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**Book Part**

## Regional integration effects of the euro: What is the empirical evidence after the first years?

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MARTIN HALLET<sup>1</sup>

# Regional Integration Effects of the Euro – What is the Empirical Evidence after the First Years?<sup>2</sup>

*(submitted in October 2001)*

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## 1 Introduction

Taking a broad definition of economic integration as any reduction of trade costs (including risks) between distant markets, the introduction of the euro can be expected to have a measurable integration effect. Indeed, apart from enhanced macroeconomic stability<sup>3</sup>, complementing the Single Market with a single currency has been one of the main motivations for European economic and monetary union (EMU). This has been best expressed by the title of the Commission's EMU study "One Market, One Money" in 1990. For transactions between different currency areas, costs occur for at least one of the transaction partners in comparing prices, exchanging foreign currency and managing exchange rate risks. The main benefit of a single currency is thus to economise on these transaction costs. While the introduction of the euro changes parameters at national level, i.e. the abolition of national currencies and their exchange rates within EMU, integration effects may well be different at the regional, sub-national level.

The introduction of the euro has effects on all cross-border transactions on goods, capital and labour markets. Since 1999, the most important integration effects have been observed on financial markets in the euro area where national currencies have disappeared although many differences in national regulations remain in place. In contrast, the integration effects on labour markets are rather limited given that

<sup>1</sup> Views expressed in the paper are exclusively those of the author and do not necessarily correspond to those of the European Commission, for whose Directorate-General for Economic and Financial Affairs (DG ECFIN) the author is working.

<sup>2</sup> Similarities to sections II.1 and II.2 of the Commission's Second Cohesion Report (EUROPEAN COMMISSION 2001) are no coincidence since the author has contributed to these sections.

<sup>3</sup> On the evidence on macroeconomic aspects of EMU after two years see DIRECTORATE GENERAL FOR ECONOMIC AND FINANCIAL AFFAIRS 2001.

geographic mobility depends on many other determinants and that an effect on wage bargaining would imply to assume that agents were subject to a money illusion prior to the introduction of the euro. In both cases, it would be difficult to identify regional effects of the euro – possibly except for some financial centres such as Frankfurt, Paris or London – so that this paper will be limited to goods markets, i.e. merchandise and services.

An important issue in any progress in European integration is whether it is beneficial or detrimental to economic and social cohesion, one of the main objectives defined in the EU treaty. For an analysis of the regional impact of economic integration, it is useful to distinguish between static and dynamic integration effects. The initial or static integration effects of the euro within the existing production structures may vary between regions and trigger dynamic integration effects changing the spatial structures of production through more competition, economies of scale, product differentiation, innovation and growth. In modelling terminology the difference is between the initial shock and how it spreads through the economy. The paper proceeds by presenting some evidence on the static integration effects of the euro in section 2 and then providing some results of regional effects of European integration in the long run in section 3. Section 4 concludes.

## 2 The static integration effects

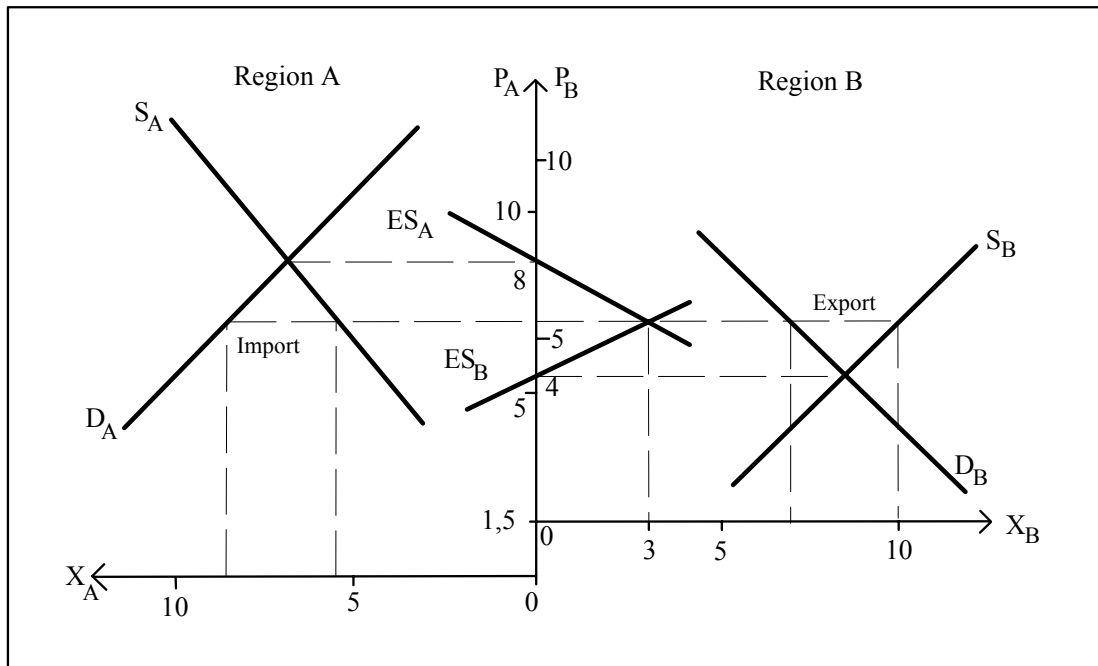
In theory, the “law of one price” should prevail on perfectly integrated markets without any trade costs. Otherwise arbitrage would allow for major profits from buying a good on lower-priced markets and selling them at markets with higher prices until price differences have disappeared. While full absence of trade costs does not exist in reality, it helps to understand the fact that prices can only differ to the extent that trade costs prevent this process of arbitrage.

In other words, trade costs have the effect of fragmenting markets. These can occur as transport costs to overcome geographic distance, information costs caused for example by different languages, costs of insurance against currency or other risks, or regulatory costs arising for example from different product standards. In the European context, economic integration has been brought about in various steps such as the creation of the customs union until 1968, the elimination of non-tariff barriers by the Single Market until 1993, the reduction of transport costs by trans-European infrastructure projects as well as the reduction of foreign exchange-related costs and risks and increased price transparency by the introduction of the euro in 1999.

In theory, market integration of two regions exerts a tendency towards the reduction of price differences and the creation of trade. Figure 1 illustrates the relation between trade costs and prices of a good in two regions. The export supply curves  $ES_A$  and  $ES_B$  result from the excess supply and demand above and below the intra-regional equilibrium<sup>4</sup>. The trade equilibrium is at a quantity of 3 units and a price of  $P_A = 7$  in region A and  $P_B = 5.5$  in Region B. Trade costs for shipping the good from A to B ( $T_{AB}$ ) of 1.5 units equal the price difference. This only holds until trade costs become prohibitive when there is no trade and price differences can vary within this range according to local supply and demand conditions (in our example between  $P_A = 8$  and  $P_B = 4$ , i.e.  $T_{AB} > 4$ ).

<sup>4</sup> Export supply curves in the quadrant of the other region are “negative” export supply curves, i.e. import demand curves.

Figure 1: Static integration effects in two regions A and B



Source: HALLET 1997, p.14, on the basis of Samuelson 1952, p.286

Since price differences can never exceed trade costs, there are only two possible ranges (cf. SAMUELSON 1952, p.287):

$|P_A - P_B| = T_{AB} \Rightarrow$  trade takes place and price differences equal trade costs; or

$|P_A - P_B| < T_{AB} \Rightarrow$  trade costs are prohibitive, there is no trade and regional prices may differ within the range of trade costs.

A reduction of trade costs in the prohibitive range has thus no effect on prices and trade, but may do so if a shift to the non-prohibitive range takes place. Lower trade costs in the non-prohibitive range usually reduce price differences and increase trade, although not necessarily so if export supply curves are fully price elastic and/or inelastic or if the margin of price differences given by trade costs has not been used due to similar regional market conditions. There is thus an asymmetric relation between integration and price differences. Progress in integration is likely to bring about a reduction of price differences for traded goods, while an observed reduction in price differences is not necessarily due to integration if the good is not traded.

Starting from this definition of economic integration as the reduction of trade costs, there are basically three groups of measures for integration. A first group measures the change of particular kinds of trade costs; in this case bank charges or other exchange costs economised by the euro. A second approach is to measure price differences for identical goods on different markets. A third possibility is more indirect in looking at the volume of trade induced by integration which is, however, difficult to trace back to one certain kind of integration project.

## 2.1 Bank charges

A study on “Bank charges in Europe” (IEIC 2000) carried out for the Commission has produced some interesting results. The procedure for surveying the charges for cross-border banking transactions made at the end of 1999 was as follows:

- a team of four researchers was constituted in each euro-zone country. Each researcher had a current account with a different bank, and an international means of payment (Visa, Eurocard or Eurocheque);
- each of the four researchers made four paper transfers of € 100 to each of two countries (A and B), and received eight transfers of € 100 (four from country A and four from another country, C);
- the four researchers then travelled abroad the same day, where they carried out the following transactions: a purchase by card for an amount of € 25, a cash dispenser withdrawal of approximately € 100, and a cash dispenser withdrawal of approximately € 50;
- on their return, they changed the € 100 at a bank, and the € 50 at a bureau de change.

The results in Table 1 show that charges for cross-border currency transactions are still considerably high. This is in particular the case for bank transfers, where a remarkable feature was that the beneficiary was often charged although the researchers had specifically asked not to do so and to ensure the beneficiary receives the full amount of € 100. While in view of the amounts the charges apply mainly to consumers and can be expected to be much lower for business transactions involving larger amounts, the level of charges is probably prohibitive for many potential cross-border purchases which could exploit lower prices. An update of the study in the beginning of 2001, although based on a different list of banks, did not reveal any major differences compared to the 1999 survey.

A similar study carried out for the Commission already in 1994 – excluding Austria and Finland – allowed to compare the charges for bank transfers. It can be observed that charges decreased by almost half in the core of the euro area (B, D, F, L, NL), whereas they remained relatively high in the periphery (E, I, IRL) and even increased by 11% in Portugal (Figure 2).

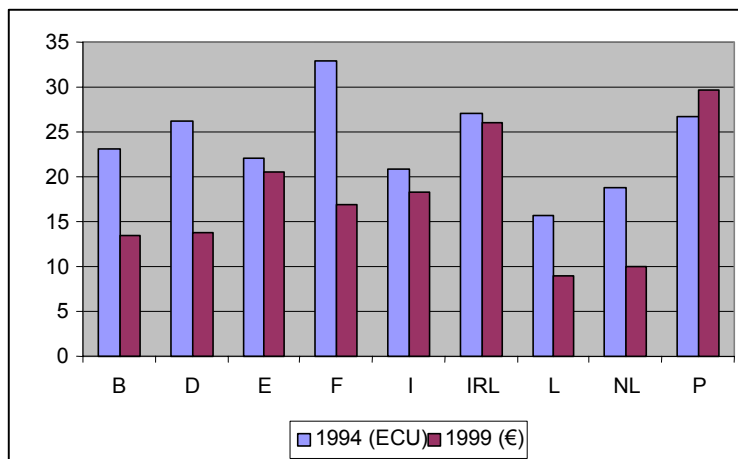
The integration effect of the euro at consumer level can thus be seen over time, although the absolute levels of conversion charges between euro currencies is still rather high and has lead the Commission to start cartel proceedings against more than 100 banks in 7 euro countries suspecting them of fixing conversion tariffs. Proceedings against several banks have been dropped in the meanwhile after they decided individually to considerably lower the fees for conversion. The introduction of the euro cash money at the beginning of 2002 gives therefore rise to expectations that banks will have to reduce these charges considerably if they want to avoid consumers doing most cross-border transactions in cash.

Table 1: Average costs of currency transactions within the euro area in November/December 1999

	€100 bank transfer (by country of origin)			€25 pay- ment by bank card	€100 cash dispenser withdrawal		€100 exchange of banknotes	
	originator	beneficiary	total		card- issuing country	country of withdrawal	in a bank	in a bureau de change
B	13.37	0.00	13.37	0.00	4.32	4.17	1.78	
D	13.39	0.39	13.78	0.79	4.17	4.38	2.19	
E	15.48	5.02	20.50	0.00	3.74	6.02	2.40	3.00
F	15.36	1.52	16.88	0.37	2.21	2.46	7.08	5.95
I	16.10	2.18	18.28	0.26	4.89	4.67	1.93	1.03
IRL	25.61	0.37	25.98	0.00	1.59		2.63	2.81
L	8.15	0.76	8.91	0.00	3.85		4.34	3.72
NL	8.68	1.32	10.00	0.10	1.93	2.21	3.69	3.90
AT	9.56	1.05	10.61	0.26	4.67	4.89	3.54	6.53
P	25.13	4.55	29.68	0.32	6.02	3.74	1.04	1.00
SF	19.77	0.34	20.11	0.00	4.45		4.57	2.55
average	15.51	1.59	17.10	0.19	3.80	4.07	3.20	3.39

Source: IEIC 2000

Figure 2: Charges for a bank transfer of ECU100/€100 in the euro area in 1994 and 1999



Source: IEIC 2000

## 2.2 Regional exchange costs savings

General estimates on transaction cost savings brought about by the euro range between 0.3-0.4% and 0.8% of GDP.<sup>5</sup> In order to get an idea of the static integration effects of the euro at regional level, trade-related exchange costs estimated for the year 1994 may give an indication of the relative magnitudes (HALLET 1999). This estimate was done by multiplying regions' trade with other euro area countries by the respective bid-offer spreads vis-à-vis the deutschmark between currencies participating in the euro since 1999. The results (see Table 2 and Map) reflect the applied methodology and can be summarised by saying that exchange costs were high in regions where:

<sup>5</sup> The figures have been taken respectively from COMMISSION OF THE EC 1990, p. 68, and IFO INSTITUTE 1998, p. 46.

- Exchange rate volatility vis-à-vis the stable core of the deutschmark area had been high. This applies in particular for regions in Spain, Ireland, Italy, Portugal and Finland;
- The share of foreign trade with other euro area countries is high which is in particular the case for the six founding members of the European Community;
- The share of production of manufacturing goods is high like in the north-east of Spain, the east of France, the north-east of Belgium, the north-east of Italy and the north of Portugal; in contrast, major cities and peripheral regions which are dominated by services have rather low exchange cost savings.

Given that the first two aspects are basically identical across all regions within a country, country characteristics seem to be much more important than characteristics of regional specialisation. Taken together, the results suggest that a clear core-periphery pattern regarding the exchange cost savings does not emerge either at the country or at the regional level.

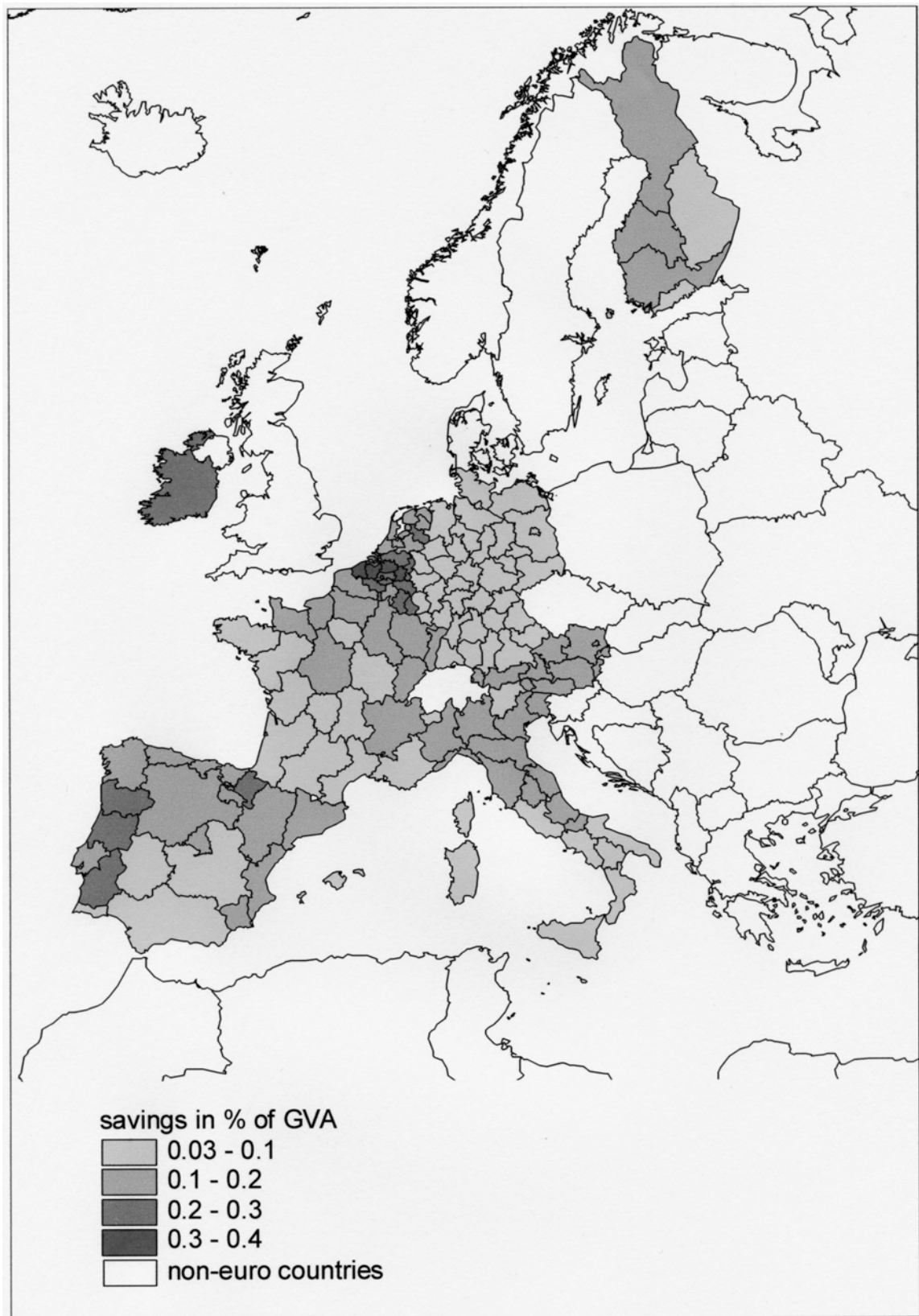
Table 2: National average, highest and lowest regional values for exchange cost savings in % of GVA, 1994

	average	highest	lowest
<b>B</b>	0.31	Limburg (0.40)	Namur (0.18)
<b>D</b>	0.05	Niederbayern (0.06)	Hamburg (0.03)
<b>E</b>	0.14	Navarra (0.23)	Ceuta y Melilla (0.04)
<b>F</b>	0.09	Franche-Comté (0.16)	Corse (0.03)
<b>IRL</b>	0.22	-	-
<b>I</b>	0.13	Piemonte (0.17)	Calabria (0.06)
<b>L</b>	0.26	-	-
<b>NL</b>	0.18	Noord-Brabant (0.24)	Utrecht (0.13)
<b>A</b>	0.14	-	-
<b>P</b>	0.22	Alentejo (0.28)	Madeira (0.08)
<b>SF</b>	0.12	Etelä-Suomi (0.14)	Ahvenmaa/Åland (0.09)
<b>total</b>	0.10	0.40	0.03

Note: For Ireland, Luxembourg and Austria calculations were based on national data.  
Source: HALLET 1999

VILLAVERDE (2000) applied the same methodology to a more precise set of data for visible trade of the Spanish *Comunidades Autónomas*. The results range from 0.01% for the Baleares to 0.22% for Navarra, averaging 0.10% for Spain relative to GDP respectively. He concludes that “although not negligible, it must be recognised that these savings alone will barely affect the evolution of regional disparities in Spain” (p.5). However, the level of exchange cost savings should be of less interest than the relative position of regions within and between Member States since every choice of bid-offer spreads is more or less arbitrary as regards the level of foreign exchange costs. It would be easy to change the level of exchange cost savings by taking other bid-offer spreads, e.g. lower ones in interbank trade or higher ones for consumers, but it would not affect the structure of results considerably.

Map: Exchange cost savings from the euro in NUTS 2 regions in % of GVA, 1994



Source: HALLET 1999, (GVA – Gross Value Added)

## 2.3 Price differences

A major difficulty when it comes to price comparisons is to actually compare identical goods and to avoid that price differences rather reflect differences in product quality. Given the wide range of product qualities and the services that come along with a product, this is already difficult within a single country. Comparisons between different countries can additionally be complicated by differences in product taxes and changes in exchange rates. A further problem occurs with comparisons over time when product qualities change due to innovations.

Several price comparisons have tried to come around these difficulties. A well-known and simple price comparison which is repeated regularly is the “Big Mac Index” by the weekly news-magazine “The Economist” (Table 3). The Big Mac shows the typical features of a non-traded good since price differences mostly reflect differences in wages and purchasing power in line with the Balassa-Samuelson-theorem, in particular when looking at the Central European countries. It is therefore of little surprise that there are little signs of price convergence within the euro area since 1999, and the price in Italy even seems to be diverging.

Table 3: Price of a Big Mac, 1997-2001

	in US \$ at market exchange rates					US price=100				
	Apr-97	Apr-98	Apr-99	Apr-00	Apr-01	Apr-97	Apr-98	Apr-99	Apr-00	Apr-01
USA	2.42	2.56	2.43	2.50	2.54	100	100	100	100	100
Britain	2.95	3.05	3.07	3.00	2.85	122	119	126	120	112
Czech Republic	1.81	1.57	-	1.39	1.43	75	61	-	56	56
Denmark	3.95	3.39	3.58	3.08	2.93	163	132	147	123	115
Euro area	-	-	2.71	2.37	2.27	-	-	112	95	89
France	3.04	2.84	2.87	2.62	2.49	126	111	118	105	98
Germany	2.86	2.69	2.72	2.37	2.30	118	105	112	95	91
Hungary	1.52	1.22	1.26	1.21	1.32	63	48	52	48	52
Italy	2.73	2.47	2.50	2.16	1.96	113	96	103	86	77
Poland	1.39	1.53	1.38	1.28	1.46	57	60	57	51	57
Spain	2.60	2.40	2.43	2.09	2.09	107	94	100	84	82
Sweden	3.37	3.00	2.88	2.71	2.33	139	117	119	108	92

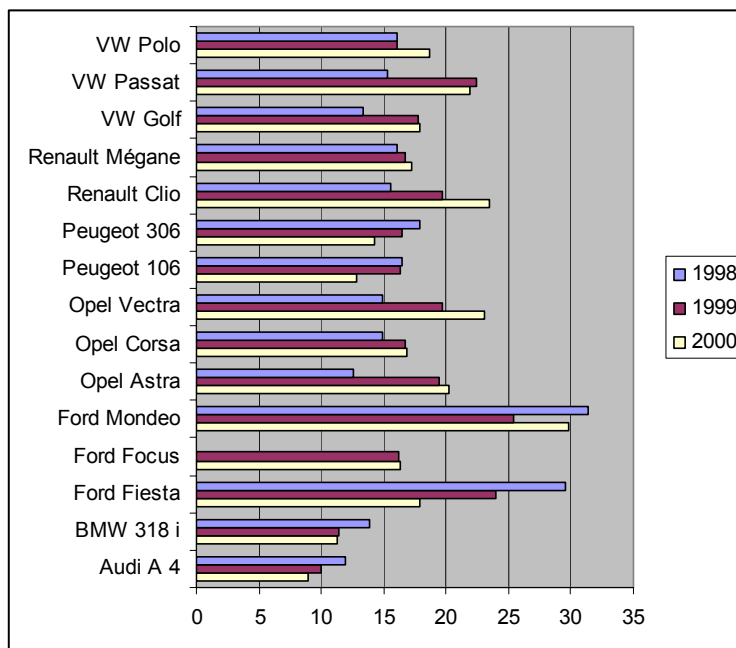
Source: The Economist, various editions

Since 1997, the Commission carries out twice a year a survey on prices of 75 car models in all Member States in order to provide information on car manufacturers’ price differentiation within the Single Market. The average results for the years 1998 to 2000 provide little evidence that the introduction of the euro has yet had an impact on manufacturers’ pricing policies given that the highest price can still differ more than 25% from the cheapest country within the euro area (Figure 3). It seems that until now, rather than the euro, other transaction costs – in particular those related to the car producers’ distribution systems – prevented from more extensive use of arbitrage. Nevertheless are the UK and Sweden frequently among those countries that have the highest prices of all Member States, while Finland, Denmark and Greece often have the lowest prices to compensate for high taxes related to car purchases. For French and German cars there is obviously a “home market effect” in that cars are most expensive in the country where they are produced due to low demand elasticities.

The Economist Intelligence Unit (EIU 2001) has recently carried out an international price comparison of branded consumer goods in France, Germany, Sweden, the UK and the US for the governments of the UK and Sweden. The 113 items surveyed were grouped into eight product categories: pre-recorded items; computer games and toys; cosmetics and fragrances; clothing and footwear (non-sporting); sports and leisure; electrical goods; household goods and furniture; and accessories. The overall result of

the survey for the European countries was that for both retail prices and net prices the UK and Sweden had the highest prices and France and Germany the lowest prices for most items. Many factors may contribute to this result, such as the nominal exchange rate of the euro, the location of the countries or the specific features of the retail sales system. However, most of the products surveyed are tradable and a certain lack of market integration is necessary to allow for the sometimes substantial price differences without arbitrage taking place. Consumers in France and Germany thus seem to benefit significantly from a higher integration into the Single Market, one factor among others being the euro.

Figure 3: Car price differences in EUR10 (euro countries excluding Finland and Greece) net of taxes, calculated as annual average of difference of highest to lowest price in %



Source: European Commission; own calculations

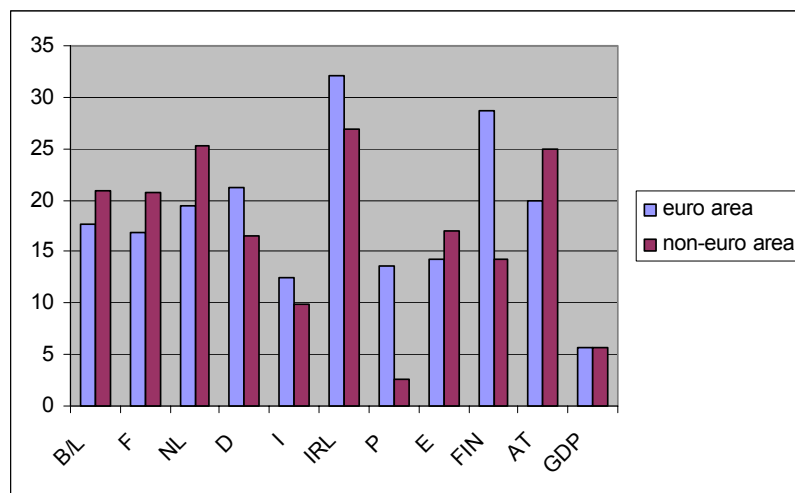
## 2.4 Trade flows

In principle, an increase in trade between the euro countries since 1999 could be expected if the integration stemming from the euro were strong enough to show up in the data. In view of the many determinants of trade, such as business cycle, distance and competitiveness, one should be cautious by merely looking at the changes. Nevertheless, given that real GDP growth has been about the same in the two country groups over the period under consideration (about 6% in both cases), a consistently higher increase in euro area trade than in non-euro area trade of all participating countries in 1999/2000 compared to 1997/1998 could be a first indication of an integration effect of the euro. However, this has not been the case, as can be seen in Figure 4. Only Germany, Italy, Ireland, Portugal and Finland had a higher euro area growth in their exports, whereas Belgium/Luxembourg, France, Netherlands, Spain and Austria had a higher non-euro area growth in exports. It would obviously be difficult to relate this pattern to an integration effect of the euro.

### 3 The dynamic integration effects

The evidence on static integration effects on regions through trade in merchandise and services has been shown above to be not very clear in the first years and probably requires more time to show up, although considerable price differences between euro and non-euro countries are visible. However, it is a well-established empirical result that welfare gains from integration through international trade and specialisation alone are usually rather low. The more important gains arise in a dynamic, long-term perspective from increased competition, better exploitation of economies of scale, more product diversity and transfer of technology which result in additional growth and employment. A negative side of these dynamic integration effects may be adjustments of productive activities by privileging the most competitive producers and eliminating less competitive ones. The latter involves adjustment costs which may concern certain firms, sectors, regions, labour skills or social groups more than others.

Figure 4: Change in merchandise exports in 1999/2000 relative to 1997/1998 in %



Note: Greece has been considered as non-euro area country since it only joined the euro area in 2001.  
Source: Eurostat (COMEXT database), own calculations

Given that the euro was only introduced at the beginning of 1999 and that changes in production structures have a much longer time horizon, hardly any direct empirical evidence can yet be expected. However, there are several analyses on the regional impact of previous European integration projects from which certain lessons can be drawn since the long-term integration effects of the euro should not be too different. A particular focus has always been on the regional income and employment effects and on the effects on geographic concentration and specialisation.

#### 3.1 Evidence from New Economic Geography

The spatial impact of economic integration has received renewed interest in academic literature through the development of the “New Economic Geography” in the 1990s.<sup>6</sup> Economic integration is modelled as the reduction of transport costs which are simplified – in order to avoid a more complicated modelling of a transport sector - by the “iceberg assumption”, i.e. a share of the good “melts” during the transport. One central hypothesis is that “while complete elimination of obstacles to trade always raises the competitiveness of the peripheral regions, partial elimination may in principle have a

<sup>6</sup> For a summary of the vast literature on the New Economic Geography see FUJITA ET AL. 1999.

perverse effect” (KRUGMAN; VENABLES 1990, p.58). These models - generating in graphical terms a U-shaped curve of the periphery’s relative income with increasing integration - have been developed on the basis of only a few crucial variables such as market size, increasing returns to scale and factor prices. Depending on the periphery’s possibilities to exploit economies of scale through access to the large markets of the core, relative wages in core and periphery diverge in a range of high to medium transport costs and converge in a range of medium to low transport costs. When transport costs are extremely high, manufactured goods are essentially not traded, and firms have to locate their production in the region that they ultimately serve so that each region produces according to local demand. As transport costs are reduced, the larger core region becomes more attractive, as firms located in the core have larger sales and, because of increasing returns, experience increasing profits. The higher profits attract more firms and production into the core which then becomes a net exporter of manufactured goods towards the periphery. At the same time, demand and prices for immobile local factors in the core rise relative to the periphery and, as transport costs fall further, this offsets the attraction of locating in the core. At the extreme where there are no transport costs, factor prices dictate the distribution of economic activity.

While these models are certainly appealing, their empirical basis is still weak since trade costs (or the degrees of integration) are extremely difficult to measure, making it almost impossible to determine a region’s position in the U-shaped curve. In the context of the evaluation of Cohesion Fund projects, an interesting empirical application of New Economic Geography models has been made to simulate the regional impact of six road transport projects (EUROPEAN COMMISSION 1999). The simulation starts out by estimating the intra-regional and inter-regional distance saved by six projects: the North-South road link in Ireland, the Madrid ring road and the Rias-Bajas motorway in Spain, the Tagus crossing in Portugal, and the Egnatia and Pathe motorways in Greece. On the basis of models for each of the countries, the regional effects are distinguished through various mechanisms. The reduction in transport costs affects prices in different regions which change firms’ sales and profits. In response to changes in profits, entry and exit of firms may occur. On the one hand, the entry of a firm increases competition which reduces profits and bids up factor prices. On the other hand, the entry of a firm increases demand for intermediate goods which increases suppliers’ profits and causes supplier firms to enter. The opposite effects take place in the case of the exit of a firm. The results for all regions within each country give a clear indication of the interregional spill-overs at work, even where the transport project is only within a single region. While the overall income effect is positive in all regions - in some cases the indirect effects are more than 50% higher than the direct effect of transport cost savings – its size is usually negatively correlated to the distance of a region to the transport project. However, due to the short, medium and long run effects, i.e. changes in prices, location of firms and of labour, some regions experience an increase in labour income whereas others experience a decrease in labour income. The latter result points to the possibility that – in these models – integration of some regions may have negative long-term effects on others.

### **3.2 Concentration and specialisation**

Some authors, inspired by arguments of New Economic Geography, maintain that the euro in combination with the Single Market would lead to a degree of market integration comparable to that of the US and would cause a similar degree of regional specialisation as in US manufacturing (KRUGMAN 1993). The result would be a higher vulnerability to regional asymmetric shocks following sector-specific shocks. Given that the empirical evidence was not very clear on this issue, several studies have been carried out

for the Commission over the last years. Three of these studies used national data for manufacturing while one study was based on regional data including also services.

A first study (AIGINGER ET AL. 1999) used data for manufacturing on value added and exports for all EU Member States between 1988 and 1998 to analyse the specialisation of countries and the geographic concentration of industries. Using various indicators, the overall speed of change in the degree of specialisation and concentration has not been dramatic, although it seems to have increased slightly during the 1990s. Fears of extremely fast and disadvantageous types of specialisation and concentration are thus not substantiated by the results. Highly concentrated industries are tending to spread across countries, with low-income countries catching up in endowments and in market shares of fast-moving industries. The strongest trend towards specialisation can be witnessed in Ireland, which has a favourable structure and growth performance. The vertical and horizontal division of labour within firms is increasing in a way that high-tech industries in the core are proliferating technology and skills to the periphery. Labour-intensive industries are concentrating geographically, but in most cases by shifting activities slowly towards low-wage countries. At the same time, in the countries in which labour-intensive industries are concentrating, a second group of industries is actively expanding in mainstream and engineering sectors. To remain competitive, firms in less dynamic industries are co-operating with low-wage countries, retaining the higher-quality jobs and producing for the higher-quality segments.

A second study (VEUGELERS ET AL. 2001) makes use of an EU market share matrix which identifies for each of 70 manufacturing sectors the five leading firms in terms of market share in total sectoral production. Comparable data exist for the years 1987, 1993 and 1997 for the 12 countries that were EU members before 1995. The authors find that the geographical structure of production within the EU has slightly changed over the period with an increase of the share of Spain, Italy and Portugal from 16.6% to 20%. This is explained by both an increasing importance of firms located in these countries and their increased share in inward investment. Using the entropy index at sectoral level, the figures show a decrease of intra-EU geographic concentration of production across all manufacturing industries. However, the study also finds large differences among industries where the largest changes in geographic concentration between 1987 and 1997 (in terms of a change in the entropy index value) were an increased concentration in leather, clocks and watches, cycles and motorcycles and steel tubes, and a decreased concentration for clay products, grain milling, man-made fibres and pasta. Textiles, wooden furniture and footwear were the sectors with the largest shift of production shares towards Southern Europe.

A third study (MIDELFART KNARVIK et al. 2000) was based on production data for 14 EU Member States (excluding Luxembourg) and 36 manufacturing industries between 1970 and 1997. Most European countries showed decreasing specialisation during the 1970s, but this trend was reversed from the early 1980s onwards, as countries have become slightly more different from the average of the rest of the EU and, in bilateral comparisons, from most of their EU partners. However, although some specialisation can be identified during the last two decades, this process is not uniform and rather slow. The only more dramatic changes in industrial structure have been the expansion of relatively high-technology and high-skill industries in Ireland and in Finland. Many, although not all, industries have experienced some changes in their location. A number of industries that were initially spatially dispersed have become more concentrated (see Table 4).

These are mainly slow-growing and unskilled labour-intensive industries whose relative contraction has been accompanied by spatial concentration, usually in

peripheral low-wage economies. Amongst industries that were initially spatially concentrated, around half of them stayed concentrated. Significant dispersion has occurred in a number of medium and high-technology industries and in relatively high-growth sectors, with activity typically spreading out from the central European countries. An econometric analysis which identifies the underlying forces that determine industrial location shows that a high proportion of the cross-country variation in industrial structure can be explained by a combination of factor cost and geographical considerations. Four interesting results came from this econometric analysis:

- The location of R&D-intensive industries has become increasingly responsive to countries' endowments of researchers, with these industries moving into researcher abundant locations;
- The location of non-manual labour-intensive industries was, and remains, sensitive to the proportion of countries' labour forces with secondary and higher education;

Table 4: Industries grouped by levels and changes in concentration (average 1994-97 compared to average 1970-73)

<b>Concentrated industries that have remained concentrated over time</b>	<b>Concentrated industries that have become less concentrated</b>
Motor Vehicles Motor Cycles Aircraft Electrical Apparatus Chemical Products NEC Petroleum & Coal Products	Beverages Tobacco Office & Computing Machinery Machinery & Equipment Radio-TV & Communication Professional Instruments
<b>Dispersed industries that have become more concentrated over time</b>	<b>Dispersed industries that have stayed dispersed</b>
Textiles Wearing Apparel Leather & Products Furniture Transport Equipment NEC	Food Wood Products Paper & Products Printing & Publishing Metal Products Non-Metallic Minerals NEC Shipbuilding
<b>Residual group</b>	
Footwear Industrial Chemicals Drugs & Medicines Petroleum Refineries Rubber Products Plastic Products	Pottery & China Glass & Products Iron & Steel Non-Ferrous Metals Railroad Equipment Other Manufacturing

Source: MIDELFART KNARVIK ET AL. 2000, p.19

- The location of industries with strong forward and backward linkages has become increasingly sensitive to the centrality/peripherality of countries. Thus, central locations are increasingly attracting industries higher up the value added chain, i.e. those industries which are highly dependent on intermediate inputs;
- Industries which have a high degree of increasing returns to scale tend to locate in central regions, but this effect has diminished markedly over the period.

A fourth study (HALLET 2000) replicated some of the statistical indices of the previous study, but used data for gross value added of 17 sectors, including five services, in 119 EU regions between 1980 and 1995. A surprising result is that regions have an increasingly similar pattern of specialisation which basically reflects the general structural change from manufacturing into services. This is rather good news in that it reduces the probability of region-specific shocks and does not support the frequently

expressed expectations of their increased probability following European integration. The results on regional concentration showed that agriculture and the processing of its products as well as day-to-day services are spatially dispersed following patterns of arable land and of settlement whereas manufacturing industries with high economies of scale are concentrated in fewer locations. Clustering seems to prevail in traditional manufacturing branches that are depending on raw materials which are only available in specific locations. Most branches tend to follow the general core-periphery pattern of GDP with only few exceptions: Banking and insurance services tend to be located in wealthier central regions whereas the more traditional labour-intensive branches are also located in peripheral regions of lower income. Altogether, three groups of branches could be distinguished: (1) agriculture with a low degree of concentration; (2) traded goods (including fuel and power products, almost all manufacturing goods, credit and insurance services and other market services) with a high degree of concentration and clustering; (3) non-traded goods (including building and construction, trade and tourism, transport and communication services as well as non-market services) which tend to follow the spatial pattern of purchasing power, obviously due to the nature of these activities.

Looking at the results of all four studies together suggests a less dramatic view of the spatial effects of European integration on concentration and specialisation for several reasons:

1. Location and relocation of production involve high investment and are therefore long-term processes with a high sluggishness, possibly also due to “lock-in” effects once a certain pattern of specialisation and concentration has developed. Significant changes are therefore difficult to identify over 20 or 30 years although several important location factors in the EU have changed due to the completion of the Single Market, several EU enlargements, the opening up of Eastern Europe and a general trend towards globalisation. However, in countries with a high pace of catching-up or structural change, such as Finland, Ireland and Portugal, patterns of specialisation have changed considerably.
2. The general process of structural change from manufacturing into services tends to make regions more similar regarding their specialisation. While further concentration in some traded goods sectors cannot be excluded in the medium to long run, the overall effect will always be limited by the increasing importance of non-traded goods whose production follows the spatial pattern of purchasing power and – given the absence of significant geographic labour mobility in the EU – counteracts possible agglomeration forces.
3. Among the determinants of location, the importance of market access and human capital endowments has been confirmed, whereas the centripetal effect of economies of scale seems to be diminishing. In this respect, and in combination with their traditional advantage of low labour costs relative to the rest of the EU, cohesion countries appear to become more attractive locations of certain types of production.

### **3.3 Border regions**

Border regions within the euro area can be considered to be an interesting “microcosmos” illustrating the maximum regional impact of the euro since cross-border transactions are relatively higher than elsewhere. At NUTS 3 level, around 15% of the total population of the euro area are living in regions which border another country participating in the euro from 1 January 1999. Main changes in behaviour that can be expected from the euro are in cross-border shopping, commuting and relocation of firms. The

introduction of the euro banknotes and coins will probably be felt here more than elsewhere. However, it is not clear whether the volume of cross-border transactions is higher in border regions than in non-border regions in absolute terms and to what extent people living in border regions are subject to an exchange rate illusion, i.e. to what degree they are aware of prices differences in different currencies and whether they already benefit substantially from existing price differences. Furthermore, it might well be that language, culture, transport, regulations, discrimination are more important barriers to cross-border transactions than different currencies.

Few of these issues of the impact of the euro in border regions have been studied yet. There is only some data on the general economic performance of EU15 border regions – presented in the Commission's Second Cohesion Report – suggesting that border regions are not very different from non-border regions in terms of unemployment and GDP per capita (see Table 5). Border regions within the EU have even a lower unemployment rate which seems to be a remarkable success of European integration given that historically border regions tended to have major economic problems when one of their main functions was a military one.

Table 5: Population, unemployment rate and GDP per head in EU border regions (NUTS 3 level)

	All EU15 regions	Non-border regions	Border regions	Border regions within EU15
<b>Population (% of total)</b>	100.0	75.1	24.9	17.8
<b>Unemployment rate (1999, %)</b>	9.4	9.4	9.3	8.5
<b>GDP per head (PPS, 1998, EU15=100)</b>	100	101	96	99

Source: EUROPEAN COMMISSION 2001, Table A.12, p. 39

An interesting case study on the impact of integration on border regions has been provided by German unification since 1990. Although many aspects in German and European integration are not comparable, in particular the sudden shift from no integration to a very high degree of integration, the potential for geographic labour mobility, the size of financial transfers and the speed of structural change in east Germany, it provides an interesting example of the most extreme effects of opening up borders. A recent study compared the labour market performance of regions along the previous east and west German border relative to the performance of the *Länder* they are located in (BARJAK 2001). While western border regions were performing worse than their respective *Länder* averages during the 1990s, the opposite was true for eastern border regions. Gross wages and salaries in mining and manufacturing were decreasing from 92% in 1991 to 90% in 1999 of their western *Länder* levels, whereas they remained at about 97% in the eastern regions. The study considers the substantial net commuter flows from eastern to western border regions mainly as an outcome of the different overall labour market situation which is after all more attractive in the West than in the East in terms of wage levels and employment opportunities. The main factor driving the bad performance of western border regions is identified to be the withdrawal in 1990 of the specific investment support schemes, from which west German regions bordering the GDR had benefited for decades ("*Zonenrandförderung*"), so that industrial investment relative to revenue was lower than in east German regions where investment is receiving substantial support since 1990.

A recent study in the context of a larger study programme on the impact of enlargement on Austrian, German and Italian regions ("PREPARITY") has analysed the effects to be expected for German border regions at the Polish and Czech border (RIEDEL; UNTIEDT 2001). Among several other aspects, following a description of the regions' endowments with factors of competitiveness and their sectoral structure, the authors conclude that these border regions will be subject to some adjustment pressure which occurs already today through the implementation of the Europe agreements and general international competition. In the medium to long run, the proximity to the candidate countries is expected to have positive effects from the potential of higher international division of labour with the fast-growing economies of Poland and the Czech Republic.

#### 4 Summary and conclusions

Evidence on the static integration effects of the euro in the first years is difficult to identify. Bank charges are still surprisingly high in absolute terms, but seem to be on a declining path following recent announcements by several banks to reduce their fees, a trend which can be expected to accelerate once the euro cash has been introduced in 2002. In general, economies of currency-related exchange costs vary between regions depending mainly on the previous exchange rate volatility, the geographic structure of foreign trade and the regions' production structure. Changes in price differences and trade volumes before and after 1999 hardly show up and may require more time to become visible, although there tend to be considerable differences between euro and non-euro countries, probably for a number of reasons such as distance, the overall degree of integration and the exchange rate level of the euro.

Regarding the dynamic integration effects some conclusions can be drawn from the long-term integration experience of the past. A tentative policy conclusion from the models of New Economic Geography is that income convergence through trade and investment can be expected if regional competitive advantages, in particular regarding wages and quality of labour, go along with good market access achieved by a significant reduction of trade costs, as provided by the combination of the single currency, the single market, stable economic policy and adequate infrastructure. Economic integration alone is thus only a necessary, but not a sufficient condition for cohesion. A sound economic policy framework is also needed to ensure the periphery's competitiveness vis-à-vis the larger markets of the core. Although a visible change in specialisation has taken place for most cohesion countries, the overall process of concentration and specialisation in the EU is in general of a slow and long-term nature and does not support concerns that peripheral regions' catching-up would impose high adjustment costs on other wealthier regions. These "macro" observations tend to be confirmed by the "microcosmos" of border regions which have performed rather well within the EU and seem to benefit considerably from integration in the long run.

To sum up, economic integration in Europe, which is further progressing with the introduction of the euro, requires structural adjustment in all regions to bring about its positive welfare effects in the long run. While policies to avoid this structural adjustment would be extremely inefficient or even without success, there is a case for reducing adjustment costs by smoothening and facilitating the transition to new production structures by regional and social policy measures. However, programmes of public expenditure will not be successful if not accompanied by sound economic policies, in particular a balanced macroeconomic policy-mix and structural reforms to enhance the efficiency of goods, labour and capital markets.

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