the closest to that of the German economy.

How could these asymmetries affect the Spanish business cycle? It depends on our assumptions about how the ECB will run monetary policy. The fact that the estimates for Spain are close to those of the largest EMU economies (Germany and France) indicate that, under the assumption that the ECB will use some aggregator of economic conditions based on GDP weights, the effects on the Spanish economy will be minimal.²³ In other words, if the response to interest rate changes of the Spanish economy is close to that of the European aggregate, a policy designed around that aggregate will also fit the Spanish economy.

²¹ What this will do to business cycles is, once again, unclear unless we specify a benchmark for comparison.

²² The degree of interest-rate sensitive of a country depends very much on the indicator being used.

²³ This is specially true if we are comparing the EMU scenario with the current situation described as one where the Bundesbank decides on monetary policy largely based on economic conditions on Germany.

3.4 FISCAL POLICY

In Section 2 we have described how fiscal policy can be used to smooth business cycle fluctuations. In this section we quantify these effects and we look at implications of the limits imposed by the Stability Pact.

Table 6 presents some basic statistics on fiscal policy in 20 OECD countries.²⁴ There are large cross country differences with respect to the size and composition of the government and, with no exception, governments have increased their share of GDP in the last 4 decades.

Table 6. Size of Government

Country	Taxes		Transfers		Expenditures	
	1970	1997	1970	1997	1970	1997
Spain	20.87	37.82	7.98	17.67	20.87	37.76
Germany	37.17	43.99	14.15	20.99	36.26	44.58
France	37.41	47.53	16.43	25.77	36.79	50.05
Italy	27.86	46.59	12.78	21.37	31.36	41.32
Netherlands	37.68	44.69	16.45	26.56	37.98	44.74
Belgium	38.33	49.88	17.85	26.60	37.84	45.31
U.K	35.57	36.06	8.29	13.99	32.57	36.53
Denmark	38.64	54.64	11.99	22.76	38.16	53.04
Greece	21.55	34.44	9.47	16.65	23.59	34.45
Portugal	20.94	41.80	2.94	17.58	19.79	42.11
U.S.	28.92	31.78	8.09	14.14	31.35	32.44
Canada	31.27	37.08	8.11	14.09	31.06	35.07
Japan	19.72	30.17	4.89	14.84	17.89	31.62
Australia	24.43	31.59	6.11	13.37	24.57	33.09
Norway	37.27	44.29	11.17	17.16	36.31	43.17
Sweden	43.40	56.14	12.16	26.01	40.21	57.82
Finland	33.03	49.91	8.71	24.77	29.22	51.50
Switzerland	29.25	43.41	10.62	24.06	29.09	45.44
Austria	38.51	46.12	15.55	21.97	36.63	45.52
All numbers are % of GDP.						

Spain still lags other European economies when it comes to the size of both government expenditures and transfers. For that reason, it is a country that displays one of the largest increase in government size in the period 1960-1997.

How do these variables behave over the business cycle? We have run regres-

²⁴ All fiscal variables used in this section are taken from the OECD Economic Outlook.

sions of some of the components of fiscal policy on the growth rate of GDP.

$$z_{it} = \alpha_i + \delta \Delta y_{it} + \nu_{it}$$

Where z represent the fiscal variable and y GDP.²⁵ Although we have tested different specifications for detrending, the results reported here correspond to the case where both fiscal variables and GDP appear in growth rates, with the exception of the primary deficit, which is expressed as a ratio of GDP. Tables 7 and 8 show the results for the pool of OECD data and for Spain.²⁶

Table 7. Cyclicalty of Fiscal Variables. OECD economies

Variable	β	R^2
Revenues	0.82 (0.05)	0.35
Expenditures	0.03 (0.005)	0.13
Primary Deficit/GDP (*)	-0.26 (0.04)	0.30
Taxes net of Transfers	1.42 (0.09)	0.24
Disposable Income	0.70 (0.03)	0.46
Sample: 1960-1997. All variables in growth rates except for (*) Standard errors in parentheses Pooled regression, $N = 20$, $T = 38$		

The numbers reveal that revenues are clearly procyclical while expenditures are acyclical. For example, a 1% increase in output raises revenues by 0.8% and expenditures by only 0.03%, in the OECD sample. The primary deficit (measured as a ratio to GDP) decreases by 0.26 percentage points. These elasticities are very similar for Spain. The primary deficit is slightly more countercyclical but the difference with the OECD average is small.

Rows 4 and 5 in Tables 7 and 8 present evidence on the stabilization effect of taxes and transfers on disposable income. The variable taxes net of transfers has an elasticity with respect to GDP changes larger than 1. A 1% fall in output

²⁵ All variables are real, deflated using the GDP deflator.

²⁶ We run the pooled regression using fixed effects.

Table 8. Cyclicity of Fiscal Variables. Spain

Variable	β	R^2
Revenues	0.87 (0.22)	0.32
Expenditures	0.04 (0.009)	0.16
Primary Deficit/GDP (*)	-0.35 (0.09)	0.30
Taxes net of Transfers	1.35 (0.43)	0.21
Disposable Income	0.89 (0.10)	0.71

Sample: 1960-1997. All variables in
growth rates except for (*)
Standard errors in parentheses

decreases taxes net of transfers by approximately 1.42%, which means that taxes and transfers smooth disposable income. This is further corroborated by the last row, which shows that a 1% fall in output translates into less than a 1% fall in disposable income. Here, the difference between the Spanish economy and the average of the OECD is larger. While for the OECD economies, in average, a 1% drop in income results in a 0.7% drop in disposable income, in Spain the fall in disposable income is closer to the fall in output (0.89%). In other words, it seems that the automatic stabilizers built into the Spanish fiscal system are smaller than in the average of OECD economies. One possible reason, that we will explore later in this section, is the smaller government size in the case of the Spanish economy.²⁷

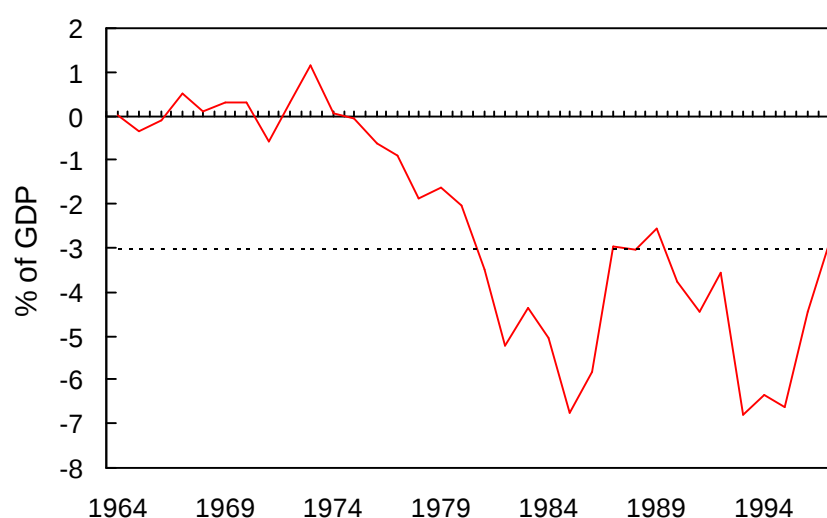
Will the stability pact limit the ability of fiscal policy to smooth disposable income? A first look at the results of Tables 7 and 8 seems to indicate that the answer is no. In both cases the deficit is not too sensitive to output fluctuations. For example, if we think about potential output growing at a rate of 3% and we think of a recession as a period of negative growth (say -1%), this implies a change in the deficit-to-GDP ratio of only 1.4 percentage points. With these numbers in mind, a 3% limit on budget deficits does not seem to be too restrictive,

²⁷ Related to our results, Bayoumi and Masson (1996) or Sorensen and Yosha (forthcoming) have explored the general issue of income smoothing achieved in European countries by either capital markets or fiscal policy. Sorensen and Yosha (forthcoming) show that approximately 40% of shocks are absorbed at the one-year frequency, half of it achieved through national government budgets.

under the assumption that governments manage to keep their budgets balanced on average.²⁸

An alternative way of exploring how restrictive a 3% limit is, is to look at the number of times that the budget deficit has been above the 3% limit. In the case of Spain, according to Figure 2, during the years 1964-1997, the deficit was above the 3% limit 14 times, which corresponds to almost 42% of the years. In none of these years was growth less than -2% and in only one occasion (1993) growth was smaller than -0.75%.

Figure 2. Budget Deficit. Spain



These numbers give a more pessimistic view on the Stability Pact, From them one could conclude that, based on the historical experience, the Stability Pact is bound to fail. Of course, there is a second reading of those numbers. Under the assumption that large budget deficits are undesirable, the Stability Pact seems to be a necessity for countries that, in the absence of constrains always fall into the side of excessive deficits.²⁹ Which of these two views is correct?

Let's take for a moment the pessimistic view on the Stability Pact and argue that history shows that the limit of 3% is going to impose a serious constraint on

²⁸ One has to be very cautious interpreting non-structural estimates of the response of deficits to output fluctuations. Also, the regressions of Tables 7 and 8 use the primary deficit and not the overall deficit, which is used in the definitions of the Stability Pact.

²⁹ The record of Spain is not much worse than the record of some of the other EU countries. In average, during the period 1960-97, 40% of the years EU governments displayed deficits well over 3%. See Eichengreen and Wyplosz (1998) for a detailed analysis of this issue.

the ability of governments to stabilize their economies in the presence of asymmetric shocks. How important might this effect be? How effective are automatic stabilizers? There are several ways of looking at this question from an empirical point of view. One is to look at the dynamic response of the fiscal deficit and do the counterfactual of limiting budget deficits to 3%. This is indeed what Eichengreen and Wyplosz (1998) do. Their conclusion is that the effects of having limited budget deficits to 3% would have had a small effect on the volatility of European economies.

A second, more general way, of looking at the effects of automatic stabilizers is to look at cross-country evidence. This also provides a broader framework to understand the general effects that automatic stabilizers have on output volatility and not only on disposable income.

Following Gali (1994) and Fatás and Mihov (1998), there is strong cross-country evidence that automatic stabilizers reduce the amplitude of business cycles. For example, Figure 3 plots the correlation between output volatility and the size of the government (measured by expenditures over GDP) for the cross section of 20 OECD economies.

Figure 3. Government Size and Volatility of GDP

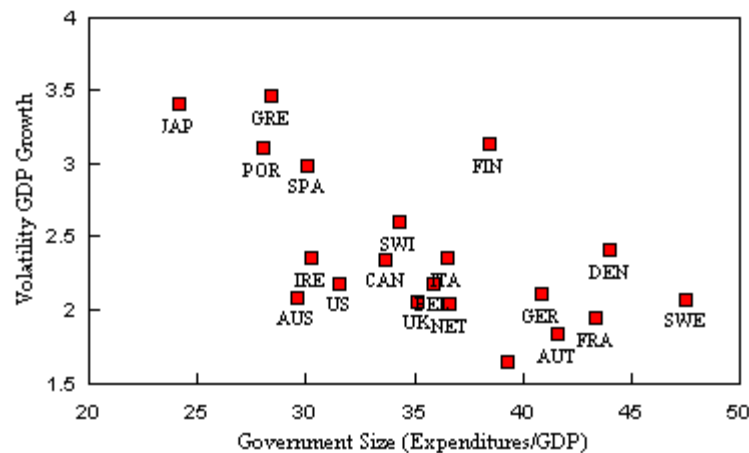


Table 9 reports cross-country regressions of the volatility of output, disposable income and consumption on government size. In all cases, large governments are associated to less volatile business cycles.³⁰

³⁰ This correlation is robust to the use of alternative measures of economic activity such as

Table 9. Size of Government and Volatility of GDP

$$\sigma(\Delta y)_i = \alpha + \beta \text{Govt.Size}(G/Y)_i + \nu_i$$

Variable	β	R^2
Output	-0.053 (0.016)	0.38
Disposable Income	-0.034 (0.022)	0.11
Consumption	-0.043 (0.026)	0.13

Sample: 1960-1997

Standard errors in parentheses

Table 10. Budget deficits and Volatility

$$\sigma(\Delta y)_i = \alpha + \beta_1 \sigma_{Def/GDP,i} + \beta_2 (G/Y)_i + \nu_i$$

Regression	β_1	β_2	R^2
Output	0.256 (0.075)	-0.051 (0.012)	0.63
Disposable Income	0.399 (0.096)	-0.030 (0.016)	0.55

Sample: 1960-1997

Standard errors in parentheses

The results of Table 9, although supporting the idea that automatic stabilizers are important, say very little about the benefits of using countercyclical budgets to smooth fluctuations. Is it true that large governments are also governments that play a more active role in fiscal policy and, thus, are better at stabilizing output fluctuations? The answer is no. Regardless on how we define active fiscal policy, the correlation between output volatility and any measure of how active fiscal policy is either insignificant or even positive.

For example, Table 10 regresses the volatility of disposable income and output on a measure of how reactive fiscal policy is: the standard deviation of budget deficits. We include in the regression the overall size of the government. We find that responsiveness, if anything, increases the volatility of output and disposable income.

These results are confirmed if we use alternative measures of how responsive fiscal policy is. For example, Table 11 presents the results of regressing the

private output and different controls for output growth or initial level of GDP. See Fatás and Mihov (1998) for an extensive analysis of this data.

Table 11. Fiscal Policy and Volatility of Output

$$\sigma(\Delta y)_i = \alpha + \beta_1 FP_i + \beta_2 (G/Y)_i + \nu_i$$

Measure of FP	β_1	β_2	R^2
Elasticity of G on Y ($\hat{\delta}$)	0.183 (0.382)	-0.058 (0.019)	0.39
Volatility of G/Y	0.479 (0.096)	-0.073 (0.011)	0.74

Sample: 1960-1997
Standard errors in parentheses

volatility of GDP on two alternative measures of active fiscal policy (labeled FP on the table). First, we approximate the responsiveness of fiscal policy by the coefficient that represents the elasticity of government expenditures to changes in income (the $\hat{\delta}$'s from the regressions of Table 7). Second, we use the volatility of the ratio government expenditures to GDP as a measure of activity of fiscal policy. In both cases, more active governments are associated to more volatile business cycles. None of these measures is free from serious endogeneity problems but, overall, our results are consistent. Although large governments are associated to smoother business cycles, whatever automatic stabilizers are built into the fiscal system seem to be unrelated to large and volatile budget deficits. In fact, governments who appear to use fiscal policy more often, are associated to more volatile business cycles.

Given the endogeneity problem of our regressions is hard to quantify how important this effect might be. If we take the coefficients of Table 10 as structural, we can do some back-of-the-envelope calculations. Volatility of Spanish GDP during the whole sample was 2.98. Standard deviation of deficits was 2.47. If deficits had been capped at 3%, the standard deviation of deficits would have been 1.47.³¹ This would have reduced the volatility of output by approximately 0.27, which represents a significant number (10% of the total volatility).

What can we conclude from these results? A reading which is consistent with all of our results is that there is evidence that fiscal policy helps smoothing output fluctuations and that large government are indeed associated with less volatile business cycles. However, there is no support for the idea that governments who

³¹ This is clearly a lower bound on the volatility of budget deficits as it ignores the fact that if deficits had been limited at 3% their behavior when they got close to 3% would have been very different.

have made more use of active fiscal policies have been more successful stabilizing business cycle. Indeed, if any, there seems to be evidence that governments who have been less constrained in the use of fiscal policy have increased the volatility of the business cycle. With the usual caveat about the fact that we are looking here at historical data, there is little support for the idea that, overall, the limits on budget deficits imposed by the Stability Pact might lead to more volatile business cycles. Although it is true that it might preclude governments to use fiscal policy as a stabilizing tool if they start very close to the 3% ceiling, it is also a constraint that, if respected, could very well lead to less fluctuations caused by fiscal policy disturbances.

4.- CONCLUSIONS

This paper presents an analysis of the changes that EMU will introduce in the Spanish business cycle. Our main focus is on whether after EMU, national business cycles will become more or less volatile and the extent to which the process of monetary unification will lead to an increase in the synchronization of European economies. The disappearance of autonomous national monetary policies coupled with the limits on fiscal deficits imposed by the Stability Pact have created the fear that nation-specific shocks might lead to deep recessions and significant tensions among EMU members.

We first explore how the disappearance of exchange rates can have effects on the patterns of geographical specialization and trade among European countries. From a theoretical point of view the outcome of this process is ambiguous. On one hand, Europe might become more geographically specialized, getting closer to the US model of industry location. In this case, and assuming that specialization takes place at the national level, we would expect more pronounced national business cycles. A second possibility is that increased trade leads to deeper linkages among European economies, causing a synchronization of their business cycles. The evidence that we present favors the second hypothesis. We show that in a broad sample of countries higher trade is associated to more synchronized business cycles. The same is true if we select a sub-sample of EU countries or one of Spain and its main trade partners. Interestingly, when we look at the numbers for the Spanish economy we find that our results underestimate the amount of synchronization between Spain and the main EU countries over the last 10 to 15 years. We interpret this a signal that the coordination of economic policies must also be behind the increased correlation.

When it comes to how changes in monetary policy will affect the Spanish business cycle, we acknowledge the difficulties of making a prediction by extrapolating from historical data. However, the experience of the discipline imposed by the EMS can provide us with some useful information. The fact that we observe an increase in the correlation among European economies and a general fall in the volatility of national business cycles during the time when the EMS discipline was the strongest, is an indication that running monetary policy in a coordinated manner can, in fact, reduce the amplitude of national business cycles. We also review the issue of whether there might be asymmetries in the transmission of monetary policy. Recent empirical studies suggest that the response of the Spanish economy to interest changes is very close to that of the German and French economies which help its integration in a unified European monetary policy.

Lastly, we look at the changes that the Stability Pact introduces on the conduct of fiscal policy. The 3% ceiling in budget deficits could impair the ability of fiscal policy to smooth nation-specific shocks. We find that, historically, the 3% limit has been surpassed numerous times. There is, however, little evidence that the working of automatic stabilizers requires fiscal policy to go beyond the 3% limit on a regular basis. In other words, the limits on fiscal policy could only pose a real threat to the stabilization if deficits are kept too close to the 3% limit. Moreover, the evidence seems to suggest that governments which have been more prone to use fiscal policy in the past are associated to economies that display more volatile business cycles.

Overall, when we put together all of our findings we find that the Spanish economy has achieved a remarkable degree of synchronization with the European business cycle in recent years. The fact that some of the trends that have contributed to that convergence are likely to continue under EMU suggests that the fears of large and volatile national business cycles when monetary policy is run by the ECB are unfounded. Despite the fact that we recognize that our predictions are, to a large extent, speculative and they make use of data generated under a regime that is very different from the future EMU regime, it is difficult to ignore the consistency of the evidence gathered in this paper.

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