2 The Theory of Optimum Currency Areas: A Literature Review

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Abstract

This paper reviews some of the most important contributions to the theory of optimum currency areas. The first part reviews traditional contributions, while the second part reviews modern views on the optimum currency areas theory. Even though many additional criteria have been introduced in this modern phase, traditional contributions are still relevant. Some of the most important criteria include labour mobility, price and wage flexibility, degree of openness, product diversification, inflation differentials, effectiveness of monetary policy, correlation and variation of shocks, character of shocks and political factors. If, for example, potential members of a common currency area do have labour force that is mobile, sufficient price and wage flexibility, a high degree of openness, similar inflation rates and political will to abandon their own currency and adopt a new one, then the common monetary policy can be a benefit to all members and therefore the usefulness of nominal exchange rate adjustments within members is reduced.

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1 Introduction

The theory of optimum currency areas (OCA) explores the criteria as well as the costs and benefits of entering/forming a common currency area. In addition, the OCA theory can be viewed as a tool for finding an answer to the question on how to choose the optimum exchange rate regime. It should be mentioned, however, that there is no widely accepted algorithm or index to indicate unambiguously should a country join a currency area or not. In fact, there is no standard theory of optimum currency areas, but rather several approaches that have been inspired by Mundell's (1961) seminal paper.

This paper tries to summarise and clarify the most important contributions to the OCA theory. The theory has evolved in a couple of phases, which the paper tries to capture. The second chapter surveys early contributions to the theory of optimum currency areas, while the third chapter gives an insight into modern views. The last chapter concludes.

2 Traditional contributions

In the early 1950s, the most influential paper regarding exchange rates was "The Case for Flexible Exchange Rates" (Friedman, 1953) and most of the debate was on the pros and cons of flexible exchange rates. That time was characterised by the Bretton Woods exchange rate regime (which included pegged but adjustable exchange rates) and capital controls, enforced by many countries. So, even though some papers about the choice of the exchange rate regime already existed (for example, Friedman, 1953 and Meade, 1957), the first time that someone used the phrase optimum currency area was Mundell (1961), when he published his seminal paper entitled "A Theory of Optimum Currency Areas". This was also the first time someone had suggested that a currency area should be a region, whose borders need not necessarily coincide with state borders. He tried to answer the questions on when countries should have their own currencies and what the appropriate domain of a common currency area is. At that time, this was more of an academic question since it

was hard to imagine that the national currency would be abandoned in favour of some other regime. But nowadays, especially since the European Union embarked on a monetary unification process, the OCA theory has got a new impulse.

Mundell (1961) emphasised the *factor mobility*, especially the *labour mobility*, as a crucial criterion in forming an OCA.[1] He argued that if the exchange rate regime within a region causes unemployment in one part of the region, or if it forces another part of the same region to accept inflation as the cure for unemployment, then this regime is not optimal. Regarding that, Mundell says, "The optimum currency area is not the world" (1961, p. 659). Further, if there is a shift in demand for products of region A towards region B and if there are price and wage rigidities, this will cause inflationary pressures in region B and unemployment in region A. If those regions have a fixed exchange rate, then another adjustment mechanism is needed to restore equilibrium. Mundell stressed labour mobility as the mechanism that may bring the balance of payments back into equilibrium. If there is a high labour mobility, then labour from region A will move to region B, so there will be no more unemployment or inflation pressures and there will be no need for having their own exchange rates, but one common monetary policy will be satisfactory to both of them.[2]

Therefore, Mundell says that if there is high degree of labour mobility within a region, then that region should have a fixed exchange rate within its borders and flexible exchange rate with the rest of the world. But if there is internal labour immobility, it does not matter what regime the respective country has.[3]

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[1] *Further discussion about labour mobility can be found, for example, in Lanyi (1969), Grubel (1970), Giersch (1973) and Tower and Willet (1976).*

[2] *In the real world there is often a problem of different languages and different cultures. So even if the restrictions with respect to labour mobility are eliminated, the above mentioned problems may reduce further integration.*

[3] *Mundell (1961) uses geographical terms in order to show this. In his example Canada and USA have their own currencies, but the continent is also divided into two regions, which are not defined by national borders but as a group of producers that produce only homogeneous products – the East, which produces products such as cars and the West, which produces products such as lumber. The assumption is that there is a flexible exchange rate between Canada and USA and that an increase in productivity in the car industry causes an excess demand for lumber products and an excess supply of cars. The result of this shift is unemployment in the East and inflation pressure in the West. In order to resolve unemployment in the East, central banks in both*

Mundell (1961) also emphasises the importance of price and wage flexibility as mechanisms to cope with idiosyncratic demand shocks. Hence, if labour mobility or price and wage flexibility is present in an economy (region), there is no need for changes in its exchange rate.

Mundell's paper has been highly cited through the years but it has also drawn criticism, which helped develop the theory further. McKinnon (1963), unlike Mundell (1961), distinguishes factor mobility in two distinct senses – as geographic factor mobility among regions (which Mundell had in mind) and factor mobility among industries. McKinnon considers a case of factor immobility between regions (each region has its own specialised industries), where it is difficult to distinguish geographical and inter-industrial immobility. If there is a negative demand shock affecting region B, then demand for B-type product falls. If region B can develop A-type products, for which there is increasing demand, the need for factor movement between regions will not be great. However, if region B cannot develop A-type products, factor movements from region B to region A can serve as an adjustment mechanism to prevent a fall of income in region B. But, McKinnon as well as Mundell concludes that if there is factor mobility between regions, then those regions should form a common currency area.

A few years later, Kenen (1969) deepened the point of factor mobility. He points out that "When regions are defined by their activities, not geographically or politically, perfect interregional labour mobility requires perfect occupational mobility. And this can only come about when labour is homogenous (or the several regions belonging to a single currency area display very similar skill requirements). In consequence, Mundell's approach leads to the sad certainty that the optimum currency area has to be small. It must,

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countries would have to expand national money supplies, while to prevent inflation in the West, they would need to reduce the national money supplies! And meanwhile, the exchange rate between Canada and USA would move in order to preserve equilibrium in the national balance of payments. Hence, unemployment in both countries can be prevented but only at the expense of inflation, or else inflation in both countries can be prevented at the expense of unemployment, or the burden of adjustment can be shared between regions with some unemployment in the East and some inflation in the West. So, the exchange rate regime does not serve as an adjustment mechanism of the balance of payments between regions, although it does between countries. And hence, a flexible exchange rate regime is not necessarily preferable to a common currency or national currencies connected by fixed exchange rates.

indeed, be coextensive with the single-product region" (Kenen, 1969, p. 44). But Mundell is aware of this problem when he says that "Such an arrangement hardly appeals to common sense" (Mundell, 1961, p. 662). Besides that, Kenen poses a question about the likelihood that factor mobility can restore a perfect balance of payments in a region's trade even when it does settle employment problems. Kenen (1969) also finds another objection to Mundell's paper. He argues that Mundell's regions cannot be found on any geographic map, but instead one must use input-output tables.

The second important contributor to the OCA theory is McKinnon (1963), who emphasised the *degree of openness* as a crucial criterion in forming the OCA and defines it as the ratio of tradables to non-tradables.[4] He argues that the more the economy is open the more arguments there are for having a fixed exchange rate. And if the economy is rather closed, a flexible exchange rate is more advantageous. The reason for this is that when there is a higher degree of openness in the economy, the likelihood that foreign prices of tradables will be transmitted to the domestic cost of living is higher. This effect would cause the reduction of money illusion, so that wage contracts and prices will be highly influenced by the exchange rate. So, changes in the exchange rate would cause adjustments in those variables, implying that changes in the exchange rate are less efficient in changing the terms of trade and less useful as an adjustment mechanism. Hence, a small open economy would find it advantageous to join a larger common currency area.[5] In order to resolve balance of payments problems in the economies with a high ratio of tradables to non-tradables, McKinnon (1963) suggests that those economies should rely more on alternative instruments, for example, on the fiscal policy.

The third important contributor to the OCA theory is Kenen (1969), who introduced *product diversification* as an important criterion. Since he believes

[4] McKinnon was not the only one who emphasised openness criterion. Suggested further reading includes Whitman (1967) and Giersch (1970, 1973).

[5] The smaller the economy, the more open it is likely to be. It is often inefficient for a small economy to produce all it needs, so it is more advantageous to engage in foreign trade and produce only those goods in which it has a comparative advantage. On the other hand, a large economy is more self-sufficient and usually, only a smaller part of its GDP is engaged in foreign trade. Hence, changes in the exchange rate influence only a smaller part of its economy.

that a perfect labour mobility rarely exists, he thought of a new criterion to determine should the economy have a fixed exchange rate (or join a currency union) or a flexible exchange rate. Kenen (1969, p. 49) argues, "...diversity in a nation's product mix, the number of single-product regions contained in a single country, may be more relevant than labour mobility." An example of how diversification criterion works could be the following. If a country is not diversified and produces only one product which it also exports, then if there is a negative demand shock affecting its exports, the economy's export revenue will fall. This fall in revenues can be attenuated by a flexible exchange rate because a fall in demand for export products will reduce the demand for domestic currency, and in turn cause a depreciation of the exchange rate. The exchange rate depreciation improves export revenues due to the fact that for every unit of foreign currency the exporter now gets more domestic currency. If the economy has a fixed exchange rate, this mechanism cannot be exploited and adjustment should be done through a reduction of wages and prices or though increased unemployment.

To further his point of view, Kenen (1969) argues that a well-diversified economy also has a diversified export sector. And each of the industries in the economy can be subject to some kind of a shock. If those shocks are uncorrelated, a positive shock in one industry and a negative shock in another industry would result in the cancellation effect on the total export, making it more stable (however, there should be adequate occupational mobility to absorb idle labour and capital[6]). Of course, if the economy is hit by some macroeconomic disturbance, then the whole export sector will be affected and diversification will not help. Or in Kenen's words (1969, p. 49): "... a well-diversified national economy will not have to undergo changes in its terms of trade as often as a single-product national economy." So, economies that are sufficiently diversified could tolerate small costs of abandonment of their national exchange rates and benefit from a single currency.

Still, diversified economies are usually large economies that are more self-sufficient than small economies and hence have a smaller export sector. Since

[6] *McKinnon (1963) also emphasised occupational mobility.*

their export sector is smaller, changes in the exchange rate have an impact only on a smaller part of the economy and that eventually produces a smaller overall effect. So, one could say that smaller economies that are less diversified have to be more open in order to be able to import goods that they need and export goods in order to acquire money to pay for their imports. Hence, Kenen's diversification criterion can be transformed into McKinnon's openness criterion.

Kenen (1969) mentions one more important viewpoint. He says that if a diverse shock hit a common currency area, fiscal integration between regions can mitigate the impact through fiscal transfers between regions.

Even though Mundell (1961), McKinnon (1963) and Kenen (1969) are considered to be the most important authors from the traditional phase, a few more authors who contributed to the OCA theory also deserve to be mentioned. This second wave includes Corden (1972), Mundell (1973), Ishiyama (1975) and Tower and Willet (1976). Also, in Ishiyama (1975) and Tower and Willet (1976) there is extensive review of the then known OCA literature. The second wave of contributors broadly analysed existing OCA criteria, while also introducing new insights into the theory.

Corden (1972), who defines a currency area as a complete exchange-rate union[7], argues that joining a common currency area with a group of partner countries causes a loss of direct control over the monetary policy and exchange rate. The loss is important if one believes that the monetary policy is effective, at least in the short-run. This means that if the country is hit by a negative demand shock, it is unable to use the monetary and exchange rate policy in order to facilitate the adjustment of relative wages and prices, so any adjustment has to be conducted through increased unemployment, reduction of nominal wages and prices or through fiscal policy (or some other expenditure absorption policy) restrictions. So, Corden considers wage and

[7] *More precisely in his words, a currency area is "an area within which exchange rates bear a permanently fixed relationship to each other even though the rates may - incision - vary relative to non union currencies", and one which is characterised by "the permanent absence of all exchange controls, whether for current account or capital transactions, within the area".*

price flexibility the most important criteria in forming a common currency area because they can respond faster to asymmetric shocks.[8] He also points out that, if countries have different inflation rate preferences, formation of a common currency area can be costly.[9]

On the other hand, Mundell (1973) still advocates factor mobility but this time he argues that if a common currency area is financially integrated, symmetric shocks inside the area, even though desirable, are no longer a firm precondition. He stresses the need to promote asset diversification for international risk sharing.[10] This means that regions in the common currency area that is affected by asymmetric shock are not hit by the asymmetric shock as severely as they could be as both regions hold claims on each other's output.[11] This is an important assumption because financial capital moves much more easily than physical capital and labour. Besides that, Mundell (1973) argues that forming a common currency area will lower the demand for international reserves and in doing so it, will generate a seignorage gain for the countries in the area.

Ishiyama (1975) was one of the first to acknowledge that there should not be only one criterion in determining OCA; he also proposed that it is in the interest of each country to evaluate the costs and benefits of entering a common currency area. Also, he identifies other criteria to consider, such as differences in inflation rates and wage increases among the countries forming the common currency area that result from different social preferences.

Tower and Willet (1976) suggested that inclusion of new criteria shows power of OCA analysis, not as a specific theory but as an approach focusing on the factors that influence the relative costs and benefits of fixed and flexible exchange rates for each individual country. Among others, they explore further

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[8] *Similar argument can be found in Fleming (1971). Fleming also stressed the importance of similarities in inflation rates when countries decide to form a currency area.*

[9] *See also Giersch (1973) and De Grauwe (1975).*

[10] *Mundell also includes vivid examples in order to support his standpoint.*

[11] *This could only work in Arrow-Debreu economies and not only in the financially integrated economies. More on this issue can be found in Obstfeld and Rogoff (1996) and McKinnon (2001).*

the impact of the usefulness of money in joining a common currency area and conclude that (1976, p. 3) "...joining a currency area will generally enhance the usefulness of money, but that the importance of this consideration will be greater the smaller and more open is the economy in question. Moreover, this is also true of effects on the efficiency of resource allocation and on each of the various functions of money - its usefulness as a medium of exchange, unit of account, store of value, and standard of deferred payments." Further, they focus on the use of discretionary macroeconomic policy and show that entrance in the currency area constrains the use of discretionary macroeconomic policy in achieving internal balance.

3 Modern views on the OCA theory

After the initial impulse in the 1960s and the first half of 1970s, it could be said that there was a slowdown in research about the optimum currency areas. Most likely, the reason was a lack of practical examples of monetary unification, especially in the developed world. But the theory had its rebirth in the 1990s in the birth of the European Monetary Union, when more and more researchers became interested again in the OCA theory.[12] Many of them had in mind a large experiment that was about to happen and new insights were needed in order to find out if the European Union is, as a matter of fact, an optimum currency area. Beside developments on the international monetary scene, Tavlas (1993) cited another important factor in the revival of interest in the OCA theory and that is the developments in macro theory. In his words, "These developments have allowed the original optimum-currency-area approach to be cast in a new light". As there was progress in economic research, the OCA theory had also to be revised. De Grauwe (1992) calls these new theoretical developments the "new" theory of optimum currency areas.

The difference between traditional and modern view is that traditionalists emphasised more potential costs, while the modern view is more prone point

[12] *As Tavlas (1993, p. 663)) says: „ The theory of optimum currency areas is back." Tavlas' paper is also one of the most influential survey papers on OCA theory.*

to the benefits of common currency areas. One of the first works in the 1990s to emphasise the benefits of a common currency area is "One Market, One Money" Report (Commission of the European Communities, 1990) in which authors realise potential problems, but do not hesitate to recommend further monetary integration nevertheless.[13]

There are many issues that the "new" theory of optimum currency areas deals with but following issues will be explored in this section: effectiveness of monetary policy, credibility of monetary policy, endogeneity vs. specialisation hypothesis of optimum currency areas, correlation and variation of shocks, character of shocks, effectiveness of exchange rate adjustments, labour market institutions, synchronisation of business cycles and political factors.

A good start in explaining those issues is to see what recent literature has said about the *effectiveness of monetary policy*. Corden (1972) argued that joining a currency area causes a loss of direct control over the monetary policy and exchange rate. Some new views have amended this judgement. Alesina, Barro and Tenreyero (2002) argue that the costs of giving up monetary independence are the lower the higher the association of shocks between countries becomes. But Mélitz (1991) points out that if countries are confronted with identical shocks, they might need different policy responses to such shocks due to differences in their initial economic positions. Calvo and Reinhart (2002) represent something that was later named the "fear of floating" literature. Both the two of them and others emphasise that if a country is unable to use the monetary policy adequately, the loss of monetary policy will not be a significant cost.

Calvo and Reinhart's (2002) conclusion follows from *discretion vs. credibility literature*. Pioneering papers in the area of discretion vs. credibility were written by Kydland and Prescott (1977), and Barro and Gordon (1983).[14] The idea of

[13] *Rather than introducing new criteria, they used tools of economic analysis in order to foresee the potential benefits.*

[14] *They focus on the consequences of discretion vs. credibility within one economy and Calvo and Reinhart use an open economy model to show that emerging market economies often harbour a fear of floating.*

discretion vs. credibility literature is the following.[15] Monetary authorities that promise to maintain a low inflation rate can play games with private agents, who set their expectations about inflation in the next period and form wage contracts according to those expectations. It is then very tempting for monetary authorities to cheat by raising inflation unexpectedly in order to reduce unemployment along a short-run Phillips curve. But this can be done only once as private agents learn fast about this strategy, so they will incorporate the information in their inflation expectations for the next period. So a discretionary decision of monetary authorities will result in higher inflation in the future, at the same rate of unemployment. What then can monetary authorities do to curb inflation? They need to acquire credibility for low inflation so that private agents believe they will not try to cheat again. Or, the country may adopt a totally credible fixed exchange rate regime[16] or join a common currency area to eliminate the inflation bias problem. If a country is trying to disinflate, then joining common currency area with lower inflation will not cause a problem of different inflation rates preferences, since both countries will share the same low inflation goal. And as Gandolfo (1992) claims, the similarities of inflation rates might have resulted from joining the common currency area, but they are not a necessary precondition.

A special issue has arisen in recent years and that is the *endogeneity vs. specialisation* hypothesis. As Frankel and Rose (1997) point out, theory shows that increased trade in common currency area can cause either increased industrial specialisation between regions in the goods in which they have comparative advantage, leading to asynchronous business cycles resulting in industry specific shocks, or else increased trade may result in increased correlation between their business cycles if common demand shocks prevail or if intra-industry trade accounts for most of the trade. Their standpoint is the latter one and they argue that international trade patterns and international

[15] De Grauwe (2003) also introduces geometric interpretation of the Barro-Gordon model, and offers a simple explanation and examples.

[16] Even though one could claim that since fixed exchange rates are not irrevocably fixed, they lack perfect credibility. As Alesina, Barro and Tenreyro (2002) point out, fixed exchange rates can create instability in financial markets and since currency unions are more costly to break than a promise to maintain a fixed exchange rate, the currency adoption is a more credible option.

business cycle correlations are endogenous, so it represents a simple application of the famous Lucas critique.[17] Figures 1 and 2 help explain these issues.[18] The downward sloping OCA line indicates that the advantages of adopting a common currency depend positively on the extent of trade and income correlation between countries. So if countries trade a lot between them and/or have a high income correlation, they might find it advantageous to form a currency union. Subsequently, we would find them above the OCA line in Figure 1. Frankel and Rose (1997) also point out that it is not possible to consider openness (degree of integration) and income correlation separately since the correlation of business cycles across countries depends on trade integration. Frankel (1999) notes that the endogeneity of OCA criteria means that some parameters such as openness and income correlation are not irrevocably fixed, but instead they can change over time in response to the countries' fundamental policies and to exogenous factors. That means that even if prospective candidates for currency area are at the moment below the OCA line, once they join the currency area further trade integration will increase the income correlation and countries will move up and to the right in Figure 1, crossing the OCA line. This indicates that those countries could satisfy the OCA criteria ex post, even though they did not ex ante.

Another view[19] tries to demonstrate that when countries increase their trade integration, the specialisation effect will be more pronounced so the respective countries will specialise in the production of those goods in which they have a comparative advantage. That, in turn, will reduce the income correlation and move the countries away from the OCA line. This is shown in Figure 2[20] and means that the countries could fail in satisfying the OCA criteria ex post, even though they did not ex ante.

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[17] According to the Lucas Critique, a prediction based on historical data would be invalid if some policy change alters the relationship between relevant variables. If the policy change alters the relationship between the variables, then the historical relationship between the variables would differ in the future relationship.

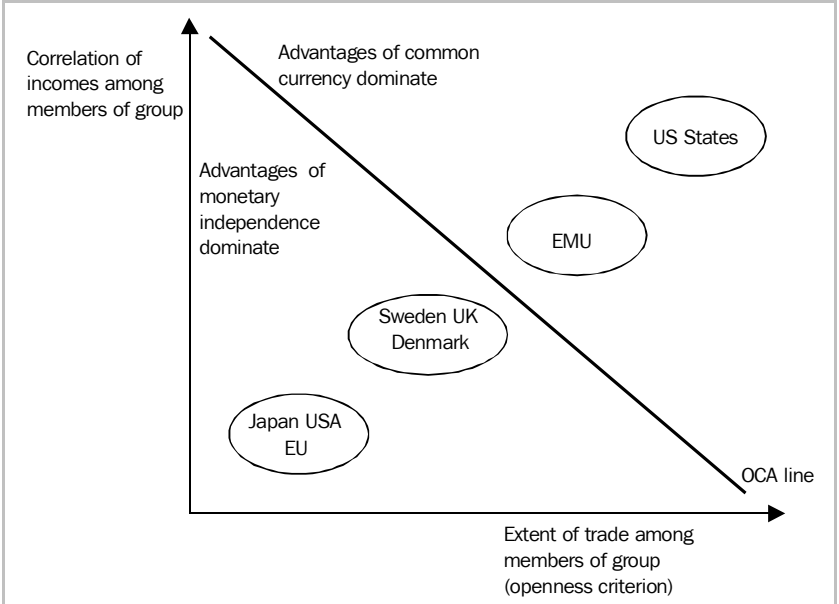
[18] Similar figures can be found in Frankel and Rose (1997), Frankel (1999) and De Grauwe and Mongelli (2004), among others.

[19] Represented by Krugman (1993), Bayoumi and Eichengreen (1992), and Bayoumi and Eichengreen (1996), among others.

[20] Frankel (1999) notes that the correlation function is steeper than the OCA line since if there is disagreement about the slope of the line, the line must be relatively steep.

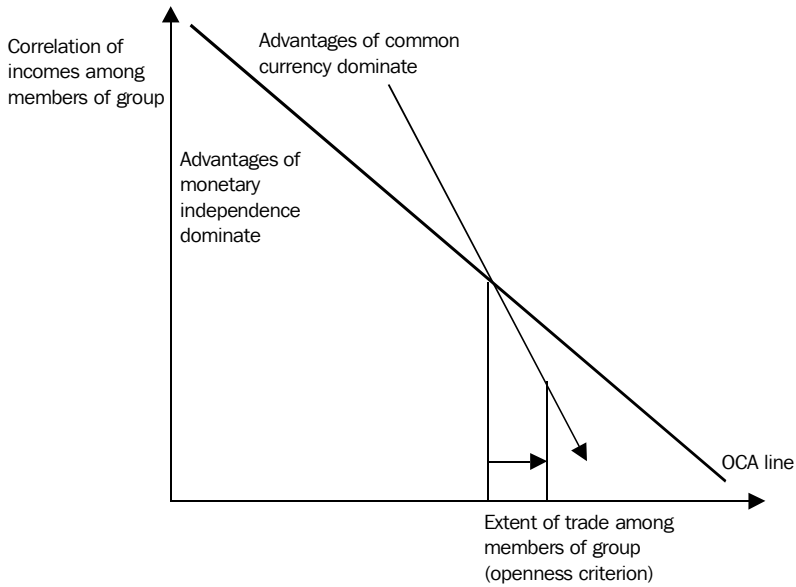
However, there are some wider views on endogeneity problem. Mongelli (2002, p. 31) points out that "... the 'endogeneity of OCA' paradigm should be interpreted in a broader sense. Endogeneity is in fact associated with a large amount of progress under many OCA properties that are indispensable to sustain monetary unification. Such progress does not always seem linear and is often the 'crowning' of previous stages. Hence, the endogeneity of OCA debate should not be confined to just trade integration and income correlation." In that sense, De Grauwe and Mongelli (2004) focus on the endogeneity of economic integration, the endogeneity of financial integration, the endogeneity of symmetry of shocks and the endogeneity of product and labour market flexibility; Blanchard and Wolfers (2000) point out the endogeneity of labour market institutions and Issing (2001) points out the endogeneity of political integration.

Figure 1 **Openness, income correlation and OCA line**



Source: Author (based on Frankel and Rose, 1997, Frankel, 1999 and De Grauwe and Mongelli, 2004).

Figure 2 **Krugman's specialisation effect**



Source: Author (based on Frankel and Rose, 1997, Frankel, 1999 and De Grauwe and Mongelli, 2004).

Regarding the *stabilisation policies and correlation of shocks*, Alesina, Barro and Tenreyro (2002) argue that costs of loosing independent monetary policy are lower the higher the association of shocks between the client (potential member of currency area) and the anchor are. In their words (p. 7) "The more the shocks are related the more the policy selected by the anchor will be appropriate for the client as well. What turns out to matter is not the correlation of shocks, per se, but rather the variance of the client country's output expressed as a ratio to the anchor country's output. This variance depends partly on the correlation of output (and, hence, of underlying shocks) and partly on the individual variance of outputs. For example, a small country's output may be highly correlated with that in the United States. But if the small country's variance of output is much greater than that of the United States, then the U.S. monetary policy will still be inappropriate for the client."

On the other hand, Berger, Jensen and Schjelderup (2001) are asking a different question: are symmetric shocks really that important? They propose a relatively simple model that challenges traditional flexibility vs. credibility view of exchange rate choice. They use purchasing power parity and standard one period model of credibility problems in monetary policy like Kydland and Prescott (1977) or Barro and Gordon (1983). In their model private agents in a small country set their expectations for inflation early on in the period, before shocks are observed. After observing shocks, the authorities steer the monetary policy so as to counter the adverse effects.

The model was developed later so it is clear how the degree and direction of correlation between shocks that spill over from the anchor country and domestic-born shocks in the pegging country impact the domestic economy. They derive three basic conclusions. First, they show that negatively correlated shocks strengthen the case for fixing the exchange rate. Secondly, they show that increase in the standard deviation of shocks unambiguously weakens the case for a fixed exchange rate if and only if correlation of shocks is non-negative. Lastly, one of the features of the model is a proxy for nominal rigidities. This proxy shows the extent to which nominal shocks have real effects. They use previous empirical as well as theoretical research[21] showing that, after adopting a peg, nominal rigidities become more profound. That fact together with negatively correlated shocks allows them to show that, indeed, there are flexibility gains after pegging.

In determining whether to enter a common currency area, several more issues are important to consider. Buiter (1995) develops a model for forming a currency area[22] in which he distinguishes the *character of shocks* affecting the economy. The nominal exchange rate flexibility in adjustment to real shocks has a significant impact, but that is not the case when it comes to financial shocks[23]. If monetary shocks dominate, a fixed exchange rate provides more

[21] *See for example Ball, Mankiw and Romer (1988), Dotsey, King and Wolman (1999) and Hutchison and Walsh (1998).*

[22] *He considers a "semi-small" open economy with perfect capital mobility.*

[23] *Actually, in that case exchange rate flexibility is undesirable.*

stability and if shocks are mostly real or external, a floating exchange rate is preferable.

Mongelli (2002) asks whether *exchange rate adjustments* are actually effective. If they are not, the cost of loosing the exchange rate as an adjustment mechanism is not significant. There are two opposite views on this matter: one that supports the idea that changes in the nominal exchange rates foster adjustments[24] in the external balance and the other one arguing that they do not[25].

Mundell (1961) was first to acknowledge the importance of labour market mobility. But there is one more issue that has to be taken into account, and that is *differences in labour market institutions*. De Grauwe (2003) points out that there could be three types of labour market centralisation – labour markets in which highly centralized unions dominate, labour markets with intermediate union centralisation and labour markets where unions are decentralised. De Grauwe (2003) uses the theory of Bruno and Sachs (1985) in order to explain specified differences. In the markets where centralised unions dominate (i.e. where there is wage bargaining centralisation), the supply shock will not lead to an excessive increase in nominal wages because unions know that excessive wage increases will lead to more inflation, making real wages the same as before. But as Calmfors and Driffill (1988) show, a similar result comes form labour markets that are highly decentralised. In the markets where wage bargaining is kept at the company level when the supply shock hits the country, excessive wage increases have a direct impact on the competitiveness of the company. So if a union is pushing too hard, this could lead to layoffs. Hence, in those markets unions may not have the incentive to ask for excessive wage increases either, just as they do not in the labour markets with centralised unions. The result is that those countries are in a better position to cope with supply shocks. On the other hand, labour markets that have intermediate union centralisation have different approach to supply shocks. An individual

[24] *For example, De Grauwe (2003), Sachs and Wyplosz (1986) and Ghosh et al. (1997) (even though they got only positive results for inflation).*

[25] *For example, Krugman (1993).*

union knows that its actions will have but a small effect on aggregate inflation, so it starts the bargaining process. But the problem is that all the unions will do the same because if they do not, their members will end up with lower real wages. The result of this process is higher nominal wages and higher inflation, making those higher nominal wages in real terms the same as before the increase. De Grauwe (2003) concludes that the countries with different labour market institutions may find it costly to form a currency union.

Among many criteria for joining/forming a common currency area, one has quite an influential status in this modern phase and that is the *synchronisation of business cycles*. This means that if the business cycles of members of a currency area are synchronised, the cost of not having its own monetary policy that would fight against disturbances is minimised. The synchronisation of business cycles is an important element in the research of, for example, the endogeneity of OCA criteria (Frankel and Rose, 1997), intensity of bilateral trade and correlation of business cycle (Frankel and Rose, 1996), monetary integration as disciplinary effect (Buti and Suardy, 2000) and specialisation hypothesis (Krugman, 1993).

Besides the already mentioned criteria of the optimum currency areas *political factors* also influence the choice of joining/forming the currency area. Political instability and government incentive to inflate are some examples. Some of those who emphasise political factors are Edwards (1996) and Collins (1996). As it was mentioned previously, governments have the incentive to cheat on economic agents and increase inflation in order to reduce unemployment. For that reason they have the incentive to tie their own hands by adopting a permanently fixed exchange rate regime (Edwards, 1996). Collins (1996) shows that exchange rate adjustments under the flexible exchange rate regime are less visible to private agents and as a result are less politically costly than devaluations under a pegged exchange rate regime, because in the latter case unpopular measures may have to be enforced in order to defend the peg.

Even though traditional elements in analysing the OCA theory and the costs and benefits of joining a common currency area remain important, additional elements were included in the analysis of whether or not to join a common

currency area. According to Obstfeld and Roggoff (1996), the main benefits of forming a common currency area include: reduced transaction costs from currency conversion; reduced accounting costs and greater predictability of relative prices for firms doing business in the countries forming the currency area; insulation from monetary disturbances and speculative bubbles that might otherwise lead to unnecessary temporary fluctuations in the real exchange rates (given sticky domestic prices); and less political pressure for trade protection because of sharp shifts in the real exchange rates. The main costs of having a common currency area include the following: individual regions in the currency union forgo the ability to use their monetary policy to respond to region-specific macroeconomic disturbances; regions in the currency unions give up the option to use inflation to reduce the real burden of public debt; political and strategic problems arise in determining how member countries split seignorage revenue; and avoiding speculative attacks in the course of transition from individual currencies to a common currency can be a major problem.

Frankel (1999) also mentions additional criteria a country should consider when joining a common currency area: a strong need for import stability, due to either a history of hyperinflation, an absence of credible public institutions or an unusually large exposure to nervous international investors; a desire for further close integration with neighbour country or trading partner; an economy in which the foreign currency is already widely used; access to an adequate level of reserves; rule of law; and a strong, well-supervised and regulated financial system.

Even though there is much advancement in the OCA theory, there is still room for further research. As Krugman (1995) emphasised, a vast majority of the optimum currency area literature has concentrated on the balance of payments adjustment costs (macroeconomic effects) under fixed and flexible exchange rates. However, microeconomic benefits and costs still remain insufficiently explored.

There are many contributions in this modern phase, or as some authors call it "new" theory of optimum currency areas. Some of them include the following.

The first is a much better understanding of the traditional criteria and implementation of new ones. Also, now more stress is put on the benefits of common currency areas and that serves as an additional incentive for forming common currency areas. Further, the lack of credibility of monetary policy leads to ineffective unemployment measures because among the results of discretionary decisions of monetary authorities is a higher inflation in the future at the same rate of unemployment. This means that monetary authorities cannot choose their preferred point on the Phillips curve. One of the most important contributions is the endogeneity hypothesis, which implies that if a country enters a common currency area, it can satisfy the OCA criteria ex post, even if it did not satisfy it ex ante. This means that increased integration between members of the common currency area will move them above the OCA line. Also, besides labour mobility, the difference between labour market institutions is important as a different degree of labour market centralisation can cause the need for a different approach to the monetary policy. Lastly, the business cycle synchronisation is an important consideration since if countries have synchronised their business cycles, the common monetary policy will have better effects.

Finally, up till now in this paper many attributes of the OCA have been explained. In order to minimise confusion, Table 1 shows the most important attributes with a brief description of how they influence the decision on whether to join a currency area or not.

Table 1 **The most important attributes regarding optimum currency areas**	
Variables	**Effect**
Labour mobility	The greater the labour mobility (when wages and prices are not flexible) the easier it is to join/form a common currency area.[26]
Wage and price flexibility	If there is wage and price flexibility in a common currency area, it will be easier to overcome asymmetric shocks and the common currency area will be more stable.
Openness	The more open the economy is, the stronger is the case for joining/forming a common currency area.[27]
Diversification of production/exports	The more diversified the economy, the more attractive is a common currency area.
Size of economy	The larger the economy, the more attractive is the flexible exchange rate.
Inflation differential	If there is inflation differential between countries, it will be harder to maintain the fixed exchange rate.
Capital mobility	The higher the capital mobility, the harder it is to maintain a fixed exchange rate (except, of course, if the country joins a common currency area).
International risk sharing	If a country is able to share risk with its partners in a common currency area, this regime could ameliorate other rigidities in the area.
Usefulness of money	Joining the common currency area enhances the usefulness of money, but the effect is that much greater the smaller and more open the economy is.
Effectiveness of monetary policy	If a monetary policy is not effective, the loss of monetary independence is not a high cost.
Credibility of monetary authorities	If monetary authorities do not have credibility to curb inflation, having a fixed exchange rate as a nominal anchor will be beneficial.
Endogeneity	A country is more likely to satisfy the criteria for entering a common currency area ex post than ex ante due to increased business cycle correlation.
Specialisation	A country is more likely to satisfy the criteria for entering a common currency area ex ante than ex post due to increased specialisation of the countries forming the area.
Similarity of shocks	Costs of loosing independent monetary policy are lower the higher the association of shocks between the client (potential member of a common currency area) and the anchor is.
Monetary shocks	If a country is facing monetary shocks, having a fixed exchange rate will be attractive.
Real shocks	If what a country is facing are real shocks (domestic or foreign), a flexible exchange rate will be more feasible.
External nominal shocks	If what a country is facing are external nominal shocks, a flexible exchange rate will be even more attractive.
Effectiveness of exchange rate adjustments	If exchange rate adjustments are not effective, the cost of loosing the exchange rate as adjustment mechanism is not significant.
Labour market institutions	If countries have different labour market institutions, it will be hard to adjust to the same kind of shock in the same way in a common currency area.
Business cycle synchronisation	If countries forming a common currency area have synchronised business cycles, they will not need flexible exchange rates as an adjustment mechanism.
Dominant trading partner	If a country has a dominant trading partner, it is beneficial to form a common currency area.

Source: Author's compilation.

[26] *Or to have some other form of fixed exchange rates.*

[27] *De Grauwe (2003) explains a paradox where a country with a less diversified output is more prone to asymmetric shocks, making it a better candidate for flexible exchange rate regime. But, at the same time the assumption is that small open economies that trade a lot with the rest of the world are also more specialised. This leads to the paradox that small and very open countries should keep their own currencies and not join currency area.*

4 Conclusion

This paper reviews some of the most important contributions to the theory of optimum currency areas. Almost 45 years since the Mundell's (1961) seminal paper, the theory has evolved. Many additional criteria have been introduced and the theory has served as an important factor in forming the European monetary union. At the same time, despite the development of the theory, traditional contributions are still very important. However, there is no simple measure that might be able to determine clearly whether a country should or should not join a common currency area. The criteria developed in these 45 years are often hard to implement in order to receive a clear answer. Often, political factors are those governing the decisions about joining/forming a common currency area.

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