The Euro: Future Prospects and Consideration for Non-Euro Countries

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Abstract: Problem statement: Many more Central and Eastern European Countries (CEEC) have decided to adopt the euro. Given the attraction and uncertainties associated with moving into a common currency, the potential gains and losses of a currency adoption was of academic and political interest. The economic impact of implementing a common currency was examined by studying the before and after of those countries that have joined the currency union utilizing data from Eurostat. **Approach:** This preliminary research strengthened the hypothesis that currency unions improve macroeconomic indicators in countries that participate in them. There were several new European Union (EU) members from the CEEC region on the path of achieving the same currency adoption goals as the former group of countries. Using statistical and econometric methods, the economic benefits that accrue to these countries in the pipeline were examined. This study isolated recessions and country-specific differences for the purpose of isolating the impact of the convergence criteria. **Results:** The study suggested that six out of the eight countries are boosting their macroeconomic variables by adopting the criteria required to join the EU currency. This study helps promote the idea of currency unions for countries interested in such transitions. **Conclusions/ Recommendations:** The regression analysis showed the values of the examined countries' coefficients were negative suggesting that as the candidate countries progressed in the compliance with the convergence criteria, they would encounter positive economic growth. Therefore, this study suggested that candidate countries should focus on exchange rates stability above other targets as they focus on joining the monetary union.

Key words: European Economic Community (EEC), European Monetary System (EMS), European commission, initial regression, transition expenditures, EU currency, convergence criteria

INTRODUCTION

The origins of the European Union (EU) are rooted in the European Community for Steal and Coal (ECSC), which was formed in the early 1950s as an effort to prevent future wars on the European continent. The EU was formed by six nations: Belgium, France, Germany, Italy, Luxembourg and the Netherlands, which marked the "first important step in the European integration process". In 1958, the European Economic Community (EEC) was formed changing the EU's direction away from political issues and more towards economic integration. One of the major goals of EEC was to establish a common external tariff while eliminating the internal quotas and tariffs among member states.

In the period until 1972, the Bretton Woods system of fixed exchange rates failed to signal the upcoming phase of slower economic growth and economic crisis.

Nations began using economic measures as a way to protect their currencies, resulting in the emergence of non-tariff barriers to trade. The European Commission felt the need to intervene and stabilize the EU by establishing the European Monetary System (EMS), an institution that was designed to resolve the currencies issues and achieve price stability. Other goals included the improvement of the internal market as well as achieving price stability. The Union also continued its expansion by accepting the United Kingdom in 1973, Ireland and Denmark in 1981 and Portugal and Spain in 1986.

The comparative success of the EMS and the internal market program, along with the collapse of the former Soviet Union made EU membership even more attractive to the countries from Central and Eastern Europe. The Maastricht Treaty introduced the EU citizenship concept, which signaled the EU's desire to go beyond the economic issues and "to illustrate the

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broader scope" of the EU. Another major achievement of the Maastricht Treaty was the formation of the Eurozone and the introduction of the euro in 1999 as the common EU currency. In 2002 the euro was adopted by all but three of the EU members: UK, Denmark and Sweden.

Today, the countries of the Eurozone share not only a common currency but also a single monetary policy as well as a common exchange rate policy. Since the euro has the characteristics of a normal currency, such as a means of payment, a value of measurement and a store value, it plays a crucial role in the economies of all of the member states (Ghannadian, 2006). As indicate, all new members joining the Union "are obliged to eventually become members of EMU".

Adoption criteria: The European Community member states used a basket of their currencies, called the European Currency Unit (ECU), as the unit of account for the European Community. One of the main purposes of the European Exchange Rate Mechanism (ERM) was to minimize fluctuations between member state currencies and the ECU. On December 31, 1998 the euro replaced the ECU and in 1999 the ERM II substituted the original ERM.

Currently, the euro is the official currency of sixteen of the twenty-seven member states of the EU: Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain. The eleven countries that are not utilizing the euro are: Denmark, Sweden, the United Kingdom, Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Romania.

From the eleven countries currently not using the euro as their official currency, Great Britain, Denmark and Sweden have already covered the requirements of the convergence criteria. However, due to certain internal negative attitudes by the public towards the adoption of a common currency, these states have refused to adopt the euro. The nations from Central and Eastern Europe (CEEC): Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Romania have actively taken steps to comply with the requirements necessary to adopt the euro.

It is important to reiterate the steps necessary to join the EMU. One of the first requirements a state must cover is the EU membership, which translates into the elimination of trade barriers and tariffs, the streamlining of custom controls, the elimination of passport requirements and other concessions. Furthermore, the convergence criteria include a price stability requirement, which states that a candidate's inflation rate must not exceed one of the three EU members with lowest inflation by more than 1.5%.

Additionally, countries' ratio of government budget deficit to GDP must not go above 3%, while the ratio of total government debt to GDP must be no greater than 60%. Before a country can join the Eurozone, it must also spend two years in the European Exchange Rate Mechanism (ERM II); show stable currency exchange rates, as well as maintain long-term nominal borrowing rate not greater than 2% than the rate of the EU members with the lowest long-term government debt.

As of January 2008, five National Central Banks (NCBs) participated in the ERMII in an effort to show their readiness for the euro adoption. Table 1 displays the countries that have adopted, are in the process of adopting and the few that presently do not want to adopt the euro.

Background on monetary unification: Robert Mundell (1961) work on optimum currency areas examines the effects of asymmetric shocks. Asymmetric shocks are factors that weaken the real economy. Therefore, if such factors are important and cannot be controlled a currency union would not be the most favorable model. However, if capital and labor move freely within the region, currency unions are more likely to be successful. Following Mundell's work, hypothesized that if price and wage flexibility exist, monetary unions contribute to the "openness" between trading partners and therefore increase trade. Additional benefits from adopting the euro include the elimination of exchange rate fluctuations associated with "uncertainty and transaction costs" and result in improved financial integration and trade.

Even though hedging techniques can provide a certain level of protection against exchange rate risks, they also come with a cost and often are ineffective. The adoption of a unified currency for all member states completely eliminates the exchange rate risks associated with trade interactions among the states. Additionally, the euro adoption can eliminate any currency transaction costs by promoting trade among members of the EU.

Table 1: EU members' status on the euro adoption

Want to Adopt Euro	Recently Adopted Euro	Do Not Want to Adopt Euro
Bulgaria (applying to ERM in 2010)	Greece Jan 1, 01	Denmark
Czech Republic	Slovenia January 1, 07	Sweden
Estonia	Cyprus January 1, 08	United Kingdom
Hungary	Malta January 1, 08	
Latvia		
Slovakia January 1, 09		
Lithuania		
Poland		
Romania (applying to ERM in 2010-2012)		

Not only does the euro promote trade through the elimination of transaction costs, but it also encourages competition through enhanced price transparency. Furthermore, the adoption of a unified currency is efficient and eliminates multiple currencies. Cohen and Subacchi (2008) also mention "improved liquidity position", funding of deficits with EU money and improved "operational independence" as benefits of the euro adoption.

In summary, the euro adoption can lead to a variety of positive effects on the national economies of the member states including decreased transaction costs, improved trading practices and enhanced competition. All of these factors "can lead to higher growth and better living standards for the society as a whole".

The implementation of a uniform currency also hides certain risks for the new members that are in the process to adopt. Some of the most obvious costs related to the euro adoption include the transition expenditures. Opportunity costs related to resources being used for the transition rather than infrastructure and healthcare could also be masked. There are potential job losses in the financial sectors that deal with currency transactions and hedging techniques as well.

Additionally, since countries that are trying to implement policies to join the currency can be characterized as emerging economies, they all have the tendency to experience "higher volatility in exchange rates than those in advanced economies". As suggest, "richer countries tend to have higher price levels expressed in the same currency. Therefore, the overall inflation rate in the catching-up countries is higher and/or their nominal exchange rate appreciates as they close the gap". This could lead to higher levels of inflation, decreased purchasing power parity and/or higher interest rates.

Dziuda and Mastrobuoni (2009) also argue that contrary to the general belief that the euro adoption improves price transparency; the introduction of the common currency could lead to decreases in price transparency. The reasoning behind the authors' argument lies in the concept of rational consumers who experience "difficulty when dealing with prices after a cash changeover". This lack of transparency can cause reductions in competition and result in higher prices.

MATERIALS AND METHODS

This article investigates the relationship between fulfilling the convergence criteria and the economic

performance of the countries which have already joined the Eurozone (Greece in 2001, Slovenia 2007, Slovakia, Malta and Cypress in 2008). Additionally, the study examines the potential success of the states that desire to adopt the euro. These states are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Romania. A few countries, such as Greece, which had adopted the euro in an earlier period and Bulgaria and Romania, which are still in the process of applying to the ERMII, have been excluded from this study.

First, the study examines the impact of the four main convergence criteria on the economies of the countries that have most recently adopted the euro. Second, it explores the changes in the economic performance of other Central and Eastern European Countries (CEEC) currently in the process of the convergence criteria. By comparing the experience of the countries that have recently adopted the euro with the ones in the process of adopting, one can foresee the benefits forthcoming to the countries yet to adopt. Another key objective is to determine which of the candidate countries are most likely to benefit the most from the euro adoption.

In order to maintain the relevancy of economic data to contemporary issues, the study covered the period from 2000-2008. The economic performance of all the countries in the study is expressed in terms of changes in Real GDP (RGDP) as a proxy for enhanced economic conditions. Equation 1 below describes the initial regression analysis:

$$\beta RGDP = \alpha + \beta 1 \beta EX + \beta 2 \beta GD + \beta 3 \beta I + \beta 4 \beta R \qquad (1)$$

$$\beta = \frac{(Xt - Xt - 1)}{Xt - 1} \times 100$$

Where:
EX = percentage change in exchange rates
GD = percentage change in the ratio of government debt to GDP
I = percentage change in inflation rates
R = percentage change in 10 year government bond interest rates

The category of recently adopted countries consists of EU members that have adopted the euro since 2001. The countries in this category are as follows: Cyprus (2008), Malta (2008), Slovenia *et al.* (2009). The candidate countries category is composed of the following: Czech Republic, Estonia, Hungary,

Lithuania and Poland. The countries in both categories were selected due to their similarities in geographic location, emerging market characteristics, as well as similar convergence criteria time period. Since the study's goal is to examine how each country's RGDP changes as it strives to meet the convergence criteria, statistical and econometric methods are used to even out these effects.

Since most economic factors affect the economy with a lag, lagging indicators were utilized to assess the impact of time on the RGDP. A number of tests were performed in order to select the optimal lag length. The econometric study also utilized dummy variables in order to isolate the effects of country-specific differences and recessions.

RESULTS

Countries in the Euro zone: The first part of this analysis includes testing whether these convergence criteria were good indicators for changes in economic performance of countries that have recently adopted the euro. The results indicate that for every one percent decrease in inflation, the ratio of government debt to GDP and exchange rates there was 0.19, 0.12 and 1.04% increase in the percentage change in RGDP.

The beta coefficient for the change in interest rates is slightly positive suggesting a positive correlation between the percentage change in interest rates and RGDP. The econometric results suggest that those countries that have adopted the euro have had an improved economic growth rate as evidenced by the change in their RGDP. This has been true even though certain negative factors were associated with the Maastricht criteria as previously discussed.

When it comes to determining the optimal lag period, the regression equation that yielded the greatest level of significance for the lagged indicators is as follows:

$$\beta RGDP = \alpha + \beta 1\ \beta EX(-1) + \beta 2\ \beta GD(-1)$$
$$+ \beta 3\ \beta I(-1) + \beta 4\ \beta R(-1) \quad\quad\quad (2)$$

$$\beta = \frac{(Xt - Xt-1)}{Xt-1} \times 100$$

Where:

EX(-1) = percentage change in exchange rates with 1 lag period

GD(-1) = percentage change in the ratio of government debt to GDP with 1 lag period

I(-1) = percentage change in inflation rates with 1 lag period

R(-1) = percentage change in 10 year government bond interest rates with 1 lag period Table 2 displays the result

This section examined the impact on dummy variables. When compared to the regression model without dummy variables for the country-specific differences, the Adjusted R-squared improvement suggested that the model is a better fit. Details on the econometric tests can be seen in Table 3.

All of the intercepts for the dummy variables carried positive values with Slovenia being the highest at 2.25, when compared to 1.67 for Slovakia, 1.17 for Malta and 1.59 for Cyprus. The higher results for Slovenia could be due to cultural factors and higher economic growth prior to complying with the convergence criteria.

In the next part, the study examined the impact of the convergence criteria without the negative fallout of recessions. Changes in the variables' coefficients would suggest that the relationship between the convergence criteria and economic growth varies depending on the existence of recessions and country-specific differences.

The Dublin-Watson statistic, which is a test for detecting autocorrelation, improved slightly suggesting no significant signs of autocorrelation. The Akaike information criterion, which is a measure of the goodness of fit of an estimated statistical model, also decreased signaling that the model was the best fit for the regression of RGDP against the Maastricht criteria.

The negative values of the coefficients for the exchange rates, inflation and the ratio of government debt to GDP remained consistent with the results of the previously ran tests. These studies further confirm that countries which strive to cover the criteria by decreasing their inflation, government debt and exchange rates, experience positive economic growth.

Table 2: Regression on Changes in RGDP Convergence Criteria with and without one lag period against for Countries that Adopted the Euro

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient w/ 1 lag	Std. Error w/ 1 lag	w/ 1 lag t-Statistic	Prob. w 1 lag
α	1.636912	0.150874	10.84954	0.0000	1.991364	0.218992	9.093301	0.0000
R	0.031905	0.019231	1.659068	0.0999	-0.164180	0.140737	-1.166575	0.2460
I	-0.191615	0.080386	-2.383678	0.0188	-0.143416	0.054663	-2.623655	0.0100
GD	-0.116500	0.036400	-3.200594	0.0018	0.114907	0.114731	1.001527	0.3188
EX	-1.037259	0.099191	-10.45713	0.0000	0.024531	0.027501	0.892026	0.3744

Table 3: Regression on Changes in RGDP against Convergence Criteria with Dummy Variables for Country Differences and Recessions for Countries that Adopted the Euro

Variable	Coefficient	Std. Error	t-Statistic	Prob
D1	2.432618	0.277324	8.771769	0.0000
D2	2.182771	0.327416	6.666651	0.0000
D3	1.529161	0.261202	5.854318	0.0000
D4	1.927642	0.268250	7.186004	0.0000
DR	-1.502846	0.339933	-4.421009	0.0000
EX	-1.008178	0.114743	-8.786362	0.0000
GD	-0.074237	0.035282	-2.104125	0.0379
I	-0.103061	0.079223	-1.300908	0.1963
R	0.035582	0.017717	2.008279	0.0473

Table 4: Candidate Countries regression on changes in RGDP against changes in interest, inflation and exchange rates and government debt to GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient w/ 1 lag	Std. Error w/ 1 lag	t-Statistic w/ 1 lag	Prob. w/ 1
α	2.049648	0.181179	11.31281	0.0000	2.296944	0.353254	6.502241	0.0000
R	-0.002563	0.016234	-0.157901	0.8747	0.033043	0.033280	0.992868	0.3222
I	-0.280789	0.134443	-2.088532	0.0382	-0.255541	0.257476	-0.992485	0.3224
GD	-0.086431	0.026006	-3.323451	0.0011	-0.090897	0.051223	-1.774527	0.0778
EX	-0.924909	0.046912	-19.71574	0.0000	0.054406	0.101662	0.535168	0.5932

Table 5: Regression on Changes in RGDP against Convergence Criteria with Dummy Variables for the Country Specific Differences and Recession Periods for the Candidate Countries

Variable	Coefficient	Std. Error	t-Statistic	Prob
D1	2.060109	0.314385	6.552823	0.0000
D2	2.755416	0.334286	8.242680	0.0000
D3	2.306852	0.356544	6.470038	0.0000
D4	2.774886	0.313323	8.856314	0.0000
D5	2.077049	0.307218	6.760838	0.0000
DR	-1.168772	0.333570	-3.503825	0.0006
EX	-0.899855	0.049556	-18.15835	0.0000
GD	-0.060971	0.026060	-2.339658	0.0205
I	-0.120949	0.146299	-0.826723	0.4096
R	-0.006559	0.015789	-0.415398	0.6784

The countries in this particular test included: Czech Republic, Estonia, Hungary, Lithuania and Poland. The goal of this test was to examine if the candidate countries, which carried similar characteristics to the countries that adopted the euro, experienced similar changes in regards to their economic growth.

The Dublin-Watson statistic showed almost perfect results of 1.99 indicating no sign of autocorrelation. All of the beta coefficients for the independent variables were negative and statistically significant. The only exception was the change in the interest rates. Table 4 displays the results.

The significance of all of the other independent variables and their negative coefficients implied that covering the requirements on the Maastricht criteria had a positive economic impact on the candidate countries. The greatest impact on the economic growth of these countries came from a decrease in their exchange rates, suggesting that these candidate countries should focus on stabilizing their currencies as a primary goal.

Again, as with countries that had adopted the euro, the best model was the one that incorporated no lags. Utilizing dummy variables the model improved with isolation of the effects of recessions and country-specific differences.

In the test for the candidate countries, all the dummy variables were significant. These results suggest that the country-specific differences and the effects of recessions were statistically significant and did have an impact on the economic growth of the sampled countries. When it comes to the significance of the independent variables, only the exchange rates and the ratio of government debt to GDP were significant. Refer to Table 5 for details.

As can be seen in Table 5, the values of their coefficients were negative suggesting that as the candidate countries progressed in the compliance with the convergence criteria, they would encounter positive economic growth. The value of the beta coefficients for the exchange rates was also much higher meaning that the impact of this variable would be much greater. Therefore, this preliminary study suggests that candidate countries should focus on exchange rates stability above other targets as they focus on joining the monetary union.

DISCUSSION

The transition to a unified currency system is a difficult process for those countries undertaking the challenge. These countries have been struggling with meeting the convergence criteria and planning for significant transition expenditures. There are numerous opportunity costs, such as infrastructure, healthcare, social welfare, associated with the transition process.

These emerging countries are more prone to experience severe exchange rate fluctuations, as well as credit crunches. The adoption of the euro as an official currency by the new member states could also lead to initial economic shocks. These shocks could come in the form of volatile price level fluctuations, decreased purchasing power and other economic challenges. However, the results from the statistical tests performed in this study showed that those countries that have recently adopted the euro were able to experience positive economic growth.

Summary: The results of the study can be summarized as:

- Countries in the Euro zone experienced positive economic growth while in the process of complying with convergence criteria
- The positive effects of the compliance took full effect after one quarter (one lag period)
- Isolating the effects of recessions and country-specific differences signaled that these countries' economic growth was not impacted by these macroeconomic factors
- The benefits of the convergence process were as positive for the candidate countries as they were for the existing EU members

CONCLUSION

This study pointed the economic benefits of joining a monetary union. It is important to note that the Czech Republic, Estonia, Hungary, Lithuania and Poland, experienced the same positive economic growth while complying with the convergence criteria. These preliminary results imply that just complying with the mandated criteria alone could promote economic growth.

Although this study had data limitations due to the short relevant period, it provided an insight on the benefits of the convergence process and the impact of the monetary rules on the new member states. It indicated the positive relationship between economic growth and compliance criteria. Further and future studies in this area should review the experiences of Europe's convergence process adding future data and taking social costs and non-monetary factors into consideration.

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