Macroeconomics and Monetary Economics

The Equilibrium Analysis of a Closed Economy Model with Government and Money Market Sector - II

Catalin Angelo Ioan[1], Gina Ioan[2]

Abstract: In this paper, we will continue the study of the dynamic equilibrium solutions in the purpose of investigating the dependence limits (potential output and interest rate limit). We find also an interesting linear relation between the potential output and interest rate limit.

Keywords: equilibrium; demand; income

JEL Classification: R12

1 Introduction

The purpose of this paper is to continue the analysis of a closed economy model when the net exports are zero. After a correction of some errors founded in [2] we have analyzed the dependence of the potential output and the interest rate limit on the depending variables presented in the model.

2 The Model Equations ([5])

For the beginning let remind the model equations:

(1) $D=C+I+G$

(2) $C=c_Y V+C_0$, $C_0>0$, $c_Y\in(0, 1)$

(3) $V=Y+TR-TI$, $TR>0$

(4) $TI=ri_Y Y+T_0$, $ri_Y\in(0, 1)$, $T_0\in\mathbf{R}$

[1] Associate Professor, PhD, Danubius University of Galati, Faculty of Economic Sciences, Romania, Address: 3 Galati Blvd, Galati, Romania, Tel.: +40372 361 102, fax: +40372 361 290, Corresponding author: catalin_angelo_ioan@univ-danubius.ro.

[2] Assistant Professor, PhD in progress, Danubius University of Galati, Faculty of Economic Sciences, Romania, Address: 3 Galati Blvd, Galati, Romania, Tel.: +40372 361 102, fax: +40372 361 290, e-mail: gina_ioan@univ-danubius.ro.

(5) $I=in_Y Y+i_r r+I_0$, $in_Y \in (0, 1)$, $i_r<0$, $I_0>0$

(6) $G=\overline{G}$

(7) $D=Y$

(8) $MD=md_Y Y+m_r r+M_0 \leq M_0$, $md_Y>0$, $m_r<0$, $M_0>0$

(9) $MD=M$

(10) $\frac{dY}{dt}=\alpha(D-Y)$, $\alpha>0$

(11) $\frac{dr}{dt}=\beta(MD-M)$, $\beta>0$

where:

- D – the aggregate demand;
- C – the consumer demand (a concave function of V);
- I – the investment demand;
- G – the government spending;
- V – the disposable income;
- Y – the aggregate supply (national income);
- TR – the government transfers;
- TI – taxes;
- c_Y – the marginal propensity to consume, $c=\frac{dC}{dV} \in (0, 1)$, $\frac{d^2c}{dV^2} \leq 0$;
- ri_Y – the tax rate, $ri_Y \in (0, 1)$;
- in_Y –the rate of investments, $in_Y \in (0, 1)$;
- i_r – a factor of influence on the investment rate, $i_r<0$;
- r – the interest rate;
- MD – the money demand in the economy;
- md_Y – the rate of money demand in the economy;

- m_r – a factor of influencing the demand for currency from the interest rate, $m_r<0$;
- M – themoney supply.

3 The Static Equilibrium

Let note for the beginning, the autonomous component:

(12) $E=c_Y(TR-T_0)+C_0+I_0+\overline{G}>0$

In order to have the equilibrium, that is D=Y, from (1)-(6) we obtain:

(13) $$\begin{cases} r=\dfrac{(M-M_0)(1-c_Y(1-ri_Y)-in_Y)-md_YE}{i_rmd_Y+m_r(1-c_Y(1-ri_Y)-in_Y)} \\ Y=\dfrac{m_rE+i_r(M-M_0)}{i_rmd_Y+m_r(1-c_Y(1-ri_Y)-in_Y)} \end{cases}$$

We will note below, for simplification:

(14) $\Omega=m_rE-i_r(M_0-M)$

4 A result on the stability of solutions of a system of differential equations of first order, linear, with constant coefficients satisfying some conditions

Lemma

Let the system of differential equations:

$$\begin{pmatrix} \dfrac{dX}{dt} \\ \dfrac{dY}{dt} \end{pmatrix}=\begin{pmatrix} a & b \\ c & d \end{pmatrix}\begin{pmatrix} X \\ Y \end{pmatrix}+\begin{pmatrix} e \\ f \end{pmatrix}, \text{ a, b, c, d, e, f}\in\mathbf{R}\text{, a, b, d<0, c, e, f>0, } X(0)=X_0,$$

$$Y(0)=Y_0.$$

Then $\lim\limits_{t\to\infty}X(t)=\tilde{X}$, $\lim\limits_{t\to\infty}Y(t)=\tilde{Y}$, $\tilde{X},\tilde{Y}\in\mathbf{R}$ if and only if:

1. $(a-d)^2+4bc=0$ with the solution:

$$\begin{cases} X = \left(\frac{a-d}{2}X_0 + bY_0 + \frac{2bf + e(a-d)}{a+d}\right)te^{\frac{a+d}{2}t} + \left(X_0 + 4\frac{de-bf}{(a+d)^2}\right)e^{\frac{a+d}{2}t} + 4\frac{bf-de}{(a+d)^2} \\ Y = \left[Y_0 + 4\frac{af-ce}{(a+d)^2}\right]e^{\frac{a+d}{2}t} - \left(\frac{a-d}{2}X_0 + bY_0 + \frac{2bf + e(a-d)}{a+d}\right)\frac{a-d}{2b}te^{\frac{a+d}{2}t} + 4\frac{ce-af}{(a+d)^2} \end{cases}$$

2. $(a-d)^2+4bc>0$ and $\lambda_1\neq\lambda_2$ are roots of the equation: $\lambda^2-(a+d)\lambda+(ad-bc)=0$: e, f$\in$**R** with the solution:

$$\begin{cases} X = k_1e^{\lambda_1 t} + k_2e^{\lambda_2 t} - \frac{de-bf}{ad-bc} \\ Y = \frac{\lambda_1 - a}{b}k_1e^{\lambda_1 t} + \frac{\lambda_2 - a}{b}k_2e^{\lambda_2 t} + \frac{ce-af}{ad-bc} \end{cases}$$

where:

$$k_1 = \frac{(\lambda_2 - a)X_0 + (\lambda_2 - a)\frac{de-bf}{ad-bc} - bY_0 + b\frac{ce-af}{ad-bc}}{\lambda_2 - \lambda_1}$$

$$k_2 = -\frac{(\lambda_1 - a)X_0 + (\lambda_1 - a)\frac{de-bf}{ad-bc} - bY_0 + b\frac{ce-af}{ad-bc}}{\lambda_2 - \lambda_1}$$

3. $(a-d)^2+4bc<0$ and $\lambda_1=\alpha+i\beta$, $\lambda_2=\alpha-i\beta$, $\beta\neq0$ are the roots of the equation: $\lambda^2-(a+d)\lambda+(ad-bc)=0$: e, f$\in$**R** with the solution:

$$\begin{cases} X = \left(X_0 + \frac{de-bf}{ad-bc}\right)e^{\alpha t}\cos\beta t + \frac{1}{\beta}\left(bY_0 - \frac{d-a}{2}X_0 + \frac{(d-a)(bf-de) + 2b(af-ce)}{2(ad-bc)}\right)e^{\alpha t}\sin\beta t + \frac{bf-de}{ad-bc} \\ Y = \left(Y_0 + \frac{af-ce}{ad-bc}\right)e^{\alpha t}\cos\beta t + \frac{1}{\beta}\left(cX_0 + \frac{d-a}{2}Y_0 + \frac{(d-a)(af-ce) + 2c(de-bf)}{2(ad-bc)}\right)e^{\alpha t}\sin\beta t + \frac{ec-af}{ad-bc} \end{cases}$$

5 The Dynamic Equilibrium

Let the system of first order differential equations:

$$(15)\begin{cases} \frac{dY}{dt} = \alpha(D-Y) \\ \frac{dr}{dt} = \beta(MD-M) \end{cases}, \alpha, \beta>0$$

which becomes after (1)-(9):

$$(16)\quad \begin{pmatrix} \frac{dY}{dt} \\ \frac{dr}{dt} \end{pmatrix} = \begin{pmatrix} -\alpha\chi_Y & \alpha i_r \\ \beta m d_Y & \beta m_r \end{pmatrix} \begin{pmatrix} Y \\ r \end{pmatrix} + \begin{pmatrix} \alpha E \\ \beta(M_0 - M) \end{pmatrix}$$

where we note $\chi_Y=1-c_Y(1-ri_Y)-in_Y>0$

Using the above lemma, it follows that: $\lim_{t\to\infty} Y(t) = \tilde{Y}$, $\lim_{t\to\infty} r(t) = \tilde{r}$, $\tilde{Y}, \tilde{r} \in \mathbf{R}_+$ if and only if:

1. $(\alpha\chi_Y+\beta m_r)^2+4\alpha\beta i_r m d_Y=0$ then:

$$\begin{cases} Y = \left(-\frac{\alpha\chi_Y + \beta m_r}{2} Y_0 + \alpha i_r r_0 - \alpha \frac{2i_r\beta(M_0 - M) - E(\alpha\chi_Y + \beta m_r)}{\alpha\chi_Y - \beta m_r} \right) te^{\frac{-\alpha\chi_Y+\beta m_r}{2}t} + \\ \left(Y_0 + 4\alpha\beta \frac{m_r E - i_r(M_0 - M)}{(\alpha\chi_Y - \beta m_r)^2} \right) e^{\frac{-\alpha\chi_Y+\beta m_r}{2}t} + 4\alpha\beta \frac{i_r(M_0 - M) - m_r E}{(\alpha\chi_Y - \beta m_r)^2} \\ r = \left[r_0 - 4\alpha\beta \frac{\chi_Y(M_0 - M) + m d_Y E}{(\alpha\chi_Y - \beta m_r)^2} \right] e^{\frac{-\alpha\chi_Y+\beta m_r}{2}t} - \\ \left(\frac{\alpha\chi_Y + \beta m_r}{2} Y_0 - \alpha i_r r_0 + \alpha \frac{2i_r\beta(M_0 - M) - E(\alpha\chi_Y + \beta m_r)}{\alpha\chi_Y - \beta m_r} \right) \frac{\alpha\chi_Y + \beta m_r}{2\alpha i_r} te^{\frac{-\alpha\chi_Y+\beta m_r}{2}t} + \\ 4\alpha\beta \frac{m d_Y E + \chi_Y(M_0 - M)}{(\alpha\chi_Y - \beta m_r)^2} \end{cases}$$

and: $$\begin{cases} \tilde{Y} = \frac{m_r E - i_r(M_0 - M)}{\chi_Y m_r + i_r m d_Y} \\ \tilde{r} = -\frac{m d_Y E + \chi_Y(M_0 - M)}{\chi_Y m_r + i_r m d_Y} \end{cases}$$

2. $(\alpha\chi_Y+\beta m_r)^2+4\alpha\beta i_r m d_Y>0$ and $\lambda_1\neq\lambda_2$are roots of the equation: $\lambda^2+(\alpha\chi_Y - \beta m_r)\lambda-\alpha\beta(\chi_Y m_r+i_r m d_Y)=0$ then:

$$\begin{cases} Y = k_1 e^{\lambda_1 t} + k_2 e^{\lambda_2 t} + \frac{m_r E - i_r(M_0 - M)}{\chi_Y m_r + i_r m d_Y} \\ r = \frac{\lambda_1 + \alpha\chi_Y}{\alpha i_r} k_1 e^{\lambda_1 t} + \frac{\lambda_2 + \alpha\chi_Y}{\alpha i_r} k_2 e^{\lambda_2 t} - \frac{m d_Y E + \chi_Y(M_0 - M)}{\chi_Y m_r + i_r m d_Y} \end{cases}$$

where:

$$k_1=\frac{(\lambda_2+\alpha\chi_Y)Y_0-(\lambda_2+\alpha\chi_Y)\frac{m_rE-i_r(M_0-M)}{\chi_Y m_r+i_r md_Y}-\alpha i_r r_0-\alpha i_r\frac{md_YE+\chi_Y(M_0-M)}{\chi_Y m_r+i_r md_Y}}{\lambda_2-\lambda_1}$$

$$k_2=\frac{\alpha i_r r_0+\alpha i_r\frac{md_YE+\chi_Y(M_0-M)}{\chi_Y m_r+i_r md_Y}-(\lambda_1+\alpha\chi_Y)Y_0+(\lambda_1+\alpha\chi_Y)\frac{m_rE-i_r(M_0-M)}{\chi_Y m_r+i_r md_Y}}{\lambda_2-\lambda_1}$$

and: $\begin{cases}\tilde{Y}=\dfrac{m_rE-i_r(M_0-M)}{\chi_Y m_r+i_r md_Y}\\ \tilde{r}=-\dfrac{md_YE+\chi_Y(M_0-M)}{\chi_Y m_r+i_r md_Y}\end{cases}$

3. $(\alpha\chi_Y+\beta m_r)^2+4\alpha\beta i_r md_Y<0$ and $\lambda_1=\mu+i\nu$, $\lambda_2=\mu-i\nu$, $\nu\neq0$ are roots of the equation: $\lambda^2+(\alpha\chi_Y-\beta m_r)\lambda-\alpha\beta(\chi_Y m_r+i_r md_Y)=0$ then:

$$\begin{cases}Y=\left(Y_0-\dfrac{m_rE-i_r(M_0-M)}{\chi_Y m_r+i_r md_Y}\right)e^{\mu t}\cos\nu t+\\ \dfrac{1}{\nu}\left(br_0-\dfrac{\beta m_r+\alpha\chi_Y}{2}Y_0-\dfrac{(\beta m_r+\alpha\chi_Y)(i_r(M_0-M)-m_rE)-2\alpha i_r(\chi_Y(M_0-M)+md_YE)}{2(\chi_Y m_r+i_r md_Y)}\right)e^{\mu t}\sin\nu t-\\ \dfrac{i_r(M_0-M)-m_rE}{\chi_Y m_r+i_r md_Y}\\ r=\left(r_0+\dfrac{\chi_Y(M_0-M)+md_YE}{\chi_Y m_r+i_r md_Y}\right)e^{\mu t}\cos\nu t+\\ \dfrac{1}{\nu}\left(cY_0+\dfrac{\beta m_r+\alpha\chi_Y}{2}r_0+\dfrac{(\beta m_r+\alpha\chi_Y)(\chi_Y(M_0-M)+md_YE)-2\beta md_Y(m_rE-i_r(M_0-M))}{2(\chi_Y m_r+i_r md_Y)}\right)e^{\mu t}\sin\nu t-\\ \dfrac{md_YE+\chi_Y(M_0-M)}{\chi_Y m_r+i_r md_Y}\end{cases}$$

and: $\begin{cases}\tilde{Y}=\dfrac{m_rE-i_r(M_0-M)}{\chi_Y m_r+i_r md_Y}\\ \tilde{r}=-\dfrac{md_YE+\chi_Y(M_0-M)}{\chi_Y m_r+i_r md_Y}\end{cases}$

We will call $\tilde{Y}$ - the potential output and $\tilde{r}$ - the interest rate limit.

6 The Analysis of Variation Limits

Therefore again:

$$(17)\begin{cases}\tilde{Y}=\dfrac{m_r E-i_r\left(M_0-M\right)}{\chi_Y m_r+i_r md_Y}\\ \tilde{r}=-\dfrac{md_Y E+\chi_Y\left(M_0-M\right)}{\chi_Y m_r+i_r md_Y}\end{cases}$$

From the above relations, we obtain:

$$(18)\ \chi_Y\tilde{Y}-i_r\tilde{r}=E$$

or, in original terms:

$$(19)\ \left(1-c_Y\left(1-ri_Y\right)-in_Y\right)\tilde{Y}-i_r\tilde{r}=c_Y(TR-T_0)+C_0+I_0+\overline{G}$$

We can easily write the relation (18) as:

$$(20)\ \tilde{Y}=\frac{i_r}{\chi_Y}\tilde{r}+\frac{E}{\chi_Y}$$

Because $\frac{i_r}{\chi_Y}<0$ it follows that the dependence of the output potential of the interest rate limit is inverse.

Because $\chi_Y m_r+i_r md_Y<0$ in order to have $\tilde{Y}>0$ it must that $\Omega<0$ that is:

$$(21)\ m_r E-i_r\left(M_0-M\right)<0$$

The first partial derivatives of $\tilde{Y}$ are:

$$(22)\ \frac{\partial\tilde{Y}}{\partial m_r}=\frac{i_r\left(md_Y E+\chi_Y\left(M_0-M\right)\right)}{\left(\chi_Y m_r+i_r md_Y\right)^2}<0$$

$$(23)\ \frac{\partial\tilde{Y}}{\partial E}=\frac{m_r}{\chi_Y m_r+i_r md_Y}>0$$

$$(24)\ \frac{\partial\tilde{Y}}{\partial i_r}=\frac{-m_r\left(md_Y E+\left(M_0-M\right)\chi_Y\right)}{\left(\chi_Y m_r+i_r md_Y\right)^2}>0$$

$$(25)\ \frac{\partial \tilde{Y}}{\partial \chi_Y} = -\frac{m_r\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = -\frac{m_r \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} < 0$$

But $\chi_Y=1-c_Y(1-ri_Y)-in_Y$ imply: $\frac{\partial \chi_Y}{\partial c_Y} = -1$, $\frac{\partial \chi_Y}{\partial ri_Y} = c_Y$, $\frac{\partial \chi_Y}{\partial in_Y} = -1$, from where:

$$(26)\ \frac{\partial \tilde{Y}}{\partial c_Y} = \frac{\partial \tilde{Y}}{\partial \chi_Y}\frac{\partial \chi_Y}{\partial c_Y} = \frac{m_r\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = \frac{m_r \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} > 0$$

$$(27)\ \frac{\partial \tilde{Y}}{\partial ri_Y} = \frac{\partial \tilde{Y}}{\partial \chi_Y}\frac{\partial \chi_Y}{\partial ri_Y} = -\frac{c_Y m_r\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = -\frac{c_Y m_r \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} < 0$$

$$(28)\ \frac{\partial \tilde{Y}}{\partial in_Y} = \frac{\partial \tilde{Y}}{\partial \chi_Y}\frac{\partial \chi_Y}{\partial in_Y} = \frac{m_r\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = \frac{m_r \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} > 0$$

$$(29)\ \frac{\partial \tilde{Y}}{\partial\left(M_0 - M\right)} = -\frac{i_r}{\chi_Y m_r + i_r m d_Y} > 0$$

$$(30)\ \frac{\partial \tilde{Y}}{\partial m d_Y} = -\frac{i_r\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = -\frac{i_r \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} < 0$$

Also, for $\tilde{r} = -\frac{m d_Y E + \chi_Y\left(M_0 - M\right)}{\chi_Y m_r + i_r m d_Y} > 0$ we have:

$$(31)\ \frac{\partial \tilde{r}}{\partial m_r} = \frac{\chi_Y\left(m d_Y E + \chi_Y\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} > 0$$

$$(32)\ \frac{\partial \tilde{r}}{\partial E} = -\frac{m d_Y}{\chi_Y m_r + i_r m d_Y} > 0$$

$$(33)\ \frac{\partial \tilde{r}}{\partial i_r} = \frac{m d_Y\left(m d_Y E + \chi_Y\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} > 0$$

$$(34)\ \frac{\partial \tilde{r}}{\partial \chi_Y} = \frac{m d_Y\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = \frac{m d_Y \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} < 0 \text{ from where:}$$

$$(35)\ \frac{\partial \tilde{r}}{\partial c_Y} = \frac{\partial \tilde{r}}{\partial \chi_Y}\frac{\partial \chi_Y}{\partial c_Y} = -\frac{m d_Y\left(m_r E - i_r\left(M_0 - M\right)\right)}{\left(\chi_Y m_r + i_r m d_Y\right)^2} = -\frac{m d_Y \Omega}{\left(\chi_Y m_r + i_r m d_Y\right)^2} > 0$$

$$(36)\ \frac{\partial \tilde{r}}{\partial ri_Y}=\frac{\partial \tilde{r}}{\partial \chi_Y}\frac{\partial \chi_Y}{\partial ri_Y}=\frac{md_Y c_Y\left(m_r E-i_r\left(M_0-M\right)\right)}{\left(\chi_Y m_r+i_r md_Y\right)^2}=\frac{md_Y c_Y \Omega}{\left(\chi_Y m_r+i_r md_Y\right)^2}<0$$

$$(37)\ \frac{\partial \tilde{r}}{\partial in_Y}=\frac{\partial \tilde{r}}{\partial \chi_Y}\frac{\partial \chi_Y}{\partial in_Y}=-\frac{md_Y\left(m_r E-i_r\left(M_0-M\right)\right)}{\left(\chi_Y m_r+i_r md_Y\right)^2}=-\frac{md_Y \Omega}{\left(\chi_Y m_r+i_r md_Y\right)^2}>0$$

$$(38)\ \frac{\partial \tilde{r}}{\partial\left(M_0-M\right)}=-\frac{\chi_Y}{\chi_Y m_r+i_r md_Y}>0$$

$$(39)\ \frac{\partial \tilde{r}}{\partial md_Y}=-\frac{\chi_Y\left(m_r E-i_r\left(M_0-M\right)\right)}{\left(\chi_Y m_r+i_r md_Y\right)^2}=-\frac{\chi_Y \Omega}{\left(\chi_Y m_r+i_r md_Y\right)^2}>0$$

7 Conclusions

As a general conclusion, we obtain the following:

- the increase in absolute value of m_r – the factor of influencing the demand for currency from the interest rate imply the increasing of the potential output and the decreasing of the interest rate limit;
- the potential output and the interest rate limit are increasing at an increase of the autonomous component;
- the increase in absolute value of i_r – the factor of influence on the investment rate imply the decreasing of the potential output and the decreasing of the interest rate limit;
- the increase of c_Y – the marginal propensity to consumeimply the increasing of the potential output and the increasing of the interest rate limit;
- the increase of ri_Y – the tax rate imply the decreasing of the potential output and the decreasing of the interest rate limit;
- the increase of in_Y – the rate of investments imply the increasing of the potential output and the increasing of the interest rate limit;
- the increase of M – the money supply imply the decreasing of the potential output and the decreasing of the interest rate limit;
- the increase of md_Y – the rate of money demand in the economy imply the decreasing of the potential output and the increasing of the interest rate limit.

8 References

Dornbusch, R.; Fischer, S. & Startz, R. (1997). *Macroeconomics*. Richard D. Irwin Publishers.

Ioan, G. & Ioan, C.A. (2011). The Equilibrium Analysis of a Closed Economy Model with Government and Money Market Sector. *Acta Universitas Danubius. Oeconomica*, Vol. 7, No. 5, pp. 127-143.

Mankiw, N.G. (2010). *Macroeconomics*. Worth Publishers.

Romer, D. (1996). *Advanced Macroeconomics*. McGraw-Hill.

Stancu, S. & Mihail, N. (2009). *Macroeconomie. Modele statice și dinamice de comportament*. *Teorie și aplicații/Macroeconomics*. *Static and dynamic models of behavior*. *Theory and Applications*. Bucharest: Economică.

The End or a New Beginning for the European Union

Romeo-Victor Ionescu[1], Gabriela Marchis[2]

Abstract: The global crisis is far away of finishing. This is why all international organizations are cautious in making economic forecasts. On the other hand, the present crisis allowed the right evaluation for all regional and international integrated organizations. It was the point zero to define and redefine new mechanism, policies and priorities. Moreover, the slogan "think global and action local" should be revised and this paper tries to define a more adequate one.

Keywords: European cohesion; growth; GDP; inflation; unemployment

JEL Classification: E66; F59; O19; O52

1 Pro or Against the Myth of European Cohesion

The European Union was founded on some important principles as equity and equality, which were supported by common policy, single market and socio-economic cohesion. The European Union project still have backing and critical. But the evolution of this integrative organization was positive, with a single syncope (European constitution) until 2008. After the latest two enlargements, a lot of voices divided the EU Member States into different groups. Popular theories talk about center and periphery or EU with two speeds of development. The present global crisis was able to test these theories and to support a new one, which is presented in this paper. In order to realize a pertinent analysis of the European Cohesion Policy's impact on Member States' economies was used the neutral and official statistic database of European Commission: "European Economic Forecasts - Spring 2011". As a result, the analysis covers four macroeconomic indicators: *GDP, unemployment rate, inflation rate* and *net exports' contribution to GDP growth*. Two of them have a **positive impact** on the economic development (GDP and net exports' contribution to GDP growth) and other two has a **negative impact** (unemployment rate and inflation rate). We have to specify this because these indicators will be used under a personal economic model in order to highlight the regional development indexes. The most important indicator for present analysis is

[1]Professor, PhD, Faculty of Economic Sciences, Danubius University of Galati, Romania, Address: 3 Galati Blvd, Galati, Romania, Tel.: +40372 361 102, fax: +40372 361 290, Corresponding author: romeo.v.ionescu@univ-danubius.ro.

[2] Senior Lecturer, PhD, Faculty of Economic Sciences, Danubius University of Galati, Romania, Address: 3 Galati Blvd, Galati, Romania, Tel.: +40372 361 102, fax: +40372 361 290, e-mail: gabrielamarchis@univ-danubius.ro.

GDP. The GDP trend during 2008-2012 is presented in Table 1. The EU27 average ***GDP growth rate*** was 0.5% in 2008. The Euro area had about the same average rate (0.4%). It is interesting that the evolution of this indicator was the same across the EU27 and Euro area during 2009-2010. The GDP growth rates were: -4.2% in the EU27 and -4.1% in Euro area in 2009 and 1.8% for both regional organizations in 2010 (see Figure 1).

Table 1. GDP trend (%)

Country	2008	2009	2010	2011	2012
UK	-0.1	-4.9	1.3	1.7	2.1
Sweden	-0.6	-5.3	5.5	4.2	2.5
Finland	0.9	-8.2	3.1	3.7	2.6
Slovakia	5.8	-4.8	4.0	3.5	4.4
Slovenia	3.7	-8.1	1.2	1.9	2.5
Romania	7.3	-7.1	-1.3	1.5	3.7
Portugal	0.0	-2.5	1.3	-2.2	-1.8
Poland	5.1	1.7	3.8	4. 0	3.7
Austria	2.2	-3.9	2.0	2.4	2.0
Netherland	1.9	-3.9	1.8	1.9	1.7
Malta	5.3	-3.4	3.7	2.0	2.2
Hungary	0.8	-6.7	1.2	2.7	2.6
Luxembourg	1.4	-3.6	3.5	3.4	3.8
Lithuania	2.9	-14.7	1.3	5.0	4.7
Latvia	-4.2	-18.0	-0.3	3.3	4.0
Cyprus	3.6	-1.7	1.0	1.5	2.4
Italy	-1.3	-5.2	1.3	1.0	1.3
France	0.2	-2.6	1.6	1.8	2.0
Spain	0.9	-3.7	-0.1	0.8	1.5
Greece	1.0	-2.0	-4.5	-3.5	1.1
Ireland	-3.5	-7.6	-1.0	0.6	1.9
Estonia	-5.1	-13.9	3.1	4.9	4.0
Germany	1.0	-4.7	3.6	2.6	1.9
Denmark	-1.1	-5.2	2.1	1.7	1.5
Czech Rep.	2.5	-4.1	2.3	2.0	2.9
Bulgaria	6.2	-5.5	0.2	2.8	3.7
Belgium	1.0	-2.8	2.2	2.4	2.2

Source: personal contribution using (European Commission 2011)

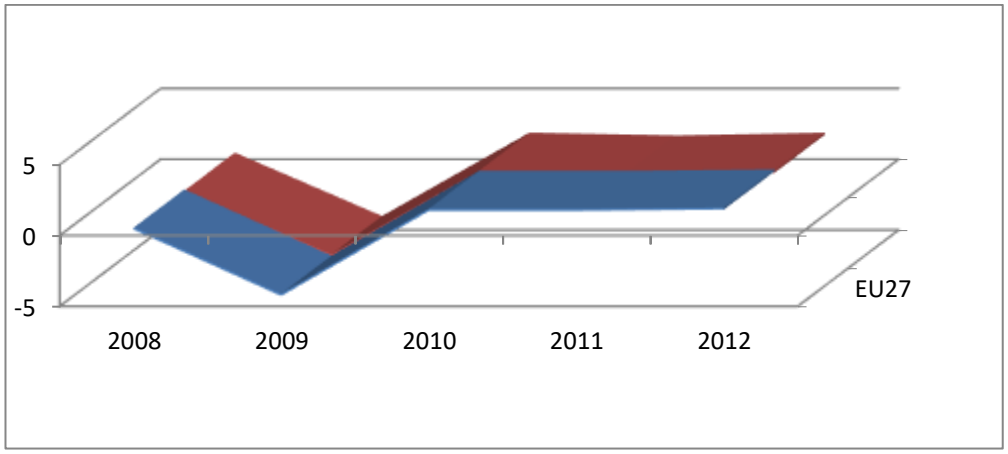

Figure 1. GDP trend during 2008-2012
Source: personal contribution

According to Figure 1, the Euro area forecasted economic growth will be less than that in the EU27 during 2011-2012. Is the first question mark connected to the socio-economic cohesion objective because almost all Euro area Member States are developed economies. But some of them were not able to face the global crisis challenges. The next step of the analysis is to have an overview on all Member States at the end of 2010. Using the GDP of these economies, under the two "organizations" (EU27 and Euro area), the Member States can be divided into three groups: economies with negative GDP growth rates (level I), economies with low and average GDP growth rates between 0.2% and 2.3% (level II) and economies with high GDP growth rates between 3.1% and 3.5% (level III). Across the EU27, 5 national economies achieved negative GDP growth rates: Romania, Latvia, Spain, Greece and Ireland. Other 14 faced to low and average GDP growth rates: UK, Slovenia, Portugal, Austria, Netherland, Hungary, Lithuania, Cyprus, Italy, France, Denmark, Czech Republic, Bulgaria and Belgium. At least, 8 Member States had high GDP growth rates: Sweden, Finland, Slovakia, Poland, Malta, Luxembourg, Estonia and Germany. The first intermediate conclusion is that the Member States' economies had three speeds in 2010 and the cohesion effect was invisible (see figure 2).

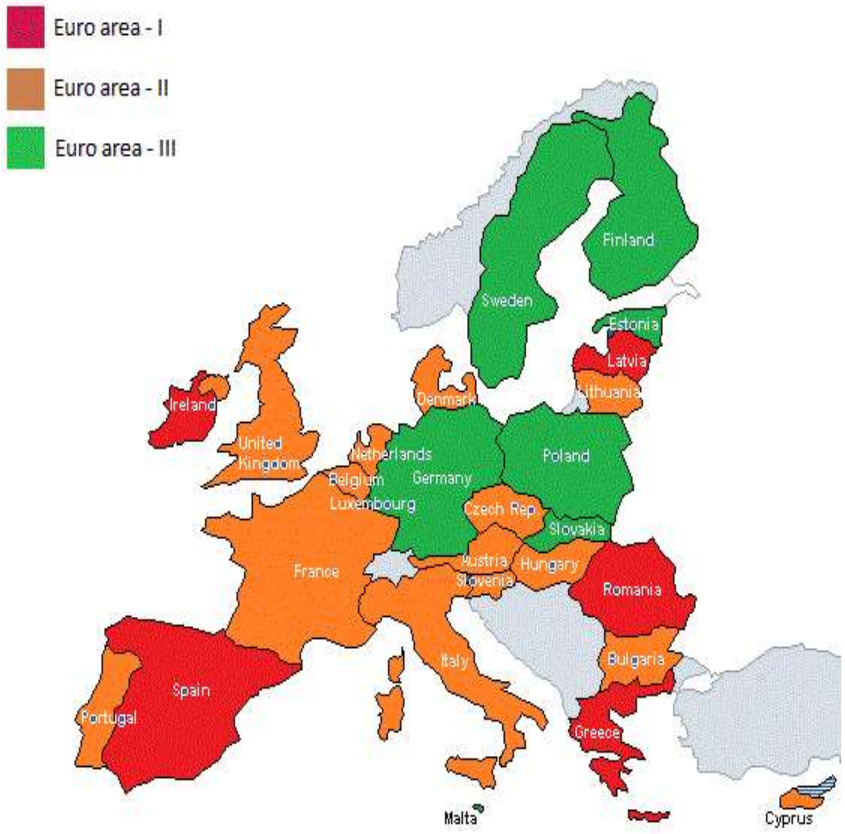

Figure 2. EU27 chart according to GDP growth rate
Source: personal contribution

The next level of the GDP analysis is across the Euro area. Paradoxically, the Euro area Member States can be divided into the same above three groups and those from the EU27: 3 with negative GDP growth rates (Spain, Greece and Ireland), 8 with low and average GDP growth rates (Slovenia, Portugal, Austria, Netherland, Cyprus, Italy, France and Belgium) and 6 with high GDP growth rates (Finland, Slovakia, Malta, Luxembourg, Estonia and Germany). Under the Euro area, the Member States can be assumed to have the same three speeds in 2010 and the cohesion effect was invisible, as well (see figure 3).

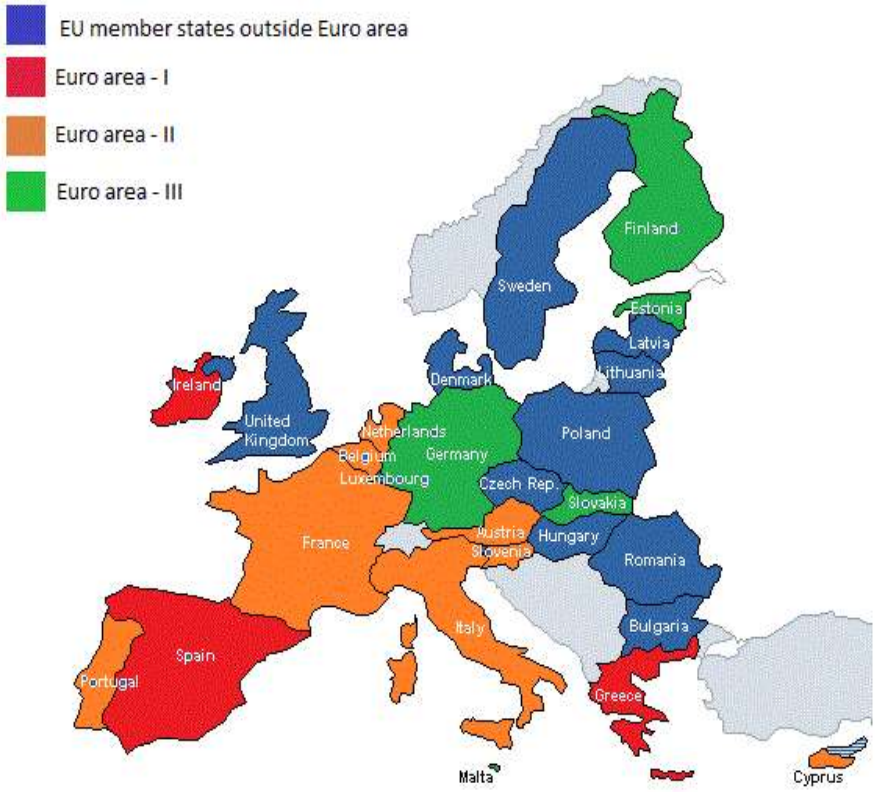

Figure 3. Euro area chart according to GDP growth rate
Source: personal contribution

Maybe is too early to have a competent conclusion of the analysis. As a result, the analysis continues with the ***unemployment rate*** discussion. As general trend, the unemployment rates grew across the EU27 and Euro area during 2008-2010. The forecasts for 2011-2012 are more optimistic, even that the unemployment rate will be greater in the Euro area compared to the EU27 (see Table 2).

Table 2. Unemployment rates' trend (%)

Country	2008	2009	2010	2011	2012
UK	5.6	7.6	7.8	8.0	7.8
Sweden	6.2	8.3	8.4	7.6	7.2
Finland	6.4	8.2	8.4	7.9	7.4
Slovakia	9.5	12.0	14.4	14.0	13.3
Slovenia	4.4	5.9	7.3	8.2	8.0
Romania	5.8	6.9	7.3	7.2	6.8

Portugal	7.7	9.6	11.0	12.3	13.0
Poland	7.1	8.2	9.6	9.3	8.8
Austria	3.8	4.8	4.4	4.3	4.2
Netherland	3.1	3.7	4.5	4.2	4.0
Malta	5.9	7.0	6.8	6.8	6.7
Hungary	7.8	10.0	11.2	11.0	9.3
Luxembourg	4.9	5.1	4.5	4.4	4.2
Lithuania	5.8	13.7	17.8	15.5	12.7
Latvia	7.5	17.1	18.7	17.2	15.8
Cyprus	3.6	5.3	6.5	6.3	5.6
Italy	6.7	7.8	8.4	8.4	8.2
France	7.8	9.5	9.7	9.5	9.2
Spain	11.3	18.0	20.1	20.6	20.2
Greece	7.7	9.5	12.6	15.2	15.3
Ireland	6.3	11.9	13.7	14.6	14.0
Estonia	5.5	13.8	16.9	13.0	11.5
Germany	7.5	7.8	7.1	6.4	6.0
Denmark	3.3	6.0	7.4	7.1	6.7
Czech Rep.	4.4	6.7	7.3	6.8	6.4
Bulgaria	5.6	6.8	10.2	9.4	8.5
Belgium	7.0	7.9	8.3	7.9	7.8

Source: personal contribution using (European Commission 2011)

According to Table 2, the EU27 Member States in 2010 can be divided into three groups: states with unemployment rates equal or greater than the EU average – 12 (Slovakia, Portugal, Poland, Hungary, Lithuania, Latvia, France, Spain, Estonia, Bulgaria, Greece and Ireland), states with unemployment rates between 7% and 9. 5% - 10 (UK, Sweden, Finland, Slovenia, Romania, Italy, Germany, Denmark, Czech Republic and Belgium) and states with unemployment rates less than 7.0% - 5 (Austria, Netherland, Malta, Luxembourg and Cyprus). The obsessive three groups of countries are available in this case, as well (see figure 4).

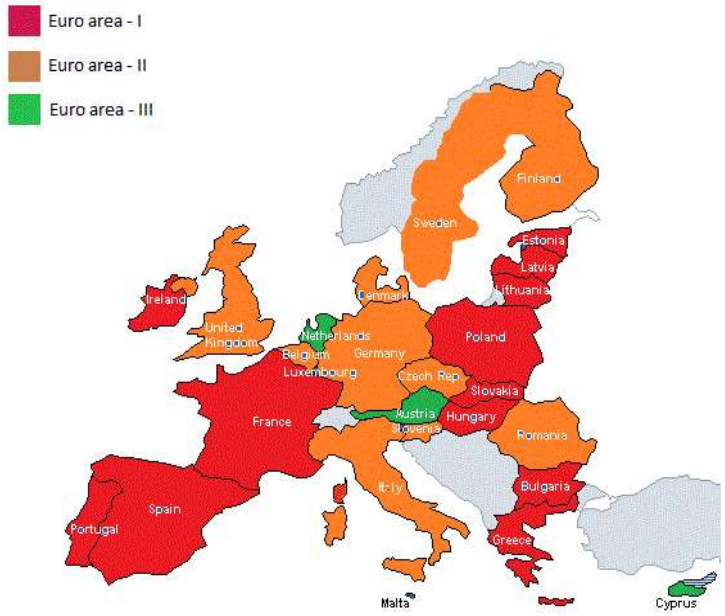

Figure 4. EU27 chart according to unemployment rate

Source: personal contribution

The average unemployment rates were 9.6% in the EU27 and 10.1% in the Euro area in 2010 (see Figure 5).

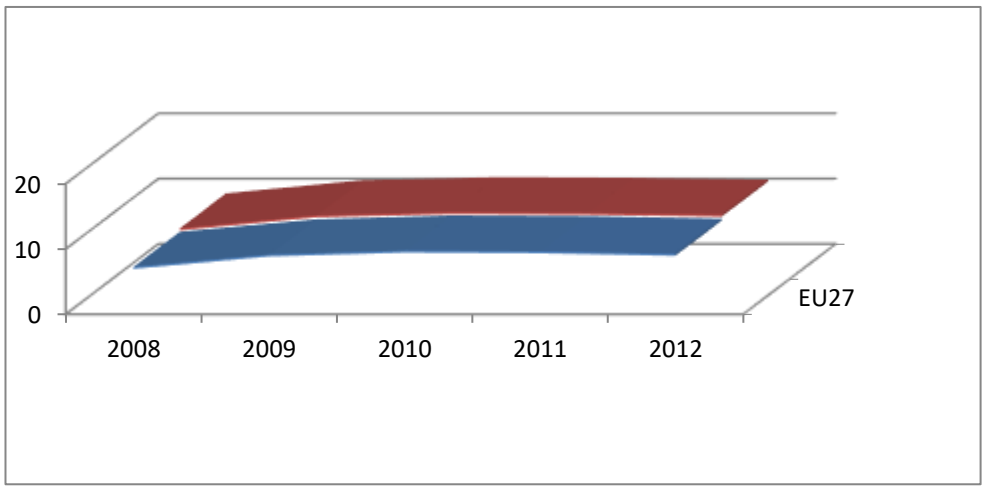

Figure 5. Unemployment rate trend during 2008-2012

Source: personal contribution

Across the Euro area, the above groups of criteria lead to new three Member States categories in 2010: states with unemployment rates equal or greater than the Euro area average – 8 (Slovakia, Portugal, Latvia, Spain, Greece, Ireland, Estonia and Belgium), states with unemployment rates between 7% and 9.5% - 4 (Finland, Slovenia, Italy and Germany) and states with unemployment rates less than 7.0% - 5 (Austria, Netherland, Malta, Luxembourg and Cyprus). The use of unemployment rate in the analysis leads to the same conclusion: the Member States (across the EU27 or the Euro area) can be divided into economies with three speeds of growth (see figure 6). It is the same conclusion as that connected to the GDP growth rate.

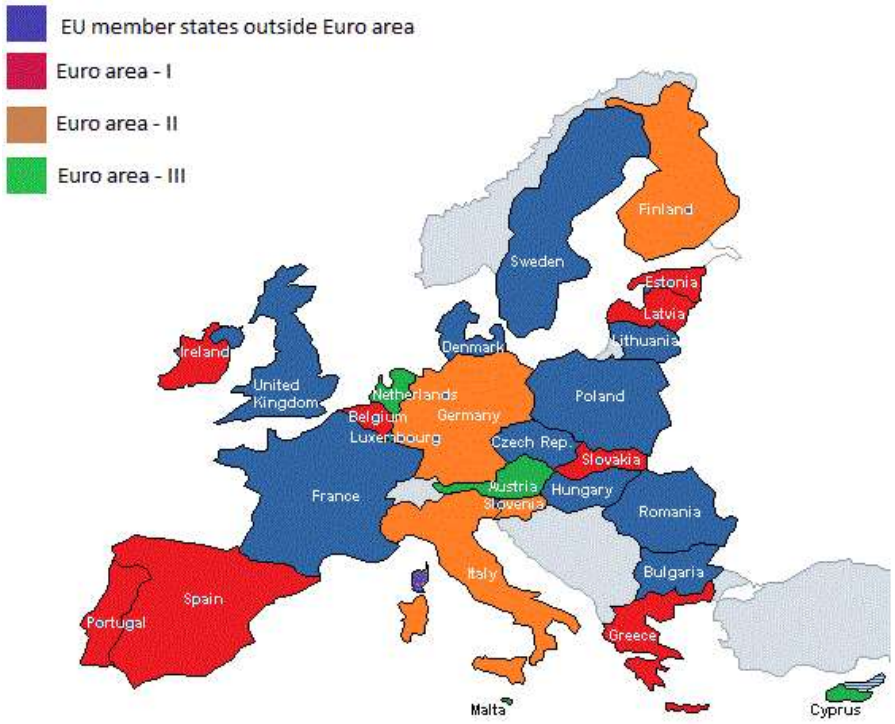

Figure 6. Euro area chart according to unemployment rate
Source: personal contribution

A distinct part of the analysis deals with the ***inflation rate trend***. As general point of view, the inflation rate was fluctuant in the Euro area and EU27. It decreased during 2008-2009, increased during 2010-2011 and will decrease again in 2012 (see Figure 7).

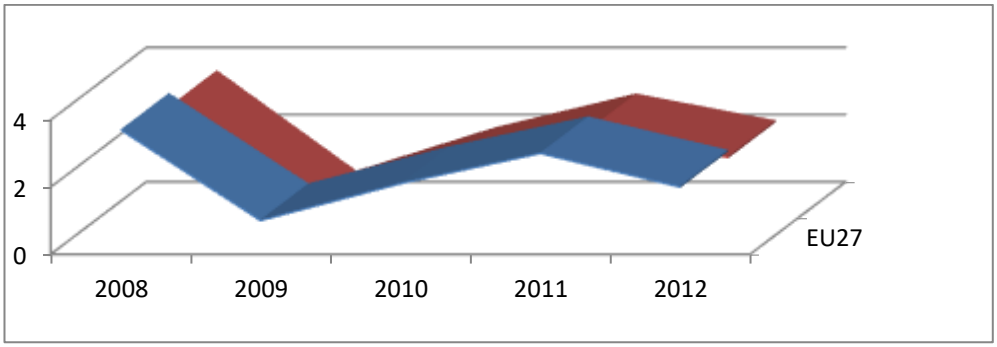

Figure 7. Inflation rate trend during 2008-2012
Source: personal contribution

There are great disparities connected to the inflation rate across the EU Member States. The 2012 forecast talks about better situation for EU27 and Euro area. The EU27 Member States can be divided into three groups again using the inflation rate from 2010: 4 states had inflation rates greater than the EU27 average (UK, Romania, Hungary and Greece), 19 states had inflation rates between 0% and 2. 0% (Sweden, Finland, Slovenia, Portugal, Poland, Austria, Malta, Luxembourg, Lithuania, Cyprus, Italy, France, Spain, Estonia, Germany, Denmark, Czech Republic, Bulgaria and Belgium) and other 4 achieved disinflation (Slovakia, Netherland, Latvia and Ireland) (see figure 8).

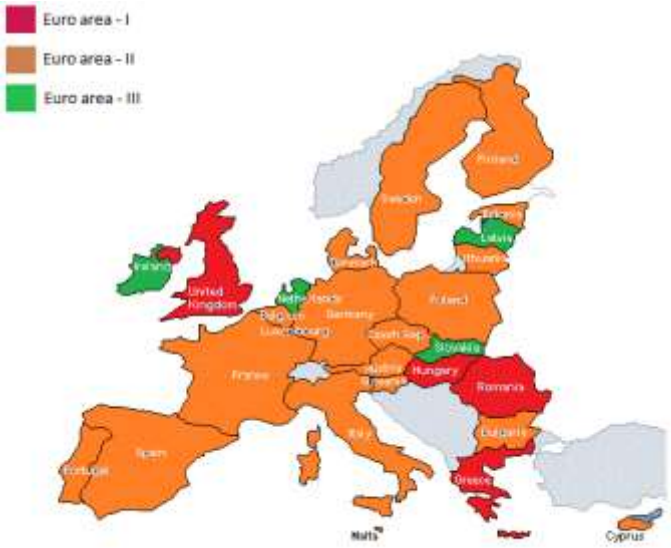

Figure 8. EU27 chart according to inflation rate
Source: personal contribution

Table 3. Inflation rates' trend (%)

Country	2008	2009	2010	2011	2012
UK	2.6	1.2	2.3	3.1	1.4
Sweden	2.3	0.9	0.9	0.7	0.6
Finland	2.9	0.6	0.7	2. 6	1.2
Slovakia	2.9	-0.1	-0.3	2. 6	1.9
Slovenia	4.5	-0.1	1.1	1.6	1.1
Romania	6.9	4. 6	5.1	5.7	3.0
Portugal	1.7	-1.9	0.4	2.4	1.0
Poland	3.2	3.0	1.7	2.8	2.2
Austria	2.2	-0.6	0.7	1.9	1.1
Netherland	1.2	0.0	-0.1	1.2	1.1
Malta	3.7	0.8	1.0	1.7	1.2
Hungary	5.0	3.0	3.7	3.0	2.5
Luxembourg	3.1	-1.0	1.8	2.5	1.3
Lithuania	10.1	3.2	0.2	2.2	1.4
Latvia	14.3	2.3	-2.2	2.4	1.0
Cyprus	3.4	-0.8	1.6	2.4	1.3
Italy	2.5	-0.2	0.6	1.6	0.9
France	2.2	-0.9	0.7	1.2	0.7
Spain	3.1	-1.2	1.0	2.0	0.4
Greece	3.2	0.3	3.7	1.4	-0.5
Ireland	2.1	-2.7	-2.6	0.0	-0.3
Estonia	9.6	-0.8	1.7	3.7	1.8
Germany	1.8	-0.8	0.2	1.6	1.0
Denmark	2.6	0.1	1.2	1.5	0.8
Czech Rep.	5.3	-0.4	0.2	1.3	1.5
Bulgaria	11.0	1.5	2.0	3.3	2.4
Belgium	3.5	-1.0	1.3	2.6	1.2

Source: personal contribution using (European Commission 2011)

According to data from Table 3, the Euro area Member States can be divided into the same three groups as the EU27 Member States (see figure 9): 4 with inflation rates greater than the Euro area average (Luxembourg, Cyprus, Greece and Estonia), 10 with inflation rates between 0% and 1. 5% (Finland, Slovenia, Portugal, Austria, Malta, Italy, France, Spain, Germany and Belgium) and 3 with disinflation (Slovakia, Netherland and Ireland).

The initial assumption of grouping was supported by the inflation rate analysis, as well. The fourth indicator of the analysis is the ***net exports' contribution to the GDP growth***. It decreased in the EU27 and the Euro area during 2008-2009,

achieved positive values in 2010 and will decrease again during 2011-2012 (see Figure 10).

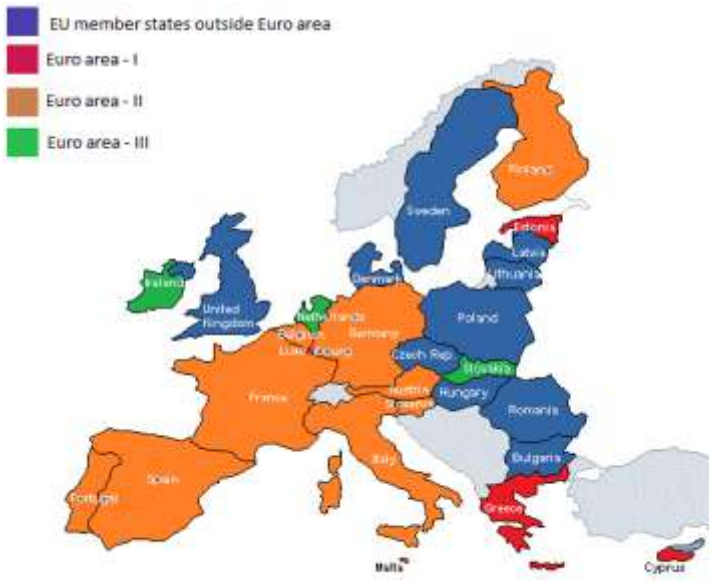

Figure 9. Euro area chart according to inflation rate
Source: personal contribution

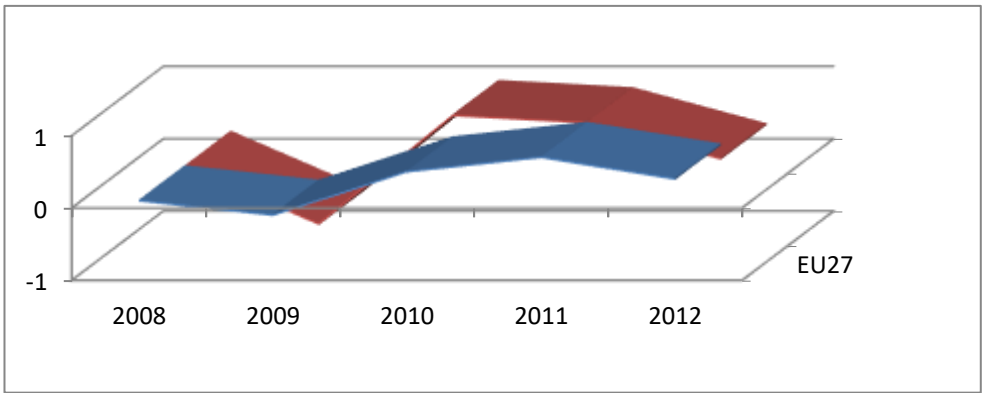

Figure 10. Net exports' contribution to the GDP growth during 2008-2012
Source: personal contribution

Even that the EU27 and the Euro area had the same net exports' contribution to the GDP growth in 2008, the situation became worst in the Euro area in 2009. Both regional organizations achieved positive net exports' contribution in 2010, and the

official forecasts are favorable during 2011-2012. A little difference in favor of the EU27 will be in 2012. There were great disparities connected to this indicator at national level in 2010 (see Table 4). As a result, the EU27 Member States can be divided in the obsessive three groups (see figure 11).

The first one is that which covers economies with net exports' contribution to the GDP growth greater than the EU27 average: Finland, Slovakia, Slovenia, Portugal, Austria, Netherland, Malta, Hungary, Luxembourg, Latvia, Spain, Greece, Ireland, Estonia, Germany, Czech Republic, Bulgaria and Belgium. Other 2 countries achieved net exports' contribution to the GDP growth between 0% and 0. 5% (Denmark and France). At least, 7 countries faced to negative net exports' contribution to the GDP growth (UK, Sweden, Romania, Poland, Lithuania, Cyprus and Italy).

Table 4: Net exports' contribution to the GDP growth (%)

Country	2008	2009	2010	2011	2012
UK	0.6	0.9	-1.0	1.2	1.4
Sweden	-0.6	-0.8	-0.1	0.6	0.3
Finland	0.3	-1.9	1.0	0.7	0.3
Slovakia	0.0	2.6	1.0	2.0	0.8
Slovenia	-0.4	2. 0	0.8	1.0	0.5
Romania	-1.0	7. 5	-0.2	0.3	-0.8
Portugal	-1.0	0.7	0.6	4.0	3.1
Poland	-0.6	2.7	-0.2	-0.4	-0.1
Austria	1.1	-1.8	1.2	0.9	0.6
Netherland	-0.2	-0.2	1.0	0.9	0.5
Malta	2.0	3.0	3.7	-0.2	0.6
Hungary	0.0	4.0	2.2	1.0	1.2
Luxembourg	-0.6	0.3	1.5	0.7	1.5
Lithuania	-0.7	12.7	-0.5	-0.7	-0.8
Latvia	8.2	14.2	0.6	-0.2	-0.8
Cyprus	-4.5	5.7	-1.4	0.7	0.6
Italy	0.0	-1.3	-0.4	0.3	0.1
France	-0.3	-0.2	0.4	-0.2	-0.4
Spain	1.5	1.7	1.0	1.4	0.5
Greece	-0.5	2.0	2.3	5.0	2.6
Ireland	1.5	3.8	3.6	3.5	2.2
Estonia	5.7	11.3	1.7	0.4	-0.1
Germany	-0.1	-2.9	1.2	0.5	0.0
Denmark	0.1	1.1	0.5	0.1	-0.1
Czech Rep.	1.3	-0.6	1.0	1.4	0.9
Bulgaria	-1.5	10.0	5.2	0.3	0.0
Belgium	-1.0	-0.5	1.8	0.6	0.2

Source: personal contribution using (European Commission 2011).

A similar situation is connected to the Euro area Member States in 2010 (see figure 12). 12 countries achieved net exports' contribution to the GDP growth greater than the average (Finland, Slovakia, Austria, Netherland, Malta, Luxembourg, Spain, Greece, Ireland, Estonia, Germany and Belgium). 3 countries achieved net exports' contribution to the GDP growth between 0% and 0. 8% (Slovenia, Portugal and France) and other 2 countries faced to negative net exports' contribution to the GDP growth (Cyprus and Italy).

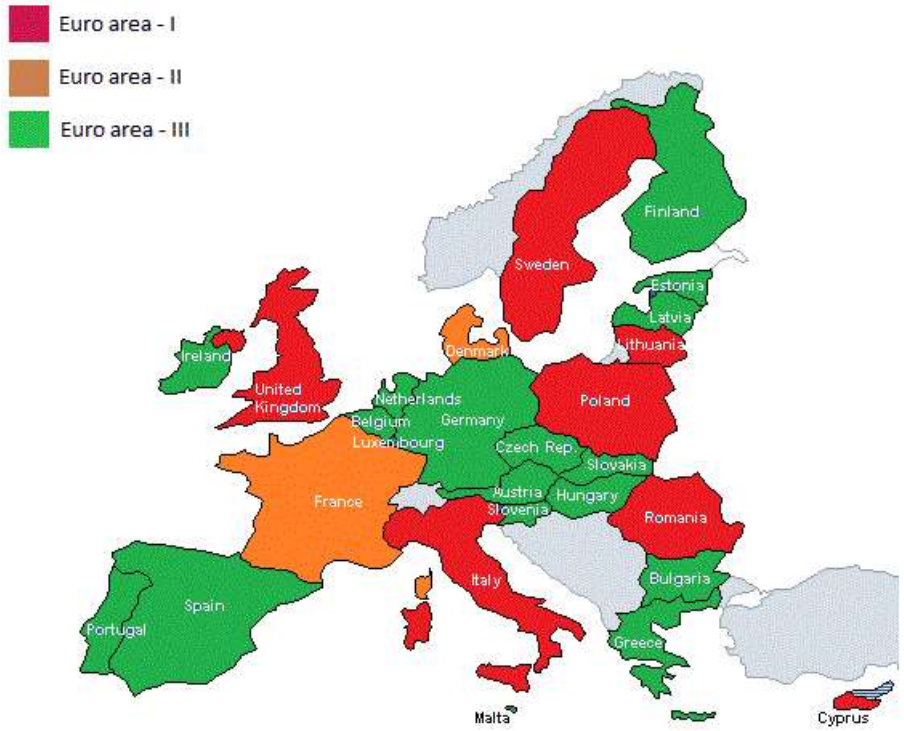

Figure 11. EU27 chart according to Net exports' contribution to the GDP growth 2008-2012

Source: personal contribution

Figure 12. Euro area chart according to Net exports' contribution to the GDP growth 2008-2012
Source: personal contribution

2 Modelling Approach and Discussions

Theme issue investigated represents a large and complex scientific segment, which makes difficulty the exhaustive treating of the papers and authors who broached it.

Nowadays, an important part of the regional development researches is focused on the analysis of the spatial interactions under regional disparities distribution. Conley and Ligon talk about the existing interregional connections' impact on the regional economic development. They consider that the economic development spreading is important for the socio-economic cohesion (Conley, Ligon 2002). The mutual influence between regions and the territorial heterogeneity were subsumed into the territorial analysis. Haining (1990), Bailey, Gatrell (1995) and Anselin (1998) studied the territorial connections between regions and demonstrated the local and global territorial dependence. Armstrong (1995), López-Bazo (1999, 2004), Le Gallo and Ertur (2002) analyzed the regional GDP/capita and the regional economic growth across the Europe. The complexity of the European economic integration has serious consequences for the inter-regional disparities across the EU, which can be reduced using adequate regional policy measures. Fujita, Krugman and Venables (1999) think that the different national economies are heterogeneous and their relationships have to take into consideration their

diversity. The development of the European regional policy has to cover different levels: national, regional and European (Bachtler, Wishlade, Yuill 2003). The present approach of the regional policy instruments asks for regional development models, in order to define, to apply and to quantify the results of the regional policies on the Member States' economies. This is why some specialists focused on the integration process' dimensions (Ionescu, Marchis 2006). These above observations lead to the idea that is very important for the decisional organisms to have an easy way of identifying the situation of a Member State at every moment in time. As a result, the analysis uses an improved form of the regional quadrilateral diagrams which are defined in order to deserve the present analysis (Ionescu 1997).

This model allows the building of regional development radiography. It is based on available official statistic information and can be built on more aggregation degrees. The model consists of a comparison between the existing situation at a moment in time and the ideal or whished situation for the central decision organisms. Practically, this model allows the difference between the factors with positive influence and those with negative influence. In the first category of factors can be mentioned the GDP growth rate and the net exports' contribution to the GDP growth. The factors with negative influence in our analysis are the unemployment rate and the inflation rate. The algorithm to achieve this regional development radiographs consists in the following steps:

- establishing interdisciplinary team of researchers engaged in this activity;
- establishing needed and available information in order to realize the regional development diagram;
- gathering information through official databases;
- achieving a goal charts (ideal) for regional development;
- groups of states diagrams' implementation in 2010;
- charts comparing the actual disparities between the ideal and highlighting them;
- identifying concrete ways and means of intervention in regional.

The two kinds of diagrams will be presented in figure 13. The ideal situation is that when the factors with positive influence (+) on regional development achieve maximum values and the factors with negative influence (-) achieve minimum values. The result of the connection between these two categories of factors is (in the ideal situation) the balanced regional development, which is presented by the horizontal line in Figure 13.

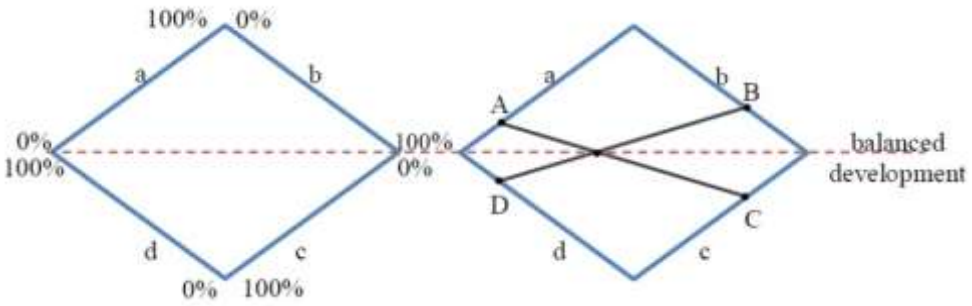

Figure 13. Regional development diagrams
Source: personal contribution

The factors with positive influence (a and b) and those with negative influence (c and d) have to be selected as antithetic and symmetric. In order to ensure compatibility, the indicators have to be measured using unique percentage scales. The Figure 13, right side, presents a hypothetic case were *a* = 10%, *b* = 20%, *c* = 15%, and *d* = 10%. Joining points *A* and *C*, respective *B* and *D* from the symmetric sides, leads to *AC* and *BD* straight lines intersecting in *E*. The position of *E* point (above or under the balanced development line) is the effect of the preponderant influence of one of the factors' categories. The analysis uses as factors connected to every three groups of Member States. As a result, the next step is to calculate the average values of the four above indicators for every group of Member States (see Table 5).

Table 5. Indicator groups of analysis in 2010 (%)

Countries' groups	GDP growth rate	Unemployment rate	Inflation rate	Net exports' contribution to the GDP growth
EU27-I	-2.60	11.57	3.70	1.74
EU27-II	1.48	7.80	1.00	0.45
EU27-III	3.79	5.34	-1.30	-0.54
Euro area-I	-1.87	14.46	2.20	1.75
Euro area-II	1.55	7.80	0.87	0.60
Euro area-III	3.50	5.34	1.00	-0.90

Source: personal contribution

According to the data from Table 5, the regional development diagrams on Member States' specific groups are presented in figure 14.

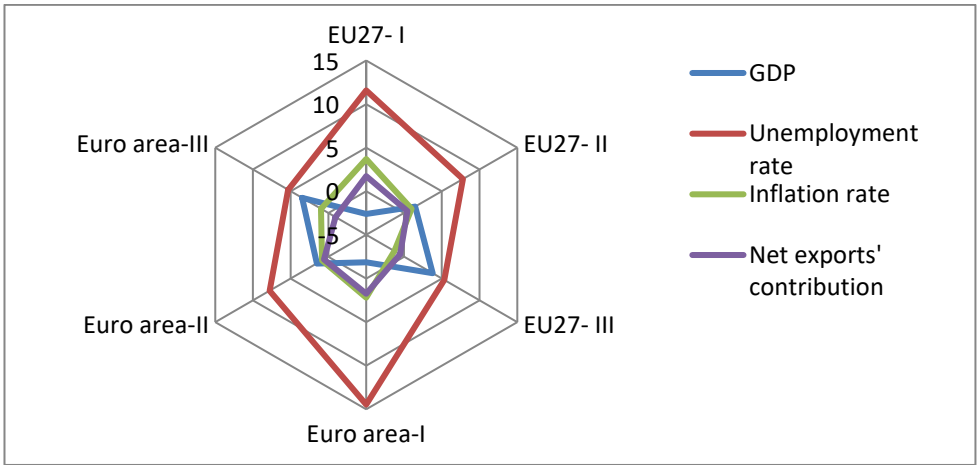

Figure 4. Regional development diagrams
Source: personal contribution

In order to establish the ways of action at macroeconomic level, the decision organisms can use specific diagrams from every group of Member States (see Figure 15). The below figure is very useful in order to observe the three groups of Member States and their regional development levels. For the beginning, the analysis was connected to the EU27 average as balanced regional development. The Member States from the EU27-I faced to better situation than average only for the net exports' contribution to the GDP growth. The other three statistic indicators used by the analysis had worst values. As a result, the diagram related to EU27-I is inoperable. EU27-II presents a better situation, which is expressed by the position of the point of intersection for both lines: above the balanced development line. This position is the result of the positive influence of the unemployment rate and inflation rate which are lower than the average, while the net exports' contribution to the GDP growth is almost the same with the average.

EU27-III faces to disinflation and negative contribution of the net exports to the GDP growth. As a result, its diagram has a particular form and expresses some disequilibrium. The existence of three different Member States groups across the EU27 is expressed by three different development diagrams in Figure 15. Under the Euro area, the first Member States group (Euro area-I) has only a single indicator with positive effects (net exports' contribution). As a result, the dedicated diagram has a single horizontal axe, which reflects bad regional development. The Euro area-II had better situation, which is reflected by the position of the point of intersection (above the balanced development line). This situation is the result of the lower inflation and unemployment rates from this group of countries. The Euro area-III faced to negative contribution of the net exports in 2010. Even that the other three statistic indicators had better values than average, the diagram reflects a worst situation than Euro area-II.

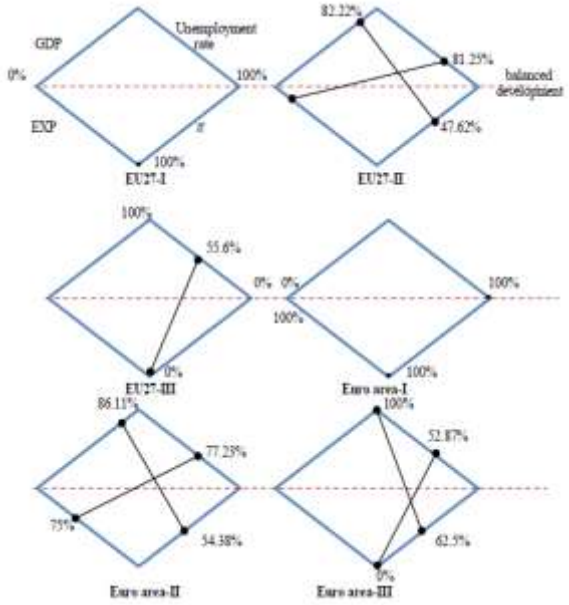

Figure 15. Regional development under the model of diagrams
Source: personal contribution

3 Forecast and Discussions

It is important to understand that the economic forecast across the EU Member States is very difficult under the present second global crisis conditions. This is why the present analysis tries to support the idea that the results of the above EU Member States' grouping will be correct at least on short and medium period. As a result, the GDP growth rate will be forecasted on the "classic" three groups of countries, using the data from Table 6.

Table 6. GDP's forecast database (%)

Countries'groups	2008	2009	2010	2011	2012
EU27-I	0.30	-7.68	-2.60	0.54	2.44
EU27-II	1.61	-5.12	1.48	1.90	2.13
EU27-III	1.73	-3.01	3.79	3.54	3.14
Euro area-I	-0.53	-4.43	-1.87	-0.70	1.50
Euro area-II	1.41	-3.84	1.55	1.34	1.54
Euro area-III	1.55	-6.43	3.50	3.35	3.15

Source: personal contribution

The forecast for 2013-2014 uses the SPSS19 software, under ARIMA model (Autoregressive Integrated Moving Average). The dependent variables are the

GDP growth rates on the six countries groups from Table 6. The independent variable is the time. The forecast leads to an interesting conclusion: after a fluctuant evolution during 2008-2012, the situation will become to be better in 2013 and certainly good in 2014 for all groups of countries (see Figure 16).

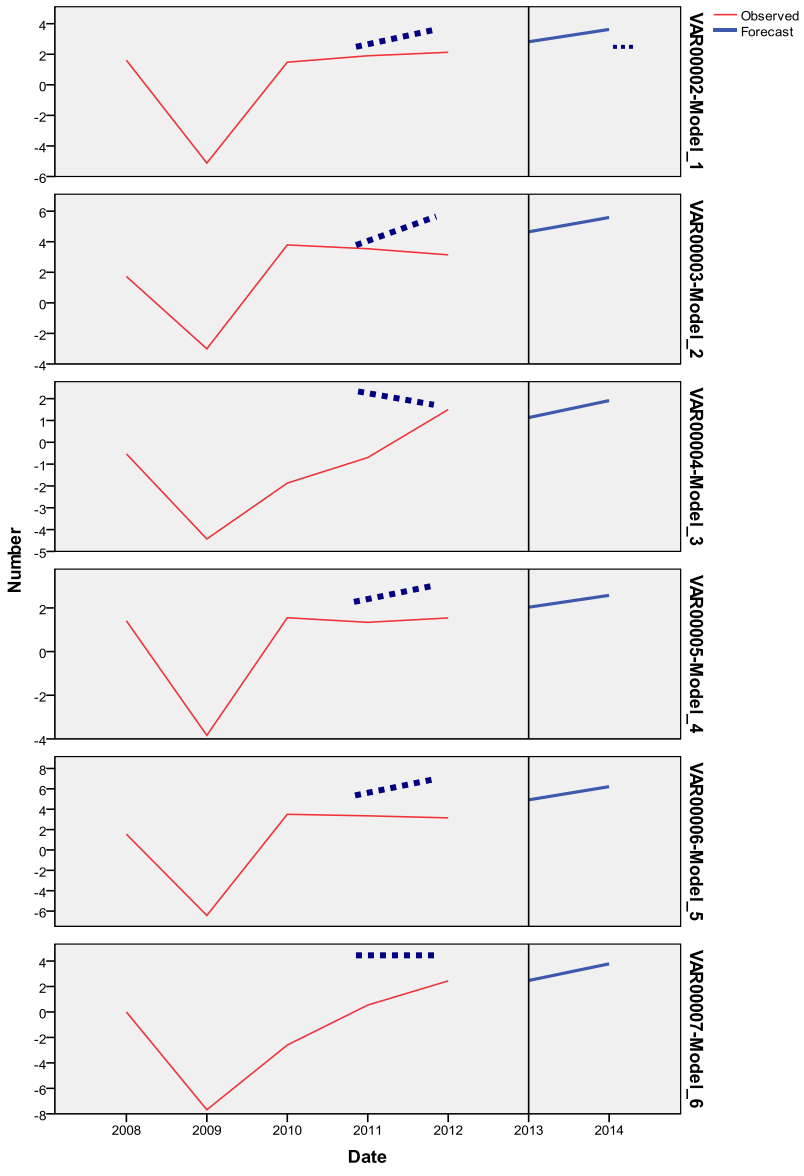

Figure 16. Economic growth forecast on countries groups (%)
Source: personal contribution using SPSS19 software

The EU27-1 Member States' economic growth is presented as VAR00007. During 2012-2013, the economic growth of this group will maintain at about 2%.

In 2014, the GDP growth rate will achieve about 3%. The second EU27 countries group will achieve a positive GDP growth rate during 2012-2014, related to 2011. After stagnation during 2012, the EU27-3 countries will achieve a higher economic growth during 2012-2014. As a result, the forecast GDP growth rate will be about 5% in 2014 for these economies. The first sharing of the EU27 Member States into three groups is viable and it is supported by the forecasted data. Every group of countries has its own trend related to the GDP growth rate during 2011-2012, and especially during 2013-2014. The Euro area faces to the same situation. The forecast supports the sharing of the Euro area national economies into three groups. The first Euro area group of countries will achieve an economic growth during 2011-2012. 2013 will be characterised by a decrease, but the situation will be better in 2014 (see VAR00004 from Figure 16). The Euro area-2 countries will achieve constant economic growth during 2011-2014 (see VAR00005 from Figure 16). The best situation will achieve Euro area-3 countries. After an economic stagnation, during 2011-2012, these countries will achieve an economic growth rate above 6% (see VAR00006 from Figure 16). According to the above latest information, the initial hypothesis of dividing Euro area into three groups of countries was proved.

4 Conclusions

The present analysis leads to the idea that the EU27 economy is far away of defeating the global crisis. Moreover, in February 2011, the European Commission talked about a new anti-crisis mechanism for the Euro area of about 500 billion Euros. It will be implemented in 2013 and it will replace the temporary system of 750 billion Euros created by the EU and IMF in May 2010. The "old" idea of the EU with more speeds is novelty. The analysis in this paper concludes which are the specific three groups of countries for EU27 and Euro area. It supports this division by a specific personal model – regional development diagram – which is able to present the level of the socio-economic development in a specific region, at a specific moment in time. This model is a new one and it was not used yet. The forecast realized in this paper presents the same situation of the countries' grouping during 2013-2014. The same analysis support a new idea: the Euro area is not able to face the crisis' challenges without big difficulties.

The good news is the moderate optimism of the European political leaders and their efforts to find solution. The bad news is that a lot of specialists talk about the necessity to exit from the Euro area for some Member States. Moreover, in August 2011, Joseph Stiglitz said that Euro will better survive if Germany will exit from the Euro area.

5 References

Anselin, L. (1998). Exploratory spatial data analysis in a geocomputational environment. In: Longley P, Brooks S, Macmillan B and McDonnell R (ed). *GeoComputation a Primer*. Wiley, New York, pp. 77-94.

Armstrong, H.W. (1995). Convergence among Regions of the European Union, 1950-1995. *Papers in Regional Science*, 74, pp. 143-152.

Bachtler, J.; Wishlade, F. & Yuill, D. (2003). *Regional Policies after 2000: Complementary or Conflict*. Glasgow, United Kingdom: European Policy Research Centre.

Bailey, T.C. & Gatrell, A.C. (1995). *Interactive Spatial Data Analysis*. Harlow, Essex: Addison Wesley Longman.

Conley, T.G & Ligon, E. A. (2002). Economic Distance, Spillovers, and Cross Country Comparisons. *Journal of Economic Growth*, Vol. 7, pp. 157-187.

European Commission (2011). *European Economic Forecasts-Spring*, Brussels, pp. 84, 87, 90, 93, 97, 100, 104, 107, 111, 115, 119, 122, 125, 128, 130, 134, 137, 140, 143, 146, 149, 152, 155, 158, 161, 164, 168.

Fujita M, Kruman P, Venables A J (1999). *The Spatial Economy: Cities, Regions, and International Trade.* Cambridge, MA: MIT Press.

Le Gall, J.; Ertur, C. & Baumont, C. (2002). The European Regional Convergence Process, 1980-1995: Do Spatial Regime and Spatial Dependence Matter? *Econometrics.*

Haining, R.P. (1990). *Spatial data analysis in the social and environmental sciences*. New York: Cambridge University Press.

Ionescu, R. (1997). *Evolution of a socio-economic territorial system.* Galati: Zigotto.

Ionescu, R. & Marchis, G. (2006). *Community Economic Integration Theory*. Galati: Fundatia Academica Danubius.

Ionescu, R. & Marchis, G. (2006). *European Union – present and perspectives.* Galati: Fundatia Academica Danubius.

López-Bazo, E. (1999). Regional economic dynamics and convergence in the European Union. *The Annals of Regional Science*, Springer, Vol. 33(3), pp. 343-370.

López-Bazo, E. (2004). Regional Externalities and Growth: Evidence from European Regions. *Journal of Regional Science*. Blackwell Publishing, Vol. 44(1), pp. 43-73.