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Optimum currency areas: State of research, the European Monetary Union

Abstract

The present paper deals with optimum currency areas (OCA). Its main goal is to give a synthesis of the central research areas in this field and provide a link to the real-life example of the European Monetary Union (EMU). Overall, the paper will possibly uncover potential areas for further research, and thus may be able to serve other researchers. The article illustrates the original OCA theory by Robert Mundell and further important research built upon it. The OCA criteria resulting from the foregoing research are then placed aside the actual Maastricht criteria set up by the European Union, necessary to fulfil for joining the eurozone. The question of whether these criteria are even necessary is examined alongside the topic of endogeneity, which is a relatively new field of research in the OCA field. Lastly, the pros and cons of joining a single currency area are analyzed, before the author provides suggestions for potential future research.

Introduction

In a world swaying between globalization and protectionism, the question of whether countries should continue to use their own currency is more relevant than ever. The motivation for this paper is to provide an entry point to the corresponding framework of the optimum currency area (OCA) theory, while also covering the stance of the European Union.

After discussing the theoretical framework and the research methodology, I will briefly describe the theory of optimum currency areas created by Robert

Mundell (1961), which can be considered the basis of all following research in this specific area. Additionally, further concepts that followed up on Mundell's original theory will be dealt with. Here, I will try to cover the most relevant ground regarding the state of current research.

After discussing the different theories of optimum currency areas, I will describe the Maastricht criteria. As the European Currency Union is a fitting example of a single currency area, it makes sense to look at the rules the Union set up for its member states and how they concur with the views of economists.

Out of all the theories dealing with optimum currency areas, the principle of endogeneity is one of the most recent and open topics. Therefore, it will be discussed in a separate section. Following that, I will present considerations regarding the perspective of a potential new member country while analyzing pros and cons of joining a currency union. Finally, after summarizing the current state of research, the results will be discussed.

The paper will attempt to show research areas requiring further exploration, which might lead to discussions in future papers. This can be seen as the main aim of this essay.

1. Theoretical framework of the research

With the end of the Bretton Woods system, 1971–1973, floating exchange rates between the currencies of the major industrial nations were established (Truman, 2018). Since then, it has been debated in many publications whether different countries should have their own currencies or a single one (e.g. in an article for the International Monetary Fund by Kocherlakota and Krueger (1998)). With Mundell's OCA theory, which will be discussed further, a basic framework has been established regarding this topic.

Moreover, with the introduction of the euro, the topic of currency unions has become the center of greater interest. Authors such as Frieden (1998) warned that the European Central Bank (ECB) may face inner conflicts when dealing with local recessions or financial crises within the EMU. In hindsight, it still cannot be answered for sure whether the benefits of a single currency union outweigh those of a country's own currency. The question, then, is to what extent currency unions have been researched and which criteria are relevant. Furthermore, this study can be applied to the eurozone and thus is of importance not only in theory, but also in practice.

2. Research methodology

The method used in this essay is quite straight-forward. As the goal of the paper is to expose open research topics regarding OCA theory and the eurozone, the

main method is the literature review of different papers and research approaches. With this goal in mind, some of the most exemplary papers regarding this topic have been analyzed for their key findings, e.g., those by Mundell, McKinnon, and Kenen. To make practical use of these findings, the framework of the EMU convergence criteria will also be reviewed and evaluated.

3. The classical OCA theory by Robert Mundell and further research

The classical theory of optimum currency areas has taken form in the 1960s, mainly thanks to three economists. Robert Mundell first introduced the theory in 1961 in his article "The theory of optimum currency areas." It states that a monetary union can only be successful if the labor mobility between the member countries is high enough. Because member states give up their instrument of devaluating currency, they can no longer react to differences in economic development. If, for example, a country faces an economic crisis, a devaluation of its currency would make produced goods cheaper abroad and thus increase the demand for them. With this natural instrument, a country can relatively easily steer against a crisis and its consequences, such as unemployment or inflation. However, in a monetary union, a country must face one common exchange rate to outside countries and a fixed exchange rate to other members. So, in an inefficient monetary union, price and wage levels can differ between member states, even if they are using the same currency.

Mundell then proposed an alternative to the missing instrument of currency devaluation to equalize different price levels: labor mobility. If a country faces high unemployment and low wages, people can move to areas of the currency union with higher wages and stable demand. This process would go on until price, wage, and unemployment levels are equal in the whole union again. For this mechanism to work, prices and wages must be flexible.

Mundell's original theory has been the basis for further research that has been conducted not long after. McKinnon (1963), just like Mundell, took a closer look at factor mobility as a main criterion for an optimum currency area. However, he distinguished between the geographical and the interindustry factor mobility. For example, if there are two regions with a different industrial focus and there is a rise in demand for a region's product, it now depends on the flexibility of the industry if the demand shock should be compensated by factor movement or by a flexible exchange rate. If the other industry can easily switch to the now more demanded product, a flexible exchange rate is optimal for an adjustment of the macroeconomic shock, as there is no need for factor movement between the two regions. However, if a switch of industries is not feasible, a factor movement towards the other industry, while using one common currency as proposed by Mundell, might be the right way to react to the new economic situation.

An additional adjustment to Mundell's and McKinnon's theories has been made by Kenen (1969), who focused on the diversification of economies. If an economy has a well-diversified industrial sector, it will not have to adjust in terms of trade (i.e., lowering its exchange rate) in case of a macroeconomic shock. A change of demand in one sector can be compensated with an increase of production in a more profitable sector. Thus, a fixed exchange rate with other economies is more feasible, as macroeconomic shocks can be better compensated by the area's own economy.

So, in the classical view, countries should form a currency union if macroeconomic shocks can be compensated by other means than adjusting their exchange rate. Those means — the factors of production, here: labor — must be mobile. Also, prices and wages need to be flexible enough to quickly react to demand shocks. Lastly, an economy needs to be well diversified to overcome smaller economic shocks at ease.

After this classical model, many more adjustments have been made to the original theory, and Mundell's theory has inspired many other economists to expand the criteria which need to be fulfilled for countries to join a currency union. These criteria are, according to Paolo Mongelli (2008): price and wage flexibility, mobility of factors of production including labor, financial market integration, the degree of economic openness, the diversification in production and consumption, similarities of inflation rates, as well as fiscal and political integration. While some of Mongelli's criteria can be covered by the previously described classical OCA view, the additional factors will now be described more extensively, providing an overview to the state of research in the OCA theory.

Financial market integration

Similarly to Kenen, Ingram (1962) also proposed a way to ease the effects of macroeconomic shocks, here through financial market integration. This also creates an alternative to the central bank instrument of lowering one's exchange rate to induce a higher number of exports. If the financial markets are integrated, it is easier for a country in a crisis to receive foreign capital of countries in the union, due to even the slightest adjustments of interest rates. This new capital can then be used to stimulate the economy. Schiavo (2008) also mentions that in one currency area, the eliminated risk of exchange rate fluctuations, will stimulate the flow of capital, thus bringing an ex-post advantage to members joining a currency union. Additional ex-post effects will be discussed in more detail in Section 5.

Similarities of inflation rates

The different economic motives of currency union member states were addressed by Fleming (1971). The dissimilar targets in rate of employment, economic policies, etc., could lead to a dispersion of the economic development of the member

states. To make sure that countries behaved similarly, Fleming introduced the convergence of the members' inflation rates as a factor. Similar inflation targets would indirectly lead to similar terms of trade and thus eliminate the need for different currencies. The inflation rate also became part of the Maastricht criteria, which the countries must fulfill to join the eurozone (see Section 4 for further information).

Fiscal integration

Also first pointed out by Kenen (1969) was the idea that in a currency union, member countries could help one another through redistribution of capital in times of crisis. This transfer mechanism in a fiscally integrated union would help overcome macroeconomic differences in terms of income and unemployment rates, and therefore serve as an alternative for a flexible exchange rate. Correspondingly, in a more recent model set up by Werning and Farhi (2014), their results showed that for countries outside a currency union, an optimal use of exchange rate adjustments will always be a better choice to ease the effects of macroeconomic shocks. However, in a currency union, where there are no possibilities of exchange rate adjustments, they show that risk-sharing through fiscal integration can have positive impacts. The beneficial effects of a fiscal union are greater with more persistent shocks and less open economies.

Political integration

Similarly to fiscal integration, political integration has also been proposed by numerous economists as an OCA criterion. Mintz (1970) mentioned how important the political will for integration in forming a currency union is. Machlup (1975) also found that many OCA definitions, in addition to the classical criteria such as free factor movements, had one common core: the willingness of the union members "to give up their independence in matters of money, credit, and interest." Thus, they also have a common monetary policy.

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As so many prestigious economists keep on contributing to the topic and there still is the open question on which criteria are necessary to fulfill for an OCA, one can see how Mundell with his original theory inspired a broad field of research.

Summarizing these theories, the higher the fulfillment level of these and possibly other criteria between monetary union members is — i.e., the more economically and fiscally integrated they are — the less need there is for their own currency. If the common currency area is actually not optimal, a monetary union could negatively influence the economic performance of the member states.

4. Maastricht criteria

The EU itself also set up a list of barriers to overcome for countries to join the eurozone with the so-called Maastricht convergence criteria (European Union, 1992) for the European Monetary Union. If an EU member state fulfills the set goals in the fields of (1) inflation rate, (2) government budget deficit, (3) government debt-to-GDP ratio, (4) exchange rate stability, and (5) long-term interest rates, it can adopt the euro as its currency. As can be seen, the common goal of these criteria is to have an aligned monetary policy of the future members to concur with standards of the European Union. This ideally should reduce the risk for local macroeconomic shocks and thus make a common economic policy more feasible.

On the homepage of the European Union (2006), one can find a summary of the convergence criteria.

Price stability

"The inflation rate of a given Member State must not exceed by more than 1 1/2 percentage points that of the three best-performing Member States in terms of price stability during the year preceding the examination of the situation in that Member State."

Annual government deficit

"The ratio of the annual government deficit to gross domestic product (GDP) must not exceed 3% at the end of the preceding financial year. If this is not the case, the ratio must have declined substantially and continuously and reached a level close to 3% (interpretation in trend terms according to Article 104(2)) or, alternatively, must remain close to 3% while representing only an exceptional and temporary excess."

Government debt

"The ratio of gross government debt to GDP must not exceed 60% at the end of the preceding financial year. If this is not the case, the ratio must have sufficiently diminished and must be approaching 60% at a satisfactory pace (interpretation in trend terms according to Article 104(2))."

Exchange rates

"The Member State must have participated in the exchange-rate mechanism of the European monetary system without any break during the two years preceding

the examination of the situation and without severe tensions. In addition, it must not have devalued its currency […] on its own initiative during the same period."

Long-term interest rates

"The nominal long-term interest rate must not exceed by more than 2 percentage points that of, at most, the three best-performing Member States in terms of price stability (that is to say, the same Member States as those in the case of the price stability criterion)."

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The bi-yearly convergence reports of the European Central Bank (2020) assess the readiness of the prospective EMU countries to adapt the euro as their currency, also taking the Maastricht criteria into account. Therefore, these reports give a good insight on where countries such as Poland or Hungary are on their way to becoming full-fledged EMU members.

Whether these standards are a viable choice as entrance criteria for a currency union has already been discussed by several economists. For instance, Paleta (2012) examined that the focus on price stability could worsen the effectiveness of a common currency if actual economic factors are not taken into consideration. He discusses Greece as an example of a country joining the currency union on a completely different economic level than the rest of the eurozone. Paleta also mentions the political background of the member countries as one of the reasons why divergence criteria often were obsolete due to ignorance in political decisions. Frait et al. (2004), in turn, criticized the exchange and inflation rate targets as contradictory, since countries would be pressured to ignore their inflation target in the two years before finally adopting the euro, just to meet the fixed exchange rate criterion. Some economists even deny the reasonableness of fulfilling any convergence criteria before joining a currency union.

5. Endogeneity of OCAs

Through the questioning of the Maastricht convergence criteria, a relatively new field of study arose: endogeneity of optimum currency areas. Frankel and Rose (1997) were among the first to state that it makes more sense to look at the EMU (European Monetary Union) criteria ex-post rather than ex-ante. In their model, they show that through continuous trade integration, business cycles of interlinked countries could synchronize. This circumstance is mainly caused by demand shocks appearing at the same time due to interindustry trade. So, if a country joins the EMU, it will not only increase its economic performance due to the loss

of trade barriers, but it will also synchronize its economic cycles with the other members. Because of this, there is a good chance that it will fulfill the divergence criteria after some time automatically ex-post.

To test the readiness of a country to join a currency area, Bayoumi and Eichengreen (1997) created an econometric equation consisting of several OCA criteria, thus creating an OCA index. Vieira and Vieira (2011) made use of this index and put Frankel and Rose's hypothesis to a test. By comparing the index for the EU countries before and ten years after establishing the eurozone, they found out that convergence had improved for nearly all countries, whether they were using the euro or not. Thus, the improvement in fulfilling OCA criteria cannot be singlehandedly attributed to the membership in the eurozone, but also to EU membership. Therefore, the authors could not prove endogeneity with this model. However, the financial crisis which hit some countries worse than others may have caused a bias in this period.

Another famous advocate of endogeneity within monetary unions is Paul De Grauwe, who has published several articles on this issue. De Grauwe (1996) already questioned whether the Maastricht critera were chosen as the right indicator for convergence of countries forming a monetary union. He also suggested to simply look at whether the benefits of joining a currency union outweigh the risks when making the decision as a country (see Section 6 for pros and cons).

De Grauwe and Mongelli (2005) also divided the possible endogeneities of the eurozone into different groups, such as economic integration (trade and prices), financial market integration, symmetry of shocks, and labor market flexibility. While looking at each criterion seperately, they came to the conclusion that some areas are showing more converging effects than others — for instance, that the currency union definitely improved inter-union trade. However, many financial market areas are still showing little to no integration effect. Overall, they are rather optimistic and suggest that endogenous effects are already at work.

One can certainly say that the endogeneity of a currency union is an interesting and open field in the OCA research, with much room for further research. Also, the EMU is continuously providing new data that can be analyzed in this regard.

6. Pros and cons of joining the eurozone

Lastly, taking a look outside the context of OCA theories, it makes sense to closer observe the perspective of a potential new member, as there need to be incentives to even consider giving up one's own monetary policy. Mankiw et al. (2008) list several advantages and disadvantages of being part of a monetary union.

The abolition of transaction costs

Trade between member countries is easier and cheaper since companies do not have to pay transaction fees for exchanging money before importing. The only aggrieved party in this case are banks, which earned money from these fees. However, for the economy as a whole, the advantages of no transaction costs outweigh the small possible shortcomings for banks.

## The abolishment of price discrimination

The argument here is that if prices are now easily comparable with only one currency, consumers will buy where it is cheapest. This will force producers to offer their goods at market equilibrium prices, and as a result, social welfare will increase. This argument only holds true in theory, though, because goods with relatively high transport costs compared to their price will not necessarily become cheaper.

The decrease in changes of currency exchange rates

Discrepancies in exchange rates might stop companies from profiting from the positive effects of trade since there are always uncertainties regarding import prices. Even with fixed foreign exchange contracts, to secure a certain exchange rate, processing fees will occur and act as a tariff, which will ultimately decrease economic welfare. The certainty in exchange rates also positively affects exporting companies, since they can calculate their future export turnover more precisely and thus are able to better plan future investments. Conclusively, the whole economy would profit from an increase in investments through higher growth rates.

At the same time, Mankiw et al. (2008) do not only see advantages of a common currency. Countries lose their power concerning monetary policy. This can lead to tensions between member countries, because the independent European Central Bank, with its goal of price stability in the whole EMU, cannot act according to the wishes of all member states. If, for instance, France is worried about a high inflation rate and Germany is more concerned about its unemployment quota, German politicians would prefer a low interest level to increase domestic demand, while French politicians would rather see high central interest rates to decrease its aggregate demand and fight inflation. In the end, the ECB might determine an interest rate based on the average EMU inflation rate. So, in this example, the monetary policy for France with its high inflation rate would be too expansive, while being too restrictive for a country with an inflation rate below the EMU average.

To determine whether the advantages outweigh the costs, Krugman et al. (2012) make use of a GG-LL diagram (Figure 1).
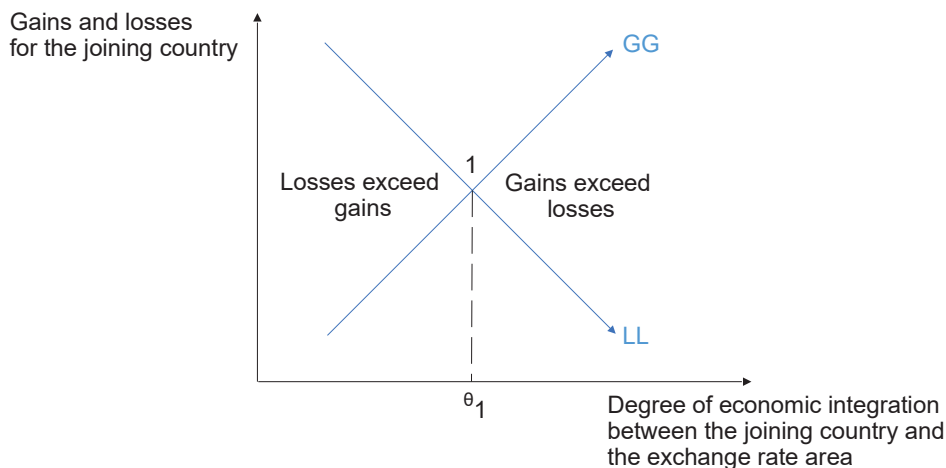
Figure 1. Deciding when to peg the exchange rate

Source: Krugman et al. (2012).

The GG curve represents the economic gains that a country would receive from joining a monetary union with fixed exchange rates. It increases with the degree of economic integration. The LL curve stands for the losses that a country would face for joining the monetary union. It decreases with the degree of economic integration.

Only if the gains outweigh the losses does it make sense for a country to join a monetary union. In cases where a country is indifferent, the degree of economic integration to join is denoted by θ_1. The GG-LL model is a basic framework for the optimum currency area theory.

Conclusion

The eurozone presents a perfect ground for further research in the field of optimum currency areas. A monetary union of this economic size has never been established before, so it seems like a real-life experiment, where the outcome is uncertain. Especially with all of Europe's cultural differences, some assumptions of the OCA theory may have to be rewritten or neglected if the EMU turns out to be a success. Especially the theory of endogeneity within currency unions holds a lot of possibilities for further research in which empirical data from the eurozone can be used.

Regarding potential research topics, other authors could analyze one of the countries which are not yet included in the exchange rate mechanism II, but are obliged to join the eurozone once they meet the Maastricht convergence criteria, without an opt-out option. These countries include Bulgaria, Croatia, the Czech

Republic, Hungary, Poland, Romania, and Sweden (European Central Bank, 2020). It certainly would be scientifically valuable to assess these countries for their readiness to finally join the eurozone. The Maastricht criteria here may be the wrong approach, not only due to their continued critique, but also because it is possible that some countries intentionally avoid having to join the eurozone.

With an ultimate goal to create a readiness ranking of the future eurozone countries, there are several possibilities to approach this issue. One could apply convergence models with a recent date, e.g., Frankel and Rose (1997) or Bayoumi and Eichengreen (1997). There is also a possibility to evaluate each country's personal benefits and costs of joining the EU and see if one side significantly outweighs the other. Lastly, one could look for further evidence of endogeneity to see if these states have to be ready to join the eurozone after all. It is even possible to define new convergence criteria and test these on the prospect or existing EMU countries. The amount of available data is only increasing, and this research field is offering many topics open for deeper analysis.

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