

# Disparities in the economic climate within the euro zone

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*Appreciable disparities in economic situations exist among the major countries in the euro zone. The interpretation of these economic differentials is essential for the analysis of macroeconomic variables in the euro zone, which remain, by construction, the aggregation of the national variables. We propose here an initial attempt to enlarge and refine the way in which the European economic surveys are to be analysed. The aim is simultaneously to provide a synthetic indicator of activity in the euro zone treated as a whole and indicators of the deviations in the economic climate for each of the major constituent countries. These new indicators are consistent with the main features of contemporary economic facts in the euro zone and in its principal countries. This qualitative relevance is moreover confirmed empirically in the light of quantified macroeconomic data.*

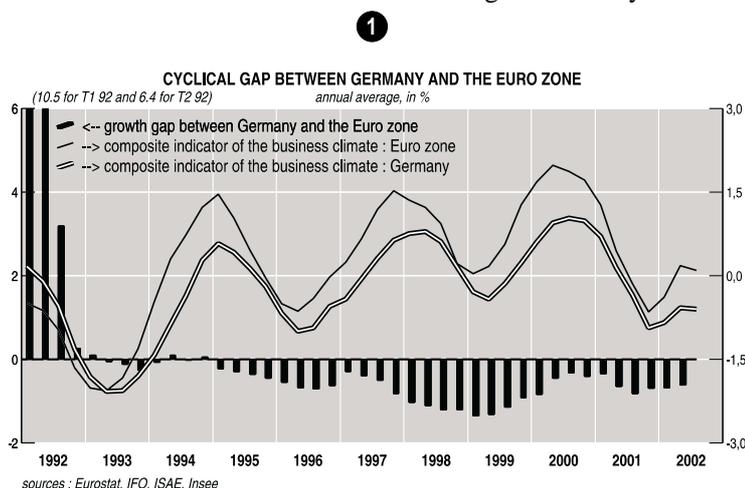
## From a "naive" measure of disparities in the economic climate...

To illustrate the existence of disparities in the economic climate within the euro zone, take the example of German unification. This asymmetric shock rapidly produced a more favourable economic situation in Germany than in the rest of the euro zone in 1991 and 1992. Subsequently, Germany's relative position in the European cycle became unfavourable, with an annualised growth rate that has been systematically below that of the euro zone since 1995.

Comparison of business climate indicators (BCI) in the euro zone and in Germany makes it possible to find this diagnosis repeated in qualitative terms (see graph 1). This suggests exploiting these indicators for the assessment of disparities in economic situations <sup>(1)</sup>.

In order to simplify the interpretation of business surveys, INSEE has in recent years adopted a methodology, namely factor analysis, involving breaking down each balance of opinion into two independent components. One of these is common to all the balances of opinion; the other is specific to the question being considered. The common tendency underlying all the questions in the survey, also known as the common factor, turns out to be a "summary" of the information contained in the survey and has been named the indicator of the business climate (BCI for Business Climate Indicator). This methodology is used by INSEE to compile and publish every month a set of national indicators as well as an indicator for the euro zone <sup>(2)</sup>.

As a first approximation, one could consider the straightforward comparison between the common factor for a given country and that of



(1) In this exercise, we have dealt uniquely with European economic surveys for industry, which are used for the construction of the BCI. Admittedly, the economic situation in industry can sometimes differ from that of the economy as a whole (this was true, particularly, of the French "air pocket" in 1999), but it makes it possible to capture roughly 80% of the variation in total output (see the special article "L'apport des enquêtes de conjoncture dans les différents secteurs d'activité à l'analyse conjoncturelle" in Note de Conjoncture, June 2002).

(2) Regarding the construction of the business climate indicator see the special article "Une grille de lecture pour l'enquête mensuelle dans l'industrie" in Note de Conjoncture, December 1995. See also Informations rapides: "European economic surveys".

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the zone as a qualitative indicator of the divergence between the economic climates of the leading economies in the zone (*see graphs 2 and 3*). This measure would be written to represent the deviation in the economic climate G (business climate gap) in the form :

$$G_{\text{Country}} = \text{BCI}_{\text{Country}} - \text{BCI}_{\text{euro zone}}$$

However, measuring the economic disparities in this way is unsatisfactory from a technical standpoint. The modelling underlying the construction of a synthetic indicator for the euro zone, on the one hand, and that for each country taken on its own, on the other, are not in fact properly articulated between themselves.

In fact, the theoretical framework, initially adopted for working at the level of a single country, is not perfectly suitable for studying the economic climate in the zone as a whole when it is recognised that there are economic differentials. The reply to a question in an economic survey in a given country would seem in fact to comprise not two types of information, but three: information that is common to the whole of the zone, additional information that is specific to the country in question (and would therefore be found in all the balances of opinion in a given country survey) and, finally, a residual element of information directly related to the question posed. It therefore seems necessary to establish a model tak-

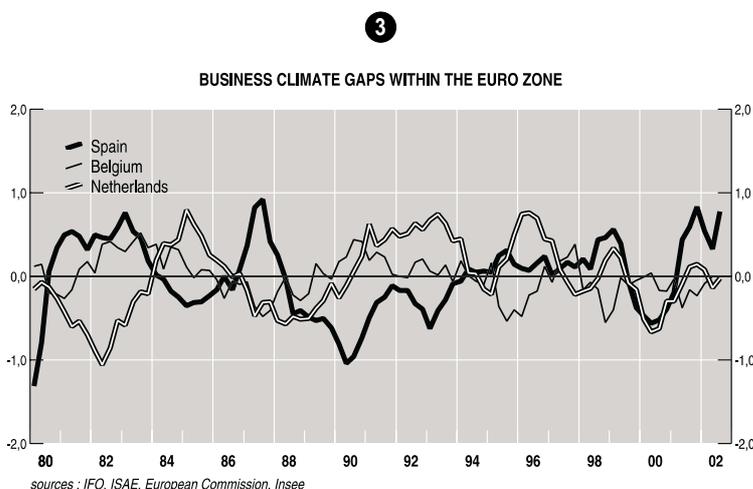
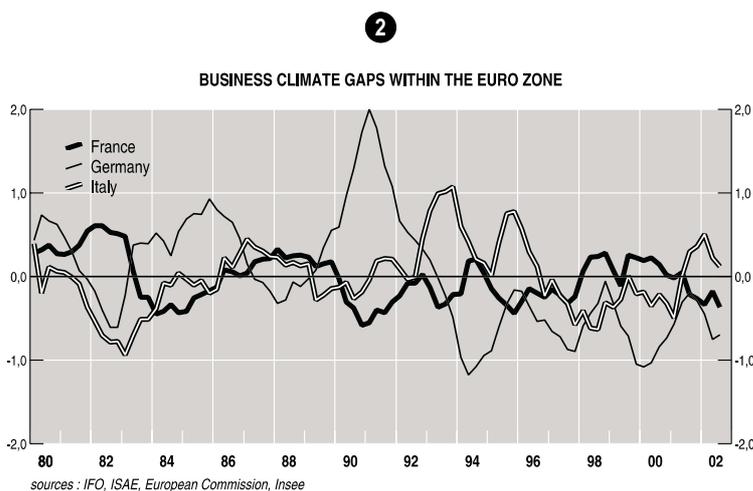
ing into account in a structured manner of the two dimensions, global and national, that are relevant for the economic analysis relating to the euro zone.

### ...To a more comprehensive manner of assessing the European cycle

The aim is to extend the analytical framework of the economic surveys in order to adapt it to the characteristics of the euro zone referred to earlier. This more comprehensive analytical model of the European economic cycle is aimed at producing in a consistent and simultaneous fashion a synthetic indicator of the economic climate for the euro zone and a set of indicators of economic disparities - or "country specific components" - for the six main economies in the zone: France, Germany, Italy, Spain, Belgium and the Netherlands (*see box 1*). For each of these countries, we have five balances of opinion emanating from the survey of industry: "past production tendency" (TPPA), "opinion regarding total order books" (OSCD), "export order books" (OSUDE), "stocks" (OSSK) and "expected production tendency" (TPPRE). All these balances of opinion are treated together in an integrated statistical framework.

The synthetic indicator for the euro zone derived from this new model is very similar to the present indicator published by INSEE (*see graph 3*). This is logical, since the definition initially adopted by INSEE for the construction of the BCI is indeed that of the common economic situation, although the underlying model is less exhaustive (*see box 2*). In both cases, it is the movements that are genuinely common to all the variables that are captured, as a sort of "lowest common denominator" of the European surveys.

Differences remain, however, between the newly-constructed indicator and the "INSEE indicator", which can be explained by the



#### How to read the graph:

Each curve represents the difference between the country's BCI and the BCI for the euro zone (expressed as points of standard deviation).

greater or lesser degree of discrimination of the observed movements as between the common cycle and country specific movements. They can also relate to the non-dynamic character of the new model used<sup>(3)</sup>.

The country specific components extracted by means of the new model, which we shall call EDIs (Economic Disparity Indicators) clearly bring out the existence of such disparities in economic climates. These specifically national movements signal an assessment of the business climate that is different from those of the principal European partners. The statistical model used assumes that each pair of country specific components is mutually independent. This can be seen in a graphic representation: the EDIs differ widely from one country to another, both as regards the timing of the turning points and the amplitude and direction of the variations (see graphs on page 19)<sup>(4)</sup>. Note that the periods of economic differentials identified by these indicators are generally consistent with those illustrated using the qualitative approximation made previously, consisting of direct comparison of the synthetic indicator for a given country with that of the euro zone.

### Evolution in the relative positions in the cycle of the major euro-zone countries

This new instrument provides a description of the shared economic climate on which we shall not dwell here, inasmuch as it has already been the subject of considerable comment, especially through the analysis of the reference cycle described by the business climate indicator for the euro zone. On the other hand, short-term economic analysis is enriched through the exploitation of the indicators of cyclical differentials, whose evolutions make it possible to appreciate the specificities of the economic situations of the major euro-zone countries. It should be remembered, however, at this point that the EDIs are indicators of a qualitative na-

### BOX 1 : A NEW THREE-COMPONENT MODEL

The assessment of the common economic situation necessitates the working out of a more precise statistical model, aimed at taking into explicit account of the existence of idiosyncratic shocks, in other words ones that affect *all* the balances of opinion for *one single* country. Each balance of opinion is therefore broken down into three independent components, as follows:

$$\forall (i, p) \in \{1, \dots, 5\} \times \{1, \dots, 6\} \quad y_{i,p}(t) = \alpha_{i,p} \cdot F_{ZE}(t) + \beta_{i,p} \cdot V_p(t) + u_{i,p}(t)$$

where  $y_{i,p}$  is the  $i$ -th balance for country  $p$ ,  $F_{ZE}$  is the common factor in all the balances for all the countries,  $V_p$  is the specific component for country  $p$  (common to all the balances in the country) and  $u_{i,p}$  is the specific component relating to question  $i$  for country  $p$ .

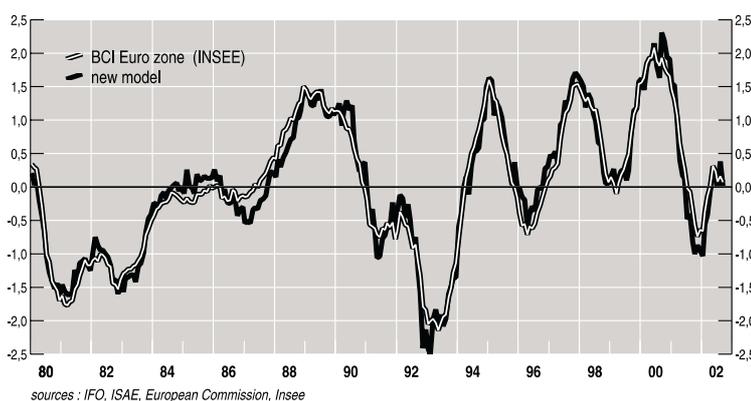
By assumption, the common factor  $F_{ZE}$ , the country specific components  $V_p$  and the specific-question components  $u_{i,p}$  have zero correlations taken in pairs.

For each of the countries examined (Germany, France, Italy, Spain, Belgium and the Netherlands), 5 balances of opinion emanating from the monthly industrial survey, adjusted for seasonal variations, were used. In the case of France, Germany and Italy, the series used are respectively those from INSEE, IFO and ISAE. For the other three countries the data are those published by the ECFIN Directorate (DG II) of the European Commission. Since the balance of opinion relating to past production in the case of Spain is available only from January 1987 on, it was not taken into account in the analysis. The model is therefore estimated on the basis of 29 balances of opinion, over the period from January 1980 to September 2002.

The natural framework for the estimation is that of dynamic factor models. However, the construction of synthetic indicators at national level shows that a static estimation by factor analysis, which is simpler to carry out, leads to acceptable results as a first approximation. Experience to date already enables us to present the exercise on the basis of a static model. The dynamic estimation of the model will be the subject of future work. ■

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SYNTHETIC INDICATORS OF THE BUSINESS CLIMATE IN THE EURO ZONE



(3) While the improvement in the interpretation shows promise, the statistical methods could do with being refined, especially to take into account the model's dynamic dimension (see box 1).

(4) Even so, this assumption of mutual independents between pairs of economic disparities, made for the sake of simplicity, can be disputed. One could, for example, imagine that one of the euro zone's "small" countries, closely linked to the economy of a "large" country, has had economic disparity that is partly correlated with that of this "large" country.

### BOX 2 : A COMMON CYCLE OR AN AGGREGATED CYCLE ?

Two methods for the construction of a synthetic indicator for the euro zone using the balances of opinion in national business surveys have so far been presented.

The harmonised business surveys at European level can first of all be aggregated on the basis of individual questions. This involves the construction of five balances of opinion, using as weightings the shares of each country in industrial value added. The next step is to extract a synthetic indicator from these five balances using factor analysis, adopting the classic underlying model used for each country:

$$\forall i \in \{1, \dots, 5\} \quad y_i(t) = \lambda_i \cdot F(t) + u_i(t)$$

This synthetic indicator is similar to an aggregated cycle. It is calculated each month by the European Commission.

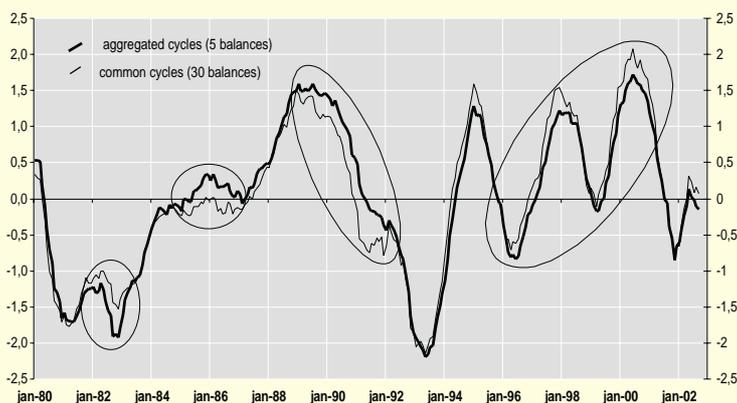
INSEE in its published short-term economic analyses (*Informations rapides*), has adopted a different approach, namely that of the common cycle, aimed at capturing movements in activity that are common to all the balances of opinion in all the countries of the euro zone, making the best use of all the available information. While still retaining the national model, the business climate indicator for

the euro zone calculated by INSEE is directly taken from 30 juxtaposed balances of opinion, in other words the five balances of opinion for each of the six leading countries in the zone.

The two definitions do not lead to the same results as regards the estimation of the business climate indicator. These divergences coincide with episodes of substantial cyclical differentials for one or other of the leading countries in the zone: the weakness of the economic situation in Italy and France in 1983, the more marked optimism on the part of German industrial leaders in 1986 and then again in 1991 and 1992 at the time of unification, or the generally laggard position of German activity since 1996.

The present special article sets out a third solution, using a model estimating an indicator for the shared cycle as well as indicators for differentials. In this approach, the business climate in the euro zone continues to designate the common cycle, whereas the aggregated cycle is also influenced by the deviations in the economic climate in the "major" countries through their importance for the economy of the zone. ■

COMPARISON OF TWO BUSINESS CLIMATE INDICATORS FOR THE EURO ZONE



sources : IFO, ISAE, European Commission, Insee

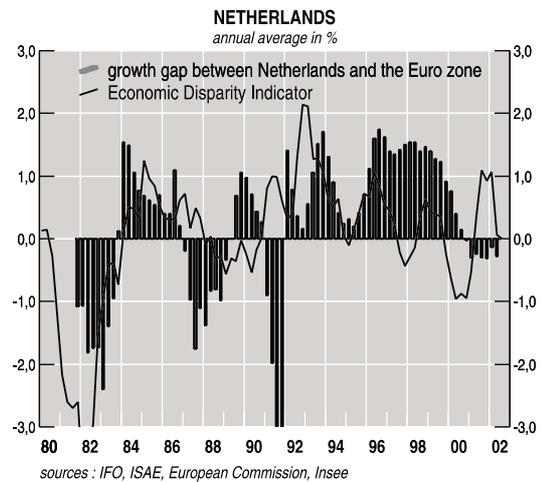
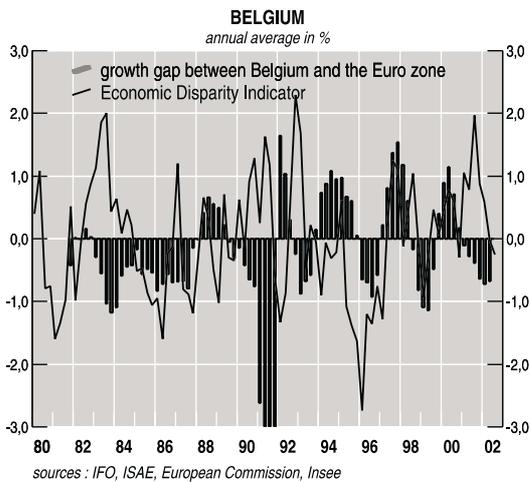
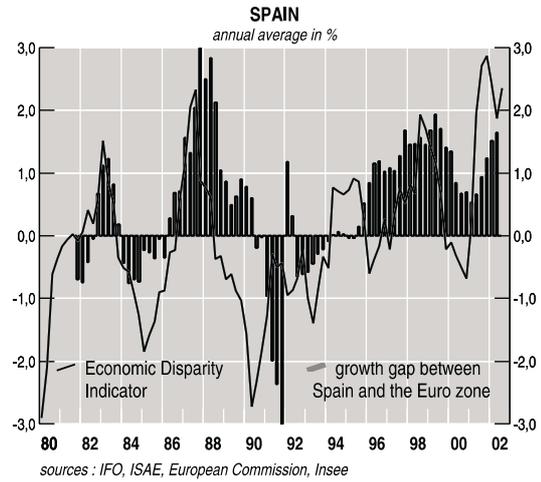
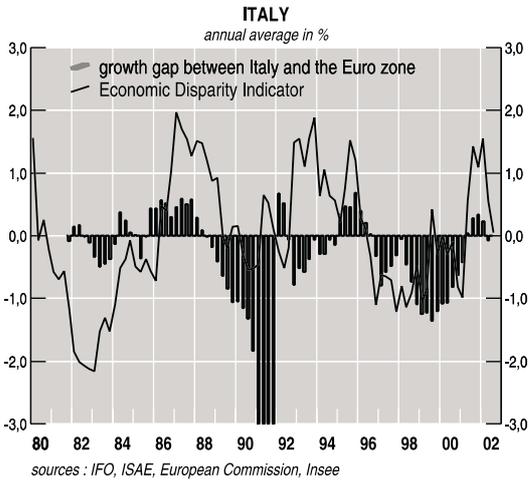
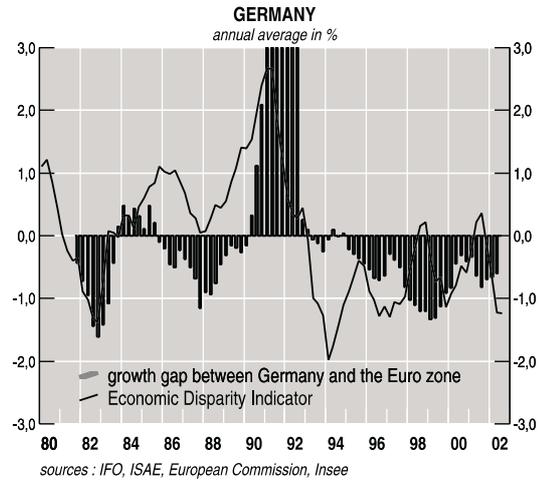
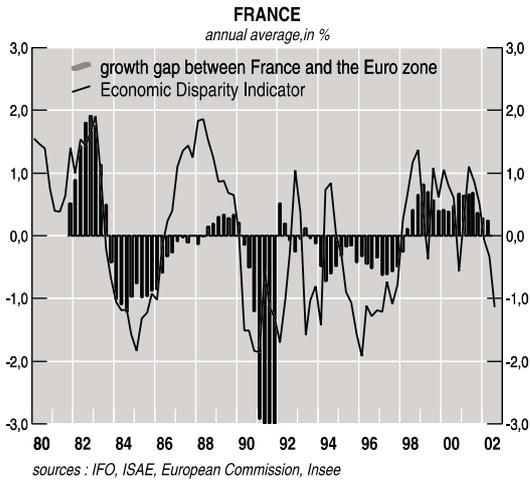
ture, being the result of replies to economic surveys expressed in the form of balances of opinion. To obtain a more quantitative evaluation of the notion of cyclical differentials, we have used an indicator of the growth differential, calculated as the difference between each country's GDP growth on an annual average basis and that of the euro zone. It is used here merely in exploratory fashion, to highlight the capacity of EDIs to express an economic reality.

The major asymmetric shocks occurring in the past 20 years within the group of countries that now

constitute the euro zone are discernible through the peaks and troughs of the EDIs. In 1982, the new direction taken by economic policy in the Netherlands under the impulse of the signature of the Wassenaar agreements coincided with the exit from a marked trough in the country specific component from 1981 to 1983. The entry of Spain into the EEC, which took effect in January 1987, was reflected in a jump in the Spanish EDI, which turned positive in Q1 1987 and was to remain positive until the spring of 1988. In 1990, the prospect of German unification, which was to bolster activity until

mid-1991, was reflected in excessive optimism on the part of German business leaders (a distinctly positive country specific component). Against a background of tight monetary policy, the drastic adjustment in fiscal policy at the beginning of H2 1991, made necessary by the evolution in public finances, provoked an appreciable deterioration in the economic climate in Germany that was in 1991 far more the result of the ending of German specificity than of any real deterioration in the European business climate (the euro-zone's BCI was generally stable over the same period). In Italy, the two devalua-

## CYCLICAL DIFFERENTIALS WITHIN THE EURO ZONE



### How to read the graphs :

In Spain in Q1 1987, the business climate was appreciably more optimistic than in the rest of the euro zone and remained so until Q2 1988. At the same time, Spanish growth was firmer than for the euro zone (positive growth differential). These graphs provide visual evidence that the link between the EDI (qualitative indicator of cyclical differential) and growth differentials (quantified macroeconomic indicator) is real but approximate only.

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tions of the lira, in 1992 and 1995, led to a re-stimulus of the economy through external trade by improving the competitiveness of Italian exports. These positive effects on activity were to be seen also in the appearance of episodes of relative

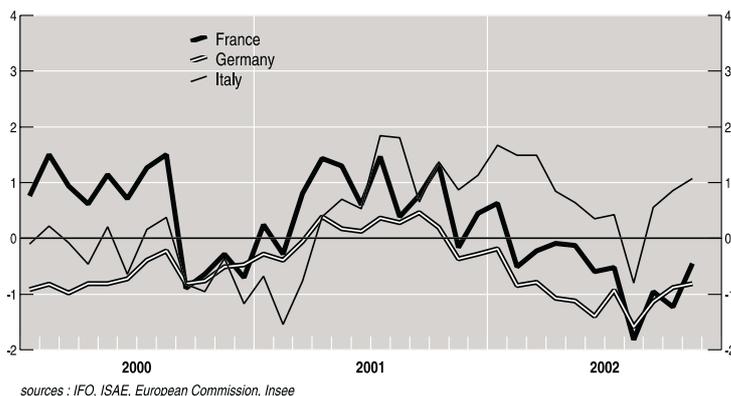
optimism on the part of Italian industrialists in Q4 1992 and in the summer of 1995.

In the final months of 2002, it is possible to draw the following conclusions regarding the relative po-

sitions in the cycle of the major euro-zone countries. Spain maintains a distinctly more optimistic climate than its neighbours, an optimism which matches its appreciably better growth performance. At the other end of the scale, the German economic situation remains generally laggard compared with the rest of the zone, with a perceptible lag in the EDI consistent with weaker activity. Italy, Belgium and the Netherlands show no particular disparity and are in line with the baseline scenario for the whole of the zone until the end of summer; these countries now experience a better oriented situation. In a situation that is new by comparison with the past three years, France's economic climate has deteriorated more appreciably than that of the euro zone as a whole, in line with the reduction in the three first quarters of 2002 of the growth disparity in France's favour seen since 1998. However, by november, the French EDI is up; meaning a come back to a more neutral cyclical position at the end of the year.

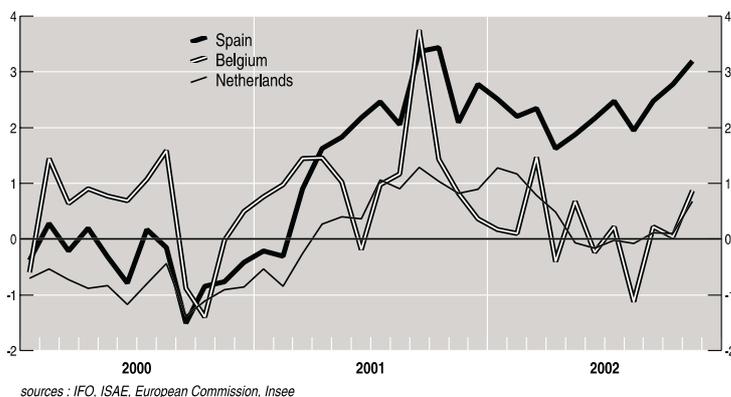
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RELATIVE POSITIONS IN THE CYCLE OVER THE RECENT PAST



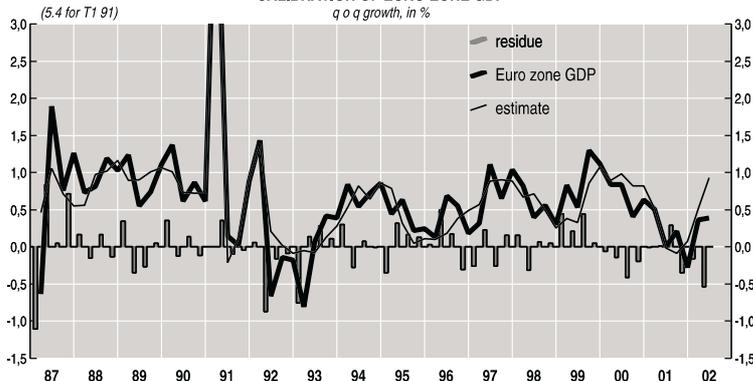
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RELATIVE POSITIONS IN THE CYCLE OVER THE RECENT PAST



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CALIBRATION OF EURO-ZONE GDP



### An example of the use of the indicators of cyclical differentials

The indicators constructed here are a response to an initial objective, namely to refine the manner in which European economic surveys are interpreted by deriving simultaneously a signal that is common to the whole of the zone and additional signals that are specific to each country. However, they remain qualitative in nature and their relevance can only be established when they are compared with quantified macroeconomic data. What is now necessary therefore is to raise the question of the empirical validation of the EDIs in the light of the data for growth differentials.

For our purposes we have chosen as the quantitative measure of a country's cyclical gap the difference between its GDP growth rate and that of its principal partners. The aim is to gauge econometrically

the link between the EDI and the growth differential for the six leading countries of the zone that have already been examined. For each of them, a rudimentary equation (linear regression) is used, adopting the method described in box 3.

For the four principal countries of the zone (France, Germany, Italy and Spain), an econometrically significant link is brought out. The EDI does indeed provide information on the evolutions in the growth differentials measured using quarterly national accounts, with an explanatory power that is similar for each of the four countries.

For Belgium and the Netherlands, on the other hand, it is more difficult to demonstrate such a link. The estimated coefficients are not significant, testifying to the EDI's low explanatory power. The very uneven pattern over time for the Belgian indicators in fact foreshadowed such a result. This is perhaps explained by the fact that these are two very open "small" economies, heavily dependent on the economic situation in their French and German neighbours. As a result, the Belgian and Dutch EDIs are not likely to be significant, with the surveys carried out in these two countries probably saying more about the business climate in the zone as a whole.

A second exercise to examine the relevance of the EDIs consists of testing their usefulness in predicting growth in the euro zone taken as a whole. In this approach, the synthetic indicator for the euro zone would act as the "spinal column" for the forecasting exercises, onto which could be grafted a set of indicators of specific shocks, providing additional information relating to the various countries of the zone while still keeping parcimony.

As an illustration, this approach was applied in the following exercise. We carried out a regression of

### BOX 3 : AN EXAMINATION OF THE LINK BETWEEN EDIS AND GROWTH DIFFERENTIALS

For each of the six major countries in the euro zone, the first step is to construct the growth differential for each country with the help of data derived from the quarterly national accounts.  $QGDP_p$  denotes the quarterly GDP variation for country  $p$  and  $QGDP_{-p}$  that of the GDP of the five other countries taken together. The following indicator is obtained :

$$\forall p \in \{1, \dots, 6\} \quad GD_p(t) = QGDP_p(t) - QGDP_{-p}(t)$$

This growth differential variable (denoted  $GD$ ) is then regressed on its past (lagged endogenous variables) and on the present and past values of the EDI for the country concerned.

$$GD_p(t) = \delta + \sum_{i \neq 0} \alpha_{i,p} GD_p(t-i) + \sum_j \beta_{j,p} EDI_p(t-j) + u_p(t)$$

The period covered by the estimation runs from Q2 1986 to Q2 2002. Dummy variables are introduced from time to time to deal with certain statistical incidents such as the German growth "peak" in Q1 1991 resulting from unification. The link between the EDI and the growth differential will be captured through examination of the degree of significance of coefficient  $\beta$ . The following coefficients are found again in table 1:

$$\alpha_p = \sum_{i \neq 0} \alpha_{i,p} \quad \text{and} \quad \beta_p = \sum_j \beta_{j,p}$$

#### THE EMPIRICAL LINK BETWEEN THE EDI AND GROWTH DIFFERENTIALS

	Lagged Endog.	Student	EDI	Student
France	<b>-0,11</b>	-1,55	<b>0,19</b>	3,71
Germany	<b>-0,23</b>	-2,09	<b>0,17</b>	2,21
Italy	<b>-0,18</b>	-2,19	<b>0,16</b>	2,03
Spain	<b>-0,17</b>	-2,67	<b>0,19</b>	2,96
Belgium	-	-	<b>0,01</b>	0,06
Netherlands	<b>0,12</b>	2,04	<b>0,10</b>	1,13

**Note :**

*In the case of Belgium, past values of the growth differential do not turn out to be significant in the linear regression.*

In the light of the results obtained, the empirical link appears to be significant only in the case of the "major" countries of the region: Germany, France, Italy and Spain. ■

**TABLEAU 1 : DESCRIPTION OF THE REGRESSION**

	Coeff.	Std. Dev.	Student	Signific.
Constant	0,66	0,10	6,77	0,00
Ind9101	4,75	0,40	11,98	0,00
QGDP_EZ{1}	-0,18	0,07	-2,52	0,01
QGDP_EZ{2}	-0,17	0,07	-2,55	0,01
QGDP_EZ{4}	0,12	0,06	1,87	0,07
BCI_EZ	1,04	0,15	7,01	0,00
BCI_EZ{1}	-0,77	0,14	-5,67	0,00
EDI_FRA	0,20	0,08	2,64	0,01
EDI_FRA{1}	-0,18	0,08	-2,28	0,03
EDI_GER	0,24	0,07	3,49	0,00

$R^2 = 0,82$        $DW = 2,15$   
Std. deviation of errors = 0,36%

the quarterly changes in the euro-zone GDP as published by Eurostat on the past values, on the present and past values of the BCI synthetic indicator for the euro zone and on those of the EDIs of the countries examined <sup>(5)</sup>.

The result is a calibration of euro-zone growth that is of satisfactory quality, given the small number of explanatory variables used. The EDIs of the two leading countries of the zone emerge significantly, which is consistent with the “aggregated economic situation” reasoning that underlies the construction by Eurostat of quarterly accounts for the euro zone. ■

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*(5) The estimation period runs as previously from Q2 1986 to Q2 2002. And ad hoc dummy indicator is used to correct the figure for Q1 1991 (closely associated with German unification) denoted “Ind9101”.*