
EUROZONE - PROS & CONS**M. Rani¹ and K. Bhutani²**^{1,2}Department of Commerce, Bharati College, University of Delhi, India¹mala.rani@bharati.du.ac.in

ABSTRACT

This paper studies an important phenomenon that how is common currency impacting the economies of members in the Eurozone. The member states participated in the EMU to increase the volume of bilateral trade among them and to improve their economic condition. The main reason put forth was reduction in cost by eliminating transaction cost of different currencies. The study concludes that the expected impact of euro did not turn out to be the actual impact. Exploring the data of GDP from 2000-2011 of two groups of member states in the Eurozone, the study could not find a direct relation between the common currency and improvement in the macroeconomic variable.

Keywords: Eurozone, European Union, Euro, GDP

1. Introduction

The emergence of Economic Monetary Union in the Eurozone is an offshoot of a long-drawn process spanned over six decades. The starting point for six founding members was to collaborate for Coal and Steel, required for rebuilding the Europe devastated by the Second World War. Gradually, the idea of collaboration and cooperation gathered steam and spread on to other economic and civic parameters. Custom union was formed which ultimately led to Single European Act. Finally, the process culminated into EMU and hence, a common currency, Euro in 1999. When other European nations sensed the benefits of EMU, there was a huge rush to apply for membership and join Eurozone (Rani, 2017). Eurozone started facing a major turbulence starting 2008. Due to some unwarranted developments in the economies of a number of EU members, political and academic debates started on the future of EU. The present study has been undertaken to understand the causes of the problem using a macroeconomic variable Gross Domestic Product (GDP) from 2000 to 2011, and comparing the data of two groups of member states.

2. Review of Related Literature

While working on this paper, the researcher has studied a number of prior studies. Some more relevant studies have been mentioned here. "A complete EMU is not an end in itself. It is a means to create a better and fairer life for all citizens, to prepare the Union for future

global challenges and to enable each of its members to prosper. Europe is emerging from the worst financial and economic crisis in seven decades. The challenges have forced the governments and EU institutions to stabilize their economies and to protect what is achieved through the gradual and tough process of European integration" (Juncker, Tusk, Dijsselbloem, & Draghi, 2015). Monetary integration is one of the most far-reaching areas of European integration; EMU stands as one of the EU's flagship achievements. But, the second decade of the single currency gave rise to an asymmetry between 'core' and 'periphery' member states (Howarth & Verdun, 2020). Studies have examined how the euro periphery has dealt with these challenges by studying the case of Italy (Notermans & Piattoni, 2020), how EMU contributed to the Greek crisis and what the EU's rescue of Greece has meant for EMU governance (Pagoulatos, 2020). The crisis of the last decade has, in fact, shaken the EU to its roots. Solely the 'bad' behaviour of some members is not responsible for the economic problems which have threatened the existence of the euro, rather the 'design faults' in the construction of the euro project is equally to be blamed. The faults such as the convergence criteria which focuses on nominal not real variables; disregards the exchange rates at which countries enter the EMU, or ignores the current account deficits and surpluses; and the differences in inflation mechanisms between countries (Arestis & Sawyer, 2011). "Inflation

differentials across the euro zone have been persistent, and real exchange rate movements across the euro area have been substantial. The adoption of the euro has resulted in economic integration; however, economic linkages with the rest of the world are also growing strongly and hence, the relative importance of trade within the European monetary union has not dramatically increased. In future, a severe economic downturn or financial crisis in a member country will decide the future political viability of the euro" (Lane, 2006). Twenty years of euro history confirms the euro's stability and position as the second global currency. Euro also enjoys the support of majority of the euro zone population. The European Central Bank is successfully keeping inflation at a low level. However, the European debt and financial crisis in the 2010s marked a need for deep institutional reform (Dabrowski, 2019).

3. Significance of the Study

The first decade of EMU was very eventful but the next decade witnessed the turbulence and sent a warning signal to the Eurozone to introspect and mend ways.

To study the impact of introduction of common currency in the Eurozone, by comparing the pre-euro and post-euro status of macroeconomic indicators of two different sets of member-states – core and periphery, is significant for the entire world because the European Union is the world's largest trading block and the second largest economy.

4. Objectives of the Study

In the light of history of Eurozone and the present global status of EU, the specific objectives of the present study are as follows.

- 1) To identify the defects in the design of EMU.
- 2) To analyse the differential impact of Euro on Eurozone by comparing pre-euro and post-euro status of problem states with that of core states.

- 3) To compare the economic status of economically weak states with stronger ones.

5. Scope of the Study

The proposed study focuses on:

- (i) Two groups of member states, namely, Germany, Austria, France, Finland and Belgium, grouped as More Prosperous European Economies, MPEE; and Italy, Spain, Greece, Portugal and Ireland, grouped as Less Prosperous European Economies, LPEE.
- (ii) Economic variable- GDP.
- (iii) Available data for the period from 2000 to 2011.

6. Research Methodology

For an empirical and comparative study of the data, the appropriate statistical tools are used, such as, Levene's Test and t-Test. Where the observed differences are found to be significant, further analysis is done to gain a better understanding of why variation exists. Correlation Analysis is used to explain why there are differences or variations in GDP.

7. Analysis

To understand the nuances of macroeconomic variable and the impact of EMU, the descriptive analysis is done.

7.1. GDP Growth Rate

Average annual GDP growth rate, maximum GDP, minimum GDP, standard deviation (S.D.) and coefficient of variation (C.V.) in GDP of each country for an overall period from 2000 to 2011, has been shown in Table 1, for pre-Euro period from 2000 to 2002 in Table 2 and for post-Euro period from 2003 to 2011 in Table 3, and efforts have been made to measure the impact of EMU on the annual GDP growth rate of each selected member-state.

Table 1: GDP Growth Rate, Overall Period (2000-2011)

Country	Mean (in %)	Maximum (in %)	Minimum (in %)	Standard Deviation (S.D.)	Coefficient of Variation (C.V.)
Austria	1.81	3.71	-3.82	2.05	1.13
Belgium	1.63	3.67	-2.80	1.69	1.04
Finland	2.17	5.34	-8.54	3.69	1.70
France	1.42	3.68	-3.15	1.72	1.22
Germany	1.36	4.01	-5.15	2.54	1.87
Greece	1.53	5.94	-7.11	4.36	2.85
Ireland	3.18	10.65	-6.38	4.49	1.41
Italy	0.67	3.65	-5.49	2.29	3.44
Portugal	0.81	3.92	-2.91	1.84	2.29
Spain	2.15	5.05	-3.83	2.49	1.15
MPEE	1.68	3.88	-4.69	2.26	1.35
LPEE	1.67	5.55	-4.35	2.74	1.64

Table 2: GDP Growth Rate, Pre-Euro Period (2000-2002)

Country	Mean (in %)	Maximum (in %)	Minimum (in %)	Standard Deviation (S.D.)	Coefficient of Variation (C.V.)
Austria	2.07	3.67	0.86	1.44	0.70
Belgium	1.95	3.67	0.81	1.52	0.78
Finland	3.14	5.32	1.83	1.90	0.60
France	2.15	3.68	0.93	1.40	0.65
Germany	1.53	3.06	0.01	1.53	1.00
Greece	4.04	4.48	3.44	0.54	0.13
Ireland	7.02	10.65	4.99	3.15	0.45
Italy	1.99	3.65	0.45	1.60	0.81
Portugal	2.22	3.92	0.76	1.59	0.72
Spain	3.81	5.05	2.71	1.18	0.31
MPEE	2.17	3.88	1.16	1.49	0.69
LPEE	3.81	5.55	2.56	1.55	0.41

Table 3: GDP Growth Rate, Post-Euro Period (2003-2011)

Country	Mean (in %)	Maximum (in %)	Minimum (in %)	Standard Deviation (S.D.)	Coefficient of Variation (C.V.)
Austria	1.72	3.71	-3.82	2.28	1.33
Belgium	1.52	3.27	-2.80	1.82	1.20
Finland	1.85	5.34	-8.54	4.16	2.25
France	1.17	2.54	-3.15	1.82	1.56
Germany	1.30	4.01	-5.15	2.87	2.21
Greece	0.69	5.94	-7.11	4.78	6.91
Ireland	1.90	6.08	-6.38	4.22	2.23
Italy	0.23	2.20	-5.49	2.39	10.55
Portugal	0.34	2.37	-2.91	1.75	5.20
Spain	1.60	4.08	-3.83	2.60	1.63
MPEE	1.51	3.50	-4.69	2.52	1.67
LPEE	0.95	3.75	-4.35	2.72	2.86

(i) Analysing GDP for Austria, S.D, suggests that the dispersion in the value of GDP growth rate over the entire period (2000-2011) is quite less at 2.05, especially in pre-Euro period (2000-2002) at 1.44. C.V. also substantiates the same argument as its values 1.13 (2000-2011), 0.70 (pre-Euro)

and 1.33 (post-Euro) indicate that the fluctuations in GDP is negligible.

(ii) GDP growth rate of Belgium also shows consistency over the period with 1.63 per cent overall, 1.95 per cent pre-Euro and 1.52 per cent post-Euro. Just like Austria, Belgium also shows that post-Euro, the

minimum GDP fell as much as by 2.0 per cent. S.D. results show that the fluctuation in GDP growth is not only consistent over the entire observed period (1.69) but also in the pre-Euro period (1.52) and the post-Euro period (1.82), emphasising that differential impact of EMU on Belgium's economy is negligible. Although the C.V. in the pre-Euro and post-Euro periods tends to show otherwise. The pre-Euro fluctuations in GDP growth were at 0.78, thus showing an increase of 0.42 in post-Euro period.

- (iii) Looking at the rate of Finland, the overall GDP growth is impressive at 2.17 per cent; it was much higher at 3.14 per cent in the pre-Euro period and was bogged down to 1.85 per cent in the post-Euro period. It is the highest fall in the minimum GDP growth among all the ten select member-states and both the groups. S.D. at 3.69 for the entire period (2000- 2011) is the third highest in the panel and shows that there were great swings in the average GDP growth.
- (iv) Now, for one of the large economies of EU, namely France, the GDP growth rate for the total period is 1.42 per cent. It was much higher at 2.15 per cent in the pre-Euro period that fell to 1.17 per cent in the post-Euro period. The minimum GDP growth stood at 0.93 per cent in the pre-Euro period that decreased to -3.15 per cent, surely not a desirable impact of EMU. C.V. data of 1.22 for the entire period, 0.65 in the pre-Euro period and 1.56 in the post-Euro period indicate a small movement in GDP.
- (v) GDP growth rate of Germany has shown almost identical percentage in all the three periods, in total (2000-2011), in pre-Euro (2000-2002) and in post-Euro (2003-2011). It can be said that in Germany, the growth rate of GDP remained static irrespective of the introduction of Euro. C.V. of German GDP for the entire period was 1.87, which was only 1.0 during the pre-Euro period and rose up to 2.21 in the post-Euro period.
- (vi) Greece emerged to be the laboratory to test the success of EMU. As far as GDP is concerned, Greece had the second highest GDP growth at 4.04 per cent before the

introduction of Euro. The overall GDP growth was also higher at 1.53 per cent than the two big economies of the EU, namely, France (1.42 per cent) and Germany (1.36 per cent). But, in post-Euro, a gigantic fall brought down its GDP to 0.69 per cent, the third lowest among all the selected member-states.

- (vii) For GDP growth rate of Ireland, much shocking results are found. Ireland had not only the highest GDP growth at 3.18 per cent for the entire study period, but also the phenomenally highest at 7.02 per cent in the pre-Euro period. No member-state in our selected group could come closer to this performance of the Irish economy. But the impact of EMU has been so severely negative on Ireland that GDP turned out to be only 1.9 per cent post-Euro. Although the fissure was huge in maximum and minimum GDP even in the pre-Euro ranging from 10.65 per cent to 4.99 per cent (more than 5.0 per cent), it aggravated further in the post-Euro from 6.08 to -6.38 per cent (almost 12 per cent). This shows the precarious condition of the Irish economy.
- (viii) Italy seems to be a poor cousin of the selected member-states having the least GDP growth rate of 0.67 per cent. During pre-Euro, its growth rate was almost 2.0 per cent which fell to 0.23 per cent in the post-Euro. This variation was less in the pre-Euro and measured only 0.81. On the contrary, in the post-Euro, the instability in the Italian economy increased sharply and C.V. reached up to 10.55, the highest among all the selected member-states.
- (ix) The overall GDP growth of Portugal was sufficiently high at 2.22 per cent in pre-Euro, but became dismal at 0.34 per cent in post-Euro. This signifies that the EMU had an adverse impact on the Portuguese economy. C.V. was 2.29, showing large fluctuations. Pre-Euro C.V. was very less at 0.72; while, it was massive at 5.20 in post-Euro period.
- (x) GDP growth rate of Spain was reasonably high at 3.81 per cent in the pre-Euro, while it fell to 1.6 per cent in the post-Euro. Overall GDP growth was the third highest at 2.15 per cent. The maximum GDP was

highest in the pre-Euro and the minimum GDP was the lowest in the post-Euro. Even the C.V. suggests that the Spanish economy became more volatile in post-Euro at 1.63 which was only 0.31 prior.

- (xi) Comparing GDP growth rate of MPEE and LPEE, the difference was non-existent in the average growth during the entire period, as the rate was 1.68 per cent for MPEE and 1.67 per cent for LPEE.

7.2. Correlation Analysis

The results of Bi-Variate Correlation Analysis & post- and pre-Euro Correlation Index between MPEE and LPEE for GDP are provided in Table 4. This correlation index reflects the change in correlation in the post-Euro relative to the pre-Euro period

Table 4: Bi-Variate Correlation Coefficients & Post- and Pre-Euro Correlation Index between MPEE and LPEE Countries

Variables	Pearson Correlation Coefficient	Study Periods			Post- and Pre-Euro Correlation Index
		Total	Pre	Post	
GDP Growth Rate	Coefficient	0.75	0.99	0.77	0.78

Correlation between LPEE and MPEE has been positive for GDP in both the periods. We find high positive correlation in overall period and post-Euro, along with very high positive correlation in the pre-Euro. This implies that, the correlation between GDP growth of LPEE and MPEE has reduced post-Euro. This is further affirmed by the less than one (0.78) value of the post- and pre-Euro correlation index.

The study now puts the data to more rigorous testing and then, further analyses the results to draw a meaningful conclusion. To test the equality of Variances and equality of Means of GDP, Levene's Test and t-Test are applied respectively.

First considering the data in Table 5, we take a Null Hypothesis (H_0) as follows.

H_0 : Average GDP Growth Rate is same in the pre-Euro and post-Euro periods.

7.3. Inferential Analysis

Now, we focus on the 3S, that is, Significance, Size and Sign.

Table 5: GDP Growth Rate, Select Member-States

Country	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	Sig. (2-tailed)	Mean Difference
Austria	0.17	0.69	0.25	0.81	0.36
Belgium	0.01	0.91	0.37	0.72	0.43
Finland	0.43	0.53	0.51	0.62	1.29
France	0.14	0.71	0.84	0.42	0.98
Germany	0.74	0.41	0.13	0.90	0.23
Greece	8.22**	0.02	2.06*	0.07	3.35
Ireland	0.53	0.49	1.91*	0.09	5.12
Italy	0.28	0.61	1.17	0.27	1.76
Portugal	0.26	0.62	1.64	0.13	1.88
Spain	2.48	0.15	1.39	0.20	2.21
MPEE	0.27	0.61	0.42	0.68	0.66
LPEE	2.31	0.16	1.70	0.12	2.86

Levene's Test: Applying Levene's Test for equality of variances, it is found that it is rejected in case of Greece. Hence, in case of Greece, the unequal variance t-Test has been used. For all other countries, the equal variance t-Test is used.

t-Test: The t-Test result is significant in the case of Greece and Ireland and hence, the null hypothesis that the GDP growth rate has equal means in pre-Euro and post-Euro periods is rejected in the case of both the member-states. In Table 5, mean difference of all the member-states and both the groups is positive. It signifies that the GDP growth of pre-Euro period is higher than the GDP growth of the post-Euro period. Interestingly, the mean difference of GDP growth rate of Greece and Ireland are significantly high at 3.35 per cent and 5.12 per cent. Their mean difference is among the top two highest followed by the mean difference of the LPEE. The mean difference of GDP growth rate is statistically significant at 10 per cent level while for Greece and Ireland; it is 7 per cent and 9 per cent respectively. The LPEE not only has a positive mean difference, indicating that the pre-Euro average GDP growth rate was higher, but also it is much higher at 2.86 than the mean difference of the MPEE which has a magnitude of 0.66 only.

8. Conclusion

The economy of Austria has been steady during pre- and post-Euro periods. The fluctuations in GDP growth of Belgium increased in the post-Euro. The differential impact of Euro on the Finnish economy has been tremendous. The oscillation increased in the German economy in post-Euro. The EMU had a severe negative impact on the Greek as well as Irish economies. The differential impact of EMU on the Italian economy was not as it was desired and expected. The EMU disturbed the Portuguese economy as well.

We may infer that EMU created unsteadiness among the economies of the LPEE. Despite the volatility, a tendency for lessening the dispersion of GDP growth rates is to be noted. However, due to the global economic crisis, an increase in the dispersion is visibly noticed in the years 2008 and 2009.

The Euro is overall a stable and successful currency. As expected, it has provided transaction cost reduction and price stability, and the shield against external instability. In a short span of time, it has become the second most important global currency as around sixty nations directly or indirectly peg their currency to it. The present crisis is the right time to work on the 'design faults' of convergence criteria to strengthen the Eurozone.

References

1. Arestis, P., & Sawyer, M. (2011). The Design Faults of the Economic and Monetary Union. *Journal of Contemporary European Studies*, 19(1), 21-32.
2. Dabrowski, M. (2019). The Economic and Monetary Union: Past, Present and Future. CASE Research Paper No.497. Retrieved from <https://ssrn.com/abstract=3393532>
3. Howarth, D., & Verdun, A. (2020). Economic and Monetary Union at twenty: a stocktaking of a tumultuous second decade: introduction. *Journal of European Integration*, 42(3), 287-293. doi:10.1080/07036337.2020.1730348
4. Juncker, J. C., Tusk, D., Dijsselbloem, J., & Draghi, M. (2015). Completing Europe's Economic and Monetary Union. ecb.europa.eu.
5. Lane, P. R. (2006). The Real Effects of European Monetary Union. *Journal of Economic Perspectives*, 20(4), 47-66. doi:10.1257/jep.20.4.47
6. Notermans, T., & Piattoni, S. (2020). EMU and the Italian debt problem: destabilising periphery or destabilising the periphery? *Journal of European Integration*, 42(3). doi:10.1080/07036337.2020.1730353
7. Pagoulatos, G. (2020). EMU and the Greek crisis: testing the extreme limits of an asymmetric union. *Journal of European Integration*, 363-379.
8. Rani, M. (2017, February). Differential Impact of European Monetary Union on

- Select Member-States, 2000-2011. Doctoral Thesis (Unpublished). Jamia Millia Islamia, New Delhi, India.
9. Rani, M. (2014). Differential Impact of Euro on Trade: A Trend Analysis. IIM Journal, 4(2)
10. Scharpf, F. (2011). Monetary Union, Fiscal Crisis and the Pre-emption of Democracy. Journal for Comparative Government and European Policy, 9(2), 163-198.