

Effects of Euro Devaluation on Eurozone Exports

Nahid Kalbasi Anaraki¹

¹ Northcentral University, School of Business and Technology Management, AZ, United States

Correspondence: Nahid Kalbasi Anaraki, Northcentral University, United States. E-mail: nkalbasianaraki@ncu.edu

Received: September 29, 2013

Accepted: December 3, 2013

Online Published: January 23, 2014

doi:10.5539/ijef.v6n2p19

URL: <http://dx.doi.org/10.5539/ijef.v6n2p19>

Abstract

The recent sovereign debt crisis in the Eurozone, which still continues to grow, is presumed to be one of the most severe financial crisis in the world economy during the past decades. The crisis represents not only a real threat to the recovery of the Eurozone but also to the world economy. Indeed, one of the challenges many European countries are currently confronting with is a trade deficit, which stems from an overvalued Euro. Many empirical studies have shown that an overvalued Euro has led to a current account deficit in many European countries. The neighbor thy policy recently adopted by Japan and the manipulation of Renminbi by China to boost its economy has created more pressures on the Eurozone exports. In order to reverse this trend, adoption of real and financial sector reforms, including devaluation of Euro, seems inevitable. The goal of this paper is to evaluate the impact of devaluation of Euro on Eurozone exports using Keynesian approach, and implementing econometric models. The results of this study suggest that a trivial devaluation in Euro has statistically significant impact on the Eurozone exports, which could reverse the delayed recovery of many peripheral countries.

Keywords: beggar thy neighbor policy, Euro devaluation, sovereign debt crisis, current account deficit, competitiveness, nominal adjustments, Eurozone exports

1. Introduction

The recent Euro crisis has substantially shaken the financial markets around the globe since 2007. The Eurozone accounts for 13% of global GDP, and the euro-dollar pair is the most active currency pair comprising 28% of global trade (Bootle, 2012). Though monetary union was supposed to create convergence among member countries, it didn't succeed due to lack of competitiveness and burden of excessive sovereign debt in some countries. Several Eurozone countries are currently suffering from a chronic shortage of aggregate demand. Greece, Ireland, Portugal, and Spain were on the edge of default due to lack of competitiveness and sovereign debt crisis. The differences among European countries cannot be explained by different productivity levels, rather by different level of inflation and competitiveness. It is more likely that these differences have been caused by nominal disequilibrium, which requires a nominal adjustment, in turn. Indeed, many peripheral countries are suffering from a prolonged twin crisis (balance of payment and banking crisis) which has delayed the economic recovery not only at the region but also at the global level. The Euro devaluation is a policy instrument that despite its dismerits could help many crisis countries in the Eurozone to rescue their economies. Though devaluation of Euro may be detrimental to some core countries, it seems to be beneficial to such countries like France (Magnani et al., 2013). Indeed, securing and restoring competitiveness among many peripheral countries depends on nominal reforms, including the labor market reform, and currency devaluation, which could turn the current account deficits to a surplus in these countries.

The parity of Euro against major currencies has attained enough attention to be among the most recent G-20 debates. While France believes that the Euro is too strong against U.S. dollar and other major currencies, the European Central Bank and German monetary authorities find this argument counter-productive. The question that concerns many policy makers is whether Euro is really overvalued against major currencies or not. Does a possible devaluation of Euro can rescue the crisis countries? Will it be beneficial to Eurozone to devalue Euro? Will it be detrimental to core countries? The euro is estimated to be overvalued in 2009 and 2010 by 15% and 8% respectively (Coudert et al., 2012). And many studies including Magnani et al. (2013) find that Euro devaluation is beneficial to France economy.

If the Eurozone export is highly elastic to the parity of Euro against major currencies, then a trivial devaluation of

Euro could have significant impact on its exports. This policy debate has emerged in the midst of Japan's Central Bank recent strategy to devalue Yen against U.S. dollar, and Euro in order to rescue its economy from a prolonged recession. Though the beggar thy neighbor policy has been criticized due to its neutralized effects if all countries follow such a policy, many believe that devaluation of Yen could have adverse consequences for the Eurozone in the form of loss of competitiveness and fall of exports. In order to respond to these questions, this study attempts to quantify the potential impacts of Euro devaluation against major currencies on Eurozone exports. The results have important policy implications for European authorities and European Central Bank because it can help the Eurozone, particularly peripheral countries, to rescue their economy from a prolonged recession.

The beggar thy neighbor policy transforms the former types of discrimination against cross border imports from tariff and non-tariff barriers to monetary and exchange rate instruments. While China has been using this policy during the past few years to raise its exports to the U.S. and Europe, Japan has recently announced its determination to restore beggar thy neighbor policy as a final instrument to rescue its economy from a prolonged recession. Though restoring to beggar thy neighbor policy may be neutral in the long-run, it certainly has some short-run effects.

Though export of Japan to Eurozone doesn't exceed 9% of its total exports, the beggar thy neighbor policy adopted by Japan could have significant impacts on Eurozone because it affects the value of dollar against major currencies as well. Indeed, in a globalized economy, a trivial change in a major currency could have a domino effect on the parity of other currencies. This study tries to investigate the effects of Euro devaluation on Eurozone exports through Keynesian approach, using econometric models where the exports of Eurozone to different countries is a function of regional GDP, the parity of Euro against major currencies, the openness of the host economy, and the price index in the Eurozone. The estimated results will help us to gauge the cross-currency elasticity of major currencies against each other on the Eurozone exports.

The results of this study could have important policy implications for the monetary authorities in the Eurozone because it enables them to evaluate the impacts of devaluation of Euro against major currencies on the Eurozone exports, which in turn, can help many peripheral countries to rescue their economies from a prolonged recession.

2. Literature Review

Magnani et al. (2013) investigate the impact of Euro devaluation on French economy. They implement a computable general equilibrium (CGE) model with 2006 input-output data, and simulate the macroeconomic effects of a shock to Euro. They evaluate the impact of a 10% devaluation of Euro on France's imports-exports. The results indicate that exports at constant prices increase by 3.2% while imports at constant prices decrease by 7%. Moreover, imports in nominal terms decrease by 2.1%, while exports increase by 3.5%. The impact on current account is positive and statistically significant. The current account transforms from a deficit of 0.5% GDP before the shock to a surplus of 2.1% after depreciation. Indeed, the ratio of current account to GDP increases in real term by 2.6 percentage points.

Patrick A. (2012) investigates the impact of Euro devaluation on Eurozone exports and GDP growth using data from 1998 to 2012. He finds that price elasticity of exports to exchange rate is relatively moderate. His results indicate that a 1% devaluation of Euro improves foreign trade by 0.06 percentage point of GDP. He also finds that a 1% devaluation of Euro would reduce GDP by 0.1 percentage points. In sum, his results suggest that the Eurozone real GDP declines in line with depreciation of Euro, since the negative effect of devaluation on terms of trade outweighs the positive effects on volume of exports.

Coudert et al. (2012) compare currency misalignment before and after the launch of euro. They compare misalignment for two periods 1988–1998, and 1999–2010 for all EU countries. They find currency misalignments have been larger since the emergence of monetary union for 8 out of 11 countries. Moreover, misalignments are more persistent after the creation of monetary union than before. Second, misalignments are more persistent in peripheral countries than in core countries. In other words, the disequilibria in real exchange rates are corrected very slowly in the former group. They argue that overvaluation of euro has been more pronounced in peripheral countries mainly due to four factors: (i) lack of adjustment mechanism, (ii) lack of progress in productivity, (iii) higher inflation rate and (iv) appreciation of euro against third currencies, which has had adverse effects on the competitiveness of peripheral countries compared to third countries. More importantly, the three countries that have been adversely affected by the sovereign debt crisis in 2010–2011, Greece, Ireland, Portugal, are exhibiting the largest overvaluation of their real exchange rates. Indeed, the gap and discrepancies in competitiveness inside the monetary union is a further challenge for a successful performance of the currency union.

Lin and Treichel (2012) analyze the roots of crisis in Europe and evaluate the extent to which it was driven by internal factors, particularly adoption of euro. They argue that adoption of euro has led to the convergence of

interest rates among peripheral and core countries, creating higher spending in peripheral countries. The real appreciation has led to the loss of competitiveness in peripheral countries, which in turn, adversely affected their export performance entailing to a current account deficit. Germany maintained its competitiveness through restraining wages, leading to higher exports to peripheral countries. As a matter of fact, adoption of Euro has exacerbated the intra-European imbalances.

A study by Quarterly Report on the Euro area (2011) using different versions of European commission model suggests that nominal exchange rate devaluation can be mimicked by internal devaluations, which can lead to similar expenditures switching from foreign goods to domestic output. They find external exchange rate devaluation has positive effects in the short-run but does not lead to a permanent trade balance improvement in the long-run.

Popov (2011) focuses on some Eastern European countries and implements data from 1992 to 2007. He estimates the relation between output and devaluation and finds that the expansionary effect of devaluation is limited. He argues when facing with external shocks countries that adopted devaluation policy experienced smaller slowdown in growth than the countries that did not devalue. He concludes that devaluation was associated with smaller reduction of output when confronting with external shocks, except for countries with very high inflation.

Magnanie et al. (2011) use a micro-macroeconomic model to evaluate the effects of potential devaluation on domestic and external variables such as GDP, fiscal deficit, and trade. They find that devaluation improves the current account by reducing imports and increasing exports. Thus the external financial position is improved. They analyze the effects of 10% depreciation of Euro, using a computable general equilibrium (CGE) model. They find that as a result of 10% devaluation, exports rise by 0.85%, while imports decrease by 3.41% at constant prices. In the nominal term, imports increase by 1.28% and exports increase by 1.19%. The impact on current account at constant prices is positive and statistically significant. And the ratio of current account to GDP increases by 1.15%.

3. Research Questions and Hypotheses

Since China, Japan, and the U.S. are the main trade partners of the Eurozone, this study attempts to evaluate the impact of Euro devaluation on Eurozone exports to above countries by estimating a series of econometric models, using quarterly data from 2001 to 2010. The research questions in this study are as follows:

- 1-To what extent, if any, devaluation of Euro will affect Eurozone exports to China?
- 2-To what extent, if any, devaluation of Euro will affect Eurozone exports to Japan?
- 3-To what extent, if any, devaluation of Euro will affect Eurozone exports to U.S.?

Based on the above research questions, this study attempts to test the following hypotheses:

1) H10= There is no significant relationship between the devaluation of Euro against Renminbi and Eurozone exports to China.

H1a= There is a statistically significant relationship between devaluation of Euro against Renminbi and Eurozone exports to China.

2) H20= There is no significant relationship between devaluation of Euro against Yen and Eurozone exports to Japan.

H2a= There is a statistically significant relationship between devaluation of Euro against Yen and Eurozone exports to Japan.

3) H30= There is no significant relationship between devaluation of Euro against dollar and Eurozone exports to the U.S.

H3a= There is a statistically significant relationship between devaluation of Euro against dollar and Eurozone exports to the U.S.

4. Research Method

This study will use a quantitative research methodology to estimate the impact of devaluation of Euro against major currencies on Eurozone exports. The results will have major policy implications for European Central Bank and monetary authorities in Europe because it can help them adopt a better strategy in choosing the parity of Euro against major currencies to overcome the trade deficit, particularly in the peripheral countries. Indeed, the results of this study will provide a rule of thumb to visualize the effects of devaluation of Euro against major currencies on Eurozone exports.

The above hypotheses will be tested through estimating the following econometric models, using Keynesian

approach. The exports of the Eurozone to U.S., China, and Japan, are assumed to be a function of the host country GDP and its openness, the parity of the Euro against major currencies such as US dollar, Yen, and Renminbi, and the price index in the Eurozone..

$$EUX_{US} = a_0 + a_1USGDP + a_2Openness + a_3CPI + a_4EU / USD + a_5EU / Yen + a_6EU / Yuan$$

$$EUX_{China} = a_0 + a_1ChinaGDP + a_2Openness + a_3CPI + a_4EU / USD + a_5EU / Yen + a_6EU / Yuan$$

$$EUX_{Japan} = a_0 + a_1JapanGDP + a_2Openness + a_3CPI + a_4EU / USD + a_5EU / Yen + a_6EU / Renminbi$$

4.1 Sample and Data

The study implements quarterly data for the period of 2001–2010 to estimate the above regression models, while checking for robustness and heteroscedasticity problems. The data on the above variables have been retrieved from the European Central Bank, the Federal Reserve Bank of St. Louis, the World Bank, and the Euro-stat.

4.2 List of Variables

EUXUS: Eurozone exports to the U.S.;

EUXChina: Eurozone exports to China;

EUXJapan: Eurozone exports to Japan;

USGDP: Gross Domestic Production of U.S.;

ChinaGDP: Gross Domestic Production of China;

JapanGDP: Gross Domestic Production of Japan;

Openness: The degree of openness measured by imports plus exports ratio to GDP;

CPI: Price Index in the Eurozone area;

EU/USD: The parity of Euro against U.S. dollar;

EU/Yen: The parity of Euro against Yen;

EU/Renminbi: The parity of Euro against Renminbi;

The estimated coefficients from this system of equations not only indicate whether Eurozone exports are elastic to the devaluation of Euro, but also measures the magnitude of its elasticity. The results could help European monetary authorities to stimulate their exports and avoid a prolonged recession.

5. Results

In this section the results of estimating the above econometric models using quarterly data for the period of 2001 through 2010 for the Eurozone exports are presented. Interestingly enough, in all models more than 75% of changes in dependent variables can be explained by independent variables including: GDP, openness of the host country, consumer price index (CPI) in the Eurozone, and the parity of Euro against major currencies.

5.1 Data Analysis

Ironically, though euro parity against major currency is statistically significant for all these countries, the coefficient on the parity of euro against Renminbi is bigger than other two currencies. Indeed, a 10% devaluation in Euro parity against Renminbi results in 3.1% increase in the Eurozone exports to China, a 10% devaluation of Euro against dollar results to 2.4% increase in Eurozone exports to the U.S. and a 10% devaluation against Yen results in 1.9% increase in Eurozone exports to Japan. The bigger impact of devaluation of Euro on Eurozone exports to China may be due to the fact that China is the main trade partner of the Eurozone and has a higher share in Eurozone exports compared to two other countries.

Openness is statistically significant for both China and Japan, though not for the United States. A higher price index in the Eurozone adversely affects its exports to these countries due to loss of competitiveness. In all cases GDP in the host country has a positive significant impact on the Eurozone exports in accordance with Keynesian theory.

Table 1. The coefficients of Eurozone exports model to China

GDP	Openness	CPI	EU/Dollar	EU/Renminbi	EU/Yen
0.46**	0.28**	-0.27**	0.03	-0.31**	-0.07*
(0.21)	(0.11)	(0.07)	(0.01)	(0.09)	(0.04)

Numbers in parentheses are standard errors. R-squared of the model is 0.87. ** Statistically significant at 1% level and * significant at 5% level.

Table 2. The coefficients of Eurozone exports model to Japan

GDP	Openness	CPI	EU/Dollar	EU/Renminbi	EU/Yen
0.19**	0.41**	-0.63**	0.11*	0.17*	-0.19**
(0.10)	(0.09)	(0.12)	(0.07)	(0.09)	(0.01)

Numbers in parentheses are standard errors. R-squared of the model is 0.81. ** Statistically significant at 1% level and * significant at 5% level.

Table 3. The coefficients of the Eurozone exports model to US

GDP	Openness	CPI	EU/Dollar	EU/Renminbi	EU/Yen
0.23**	0.64	-0.78**	-0.24**	0.16	0.44
(0.09)	(0.71)	(0.26)	(0.07)	(0.09)	(0.53)

Numbers in parentheses are standard errors. R-squared of the model is 0.76. ** Statistically significant at 1% level and * significant at 5% level.

6. Conclusion

This study has investigated the impact of the devaluation of Euro against major currencies on Eurozone exports to U.S., China, and Japan. The results are very close to those of Magnani et al. (2013) who found that a 10% devaluation in Euro has a positive impact of 3.2% on its exports. Our results suggest that a 10% devaluation of Euro leads to 3.1% increase in Eurozone exports to China, 1.9% increase in exports to Japan, and 2.4% increase in exports to the U.S. Indeed, exports to China is more elastic to the devaluation of Euro compared to exports to Japan and the U.S. The reason may be due to the fact that China has a larger trade share with the EU. Interestingly enough, the cross elasticity of exports to other major currencies is statistically significant for exports to China and Japan but not for exports to the U.S.

Now, it is more than three years that many peripheral countries, like Greece, Spain, Italy, and Portugal are suffering from the sovereign debt crisis and the adverse consequences of an austerity plan implemented by the European Central Bank, which has led to a huge trade deficit. Though the current parity of euro hasn't affected the competitiveness of the core countries, like Germany and France, it has been detrimental to many peripheral countries due to overvaluation of euro compared to other major currencies. It is time to help this group of countries to rescue their economy through nominal adjustments, ones that are deflationary and increases their competitiveness, not only through labor market reforms but also through devaluation of Euro. The results of this study suggest that devaluation of Euro can help many European countries and the Eurozone to overcome the current account deficit by increasing their competitiveness.

References

- Artus, P. (2012). *Could the depreciation of the Euro save the Eurozone*. Flash Economics, Economic Research, Corporate and Investment Banking, No. 62. Retrieved from <http://cib.natixis.com/flushdoc.aspx?id=62105>
- Bootle, R. (2012). *Leaving the euro a practical guide*. Capital Economics, London, A submission for the Wolfson Economics Prize MMXII by Capital Economics. Retrieved from <https://www.capitaleconomics.com/data/pdf/wolfson-prize-submission.pdf>
- Caldentey, E. P., & Vernengo, M. (2012). *The Euro imbalances and financial deregulations: A post-Keynesian interpretation of the European debt crisis*. Levy Economics Institute of Bard College, Working Paper No. 702, <http://dx.doi.org/10.2139/ssrn.1980886>

- Coudert, V., Couharde, C., & Mignon, V. (2012). *On currency misalignments within the euro area*. Center d'études projectives et d'informations internationales, CEPII, No. 2012-07. Retrieved from http://www.cepii.com/PDF_PUB/wp/2012/wp2012-07.pdf. <http://dx.doi.org/10.1111%2Froie.12018>
- Daravas, Z., & Pisani, F. J. (2010). *The threats of currency wars: A European perspective*. European Parliament, Economic and Monetary Affairs. Retrieved from <http://www.europarl.europa.eu/document/activities/cont/201101/20110105ATT11247/20110105ATT11247EN.pdf>
- Lin, J. Y., & Treichel, V. (2012). *The crisis in the Eurozone: Did the Euro contribute to the evolution of the crisis?* The World Bank, Policy Research Working Paper 6127. Retrieved from <http://elibrary.worldbank.org/docserver/download/6127.pdf?expires=1380308556&id=id&accname=guest&checksum=C2F65B6A7E03096309C738FB8CAFCC5E>
- Magnani, R., Piccoli, L., Carre, M., & Spadaro, A. (2013). *Would a euro's depreciation improve the French economy?* Universite Paris XIII, Universitat de les Ills Balears and Universite Paris Dauphine. Retrieved from http://dea.uib.es/digitalAssets/235/235067_w60.pdf
- Magnani, R., Piccoli, L., Spadaro, A., & Carre, M. (2011). *The effects of Euro's depreciation using a micro-macro simulation approach*. Universite Paris XIII and CEPII, Universitat de les Ills Balears and PSE, and Universite Paris Dauphine. Retrieved from http://ecodroit.univ-lemans.fr/IMG/pdf/riccardo_magnani_paper.pdf
- Mbaye, S. (2012). *Beggar thy neighbor effects of currency undervaluation: Is China the tip of the iceberg?* <http://dx.doi.org/10.2139/ssrn.2190066>
- Merler, S., & Pisani, F. J. (2012). *The simple macroeconomics of North and South in EMU*. Bruegel Working Paper 2012/12. Retrieved from http://www.google.com/url?q=http://www.bruegel.org/download/parent/740-the-simple-macroeconomics-of-north-and-south-in-emu/file/1603-the-simple-macroeconomics-of-north-and-south-in-emu/&sa=U&ei=ZxNWUtpDLq6p4AosxYDoBw&ved=0CB0QFjAB&usg=AFQjCNE3xCDvEX1UhymSal6j7_e6-Clizg
- Popov, V. (2011). To devalue or not to devalue: How East European countries responded to the outflow of capital in 1997–1999 and in 2008–2009. *Periodical of the Hungarian Academy of Sciences*, 61(3), 255–279.
- Quarterly Report on the Euro Area. (2011). *Internal evaluations and external imbalances: A model based analysis*. Retrieved from http://ec.europa.eu/economy_finance/publications/qr_euro_area/2011/pdf/qrea3_section_1_en.pdf
- Wolff, G. B. (2012). *Arithmetic is absolute: Euro area adjustment*. Bruegel Policy Contribution, 2012/09. Retrieved from [http://aei.pitt.edu/35052/1/Arithmetic_is_absolute__euroarea_adjustment_\(English\)__\(English\).pdf](http://aei.pitt.edu/35052/1/Arithmetic_is_absolute__euroarea_adjustment_(English)__(English).pdf)

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).