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**Endogeneities of Optimum Currency Areas:
What brings Countries Sharing a Single Currency Closer together?***

Paul De Grauwe and Francesco Paolo Mongelli

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Submission of Papers for Publication (Para submissão de artigos para publicação): Prof. Francisco
Torres (ftorres@egi.ua.pt). Universidade de Aveiro, DEGEI, Economia, Campus Universitário de
Santiago. 3810-193 Aveiro. Portugal.

Endogeneities of Optimum Currency Areas: What brings Countries Sharing a Single Currency Closer together?

Paul De Grauwe and Francesco Paolo Mongelli*

5 March 2005

Abstract

This paper brings together several strands of the literature on the endogenous effects of monetary integration: i.e., whether sharing a single currency may set in motion forces bringing countries closer together. The start of the European Economic and Monetary Union (EMU) has spurred a new interest in this debate. There are four areas that we analyse in this context: the endogeneity of economic integration, in which we look primarily at evidence on prices and trade; the endogeneity of financial integration or equivalently insurance schemes that can be provided by capital markets; the endogeneity of symmetry of shocks and (similarly) at synchronisation of outputs; and the endogeneity of product and labour market flexibility. The paper presents a conceptual framework within which to illustrate such endogeneities. We present diverse arguments and, where possible, explore the incipient empirical literature focussing on the euro area. On the whole, concerning EMU, our preliminary conclusion is one of moderate optimism. The different endogeneities that exist in the dynamics towards optimum currency areas are at work. How strong these endogeneities are and how quickly they do their work remains to be seen.

JEL classification: E42, F13, F33 and F42

Keyword: Optimum Currency Area, Economic and Monetary Integration and EMU

1. Introduction

This paper brings together several strands of the literature on the endogenous effects of monetary integration. The start of the European Economic and Monetary Union (EMU) has spurred a new interest in this debate: i.e., whether sharing a new single currency, the euro, sets free forces that bring euro area countries closer together. Much of the merit for having kick-started it goes to Andrew Rose and Jeffrey Frankel (see Rose (2000 and 2004) and Frankel and Rose (1997 and 2001)).

By studying the effects of several currency unions that occurred in the past, Rose and Frankel showed that monetary integration leads to very significant deepening of reciprocal trade. The implication for EMU is that the euro area may turn into an optimum currency area (OCA) after the launch of monetary integration even if it wasn't an OCA before, or "*countries which join EMU, no matter what their motivation may be, may satisfy OCA properties ex-post even if they do not ex-ante!*" (Frankel and Rose 1997). Consequently, the borders of new currency unions could be drawn larger in expectation that trade integration and income correlation will increase once a currency union is created. This has been termed the "endogeneity of optimum currency area" effect.¹

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¹ However, an optimum currency area needs to be judged along more dimensions than just trade openness. Optimality is also captured by the mobility of labour and other factors of production, price and wage flexibility, diversification in production and consumption, similarity in inflation rates, financial integration, fiscal integration, similarity of shocks, and political integration. Sharing of these

The endogeneity of OCA effect (of Frankel and Rose, et alii) is grounded on two main insights. The first insight is that the degree of openness, i.e., reciprocal trade between the members of the currency area, is likely to increase. This insight is widely accepted although there are different views on its strength (as we shall discuss below). The second insight postulates a positive link between trade integration and income correlation. On this insight there are instead diverging views (as we shall also discuss below).

This paper revisits the arguments behind both insights and explores more systematically the notion of endogeneity of OCA that could originate from several other sources. Several authors have in fact brought forward concepts similar to the above hypothesis of “endogeneity of OCA” but in different areas than trade. Artis and Zhang (1999) and others have discussed the endogeneity of symmetry of shocks. Blanchard and Wolfers (2000), Saint Paul and Bentolila (2002), and Saint-Paul (2002) discuss the endogeneity of labour market institutions. Kalemli-Ozcan, Sørensen, Yosha (2003) and other authors have discussed the effects of sharing a single currency on financial markets and insurance schemes. Therefore, we address here the issue of “endogeneities of OCA.”² These, endogeneities of OCA can be seen as a set of processes triggered by the start of a monetary union.

Our working definition of “endogeneities of OCA” is that monetary integration represents, amongst others, a removal of “borders” (very broadly intended to include also national monies), that contributes to the narrowing of distances and a change in the incentive structure of agents. It also reveals the willingness to commit over time to even broader economic integration amongst others “on issues of property rights, non-tariff trade barriers, labour policy, etc” (Engel and Rogers (2004)). This might catalyse progress in several areas by which we judge an optimum currency area such as: the mobility of labour and other factors of production, price and wage flexibility, diversification in production and consumption, similarity in inflation rates, financial integration, fiscal integration, and similarity of shocks.³

Hence, endogeneities of OCA are a set of interacting processes improving the OCA-ratings of a currency area (i.e., a group of sovereign countries sharing a single currency). Against this background there are four areas that we analyse in this context:

- the endogeneity of economic integration, and primarily at evidence on prices and trade;
- the endogeneity of financial integration or equivalently of insurance schemes provided by capital markets;
- the endogeneity of symmetry of shocks and (similarly) at synchronisation of outputs; and
- the endogeneity of product and labour market flexibility.

Given that this subject is so new, and the start of EMU is so recent, what can we deliver? In Section 2 we present a conceptual framework to discuss endogeneities. Section 3 discusses the endogeneity of economic integration. Section 4 discusses the endogeneity of symmetry of shocks. Section 5 discusses the endogeneity of insurance schemes. Section 6 discusses the endogeneity of labour market flexibility. These four areas are of course inter-linked and we

OCA properties -- among countries forming an “area” -- reduces the usefulness of nominal exchange rate adjustments among them by: fostering internal and external balance; reducing the impact of some types of shocks; or facilitating the adjustment thereafter. See Mundell (1961), McKinnon (1963) and Corden (1972). For recent surveys see Tavlas (1993), De Grauwe (2001) and Mongelli (2002).

² Several relevant aspects are not covered in this paper. Artis and Zhang (1998) and Buti and Suardi (2000) argue that the European process of economic and monetary integration might have had a “disciplining effect.” Other authors have mentioned that political institutions might also be endogenous to some extent (Issing (2004)). Alesina, Angeloni and Etro (2005) compare “rigid” and “flexible” international unions which pose organisational trade-offs.

³ Padoan (2002) discusses EMU as an evolutionary process that is sustained by: the transformation of economic structures to support monetary integration, and the transformation of the policy regime towards a new model of economic governance (due to enhanced policy spillovers).

try to highlight some of the main connections and interdependences. Section 7 presents some preliminary concluding observations and open issues for further consideration.

We should acknowledge here that several assessments of the impact of EMU, or specifically the euro, have already appeared (e.g., OECD (2000), Baldwin, Bertola and Seabright (2003), European Commission (2004), and others). They are all very useful and informative: but what distinguishes this paper from them is a systematic attempt to focus on the sources and foundation of the four endogeneities.

2. Some conceptual elements of endogeneities of OCA

Why should European monetary integration improve the *OCA-rating* of the euro area? What drives any endogenous effect? How can we illustrate these phenomena?

a. Market-based forces fostering endogeneity

There are diverse market-based forces at play. Engel and Rogers (2004) note that a currency union strengthens the effects of a free market by rendering the latter irrevocable and by signalling a commitment toward even more harmonisation in areas of regulations and social policies. A common currency among partner countries is seen as “a much more serious and durable commitment” than other monetary arrangements between countries (McCallum (1995)). It precludes future competitive devaluation, facilitates foreign direct investment and the building of long-term relationships, and is likely to encourage forms of political integration. Producers may be more willing to undertake large fixed costs involved with exporting abroad (see Box 2 below). This will promote reciprocal trade, economic and financial integration and foster even business cycle synchronisation among the countries sharing a single currency. However, there are diverging views on this link (as we shall also discuss below).

Some pecuniary costs disappear or fall following monetary integration. The introduction of the euro contributes, amongst others, to reducing trading costs both directly and indirectly: e.g., by removing exchange rate risks and the cost of currency hedging. Some information costs will be reduced. The euro is expected to have a catalyzing role for the Single Market Program by enhancing price transparency and discouraging price discrimination therefore removing money illusion. This should contribute to reducing market segmentation and fostering competition.

Finally, one single money is more efficient than multiple currencies in performing the roles of medium of exchange and unit of account. As a result, a common currency promotes convergence in social conventions with potentially far reaching legal, contractual and accounting implications (Garcia-Herrero et al (2001)).

b. Institutional forces fostering endogeneity

There are institutional forces at play, and EMU might have a catalysing role. The existence of EMU is likely to intensify ongoing institutional reforms, as for example, those fostered and monitored by the EU Commission and including the Financial Services Action Plan (FSAP), the Lamfalussy Report and its follow ups, the Giovannini Report and others (see for example the EU Commission Scoreboard).

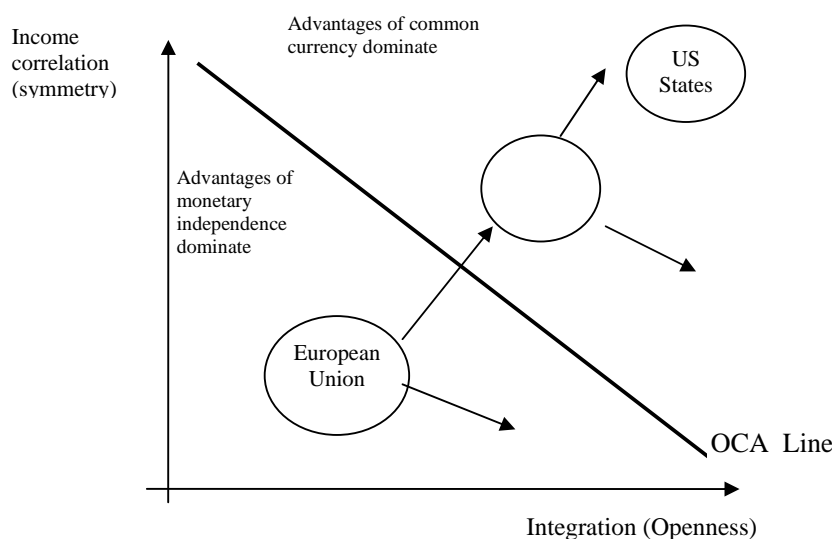
c. A graphical representation

In this section we use a simple graphical device to illustrate changes in the *OCA-rating* along three main dimensions: i.e., economic integration (including e.g., openness),

income correlation within the currency area, and flexibility of each country participating to the currency area. A deepening of different OCA properties generates improvements in the scores of these three dimensions as follows:

Economic integration and income correlation. The degree of economic openness and the correlation of incomes are crucial in assessing the net benefits from currency union. Countries sharing a high level of either openness or income correlation among them will find it beneficial to share a single currency. This trade-off is illustrated by the downward sloping “OCA line” in Figure 1.

Figure 1. Openness, Income Correlation and OCA



The OCA-line is the collection of combinations of symmetry and integration among groups of countries for which the cost and benefits of a monetary union just balance. It is downward sloping for the following reason. A decline in symmetry (increase in asymmetry) raises the costs of a monetary union. These costs are mainly macroeconomic in nature. They arise because the loss of a national monetary policy instrument is more costly as the degree of asymmetry increases. Integration is a source of benefits of a monetary union, i.e. the greater the degree of integration the more the member countries benefit from the efficiency gains of a monetary union. Thus, the additional (macroeconomic) costs produced by less symmetry can be compensated by the additional (microeconomic) benefits produced by more integration.

Points to the right of the OCA-line represent groupings of countries for which the benefits of a monetary union exceed its costs. We have put the 50 US States and the euro area to the right of the OCA-line because we believe that the microeconomic benefits of these monetary unions more than compensate their macroeconomic costs. To the left of the OCA line the benefits from monetary independence dominate the efficiency gains from the union. We have put the newly enlarged European Union (with 25 member states) to the left of the OCA-line because we believe that this group of countries is not yet sufficiently integrated to generate efficiency gains that will compensate for the macroeconomic costs of the union. We realize, however, that this is a controversial issue and that not all economists may agree.

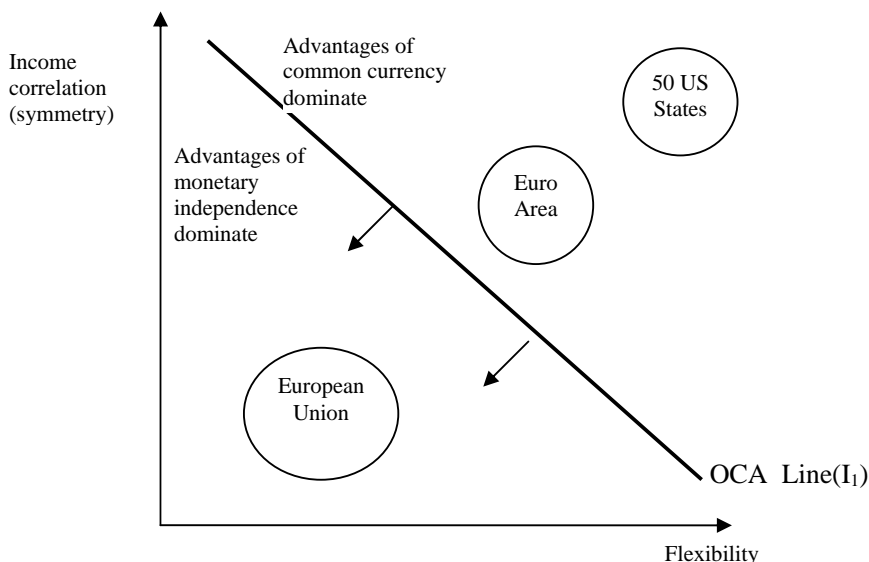
The degree of economic integration and income correlation evolve over time. There are different views on such evolution (as illustrated by the arrows around the EU and euro area circles in Figure 1). As is discussed in Section 3 below, most authors agree that openness is likely to increase among countries sharing a single currency. The intuition is the following: the introduction of the single currency will contribute to reducing trading costs both directly

and indirectly, e.g., by removing exchange rate risks (and the cost of hedging) and diminishing information costs. The single currency will also spur transparency and competition, lessen segmentation, and reduce transportation and transaction costs.

There is disagreement concerning the extent to which income correlation might rise, or fall. In one case the increased openness raises income correlation (and reduces asymmetry of shocks). The EU then moves along the upward arrow. In another case, that we call the specialisation case, we move along the downward sloping arrows in Figure 1. This then produces the opposite effect, and more flexibility for the monetary union would be required as is discussed next.

Income correlation and flexibility. In addition to the degree of economic openness and income correlation there is another important dimension to judge the merit of monetary integration, i.e., the degree of flexibility. The trade-off between symmetry and flexibility is illustrated by the downward sloping “OCA line” in Figure 2.

Figure 2. Symmetry, flexibility and OCA



Points on the OCA-line define combinations of income correlation (symmetry) and flexibility for which the costs and the benefits of a monetary union just balance. It is negatively sloped because a declining degree of symmetry (which raises the costs) necessitates an increasing flexibility (which is a source of benefits of a monetary union) To the right of the OCA-line the degree of flexibility is large given the degree of symmetry, so that the benefits of the union exceed the costs. To the left of the OCA-line there is insufficient flexibility for any given level of symmetry. Note that the OCA-line is drawn for a given level of integration (I_1)

Again, the 50 US States and the current members of the euro area are located on the right of the OCA line. Some authors doubt that the newly enlarged European Union (EU25) as a whole should yet share a single currency, and we illustrate this by placing the EU on the left of the OCA line. How would further integration affect the movement towards the OCA line for the newly enlarged EU25? The OCA-line was drawn for a given level of integration (I_1). Increasing integration has the effect of shifting the OCA-line downwards, i.e. when integration increases the benefits of the union increase so that we need less flexibility and/or less symmetry to make the monetary union beneficial. If there is endogeneity in integration then starting a monetary union among the EU will bring it closer to the OCA-zone.

Box 1. An illustration of the interaction between integration, flexibility and symmetry

There is interaction between integration, flexibility and symmetry that we now illustrate in more detail. Let's postulate that the net benefits of monetary union are a positive function of:

- the degree of flexibility (F)
- the degree of symmetry (S)
- the degree of integration (I)

We can specify the relation between net benefits (B) and the three variables, F, S, and I as follows (assuming that these relationships are linear)

$$B = \alpha F + \beta I + \gamma S$$

where α, β, γ are positive parameters. This allows us to derive the OCA-plane, i.e. the combinations of F, I and S for which the net benefits of a monetary union are zero. Set $B=0$, then:

$$F = -\beta'I - \gamma'S$$

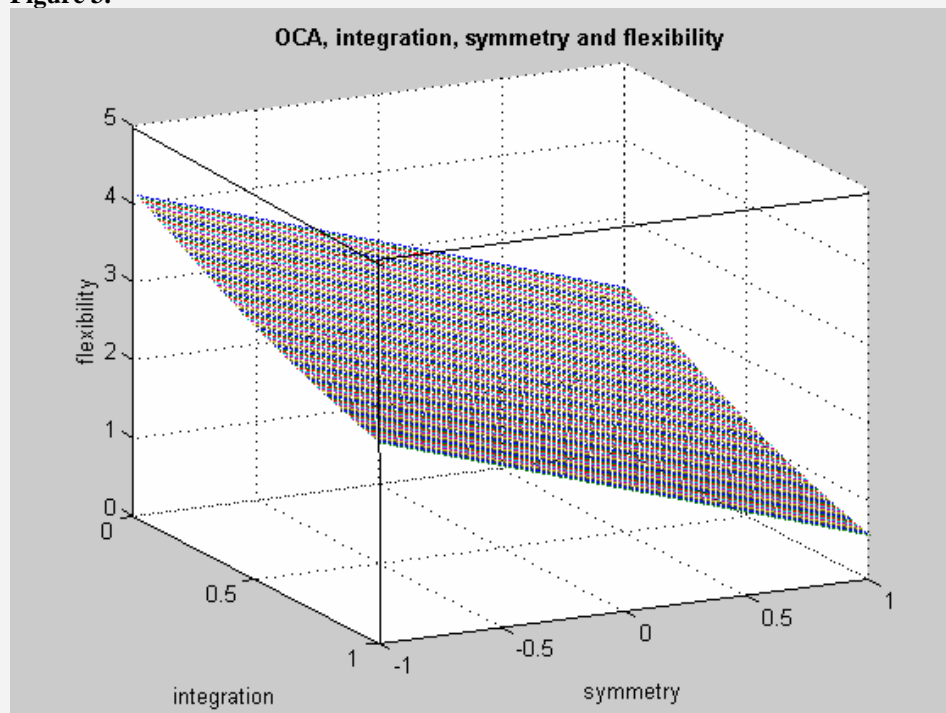
where $\beta' = \beta/\alpha$ and $\gamma' = \gamma/\alpha$. A graphical representation of this relation is given in figure 3. We have normalized the variables such that

$$0 < I < 1 \text{ and } -1 < S < 1;$$

Thus, S can be positive and negative depending on whether shocks are symmetric or asymmetric. Figure 3 synthesises the three trade-offs between: flexibility and integration, symmetry and flexibility, and symmetry and integration.

The figure also highlights the interaction between these tradeoffs. To illustrate this, let us concentrate on the trade-off between symmetry and flexibility, which shows that when symmetry declines more flexibility is needed to make OCA beneficial. It can be seen that this trade-off depends on integration. Start with zero integration and let it gradually increase. Then the relationship between symmetry and flexibility is shifted downwards, i.e. one needs less flexibility for any given level of symmetry.

Figure 3.



There are more such interactions. Let us focus on the trade-off between integration and flexibility. This trade-off is influenced by the degree of symmetry. An increase in the latter leads to a downward shift of the trade-off between integration and flexibility. Finally, there is a trade-off between integration and symmetry. This trade-off is influenced by the degree of flexibility. When flexibility increases the trade-off between integration and symmetry shifts downwards so that one needs less of both integration of and symmetry to make a monetary union advantageous.

These interactions are important for understanding endogeneities and their interdependence. Let us assume that the European Union 25 as a whole is located below the OCA-plane. A decision to form a monetary union then sets in motion different endogeneities. First, integration in terms of more trade between countries sharing a single currency is likely to increase. This has the effect of improving the symmetry-flexibility trade-off thereby facilitating the movement into the OCA-zone. A second endogeneity is symmetry. The decision to enter monetary union has the potential to increase symmetry. This in turn improves the trade-off between flexibility and integration, thereby facilitating the movement into the OCA-zone. In this sense, endogeneities in integration, symmetry and flexibility reinforce each other, and speed up the process into the OCA-space. In the next section we discuss the nature of these endogeneities in greater detail.

Section 3. Endogeneity of economic integration

In what follows we start by discussing some research focussing on trade and then turn to evidence on prices. Financial integration is discussed in Section 6.

a. Borrowing gravity from physics and “border effects”

There is an old literature from the sixties (see Tinbergen (1962), Poyhonen (1963) and Linnemann (1966), that looks at geographical distance as a determinant of international trade patterns. This literature draws on the gravity model from physics. Translated into economics: attraction is trade, mass is GDP, and distance is distance. An important difference between interplanetary science and economics are of course “trading costs,” broadly intended to include transportation costs, tariff and non-tariff regulatory barriers, exchange rate risk, different languages and conventions, and legal systems and information asymmetries. National monies also constitute a barrier to trade. This literature has recently been revived and has been used to measure the effect of a monetary union on international trade.

Several recent studies have improved our knowledge of the effects of a monetary unification (union) on trade. First, Engel and Rogers (1995) found that crossing the border between the US and Canada has an impact on relative price volatility, equivalent to an addition of, at least, 1780 miles, to the distance between cities. Second, McCallum (1995) and Helliwell (1998) conclude that Canadian provinces are 12 to 20 times more likely to trade with each other than with US States. Third a series of studies initiated by Andrew Rose (2000) and Jeffrey Frankel and Andrew Rose (1997 and 1998) and using a large international panel data sets, find that membership in a currency union leads to a multiplication of trade by a factor of three or more: such effects of monetary integration on trade are also known as “Rose effects” that is illustrated in Box 2.

Box 2. The “Rose effect” behind the endogeneity of economic integration

Several authors have inquired whether the mere creation of a currency union leads to an increase in trade, over and above the positive impact generated by the elimination of nominal exchange rate volatility (see, amongst others, Rose (2000), Skudelny (2003), Baldwin, Skudelny and Taglioni (2004), and references therein).

The link between trade deepening and exchange rate volatility has been discussed at length by the literature. Most studies employing time series techniques find no significant relationship between the two, or at most some very small negative effect of volatility on trade (see Baldwin, Skudelny and Taglioni (2004) for a survey). Cross-sectional studies find relatively small effects, while more recent studies based on panel data analysis find some significant and negative effects of exchange rate uncertainty on trade: in the long run the impact could be quite large and even in the order of 10 percent (see Rose (1999), De Grauwe and Skudelny (2001) and Anderson and Skudelny (2001)).

Baldwin, Skudelny and Taglioni (2004) theorize that a drop in exchange rate volatility may increase the volume of trade in two not mutually exclusive ways:

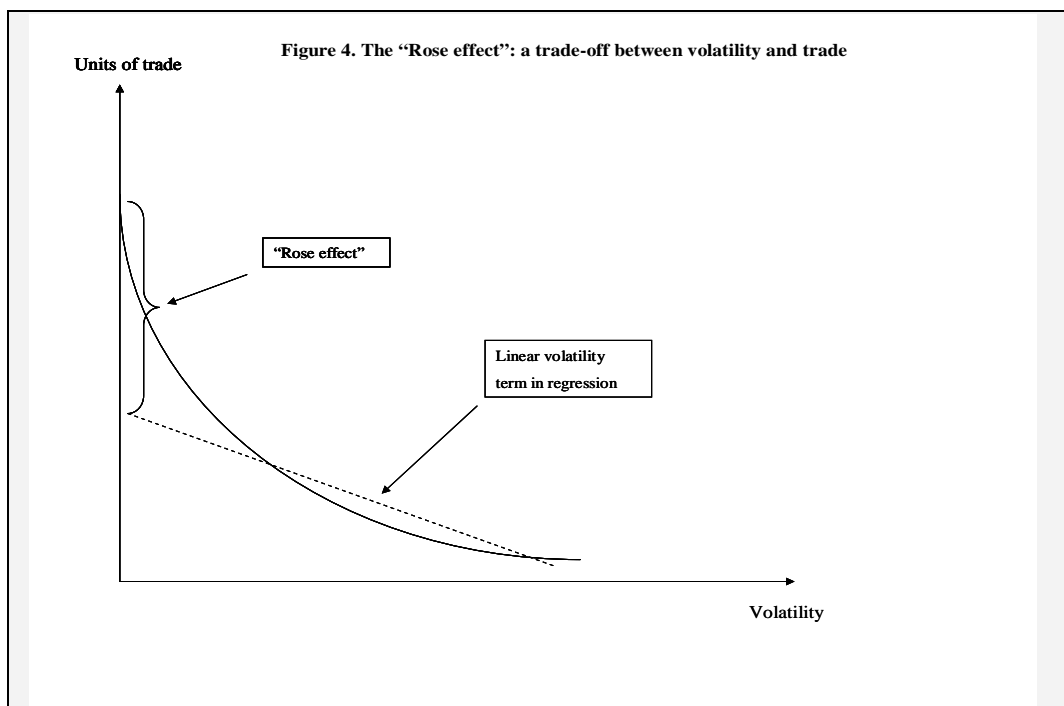
- first by encouraging more export per firm, and
- second by increasing the number of firms that are engaged in exporting.

However, of these two effects the second must be dominating as given the magnitude of the impact of monetary union on trade found by most empirical studies and the small size of transaction costs (conversions of currencies and hedging of exchange rate) that are eliminated by a currency union. Hence, a crucial element is the decision of firms to enter foreign markets as postulated by the “beachhead model” of Baldwin (1988) that is empirically supported by Tybout and Roberts (1997).

In order to conceptualise the “Rose Effect” Baldwin, Skudelny and Taglioni (2004) start by observing that Europe has a high share of small firms that either do not export, or export very little. One factor that keeps them from exporting is the uncertainty involved in trade: therefore, a reduction in uncertainty can induce more firms to export, raising trade volumes. While this accounts for a negative volatility-trade link -- see straight dotted line in Figure 4 -- it still does not address the “Rose effect,” namely the impact of currency union controlling for a linear (or log-linear) volatility-trade link. To get this, we must also explain why the volatility-trade link is *convex*. Figure 4 helps illustrating this argument.

Suppose the true relationship between volatility and trade is convex, as illustrated by the solid curve in the diagram. An empirical model that assumed a linear link between volatility and trade (again, the straight dotted line), but also allowed a dummy for monetary union (implying zero exchange rate volatility), would estimate the dummy to be positive and significant. There may be two additional sources of convexity discussed by Baldwin et alii (2004):

- first, exchange rate volatility affects relatively more small firms than larger ones. When the initial set of exporting firms includes more small firms, the marginal impact of lower volatility could be large; and
- second, the distribution of European firms is heavily skewed towards smaller firms. “Thus each reduction in the minimum size-class necessary for exporting brings forth an ever larger number of new exporters” generating the Rose effect” jump in the figure.



b. A survey of “endogeneity of OCA” international studies

A large number of studies ensued and an extensive survey, as well as, a “meta-analysis” is in Rose (2004). Skudelny (2003) proposes the summary of the effects of a currency union on trade creation. Using the findings of each study, in the last two columns of Table 1, she calculates a confidence interval of 5% around the currency union coefficient. For Rose (2000) that uses no EMU-data at all, she finds that the effect lies between 150 and 340 percent, for Rose and Engel (2001) between 60 and 590 percent – for the model including all regressors– and for Glick and Rose (2001) between 90 and 130 percent for the fixed effects estimation.

Table 1. The Effects of a Common Currency (Dummy) on Trade

		Coefficient	Standard error	Effect on trade 1/	Effect on trade given 5% conf. interval of coefficient	
					Minimum	Maximum
Rose	(2000)	1.21	0.14	3.35	2.55	4.41
Rose-van Wincoop	(2001)	0.91	0.18	2.48	1.75	3.54
Persson	(2001)	0.51	0.26	1.67	1.00	2.77
Rose	(2001)	0.74	0.05	2.10	1.90	2.31
Honohan	(2001)	0.92	0.4	2.51	1.15	5.50
Pakko and Wall	(2001)	-0.38	0.53	0.68	0.24	1.93
Melitz	(2001)	0.7	0.23	2.01	1.28	3.16
López-Córdova and Meissner	(2001)	0.72	0.19	2.05	1.42	2.98
Tenreyro	(2001)	0.47	0.32	1.60	0.85	3.00

Levy Yeyati	(2001)	0.5	0.25	1.65	1.01	2.69
Flandreau and Maurel	(2001)	1.16	0.07	3.19	2.78	3.66
Engel-Rose	(2001)	1.21	0.37	3.35	1.62	6.93
Frankel-Rose	(2002)	1.36	0.18	3.90	2.74	5.54
Glick-Rose	(2002)	0.65	0.05	1.92	1.74	2.11
Nitsch	(2002b)	0.82	0.27	2.27	1.34	3.85
Walsh and Thom	(2002)	0.1	0.2	1.11	0.75	1.64
Nitsch	(2002a)	0.62	0.17	1.86	1.33	2.59
Klein	(2002)	0.5	0.27	1.65	0.97	2.80
Estevadeoral, Frantz and Taylor	(2002)	0.29	0.15	1.34	1.00	1.79
Nitsch 2/	(2002)	High 0.93-1.25	0.23-0.39	2.53-3.49	1.18-2.10	4.22-6.08
		Low 0.18-0.63	0.25-0.45	1.20-1.88	0.51-1.15	2.31-3.22

1/ If the effect is X, the country participating in a currency union would trade X times (or X - 1 times more than) what a country outside a currency union would trade.

2/ Nitsch presents a range of estimates. The highest (shown) include a corrected Rose (2000) data set, with ranges for the different yearly estimations. The lowest (shown) allow for the introduction of different currency dummies, with ranges for the different yearly estimations.

Source: Rose (2002b), Nitsch (2002), and Skudelny (2003)

Although these results were received with some scepticism, the trade creation effects from monetary unification proved to be quite robust qualitatively. There are however some qualifications.⁴ Recent research by Melitz (2001) and Persson (2001) argues for lower estimates. The minimum point estimate (from Persson) still suggests a 13 per cent increase in trade from currency unification with a preferred estimate of around 40 per cent. Skudelny (2003) asks whether the mere creation of a currency union leads to an increase in trade, over and above the positive impact generated by the elimination of nominal exchange rate volatility. She finds that, with the exception of Rose (2000), no other study includes a volatility variable in addition to the currency union dummy. Therefore, the effects that are attributed to currency unions might also reflect the effects of the disappearance of nominal exchange rate volatility.

c. European evidence (1): the effects of the euro on euro area trade

The above proposition of a trade creation effects from monetary unification can only now begin to be tested for the euro area using a few years of data. Rose and Van Wincoop (2001) use an estimated version of the theoretical model of Anderson and van Wincoop (2001) to infer the impact from EMU on intra Euro Area trade and welfare. They conclude that intra euro area trade would expand by more than *50 percent*. Interestingly a similar order of magnitude is also postulated by Bun and Klaassen (2002) who use a dynamic panel model finding a cumulated long-run effect of about *40 percent*. Bun and Klaassen (2002) using a dynamic panel model also find that the euro has already increased trade by 4 percent in the first year. It is also clear from these recent studies that the large trade-boosting effect of monetary unions uncovered by Rose will take a long time to be fully realized.

⁴ For example, Quah (1999) notes that this empirical evidence pertains to a narrow set of relatively small (or even tiny) countries/territories representing about 1% of the sample used by Frankel and Rose (2002) and Rose (2000). Such entities have at times adopted the currency of a much larger partner country: often the US or some other former coloniser, or a large neighbour, or an important trading or financial partner of the small country.

Anderton and Skudelny (2001) estimate an import demand function for the euro area vis-à-vis its main extra-area trading partners which takes into account the possible impact of both intra- and extra-euro area exchange rate uncertainty. Using some panel estimates they find that extra-euro area exchange rate volatility may have reduced extra-euro area imports by around 10 per cent resulting in some substitution between extra- and intra-euro area imports.

Micco, Stein and Ordoñez (2003) employ a modified version of the gravity model using panel data and country-pair fixed effects. Their finding is that, the impact of shared adoption of the euro (i.e., membership in EMU) ranges from 4 to 10 percent, and from 8 to 16 percent when compared to trade between countries that have not adopted the euro. In addition, there is no evidence of trade diversion.

Baldwin, Skudelny and Taglioni (2004) present an analysis based on sectoral data (chemicals and related products, manufactured goods classified by material, machinery and transport equipment, and miscellaneous manufactured articles). They find that the creation of EMU would increase trade by 70-112 percent according to regressions pooled by countries and industries, and by 21 to 108 percent according to sector-by-sector panels. Third countries tend to trade up to 27 percent more with euro area countries since the launch of the euro.

c. European evidence (2): the effects of the euro on euro area prices

Figure 5 illustrates the significant convergence of HICP inflation in Stages I, II and III and particularly in the run up to EMU. Figure 6 illustrates a significant decline in inflation dispersion in the euro area. In particular the unweighted standard deviation fell from around 6 percentage points (p.p.) during the 1980s to 1 p.p. since the beginning of Stage 3. This figure, however, also shows that the low inflation dispersion was achieved prior to the start of EMU.

The inflation dispersion observed in the euro area is very similar to that of the 14 Metropolitan Statistical Areas (MSAs) in the US (using either monthly or bimonthly data). However, the degree of inflation dispersion within the euro area is still double the comparable measures computed across the German Länders, the Spanish Autonomous Communities and the Italian cities since 1997.

Beck and Weber (2001) focus on the volatility of relative price changes across locations. The authors draw on Engel and Rogers (1996) and apply a similar methodology to a European data set. Their data are monthly covering the period from January 1991 to June 2000. The data cover the aggregate CPI, 7 categories of goods and 81 locations in five different countries: Germany, Austria, Italy, Spain and Portugal. Four Swiss locations are used as controls. Comparing the periods pre- and post- EMU: there has been a significant decline in the cross border volatility of relative prices. This pattern is particularly noticeable for regions in Italy, Spain and Portugal relative to regions in Germany. Border effects for these pairs have been reduced to 20% of pre-EMU levels

Anderton, Baldwin and Taglioni (2002) observe that while most intra-European bilateral exchange rates were fairly volatile in the 1980s and 1990s, one group of countries -- the "Deutsche Marc bloc" consisting of Germany, Austria, the Netherlands, Belgium and Denmark -- consistently maintained very narrow margins of exchange rate volatility. They estimate separate threshold autoregressive (TAR) processes for intra-DM bloc trade and Germany's trade with other EU nations (exhibiting higher exchange rate volatility vis-à-vis the DM, such as Italy, Spain and France). Their finding is that in an environment characterised by lower volatility the pass-through of price changes was higher. The implication of this "natural experiment" from Europe, according to the authors, is that monetary union could produce changes in corporate strategies: i.e., in EMU segmentation strategies would become less advantageous and firms would be less able to maintain large

price gaps across countries. This would result in faster cross-boarder transmission of price movements which, in turn, would tend to homogenise price movements across member countries of a monetary union.

Figure 5. HICP inflation convergence in the euro area

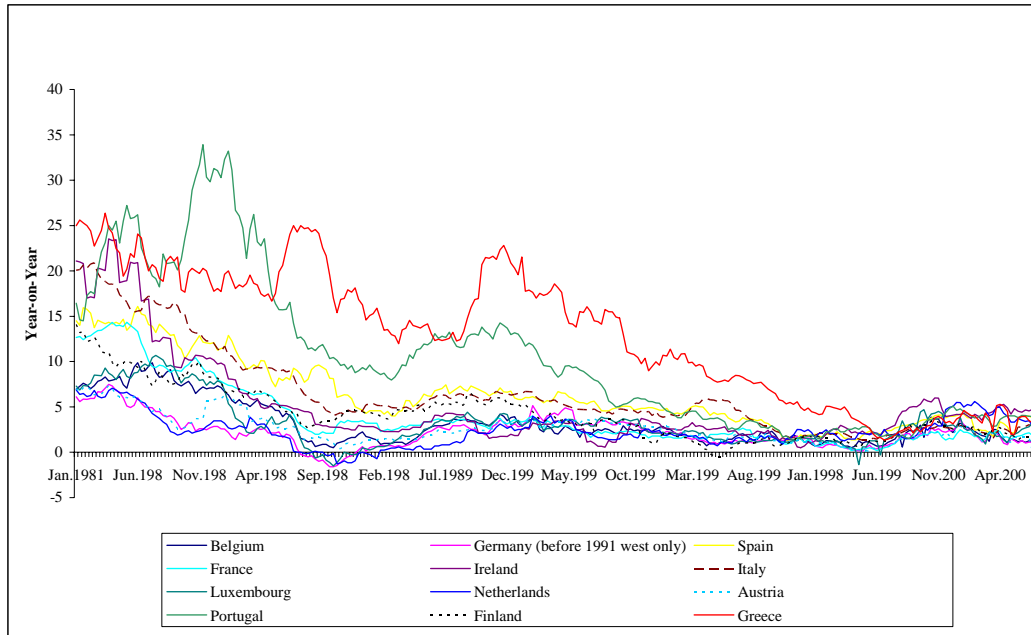
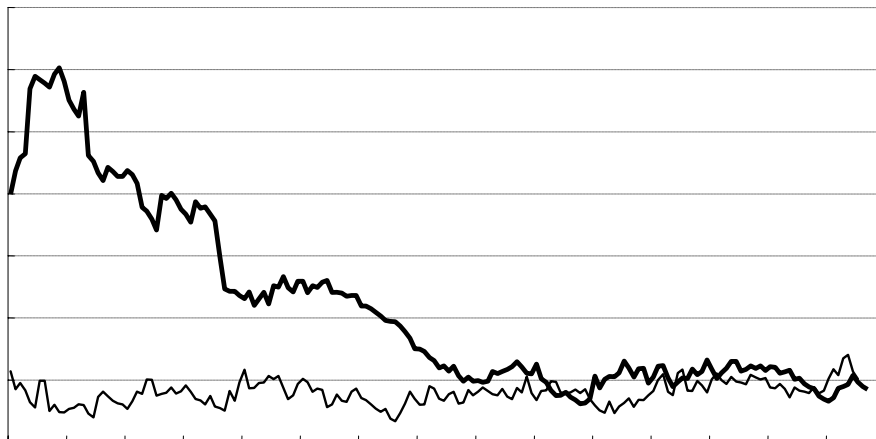


Figure 6. The dispersion of annual inflation across euro area countries and the US 14 Metropolitan Statistical Areas
(unweighted standard deviation in percentages)



Sources: Eurostat and US Bureau of Labor Statistics.

Engel and Rogers (2004) provide a cautionary finding. They exploit a unique database assembled by The Economist Intelligence Units that has collected prices on a variety of comparable goods and services across over 100 cities worldwide during 1990 and 2003. Looking at euro area countries, they find a decline in price dispersion over much of the 1990s (that is likely to be linked with the Single Market Programme) but no evidence of a tendency for prices to converge after January 1999: i.e., after the introduction of the euro. This

seeming lack of progress of the law of one price since January 1999 needs to be better understood. Engel and Rogers explain that it may partly be explained by the drive toward the Single Market Programme early in the sample period, and by the anticipation of the euro prior to its launch. Furthermore,

d. Some summary observations on the endogeneity of economic integration

In summary, the theory and the international empirical evidence of the trade creating effects of a monetary union is now well-established. The international empirical studies of the “endogeneity of OCA” suggests that the potential for deeper economic integration after monetary unification is large: trade could grow by several multiples upon monetary integration. Such gains would apply even to closely linked countries such as Canada and the US.

The early evidence for euro area countries is encouraging but still very dispersed: the launch of the euro may contribute to raising reciprocal trade among euro area countries between a few percentage points to over 100 percent. At the same time, the evidence of such an effect in the euro area is still rather limited. More studies are now being produced as more data are becoming available.

There are two important qualifications to keep in mind in order to set these findings into context. The *first qualification* is that in any case European countries exhibit already high degrees of openness: trade among European countries has continuously risen since the onset of European institutional integration that started in 1958 with the launch of a free trade area, followed by a custom union in 1968, and a common market in 1993 (see Dorrucchi, Firpo, Fratzscher, and Mongelli (2004), and Mongelli, Dorrucchi and Agur (2004)). Hence, at this point it may be difficult to witness spectacular surges in intra-European trade of several magnitudes. The *second qualification* is that, the trade creating effects of a monetary union may take a lot of time to be felt (a point also risen by Rose (2004)). Rose suggests a period of about 15-20 years).

Section 4. Endogeneity of financial integration (i.e., insurance schemes)

Defining financial integration is a broad and complex task as it embraces an assortment of financial instruments, a wide array of financial intermediaries, and a variety of financial market segments. Following Ferrando et alii (2004) we postulate that financial integration is achieved when all potential market participants with the same relevant characteristics: (1) face a single set of rules when they decide to deal with those financial instruments and/or services; (2) have equal access to the above-mentioned set of financial instruments and/or services; and (3) are treated equally when they are active in the market.

a. Effects of financial integration

Financial integration generates several widely accepted benefits such as the improved allocation of capital, higher efficiency, and higher economic growth. Amongst others, financial markets can provide a significant source of insurance against asymmetric shocks. Graphically, financial integration has the effect of endogenously shifting the OCA lines in Figures 1 and 2 downwards (i.e., raising the net benefits from EMU). To the extent that monetary unification enhances financial integration, it will endogenously improve insurance against asymmetric shocks, thereby reducing the costs of a monetary union: an important endogenous component for EMU.

One interesting line of research has led to the identification of a “border effect” also for financial market integration. Atkeson and Bayoumi (1993), Bayoumi and Klein (1997) and

Crucini (1999) all find that risk sharing across the regions of a country is significantly larger than across countries. Asdrubali, Sorensen and Yosha (1996) looked at channels of interstate risk sharing in the US. They focused on shocks to gross state product and found that: 39% of the shocks were smoothed through *capital markets*, 23% are smoothed through *credit markets* and 13% through the *federal government*. 25% are not smoothed. Hence, financial markets and institutions in the US contribute with 62% (i.e., 39% + 23%) to the absorption of state idiosyncratic shocks. The effect is about five times more important than the federal budget.⁵

A similar analysis using the same methodology by Marinheiro(2003) finds considerably lower smoothing through the capital markets across within the Eurozone. In the latter most of the smoothing occurs through the national governments budget and has an intertemporal character, instead of an interregional one.

Melitz (2004) reconsiders the approach of Asdrubali et alii and obtains a lower smoothing through capital markets and casts doubts over the measured risk sharing via credit markets. Household savings play a more important role and the uninsured share of shocks is larger.

b. European evidence (1): the effects of the euro on financial prices, interest rates and equity returns

Money markets integrated almost immediately after the introduction of the euro. The transition was smooth and swift. However, even in money markets, integration has not progressed in a uniform way in the different market segments. The unsecured deposit market may be regarded as fully integrated. The repo segment, where market participants exchange short run liquidity against collateral is less well integrated (see Berg, Grande and Mongelli (2004) and ECB, July 2001 “The Euro area Money Market Report”).

Looking at bond markets it is clear that the integration of financial markets in the euro area started well before Stage 3 of Economic and Monetary Union. Yield differentials among euro area government bonds converged markedly since 1996. This convergence accelerated further after the pre-announcement of the irrevocable fixing of parities in May 1998. Since May 1998 yield differentials have only rarely exceeded 40-50 basis points while in early nineties spreads of more than 500 basis points – mostly reflecting inflation differentials – were not uncommon. There are diverse explanations for this phenomenon: institutional investors have, to some extent, seized the opportunities opened by the disappearance of relevant currency matching restrictions. However, Adjaoute, Danthine and Isakov (2003) discern no obvious pattern in the dispersion of *ex-post* real yields *pre- and post-EMU*. But still there is a considerable decrease in volatility of real yields.

Adjaoute, Danthine and Isakov (2003) find some new evidence that the equity risk premium may have decreased in Europe reducing the cost of capital. There is also evidence that the structure of equity returns has changed in Europe: country factors now appear to be dominated by the factors associated with industries or sectors. They conclude, however, that there is little evidence in support of the hypothesis that the average European investor is now more financially diversified than in the recent past. Rather European financial markets continue to be seriously undiversified. See Galati and Tsetsaronis (2001) BIS.

Angeloni and Ehrmann (2003) seek evidence of euro area-wide banking integration and the degree of interest rate pass-through using post-1999 data. Banks are in fact likely to rapidly internalise the changes stemming from EMU. They show that the pass-through of changes in money market rates is not only faster and more complete but also increasingly homogenous across the euro area. Bank retail rate spreads have also fallen steadily.

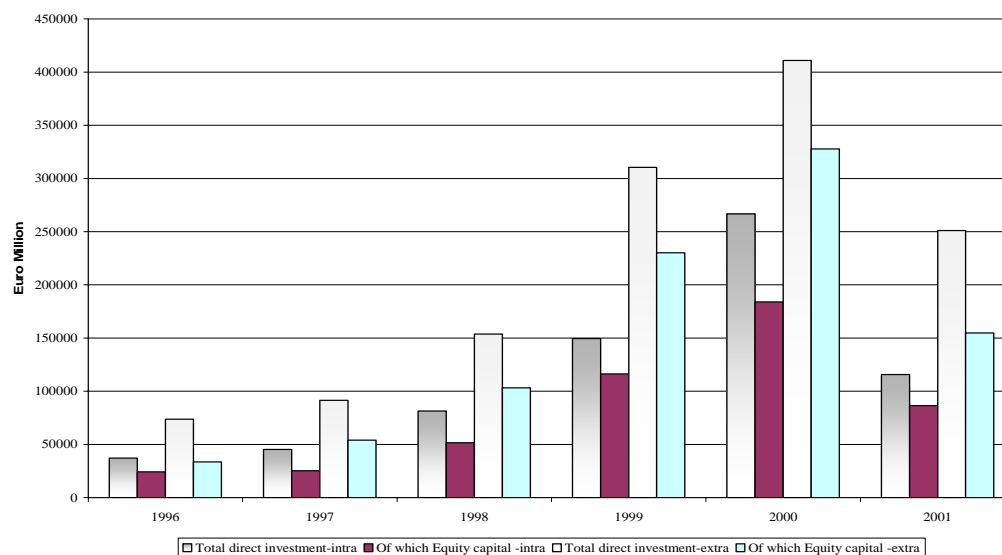
⁵ Another limitation of this comparison is that the European Union is not currently endowed with a “federal budget” i.e., a supranational shock-absorbing scheme. The bulk of the EU budget consists of structural and solidarity funds aimed at redistribution.

c. European evidence (2): the financial effects of the euro

Much attention has been attracted by the substantial increase in direct and portfolio investment flows *between the euro area and abroad* since the end of the 1990s. However, there has also been a less well documented increase in direct and portfolio investment flows *within the euro area*.

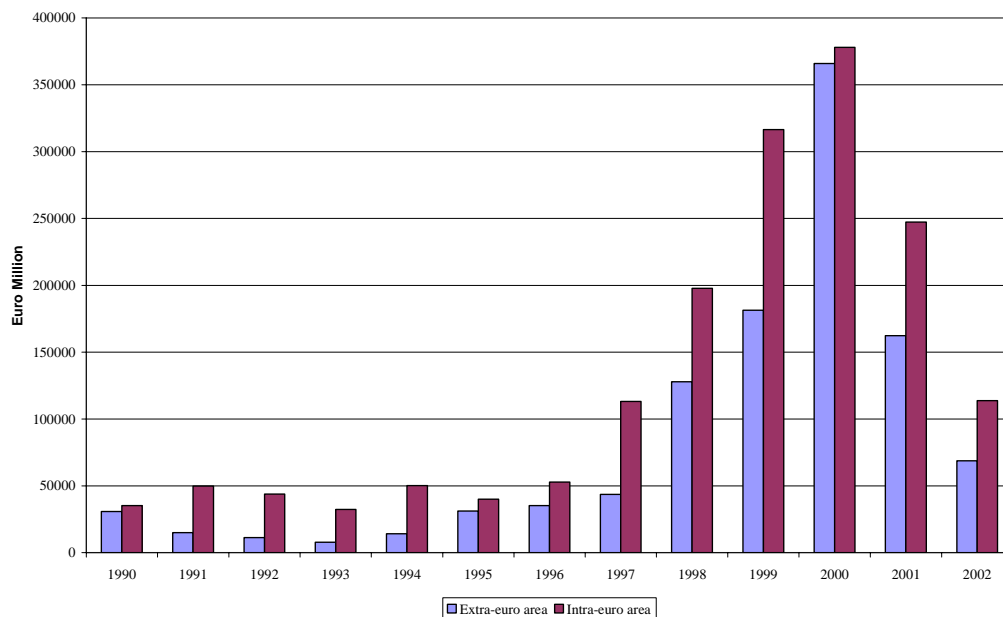
Figure 7 shows both the intra and extra-euro area total foreign direct investment (FDI) and equity capital flows. Over the sample period intra-euro area and extra-euro area FDI showed comparable patterns, posting a remarkable increase in 2000 and 2001. It is noteworthy that the annual percentage change of intra-euro area FDI, has been higher than the extra-euro area FDIs during 2000-1. There are important caveats and qualifications of these data. The most important one is that it is as yet unclear how much of this observed increase in FDI is due to the conditions of economic boom during 1999-2001.

Figure 7. Foreign Direct Investment flows intra- and extra-euro area, 1996-2001



Mergers and Acquisition (M&A) transaction show a similar development as the intra and extra-euro area FDI. M&A investments increased markedly between 1996 and 2000 posting a seven-fold increase (Figure 8). However, here also a qualification should be made. The large increase in M&A activity observed during 1997-2001 is probably linked to the asset bubbles and the economic boom. We observe a sharp fall since 2001. It is therefore unclear whether EMU is in any way responsible for these developments.

Figure 8. Mergers and Acquisition activity intra- and extra-euro area, 1990-2002



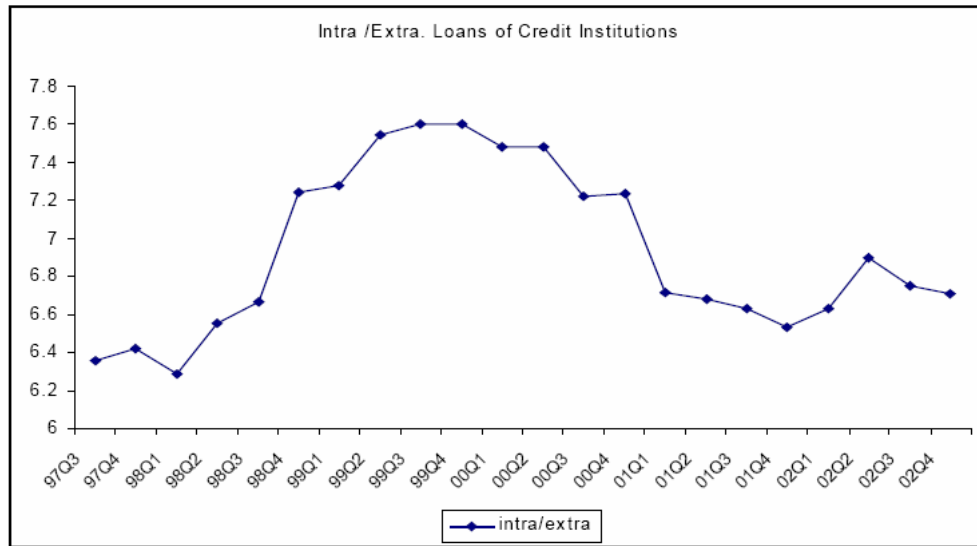
There has also been an increase in bond issuance both by non-financial corporations and by monetary and financial institutions (MFIs) – see Ferrando et alii (2004). The increased access of non-financial corporations to market finance reflects, in part, stronger competition within the European financial sector. Banks are therefore under pressure to use their balance sheet more efficiently in order to increase their return on equity. As a consequence banks are increasingly facilitating the access by corporations to capital markets. A particular significant development, in this context, is the very fast growth of issuances by smaller and less well established firms.

A look at the assets side of the balance sheet of the MFIs in the euro area -- and more specifically at the loans of the MFIs -- provides some indications of progress in integration in financial services. Loans represent in fact the most important asset in the balance sheet of the MFIs. Figure 9, which collects also the gross stock of the loans to euro area residents versus non-euro area residents, shows a remarkable increase of intra- euro area loans, compared to the extra-euro area loans, after the 1998. However, after the year 2000 a sharp decline occurs again, leaving this ratio at a somewhat higher level than at the start of the eurozone.

Adam, Jappelli, Menichini, Padula and Pagano (2002) find that the share of funds managed with a Europe-wide investment strategy increases for money market and bond market funds. Both types of funds show a significant progress during the first months of 1999 for almost every country. Galati and Tsatsaronis (2001) observe a significant acceleration in German investor purchases of euro-area securities, ahead of EMU in 1998, with an intensification in 1999 and 2000.

Similarly, the share of euro area bonds in the overall bond portfolio of Italian neutral funds increased from 8% in 1995 to 23% in 2000.

Figure 9, Ratio of loans of the MFIs to euro area residents and non-residents.
 Source: ECB. MFIs database.



d. Some summary observations on the endogeneity of financial integration

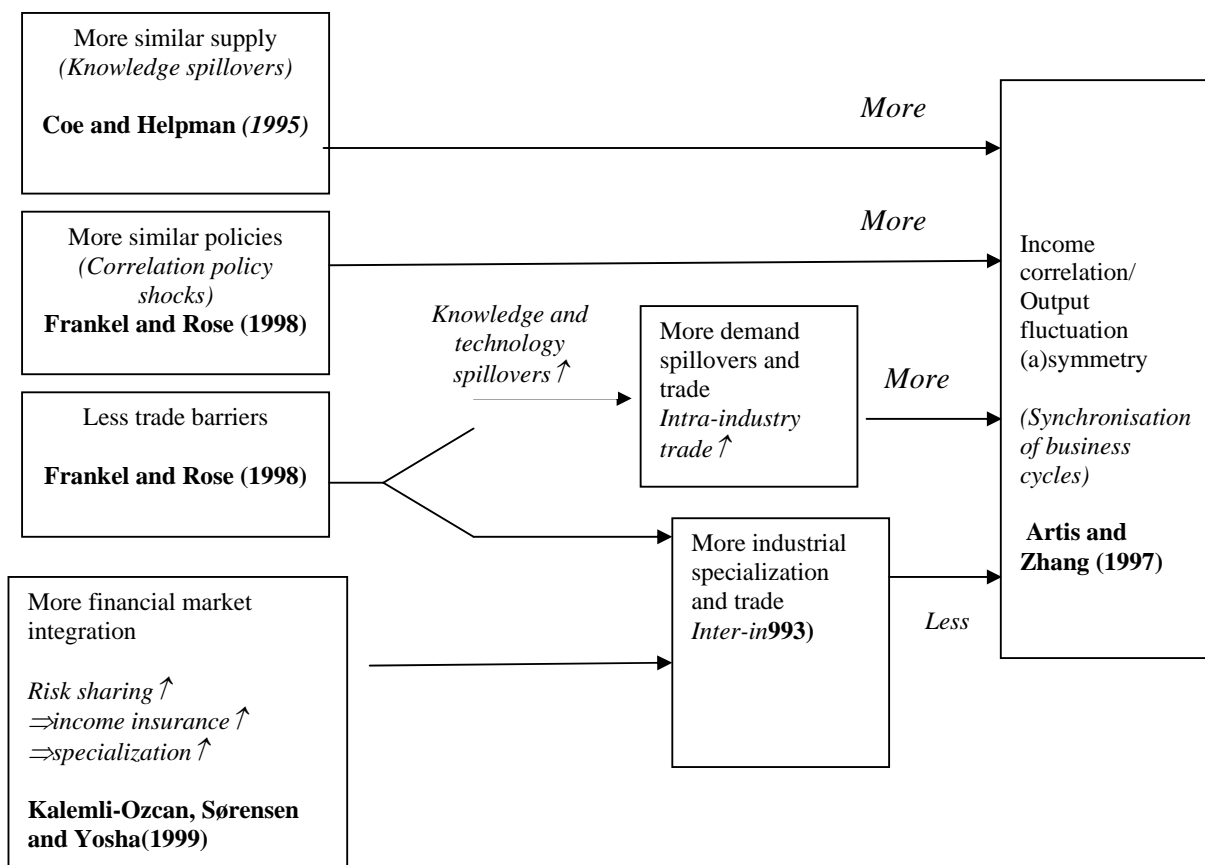
In summary, from the partial evidence reported here, one can deduce that some progress has been made towards more financial integrations in the euro area. There is no doubt that this progress, especially in the money and bond markets has been due to the introduction of the euro. Yet, the euro area is still far from a unified financial market. The view of Giovannini (2002) according to which European financial markets are still a *juxtaposition* of national markets may not be far off the mark. But over time financial market integration in the EU/euro area might lead to stronger international risk sharing.

Section 5. Endogeneity of symmetry of shocks.

a. Effects of economic and financial integration on income correlation

Several authors note that the process of economic integration affects the symmetry of output fluctuations through diverse channels (see Figure 10). According to Frankel and Rose (1998) the removal of trade barriers raises trade, allows demand shocks to more easily spread across the trading partners, and leads to more correlated business cycles. They also mention that policy shocks will become more correlated. Coe and Helpmann (1995) argue that knowledge and technology spillovers will also increase with economic integration and support symmetry of output fluctuations.

Figure 10 – Effects of Economic Integration on Income correlation (Output (A)Symmetry)⁶



Kalemli-Ozcan, Sørensen, Yosha (2003) argue instead that higher financial integration may lead to more asymmetric macroeconomic fluctuations, possibly counterbalancing the other channels. The argument runs as follows. Economic integration leads to better risk-sharing opportunities (income insurance) through financial market integration. This in turn makes specialisation in production more attractive, rendering macroeconomic fluctuations less symmetric.

The implications for EMU of the work of all these channels could be substantial. We illustrate these with the following two distinct (illustrative) paradigms -- specialisation versus endogeneity of OCA -- which have different implications for the benefits and costs of a single currency.

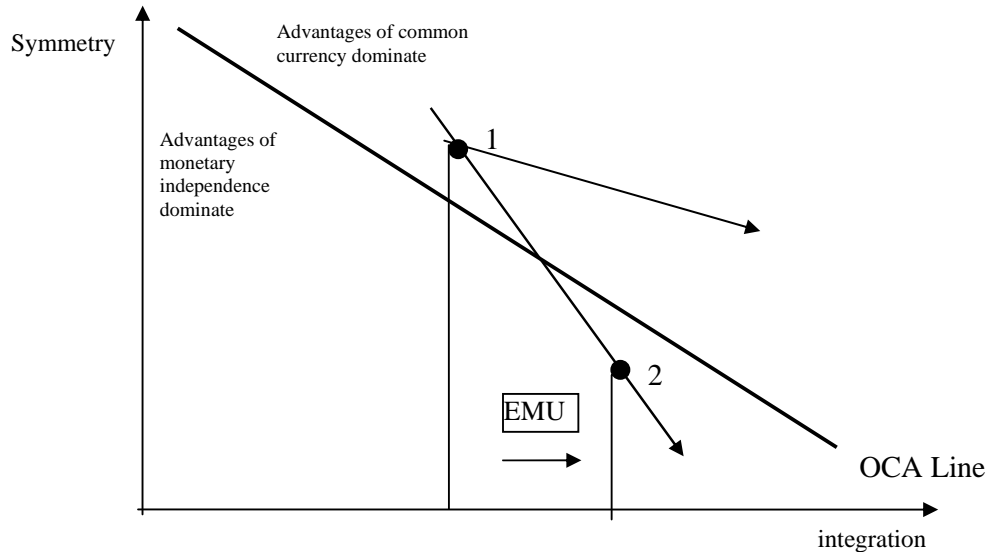
a. The specialisation paradigm

The specialisation paradigm postulates that as countries become more integrated, they become increasingly specialized. The dynamics underlying this process is based on economies of scale and agglomeration effects. Members of a currency union would then become less diversified and more vulnerable to asymmetric shocks. Correspondingly their incomes will become less correlated. Kalemli-Ozcan, Sørensen and Yosha (2003) provide empirical evidence that financial integration enhances specialisation in production. The

⁶ Adapted and extended from Kalemli-Ozcan, Sørensen, Yosha (2001)

consequence is that an increase in integration could move a group of countries that are in the OCA-zone outside this zone, e.g., from point 1 in Figure 11 to point 2. Whether it does this depends on the relative strength of two opposing forces that result from increased integration: the increase in asymmetry which increases the costs of the union and the increase in the efficiency gains of the monetary union.

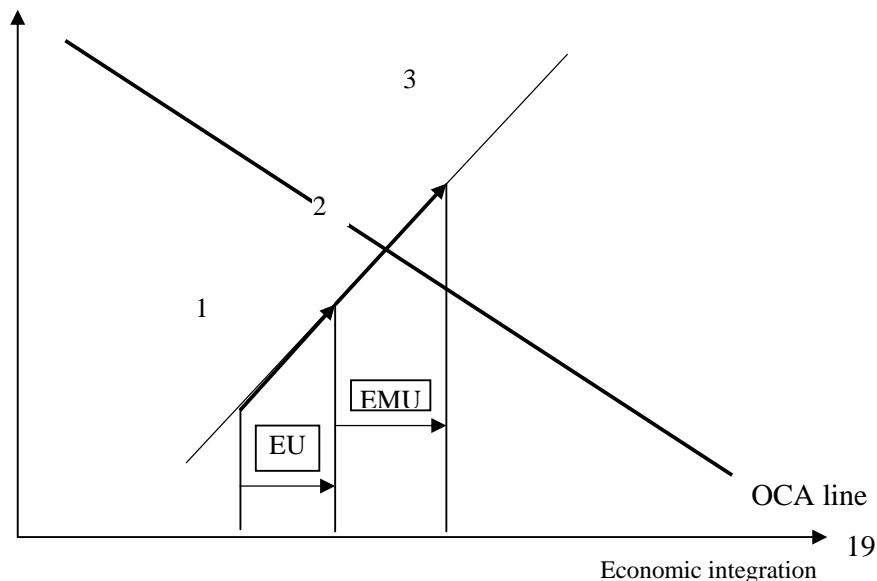
Figure 11. Specialisation Increases and Correlation of Incomes



b. The “endogeneity of OCA” paradigm

The second paradigm is the “*endogeneity of OCA*” hypothesis that postulates a positive link between income correlation and trade integration. The basic intuition behind this hypothesis is that a common currency as “a serious and durable commitment” (McCallum (1995)). It precludes future competitive devaluations, facilitates foreign direct investment and the building of long-term relationships, and may over time encourage forms of political integration. This will promote reciprocal trade, economic and financial integration and it will foster business cycle synchronisation among the countries sharing a single currency. This idea is represented graphically in Figure 12.

Figure 12. A Country Joins the EU and then EMU and the “Endogeneity” of OCA Dominates



The group is initially on the left of the OCA line. If these countries join together and form a “union,” such as the European Union (EU), both trade integration and income correlation within the group will rise: i.e., they will gradually move to point 2. If the same countries were to start a currency area -- e.g., EMU -- the degree of trade integration and income correlation within this group would rise even further and the group would subsequently find itself on the right of the OCA line.

c. The empirical evidence thus far for specialization or endogeneity of OCA

Frankel and Rose (1996) have undertaken important empirical research relating to this issue. They analysed the degree to which economic activity between pairs of countries is correlated as a function of the intensity of their trade links. Their conclusion was that a closer trade linkage between two countries is strongly and consistently associated with more tightly correlated economic activity between the two countries. This is also confirmed in the studies of Rose and Engel(2001) and Rose(2002). Similar evidence is presented in Artis and Zhang (1995), who find that as the European countries have become more integrated during the 1980s and 1990s, the business cycles of these countries have become more correlated.

Firdmuc (2004) makes a case that intra-industry trade (the type of trade that has risen the most among euro area countries thus far), raises symmetry of business cycles (while inter-industry trade would do the opposite). Melitz (2004) explains why EMU would promote intra-industry trade, reduce national specialization, and increase the symmetry of business cycles as follows. As income rises, the additional trade is likely to concern goods that are more income elastic and price-elastic in demand. This entails more trade in differentiated products and increasing intra-industry trade. Industry shocks would become increasingly common shocks and spread more rapidly.

There is another piece of empirical evidence that enhances the view that economic integration may not lead to increased asymmetric shocks within a union. This has to do with the rising importance of services. Economies of scale do not seem to matter as much for services as for industrial activities. As a result, economic integration does not lead to regional concentration of services in the way it does with industries. As services become increasingly important (today they account for 70% or more of GDP in many EU-countries) the trend towards regional concentration of economic activities may stop even if economic integration moves forward. There is some evidence that this is already occurring in the USA. In a recent study, the OECD (2000) came to the conclusion that the regional concentration of economic activities in the USA started to decline after decades of increasing concentration.

d. Some summary observations on the endogeneity of symmetry of shocks

In summary, there seems to be some evidence indicating that in the past increased integration leads to more symmetry in economic shocks. Whether this will continue to be so in the future remains uncertain. Economies of scale and agglomeration effects may do their work in enhancing asymmetries. In addition, it is difficult at this stage to gauge the effect of financial integration on specialisation. Nevertheless we are inclined to conclude that the endogeneity of the OCA-paradigm will tend to prevail.

Section 6. Endogeneity of product and labour market flexibility

In this section we identify, and graphically illustrate, the conditions under which a monetary union may foster product and labour market flexibility. Most inferences here are

still very preliminary and more time may be required for more clearly discern the effects of the euro.

a. Some “early” evidence: the effects of the euro on wages

A visible phenomenon of recent years has been the stabilisation in the run-up to EMU and since the launch of the euro. A large part of this stabilisation of nominal wages is concurrent with the decline in inflation observed during the same period. Calmfors (2001) and Pichelmann (2003) note that this wage moderation had coincided with a reappearance of national income policies, a strengthening of national wage co-ordination in some countries, and longer contract periods in some others (as a result also of lower negotiation costs and a higher predictability of real wages). The following Figure 13 shows that wage rate inflation has declined across the euro area and so has wage dispersion. It is reassuring that other indicators, such as unit labour costs and compensation per employees (not shown here), provide a similar picture.

The increased use of national wage policies might be linked to the monetary discipline imposed by a common currency. There are other areas in which the common currency affects the wage bargaining process. In particular, monetary unification, may affect wage bargaining more generally by enhancing price transparency and fostering competition in product and service markets. This reduces the potential rent to be shared by workers and firms and encourages a de-centralisation of wage bargaining.

In this connection, Calmfors (2001) remarks that the current resurgence of national bargaining co-ordination through national income policies, social pacts, and consensual norms may represent a transitional phase that might be exhausted over the next 10-15 years. There is instead a long run shift towards decentralised bargaining. The macroeconomic implications of such a change could be very significant.

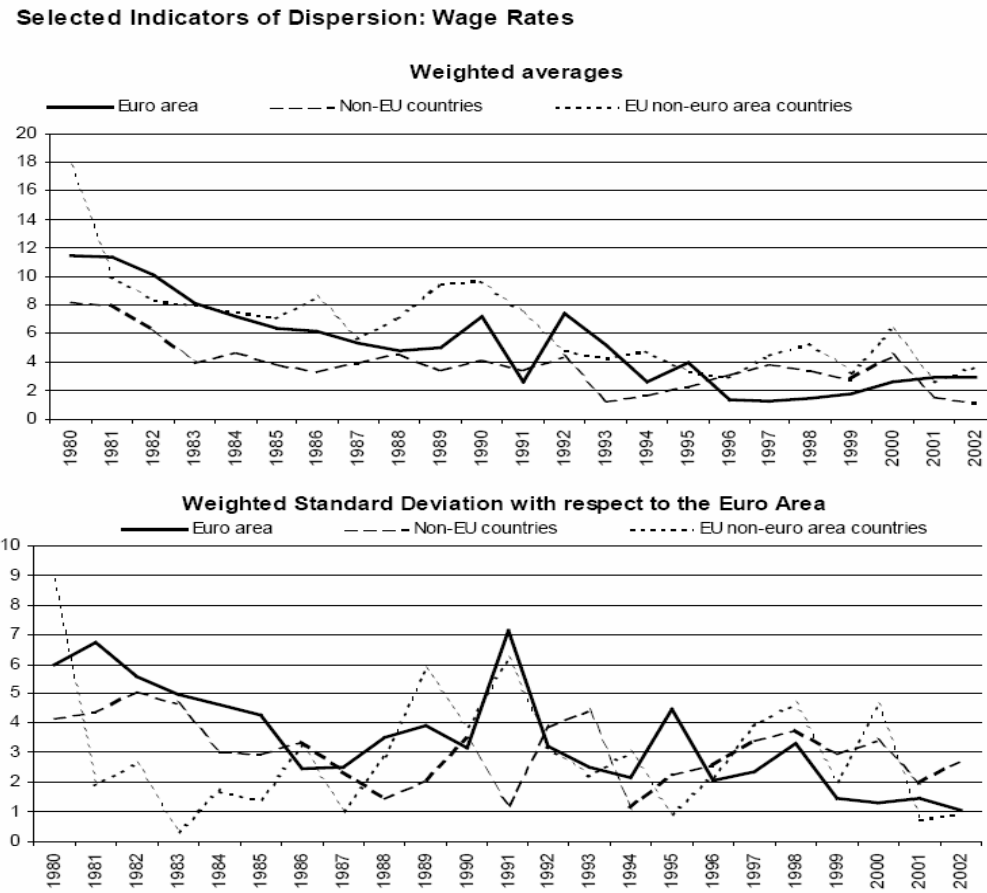
b. Looking at labour market reforms and policies

Is EMU encouraging or hindering labour market reforms? As so often in economics there are strikingly opposing views on this issue. One view is pessimistic and argues that a monetary union weakens the incentives to introduce structural reforms. This view is exemplified by Saint-Paul and Bentolila (2002). These authors note that the loss of monetary policy discretion at the country level lowers the incentive to undertake large-scale reform of labour markets as it precludes a “two-handed” approach according to which macroeconomic stimulus should facilitate structural reforms. They conclude, however, that EMU increases the likelihood of having *gradual* reforms and co-ordination of reform across countries.

Other representatives of this pessimistic school of thought are Sibert and Sutherland(2000), Soskice and Iversen (2001) and Cukiermann and Lippi (2001)). These authors are concerned that with EMU the “deterrence argument” might be weakened, or at least diluted, so that incentives for real wage restraints could be diminished.

A second more optimistic view is to be found in Blanchard and Giavazzi (2003) according to these authors, product market deregulation and enhanced competition decrease total rents to be shared, the incentives for workers to appropriate such rents would then decrease making labour unions weaker, reducing insider power and leading to labour market deregulation. In this connection, Jean and Nicoletti (2002) find a significant relationship between product market regulations in several sectors and wage premia.

Figure 13.



c. Empirical evidence on an EMU-effect of labour market reforms

Which labour market reforms do we actually see? Bertola and Boeri (2003) conduct an insightful experiment: they take stock of reforms carried out in Europe in the field of employment protection and non-employment benefits. In a first step they look at the broad orientation of reforms: in the case of employment protection whether they are becoming more or less stringent, and in the case on non-employment benefits whether their “reward” would increase or decrease. Non-employment benefits include a variety of rewards: the most important are unemployment benefits, but various other cash transfers are also included, as well as pensions and some forms of employment protection.

The second step in their exercise is articulated in two distinct stages. In a first stage they classify reforms as marginal or radical depending on whether the reforms are comprehensive, involve existing entitlements and reduce replacement rates of the average production worker by 10 percent or more. The second stage is a validation procedure to verify the actual behaviour of the series. This requires collecting a number of successive observations to confirm the initial qualitative assessment (and exclude that a reform has been reverted). An important working assumption by the authors is that they choose a relatively early EMU break, i.e., 1995, presuming that the convergence process led by the Maastricht Treaty Criteria, and expectational effects of EMU even preceding 1997 were at work.

They report then reform frequencies on -- per-country and per-year basis -- for 1987 through 2002 for euro area and non-euro area EU countries. The impact of EMU on reforms is visible since mid-1990s and particularly for reforms of non-employment benefits. The data indicate an acceleration of reforms especially in the euro area and in the field of non-employment benefits. Bertola and Boeri caution against any over-interpretation of these results as it will take more time to understand the joint effect of many reforms (several of which are marginal or are offset or compensated by measures to compensate specific interest groups).

A very different approach is pursued by Morgan and Mourougane (2003) who show an increasing relevance of Active Labour Market Measures across all European countries during 1985 and 2000. In percentage of GDP, such measures grew to about 1 % in 1999 and 2000.

d. Some summary observations on the endogeneity of labour market flexibility

In summary, there has been significant progress towards wage moderation and discipline. This progress, however, was made prior to the start of EMU, and has been maintained since. It is not inconceivable that the wage moderation occurring prior to 1999 was influenced by the expected start of EMU and the discipline imposed by the Maastricht convergence requirements.

More importantly, several empirical studies have uncovered an endogenous component in labour market flexibility. Despite the fact that the theory is unable to predict whether a monetary union gives incentives to introduce labour market reforms, the preliminary empirical evidence suggests that EMU does create incentives to introduce more labour market flexibility.

Section 7. Some preliminary conclusion

This paper brought together several strands of the literature on the endogenous effects of monetary integration. A conceptual framework within which to discuss “endogeneities of OCA” was presented. The focus was on four areas: the endogeneity of economic integration, the endogeneity of symmetry of shocks, the endogeneity of product and labour market flexibility, and the endogeneity of financial integration and the insurance provided by capital markets. We then surveyed the empirical literature to find out how strong these endogeneities are likely to be. In all the four areas our conclusion is a measured one. Since much of the empirical work is preliminary these conclusions are also.

First, as far as the endogeneity of economic integration is concerned (where we looked primarily at trade and prices), we found that EMU has already had a significant effect on price changes in product markets: they have become more homogeneous across euro area countries. It is unclear, however, how much of this convergence comes from EMU and how much from the internal market program. Concerning trade, countless international studies suggests that the potential for more trade after monetary unification is large: a monetary union is a strong force towards additional trade creation among its members. Such gains would apply even to closely linked countries such as Canada and the US.

The launch of the euro may have already contributed to raising reciprocal trade among euro area countries. However, these estimates are still very dispersed and limited (due to the few data points that are available). There are two important qualifications to keep in mind in order to set these findings into context. The first is that in any case European

countries exhibit already high degrees of reciprocal openness: trade among European countries has continuously risen over the last 50 years since the onset of European institutional integration that started in 1958. Hence, it may be difficult to witness spectacular surges in intra-European trade of several orders of magnitudes. The second qualification is that, the trade creating effects of a monetary union may take a lot of time to be felt (a point also risen by Rose (2004)). Rose suggests a period of about 15-20 years).

Second, the impact of the euro on financial markets is evident in some market segments such as money markets. In other segments, the introduction of the euro may be starting to contribute to greater depth and liquidity. In bond and equity markets a gradual process of structural change and increasing integration is unfolding. Evidence of significant risk-sharing is modest thus far, but encouraging. However, there are several areas in which financial market integration has not yet had significant effects.

Third, our discussion leads to the expectation that we should await more symmetry in shocks for euro area countries. Although there is still a lot of uncertainty here on how clustering forces will display their effects vis-à-vis dispersion forces, and to what extent increased risk sharing (i.e., financial integration) will foster income insurance and specialisation, it is not unreasonable to observe that there is an endogeneity effect in the degree of symmetry of shocks in EMU.

Fourth, although the theory is ambiguous, some empirical studies have come to the conclusion that labour market flexibility is likely to be enhanced in a monetary union. If this is confirmed by more studies, it leads to the conclusion that the start of a monetary union creates a potentially powerful endogeneity for these OCA-criteria.

On the whole our conclusion is one of moderate optimism. The different endogeneities that exist in the dynamics towards optimal currency areas are at work. How strong these endogeneities are and how quickly they do their work remains to be seen. Some non-economic factors may be playing a role as well. In fact, some authors are asking whether it matters why a currency union is created in the first place. *Would alternative motivations for the creation of a monetary union affect the endogeneities they may engender?* It remains also to be understood how such historical and cultural motivations may affect the linkages that have been discussed in the paper. These questions will continue to provide rich sources of future research.

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