

European Central Bank

**“New” Views on the Optimum Currency Area Theory:
What is EMU Telling US?**

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Abstract

This paper traces the advancements of the optimum currency area (OCA) theory through successive phases, and discusses what EMU is telling us about the interpretation of the OCA properties. The motivation of the paper is that there is now a large number of studies making reference to the OCA theory, and providing direct or indirect insights for OCAs. This paper seeks some common threads in these studies. In our view there are four defining phases of the OCA theory: the “pioneering phase,” the “cost-benefit phase,” the “reassessment phase,” and the “empirical phase” in which we focus mostly on Europe because there is now a wealth of data, research and other information on European integration. We find that the thrust of the pioneering contributions is still relevant and we still discuss all OCA properties. Several weaknesses of the analytical framework of the early OCA theory have now been amended. The analysis of the benefits and costs from monetary integration has greatly evolved. There are more benefits and some of the perceived costs are smaller than previously thought. We also need to distinguish between an “OCA question” and an “EMU question.” The latter is a qualitatively different question, which builds on the OCA theory. Last, the merit of the OCA theory is to have catalysed a large amount of research on monetary integration although we are still far away from a unified theory in this area.

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1. Introduction

An optimum currency area (OCA) is the optimal geographic domain of a single currency, or of several currencies, whose exchange rates are irrevocably pegged. The single currency, or the pegged currencies, can fluctuate only in unison against the rest of the world:

- The *domain* of the OCA is defined by the sovereign countries choosing to adopt a single currency or to irrevocably peg their exchange rates;
- *Optimality* is defined in terms of several OCA *properties*. These include mobility of labour and other factors of production, price and wage flexibility, economic openness, diversification in production and consumption, similarity in inflation rates, fiscal integration and political integration; and
- *Sharing* the above properties reduces the usefulness of nominal exchange rate adjustments within the currency area by fostering internal and external balance, reducing the impact of some types of shocks, and facilitating the adjustment thereafter.

Countries would relinquish direct control over monetary policy and the exchange rate in expectation of significant current and future *net benefits*: i.e., that benefits exceed costs.

The goal of the paper is twofold: first, to trace how the optimum currency area theory has evolved over time, and second, to discuss what EMU is telling us about the interpretation of these properties. The motivation for the paper is that the OCA theory has evolved over various phases. At the same time, a variety of studies in diverse areas make reference to the OCA theory, and provide some insights for defining OCAs. This paper attempts to find some common threads over all these OCA-related studies. The paper does not put the final word on the OCA theory, far from that. Rather it presents a set of reflections for further consideration.

We recognise four main phases of the optimum currency area theory. Most OCA properties were laid out in the "*pioneering phase*" that started in the late 1950s-early 1960s. In the "*costs-benefits phase*" of the early 1970s, a second group of authors examined the OCA properties in order to reconcile them. These authors propose a framework to analyse the benefits and costs from sharing a single currency. After these two phases, the OCA theory lost some momentum due to: a slow-down in the process of European integration, but foremost, the weakening of its analytical framework that succumbed to several theoretical and empirical advancements.¹ This led to a reinterpretation of some OCA properties and a revised assessment of the benefits and costs from sharing a single currency. This "*reassessment phase of OCA*" of the 1980s and early 1990s led to the "new" theory of optimum currency area. The latter part of the survey has instead a more empirical content. In this "*empirical phase*," that spans over the last 15-20 years, we focus mostly on Europe because there is now a wealth of data, research and other information available on Europe.

It is important to distinguish between two complementary questions. First, there is an "*OCA question*" about defining the optimal geographic domain of a new single currency. The precise set of countries in this domain might in principle be unknown a priori. There is then a second complementary question being posed. Let's assume that the geographic domain for a new single currency is known a priori: e.g., because, as in Europe, a group of countries has sponsored deeper integration over time. How can we then define the optimum economic and monetary competencies of such a given geographic domain and the appropriate timing of their monetary integration? We could call this question the "*EMU question*" as it is faced by European policy makers, academics and the public at large. It is a qualitatively different, and

¹Buiter's (2000) called this the "fine tuning fallacy." He also condemned the OCA theory as one of the low points of post-World War II monetary economics due to two fatal weaknesses: the failures to distinguish between short-term nominal rigidities and long-term real rigidities, and to allow properly for the international capital mobility.

possibly more complex question which was brought out forcefully by the authors of the “One Money, One Market” report, i.e., Emerson et al. (1992).

The OCA theory can provide guidance for the EMU question but it cannot answer it completely. In fact, it is not simple to weigh and reconcile the OCA properties for a group of countries (particularly a large group) and clearly pin down current and future benefits and costs from their sharing a single currency.² Frustration about the implications of the OCA theory has led some authors to define alternative notions such as “feasible currency area” (Corden (1972)), “advantageous monetary area” (Emerson et al (1992)), “viable currency area,” and others that represent alternative answers to the EMU questions.

The paper is organised as follows. Section 2 surveys the “pioneering phase,” Section 3 the “reconciliation phase,” Section 4 turns to the “reassessment phase,” and Section 5 discusses the “empirical phase.” Each section presents some observations and Section 6 provides some conclusions.

2. The “Pioneering Phase:” the Main OCA Properties

The official start of the OCA theory is the seminal contribution by Mundell (1961) although some of the original insights were present already in earlier contributions such as Friedman (1953) and Meade (1957). That period was characterised by the Bretton Wood system, overall low inflation, capital controls in many countries, and the incipient process of European integration. The OCA theory stemmed from the debate on the merits of fixed versus flexible exchange rate arrangements, and the comparison of several features of the US and European economies. We now list the pioneering OCA properties, that are also called “prerequisites,” “characteristics,” or “criteria” by some authors.

2.a Price and wage flexibility. When nominal prices and wages are downward flexible between and among countries contemplating a single currency, the transition towards adjustment is less likely to be associated with sustained unemployment in one country and/or inflation in another. This will in turn diminish the need for nominal exchange rate adjustments (Friedman (1953)). Alternatively, if nominal prices and wages are downward rigid some measure of real flexibility could be achieved by means of exchange rate adjustments. Price and wage flexibility is particularly important to facilitate the adjustment process in the very short-run.³

2.b Mobility of factors of production including labour. High factor market integration within a group of partner countries can reduce the need to alter real factor prices, and the nominal exchange rate, between countries in response to disturbances (Mundell (1961)). A distinction needs to be drawn between mobility of physical factors of production other than labour, and labour mobility. The former is limited by the pace of investment and could even respond pro-cyclically to worsening business conditions in a country. Labour mobility could ease the adjustment to permanent shocks and when real wages are downward rigid. However, labour mobility is no *panacea* either: it would be in any case low in the very short run, but possibly higher in the medium- and long-term. It also entails a set of costs –such as migration and retraining -- that could be quite significant (Corden (1972)).

² Following Eichengreen (1990) “... the question of whether Europe is an optimum currency area is not one, unfortunately, which can be answered with a simple yes or no. The OCA literature does not provide a formal test through whose application the hypothesis can be accepted or rejected.”

³ See also Kawai (1987) for a description of this property. Some authors propose that in addition relative prices (terms of trade) should exhibit narrow fluctuations between countries planning to share a single currency (Eichengreen (1990)). Hence, real exchange rates should display similar developments.

2.c Financial market integration. Ingram (1962) noted that the mobility of financial resources can ease the financing of external imbalances -- e.g., in the aftermath of a shock -- and reduce the need for exchange rate adjustments. Households and firms could more easily decumulate financial assets or borrow on wider financial markets. Under a high degree of financial integration even modest changes in interest rates would elicit equilibrating capital movements across partner countries. This would reduce differences in long-term interest rates and ease the financing of external imbalances between partner countries. The need for exchange rate changes is correspondingly reduced. However, as observed by Corden (1972), Ishiyama (1975) and several other authors, a difference must be drawn between temporarily financing an imbalance (ensuing a shock) and the adjustment process to a new equilibria if the shock has lasting effects. Financial integration permits to cushion temporary disturbances through capital inflows -- e.g. by borrowing from surplus areas or de-cumulating net foreign assets (risk sharing) that can be reverted when the shock is over. However financial integration is not a substitute for permanent adjustment when necessary in which case it can only smoothen the long-term adjustment process.

2.d The degree of economic openness. Openness has various dimensions. The most commonly referred ones are: the degree of trade integration (i.e., the ratio of exports plus imports over GDP) with the countries contemplating to share a single currency; the share of tradables versus non tradables goods and services in production and consumption; the marginal propensity to import; and international capital mobility. These concepts overlap but are not necessarily synonymous. An economy could display a high share of tradeables but have low imports and exports (and exhibit a modest foreign trade multiplier, such as the US). The higher the degree of openness, the more changes in international prices of tradeables are rapidly transmitted to the domestic cost of living, and the smaller the potential for money and/or exchange rate illusion by wage earners (McKinnon (1963)).⁴ Small and less-diversified economies are generally more open than larger and more diversified ones.

2.e The diversification in production and consumption. A high degree of diversification in production and consumption -- i.e., diversification in the "portfolio of jobs" -- and correspondingly in imports and exports, dilutes the possible impact of shocks specific to any particular sector. Therefore diversification reduces the need for changes in the terms of trade via the nominal exchange rate and provides "insulation" against a variety of disturbances. (Kenen (1969)). More diversified partner countries are more likely to endure small costs from forsaking nominal exchange rate changes amongst them, and to find a single currency more beneficial. McKinnon (1969) notes that more diversified economies are generally larger and have smaller trade sector.

2.f Similarities of inflation rates. External imbalances can arise from persistent differences in national inflation rates resulting, inter alia, from: disparities in structural developments, diversities in labour market institutions, differences in economic policies, and dissimilar social preferences (such as inflation aversion). Fleming (1971) notes that when inflation rates between countries are (low and) similar over time, terms of trade will also remain fairly stable. This will in turn foster more equilibrated current account transactions and trade, and reduce the need for exchange rate adjustments. On the other hand, not all inflation differentials are necessarily problematic. Some "catching up" process by less developed countries could lead to "Balassa-Samuelson" types of effects until the process is completed.

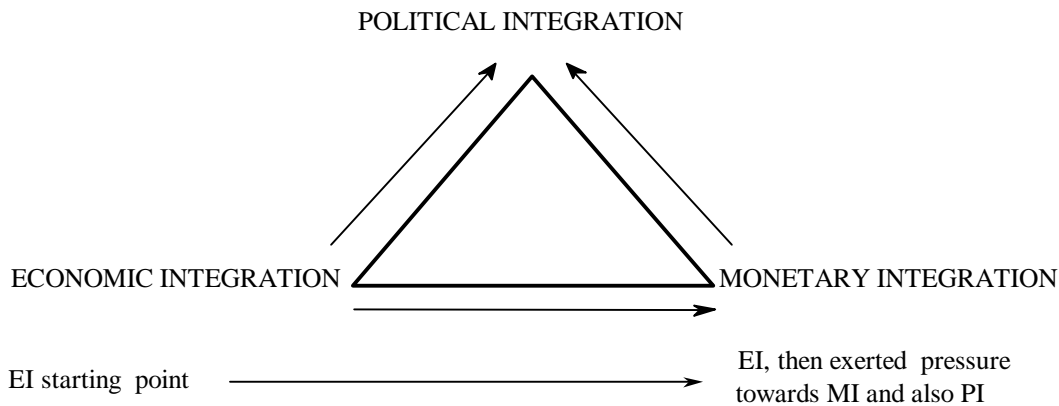
2.g Fiscal integration. Countries sharing a fiscal transfer system that would allow them to transfer funds to a member country affected by an adverse shock would also be facilitated in

⁴ For example, the higher is openness the more changes in international prices, such as commodity prices, would impact both directly and indirectly on domestic prices. Labour unions would then be more likely to command higher nominal wages to safeguard real wages. Also a devaluation would be more rapidly transmitted to the price of tradeables and the cost of living, negating its intended effects.

the adjustment to a shock and require less exchange rate adjustments (Kenen (1969)). Such a property would require an advanced degree of political integration and willingness to undertake risk sharing withstanding possible moral hazard and other operational difficulties.

2.h Political integration. The political will to integrate is regarded by some as the single most important condition for adopting a common currency (Mintz (1970)). Haberler (1970) stresses that similarity of policy attitudes among partner countries is relevant in turning a group of countries into a successful currency area. Tower and Willett (1975) add that a successful currency area needs a reasonable degree of compatibility in preferences toward growth, inflation, and unemployment and significant ability by policy-makers in trading-off between objectives. There has also been an intense debate about the links between political, economic and monetary integration. In Europe a ‘functional’ integration process has prevailed (Figure 1), with economic integration as its starting point in the 1950s. Thereafter, economic integration has spurred monetary and some political integration.

Figure 1. A View of Economic, Monetary and Political Integration
“Functional” Integration Process Underlying Treaty of Rome (1957)



Some observations on the “pioneering phase”

a. A shortcoming of several OCA properties is that they still needed to be spelled out and analysed in some detail, and to acquire an empirical content as shown by subsequent contributions. Robson (1987) observes that several properties are difficult to measure unambiguously and evaluate against each other.

b. A shortcoming of the pioneering phase is that it lacked a unifying framework. One could still end-up drawing different borders for a currency area by referring to different OCA properties. Tavlas (1994) calls this the “*problem of inconclusiveness*,” as OCA properties may point in different directions: for example, an economy might be open indicating the preferability of a fixed exchange rate, or even monetary integration, with its main partners, but the same economy might display low factors of production and labour mobility with respect to the same partners suggesting the desirability of a flexible exchange rate.

c. Tavlas (1994) observes that various properties can lead to a “*problem of inconsistency*.” For example, a small economies, that are generally more open, should preferably adopt a fixed exchange rate, or even integrate monetarily, with their main partners following the openness property. However, the same small economies are more likely to be less diversified in production than larger economies. In this case they would be better candidates for flexible exchange rates according to the diversification in production property. An additional complexity observed by Ishiyama (1975) is that various OCA properties are interdependent.

d. A ranking of OCA properties was not yet possible. However, price and wage flexibility, and the mobility of factors of production including labour, seemed to be the most relevant in the economic debate. Financial market integration has an ancillary role in smoothing the adjustment process. Inflation differentials were still relatively modest until the oil shocks (at least compared with the differentials of the subsequent periods). Economic openness and the diversification in production and consumption tended to display their effects indirectly through product and labour markets. The political will to integrate was understood to be extremely relevant and could be seen as encompassing also economic policy variables (such as fiscal and monetary policies), as well as, the will to reform economic and financial structures. At the same time, political integration is a broad concept that takes quite different meanings in the national and international context.

e. The pioneering phase also initiated a debate on the main benefits and costs from adopting a single currency. However, the analysis of the costs and benefits was still unsystematic and received an impetus only with the subsequent wave of contributions.

3. The “cost-benefits phase”

The contribution of Corden (1972), Ishiyama (1975), Tower and Willet (1976), and other authors was to reconcile the main elements of the debate on OCA, assess the comparative advantage of the diverse OCA properties, and address the benefits and costs more systematically. This reconciliation strengthened the interpretation of some OCA properties, and showed that they interact, and led to diverse new insights. There is also a second seminal contribution by Mundell (1973) discussing the role of financial integration for international risk sharing.

The benefits from a single currency result principally from the increased usefulness of money, the disappearance of intra-area nominal exchange rate uncertainty that would foster trade and promote cross-area foreign direct investments, and the access to broader and more transparent financial markets. The costs from a single currency result principally from a narrower menu of policy instruments directly available to national governments. The main benefits and costs are reviewed in Box 1 at the end of the section.

Corden (1972) points out that forming a currency area with a group of partner countries entails a loss of direct control over the national monetary policy and the exchange rate. This entails forsaking *expenditure switching policies*. A country faced with a current account deficit – e.g., following an adverse demand shock to its exports -- may be faced with fewer policy options in the currency area rather than, e.g., in a fixed-but-adjustable or a flexible exchange rate regime. In fact, most pioneering authors had a stabilisation framework in mind. They believed that, at least in the short run, monetary policy is an effective policy instrument and, jointly with flexible exchange rates, it could facilitate the adjustment of relative wages and prices in the wake of some types of shocks (“fine-tuning”). This would provide a less costly adjustment than having to endure some unemployment to facilitate a real adjustment. There was also a belief that governments could select a specific trade-off between inflation and unemployment along a short-term Philipps curve. Hence, losing direct control of monetary policy and exchange rates was deemed to entail a significant cost particularly in the wake of asymmetric shocks within a currency area.

In a currency area, a country facing an adverse demand shock to its exports will need to resort instead to *expenditure absorption policies* -- such as a fiscal tightening or expansion -- to restore its external balance. At the same time, it would also need to rely on changes in its real exchange rate. Flexibility in nominal prices and wages can bring about real exchange rate flexibility in the wake of some shocks or in the presence of some imbalances. This could in turn reduce the amount of absorption policy that is needed. In fact, there is a trade-off

between real exchange rate flexibility, that is market-based and could operate quite rapidly, and the amount of expenditure absorption policy, which is less rapid.⁵

Corden also notes that the mobility of factors of production and labour is highly desirable in a currency area. However, labour mobility also entail some costs (e.g., migration and resettlement costs) and cannot effectively cope with shocks in the very short-term. Short-term capital movements can instead contribute to easing the adjustment process. The flexibility of fiscal policy should be raised in a currency area while securing fiscal discipline. The similarity in shocks is an important element in the decision to share a single currency (see Box 2). Countries with similar characteristics and that respond in similar ways to external shocks will require less exchange rate adjustment between them (Tavlas (1994)). In particular, a group of countries sharing similar shocks and enjoying flexibility in nominal prices and wages would form a feasible currency area. However, the single currency does not safeguard the members of the currency area from the effects of real economic shocks.

Ishiyama (1975) recognizes the limitations of defining OCAs based on a single property and postulates that each country should evaluate the costs and benefits of participating in a currency area from the **point of view of its own self-interest and welfare** (“...if the pros outweigh the cons...”). Ishiyama also points out that differences in inflation rates and wage increase resulting from different social preferences, and conflicting national demand management policies overwhelm in importance several other OCA properties (including differences in exposure to micro-shocks most of which are likely to be temporary).

Tower and Willett (1976) illustrate the diverse OCA-properties and the trade offs they entail between the various costs and benefits from adopting a single currency. For this purpose they develop a powerful graphical apparatus. They show, amongst others, that joining a currency area enhances the usefulness of money the more open is a country. However, it also constrains the use of discretionary macroeconomic policies to achieve internal balance due to the external constraint for the area as a whole. Also, the total cost of adjustment hinges upon the sources, type and strength of external disturbances. Such costs are a decreasing function of openness. In the end, they argue, that there is no general agreement on the quantitative importance of each OCA property, and highlight the need for more empirical research. However, the OCA theory has thus far been a catalyser for new research leading to valuable new insights, as for example, by encouraging the examination of the major factors influencing the desirability of alternative exchange rate regimes.

McKinnon (2001) “rediscovers” a second seminal contribution by Mundell (1973). This contribution, that is hardly cited any more, discusses the role of financial integration, in the form of cross-country asset holding, for international risk sharing. Countries sharing a single currency can mitigate the effects of asymmetric shocks among them through the diversification of their income sources and by pooling their foreign exchange reserves.⁶ A country suffering an unexpected output shock can reduce its cost if it holds claims on another country not affected by the shock. A corollary of this argument is that similarity of shocks is not a strict pre-requisite for sharing a single currency if all members of the currency area are

⁵ A high marginal propensity to import and export (i.e., high economic openness) would also require a smaller tightening in absorption to re-establish the external balance.

⁶ The geographic diversification of income sources in capital markets can operate through two main channels (Kalemli-Ozcan, Sørensen and Yosha (2001a)). The first channel is *income insurance* when residents of a country can hold claims to output in other countries. Dividends, interests and rental revenue from these claims will insure income as long as output is imperfectly correlated. Such ex-ante inter-regional insurance allows the smoothing of both temporary and permanent shocks. The second channel is that a country’s residents *adjust their wealth portfolio* in response to income fluctuations by buying and selling assets and by borrowing and lending on inter-regional, or international, credit markets. Such ex-post adjustment of asset portfolios allows for the smoothing of transitory shocks.

financially integrated and hold claims on each other's output. This point has important implications on the debate about the size of a single currency area.

Some observations on the “cost-benefit phase “

a. The above contributions clearly illustrate the difficulties of assessing, and jointly interpreting, the diverse OCA properties. The debate on the various properties still lacked a clear empirical content. The cost-benefit analysis acquired more structure but remained quite indeterminate. Several other weaknesses, as in the analytical apparatus used by the pioneering authors, gradually emerged and are discussed in the next section.

b. Which properties matter most after the cost-benefit phase? Corden holds that price and wage flexibility rank the highest and can permit rapid responses to disturbances. Openness and similarity in shocks are also important (albeit the qualification in point d below). The mobility of factors of production and labour is highly desirable but also entail some costs and cannot effectively cope with disturbances in the very short-term. For Ishiyama, similarity in price and wage inflation ranks the highest. Tower and Willett are instead more agnostic. Corden also postulates that short-term capital movements can contribute to easing the adjustment process, and that the flexibility of fiscal policy should be raised in a currency area in order to undertake expenditure switching policies if needed to restore the external balances. All in all, though, the balance for the OCA theory is still dismal. The OCA properties are still difficult to measure unambiguously and evaluate against each other.

c. Despite the disappointments with the Several authors assign a high prominence to the discussion of the benefits and costs from participating in a currency area. Some authors even start their analysis with such an assessment. After all, the prospect of a positive balance between benefits and costs is the principal reason for contemplating monetary integration with one or more partner countries. A few authors separate between the analysis of OCA properties, that may be rather inconclusive, and the analysis of the main benefits and costs, that has its own dignity and merits irrespectively of the OCA theory (Ishiyama (1975). Box 1 lists some of the main benefits and costs as they appear in the more recent OCA literature.

d. A new “meta” OCA property was added: the *similarity in shocks* among the countries considering adopting a single currency. The measurement and comparison of different types of shocks lagged behind several advancements in econometric techniques (that are discussed in Section 5). Measuring the vulnerability to certain shocks, their transmission (impulses) over time and across countries, and the policy responses to them then became a way to indirectly capture, and compare, some features of the underlying economic and financial structures and the degree of price and wage flexibility. In fact, the similarity of shocks, is almost a “catch all” property capturing the interaction between several OCA properties.

e. The “forgotten” contribution of Mundell (1973), that was rediscovered by McKinnon has far-reaching implications on the debate about the size of a single currency area: if all members of a currency area are financially integrated and hold claims on each other's output, a high similarity of shocks among them is no longer a strict pre-requisite for their sharing a single currency. In this case, a common currency could even span a larger and even more heterogeneous area. Until then the tenet was that members of a currency area should share several OCA properties and foremost price and wage flexibility, financial integration, high openness and similarity in shocks. Currency areas would in this case tend to be smaller and quite homogeneous.

Box 1. The Main Benefits and Costs of Participating in a Currency Area⁷

The OCA literature has examined both one-off and permanent benefits and costs from participating in a currency area. They cannot be judged statically as they can take different profiles over time – i.e., in the early stages of a currency area vis-à-vis when the new single currency can fully display its benefits domestically and internationally -- and across participating countries – e.g., between small and open versus large countries. We can classify the main benefits as follows:

a. **Benefits from improvements in microeconomic efficiency** result principally from the increased usefulness of money – i.e., the liquidity services provided by a single currency circulating over a wider area-- as a unit of account, medium of exchange, standard for deferred payments, and store of value. The latter benefit is subject to “network externalities” i.e., the broader the circulation of a currency, the greater this benefits. There will be greater price transparency that will discourage price discrimination, decrease market segmentation, and foster competition. Intra-area nominal exchange rate uncertainty will disappear (and correspondingly intra-area exchange rate risk) leading to savings in transaction and hedging costs.⁸ This will strengthen the internal market for goods and services, foster trade, lower investment risks, and promote cross-area foreign direct investments (FDI) and enhance resource allocation.

b. **Benefits from increased macroeconomic stability (and growth)** resulting from: improved overall price stability, the access to broader and more transparent financial markets increasing the availability of external financing; reputational gains for those members with a history of higher inflation that benefit from an anti-inflationary anchor; the reduction of some types of fluctuations of output and employment across the currency area due, possibly, to different economic policies. However, the single currency does not safeguard the members of the currency area from the effects of real economic shocks.

c. **Benefits from positive external effects** resulting principally from: savings on transaction costs resulting from the wider international circulation of the single currency, revenues from international seignorage, the reduced need for foreign exchange reserves; and simplified international co-ordination.

We can classify the main costs as follows:

a. **Costs from the deterioration in microeconomic efficiency.** There are changeover costs from switching to a new currency. These costs include administrative, legal and hardware costs such as re-denominating contracts and adapting vending machines. There is also the psychological costs resulting from a new numéraire. With boundedly rational individuals such costs will fade out very slowly (Buiter (2000)). Furthermore, if a country chooses the wrong nominal exchange rate parity at the onset of a currency area, this country may be too competitive or too un-competitive with respect to the other members. The imbalance in the external accounts will likely persist until the structure of prices and wages, as well as the level of economic activity, adjusts to those prevailing in the other members. With the introduction of a single currency a supranational institution is needed. This will result in increased administrative costs for each member country that could be offset by a fall in size of some national institutions due to a redistribution, and sharing of functions. A neo-classical optimal public finance argument against relinquishing monetary sovereignty is that joining a monetary union prevents a national government from

⁷ An extensive examination of the benefits and costs of monetary integration is in the report “*One Market, One Money*” by Emerson, Gros, Italianer, Pisani-Ferry, and Reichenbach (1992) and De Grauwe (2000). Several benefits and costs are discussed, amongst others, by Tavlas (1993 and 1997), Masson and Taylor (1991), Artis (1991), Eichengreen (1990 a and b, and 1994), Buiter (2000), Portes (1999), Mongelli (1998), and Dowd and Greenaway (1993).

⁸ The impact of exchange rate volatility on trade is believed to be quite modest due also to the possibility of hedging this risks. Hence, this benefit could be quite modest. Fratianni and Von Hagen (1990) note that there could be an increase in exchange rate uncertainty vis-à-vis external currencies which could represent a bias against external and leave the overall welfare implications ambiguous.

equalizing the marginal cost from taxation and inflation (i.e., losing control over the "inflation tax"). But such a scheme may conflict with the price stability objective.

b. **Costs from decreased macroeconomic stability.** The OCA narrows the menu of policy instruments directly available to national governments. As the responsibility for setting monetary policy and exchange rates is transferred to a supra-national central bank, no country can pursue some real adjustment in the wake of asymmetric disturbances (and if its prices and wages are downward sticky). Furthermore, when a member country exhibits higher nominal price and wage rigidities than the other partner countries in the currency union, the lower inflation rate in the area can increase its frictional unemployment (until its nominal rigidities are reduced by means of structural reforms). This may eventually lead to more pronounced short-term output and employment fluctuations in the "rigid countries." Direct control of foreign exchange reserves and other assets is also transferred to the supranational central bank. National governments also forego the option of "inflating away" their national debt in the future. In addition, common fiscal restraints (as is the case with the Stability and Growth Pact and its Excessive Deficit Procedure) may be superimposed to reduce the ability of national governments to conduct possibly unsustainable national fiscal policies. These restraints may be relatively more binding for countries with relatively higher public debt and/or high budget deficits. In addition, the EMU will lack a supranational risk sharing arrangement that may assist its members in coping with asymmetric economic shocks. National governments also lose the option of "inflating away" their national debt. Any future "gradual default" by means of unanticipated inflation during exceptional times is also precluded. At the same time, country-specific outright default risk premium may have to be re-assessed (this is the financial market discipline argument).

c. **Costs from negative external effects.** If one or more member countries run sizeable budget deficits, and accumulate unsustainable debts, the pecuniary externalities will ripple through the currency area. The debt may be monetized, putting a strain on the interest rate of the union. International confidence in the union's currency may plummet, resulting in speculative flows against the union's currency. Every member would suffer in this scenario, particularly those that previously had stable currencies and were perhaps collecting revenue from the international use and holding of their currencies.

Box 2. Foreign versus Domestic Shocks: a Precursor of the Debate on Symmetric Shocks

The merit for a currency area rests also on the type of disturbances that a country, and its envisaged monetary partners, face. Here there are diverse possibilities. Let's postulate that there are a Country A and a Country B that have to decide whether it may be beneficial for them to share a single currency. McKinnon (1963) assumes that Country A has to decide whether to integrate monetarily with Country B that displays very stable domestic prices and factor costs (i.e., a low inflation country). Instead, country A is prone to some micro shocks such as domestic shifts in demand and supply. By fixing its exchange rate with Country B it will safeguard the stability of prices of foreign goods (i.e. of tradeables), retain the benefits from deeper trade integration and investment flows, and prop up the usefulness of money (by maintaining its value in terms of foreign goods). Obviously, the domestic micro shocks in Country A would still impinge on its domestic prices of non-tradables. But, the alternative of maintaining a flexible exchange rate arrangement would be certainly inferior as there would be price instability in terms of both domestic and foreign prices entailing higher costs as well as lower benefits. It is noteworthy that the McKinnon argument was advanced during the Bretton Wood period at a time of mostly stable international prices (i.e., the "foreign" prices). The McKinnon's argument also anticipates the "nominal anchor" argument.

Some years later, following the demise of Bretton Wood, and with a higher inflation climate worldwide, a rather different challenge arose. Corden (1972) noted that nominal exchange rate changes may have an insulating role with respect to price changes originating abroad. If Country A now endured uncertain foreign prices (such as higher energy prices)

originating in Country C (that is an oil exporter to Country A), it would be better off by insulating itself -- to the extent possible -- by undertaking an exchange rate appreciation. For instance, Country A would be protecting itself from inflation imported from Country B. Evidently, in this latter example Countries A and B would not be suitable candidates to form a monetary union. The following Table 1, summarises McKinnon's and Corden's arguments.

		Table 1: Foreign Shocks versus Domestic disturbances	
		<u>MCKINNON'S (1963) ARGUMENT</u>	<u>CORDEN'S (1972) FOLLOW UP ARGUMENT</u>
		FOCUS ON PRICES OF DOMESTIC NON-TRADABLE GOODS	FOCUS ON PRICES OF FOREIGN TRADABLE GOODS
<u>PREFERABLE EXCHANGE RATE ARRANGEMENT</u>		↓	↓
FIXED	←	uncertain/unstable	certain/stable
FLEXIBLE	←	certain/stable	uncertain/unstable

4. The "Reassessment Phase:" the "Old" versus the "New" OCA Theory

A period in which "the subject [i.e., the OCA theory] was for years consigned to intellectual limbo" (Tavlas (1993)) followed the pioneering contributions. This pause is partly due to the loss of momentum toward monetary union. But there is also a lack of clear indications from the OCA properties: the problems of inconclusiveness and inconsistencies remained. To complicate matters further, the analytical apparatus behind the OCA theory thus far started to weaken. As already said, the pioneering authors had a stabilisation framework in mind and believed that, at least in the short run, flexible exchange rates could facilitate the adjustment in the wake of some adverse shocks (Buiters (2000) calls this the "fine-tuning fallacy"). This new phase leads to a reassessment of the effective costs from monetary integration and the loss of control over the exchange rate. At the end of this phase a "new" OCA theory starts emerging vis-à-vis the "old" OCA theory (Tavlas (1993)).

4.a The "One Market, One Money" Report

The report -- authored by Emerson, Gros, Italianer, Pisani-Ferry, and Reichenbach (1992) -- was released in 1990 and then published in 1992. It points out that "there is no ready-to-use theory for assessing the costs and benefits of economic and monetary union (EMU)." The optimum currency area theory has, in their view, provided important early insights but constitutes now a narrow and somewhat outdated analytical framework to address the question whether Europe should proceed toward complete monetary integration.⁹ On the other hand, there is not yet a unified theory of monetary unions to answer the above question.

⁹ The report notes that some of the benefits of monetary integration were simply assumed without investigation, and the analysis of costs is rather limited and outdated. Although labour mobility is low in Europe, the mobility of physical and financial capital is instead quite high and rising. This provides a powerful alternative adjustment channel. The effective degree of wage and price stickiness is lower than what is assumed by several authors. Flexible exchange rates could be ineffective and also entail higher costs than earlier presumed. The issue of credibility, as well as, several other advancements in micro and macroeconomics were ignored by the "old" OCA theory. The external effects of monetary integration and the wider circulation of a new European currency were neglected.

This gap is filled by drawing on many elements spanning several areas. And here resides the fundamental contribution of the report that brings together a vast amount of theoretical and empirical research, some of which was even catalysed by the preparation of the report itself (e.g., in *European Economy* (1990)). Several arguments for and against EMU, that are not always easy to compare, are put forward. For example, gains in micro-economic efficiency cannot be compared with the added macro-economic stability that can be secured by the new policy setting.

One important empirical contribution of the report is to show that in the long run inflation does not yield any macroeconomic benefits in terms of unemployment or growth (for OECD countries). On the contrary, higher inflation is associated with higher unemployment and low levels of real per capita income. Unanticipated inflation has even stronger adverse economic effects than anticipated inflation through several channels. The costs of reducing inflation can also be quite substantial. These findings, that are also underpinned by several other studies (Fischer (1981) and Cukierman (1983)) have great implications for the analysis of the current and future benefits and costs from currency union. It is now clear that inflation has high welfare costs whether it is anticipated or unanticipated. A currency area must therefore pursue a low and stable inflation policy to be successful.

The report also maintains that the many shortcomings of the OCA theory are likely to bias downwards the expected net benefits from monetary integration. EMU is instead likely to be more beneficial than what can be presumed on the basis of the application of the OCA properties alone. Therefore, more countries should be able to share the single currency and obtain positive net benefits from it. I.e., the “size” of currency areas can be larger. Whether the new analytical elements discussed in the report should at some point be reconciled within the optimum currency area theory remains to be seen.

4.b Elements of the “New” Theory of Optimum Currency Areas

We review here several fields of dispute between the old and new OCA theory.

The verticality of the Phillips Curve and Ineffectiveness of Money Policy

One of the main perceived costs from monetary integration is that its member countries lose direct control over national monetary policy.¹⁰ However, the monetarist critique of the Phillips curve has altered the analysis of this specific costs of monetary integration. It has become clear that the ability to pursue this type of independent macroeconomic policies is a myth. The view of a short-term constant Phillips Curve, implicit in most of the early OCA literature, was undermined by the fact that labour negotiates in terms of real wages rather than nominal wages. Correspondingly, the Phillips Curve needs to be augmented by expected inflation, and perfectly anticipated policy changes could exert no impact upon real variables (McCallum (1989)). The Phillips Curve was then displaced by the natural rate of unemployment (NRU). This implied that policy makers have principally a choice of a rate of inflation rather than of a level of desired unemployment and economic activity (Artis (1991)). Hence, from this standpoint, the costs from losing direct control over monetary policy seemed to be rather low.

This view is not undisputed though. There are potential sources of money non-neutrality (see Tavlas (1993)). Melitz (1991) notes that even countries confronted with identical shocks may require different policy responses due to differences in their initial positions, degree of price and wage flexibility, tax structures, trade responsiveness, and

¹⁰Furthermore, a country with a stronger dislike for inflation, rather than unemployment, could be worse off by sharing a single currency with a country with opposite preferences.

preferences. In more recent years several studies have reconsidered the trade-off between low levels of inflation and unemployment (see, amongst others, Akerlof, Dickens and Perry (2000)).¹¹ Groshen and Schweitzer (1999, 2000) take instead a different approach. They find that in the US higher nominal wage growth contributes to ease downward wage rigidities (“grease”). However, simultaneously, inflation also generates disruptive, unintended wage variations (“sand”) from symmetrical rigidities. These variations continue to mount long after the benefits have been exhausted. Thus, rigidities interact with levels of inflation in a complex manner, implying that grease-only benefit estimates exaggerate the negative impact of low inflation on labour markets.

In summary, the perceived costs from losing direct control over monetary policy, and the exchange rate, seemed high in the pioneering contribution, then subsided following the monetarist critique, and could now be a bit higher according to some if sub-optimal low inflation is pursued. However, any short-lived gain from exploiting changes in inflation cannot be exploited systematically. They are also likely to be of a smaller order of magnitude than the losses ensuing from relatively higher inflation.

The Credibility Issue

The ability of a country, or a group of countries, to achieve and maintain low inflation credibility, is very important in evaluating the costs of a monetary union. Some governments could have an incentive to renege on a low inflation commitment, that has been accepted at face value by the public, in order to reduce unemployment along some short-run Phillips curve (Kydland and Prescott (1977) and Barro and Gordon (1983)). But economic agents quickly learn about such a strategy. After a surge in inflation the public’s expected inflation increases. Even future surges in inflation may be discounted eroding any initial short-lived gain from previous announcements of a low inflation objective. Similarly, devaluations can also engender strong and lasting expectational effects. This country may be trapped in a high inflation equilibrium at the NRU. The cost of disinflating on its own may be quite steep.

For a country with a track-record of relatively higher inflation and a reputation for breaking low inflation promises, a way to immediately gain a low-inflation credibility is to ‘tie its hands’ by forsaking national monetary sovereignty and establishing a complete monetary union with a low inflation country (Giavazzi and Giovannini (1989)). An important pre-requisite is that such an anchor country exists in the envisaged monetary union. This low inflation anchor country has instead fully recognised the costs of high and variable inflation (Goodhart (1989)), has built a strong track-record of low and stable inflation, and will not alter its monetary discipline after establishing the monetary union: i.e., this country can indeed provide the nominal anchor for the monetary union (Rogoff (1985) and Goodhart (1990)). Hence, similarities of inflation rates are a feasible outcome from participating in a monetary union but is not a necessary precondition (Gandolfo (1992)).

Hence, one of the OCA properties is then turned around provided that the nominal anchor country can maintain the hegemony of the institutional setting that have preserved the low inflation environment (Tavlas (1993)). The benefits of a quick transition to low inflation -

¹¹ Akerlof, Dickens and Perry inquire how agents actually use expectations rather than how they form them. Some recent psychological studies show that people concentrate on the information that matters most to them. An economic stimulus (such as a change in the rate of inflation) must pass a certain threshold before it is even perceived. The result is that price and wage setters under-adjust for inflation when it is not very high. In fact, the cost from near-rational behaviour in terms of lost profits is negligible when rates of inflation are very low. But at successively higher rates of inflation, more and more agents and firms will fully adjust for expected inflation when setting wages and prices. There is a point of lowest sustainable unemployment that lies below the natural rate of unemployment (NRU) but above zero inflation. The result is a Phillips curve that is vertical at the NRU at both high levels of inflation and with zero inflation, but has an inflection at some moderate rate of inflation.

- and the absence of heavy costs of disinflation! -- are of course the highest for the countries with a track record of relatively higher and variable inflation

The Single Currency and Labour Markets

Differences in labour market institutions could lead to divergent developments in wages and prices even in the presence of similar disturbances. Bruno and Sachs (1985) point out that supply shocks, such as the second oil shock, can have very different macroeconomic effects depending on the degree of centralisation in wage bargaining. When wage bargaining is more centralised, the labour union tend to take into account (internalise) the inflationary effects at wage increases, changes in real wages may be contained, and the negative supply shock will have a shorter duration and be less disruptive for economic activity.

On the other end of the spectrum, less centralised wage bargaining renders it more difficult to secure wage moderation following a supply shock. Calmfors and Driffil (1988) note that the relationship between centralisation of wage bargaining and labour market outcome is not linear. Countries with either strong centralisation or strong decentralisation (e.g., with wage bargaining conducted principally at the firm level and the internalisation of wage claims on the competitiveness of the firm), are more capable of facing supply shocks than countries with an intermediate degree of centralisation. Therefore, countries with differences in labour market institutions may find it costly, from this standpoint, to form a monetary union De Grauwe (2000).

Are Exchange Rate Adjustment in Any Case Effective?

Are changes in nominal exchange rate actually effective? If not, the cost from losing direct control over the exchange rate instrument would not be as significant as previously thought. There are two differing views on this matter. The first view is that changes in nominal exchange rates do not foster adjustments of external disequilibria, as was assumed by the “old” optimum currency area theory that used a “trade-flow model” of exchange rate determination (see Krugman (1989 and 1991), De Grauwe (1989) and Tavlas (1993)). Exchange rate changes operate instead with considerable lags due to the slowness of the portfolio-balance channel (Branson (1985)). With Ricardian equivalence and perfect foresightedness by agents, changes in macroeconomic policies may not affect current exchange rate (De Grauwe (1989)). Last, the ‘sunk cost’ model (Krugman (1991)) and the pricing to market model, also illustrate why rational firms may not always quickly alter their export prices. This reduce therefore the effectiveness of nominal exchange rate changes.

The second view is that some episodes of nominal exchange rate adjustment have been quite effective. De Grauwe (2000) notes that the 1982 devaluation in Belgium has helped to “restore domestic and trade account equilibrium at a cost that was most probably lower than if it had not used the exchange rate instrument.” The french devaluation of 1982-83 also stands out as a success (Sachs and Wyplosz (1986)). The Italian devaluation after the exit from the ERM in 1992 also contributed to a revival of the economy. These and other episodes illustrate that some nominal exchange rate adjustments can actually be quite effective under very specific circumstances: i.e., if they are accompanied by a serious attempt to correct the sources of the external disequilibrium (wrong policies and/or structural weaknesses), and if they are seen as one-off remedies. I.e., the exchange rate instrument cannot be used systematically.¹²

¹² Mike Artis noted that the suggestion that nominal exchange rate changes don’t translate very durably into real exchange rate was one of the factors that helped to propel the EMU project, even though, ironically the post-1992 experience didn’t validate the “new” wisdom on this subject. Foreign exchange markets seem, at times far from the paradigm where they are bound to support equilibrium results: on the contrary they seem to be open to herd behaviours, irrational fads and the like.

Hence, according to those holding the second view, there could be some costs from losing direct control over the exchange rate instrument. This cost would actually manifest itself in more severe deflations following some disturbances. The remedy is of course to enhance real exchange rate flexibility by raising price and wage flexibility.

Some observations on the “reassessment phase”

a. When a true “currency area test” came along -- i.e., the need to assess whether Europe should adopt a single currency and how many countries should initially join -- the OCA theory failed to provide clear indications. The “One Market, One Money” Report maintains that the OCA theory was providing only a narrow and somewhat outdated analytical framework for the question at hand.

b. The authors of the Report also noted that they were facing a qualitatively different question than just a “OCA question.” On one hand, the question addressed by the OCA theory is one of finding the optimal geographic domain of a single currency (i.e., the jurisdiction in which several adjustment channels could operate reducing the need for changes in nominal exchange rates among the participating countries). On the other hand, the authors of the “One Money, One Market” report faced instead the daunting task of defining the optimum economic and monetary competencies of a given geographic domain (i.e., set of countries). The latter is possibly a more complex question.

c. In the end, the One Money, One Market Report comes out in clear favour of proceeding toward complete monetary integration in Europe for several EU members. However, this recommendation is not based on the arguments of the “old” optimum currency area theory, but rather on new theoretical (and empirical) insights and an analysis of the structure of the European Union. The report also showed the true extent by which economic and monetary integration is a multi-faceted and multi-dimensional phenomenon: a legacy that remained thereafter.

d. Another merit of the One Money, One Market Report was to discuss several desirable features of, and possible implications from, EMU including: its public finance requirements and the need to secure fiscal discipline; the increased resilience to shocks by its member countries; the international role of the single currency; the transitional costs and benefits; the possible impact on regions within member countries; and the issues of equity between countries and regions. This adds a new forward looking dimension to the debate.

e. Despite the critical view of the “old” optimum currency area theory, reflected in the “One Money, One Market” Report, this report still greatly revitalised interest in the OCA theory debate, brought together many strands of theoretical and empirical literature (directly or indirectly related to OCA theory), catalysed several background studies, and spurred a vast amount of new research during its preparation and thereafter.

f. Partly in response to the many criticisms levied on the “old” OCA theory, a “new” optimum currency area theory was put forward by Tavlas (1993). The analytical apparatus to tackle both the OCA and the EMU question has now changed owing to new views on the Phillips Curve, the credibility issue, the effects of a single currency on labour markets, and the views on the effectiveness of exchange rate changes.

g. Perhaps the most important legacy of both the “new” OCA theory (but also the One Money, One Market Report) is that, compared with the earlier literature, there are somewhat fewer costs in terms of the loss of autonomy of domestic macroeconomic policies. There are also more benefits, due to credibility gains, for countries with a track record of higher and

more variable inflation (the similarity of inflation property can then be satisfied ex-post). Hence, the benefits from a single currency could be reaped across a larger number of countries than previously believed.

5. Empirical Studies of OCA

This section reviews several recent empirical studies of OCA. The flourishing of these studies is due to the advancements discussed in Section 4, the enhancement in econometric techniques, and foremost the renovated interest toward European economic and monetary integration.¹³ For convenience we group the studies in four main areas that are not mutually exclusive and often overlap: broad-based empirical studies; the “shocking” studies of OCA properties; studies investigating the endogeneity of OCA; and studies of regional developments within sovereign countries. Of course not all the contributions that are discussed fall clearly in any of these areas, and several studies may contribute to more than one area. Therefore, some subjective calls are made.

The focus of this section is on Europe. The main reason for this choice is that the European integration process started already in the 1950s.¹⁴ Europe is in some sense, providing a “laboratory” to assess whether the pioneering OCA properties are still valid and to monitor the effects of deepening economic, financial and monetary integration. There is now a wealth of data, research and other information available on Europe. This has allowed researchers to assess all OCA properties in great depth for all European countries. The US and Canada, but also other sovereign countries -- such as Australia and Germany -- are often used as a benchmark for comparison.

What are we trying to obtain from a review of these empirical studies? One is now struck by the very high number and diversity of studies making reference to the OCA theory, and trying to directly or indirectly provide some insights for the formation of currency areas. This section intends to find some common threads in these studies. It shows that the analysis of most OCA properties now goes deep into the features of the economy, as well as, the institutions of each country and the preferences and behaviours of economic agents. All OCA properties are now better defined and most have now an empirical content. Some OCA properties can even be looked at from different complementary perspectives (e.g., for financial integration). This analytical depth allows us to assess with more precision than ever before the extent by which some partner countries possess – and either share, or do not share – the OCA properties. We are also more aware now of the difficulties, nuisances, obstacles, and limitations in assessing each OCA property.

5.a Broad-Based Empirical Studies

This section surveys the performance of euro area countries – at the country-wide level - with respect to the optimum currency area properties discussed in Section 2.

¹³ There is also a rich empirical literature examining the suitability of other regions – such as Latin America, Far East Asia, and Sub-Saharan Africa -- to some forms of monetary integration (see diverse contributions by Eichengreen, Bayoumi, Artis, Kohler, Melitz, and others).

¹⁴ Some of the main steps of European integration include the European Steel and Coal Community of 1952, the Treaty of Rome of 1957, the adoption of common agricultural policy in 1965, the custom union established in 1968, the Single Market Programme launched in 1985, the Single European Act of 1986, the increase of shared competencies, the centralisation of several regulatory functions, the setting up of the European System of Central Banks with the ECB at its centre in June 1998 and the launch of a single monetary policy on 1 January 1999 (see Vanthoor (2000), Smets, Maes and Michielsen (2000), and Maes (2000) and references therein).

1. Price and wage flexibility. Price and wage flexibility could be the most useful in coping with disturbances in the very short-term. Concerning *price flexibility*, Eichengreen (1990) finds that real exchange rates within Europe have been more variable than those within US States by about three to four times. This is due, in large part, to nominal exchange rate variability and monetary “disturbances” in some countries. There is broad agreement that low wage flexibility is an important factor behind the lack of price flexibility in European countries. In addition, OECD (1999) and EU Commission (1998) find that price flexibility is hampered, albeit by different degrees across the euro area, by the slow implementation of the Single Market Programme (SMP), a slow dismantling of some non-tariff internal and external trade barriers, and continuing state aid to several sectors.¹⁵

Several recent studies establish a significant link between product and wage markets: and hence price and wage flexibility are inter-linked. Countries with more stringent product market regulations tend to have more restrictive employment protection legislation (OECD (2000)). Therefore, product market reforms can also be a catalyst for easing restrictive employment protection legislation. Such structural reforms would enhance competition, strengthening the links between wage and price flexibility allowing prices to adjust more rapidly in the wake of shocks. Hence, the drive to continue implementing the Single Market Programme will enhance both price and wage flexibility.

Concerning *wage flexibility*, despite significant progresses in recent years, real wages are still quite rigid across most European countries, albeit with notable differences. In general, the elasticity of nominal wages with respect to prices is higher in Europe than in the US (Bini-Smaghi and Vori (1992)). There is also a significantly slower speed of adjustment of real wages to economic shocks in continental Europe (OECD (1994)). Unemployment does eventually put some downward pressure on real wages in Europe, but a large share of the adjustment is borne by employment (OECD (1994)). But Cadiou, Guichard and Maurel (2001) find significant labour market asymmetries across EU countries and that overall the responsiveness of wages to unemployment rose in the 1990s.

The dominant view of the main factors behind the higher wage rigidity in Europe is that high and persistent levels of unemployment in most European countries are the result of the interaction of adverse shocks and labour market institutions including: wage bargaining arrangements, employment protection, unemployment insurance systems, and minimum wage provisions (see Blanchard (1999) and Blanchard and Wolfers (2000)). EU Commission (2000) and IMF (1999) provide supportive analysis of the above interaction as well. Several studies find a wide heterogeneity of European labour market institutions including, wage bargaining arrangements, measures of employment protection, the generosity of unemployment insurance systems, minimum wage provisions, and others (Nickell (1997), Layard and Nickell (1998), and OECD (1999)).

2. Labour market integration. Labour mobility could contribute to the adjustment in case of permanent shocks and when real wages are downward rigid. However, several studies have found that this mobility was two to three times higher in the US than in Europe (OECD

¹⁵ There is still low market competition and monopolistic tendencies in several sectors particularly those with a high concentration of State Owned Enterprises or of previous state monopolies. Electricity and communication are a case in point (ECB (2000) Structural Issue Report). Firms in protected and regulated sector are slow in adjusting their prices shifting the burden of adjustment in the wake of a shock to the more “open” and unregulated sectors in terms of slow inward pressure on prices, profitability, output and employment (OECD (1999)).

(1986) and (1999)).¹⁶ Eichengreen (1990b) found that the variation of unemployment in Europe was twice that of the United States, while its dispersion was four times higher in Europe than in the United States. Thomas (1995) noted significant differences between Europe and the United States in their responses to the unemployment rate to employment shock. In the US unemployment shocks that result from a fall in demand for goods and services produced in a particular region are not persistent. Due to a high degree of interregional migration of the labour force, the regional unemployment rate tends to return to its normal level (i.e., it shows no persistency). In Europe, however, changes in the unemployment rate tend to be persistent due to a low mobility of the labour force across countries. Bentolilla (1997)) found that the probability of moving is not (or only weakly) responsive to relative unemployment. Furthermore, the OECD (1999) noted that cross-country migration is an unlikely response to economic shocks in the euro area, and instead is motivated by other factors and is permanent. The economic incentives to move have weakened even further due to high overall levels of unemployment, income convergence and reduced wage differentials across countries (OECD (1999)). The process of economic catching up with more advanced economies has in fact narrowed the gap between wages and income per capita within the EU thereby reducing the incentives to migrate (Bentolilla (1997)).

Several factors help to explain low labour mobility in most EU countries. Bertola (1999) observes that quantity and price dimensions of labour market rigidity are inter-related and that lack of employment flexibility with wage rigidity reinforce each other. But there are also some specific social, cultural, and administrative determinants behind the low geographic mobility in Europe. Faini et al. (1997) noted inefficiencies in the inter-regional job matching process as well as high mobility costs. Blanchard questions whether the cultural and language barriers can ever disappear. Also, there are significant barriers in the housing markets across the EU. A panel of experts set up by the EU Commission in 1996 partly attributes low labour mobility to a combination of institutional and administrative factors including: limited cross border portability of social protection and supplementary pension rights; administrative difficulties and the high costs of gaining legal resident status; lack of comparability and reciprocal recognition of professional qualifications; and restrictions on public sector employment.

While labour mobility could ease the adjustment to permanent shocks, EMU will not be able to significantly benefit from this attribute in the immediate future. In any case, labour mobility is no panacea either: it would be in any case low in the very short run, but possibly higher in the medium- and long-term, and it entails reallocation and/or migration plus retraining costs that could be quite significant.

3. Factor market integration. Factor market integration can best cope with permanent shocks. Concerning productive capital, several studies show that cross-country foreign direct investments have become more relevant in the euro area. OECD (1999) shows that both inward and outward foreign direct investment (FDI) from other euro area countries have risen in almost all countries over the last 5 years. Also in the medium run FDI seem quite responsive to changes in regional economic conditions. Public procurement markets are still operating on a largely national basis. The EU Commission (1998) estimates that significant barriers to market access still remain in several sectors accounting for about half of EU GDP. In summary, foreign direct investment flows -- that are likely to be underestimated but are still modest in comparison with trade and other financial flows -- are on the rise and add up over time leading to an increase in the share of foreign owned assets and portfolio diversification that foster risk sharing.

¹⁶ OECD (1999) reports that only 5.5 million European Union citizens reside in another member state out of 370 million (or about 1.5 percent of the population, and half of the proportion for non-EU citizens). This ratio was actually higher in the 1950s and 60s when 10 million people migrated from Southern to Northern Europe. Hence, in some sense labour mobility has fallen in Europe (Bertola (1999)).

4. Financial market integration. The extent by which European countries are financially integrated is evaluated from diverse complementary angles including the intensity of financial flows (quantity tests), the law of one price (arbitrage tests), and similarity in financial structures. The common view is that financial integration is lower across Europe in comparison to the financial integration across US States, but that it is raising fast in several areas.

Concerning cross-border financial flows within Europe, mostly indirect measure can be gauged. Backus, Kehoe and Kydland (1992) find evidence of a low level of risk sharing by comparing cross-country GDP and consumption correlations. Sørensen and Yosha (1998) and Arreaza (1998) carry out cross-country variance decompositions of shocks to GDP and point to negligible risk sharing through cross-country ownership of assets. Tesar and Werner (1995) document a “home bias” in portfolio holdings (see also Obstfeld and Rogoff (2000)), and a host of authors have found evidence of low financial market integration in terms of cross-country ownership of assets. Bordo, Eichengreen and Kim (1998) show that the ratio of the current account balance over GDP, averaged across a number of countries, has increased somewhat since the mid-1960s but still remains below the levels seen from the mid-1870s to 1914. However, in volume terms gross financial flows are larger today than in the period before 1914. Encouragingly, Alesina, Angeloni and Etro (2001), and Gaspar and Mongelli (2001) find that the relation between current account balances and GDP per capita has risen in recent years across European countries indicating an increased importance of net financial flows. Liebermann (1998) finds evidence of higher cross-country insurance via capital markets during the period 1992-97 that indicates that capital markets in Europe are integrating.

There are clear indications that financial integration has risen in recent years in terms of fewer opportunities of arbitrage and smaller interest differentials. Several authors are observing an increasing degree of financial markets integration in terms of the law of one price (Issing (2000)). Money markets across the euro area integrated very rapidly after the introduction of the single currency, and yield differentials among euro area government bonds have converged markedly (see Gaspar and Mongelli (2000) and references therein).¹⁷ Chen and Knez (1995) develop an indicator which exploits the idea of absence of arbitrage opportunity to derive a necessary and sufficient condition for the law of one price to hold across two markets. Ayuso and Blanco (1999) apply a refined version of the method suggested by Chen and Knez to stock price data for the United States, Germany and Spain. Their finding suggests that, during the 1990s, there was an increase in financial market integration for these countries.

Concerning the similarity in financial structures, we can gauge some evidence from the studies of the monetary transmission mechanism (MTM) across euro area countries (Angeloni, Kashyap, Mojon, and Terlizzese (2001), Bean, Larsen and Nikolov (2001), Cecchetti (2001), and De Bondt (2000)). Such studies analyse and compare, amongst others, the financial structures of countries.¹⁸ They show that European countries display significant differences in terms of, amongst others, interest sensitivity of spending, maturity structure of

¹⁷ At the same time, Bordo, Eichengreen and Kim (1998) show that the degree of co-integration in financial prices around the world (i.e., the extent of interest rate equalization) is quite high across the world. Hence, it is not a European-specific phenomenon. Several caveats of such measurements are pointed out by Obstfeld (1994).

¹⁸ MTM studies investigate and compare financial structures and the relative impact of monetary policies. They provide some indirect insights also for the OCA question as differences in monetary transmission might have a bearing on the costs from sharing a single currency e.g., by engendering cyclical divergences (Clements, Kontolemis and Levy (2001)).

debt, net-worth of firms and household sectors, the legal structure, contract enforcement costs, the bank lending channel and the alternatives to bank financing. Such differences are likely to diminish only gradually over time. Issing (2000) asks whether the provision of financial services is opening to competition, within the local economy and from the outside. He finds that the convergence of average bid-ask spreads on comparable financial products that is an indirect indicator of the opening of local financial markets to competition has undoubtedly risen.

To what extent do differences in economic and financial structures really matter? A second strand of Monetary Policy Transmission studies analyses and compares the impact of monetary policies on output and inflation using a variety of methodologies. Peersman and Smets (2001) estimate a VAR system on synthetic euro area data from 1980 to 1998 to study the macro-economic effects of a monetary policy shock in the euro area. They find that the effects of a temporary rise in nominal and real short-term interest rate on the exchange rate, output and prices is very similar -- in terms of both time profile and intensity -- for the US economy and the euro area. Angeloni, Kashyap, Mojon, and Terlizzese (2001) draw on a recent research project applying similar VAR models and structural models to each euro area country and using a new data set for each of them to test for the MTM across them: they also find broad similarities in the monetary transmission in the euro area and the US although there are differences in the relative potencies of channels.¹⁹

*Deeper financial integration will play an increasingly important role in the adjustment to shocks. It would allow amongst others the “private risk sharing channel” to increasingly complement and over time even substitute the public risk sharing channel. Atkeson and Bayoumi (1993) emphasize that, to the extent that individuals protect themselves from regional fluctuations through geographic diversification of their investments and income, there is no need to have individual national governments pursue independent fiscal and monetary policies to smooth their own idiosyncratic fluctuations.

5. The degree of economic openness. Openness, as measured by the ratio of the export plus import of goods and services to GDP is quite high across all European countries: it ranges from about 40 percent in Spain, to over 150 percent in Luxembourg. Due to the process of price liberalisation, spurred also by the implementation of the Single Market program, and the deepening of industry trade (that is discussed below) prices of tradeables are becoming progressively more aligned across the EU.

Beck and Weber (2001) investigate the departure from the law of one price by applying a methodology similar to Engel and Rogers (1996) to a European data set. The monthly data used cover the aggregate CPI, 7 categories of goods and 81 locations in five different euro area countries from January 1991 to June 2000. Four Swiss locations are used as controls. Focusing on the volatility of relative price changes across locations the authors find that there has been a significant decline in the cross border volatility of relative prices since January 1999: when the single currency was introduced. Border effects have been reduced to 20% of pre-EMU levels, although distance and border effects are still significant post-EMU. Hence, the arbitrage tests might bear the signs of the introduction of a single currency faster than the quantity test.

¹⁹ However, Clements, Kontolemis and Levi (2001) find significant differences in transmission across euro area countries even after correcting for differences in monetary policy reaction functions prior to EMU. ECB (2000) finds a lack of statistically significant cross-country differences in the transmission mechanisms. Kieler and Saarenheimo (1998) note that very different results can be obtained for the same country using different methodologies. These differences are often larger than the differences that emerge using a given methodology across countries. In any case these studies are still fraught with several difficulties and the (Guiso, Kashyap, Panetta and Terlizzese (2000)).

One important aspect to take into consideration is that the euro area as a whole is more closed than each of its constituent countries. As such it compares with the US. There is also some concern that there will be trade diversion that will lead the euro area to become gradually less open to the outside (Fратиanni and Von Hagen (1990)). Anderton and Skudelny (2001) find some evidence that such diversion may in fact be taking place albeit at a small pace. This could reduce somewhat the degree of openness of the whole euro area.

6. The diversification in production and consumption. The diversification in production is high in most EU member countries. Bini-Smaghi and Vori (1992) find that "...in the manufacturing sector, on average, the difference between regional production structures [i.e., the diversification of the productive structure of each country] are much larger within the EU than within the United States." This difference amounts to only half the size of the difference that can be observed in the twelve U.S. Federal Reserve District. Consistently Krugman (1992) finds that the degree of specialization is larger in the United States than in Europe. Bini-Smaghi and Vori also find that the variance of the composition of output is twice as large in the US as that in the EU.

OECD (1999) examines the degree of similarity in the structure of consumption across EU/euro area countries. An index of similarity in consumption is compiled based on the correlations of various components of real consumption in each country. For euro area countries the benchmark is the euro area average. The results show a very high similarity in most countries except Spain. Furthermore, similarity in the structure of consumption has increased in virtually all EU countries. Hence, the members of the EU are less likely to be subject to asymmetric disturbances because they are still more homogenous than the US, i.e., they all produce a bit of everything and have similar consumption structures. For this reason, EU countries tend to behave more as a group than the 12 U.S. Federal Reserve districts.

7. Similarities of inflation rates. Inflation rates have gradually declined in all industrialised countries over the past 10-15 years, albeit at different paces. In the wake of Stage Three of EMU, inflation differentials have narrowed down within thin margins among all EU countries, and in particular euro area countries (EMI (1998) and ECB (1999)). However, inflation rates have since shown some national variations owing to differences in national economic condition. OECD (1999) argues that sustained, but not large, differences in inflation rates are acceptable provided that they reflect mostly a "catching-up" process. But there could also be some significant short-term differentials due to differences in the relative cyclical position or to tax changes.

ECB (1999) finds that the magnitude of inflation differentials in the US and the euro area are fairly similar and are attributable to three types of factors: 1) statistical and erratic factors (noise); 2) some deeper economic forces that are at work including the completion of the single market and the increase in cross-border transparency that is contributing to reducing differences in prices of traded goods, and also the Balassa-Samuelson effect that is leading to convergence of productivity and living standards; and 3) differences in cyclical conditions and demand policies. Rogoff (1996) reports two important findings of recent empirical studies: that real exchange rates tend toward PPP in the very long run but with quite a low speed of convergence (the half life of PPP deviations is 3 to 5 years); and that short run deviations from PPP are large and volatile. However, following Hasker and Wolf (1999) deviations from PPP may be bounded and there is threshold mean reversion ensuring that relative price remain within corridors determined by arbitrage costs.^{20 21}

²⁰ Reassuringly, OECD (1999) finds that there is no empirical evidence of sustained inflation differentials leading to permanent changes in relative consumer prices between regions in Australia (during 1956-1998) and Spain (during 1978 – 1998).

8. Fiscal integration. Fiscal integration has three main dimensions, including, the degree of fiscal convergence, the ability to absorb shocks through the operation of the fiscal stabilisers, and the public risk sharing feature. From the standpoint of *fiscal convergence*, one very evident achievement is that all euro area countries have satisfied the fiscal criteria of the Maastricht Treaty and are now complying with the Stability and Growth Pact. There is also some evidence of a deeper level of fiscal convergence. Fiscal positions are coming closer together due to economic integration that is fostering harmonisation in several areas of taxation, spending and fiscal legislation. De Bandt and Mongelli (2000) run contemporaneous cross-correlation, dispersion and cointegration tests using annual data over the 1970-98 period. Fiscal convergence among euro area countries is checked against developments in non-euro area EU countries and in selected OECD countries. They find evidence that for euro area countries cross-correlation has increased steadily over the 1970-98 period, while fiscal dispersion has been declining at a sustained pace among all countries in the sample. They also find a common euro area fiscal cycle for net lending across the euro area. However, idiosyncratic national components still contribute to a significant share of the variability of individual countries. These positive preliminary findings need to be qualified by the still important differences in levels of public indebtedness and fiscal structures.

Concerning *fiscal stabilization*, euro area countries would be able to withstand even severe economic disturbances affecting the budget once they have complied with the medium-term targets of Stability and Growth Pacts (Artis and Buti (2000)). These targets entail a balanced budget or even a fiscal surplus in order to satisfy the SGP "in good times and bad times" (Eichengreen and Wyplosz (1998) and Buti, Franco and Ongena (1998)). If automatic fiscal stabilisers work in the wake of adverse shocks, the need for real exchange rate adjustments is somewhat reduced and, on the other hand, also the need for supranational transfers. Last, to undertake truly autonomous fiscal policies, over and beyond stabilisation, each country may need to build some additional fiscal cushion that will require some additional efforts.

The third dimension of fiscal integration, is the *public risk sharing facility* provided by a supranational budget, such as a federal government. This entity can increase transfers to a region or state, and reduce its receipts from the same region or state, thereby absorbing a share of the "regional" shock. Sachs and Sala-i-Martin (1991) analyze the role of the U.S. federal government in insulating its states against regional income shocks. According to their estimates, between 22 and 33 percent of the initial shock is absorbed, respectively, by the federal tax system and federal grants-in-aid. These adjustments are triggered automatically by a region's decline in personal income. Von Hagen (1991) disputes the magnitude of these findings on the ground that taxes are levied in proportion of the levels of income and not its changes. Using a different methodology to examine the inter-state stabilization role of the U.S. federal government, Atkeson and Bayoumi (1993) find that U.S. fiscal policy is able to offset up to a 13 percent of variation in relative personal income. OECD (1999) notes several studies arguing that a significant share of risk sharing transfers perform instead a

²¹ Caves, Frankel, and Jones (1990) maintain that the complete convergence of the price structures of tradables across the EU is delayed by the following factors: "(1) transportation costs create a band in which prices can fluctuate before arbitrage becomes profitable; (2) prices of non-traded goods and services cannot be arbitrated internationally; (3) imperfect information, contract, inertia in consumer habits, and so forth renders elasticities lower in the short run than in the long run. This low degree of substitutability allows prices to be 'sticky' and allows large deviations from purchasing power parity (PPP) in the short run, without inducing large scale arbitrage." The recent literature maintains that neither the law of one price nor the PPP hold at a point in time. Among the culprits, the literature has cited market segmentation, large trading frictions, optimal price setting behaviour by multinational enterprises, menu and adjustment costs, expected permanence of costs, fixed entry costs and pricing to market, and the role of distribution networks (Rogoff (1996)).

redistributive role. Whatever the effective magnitude of risk sharing, such a facility takes in any case away part of the burden of counter-cyclical policies from the US State fiscal authorities. The latter is a non-negligible aspect given that most US States are subject to even tighter fiscal constraints than euro area countries as shown by Von Hagen. Bini-Smaghi and Vori (1992) find that some smaller and more homogeneous monetary unions, such as Switzerland, Belgium, and Luxembourg, have been able to function proficiently with a very limited federal budget. However, in countries with a public risk sharing facility, the latter has contributed to reducing the disadvantages for regions or states of tying exchange rates.

- The euro area is proceeding without this facility but is very attentive in securing that the national automatic stabilisers can be used fully while complying with the Stability and Growth Pact.
- In addition, EMU members will have to rely almost entirely on their own resources and on the operation of other adjustment channels in the wake of shocks including the wealth, deflation, and price and wage channels. Consequently, fiscal discipline will be even more crucial in the EMU than in most other monetary unions. In addition, other forms of adaptability to counter shocks will need to be strengthened.
- However, if asymmetric shocks will become more likely and more intense, for example due to the operation of the Krugman concentration hypothesis, the lack of a supranational shock- absorbing facility may be significant.

9. Political integration. The early OCA literature highlighted the importance of political will and similarity of policy preferences. The events of the last decades have demonstrated that a strong political will has indeed supported the continuing advancement in European integration (a chronology is in Vanthoor (2000)). In a study of six currency unions Cohen (1993) finds that, in the successful one, political criteria have dominated economic ones. Political will fosters, amongst others, compliance with joint commitments, sustains co-operation on various economic policies, and encourages more institutional linkages. Differences in policy preferences across EU countries – and particularly euro area countries -- have narrowed down: otherwise it would have been very difficult for many countries to satisfy the Maastricht convergence criteria. Gaspar and Mongelli (2001) argue that the stabilisation of inflation, budget deficits, and exchange rates across the current euro area countries reveals a clear preference for monetary unification. Hence, given the original proposition of this property by Mintz (1970) and Haberler (1970), all euro area countries have satisfied it. But is that sufficient to claim that political integration has been achieved? A tentative answer hinges on what we now mean by political integration.

At present, the single European currency is shared by a group of sovereign countries that do not form a single European state. Furthermore, the euro area is not likely to become a single state in the traditional sense in the very near future. This is a unique situation that requires that political integration is assessed against a different benchmark (Issing (2001) and Padoa-Schioppa (2000)). There are at least three aspects to be considered.²²

The first aspect is the increasing *functional political integration*. Diverse areas of government have already come closer together. The EU Council (that is an inter-governmental body) and the European Parliament are the European Union's supranational legislators. They are also fostering the harmonisation in several areas of member countries national laws. The European Commission contributes to initiating common policies and, inter

²² In addition, the functions of States are also changing under the pressure of globalisation, deeper economic and financial integration and interdependence, and the increasing role of knowledge (Leonard (1999)). Padoa-Schioppa (2000) observes that the European Union brings to an end the absolute economic power of the nation state, although it does not cancel its role altogether. However, OECD (1999) observes that the allocation role, the income redistribution and stabilisation functions, and growth promotion and employment role have not been transferred at the supranational level.

alia, vigilates on the implementation of EU supranational laws and regulations. The European Court of Justice gives unity to European Law. There is also an enhanced system of multilateral surveillance and binding budgetary commitments. This architecture is described, amongst others, by Simon (1998). Hence, EU member countries already share some elements of a common supranational constitutional framework. The effective power that these institutions hold vis-a-vis national states is not easy to assess.²³ Hence, functional political integration may only deepen over time as the legal and regulatory framework is harmonised further and a common European view and identity emerges.

The second aspect is that euro area countries have *transferred sovereignty over several elements of their economic policy*. Monetary and exchange rate policies are now centralised. Monetary policy has been relinquished to the European System of Central Banks (ESCB), with the ECB at its centre. Exchange rate policy has been relinquished to the ESCB and the EU Council that jointly decide on the overall framework within which exchange rate policy must be conducted. The ECB is instead solely responsible for holding and managing foreign exchange reserves and for conducting foreign exchange operations. Microeconomic policies are also to a large extent centralised by the European Union in the areas concerning the single market, competition, and trade policies (OECD (1999)).²⁴ All euro area countries still set their national fiscal policies, but must do so within the margins allowed by the provisions of the Stability and Growth Pact (SGP) and the Excessive Deficit Procedures therein. An annual Stability Programme, containing the budgetary objectives, must be submitted every year. National governments must also adhere to the Broad Economic Policy Guidelines (BEPG) that are endorsed annually (since 1998) by the EU Council. The BEPG also contain country-specific recommendations on both macroeconomic and structural policies.

The third aspect of political integration pertains to the *increased need for policy co-ordination* that is justified on the basis of increasing policy spillovers between countries, the presence of economies of scale and indivisibilities for some functions, and the possible welfare benefits from risk pooling. The challenge in the EU/EMU context emanates from the institutional set-up of a single euro area monetary policy and of several national non-monetary policies which have in turn a problem of co-ordination between themselves (Bini Smaghi and Casini).²⁵ Co-ordination across the EU/euro area includes multilateral surveillance and frequent exchange of views on country specific and euro area developments and policies in the context of several supranational forums including ECOFIN, the EFC and the EPC (Bini Smaghi and Casini (2000) and ECB (2000)). There are also frequent consultations and mutual participation in the working of the main supranational institutions of the EU, and various forms of collaboration on specific initiatives and joint rule making.

²³ The new literature on political economics, reviewed by Persson and Tabellini (2000), is highlighting the role of incentives and trade-offs for economic agents and politicians in the formation of policies and the working of political institutions. In the end it must be the voters and the politicians that will need to take a pan-European view of economic policies.

²⁴ There are also targeted structural initiatives, such as, the EU-wide benchmarking of industrial performance and the co-ordination of several research efforts. The Luxembourg Process (1997) on employment policies envisages the adoption of Employment Guidelines by the EU, and the submission of National Action Plans for employment by the member states. The Cardiff Process (1998) on structural reforms envisages annual reports on reforms in products and capital markets. The Cologne Process (1999) envisages a macroeconomic dialogue aimed at the reduction of unemployment. The Lisbon strategy (2000) is aimed at economic and social reforms. Immigration, health protection, some cultural matters, environmental issues, and security matters are also areas in which some form of harmonisation or common initiative have been undertaken.

²⁵ The commitment problem is solved in terms of pre-commitments strategies that attribute clear objectives to the monetary and fiscal authorities (Persson and Tabellini (1995)). The independence of the ECB is enshrined in the Treaty and the price stability objective of the ECB is clearly formulated (ECB (1999a)). The objectives of national fiscal policies may instead differ to some extent across countries. But as seen below, each member country is bestowed with a set of fiscal rules.

*Hence, euro area countries have transferred a significant share of their national sovereignty to the EU supranational bodies and to inter-governmental forums. On one hand the room of manoeuvre to conduct truly autonomous national economic policies is narrower than before EMU. On the other hand each member country gains a better view, and could have a bigger say, in the policies undertaken by its partners. Padoa-Schioppa (2000) maintains that the current policy architecture of the EU and the European System of Central Banks possesses many elements of state-formation and amounts to a partial political union. Partial because some major deficiencies persist, as for example: the inability of setting competencies and defining the political agenda particularly in the area of internal and external security, the limited application of the majority principle, and the lack of a significant European “federal” budget similar to the one in places in the US to help cushioning State-specific shocks. At the same time, the current lack of a supranational federal risk-sharing arrangement across the euro area is mitigated by the higher proclivity to symmetric shocks (due to the high degree of diversification), and the strengthening of the private risk sharing through financial markets.²⁶

Some observations on the broad-based empirical studies

a. The survey of these broad-based empirical studies shows that the basic “pioneering” intuitions of the optimum currency area theory were remarkably strong: in fact we still discuss all these properties. They have withstood the demise of the Bretton Woods regime and the move to a managed floating exchange rate arrangement: the loss of momentum toward European monetary integration during part of the 70s and 80s; a host of exchange rate arrangements (most notably aimed at pegging European currencies from end-70s); and various theoretical and empirical advances in economics.

b. The assessment of some OCA properties has now become much more articulated – and sophisticated -- than ever before. There is now some deep analysis available on the institutional and non-institutional factors behind each OCA property. We now can pretty much tell why, and to what extent certain properties are shared, or not shared.

c. At the same time there is a new added challenge for the OCA theory: to reconcile the empirical evidence about several properties. Financial market integration is a case in point. It can be looked at from several complementary facets, including amongst others: the liberalisation and harmonisation of the legal and regulatory financial framework, similarities in financial structures, the effective financial flows, interest rate equalization, the cross-country-ownership of assets, the risk sharing, the financing of actual current account imbalances, and the “fading” of home bias. The above discussion shows that the final interpretation of the effective degree of financial market integration is not so straightforward.

5.b “Shocking” Studies of OCA

In the late 1980s and early 1990s the debate on similarities of shocks -- i.e. the extent by which partner countries intending to adopt a single currency endure symmetric versus asymmetric shocks -- acquired great prominence. This was the result of advancements in

²⁶ The latter is a very open debate. In any case, the common component of euro area shocks can be addressed by co-ordinated policy responses. A crucial issue here is the significance of this common component: if it becomes more significant over time as integration deepens and business cycles become more synchronised, the lack of a “federalistic” risk sharing arrangement could be endured more easily. Furthermore, risk sharing can also be provided by private financial markets (Atkeson and Bayoumi (1993)). This aspect is discussed further in Section 5.c.

econometric techniques by Blanchard and Quah (1989) and other authors, and various contributions by Eichengreen and Bayoumi, alone, jointly, or in combination with other authors.²⁷ The main argument underlying the techniques goes as follows. If the incidence of supply and demand shocks and the speed with which the economy adjusts – taking into consideration also the policy responses to shocks – are similar across partner countries, then the need for policy autonomy is reduced and the net benefits from adopting a single currency might be higher. Hence, the similarity of shocks, and policy responses to shocks, is almost a “catch all” property, or “*meta*” property, capturing the interaction between several other properties.²⁸ Masson and Taylor (1992) note that shock absorption combines the influence of several OCA properties. A detailed taxonomy of shocks is in Emerson et al (1992), OECD (1999), De Grauwe (2000), and references therein. A discussion on the use of stochastic simulations of macroeconomic models to gauge the nature of shocks is in Tavlas (1994).

Blanchard and Quah (1989) propose instead a structural vector-autoregression approach to identify aggregate supply and demand disturbances and to distinguish them from subsequent policy responses. This innovation permits to more accurately measure and compare asymmetric shocks across countries. Bayoumi and Eichengreen (1992, 1994 and 1996) estimate bivariate auto-regressions for output and prices restricting demand disturbances to effect only prices in the long run while allowing supply disturbances to have long-run effects on both prices and output. In particular, they find a positive correlations between the fundamental shocks in Austria, Germany, Denmark, France, the Benelux countries and Switzerland, while the correlation between these countries and the southern countries is weaker. These authors also find that these correlations are a little below the correlations of disturbances between the eight Bureau of Economic Analysis regions of the US.

Funke (1995) finds instead significantly higher correlation among supply disturbances to German Landers than to the above “core” EU countries. The above results lead Bayoumi and Eichengreen (1996) to observe that the jury remains out on whether the observed correlation of disturbances within existing monetary unions seems encouraging for EMU. Demertzis, Hallett and Rummel (2000) find some evidence of overall symmetry of shocks between European countries. However, the correlation of shocks is stronger within a core group (including Austria, France, Germany, Belgium, the Netherland, Denmark, and Luxembourg) and a periphery group (including the UK, Greece, Ireland, Portugal, Spain, Italy, Finland, and Sweden). Furthermore, there is more symmetry on the demand side -- due largely to policy interventions -- than on the supply side or for the “monetary shocks.” The authors also find that few policies have been directed to the supply side and that country-specific shocks have dissimilar sizes. The observed symmetry is largely attributable to demand policies -- rather than to a convergence in the underlying economic structures. Hence, Demertzis, Hallett and Rummel conclude that EMU seems to be held together largely by policy makers. Several other studies in this area are reviewed by Tavlas (1994).

²⁷ In the early empirical OCA literature, asymmetric shocks were assessed on the basis of the variability of a real exchange rate and/or relative prices (e.g., in Boltho (1990)) or of output (Cohen and Wyplosz (1989)). The drawback of these approaches is that they reflect shifts in both demand and supply affecting one country/region relative to another without differentiating between them.

²⁸ For example: diversified and open economies are likely to endure more differentiated and, possibly, smaller unit shocks; to the extent that shocks do strike, price and wage flexibility could immediately ease adjustment; if the above flexibility is not sufficient and resources are still left idle after the shock, a high mobility of factors of production (including labour) also eases the adjustment process (but would require some more time); while the economy is on the path to a new equilibrium (if the shock is long-lasting) a high degree of financial market integration can foster the private wealth channel and smooth the adjustment process (but not replace it), all along national economic policies which also play a role in responding to shocks (e.g. through the fiscal lever) but could greatly differ across countries in terms of timing, strength and execution. This could in turn produce dissimilar responses to shocks even if the original shock was identical across partner countries.

Some observations on the shocking studies of OCA

a. Tavlas (1994) notes that the results of the shocking studies are ambiguous and often in conflict. There is no concurrence on the theoretical underpinning of the tests, e.g., on the relationship between exchange rate variability, trade and investment. Argy and De Grauwe (1990) regret the difficulty in constructing measures of future shocks. There is no account of the Lucas critique and the changes in structures due to changes in policy regimes. Several authors mention here a “disciplining effect” on policy-makers as well as the effects of market liberalisation.

b. The diverse shocking studies of OCA lead to the drawing of narrower borders for European monetary integration, i.e., the “core group,” than other type of studies. Due to the need for relatively long time series for econometric tests, these studies cannot reflect a progress under some properties, such as a change in policy preferences accompanying a fall in inflation differentials, in the more recent part of the sample period.

c. Despite their limitations, shocking studies of OCA do provide a useful benchmark of comparisons across many countries whose economic and financial structures would be otherwise difficult to summarise. Such studies complement and challenge the other OCA studies. Some additional “shocking studies” focussing on regional developments within sovereign countries are reviewed in Section 5.d.

5.c Looking Ahead: Specialization Versus Endogeneity of OCA

Empirical studies investigating whether a group of partner countries should integrate monetarily are by necessity backward looking. The OCA properties are in fact assessed on the basis of past information. At the same time, monetary integration represents a structural break for any group of countries, and the single currency will affect all economic and financial areas and the policy decision-making process. A question naturally arises: *what type of forces will monetary integration unleash over and beyond other types of integration such as the implementation of the Single Market Program?* Looking ahead, we may be confronted with at least two distinct paradigms with quite different implications for future economic and financial developments in the currency area and the benefits and costs from sharing a single currency. The first paradigm could be identified as the “*Krugman specialisation hypothesis*,” that postulates increasing specialisation and possibly greater exposure to asymmetric shocks. The second paradigm is the “*endogeneity of OCA hypothesis*” that postulates that countries adopting a single currency are more likely to become more integrated. Both hypotheses have strong underpinnings.

The “Krugman specialisation hypothesis”

This hypothesis is based upon the “Lessons of Massachusetts” i.e., the observation of the economic developments experienced by the US over the last century (Krugman (1993) and Krugman and Venables (1996)). The hypothesis is rooted in trade theory, as the single currency will allow to exploit economies of scale, and the new literature on economic geography, that postulates a U-shaped relation between integration and geographic concentration. In this literature, very high and very low trading costs favour dispersion of production (see Ricci (1999), Wolfmayr-Schnitzer (1999) and references therein). To illustrate the working of this hypothesis we assume initially some significant trading costs that the introduction of the single currency will contribute to reduce both directly and indirectly. An example of the first are exchange rate risks (and the cost of hedging) plus information costs. But the single currency could also speed up the implementation of the Single Market

Program and spur transparency, competition, as well as the removal of diverse obstacles to trade. This will in turn lead to a reduction of transportation and transaction costs.²⁹

When trading costs fall and obstacles to trade fade, firms will be encouraged to exploit increasing returns by relocating and thereby altering the industrial structure. Krugman (1991a), (1991b), and (1992), Bertola (1993), and Rauch (1994) argue that at this stage any external economy leading to increasing return will produce a concentration of some industries in any country that enjoys even a small advantage over the others.³⁰ There could be for example a split between "central" (or "core") regions in which the access to the largest share of the area's common market is optimal, or peripheral regions in which the local market is smaller and access to the whole market of the area is worse.

If parts of the activities of a region (or even an entire country) indeed relocate to a more central and profitable region (or country), the degree of national specialization is raised with a consequent drop in diversification. Similarly, when the activities of a region have to close down due to their inability to compete, the level of economic activity falls and the degree of specialization raises as well. Consequently, the industrial structures of the EMU members might become increasingly more differentiated. The common view is that the direction of the concentration process is likely to move from the periphery to the center of the EMU. To the extent that monetary integration might expedite industry concentration and eventually national specialization, a "common" shock to a specific sector or industry will asymmetrically affect the countries in which that industry is located. This will in turn lead to more asymmetric output fluctuations. Over time as transportation and transaction costs continue to fall even further, the above trend may slowdown or even be reversed for some industries (Krugman and Venables (1996) and Ricci (1999)).

Although we name this hypothesis after Krugman, there are other authors investigating this hypothesis including Eichengreen (1993), and Eichengreen and Bayoumi (1996). Kalemli-Ozcan, Sørensen and Yosha (2001a) provide empirical evidence that private risk sharing enhances specialisation in production. More integrated, inter-regional and international financial markets allow regions and countries to insure against idiosyncratic shocks, permitting them to reap the gains from specialisation. Kalemli-Ozcan, Sørensen and Yosha (2001b) then find that regions with a more specialised production structure exhibit output fluctuations that are less correlated with those of other regions.

Eichengreen (1996) compares the developments of 8 industrial sectors across Europe and the US States and reports an increase in specialisation in Europe and a fall in the US. The EU Commission (1999) finds in its 1999 report on the competitiveness report of European industries (p. 29) that an apparent paradox is unfolding: there is evidence of rising specialisation but declining concentration. EU countries are becoming more specialised by focusing on the activities in which they are comparatively stronger, while industries are becoming less concentrated (i.e., industries are becoming more distributed across countries). "Although most countries were specialising more in what they do best, this did not lead to increased concentration of industries because the smaller countries (which tend to account for the smaller share in any particular industry) have grown more rapidly than the larger countries."

²⁹ The single currency will not affect other trading costs such as differences in conventions, languages, and legal systems.

³⁰ "At the theoretical level, if increasing returns to scale are as important as recent models of endogenous growth suggest, and if they may be exploited along geographical dimensions as well as over time, then removal of obstacles to factor reallocation may well lead to concentration of production and growth in privileged regions....Geographic concentration of production and growth may indeed be necessary to exploit the scale economies made possible by economic integration" Bertola (1993).

Some observations on the “Krugman concentration hypothesis”

- a. The “Krugman specialisation hypothesis” has a bearing on the costs from monetary integration. If countries become more specialised and vulnerable to asymmetric shocks, and output fluctuations start diverging, then each member country might feel a higher cost from the loss of the direct control over its nominal exchange rate and national monetary policy.
- b. How rapidly could the specialisation hypothesis display its effects in Europe? Its intensity and speed will depend on a variety of factors including, amongst others, the availability of human capital and knowledge-related variables, R&D expenditure, product cycles, the share of intra- and inter-industry trade, the effective mobility of factors of production including labour, as well as cultural, linguistic, and other historical barriers. Specialisation could be expedited by the implementation of the single market programme and the cut back of state subsidies and various privileges for national enterprises.
- c. The fear that monetary integration might lead to concentration of industries and higher exposure of European countries to idiosyncratic shocks is currently quite low. The “core” of Europe seem not to be strengthening at the expense of the “periphery.” If we actually believe in the U-shaped relationship between integration and geographic concentration, the EU Commission (1999) report postulates that the future may be brighter for peripheral countries with the periphery catching up in several indicators (such as exports and research-intensive industries).
- d. Nevertheless the EU Commission (1999) notes the short time period of its study (1988-98) and the need to complement these preliminary findings by some further analysis. Furthermore, another relevant aspect is that the specialisation hypothesis applies to manufacturing whose economic role is receding in every industrialised country due to a growing role of services that are less prone to concentration.

The “hypothesis of endogeneity of OCA”

The intuition behind the hypothesis of endogeneity of OCA is that monetary integration reduces trading costs beyond the elimination of the costs from exchange rate volatility (that can be to some extent hedged). A common currency among partner countries is seen as “a much more serious and durable commitment” (McCallum (1995)). Amongst others, it precludes future competitive devaluation, fosters trade and financial integration, facilitates foreign direct investment and the building of long-term relationships, and might over time encourage forms of political integration. This will in turn promote economic and financial integration and even business cycle synchronisation among the countries sharing the single currency. Taken to an extreme this paradigm suggests that a group of countries adopting a single currency might develop into an “optimum currency area” *ex-post* even if they don’t constitute one *ex-ante* (Rose (2000) and Frankel and Rose (1998, 2000)).

McCallum (1995) and Helliwell (1998) find that Canadian provinces are 12 to 20 times more likely to trade with each other than with US states. Engel and Rogers (1995) conclude that crossing the border between the US and Canada had an impact, on relative price volatility, equivalent to an addition of, at least, 1780 miles, to the distance between cities. Engel and Rogers (1996) also found that taken exchange rate volatility into account reduced, but did not eliminate the border effect. This literature suggests that the potential for deeper economic integration are very large and apply even to countries such as the US and Canada.

Rose (2000) finds a large positive effect of a currency union on international trade, and a small negative effect of exchange rate volatility. By using a gravity model on a panel

covering 186 countries during 1970-1990, Rose finds that countries sharing the same currency trade three times as much as they would with different currencies.³¹ Frankel and Rose (2000) extend the framework of Rose (2000) and use a panel covering 200 countries plus dependencies. Their main findings are that: currency union more than triples trade among partner countries; the ratio of trade to output falls by 0.2 % for every 1 % increase in size (hence, larger countries are relatively more self-sufficient); there is no evidence of trade diversion; and every 1 % increase in trade – to GDP ratio raises income per capita by about 1/3 of a percent over a 20-year period. These findings are robust to the inclusion of linguistic, historical and political links.

Rose and Van Wincoop (2001) postulate that EMU would spur intra euro area trade by more than 50%, that is a smaller estimate than in the previous papers. Frankel and Rose (2000) explore first the link between currency unification and trade and then the link between trade and growth. Their intuition is that scale is important for an economy. Scale can be attained through the extension of the area of political unity or through trade. From their empirical results they find that the potential benefits from currency unions on growth (through trade) are large. An earlier study also by Frankel and Rose (1996) had found a strong positive relationship between the intensity of bilateral trade and the correlation of business cycle: hence, greater integration had resulted in more synchronised cycles..³² Trade theory explains the positive effect of trade on growth by means of increasing returns to scale, a role for trade in imperfect substitutes, and by endogenous technology.

Some qualifications are due. Commenting on Frankel and Rose, Quah (2000) notes that the partition in the sample is skewed against the hypotheses being tested: less than 1 % of the total sample is in the single-currency group. Hence, inferences are made on the basis of very few observations. Furthermore, these observations are, for various reasons, unrepresentative of most of the real-world economies. According to van Wincoop (2000) these results are exaggerated as they focus on trade flows from the viewpoint of the smaller economy. Recent research by Melitz (2001) and Persson (2001) argues for lower estimates. However the minimum point estimate (from Persson) still estimates a 13 per cent increase in trade from currency unification with a preferred estimate of around 40 per cent. Melitz's estimates are higher.

Fontagné and Freudenberg (1999) emphasize the importance of product differentiation in international trade: intra-industry trade can occur in horizontally differentiated goods (two-way trade in varieties) as well as in vertically differentiated goods (two-way trade in qualities).³³ The former type of intra-industry trade fosters more diversified economies and symmetric shocks (Kenen (1969)), and the endogeneity of OCA paradigm. The latter type is instead characterised by differences in research and development contents and skills that lie beneath products which can have differentiated qualities. This type of intra-industry trade not necessarily guarantees the symmetry of shocks and could foster greater specialisation (i.e., it would support the Krugman specialisation hypothesis). Fontagné and

³¹ Rose (2000), and other authors in the past such as Tinbergen (1962), were inspired by the gravity model from physics. Translated into economics attraction is trade, mass is GDP and distance is distance. Trading costs are converted into distance: i.e., higher trading costs are equivalent to a greater distance. In this context national money are seen as a barrier to trade entailing higher trading costs.

³² That study uses a panel of thirty years of data from twenty industrialised countries. These findings hold up to several de-trending techniques, various measures of the regressand and the regressor, an instrumental variable estimation, and other sensitivity analysis including controlling for the exchange rate regime and for global oil price shocks.

³³ Intra-industry and inter-industry trade are classified on the basis of overlap and the threshold is chosen at the level of 10 % by the authors (e.g., the minority export flow must be at least that share of the majority import flow). Horizontal differentiation then occurs if import and export unit values differ by less than 15 % for a given product and for a given country.

Freudenberg find that the elimination of exchange rate variability fosters intra-industry trade and raises its share above that of inter-industry trade. Since the share of horizontally differentiated goods (two-way trade in varieties) raises more than proportionately symmetry in shocks should increase with EMU.

Some more qualifications are due. Alesina, Spolaore and Wacziarg (2000) analyse the relation between economic size and openness, and the effects of both on growth. Economic size influences productivity allowing larger political units to attain higher incomes than smaller ones. In the absence of size, trade permits countries to attain economies of scale and higher income levels. However, the product of the two variables is shown to have a negative effect on growth: “the more you have of one, the less you need of the other.” There are important counter-balancing factors at work that tend to limit the size of political units. An increase in size through economic growth leads to diminishing returns and congestion effects. Public goods can instead be more efficiently supplied by smaller political units. When a geographic unit, such as a currency area, becomes too large the advantages of monetary independence will outweigh the advantages of fixed exchange rates with the partners.

Last, what effect could monetary integration have on relative prices and hence real exchange rates? Beck and Weber (2001) use consumer price data for 81 European cities (in Germany, Austria, Switzerland, Italy, Spain and Portugal) to study the effects of German and European Economic and Monetary Union (EMU) on both intra-national and international relative price volatility. They find that the elimination of nominal exchange rate volatility during EMU has largely reduced cross-borders real exchange rate volatility (by roughly 80 percent). However, distance and national borders still have a positive and significant impact on relative price volatility even in EMU.

Some observations on the hypothesis of endogeneity of OCA

a. The findings of this strand of literature are quite significant and seemingly robust to various sensitivity analyses, and yet we know still so little about their causality. Frankel and Rose, as well as several other authors, including Rodrik (1994), Helpman (1988) and Bradford and Chekwin (1993) raise the issue of simultaneity between trade and growth, and argue that causality may run from investment to growth and then to exports, rather than the other way around. Frankel and Rose see this problem as largely an intractable one from the standpoint of the analytical framework adopted in their paper. They also confide in the instrumental variables technique and the gravity model to reduce the simultaneity problem.

b. EMU has the character of a collective endeavour both from an institutional and economic standpoint. There is a “core” of countries that could pull towards it the “peripheral” ones. It would be interesting to see this hypothesis tested in a more detailed model. Furthermore, the trade-channel should be operating in addition to other channels such as the nominal anchor effect (i.e. monetary discipline).

c. A relevant question at present in Europe is whether countries are in a currency union because they trade a lot, or start trading more because they are in a currency union. Incidentally, the extent of trade diversion is also a critical aspect in such investigation that if confirmed would lead to presume that the currency area will also become progressively more closed. Some measures of the timing and size of these effects are also relevant.

d. The endogeneity debate is not confined to the above two hypotheses. Several authors including Artis and Zhang (1997 and 1998), Buti and Suardi (2000) and others argue that the process of gradual monetary integration has had a significant “disciplining effect” on participating countries which has led to an increasing synchronisation of their business cycles (and in their economic symmetries). The same has happened for inflation in countries with a

poor track record in maintaining low inflation after “anchoring” themselves to low inflation countries. Issing (2001) discusses the endogeneity of political integration, and Blanchard and Wolfers (2000) discuss the endogeneity of labour market institutions.

5.d Studies investigating developments within sovereign countries

Studies of “regions” within sovereign countries – such as the US States, German Länders, Spanish provinces, and Italian regions -- have received a lot of attention in recent years. Such regions lack the nominal devaluation option that is a privilege of sovereign countries. Several questions arise: is labour mobility higher within European countries than between them? How are shocks distributed across regions and countries? Are real exchange rate more variable within European countries than between them? What adjustment mechanisms do regions have?

Blanchard and Katz (1992) study of the evolution of “regional” (i.e. State) labour markets in the United States, opened a new chapter in the investigation of labour market adjustments. Using data for the US they find that during 1950-90 US states have experienced large and sustained differences in employment growth rates, while unemployment rates have exhibited a low degree of persistence and tended to return to their historical averages relatively quickly after a shock. At the same time wages have exhibited a tendency to converge over time across US States: implying that wage flexibility has overall contributed very modestly to the adjustment to labour market shocks. In addition, the response of job creation to movements in wages is rather weak, a phenomenon that could also be due to downward nominal wage rigidity in the wake of adverse shocks. Labour force participation shows a high persistence. Instead, inter-state migration plays a crucial role in the adjustment to shocks. Furthermore, it is movements of firms that trigger movements of workers.

Decressin and Fatás (1993) adapt the framework of Blanchard and Katz (1992) to Europe. They find that only 20% of changes in regional employment are common to all European regions, whereas in the US 60% of these changes are common to all US states. The dispersion of changes in employment is also lower in the US. Differences in relative unemployment rates between regions are more persistent in Europe than in the US, with regional relative unemployment rates returning to their means more rapidly in Europe than in the US. Furthermore, up to one half of the total variance in regional employment growth rates remain unexplained by both national as well as European factors. Decressin and Fatás then investigate how shocks to regional labour demand are absorbed. The main difference between the US and Europe stems from the different roles played by labour force participation and migration. In the US net immigration accounts for 52% of the increase in regional employment from the first year onwards, whereas in Europe it is only after the third year that immigration accounts for a similar proportion of the rise in employment. The reverse holds for labour force participation that in Europe accounts for 78% of the rise in employment in the first year and 50% in the second, whereas the respective figures for the US are respectively 18% and 17%. Hence, there is greater heterogeneity among European regions than among US states.

De Grauwe and Vanhaverbeke (1991) find a higher degree of inter-regional labour mobility in northern European countries (including Germany, the UK and France) than in Southern European countries (like Spain and Italy). No comparison is drawn with the US in this study. Decressin and Fatás (1993) find that employment in US states responds much faster to employment conditions in the whole US than employment in individual European regions respond to employment in Europe as a whole. Viñals and Jimeno (1996) estimate a model of regional unemployment in which unemployment is decomposed into region-specific constants, and regional, national and EU-wide random components. They find that regional

specific factors explain almost two thirds of the conditional variance of European sub-national unemployment.

Decressin and Fatás (1993) show that shocks are distributed less symmetrically in Europe with a higher proportion of region-specific shocks. Forni and Reichlin (1997) apply an unobserved index model to detect the role of EU, national and regional factors in the fluctuation of regional growth of real output. Regional shocks are found to play a significant role in Europe, albeit smaller than in Viñals and Jimeno's study of regional unemployment. An interesting finding by Forni and Reichlin is that when they search for a European "core" – i.e. a group of regions in which at least 70% of output variance stems from EU factors – all major countries have regions outside of it. Spain and Italy, that are generally deemed to be peripheral countries, have instead important regions in the European core.

Bayoumi and MacDonald (1998) find no evidence of mean reversion in regional relative prices in Canada and the US over the past 30 years. Instead, OECD (1999) finds that there is no empirical evidence of sustained inflation differentials leading to permanent changes in relative consumer prices between regions in Australia (during 1956-1998) and Spain (during 1978 – 1998). Inflation ranged from a low of 1% to a high of about 3% per year in Australia and almost 4% in Spain. Alberola and Tyrväinen (1998) extend the Belassa-Samuelson model and estimate that, based on historic trends in productivity and wages, sustained inflation differentials of up to 2 percentage points could manifest itself between the more and less advanced euro economies. De Grauwe and Venhaverbeke (1991) find that real exchange rates (i.e., relative prices) were significantly less variable within European countries than between them.

Atkeson and Bayoumi (1993), Bayoumi and Klein (1997) and Crucini (1999) all find that financial market integration is significantly larger within countries than across countries. This allows countries more risk sharing across their regions, than is possible internationally. Asdrubali, Sorensen and Yosha (1996) looked at channels of interstate risk sharing in the US. They focused on shocks to gross state product. They 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. That is financial markets and institutions in the US contribute with 62% to the absorption of state idiosyncratic shocks. The effect is five times more important than the federal budget.

Some observations on the studies investigating regional developments

- a. When shocks occur in Europe, inter-regional migration, both within and between countries, is not substantial, particularly in the short run. Even worse, labour mobility has fallen in Europe with respect to the 1950's and 60s (Bertola (1999)).
- b. EMU is more likely to reduce relative price volatility and real exchange volatility. This is consistent with the already cited paper by Beck and Weber (2001) that monetary integration greatly reduced cross-borders real exchange rate volatility across some selected European sites.
- c. Very importantly, integration is proceeding at a higher pace between some regions of different European countries. Several studies show that the most industrialised regions of France, Germany, Italy, Spain, and northern Europe in general, enjoy a high level of reciprocal trade in goods and services, and high factor market integration. Labour mobility is low even within this relatively homogeneous pan-European "core".

d. As European countries do not have an inter-state transfer system -- e.g., through a supranational budget -- and exhibit very low labour mobility, securing high wage flexibility will be fundamental to foster adjustments in relative shocks (Blanchard and Katz (1992)).

e. This suggests that financial market integration may eventually lead to stronger international risk sharing in the euro area through the functioning of financial markets and institutions.

6. Some Concluding Remarks

This paper has provided an excursion into the four main phases of the OCA theory. In addition to the observations following each section, we have the following remarks.

40 years have passed since the founding of the optimum currency area theory. The views on most OCA properties have greatly evolved. However, the basic “pioneering” intuitions and motivations of the optimum currency area theory were remarkably strong. The basic question posed by Mundell, Kenen, McKinnon, Corden and the other OCA pioneers and early contributors are is still very relevant today. In fact, we continue to discuss all OCA properties including price and wage flexibility, labour mobility, factor market and financial integration, economic openness and diversification, and others. At the same time, studies of the OCA properties have become very comprehensive and technically sophisticated, and the analytical framework behind the OCA theory has greatly changed.

Concerning the analytical framework, the early OCA theory had some important weaknesses in its underpinnings that have now been amended. The pioneering authors had a stabilisation framework in mind and believed that, at least in the short run: flexible exchange rates could foster adjustment of relative wages and prices in the wake of stickiness and other rigidities; provide a less costly way of correcting current account imbalances; and allow to pursue independent macroeconomic policies. This framework crumbled and there are few doubts at present about the fine tuning fallacy, the fundamental role of credibility, and there is a patrimony of knowledge on the benefits of low and stable inflation.

Have all these theoretical and empirical advancements rendered the OCA theory any simpler? Yes and no. There is still no simple OCA-test with a clear-cut scoring card. On one hand, we are in a *better position* now than 15-20 years ago in many respects. All OCA properties can now be discussed in much greater detail than ever before. We can discuss to great length the features of economic and legal institutions, as well as the preferences and behaviour of agents, the incentives of policy-makers, and so forth. We can be much more precise in comparing the extent by which a group of countries contemplating a single currency shares, or does not share, such OCA properties.

On the other hand, we are in a somewhat *harder position* now because new advancements in micro- and macro-economics show that the response of agents to economic changes and the policy regime -- and monetary integration such as EMU is a major change in regime-- is conditioned in a complex way by the institutional environment in which they operate. We can gain some important insights by studying the OCA properties in great detail. But we can still face the “*problem of inconclusiveness*,” as OCA properties may point in different directions, or a “*problem of inconsistency*,” if candidates for a currency area were supposed to satisfy, or not satisfy, different OCA properties given their characteristics.

One common trait of most OCA studies is that they are largely backward looking. Some authors believe instead that the OCA test could be satisfied *ex post* even if it is not fully satisfied *ex ante*: hence, the borders of new currency areas could be drawn even larger. This possibility is causing both excitement and misbelief. On one hand, there is compelling

empirical evidence that removing “borders” and sharing a currency is a powerful magnet for deeper trade and overall integration. On the other hand, could any set of countries join and just wait for the deepening of integration to take place almost automatically and thereby obtain the gains from a single currency? This paper claims instead that all OCA properties play a role and interact with each other. Furthermore, it will take a long time for the wide heterogeneity in terms of institutions and economic structures to gradually diminish. The alternative to the endogeneity of OCA paradigm is that industrial concentration and national specialisation may prevail. This would lead to a decline in diversification. This latter paradigm has also strong theoretical and empirical support.

The perception of the benefits and costs from monetary integration has greatly changed since the pioneering contribution on OCA theory. There are more benefits (e.g., due to credibility gains for some members and a greater international role of the single currency) and some of the perceived costs are smaller than previously thought (because independent macro-economic policies are a myth due to the “fine-tuning fallacy”). Correspondingly monetary integration is likely to produce more net benefits for a larger group of countries: this may explain why the euro area now has more members than would have seemed possible 15-20 years ago.

To complicate matters much further some recent empirical studies of OCA now span the supra-national, national and sub-national levels. The analysis of regional developments within sovereign countries (that are OCAs by definitions) show that there are several similarities, but more problematical dissimilarities, between the euro area and sovereign countries (i.e., already established OCAs). In addition, some authors fear that business cycles may become more synchronised at the level of the euro area, but more differentiated within sovereign countries.

All the open issues and qualifications should not detract from the achievements and merits of the OCA theory. To put the contribution of the OCA theory in some context we have distinguished between the “*OCA question*” and the “*EMU question*.” The OCA theory has provided guidance for the EMU question, but it cannot answer it completely. Yet there has been a tremendous complementarity between the two questions (even if those dealing with the second have often felt hopeless in applying the OCA theory). The merit of the OCA theory is to have catalysed an enormous amount of research on monetary integration although we are still far away from a unified theory in this field. The European process of economic, monetary and political integration has instead been a phenomenal catalyst for a host of empirical research on optimum currency area. The insights of these applied studies have, as seen, contributed to amendments of the analytical framework of the OCA theory. Hopefully other regions will be able to benefit from the lessons from EMU.

What is EMU telling us thus far? The experience thus far with EMU opens a new hindsight (perspective) on the cost side. Countries, faring poorly on the same OCA property – e.g., because they share similar structural rigidities -- could seek common solutions to their rigidity. An example for the EU/euro area is the increased degree of co-ordination of structural reforms aimed at enhancing labour and product market flexibility and adaptability. A case in point is the new co-ordinated EU employment strategy that was first established in 1997 with the, so called, “Luxembourg Process”. This strategy is based on annual Employment Guidelines (EG) and a set of country specific recommendations.

Is the current lack of a public risk-sharing arrangement detrimental for EMU? In other terms, will the fact that the EU/euro area does not have a federal budget akin to the one in place in the US and that allows to absorb parts of US States-specific shocks a significant cost? Due to the rather high degree of economic diversification it is not clear if in the immediate future the euro area should set up a public risk sharing facility to face asymmetric shocks. Perhaps only if country-specific asymmetric shocks deepen. There is also a deepening

of private risk sharing through financial market integration by two main channels: income insurance when residents of a region can hold claims to output in other regions, and borrowing and lending on inter-regional, or international, financial markets. The funds so available far exceed any conceivable public risk sharing.

If the Krugman specialisation hypothesis prevails over time, the prospect of greater national specialisation and increasing asymmetries of business cycles could be quite worrisome for a young currency area. This would also revert or weaken some OCA properties, such as diversification in production and consumption. However, such changes -- that are not corroborated by the empirical evidence -- would eventually operate through some *slow channels*. On the other hand there are some other *faster channels* that are rapidly gaining ground, including: financial market integration that could strengthen private risk sharing through portfolio diversification and easier borrowing and lending across the currency area; and price and wage flexibility that could be enhanced by increased transparency, competition and structural reforms. These faster channels would permit a more effective absorption of idiosyncratic shock and ease permanent adjustments. Hence, EMU has eventually the means to reduce the costs from greater national specialisation and asymmetries of business cycles faster than these costs may actually arise.

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