THE CREDIBILITY OF THE EXCHANGE RATE AFTER THE FAILURE OF THE EUROPEAN MONETARY SYSTEM AND IN THE CONTEXT OF THE CURRENT CRISIS

ISABELLA SIMA, CAMELIA MARIN, MIHAELA RUXANDA, ELENA NISIPEANU
ACADEMY OF ECONOMIC SCIENCIES - BUCHAREST,
i_onescu@yahoo.com, cameliamarin81@yahoo.com, elenanisipeanu@yahoo.com

Abstract:
When in the European Union has appeared for the first time the European Monetary System, some States have met with reluctance while others have embraced almost immediately. However, one thing is certain, until at one point, all States that were part of this system have had confidence in it. Its credibility began to lose after the great crisis of 1992-1993, and in 1999 it was recognised the failure of this system. In the present work we have chosen to analyze the credibility of the exchange rate Euro/dollar after the advent of the single currency on the international market. For this we turned to econometric modeling by multiple regression method. The bottom line is that although some indicators influenţeaă this rate more than others, the exchange rate Euro/dollar is still a pretty credible.

Key ords: *European Union, crisis, European Monetary System, credibility, exchange rate*

JEL classification*:F15 - Economic Integration*

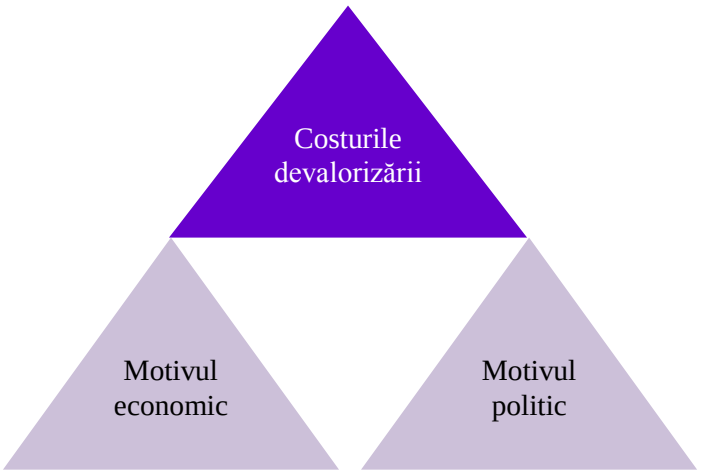
The most important issue that arises in connection with the European monetary Sisitemul is linked to its credibility. There are factors that help the system to define this issue of credibility, namely:

These bands of fluctuation were set at ± 2.25%, compared with a central parity (official), allowing a variation of exchange rates by 4.5%. For some of these countries are members of the European monetary system, the bands of fluctuation were set at ± 6%, so with a variation of the exchange rates of 12%. The width of these margins make it possible for those countries to change regularly exchange rates in small proportions, without having to deal with the great crisis hedge. Also, this fluctuation bands to largheţe does not preclude the existence of higher inflation rates in some countries compared with others.

With regard to the second factor, the cost of devaluation, we can say that they are higher than the cost of the change in the rate of inflation. For example, a country that promises a fixed exchange rate, have fewer incentives to devalue the currency, than one who announced a specific inflation rate. If the question is birth, natural, why are the costs greater devaluation, the two reasons, which I consider to be most important and that would be the answer to this question would be on the one hand the multiple implications of the change in exchange rate in other economic areas, and on the other hand, transparency, official exchange rate cannot be modified without prior consultation

with the other Member countries of the European monetary system. The following figure is intended to summaries these things.

Figure 1- The reasons for the occurrence of the costs related to devaluation



Source: Figure prepared by the authors based on data taken from

The reasons we've stated above are nothing else than some factors contributing to the rising cost of depreciation, so the incentives for devaluation and resulting in increasing in this way the system of fixed exchange rates.

In the evolution of turbulent European monetary system were calm period during which its credibility was on the rise, but there were critical, and times of crisis that have shaken confidence in the European Monetary System. One of these crises and in my view, the most important, is the crisis in September 1992 to August 1993.

In what follows we will try to do a summary of the events of the black period of the European Monetary System.

Until the advent of the Forex market turmoil of 1992-1993, the exchange-rate mechanism is look like a successful monetary arrangements and intra-union more importantly, able to provide the functional framework would lead to a full monetary Union. But unfortunately this beautiful dream, the place has been taken by a cruel reality with the advent of the first major distortions within the European monetary system. We can affirm that there was a paradox between the celebrations by this complete email system has five years of stability in January 1992 and in September 1992, he faced the most drastic crisis period in its history. Between member currencies, the pound sterling and Italian lira left the system, as I pointed out before, it was not Greek drahma still exchange rate Mechanism, the Luxembourg franc was associated with the belgian franc, controlling 51% Spanish and Portuguese escudo website have an impairment spontaneous, what caused that towards the end of 1992, the European Union's Monetary Committee will meet three times to restore equilibrium but no use.

The most popular explanation of the crisis is the time of competitiveness, namely inflation and an increase in the cost of labor.

At that time there were three categories of countries with currencies in the crisis:

- Italy (because of being partial competitiveness);
- Spain, the United Kingdom, plus two members of the European monetary system, Sweden and Finland;
- France, Belgium, Denmark, which had no significant deterioration of competitiveness.

Although the events of August 1993 appear to be tailored according to the same pattern as those in September 1992, there is still a huge difference that shows that the crisis in August was due to differences of economic growth, but rather the faith that the

Bundesbank will not cut interest rates enough to allow its rate reductions, in particular in France and Denmark, where unemployment was high and low inflation.

In the literature it is said that if France had a Central Bank independent historical tradition and a commitment to price stability, could have avoided the crisis.

As a result of the failure of the European monetary system has shown that the system of fixed exchange rates is subject to speculation when the Central Bank is not involved enough and when those expectations speculative turn out to be real.

On the crisis of 1992-1993, economists have achieved four interpretations. The first two of these concern a crisis in fundamental terms and stress the fact that countries have suffered due to the problems of competitiveness divergences in inflation rates, persistent or hidden problems due to shock of German unification. The third interpretation relates to future expectations rather than on issues of competitiveness, while a fourth interpretation starts from the idea that this crisis would be speculative appeared even in the absence of problems related to competitiveness.

We saw that there was a certain credibility to the European monetary system to a certain point, respectively, but still we wanted to see how evolved this credibility of the exchange rate after the introduction of the Euro. So, we chose to search using multiple regression, the influence of the four macroeconomic indicators, Euro area exchange rate of Euro/Dollar.

There were several measurements of the credibility of the European monetary system in the literature. For example, Svensson[1] presented a simple model for the study of the credibility of the exchange rate of specific areas that have a stripe of fluctuation. Vredin and Edin[2] uses a model to estimate the probability of the discretion conferred on the re-alignment of explanatory variables, such as interest rate differential, inflation differential, current account balance and the rate of unemployment.

Proposed include statistical variables which have relations of interdependence. Types of variables used in this model are:

- Endogenous variable, also called resultative or effect variables, variables are those whose values are determined by one or more exogenous variables. Endogenous variables are obtained by solving the model, and therefore they are also called dependent;
- Independent variables and the variables to be a danger or influencing factors are those variables whose status and evolution depends on factors outside the system studied. These explanatory variables are always, i.e. their value is predetermined, known in advance or is determined by placing the primary data. Note that not all the explanatory variable and the pattern are exogenous.

Exogenous variables, in turn, may refer to:

- predetermined or explanatory variables whose values – are known a priori and are used to explain the status and evolution of endogenous variables;
- delayed-effect variables that can be highlighted by retrospection or, in other words, evolution is dependent on the current variables and variables of past periods;
- Residual variables and errors that appear in the model as the sum of all unknown influences.

The proposed model is shown at the same time and its parameters, and the coefficients of the regression, actual sizes and unknowns, which appear in the model in

[1] Svensson L.E.O. – „The simplest test of target zone credibility", FMI Staff Papers 38, 1991, p.655-665

[2] Edin P.A. and Vredin A. – „Devaluation risk in target zone: evidence from the nordic countries", Economic Journal 103, 1993, p. 161-175

different expressions with variables. Process parameters subject to estimation and statistical testing.

Proposed model wants to quantify the influence of factors of an economic nature on the credibility of the exchange rate in the European Union. Includes in its structure 5 variables, one of which four endogenous and exogenous, as indicated in the following table:

Table 1-Symbols of the variables used in the mode and their meanings

Symbol	Meaning	Variable nature
ER	Exchange rate (€ - $)	Endogenous variable
REZI	International reserves denominated in Euro (%)	Exogenous variable
c_1, c_2, c_3, c_4, c_5	Coefficients	
RŞ	The unemployment rate in the European Union (%)	Exogenous variable
RI	The rate of inflation in the European Union (%)	Exogenous variable
RD	The interest rate in the European Union (%)	Exogenous variable

Source: Table prepared by the authors based on data taken from the model

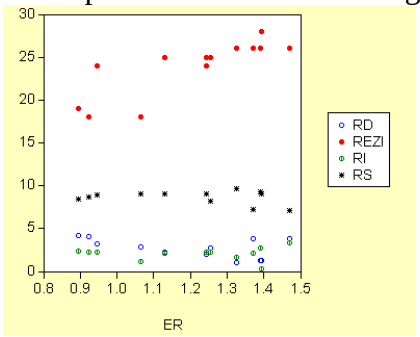
For this model we picked data during the period 1999-2011, with a number of observations. As we said, the target is not only the European Union and the Euro area, because we consider that the other members of these organizations are integrationist affected, if not to a greater extent, increase or decrease the credibility of the exchange rate. We chose to make the parity between the Euro and the dollar, because they are at the present time the key international currencies on the world market. The period is not one chosen at random, but since 1999, the Euro became the single currency of the European Union market.

Table 2- Annual values of factors

Year	ER (USD per 1 EURO) *	REZI (%) **	RS (%) ***	RI (%) ****	RD (%) *****
1999	1,0663	18	9,1	1,15	2,9
2000	0,9241	18	8,7	2,2	4,06
2001	0,8956	19	8,5	2,4	4,23
2002	0,9455	24	8,9	2,2	3,2
2003	1,1311	25	9	2,1	2,25
2004	1,2431	25	9,1	2,2	2
2005	1,2449	24	9	2,2	2,02
2006	1,2559	25	8,2	2,2	2,79
2007	1,3706	26	7,2	2,1	3,85
2008	1,4706	26	7,1	3,3	3,85
2009	1,3942	28	9	0,3	1,23
2010	1,3266	26	9,6	1,6	1
2011	1,3922	26	9,3	2,7	1,28

Source:
** - annual average, www.fxtop.com*
*** - IMF*
**** - calculated for UE27, www.epp.eurostat.ec.europa.eu*
***** - HICP (Harmonised Indices of Consumer Prices) – annual average, www.epp.eurostat.ec.europa.eu*
****** - annual average calculated on the basis of data from the European Central Bank*

Based on these data, in order to determine what kind of dependency exists between exogenous and endogenous variables, variable using Eviews software, we realized the diagram "the cloud of points" with the following:



Looking at the chart above and around noting that points are grouped, it can be asserted that between each of endogenous exogenous variables and variable there is some connection to the level of the sample. If the points had been scattered throughout the graph, between them there would have been no connection.

Thus, multiple regression model proposed is the following equation:

$$ER = c_1 + c_2*RD + c_3*REZI + c_4*RI + c_5*RS + \varepsilon$$

It is observed from this equation that we have a number of five parameters to be estimated and have a number thirteen observations, so the number of comments is greater than that of the parameters, which urges us to think that the model chosen is invalid.

Below we used the Method of least squares in order to estimate the parameters, the results being visible in the following figure:

Figure 2- Estimation results by OLS Method

Dependent Variable: ER
Method: Least Squares
Date: 02/08/12 Time: 11:23
Sample: 1999 2011
Included observations: 13
ER=C(1)+C(2)*RD+C(3)*REZI+C(4)*RI+C(5)*RS

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	5.979134	0.654997	9.128491	0.0000
C(2)	-0.317911	0.036502	-8.709368	0.0000
C(3)	-0.023561	0.008817	-2.672131	0.0283
C(4)	0.032725	0.018952	1.726687	0.1225
C(5)	-0.395896	0.043373	-9.127642	0.0000

R-squared	0.971001	Mean dependent var	1.204669
Adjusted R-squared	0.956502	S.D. dependent var	0.194914
S.E. of regression	0.040652	Akaike info criterion	-3.283835
Sum squared resid	0.013220	Schwarz criterion	-3.066547
Log likelihood	26.34493	Durbin-Watson stat	1.636635

By entering the values estimated in the proposed resulted the following regression:

ER = 5,979134+ (-0,317911)*RD + (-0,023561)*REZI + 0,032725*RI + (-0,395896)*RS

(0,654997) (0,036502) (0,008817) (0,018952) (0,043373)

We used the t test to verify the significance of estimators which i obtained by applying the above model. Thus:

- For the free term c_1:

  $H_0 : c_1 = 0$ şi $H_1 : c_1 \neq 0$

  From the results above, note that the estimated value for parameter free c_1 is 5,979134 with an r-squared value of 0,654997, and the value of the test statistic is 9,128491. The level of marginal significance (p-value) recorded a value of

less than 0.05. In this case the value of being 0,0000 hence reject null hypothesis, according to which the term is null. In conclusion, we can say that the term free differ significantly from zero.

- For the c_2 term:
  $H_0 : c_2 = 0$ şi $H_1 : c_2 \neq 0$
  The data resulting from the OLS Method is apparent that the estimated value for the c_2 is 0,317911 with an r-squared value of 0,036502, and the value of the test statistic is 8,709368. The level of marginal significance (p-value) recorded a value of less than 0.05, in the present case being 0,0000 hence reject the null hypothesis, according to which the term c_2 is null.
- For the c_3 term:
  $H_0 : c_3 = 0$ şi $H_1 : c_3 \neq 0$
  Note from the table above that the estimated value for the c_3 is 0,023561, with an r-squared value of 0,008817, while the amount of testing is 2,672131. In the present case the marginal significance level is a value less than 0.05, 0,0283, leading to the conclusion that it rejects the null hypothesis, according to which the term c_3 is null.
- For the c_4 term:
  $H_0 : c_4 = 0$ şi $H_1 : c_4 \neq 0$
  Watching the data in the figure above, we note that the estimated value of the parameter 0,032725, c_4 is having an r-squared value of 0,018952, while the amount of test statistics is 1,726687. In the present case it is observed that the level of marginal significance in an amount greater than 0.05, being in the case of 0,1225, therefore we can say that we will make a 12% if we reject the null hypothesis. Assuming this risk, we reject H0 and accept the fact that at least one non-zero coefficient. Thus, we can conclude that the hypothesis of homoscedasticitate is raped, so heteroscedasticitatea is present. Through logaritmare, we obtain that the hypothesis of normality of errors cannot be rejected.
- For the c_5 term:
  $H_0 : c_5 = 0$ şi $H_1 : c_5 \neq 0$
  From the data presented in figure above it appears that the expected value of the parameter is 0,395896 c_5, the standard deviation has a value of 0,043373, while the amount of testing is 9,127642. The level of marginal significance is worth a lot less than 0.05, as in the case of the null hypothesis, so 0,0000 is rejected, so the term is not a null title.

Analyzing all the data above we can affirm that the regression model chosen contains parameters which, statistically, are correct.

In this model a strong information owned by the four factors. For dimming the link between the variables we used multiple correlation coefficient, R:

$R = \sqrt{R^2} = \sqrt{R_{squared}} = \sqrt{0,971001} = 0,9854$

From here we were able to figure out the following things:

- The value of R is close to a value of 1, indicates a very strong connection between endogenous variable, the conversion rate and the explanatory variables, the interest rate (RD), reserves (REZI) (RI) inflation rate and unemployment rate (RS);
- Due to the fact that $R_{squared}$ it is 0,971001 (very large) endogenous variable changes are explained by variations in exogenous variables in proportion of 98,54%.
- Also, the value of $R_{squared}$ indicates us that the model adjusts well sampled data, which makes me to conclude that the multiple regression model is properly drawn up.

Although Durbin-Watson statistic is very close to the value 2, in the case of it being 1,636635, we try to confirm or infirm autocorelarea errors and applying test Brusch-Godfrey.

Figure 3- Brusch-Godfrey test for errors autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.238756	Probability	0.640041
Obs*R-squared	0.428779	Probability	0.512589

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 02/08/12 Time: 13:52
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RD	0.001866	0.038563	0.048390	0.9628
REZI	0.000541	0.009335	0.057928	0.9554
RI	-0.001062	0.020042	-0.053012	0.9592
RS	-0.002302	0.045840	-0.050219	0.9614
C	0.004688	0.688643	0.006808	0.9948
RESID(-1)	0.211571	0.432991	0.488627	0.6400

R-squared	0.032983	Mean dependent var	4.79E-16
Adjusted R-squared	-0.657743	S.D. dependent var	0.033192
S.E. of regression	0.042736	Akaike info criterion	-3.163528
Sum squared resid	0.012784	Schwarz criterion	-2.902782
Log likelihood	26.56293	F-statistic	0.047751
Durbin-Watson stat	1.992789	Prob(F-statistic)	0.997977

Residual value RESID(-1) differ significantly from zero, it being 0,211571, F-statistic has a small value, 0,238756, which indicates that there is no correlation of residues, so the validity of the model is not in jeopardy, since DW is greater than the value 1.

Heterosckedasticity, variance hypothesis concerning the failure of the series no reaction residue, a check with the White test results and achieve the following:

Figure 4- White test for verifying heterosckedasticity

White Heteroskedasticity Test:

F-statistic	0.753942	Probability	0.660864
Obs*R-squared	7.816348	Probability	0.451613

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 02/08/12 Time: 14:02
Sample: 1999 2011
Included observations: 13

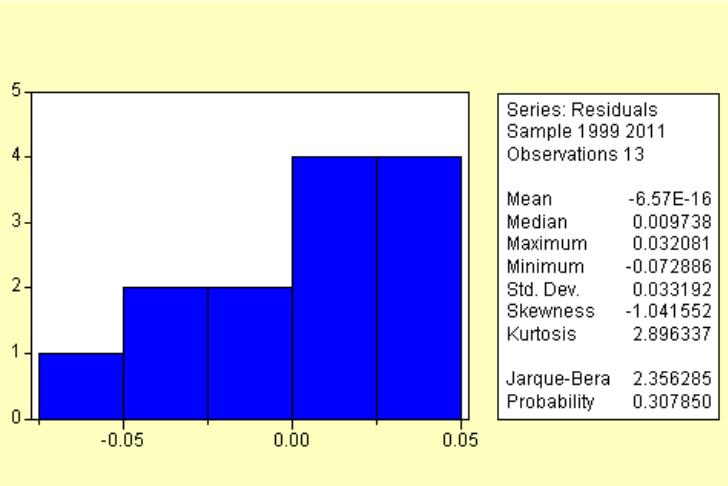
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.101244	0.100987	-1.002546	0.3728
RD	-0.001400	0.005107	-0.274147	0.7975
RD^2	-0.000164	0.000763	-0.214710	0.8405
REZI	-0.001982	0.007695	-0.257563	0.8095
REZI^2	4.03E-05	0.000177	0.227256	0.8314
RI	0.003930	0.004825	0.814534	0.4611
RI^2	-0.000835	0.001093	-0.764036	0.4874
RS	0.034014	0.020030	1.698135	0.1647
RS^2	-0.002216	0.001259	-1.760015	0.1532

R-squared	0.601258	Mean dependent var	0.001017
Adjusted R-squared	-0.196227	S.D. dependent var	0.001458
S.E. of regression	0.001594	Akaike info criterion	-9.838908
Sum squared resid	1.02E-05	Schwarz criterion	-9.447789
Log likelihood	72.95290	F-statistic	0.753942
Durbin-Watson stat	3.069871	Prob(F-statistic)	0.660864

In the present case, the value of Obs *R-squared being 7,816348, that is greater than the value of 1.96-valued, so one can say that in the case of errors in this model there is no heterosckedasticity, so they are homosckedastic, the model being suitable for projections. This can be seen from the amount of probability (66%), i.e. that we lose a lot if we reject the null hypothesis, meaning that one model is homosckedastic.

To verify the hypothesis of normality we conducted the test of the histogram and we got the following results:

Figure 5 – Checking the hypothesis of normality



We took into account the two assumptions, namely:

H0: Skewness= 0 , Kurtosis = 3, resulting that the asymmetry is = 0, flattening = 3, so the distribution is normal.

H1: the distribution is not normal.

In the present analysis we have that repartition is an asymmetrical, directed towards the negative values (Skewness =-1.04), with a flattening of 2.89, which leads us to the conclusion that the distribution of errors is one payment. The probability for rejection of the null hypothesis (H0: the normal distribution is the one) about 31%, so we could not assume the risk of rejection and to admit that the error is almost normal.

In conclusion, on the basis of the above, it can be said that between the conversion rate (ER) and the reference interest rate charged by the European Central Bank (RD), reserves denominated in Euros (REZI) and the unemployment rate in the European Union (RŞ) we have an inversely proportional, while between the exchange rate (ER) and the rate of inflation at the level of the European Union (RI) we have a link directly proportional.

Thus, an increase of one unit in the interest rate will be reflected in a drop in the exchange rate (EUR/USD), with 0,317911 units, thus a depreciation of the Euro against the dollar. An increase of one unit of the reserves denominated in Euro will cause a decrease in the rate of Exchange with 0,023561 units, which means all depreciation of the Euro in the face of U.S. currency. As regards the influence of inflation it is observed that an increase of one unit of its will lead to an increase of 0,032725 units of currency exchange rate and hence to an appreciation of the euro against the dollar. And last but not least, an increase by one unit of unemployment in the European Union will lead to a decrease in the rate of Exchange with 0,395896 units, which will lead to a depreciation of the Euro against the dollar. Where to get the parameters of this model, we see that the exchange rate is more influenced by changes in the rate of interest and the reference by the changes in unemployment and less influenced by the other two factors.

Perhaps some of these influences do not coincide with those described in the literature, but we must not forget that the Euro area is currently undergoing a series of major changes which have produced some shocks worthy captured on the economy and not only.

BIBLIOGRAPHY

- Balassa B. — Towards a Theory of Economic Integration, Homewood Illinois, Irwin, 1961
- Bibere O. — "The European Union between real and virtual" All Ed, 1999, p.37
- Edin P.A. and Vredin A — „Devaluation risk in target zone: evidence from the nordic countries", Economic Journal 103, 1993
- Machup F. — „A History of thought on economic Integration", Macmillan Press ltd., London, 1977, p.17-18
- Niţă Ion Voicu Iulica, Sărlătescu Juliana, Isabella Sima — "Explanatory Dictionary of the European Union" unreasonable Publishing House, Bucharest, 2009, p.216
- Svensson L.E.O. — „The simplest test of target zone credibility", FMI Staff Papers 38, 1991
- Vajda I. — - "Integration, Economic Union and the National State", Foreign Trade in a Planned Economy, Cambridge University Press, 1971, p. 33, in D. Miron - European Union economy, "Morning Star Publishing, Bucharest, 2002
- *** — www.europarl.europa.eu / news / public / documents
  www.euractiv.ro / European Union