# SEEJE

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# WHAT WAS THE ROLE OF MONETARY POLICY IN THE GREEK FINANCIAL CRISIS?

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**Abstract**
To what extent is Greece's current economic crisis the result of monetary policy misalignment between the European Central Bank and Greece? We use a risk adjusted Taylor Rule to examine Greece's monetary policy from 1993 to the present. We argue that the monetary policy of the Bank of Greece satisfies several criteria for a good monetary policy. The monetary policy of the ECB, on the other hand, exhibits characteristics that suggest it had a destabilizing effect on the economy of Greece. That is, whereas the ECB could have balanced excessive fiscal stimulus with a contractionary monetary policy, the ECB's actual expansionary monetary policy may have reinforced the fiscal stimulus and led to further destabilization.

**JEL Classification:** E00, E50, E58
**Keywords:** Greece, Monetary Policy, Bank of Greece

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## 1. Introduction

The sovereign debt crisis in Greece has posed major problems in financial markets and has nearly caused the breakup of the euro. It would be worthwhile to study the causes of the crisis. Much of the media coverage of the economic crisis in Greece has emphasized unsustainable fiscal policies as a leading cause. Popular, moralizing narratives describe a profligate Greece using deficit spending for unsustainable social programs; these popular narratives have contributed to the reluctance of stable countries like Germany to provide bailouts. Austerity measures and fiscal consolidation in Greece are widely prescribed as a necessary remedy.

Fiscal policy tells only part of the story of the crisis, however. In adopting the euro and joining the European Economic and Monetary Union, Greece ceded control of its monetary policy to the European Central Bank in Frankfurt, which sets euro interest rates based on the conditions in the entire eurozone. Given the importance of monetary policy, it is important to determine what kind of monetary policies were in place under the separate regimes of the Bank of Greece and the European Central Bank. Clarida, Gali, and Gertler (1998, hereafter CGG) have developed a suitable method, based on Taylor's (1993) research in monetary policy rules, for characterizing monetary policy by its response to macroeconomic conditions such as inflation and output gaps. The response of a policy rule to macroeconomic conditions allows researchers to draw inferences about that policy's effectiveness. Once a central bank's policy rule is estimated, it can be used to simulate how it would have reacted under hypothetical macroeconomic conditions. Taking the estimated policy rule of a highly respected central bank, like the Bundesbank or the Federal Reserve, one can construct a counter-factual monetary policy to use as a benchmark to which other policies can be compared.

We propose to analyze the monetary policies of the Bank of Greece and the European Central Bank. Based on estimated policy rules, we shall determine whether each policy would be expected to have a stabilizing or destabilizing effect on the macroeconomy of Greece. We shall then evaluate each central bank's realized policy in light of a hypothetical policy constructed from the Bundesbank's and Federal Reserve's estimated policy rules. Based on these analyses, we hope to discover whether monetary policy contributed to Greece's current economic crisis, and to gain a better understanding of how Greece has been affected by adopting the euro as its currency.

In the following section we shall introduce the economic background of Greece. Greece has experienced a succession of very different monetary regimes, and knowledge of these special circumstances will help with interpreting the analysis. In the third section we present our hypothesis. In the fourth section we describe our analytical method. In the fifth section we report the results of our Taylor rule analysis using the Bundesbank as a proxy for a conservative central bank. As a robustness check, we augment our analysis by investigating whether differences in expropriation risk

between Germany and Greece may have biased our results. The sixth section offers a further robustness check, where we conduct a second counterfactual analysis using the Federal Reserve's, rather than the Bundesbank's, estimated Taylor rule. In the seventh section we discuss our results. The eighth section is our conclusion.

## 2. The Economic Situation of Greece

### *2.1 Expansion of Social Programs: 1974-1993*

In the year 1974, momentous changes swept through Greece: the authoritarian regime collapsed, King Constantine II was deposed, and a new democratic government was established. Prior to this period, Greece had attained low inflation and a credible peg to the United States dollar. However, inflation rose with the elimination of the Bretton Woods constraints; the first oil shock; and internal populist pressure for income redistribution, full-employment policies, and expansionary fiscal policy (Alogoskoufis 1995).

Inflation, which averaged 3.8% annually from 1954 to 1973, rose to an average of 18.1% from 1974 to 1993. Output growth, which averaged 7.1% from 1954 to 1973 (the so-called "Greek Miracle"), fell to an average of 2.1% from 1974 to 1993. The result was a lengthy period of stagflation; several industries were nationalized, calling into question the security of property rights in Greece (Alogoskoufis 1995). The Bretton Woods peg gave way to a "crawling" peg, with several devaluations and failed attempts to regain credibility (Panagiotidis and Triampella 2005). Government fiscal deficits, intended to accomplish income redistribution, were financed by debt and seigniorage (Lazaretou 2003).

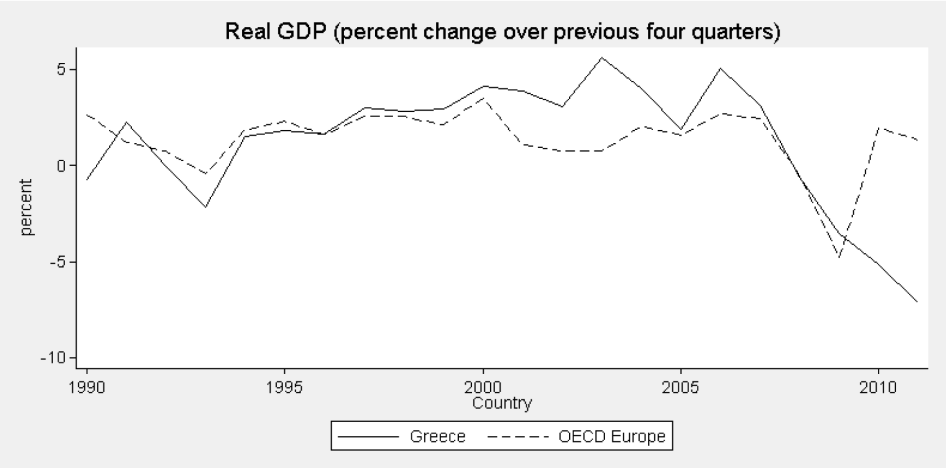


**Figure 1.** Prior to the sovereign debt crisis, real GDP growth in Greece outpaced that in the other European OECD member countries.

### *2.2 Maastricht Treaty and Convergence: 1993-2001*

In 1993, Greece signed the Maastricht Treaty, pledging to converge economically with her future currency partners. To attain convergence, Greece set out to tighten fiscal policy and curb inflation according to a plan approved in March of 1993; the government had already abandoned this plan before the end of the year, and approved a more gradual plan in June of 1994.

Parallel to fiscal reform, Greece also conducted monetary reform. Inflation fell from 23.3% in October of 1990 to 3.9% in December of 2000. As part of the convergence program, the Bank of Greece engaged in a foreign-exchange policy known as the "hard drachma" policy. The Bank of Greece announced an official exchange rate target, which would serve as an important benchmark in Greece's monetary policy. Indeed, Arghyrou (2009) uses Taylor rules to find that Greek interest rates in the 1990's were statistically significantly correlated with domestic inflation, but even more significantly with foreign interest rates, namely those of the Bundesbank, and later the ECB. Furthermore, he determines that foreign interest rates were more important during normal demand conditions, with domestic inflation being more important during overheating demand conditions.

Tavlas and Papaspyrou (n.d.) note that during the first phase of the convergence program, 1995-1997, inflation halved and GDP growth accelerated. They attribute both of these outcomes to the high credibility of the Bank of Greece's foreign-exchange peg. Previously, the Bank of Greece had not announced specific exchange-rate targets; the drachma had experienced decades of devaluation since the collapse of Bretton Woods. Nevertheless, the drachma increased in value with respect to PPP and became increasingly overvalued until an exchange-rate crisis in 1998. Even after the 1995 announcement of a fixed exchange-rate target, an inflation differential persisted between Greece and the rest of Europe. Arghyrou (2009) uses an Uncovered Interest Parity model to estimate that markets demanded a 9-11% risk premium on drachma denominated assets from 1990 through 2000. Tavlas and Papaspyrou (n.d.) identify several obstacles to the strong drachma policy. High interest rates, necessary to suppress domestic inflation, led to capital inflow, which was costly to sterilize for the Bank of Greece. Furthermore, a current account deficit widened as the drachma became increasingly overvalued. These factors, combined with international financial turbulence following the devaluation of the Thai Bhat in July 1997, strained the Greek money market, ultimately leading to the collapse of the drachma's peg in March 1998. The Bank of Greece devalued the drachma by 12% and entered into the wide-fluctuation band Exchange Rate Mechanism. In the years that followed, Greece moved closer to the Maastricht Treaty's convergence criteria, and was permitted to join the euro.

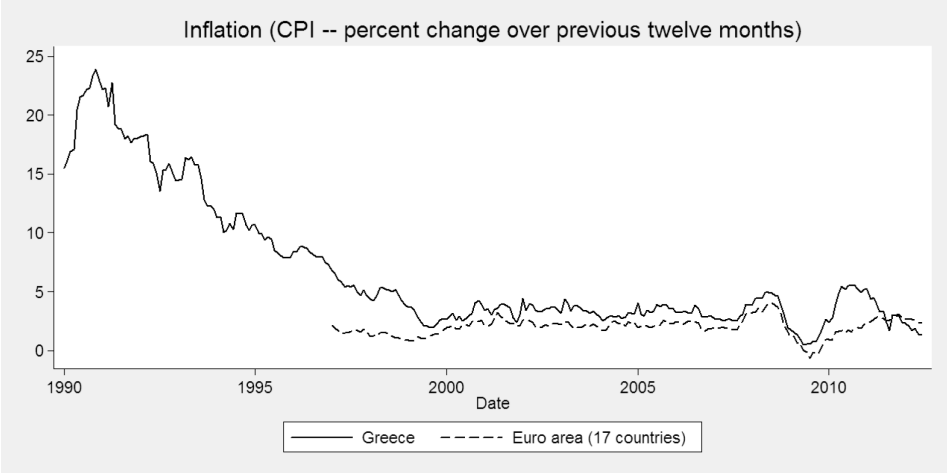


**Figure 2.** Inflation in Greece cooled from 23.3% in October, 1990 to 3.9% when Greece joined the euro in December, 2000. Despite progress toward convergence in the 1990s, inflation in Greece did not drop below the Eurozone average until July of 2011. From 2001 through 2008, average CPI inflation was 3.5% in Greece and 2.4% in the Eurozone.

Greek monetary policy in the convergence era, which spans from 1993 through 2000, is importantly characterized by the external constraints of foreign-exchange targets, which historically have been important in Greece; during the Greek Miracle period, 1954-1973, the Bretton Woods system had provided such a constraint.

### *2.3 Accession, Growth, and Crisis: 2002-2012*

Greece formally adopted the euro on January 1, 2001. Drachma overnight interest rates, continuing their downward trend from the 1990s, had fallen to 6.16% in December, 2000; and when Greece adopted the euro in January, euro overnight rates were at 4.76%, then fell over the course of several years, reaching a low of about 1.97% in November, 2003, then rising slowly to a high of 4.3% in August, 2008, as the financial crisis was breaking (see Figure 3). Greece, both in money markets and in the sale of government debt, enjoyed considerably lower interest rates than it experienced under the drachma regime. A Taylor-rule counterfactual analysis by Arghyrou (2009) suggests that, during this period, the ECB set interest rates lower than the Bank of Greece would have. Arghyrou argues that such lower interest rates could potentially cause inflation in Greece, resulting in overheated demand, real-exchange-rate overvaluation, and current account deficits. Furthermore, he argues, Greece's accession to the euro eliminated the risk premium of drachma-denominated assets. The elimination of this risk premium would increase inflation and current-account deficits in the short term, but the inflation and deficits would subside in the medium-term.

Nevertheless, government final consumption expenditure decreased as a share of GDP immediately after accession, and only gradually increased before rising sharply to a peak in 2009:Q4. It is perhaps interesting that the government share of GDP in Greece did not exceed that of the weighted average of all European OECD countries until 2009:Q4. Furthermore, Greece experienced strong economic growth after her accession to the euro.

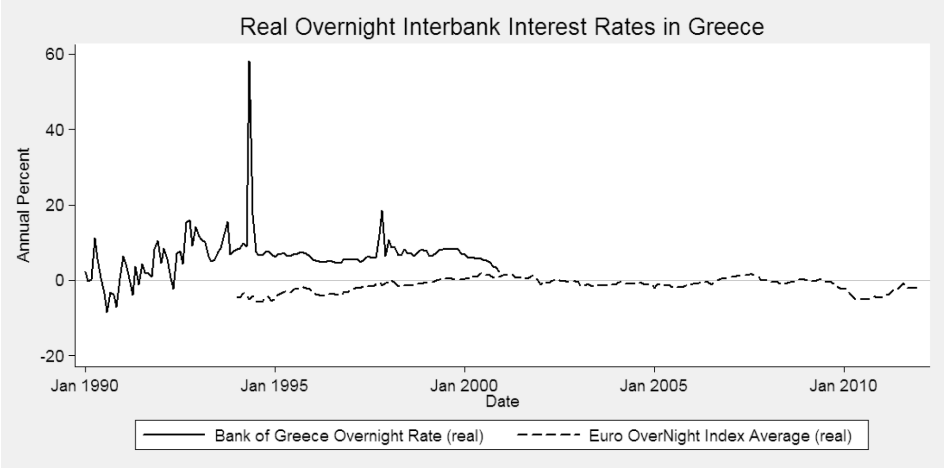


**Figure 3.** Prior to adopting the euro in January of 2001, the Bank of Greece determined Greece's monetary policy.

It is worth noting, however, that the OECD's statistics for Greece are taken from the National Statistical Service of Greece, which the European Commission criticized in a January 2010 report, describing actual instances of misrepresented data, especially in GDP and budget deficit as a percent of GDP. Indeed, the National Statistical Service of Greece revised GDP figures upward by as much as 25% in some quarters, purportedly by including the black-market and illegal-goods sectors, with the apparent purpose being to keep its budget deficit to GDP ratio within specific bounds (International Herald Tribune 2006, Economist 2011b).

Problems began to emerge in Greece during the late 2000's financial crisis and economic downturn, with the sovereign debt crisis beginning to unfold in 2010. Specifically, the government of Greece had accumulated large debts, saw declining tax revenues as a result of the recession, faced unsustainable interest rates in bond markets, and was on the brink of insolvency. A Greek government default would be catastrophic for Greece, and for not only the banks in Greece, but also those in the rest of Europe. So far, European leaders have addressed this situation through a combination of additional bailout loans, debt renegotiations and "haircuts," and austerity measures for the Greek government. The process of dealing with Greece has been particularly difficult because of the conflicting viewpoints: some, especially in fiscally

strong countries like Germany, hold that Greece was a profligate country and deserves to default; others support bailouts because of the enormous risks facing the European financial system as a whole, even in sound countries like France and Germany; and still others would support bailouts but worry about the problem of moral hazard. The Greek debt crisis has even, at times, called into question the very survival of the euro as a common currency (Economist 2011a).

### 3. To What Extent was Monetary Policy a Factor?

The broad consensus is that the Greek sovereign debt crisis was caused by poor fiscal policies, with the Greek government running budget deficits to finance social programs. In the past, Greece was accustomed to doing this without dire consequence because it could escape its debts through inflationary finance and currency devaluation; that is, proper monetary policy offered a counterbalance to fiscal policy. Today, however, Greece cannot devalue its currency unilaterally because it shares a currency with countries like Germany. To what extent has Greece's lack of a nationally appropriate monetary policy exacerbated, or even caused, its current crisis?

Monetary policy in Greece has been exceptional in the past nineteen years. Monetary policy, as practiced by the Federal Reserve, for example, is often intended to stabilize inflation at a low level, and to mitigate the business cycle. From 1993 until 2000, however, Greece's monetary policy was focused not only on inflation and stabilizing output, but also on maintaining a foreign-exchange peg (under tremendous speculative pressure) and converging to the requirements of the Maastricht Treaty with respect to several indicators, including inflation. From 2001 to the present, Greece's monetary policy has been determined not by a Bank of Greece in Athens setting interest rates with only the Greek economy in mind, but by the European Central Bank in Frankfurt setting interest rates for the entire eurozone.

Furthermore, if the central bank restricts credit, interest rates will rise, businesses will be less likely to invest, and economic output will fall. On the other hand, when central banks undertake monetary expansion to depress interest rates, the economy will enjoy a short-term boom, but the risk develops that credit will be allocated into speculative bubbles that will burst, driving down asset prices and leading to a period of deflation and economic contraction. Central banks are thus generally encouraged to set interest rates between these two hazards. Taylor's (1993) policy rule is meant to provide a middle ground for central bankers.

It would be interesting, given the potential for monetary policy to affect the macroeconomy, to assess what kind of monetary policy was in use in Greece during the period in question. CGG (2000) have provided a method for estimating Taylor-rule coefficients to describe a monetary policy and characterize the general behavior of a central bank. Furthermore, they use these coefficients to perform counter-factual analyses that suggest what one central bank might have done given certain economic conditions. Specifically, we can determine whether a central bank followed the Taylor

principle, i.e., whether the central bank raised real interest rates in response to rising inflation, and vice-versa.

We intend to use CGG's methods to evaluate the monetary policy in Greece during the periods 1993:1-2000:12 and 2001:01-2010:12. If we view the Bundesbank as a highly respected central bank, we can see whether the Bank of Greece set rates higher or lower than this benchmark. Furthermore, we can carry these projections forward and evaluate whether the rates set by the European Central Bank made sense given economic conditions in Greece. Finally, we can estimate Taylor-rule coefficients to characterize the general behavior of the Bundesbank and the Bank of Greece. We can also estimate coefficients for the European Central Bank, but based on Greece's economic data, so that we can analyze the Taylor rule that was *de facto* in use in Greece from 2001 to 2010. Using the Taylor rule coefficients, we can ascertain whether the banks responded to inflation and output gaps in the manner we expect.

Specifically, we expect the following for a stabilizing policy rule: The inflation coefficient $\beta$ should be greater than one, and the output-gap coefficient $\gamma$ should be greater than 0. In both cases, the rule applies negative feedback to macroeconomic forces. This policy stimulates the economy with lower interest rates in response to disinflation and decreased output, and dampens an "overheated" economy with higher interest rates in response to inflation and increased output. Such a rule dampens deviations from the target path of prices and RGDP. Clarida, Gali, and Gertler (1998) run a simulation to show that a policy rule with $\beta < 1$ can cause bursts of inflation even without fundamental shocks to the economy, whereas policy rules with $\beta > 1$ do not allow such outbursts.

## 4. Method

### *4.1 Estimating the Taylor Coefficients*

In this section we derive and explain CGG's (Clarida, Gali and Gertler 1998) Taylor rule. The equation takes the basic form:

$$r_t^* = r^* + \beta\left(E\left[\pi_{t+n}|\Omega_t\right] - \pi^*\right) + \gamma(y_t - E[y_t^*|\Omega_t]) \quad (1)$$

where

$r_t^*$ is the implied nominal interest rate at time $t$
$r^*$ is the long-run equilibrium nominal interest rate
$\beta$ is the inflation reaction coefficient
$E$ is the expectations operator
$\pi_{t+n}$ is the inflation n periods from time $t$
$\Omega_t$ is the information set available to policymakers at time $t$
$\pi^*$ is the target rate of inflation
$\gamma$ is the output-gap reaction coefficient
$y_t$ the real national output at time $t$
$y_t^*$ the potential output of the economy at time $t$

It is assumed that the long-run equilibrium interest rate $rr^*$ follows the long-run neutrality of money hypothesis; as such, it is determined by non-monetary factors and can thus be treated as an exogenous constant. If $rr^*$ is known, then equation 1 can be rewritten to specify to specify a target real rate, $rr_t^* = r_t^* - E[\pi_t|\Omega_t]$,

$$rr_t^* = rr^* + (\beta - 1)\left(E\left[\pi_{t+n}|\Omega_t\right] - \pi^*\right) + \gamma\left(E\left[y_t\ |\Omega_t\right] - y_t^*\right) \quad (2)$$

Equation 2 demonstrates the Taylor Principle: if $\beta < 1$, the real interest rate will decrease as inflation increases. Conversely, if $\beta > 1$, the real rate will increase as inflation increases.

Interest rates are seldom adjusted instantaneously. Therefore, to allow for "interest rate smoothing," CGG model the interest rate as an AR(1) process as in:

$$r_t = (1 - \rho)r_t^* + \rho r_{t-1} + v_t \quad (3)$$

where $r_t$ is the *actual* nominal interest rate at time $t$, $\rho \in [0,1]$ is the degree of interest rate smoothing, and $v_t$ is an i.i.d. error term representing a random disturbance.

Substituting equation (1) into equation (3) and collapsing the expectations operators, we obtain

$$r_t = (1 - \rho)[\alpha + \beta\pi_{t+n} + \gamma x_t] + \rho r_{t-1} + \epsilon_t \quad (4)$$

where $\alpha \equiv r^* - \beta\pi^*$, $x_t \equiv (y_t - y_t^*)/y_t^*$, and the error term $\epsilon_t$ is defined as

$$\epsilon_t \equiv -(1 - \rho)\{\beta(\pi_{t+n} - E[\pi_{t+n}|\Omega_t]) + \gamma(x_t - E[\pi_t|\Omega_t])\} + v_t$$

Importantly, $\epsilon_t$, is a linear combination of forecast errors

$$\{\beta(\pi_{t+n} - E[\pi_{t+n}|\Omega_t]) + \gamma(x_t - E[\pi_t|\Omega_t])\}$$

and a random disturbance $v_t$, and is assumed to be *i.i.d.* (CGG 1998). The coefficients of equation (4) can be estimated by generalized method of moments estimation (GMM).

### *4.2 Applying Germany's Rule to Greece: The Counter-Factual Analysis*

While the Bank of Greece struggled for political independence and credibility during the periods we examine, the German Bundesbank has enjoyed considerable independence and high credibility. Therefore, we use the Bundesbank's Taylor-rule coefficients as an example of a "good" policy-reaction function. Using the Bundesbank's coefficients and Greece's economic conditions, one may form a conjecture about the monetary policy that would have existed in Greece had the governors of the Bundesbank continued to make decisions as they would for Germany, but instead considering economic conditions in Greece. We compare these conjectural interest rates to the actual interest rates of the Bank of Greece (until December of 2000) and of the European Central Bank (from 2001 forward). This analysis aims to provide some basis of a "good" policy from which to discern whether the Bank of Greece acted wisely in managing the affairs of its own country, and whether the European Central Bank was appropriately responding to conditions in Greece.

By calculating the average real interest rate in Germany, we obtain $\overline{rr}_{de}$, denoting Germany as "*de*" for convenience. By estimating equation 4 using data from Germany and performing the appropriate arithmetic, we obtain the coefficient vector $\{\alpha_{de}, \beta_{de}, \gamma_{de}, \rho_{de}\}$.

Instead of using Germany's average real interest rate $\overline{rr}_{de}$ to estimate a conjectural monetary policy for Greece, we use the average real interest rate for Greece, $\overline{rr}_{gr}$, because the factors that determine the long-run equilibrium real interest rate are considered to be exogenous to monetary policy. Thus, $\overline{rr}_{de}$ is exogenous to the Bundesbank, just as $\overline{rr}_{gr}$ is exogenous to the Bank of Greece; each central bank takes this as a datum. We calculate the constant term for the Bundesbank's reaction function given Greece's long-run real interest rate:

$$\alpha_{de|gr} = \overline{rr}_{gr} + (1 - \beta_{de})\pi^*_{de}.$$

This term $\alpha_{de|gr}$ will be used in place of $a_{de}$ for the counter-factual analysis because $\alpha_{de|gr}$ properly accounts for the target rate of inflation, $\pi^*$, which is endogenous to the Bundesbank's monetary policy, and $rr^*_{gr}$ (estimated as $\overline{rr}_{gr}$), which we assume is exogenous to monetary policy in general. Therefore, in our counter-factual analysis, the implied interest rate for Greece given the Bundesbank's Taylor-rule coefficients, $r^*_{t,gr|de}$, is given by a modification of equation 4:

$$r_{t,gr|de} = (1 - \rho_{de})\left(\alpha_{de|gr} + \beta_{de}E\left[\pi_{t+n,gr}|\Omega_t\right] + \gamma_{de}E\left[x_{t,gr}|\Omega_t\right]\right) + \rho_{de}r_{t-1,gr|de}. \quad (5)$$

The counter-factual rate depends upon the interest rate in the previous period, $r_{t-1}$. The counter-factual rate for the initial period was estimated using (5) without the inertial lag term. Because the coefficients were estimated using expectations of forward looking data, we estimate predicted values for future CPI inflation and the output gap using the variables from the instrument set.

### *4.3 Data Selection*

We use the OECD's consumer price index (percent change over previous year) to measure inflation, and the OECD's index of industrial production, specifically all industry, as a proxy for output. The industrial production index was processed through a Hodrick-Prescott filter ($\lambda = 129{,}600$) to de-trend the data; we divided the difference between the realized values and the smoothed values by the smoothed values and multiplied this ratio by 100 to obtain a percentage output gap. We use overnight interbank interest rates to estimate Taylor rules for the Bundesbank and the Bank of Greece. CPI and industrial production data for "Germany" refer to West Germany prior to 1991 and refer to unified Germany from 1991 to the present.

Following CGG, we select instruments that would be of use to monetary policy makers in forecasting future inflation and output gaps: the spread between long term and short term interest rates, the producer price index, the growth rate of the M2 money stock, as well as lagged values of the output gaps and inflation.

Long term and short term rates for Germany and the euro area are taken from the OECD. The government of Greece did not regularly issue fixed-income securities until 1997, so we estimate Greek sovereign debt yields from long-term and short-term corporate bond yields obtained from the Bank of Greece. The producer price index is the Domestic Producer Price Index for Manufacturing, obtained from the Federal Reserve Economic Database (FRED). M2 growth for Greece is taken from the Bank of Greece, from FRED for Germany, and from the ECB for the euro. The Deutchmark-US dollar exchange rate is used for Germany, following CGG (1998), and was obtained from the OECD.

The Bundesbank's coefficients were estimated using data from January 1980 to December 1998. The Bank of Greece's coefficients were estimated using data from January 1993 to December 2000. The ECB's coefficients were estimated using data from January 2001 to December 2010.

To estimate the risk-premium, we use the PRS Group's "Investment Portfolio" risk factor, which specifically accounts for expropriation risk/contract viability, profits repatriation, and payment delays. It should be interesting to note that Greece and Germany have similar risk indices for the period under consideration (see Figure 5). We also use overnight interest rates from the OECD database. To represent the European Central Bank's monetary policy, we use the Euro OverNight Index Average, or EONIA, which is an average of all euro-denominated overnight money-market rates in Europe.

Important to our econometric analysis is the assumption of stationarity of nominal interest rates, CPI inflation, and the output gap. The intuition provided by economic theory is that these series should be stationary: output gaps should be stationary if economic output tends towards its potential level, monetary authorities striving for price stability generally keep inflation within certain bounds, and real money market interest rates are seen as varying about a long-run mean value that reflects the time value of money and the fundamental need for liquidity in markets. Taking into account the low power of the Dickey-Fuller test to reject nonstationarity, especially in small samples, we test for stationarity over the entire observed values for our data, and are able to reject a unit root at 0.1 p-value for the series we use, allowing for drift[1].

## 5. Results

### *5.1 Analyzing Taylor-Rule Coefficients*

First we estimate Taylor-rule coefficients for the Bundesbank and the Bank of Greece using each bank's domestic data. We also estimate Taylor-rule coefficients for the

1. We reject the null of a unit root using Augmented Dickey-Fuller tests with one lag and a trend. Six lags were required for the EONIA series.

European Central Bank, but with inflation and output-gap data taken from Greece after its accession to the eurozone. From these estimated coefficients we can infer the character of each policy. The results appear in Table 1. Each policy rule is specified with three lags of the overnight interest rate to eliminate autocorrelation in the residuals[2]. In no cases are we required to reject the model's overidentification restrictions[3].

**Table 1.** Interest Rate Policy Rules

| | Central Bank | α | β | γ | ρ1 + ρ2 + ρ3 | $\overline{rr}$ |
|---|---|---|---|---|---|---|
| 1 | Bundesbank | 2.76 | 1.20 | 0.43 | 0.94 | 3.34 |
| | | (0.16) | (0.05) | (0.04) | (0.00) | (1.24) |
| 2 | Bank of Greece | 6.17 | 1.10 | -0.27 | 0.84 | 6.94 |
| | | (0.19) | (0.03) | (0.04) | (0.01) | (1.90) |
| 3 | ECB (Greece's data, 2001:1-2010:12) | 1.77 | 0.23 | 0.32 | 0.96 | -0.32 |
| | | (1.41) | (0.39) | (0.15) | (0.02) | (0.92) |
| 4 | ECB (Greece's data, 2001:1-2007:12) | 2.27 | 0.16 | 0.32 | 0.95 | -0.30 |
| | | (1.64) | (0.46) | (0.13) | (0.02) | (1.00) |

*Note:* Standard errors are shown in parenthesis. These coefficients were estimated using the generalized method of moments with a heteroskedasticity and autocorrelation consistent weighting matrix using the Newey-West optimal lag-selection algorithm. For the BOG's policy rule, using one lag of the interest rate in the Taylor rule was sufficient to eliminate autocorrelation in the residuals. For the Bundesbank and ECB, three lags of the interest rate were required to eliminate autocorrelation.

For the Bundesbank (Table 1, row 1), which serves as an example of how a highly respected central bank acts, we estimate Taylor-rule coefficients for the period 1980:1-1998:12. The variables $\beta$, $\gamma$, and $\rho$ are all significant at the p = 0.01 level. The inflation response coefficient $\beta$ takes a value greater than one, implying that the Bundesbank's policy rule satisfies the "Taylor principle" criterion. We can additionally reject the hypothesis that $\beta < 1$ at p=0.04 significance. The output-gap coefficient $\gamma$ has a positive sign, which we expected of a stabilizing response. The smoothing coefficient $\rho$ takes a value close to its upper bound of 1, which implies that the Bundesbank adjusted interest rates very gradually.

For the Bank of Greece (Table 1, row 2), coefficients were obtained based on data from January 1993 to December 2000, because the period prior to 1993 was characterized by a very different monetary policy regime with far less central-bank independence and far greater government dependence on seigniorage revenue. We

2. Using a Ljung-Box Q test with 40 lags, we did not find evidence of autocorrelation. Under the null hypothesis, the error term is independently distributed, with the lowest p-value we observe being 0.4321.
3. We do not reject the null hypothesis of Hansen's J-test, with the lowest p-value observed being 0.9639.

replace the observed overnight rates for May 1994 and October-November 1997 with interpolated values to exclude the effects of the two speculative attacks on the Greek money market (see Figure 3); in these attacks, global financial forces overpowered the Bank of Greece, and so the interest rates during these periods should not be considered representative of the Bank's policy rule.

The inflation coefficient $\beta$ is found to be statistically significant, and takes a value greater than 1, implying that the Bank of Greece's policy rule, like the Bundesbank's, satisfies the Taylor principle. We can additionally reject the hypothesis that $\beta<1$ with much higher than p=0.001 significance. The sign on the output-gap coefficient is negative. This is the opposite of what we would expect of a stabilizing policy rule. The implications of this are not entirely clear. The lag coefficient $\rho$ is estimated at 0.84 (s.e. 0.01). This value is less than the estimate for Germany. The Bank of Greece's lower observed value of ρ for the period 1993-2000 is likely explained by the high interest-rate volatility of 1993 and 1994.

The observed value of Greece's $\overline{rr}$ is somewhat high (Table 1, row 2) in comparison to Germany's (row 1S), but this is likely a consequence of the time period selection. Because the Bank of Greece was bringing about disinflation prior to adopting the euro, the average real interest rate observed during this period is likely an overestimate of the true, long-run equilibrium real interest rate (CGG 2000). CGG's method assumes that $rr^*$, the long-run equilibrium real interest rate, can be estimated by taking the average real interest rate over the period in question. Because our observations include a period of disinflation, real interest rates were unusually high and are likely a biased estimate of the true long-run equilibrium real interest rate.

Compare this to the European Central Bank period (Table 1, rows 3 and 4). To allow for the possibility that the Greek sovereign debt crisis has forced the ECB to adopt unconventional monetary policies, we examine two periods, a longer one covering January 2001 through December 2010, and a shorter one covering January 2001 through December 2007. Both calculations find statistically significant and positive $\gamma$ coefficients on the output gap, which CGG would characterize as stabilizing. Yet both also reject the hypothesis $\beta>1$ at the p=0.05 significance level, which CGG would characterize as destabilizing. The smoothing coefficient $\rho$ is comparable to the Bundesbank's value. Somewhat more problematic is that since Greece joined the euro, real interest rates have been, on average, negative.

### *5.2 Counter-Factual Analysis*

In our counter-factual analysis, the Bundesbank's Taylor-rule coefficients are used to generate a series of implied interest rates, $r_{gr|de}$, based upon economic conditions in Greece. Figure 4 presents the counterfactual overnight interest rate for Greece, using the Bundesbank's Taylor rule coefficients and Greece's economic data. Also presented are two series of realized interest rates, one which represents the monetary policy of the Bank of Greece, and the other which represents that of the European Central Bank.

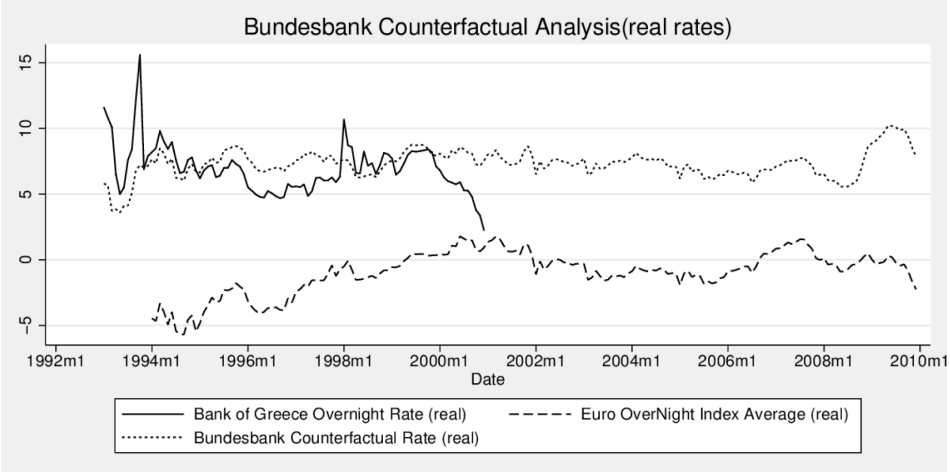


**Figure 4.** Implied interest rates for Greece using Bundesbank Taylor rule coefficients. Observed rates for May 1994 and October-November 1997 were replaced with interpolated values.

**Table 2.** Counterfactual Analysis: Differences from Bundesbank Implied Target Rate

| Series | E[diff*] | Stdev[diff*] | Min | Max |
|---|---|---|---|---|
| Bank of Greece | 0.34 | 2.24 | -8.39 | 5.28 |
| European Central Bank | 7.67 | 1.14 | 6.16 | 10.32 |

*Note:* Data from May 1994, October-November 1997 foreign exchange crises were excluded. diff* = (counterfactual rate) - (realized rate). Bank of Greece data are from 1993:1 to 2000:12, ECB data are from 2001:1 to 2010:12.

If the foreign exchange crises of May 1994 and October-November 1997 are excluded, one can observe by mere visual inspection that there was little difference between the Bank of Greece's actual interest rates, and those calculated hypothetically from the Bundesbank's policy rule. An appreciable difference emerges, however, after Greece's transition to the euro, when the Bundesbank would have set rates much higher than the ECB actually did.

Table 2 presents this inference numerically. Realized interest rates were subtracted from the counter-factual implied series (with the foreign exchange crises removed). The Bank of Greece set interest rates, on average, only 34 basis points below what was implied by the Bundesbank's policy rule, adjusted for expropriation risk, and excluding the two foreign exchange crises. The European Central Bank, on the other hand, set rates an average of 7.67% below the Bundesbank's hypothetical rate.

### *5.3 Risk Adjustment*

A counter-factual analysis could be biased if there exist differences in expropriation risk, which affects the risk premium demanded by lenders. Whereas Germany is perceived as a highly developed and stable economy, Greece has suffered from high inflation and a turbulent political climate. To account for this, we adjust the implied interest rate for Greece given the Bundesbank's Taylor-rule coefficients, $r^*_{t,gr|de}$ , using:

$$rr^*_{t,i} = R_f + \theta\varphi_{t,i} + \epsilon_t \quad (6)$$

where the index *i* denotes a given country, and the "return" refers to the overnight interest rate. We denote the risk for country *i* at time *t* as $\varphi_{t,i}$; we denote the risk-free rate, or intercept term, as $R_f$, and the market risk premium as $\theta$. Note that we use real interest rates in estimating the risk premium. This prevents differing inflation targets across countries from affecting measurements of the actual market risk premium, which would appear in real returns. In finding a risk-premium with which to adjust interest rates implied by the Bundesbank's coefficients for the Greek economy, we combine two versions of equation 6, subtracting the equation for Germany from the equation for Greece:

$$rr^*_{t,gr} - rr^*_{t,de} = \{R_f + \theta\varphi_{t,gr} + u_t\} - \{R_f + \theta\varphi_{t,de} + v_t\} = \theta(\varphi_{t,gr} - \varphi_{t,de}) + e_t \quad (7)$$

The risk premium is exogenous to monetary policy and is best thought of as a component of the long-run equilibrium real interest rate, $rr^*$ (it will be estimated from real interest rates). Therefore, the risk premium should be added to $rr^*$, which does not appear directly in equation (5), but rather is a component of $a = r^* + \beta\pi^*$, where $rr^* = r^* - \pi^*$. Consequently, we include the risk premium by adding the difference in returns $\theta(\varphi_{t,gr}-\varphi_{t,de})$ to $\alpha$, so that $\alpha'_t = rr^* + \theta(\varphi_{t,gr} - \varphi_{t,de}) + \beta\pi^*$. This value can be substituted in place of a non-risk-adjusted α to define a new risk-adjusted interest rate series,

$$r'_t = (1-\rho)[\alpha'_t + \beta\pi_{t+n} + \gamma x_t] + \rho r'_{t-1}. \quad (8)$$

From the "Investment Portfolio" cross-sectional time series from the PRS Group, we obtain a risk index for each country. The indices vary from 1 (riskiest) to 12 (safest). From the OECD's database we construct a cross-sectional time series of interest rates and inflation rates, from which we obtain a cross-sectional time series of real interest rates.

One important task is to determine which data to include. The objective of this analysis is to determine a market risk premium. Some of the countries sampled experienced hyperinflation at some point during the observation period. Credit markets experiencing hyperinflation are very different from those not experiencing hyperinflation. Specifically, we want to find a market risk premium for Greece, which has not experienced hyperinflation from 1993 to the present. Consequently, data from countries experiencing hyperinflation or countries with exceptionally high risk levels were excluded so that this risk premium for Greece would be formed based on a like

comparison. Specifically, all countries with a risk level more severe than 4 were excluded, as Greece's worst risk level since 1993 was a 4, and markets riskier than this are probably heavily influenced by non-market forces (whereas the purpose of this test is to determine a market risk premium). We also excluded all countries with real interest rates less than -10%, as interest rates more negative than this are also not likely the result of market action.

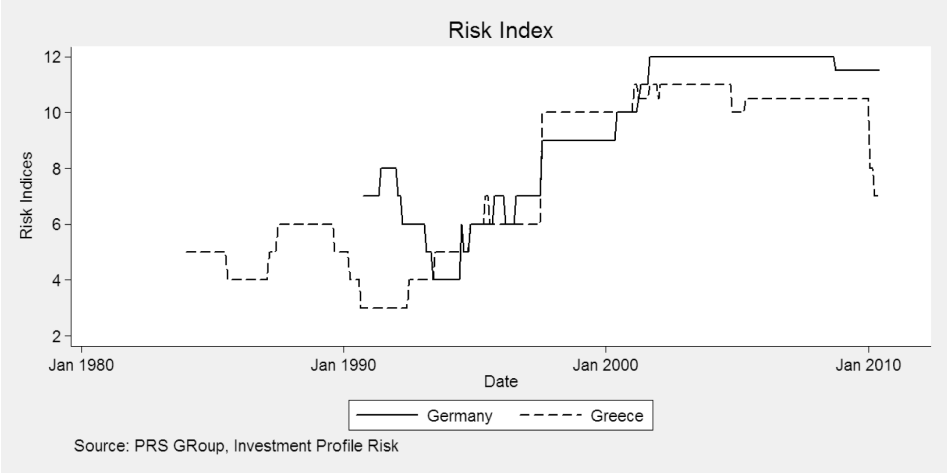


**Figure 5.** Risk Indices for Greece and Germany.

Using a cross-sectional time-series regression, we estimate the risk coefficient to be -0.30, with a standard error of 0.055; therefore, a 1 point increase in the risk index decreases real interest rates by 0.3%.

The risk adjustment increases the Bundesbank's counterfactual rate by an average of 17 basis points, although the risk-adjusted rate is lower than the unadjusted rate from April of 1998 through December of 2001. Although this gap does widen to a more substantial 60 basis points in June of 2010 (the last month for which data are available), the calculated impact of expropriation is modest during both the Bank of Greece's and the ECB's regimes. Table 3 demonstrates that the Bank of Greece still behaved much like the Bundesbank, whereas the ECB did not.

**Table 3.** Counterfactual Analysis: Differences from Bundesbank Implied (Risk Adjusted) Target Rate

| Series | E[diff*] | Stdev[diff*] | Min | Max |
|---|---|---|---|---|
| Bank of Greece | 0.37 | 2.13 | -8.09 | 5.12 |
| European Central Bank | 7.96 | 1.16 | 6.09 | 10.69 |

*Note:* Data from May 1994, October-November 1997 foreign exchange crises were excluded. diff * is equal to the counterfactual rate less the realized rate.

## 6. Counterfactual Analysis Using Federal Reserve Coefficients

We expand our counterfactual analysis by using the Federal Reserve's policy rule during the period 1982:10-1996:12, which was described by CGG (2000) as corresponding to the "stable" era of recent macroeconomic history. We use GMM estimation to obtain a policy rule for the Federal Reserve using data taken from the OECD: the monthly Federal Funds Rate, output gaps measured from an HP-detrended Industrial Production Index, and the CPI. We use as instruments the spread between ten-year Treasury bonds and three-month Treasury notes as well as the year-over-year growth of the M2 money stock. We risk-adjust the data using the same PRS "portfolio risk" index.

We report the results of estimation in Table 4[4]. We used the Federal Reserve's coefficients to generate a series of counterfactual interest rates. A comparison can be made visually in Figure 6, or quantitatively in Table 5. The Federal Reserve largely concurs with the Bundesbank. A large difference appears between the Federal Reserve's implied rates and the ECB's actual rates. We found that risk adjusting the Federal Reserve's rates had negligible effects on the results.

**Table 4.** Federal Reserve Policy Rule

| Central Bank | $\alpha$ | $\beta$ | $\gamma$ | $\rho 1+ \rho 2+ \rho 3$ | $\overline{rr}$ |
|---|---|---|---|---|---|
| Federal Reserve | 2.53 | 1.08 | 0.47 | 0.98 | 3.15 |
| | (0.95) | (0.28) | (0.09) | (0.00) | (1.87) |

*Note:* Federal Reserve data are from October 1982 to December 1996. Standard errors are shown in parentheses.

4. As in our previous estimations, we specify a model with three lags of the interest rate to eliminate autocorrelation in the residual term, as determined by the Ljung-Box Q test. Hansen's J-test does not lead us to reject the model's overidentifying restrictions.

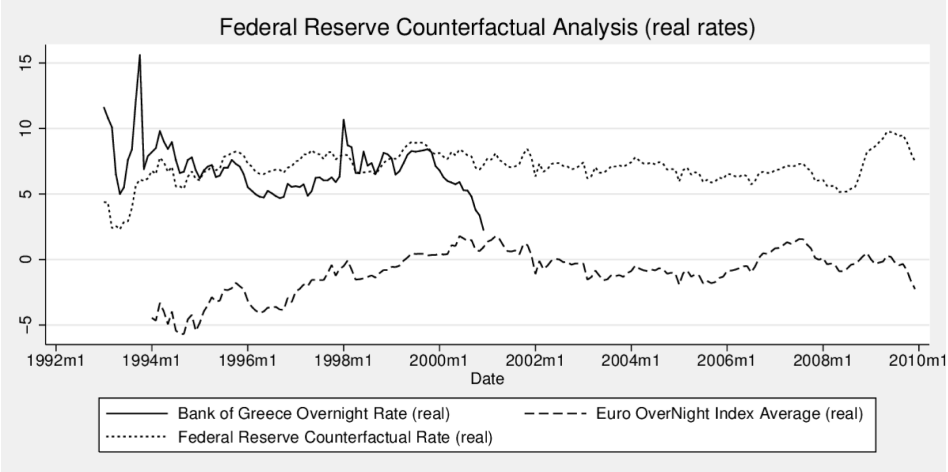


**Figure 6.** Implied interest rate for Greece based on the Federal Reserve Taylor rule coefficients. Observed rates for May 1994 and October-November 1997 were replaced with interpolated values.

**Table 5.** Counterfactual Analysis: Differences from Federal Reserve Implied (Risk Adjusted) Target Rate

| Series | E[diff*] | Stdev[diff*] | Min | Max |
|---|---|---|---|---|
| Bank of Greece | -0.17 | 2.38 | -9.08 | 4.79 |
| European Central Bank | 7.61 | 1.14 | 5.87 | 10.24 |

*Note:* Data from May 1994, October-November 1997 foreign exchange crises were replaced with interpolated values. diff* is equal to the counterfactual rate less the realized rate.

## 7. Discussion

We saw that the Bank of Greece set interest rates in accord with the Taylor principle ($\beta > 1$), but did not exhibit the expected response to output gaps (the expected response is $\gamma > 0$), and exhibited a lesser degree of interest-rate smoothing in comparison to Germany. The lack of response to output gaps has economic implications, although there is debate among economists as to whether monetary policy ought to respond to changes in real output. CGG (2000) conjecture that the United States' poor monetary policy in the 1970's may have arisen in part from underestimates of the "natural" rate of unemployment. Furthermore, Greece was at this time pursuing an exchange-rate target; inflation may correlate to exchange-rates in a way that real economic output does not. Thus, the Bank of Greece's efforts to sustain an exchange rate program may have conveniently coincided with attempts to engineer a disinflation.

The lesser degree of interest-rate smoothing is more difficult to explain. Perhaps the Bank of Greece was less able to forecast economic conditions and found the need to make more frequent corrections to the path of interest rates. Perhaps the Bank of Greece faced greater external forces in drachma money markets and was unable to set interest rates precisely. It is possible that interest rate smoothing in Greece was suboptimal; the extent to which the Bank of Greece can be faulted for this and the extent to which this interest-rate volatility impacted the Greek economy are uncertain.

Notwithstanding these two discrepancies between the Bank of Greece's policy and expectations, we observed that the Bank of Greece's actual policy, excluding rates during two foreign exchange crises, coincided largely with a hypothetical policy constructed from the Bundesbank's estimated policy rule. Because the Bundesbank was historically quite highly regarded for its monetary policy, such a similarity between the policies of the Bundesbank and the Bank of Greece constitutes an interesting "endorsement" of sorts for the Bank of Greece. Our additional counterfactual analysis using the Federal Reserve serves to buttress this endorsement. Thus, the Bank of Greece, even while focusing mainly upon an ambitious exchange-rate target in the face of extraordinary speculative pressures, seemingly pursued a quite sound interest-rate policy.

On the other hand, the European Central Bank pursued an interest rate policy that greatly differs from the Bundesbank's. The average real interest rate in Greece over the past decade has been negative. Our study finds evidence that the European Central Bank's interest rate policy would destabilize prices in Greece. This would be consistent with the idea that the ECB sets policies that satisfy several different countries. The positive sign on the output gap coefficient suggests that the ECB was able to pursue a policy that stabilized output in Greece, but it was just such a strategy, one that stabilizes output without stabilizing prices, that the Federal Reserve employed during the Martin-Burns-Miller years, a time not remembered fondly in the macroeconomic history of the United States.

Based upon the Bundesbank comparison, and the fact that real short-term interest rates have been negative for most of the past decade in Greece, it is quite possible that interest rates in Greece have been too low since Greece acceded to the euro. An extended period of monetary easing brings with it a boom, which Greece (if the data are to be trusted) experienced immediately after adopting the euro; the boom, however, often ends with the bursting of credit bubbles and with rising inflation as economic agents agree on prices based on high inflationary expectations. If Greek sovereign debt can be thought of as a credit bubble, then it seems that monetary policy could have contributed to the current crisis, in addition to the budget deficits and other fiscal problems that are commonly discussed. The existence of widening current account deficits in Greece throughout the 2000's may have been exacerbated by the abundance of liquidity in Greek money markets, brought on by the ECB's low interest rates.

Whatever criteria the European Central Bank used in setting interest rates, those criteria did not lead the ECB to set interest rates in accordance with the state of the Greek economy. Even if the GDP data for Greece were completely unreliable, the persistence of negative real interest rates for an extended period is generally a sign either of a deflationary liquidity trap, or a brewing macroeconomic calamity.

It would be worth pointing out that Greek monetary policy during the Greek Miracle (1954-1973), a period of low inflation and high growth, was constrained by the Bretton Woods exchange system. From 1974-1992, the Greek economy faced sluggish growth and persistent inflation, and, in the absence of a firm commitment to a foreign exchange policy, the drachma was repeatedly devalued. The period 1993-2001, like the Greek Miracle, was constrained by a foreign exchange program. Such a correlation could be mere coincidence, but it casts doubt on the assertion that rigid foreign-exchange programs render a central bank unable to respond to the needs of their economies.

It would be worth asking whether Greece should have joined the eurozone to begin with. Where persistent inflation differentials exist, it would be worth determining whether the benefits of integrating into a monetary union outweigh the loss of interest-rate autonomy. Indeed, Greece attained stronger inflation convergence under the Bank of Greece than it did under the ECB; such a result calls for further study of inflation differentials in monetary unions.

## 8. Conclusion

To summarize, we followed Clarida, Gali, and Gertler's (1998) method for estimating Taylor-rule coefficients and performing a counter-factual analysis to conjecture what the Bundesbank and the Federal Reserve might have done had they been responsible for setting Greece's interest rates. We determined that the Bank of Greece set interest rates very similar to those "optimal Taylor rules" as proxied by the Bundesbank's and Fed's estimated Taylor rules, even after adjusting for differences in expropriation risk. Furthermore, we have shown that the Bank of Greece's Taylor rule functions were "stabilizing" policies, whereas the ECB's was not. We suggest that the European Central Bank, in determining monetary policy for all of the eurozone, set rates that were too low for the economic conditions in Greece. A continued period of low nominal and negative real interest rates may have exacerbated sovereign debt bubbles, which Greece, as a euro member state, could not simply inflate away. In addition to the fiscal element that is often and rightly emphasized, we now add that monetary policy might also have contributed to Greece's sovereign debt crisis.

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# EFFICIENCY OF THE TRANSITION OF INSURANCE MARKETS IN SOUTH-EASTERN EUROPEAN POST-COMMUNIST COUNTRIES

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**Abstract**
This article focuses on the insurance markets transition process in ten South-Eastern Europe (SEE) post-communist countries. These insurance markets, characterized by a large number of small insurance companies, have been analyzed from several aspects in order to underline the main obstacles to their development. The research aims at identifying the relations between insurance market development and the European Union (EU) integration process as well as the overall economic development. To this end, indicators of the success in implementing these relevant processes have been identified and countries have been consistently ranked.

**JEL Classification:** C82, G22, G28, P30
**Keywords:** Insurance, Transition, Post-Communist Countries, South-Eastern Europe

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## 1. Introduction

In the past two decades, the transition of the sector of financial services in post-communist countries has mostly involved banks and capital markets development. In these countries, the change in the insurance sector was slower, causing a clear gap with the Western insurance sector. Banks' domination is evident from the official data about the structure of the financial service sector of the countries available in the official publications from their central banks or statistical offices as well as in research provided by Fink *et al*. (2007) or Hagmayr *et al*. (2007). Besides worse regulation and lower demand for insurance, the reason for that lies in the special features of the insurance industry and also in the many difficulties in its transition as well as, in some countries, limited economic development. The transition was even slower in the countries where the impact of war was devastating for the insurance sector.

Previous studies in this field mostly focused on Central-Eastern European countries whose insurance markets are commonly defined as CEE markets in the literature. This article is about ten post-communist countries in South-Eastern Europe (SEE): Albania, Bosnia and Herzegovina (BiH), Bulgaria, Croatia, Former Yugoslav Republic of Macedonia (FYRM), Kosovo[1], Montenegro, Romania, Serbia and Slovenia.

Their geographical location requires their involvement in the European Union (EU) enlargement process. Presently, Slovenia, Bulgaria, Romania and more recently, Croatia (from 1 July 2013), are already EU Member States, while the other countries are at different levels in the EU integration process. Official data about economic development (e.g. GDP per capita) show that the transition is much more efficient in countries like Slovenia (i.e. countries bordering highly developed areas).

Before the wars of the 1990s, BiH, Croatia, FYRM, Kosovo, Montenegro, Serbia and Slovenia were part of Yugoslavia, which had the most "sophisticated and advanced" insurance sector of all communist countries (Rogers *et al*, 1988). Unfortunately, the impact of the wars affected economic development, the EU integration process and, in particular, the insurance markets in this region.

This article aims at analyzing the efficiency of the transition of the insurance sector in these countries in the period 2001-2010, when the most significant changes happened. Therefore, the basic features of the insurance sector in the previous centrally-planned communist economies will be outlined as well as the barriers to the transition process. The level of development in the insurance industry will be measured by several indicators, providing a ranking of these countries. At the same time, basic indicators of economic development and EU integration level will provide a ranking of the countries in these two processes. A relation between the insurance sector transition and economic development as well as the EU integration process

1. As defined under UN Security Council Resolution n. 1244.

will also be determined. The methodology used to measure these relations is based on the Spearman coefficient of rank correlation, which needs countries ranked according to defined criteria. The main findings provide a general overview of the transition level of the insurance sector in these countries, identifying prospects and challenges in the relevant insurance markets.

The article is structured in six sections. Section 2 presents the literature review of similar research into the insurance markets in the region. Section 3 describes key obstacles to the post-communist transition of insurance markets as well as the impact of the European integration process. Section 4 describes the efficiency of the transition in the insurance markets and of European integration for the countries based on data for the last ten years. Section 5 presents results of statistical analysis and discusses important relations as well as main findings. Prospects and challenges for SEE insurance markets are discussed in Section 6**.**

## 2. Literature review

Very few studies were available on the insurance markets of communist countries up until the 1990s. Most published works had been written by authors from the SEE countries, and only a few authors from Western Europe and United States took an interest in these markets, such as Rogers (1986), Rogers *et al.* (1988), Marbacher and Furrer (1990) and Frinquelli *et al.* (1991). These studies pointed out a monopolistic and uncompetitive insurance market, whose dynamics were driven by political factors. Interest in the transition of insurance markets grew sharply in the 1990s, together with the expectation of European enlargement and new business opportunities in the region. Therefore, very important contributions to the literature were provided by authors with professional experience in the insurance industry, such as Baur and Enz (1994), Baur and Hess (1995), Meyer *et al.* (1998), Rüstmann (2001), Birkmaier and Codoni (2002 and 2004) from Swiss Re. On the other hand, many academics considered this transition process as important field for research, even if much more interest was shown in the development of the banking industry. An important analysis of the transition process in the insurance market in Poland, the Czech Republic and Hungary was carried out by Dorfman and Ennsfellner (2001), who developed a methodological framework to measure the progress of these countries in the transition process. Pye (2005) provided an accurate analysis of insurance market evolution in 1990-2001 in Central and Eastern European countries and in the countries of the former Soviet Union. This author pointed out that in many countries further efforts were required to implement market-based principles to the insurance market. Changes in regulations are only a prerequisite and a starting point in the transition process, as it takes some time to implement rules effectively and to build up an 'insurance culture'. Moreover, Cooper and Dorfman (2003) pointed out that, in many countries, business ethical problems grew worse in the insurance industry during the transition process and some prevention measures had to be implemented.

An important analysis of the trend of insurance market concentration during the transition process in Central and Eastern Europe was carried out by Tipurić *et al.* (2008). The transition process required insurance market liberalization and the access of new private – and very often foreign – insurers that replaced the monopolies of state-owned insurers. This process introduced competition in the market, reducing concentration and increasing the efficiency of the sector. However, it must be noted that in Western European countries, with higher efficiency levels in financial services, mergers and acquisitions prevailed among companies with a view to finding better risk diversification opportunities, resulting in increased market concentration (see, for example, Casu and Girardone, 2006).

The relation between insurance market development and economic growth was investigated by Haiss and Sümegi (2008). These authors emphasized the role of insurers as institutional investors that may provide an important contribution to economic growth at national level, if supported by an appropriate range of investment instruments and effective stock and bond markets. They identified a positive correlation between expenditure in non-life insurance premiums (as life insurance was not developed yet at a sufficient level) and GDP also in SEE countries. Enz (2000) suggested the use of econometric models for long-term premium forecast based on GDP projections. Ćurak *et al.* (2009) recently confirmed the previous findings on a positive relationship between the development of both life and non-life business and economic growth in ten countries involved in the EU transition process over the period 1992-2007.

Kozarević *et al.* (2008) carried out a comparative analysis of the insurance markets of the former Yugoslavia, pointing out a significant correlation between the EU integration process and insurance market development in these countries. This correlation was thoroughly investigated for the countries of the Western Balkans by Kozarević *et al.* (2011). The authors have identified insurance penetration, insurance density, share of life insurance premiums in total premiums, share of motor third part liability (MTPL) insurance premiums in total premiums and the level of the applicable solvency rules as key indicators of EU integration level. An interesting analysis of the insurance market in SEE countries and of the role of insurers associations in the EU enlargement was carried out by Kozarević (2011) in collaboration with local insurance associations. This study provides detailed data and comparative analysis of insurance markets of SEE countries, including Greece and Turkey.

The EU enlargement requirements as well as the ongoing liberalisation process of financial services in the EU have played a crucial role in the definition of the transition process. The role of financial service liberalisation and the financial market integration processes in the EU are continuously monitored by reports of the European Commission (2013) and European Central Bank (2013). The need for including the insurance sector in economic analysis of liberalisation and integration is stressed by Haiss and Fink (2006). An interesting study of the financial market

integration process of new EU member States and the challenges of EU accession was carried out by Stirbu (2004). Unfortunately, the author neglected the insurance market, but an accurate overview of the EU accession requirements and financial services development in the new EU Member States was outlined. The challenges of accession become clearer, if the European insurance market integration process and its impacts on the EU members are taken into consideration. Important contributions in this field were made by Hess and Trauth (1998), Sterzynski (2003) and Masciandaro and Quintyn (2012).

This paper contributes to the literature providing a very serious analysis of the insurance market development of the countries with very specific historical, political and economical environment. Regarding this, these countries differ from other parts of the world, even from the Central-Eastern Europe post-communist countries. Moreover, another very important contribution of the paper is to show the relationship between the insurance market development of these countries and two other very important processes, economic development and integration into the EU ones.

## 3. Conceptual background

To understand the current SEE insurance environment, an overview of the previous government system in these countries and its impact on the insurance sector is provided. The core differences between centrally-planned and western insurance systems must be identified to gain an insight into the key obstacles encountered by the insurance sector in its transition. At the same time, in Western Europe, the ongoing European integration process has resulted in the introduction of new rules for insurers operating in the EU, making the transition process of SEE insurance markets even more challenging.

### *3.1 Centrally-planned vs. western insurance market conditions*

Unlike competitive Western markets, the monopoly of state-owned insurers is the distinguishing feature of the centrally-planned insurance markets. The insurance sector was nationalized after World War II and foreign insurers were expropriated. Decisions on all fundamental issues, like premium rating and policy provisions, were taken by the Ministry of Finance on the basis of the general economic policy of the state. Underwriting practices were not based on sound actuarial analysis, as insurance was meant to be a service provided by the State with no need for profit. In this context, statistics were not seriously collected and skilled staff were not specially trained for these jobs. As a result, there was insufficient control of adverse selection, so that insurance products became attractive only for customers with a level of risk above the average. At the same time, many insurance products were compulsory for all state-owned companies as well as the transfer of some risks through reinsurance. However, reinsurers were forced to accept all risks and a part of them only could be transferred abroad by retrocession.

In the centrally-planned economies the trust between insurer and insured was not so much based on contracts and the commercial legal systems, as on state policy and confidence in state solvency. Some types of insurance were provided even without a written contract between the insurer and the insured. As pointed out by Dorfman and Ennsfellner (2001, p. 3-5), the absence of an insurance-oriented culture and lack of demand for insurance were major limits to the development of the insurance sector in the centrally-planned economies.

Some other general features of the centrally-planned economies – which also had an impact on the insurance sector – must also be taken into account. First of all, managers were not focused on company profitability and risks. As the managers' selection was based on political affiliation, they were not motivated to take responsibility for pure risks which the company's assets and employees were exposed to. Personal risk management also was neglected, because the property was mostly state-owned, and the social security system provided a wide range of benefits. The underdeveloped financial sector, extremely high inflation rates and a poor economy were a huge burden on the development of life insurance.

### *3.2 Key obstacles to the transition process of insurance markets*

SEE countries implemented their transition from a centrally-planned economy to a market economy in different ways. Most countries of the former Yugoslavia were affected by war during the 1990s, while Albania, Bulgaria and Romania were extremely poor countries, at the beginning of the transition. On the other hand, Slovenia benefitted from being the closest country to the western economies. In any case, several specific obstacles are common to all countries.

As a prerequisite for a thorough transformation of insurance markets, the new democratically-elected governments had to create a new legal and institutional framework with a view to implementing reforms. It took many years, especially in countries that had been disrupted by war.

As a first step in the transition of insurance markets, monopolies were dismantled and supervision was introduced. The privatisation of state insurance companies provided access to foreign capital and the number of active companies increased. There were many difficulties in this process, as Furstenberg and Junker explain (2005). However, new insurance regulations –very often based on developed insurance markets in the EU without previous institutional preparation– were difficult to implement in countries that had different legal systems. New supervisory authorities had an insufficient staff potential and were not able to efficiently supervise a rapidly growing number of insurers in markets affected by many problems.

The lack of an insurance-oriented culture and the economic and politic instability in some countries had a negative impact on insurance market development. The dominant products were those featuring compulsory insurance, primarily MTPL

insurance, while voluntary insurance products were long neglected. In general, savings were deposited in banks and in other financial institutions than in insurance companies.

Additionally, economic reforms in most SEE post-communist countries slowed down because of many unsolved political problems, irregularities in the privatization process, slow financial consolidation of economic organizations, exchange rate instability and inflation. Inflation was one of the important obstacles to the development of life insurance. Insufficient economic activities resulted in high unemployment rates and reduced purchasing power of the population. Insurers' frequent insolvency and delays in indemnifications made insurance services even less attractive.

Moreover, financial markets of SEE post-communist countries were poorly regulated for years and they were not able to provide insurers with appropriate investment opportunities. Even now, these markets are still at an early stage of development and they offer a limited range of financial instruments.

Finally, insurance companies need statistical databases to determine adequate prices for their products. Unlike Western markets, where databases cover periods of many decades and even up to a hundred years, in SEE post-communist countries data are barely available for the last couple of decades only. Additionally, data are often unreliable and they are not diversified, especially in countries which were deeply affected by war. In such a context, sound insurance premium calculations are very difficult.

A lack of highly skilled managers and actuaries in insurance companies and underdeveloped accounting standards unable to provide adequate information for internal management represent further relevant obstacles to the transition process (Dorfman and Ennsfellner, 1998).

### *3.3 Impact of the European integration process*

With the fall of communism, expectations for a wider European Single Market involving Central and Eastern European countries were raised. In 1993, the EU Single Market was completed with the introduction of the free movement of people, goods, services and capital. Additionally, the EU Council defined the following criteria for European accession (as reported in the Conclusions of the Presidency of the European Council in Copenhagen, 21-22 June 1993):

- 'Stability of institutions guaranteeing democracy, the rule of law, human rights, and respect for the protection of minorities;
- The existence of a functioning market economy as well as the capacity to cope with the competitive pressure and the market forces within the Union;
- The ability to take on the obligations of membership, including adherence to the aims of political, economic and monetary union'.

Candidate countries had also to come to terms with the ongoing western countries'

market integration process. In 1994, an important step towards the European insurance market integration process was taken with the implementation of the third generation directives (92/49/ECC and 92/96/ECC), which introduced some fundamental principles: the single EU license on transactions anywhere in EU, the home country control and the deregulation of prices and conditions, leaving to supervisors only the control over insurer solvency. Deregulated insurance markets are expected to result in a better risk diversification in both underwriting and investment activities and higher efficiency and competition. Additionally, a wider range of new and/or innovative products can be introduced to satisfy a wider range of customer needs. The higher level of integration reached in the European insurance market in recent years also translated into an increase in the number of foreign companies, global competition and a wave of mergers and acquisitions – that resulted in increased market concentration. However, the creation of a single market has been hampered by some not harmonized but very important different local rules, as, for example, the regulation on taxation, accounting principles, contracts, solvency, thus preventing the creation of a European playing field for insurers (Sterzynski, 2003). The Solvency II project –defining the new solvency rules for European insurers– and the IFRS project –defining common accounting standards for companies in the EU– are examples of the further measures needed to support the single European market. The financial crisis and the need for recovery strategies are new challenges for the market. In such an environment, SEE countries have to adapt their legal and institutional environment to these new requirements for European insurers.

## 4. Empirical analysis

The success of the transition of insurance markets and the European integration process in the SEE post-communist countries depends on many factors. Therefore, estimates of the progress in these processes must be based on several key indicators. A ranking of the countries based on these key criteria may result in very important findings and correlations. Some relevant studies have been published on the relationship between insurance sector development and economic growth (Pye 2005, Tipurić et al. 2008, Haiss and Sümegi 2008, 2009) in some post-communist parts of Europe, but this work focuses on the relationship between insurance market development and European integration process in the SEE post-communist countries.

### *4.1 Estimate of transition in insurance markets and of European integration efficiency*

Efficiency of transition in insurance markets of the SEE post-communist countries can be defined as level of development of insurance markets. The benchmark used for the estimate is the level of development of the insurance market of the EU countries. To assess the efficiency of transition, the following indicators of insurance market environment progress and market development have been applied:

- Legal and institutional environment,
- Solvency standards,
- Insurance penetration,
- Insurance density,
- Share of life insurance,
- Share of MTPL insurance.

The analysis of the legal framework aims at describing the main changes that have occurred in the national insurance regulations and consistency with EU directives. The insurance market institutional framework has also to be taken into consideration to determine the ability of supervisors and other institutions to implement the new regulations successfully. Solvency standards are the indicators of the access level of the insurance market, as they define the minimum amount of equity required to ensure the insurer's capacity to meet its obligations. Insurance penetration is the ratio between insurance premiums and the national GDP and it points to the role of the insurance sector in the national economy. Insurance density is the most revealing indicator of insurance market development, as it consists of the average amount of premiums per capita or –in other terms– the amount of money each citizen spends on insurance per year. Insurance penetration and density indicators are typically used in the comparative analysis of the achieved development levels of different insurance markets. The share of life insurance premium in the total premium income determines the consumer's familiarity with financial transactions. Finally, as the MTPL insurance is compulsory in all the countries included in this assessment, its share in the total premiums is a good indicator of the insurance-oriented culture or of the lack of interest in voluntary insurance products.

The progress of SEE post-communist countries in the European integration process can be evaluated in terms of the level of compliance with the previously described main EU accession criteria (political criteria, economic criteria and ability to comply with EU obligations). On the basis of the EU 2010 progress reports for candidate and potential candidate countries, a qualitative overall judgment can be made with a view to consistently ranking SEE post-communist countries.

### *4.2 Comparative analysis of transition in insurance markets and of European integration efficiency*

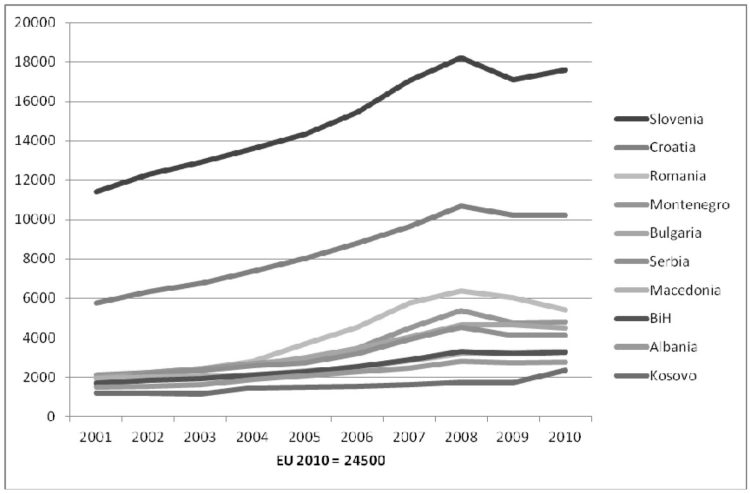
In this study, empirical analysis is based on the data from the past ten years. Unfortunately, as previously underlined, longer historical series are either not available or not reliable. Since 2001, insurance market statistics have been collected and processed by supervision authorities or by insurers associations in official reports. These are the sources of data that have been used in this study. Whenever official reports were not available, data were collected directly from country's insurers associations reports or using Swiss Re World insurance reports. Additionally, the

most recent available official reports on the EU enlargement process have been used. SEE countries' insurance markets comparative analysis is based on the above mentioned indicators of insurance market development. Whenever quantitative indicators were not available, as for the legal and institutional framework, a simple ranking based on 2010 information has been worked out. The transition indicator provided by the European Bank for Reconstruction and Development as well as the methodology developed for financial markets by Haiss and Kichler (2009) can also be used for ranking. For a better insight into the assessment, a preliminary short review of basic macroeconomics has been outlined.

### *4.2.1 Basic macroeconomics*

All the analyzed countries have had positive trends in their basic macroeconomics, but the level of their economic development is still far from the level of the industrialized Western countries. In recent years, the economic crisis has disrupted the high rates of GDP growth of the previous period. Detailed comparisons of SEE post-communist countries GDP per capita over the period 2001-2010 are reported in Figure 1.

**Figure 1.** GDP per capita in the period 2001-2010 (EUR)




*Sources:* Compiled by the authors from official national statistic reports

In 2010, the total population of these countries was 54,103 million, accounting for 6.7 percent of the European population (including transcontinental countries) and 10.8 percent of the EU population (including Romania, Bulgaria and Slovenia). The total GDP of the countries was equal to EUR 296,401 million, i.e. 2.4 percent of the EU total GDP (Purchasing Power Standards). GDP per capita in all these countries

was EUR 5,478, i.e. 4.5 times lower than the GDP per capita in the EU, resulting in a very significant gap in economic development with EU countries. Slovenia and Croatia only had a GDP per capita exceeding EUR 10,000 in 2010. Unfortunately, the economic crisis halted the long-term trend of GDP growth in all countries.

*4.2.2 Legal and institutional environment*

The creation of an appropriate legal and institutional framework is the first step in the SEE post-communist transition of insurance markets. The related changes require a different time frame and countries are in different stages of the implementation as, using reports of the countries' supervisory authorities, summarized below. Since there are no quantitative measures of progress in the legal and institutional environment, a ranking of the SEE countries can be based on the analysis of the laws and bylaws introduced in accordance with EU regulations as well as of the efficiency of established supervisory institutions and insurance associations.

Slovenia has been the most successful in this process. The new insurance law was introduced in 2000, followed by many amendments and secondary legislative acts, increasing the frequency of changes as the market started preparing for the new Solvency II standards. The compulsory MTPL insurance law has also been amended many times. The Insurance Supervisory Agency became operational in 2000. The Slovenian Insurance Association, founded in 1992, is a member of the CEA (European Insurance and Reinsurance Federation).

In view of the EU enlargement, Bulgaria and Romania had to increase the pace of changes in their legal and institutional frameworks. The Bulgarian insurance market is regulated by the code on insurance introduced in 2005 on insurance and reinsurance undertakings, insurance and reinsurance intermediaries, state supervision over insurance (reinsurance) activities and intermediation as well as insurance contracts and compulsory insurance. The market is supervised by the Financial Supervision Commission established in 2003. It is a single supervisor for the non-banking financial sector (insurance, pension schemes, securities market). In Romania, the law on insurance business and insurance supervision was introduced in 2000. The amendments to the law, including compulsory MTPL insurance, were introduced in 2002. The Insurance Supervisory Commission, an independent insurance supervision authority, was founded in 2000. The Association of Bulgarian Insurers and the National Association of Insurance and Reinsurance Companies from Romania are members of the CEA.

Croatia insurance law and the Act on Compulsory Insurance within the Transport Sector were introduced in 2005 and the Croatian Financial Services Supervisory Agency was established in the same year as supervisory authority for the insurance market as well as for other non-banking financial services. The Croatian Insurance Bureau, i.e. the insurers' associations, is a member of the CEA.

In Serbia, the legal framework on the insurance market changed in 2004, when a new insurance law was introduced. The law on compulsory motor insurance was introduced in 2009. Supervision has been implemented by the National Bank of Serbia since 2004. The Association of Serbian Insurers is a representative of the insurers in Serbia.

Against the backdrop of its constitutional constraints, BiH has a very complex legal and institutional framework for its small insurance market. The insurance business is structured and regulated at entity level (Federation of BiH and Republic of Srpska), with the Insurance Agency of BiH providing a sort of supervision at state level. The state agency is not a supervisory authority and its role is to harmonize the entities' legislation and the supervisory work of the entities' agencies, to process statistical data at the state level, and to represent the country in international relations. The law on the state insurance agency was introduced in 2004. Entity laws on insurance as well as entity laws on MTPL insurance and laws on insurance mediation were introduced in 2005. Insurance companies are members of two insurance associations and their activities are very often coordinated by the state agency.

Albania adopted the new law on insurance, reinsurance and intermediation in insurance and reinsurance in 2004. MTPL insurance is now regulated by the law on compulsory insurance in the transport sector, introduced in 2009. The insurance market is supervised by the Albanian Financial Supervisory Authority established in 2006. The Albanian Insurers Association is active and it includes insurers and intermediaries operating in Albania.

FYRM insurance supervision law was adopted in 2002, and the law on MTPL insurance was introduced in 2005. In 2009, the Insurance Supervision Agency took over the role of the insurance sector supervisor from the Ministry of Finance. The National Insurance Bureau is the insurers' association in FYRM.

A new insurance law in Montenegro was adopted at the end of 2006. Other regulations on MTPL insurance, bankruptcy and winding-up of insurance companies were introduced in 2007. Supervision of the insurance sector is implemented by an independent supervisory agency established in 2008. The National Bureau of Insurers, as the insurers; association, was established in 2007.

In the light of Kosovo's special status (under UN Resolution 1244), a specific legislation known as the Insurance Rules has been enacted. The insurance market is supervised by the Central Bank of the Republic of Kosovo. The Insurance Association of Kosovo (IAK) was founded in 2002.

### *4.2.3 Solvency Standards*

Regulators have set specific solvency standards in terms of solvency margin and minimal capital requirements so that insurers have a sufficient financial capacity. Most of these countries adapted their solvency standards to the EU directives. In the

EU, solvency standards were regulated for the first time in 1973 with the Directive of the European Economic Community on non-life insurance (73/239/EEC) and in 1979 on life insurance (79/267/EEC). Despite the fact that specified standards were not adequate, these rules remained unchanged for almost three decades. New standards, known as 'Solvency I', were established at the beginning of this century (directives 2002/13/EC on non-life insurance and 2002/83/EC on life insurance). Under these standards, the minimum guaranty fund was increased to EUR 2.0-3.0 million from EUR 0.2-1.4 million. The basis for the calculation of the solvency margin for non-life insurance was also increased to 18 percent of the premiums below EUR 50.0 million and to 16 percent for premiums exceeding EUR 35.0 million (previously it was EUR 10.0 million) or to 26 percent of the claims below EUR 35.0 millions and to 23 percent for claims above EUR 35.0 million (previously it was EUR 7.0 million). The higher amount of the two is the solvency margin. The latest solvency regulation, known as 'Solvency II', is more ambitious and it aims at making the solvency requirements more sensitive to insurer risk exposures. It is expected to be fully implemented in 2016. The solvency standards currently in force in these countries are listed in Table 1.

*4.2.4 Insurance penetration and density*

The best indicators of insurance market development level are insurance penetration and insurance density. A preliminary comparison of the total insurance premium data among countries is shown in Figure 2.

The SEE post-communist countries total premiums in 2010 were EUR 7,286 million, i.e. 0.68 percent of the total premiums in the EU. As the population of these countries accounts for 10.8 percent of the EU overall population, clearly there is a huge gap as compared to the EU market. The insurance markets of these countries had positive trends until 2009 when, as a consequence of the economic crisis, stagnation or decreases in premiums were reported. Romania had the most intensive premium growth over the last decade, but it was also affected by the highest decrease in premiums after 2009. In spite of the significant growth in premiums over the last decade, however, in all countries growth was expected to be sharper in view of their level of economic development and the changes implemented in their markets.

Insurance penetration – the share of insurance premiums in the total GDP – shows the role of insurance in the economy. In 2010, the average insurance penetration in these countries was 2.46 percent, pointing to a low level of insurance market development if compared with 8.55 percent at EU level. Additionally, as shown in Figure 3, except in Slovenia, insurance penetration in the other countries has not changed significantly in the past ten years.

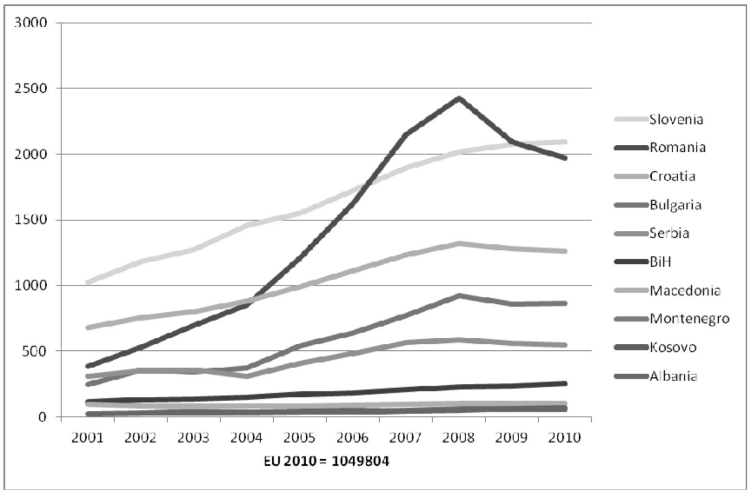
**Table 1.** Current solvency standards

| Country | Minimum capital requirements (in million EUR) | The basis for the solvency margin calculation |
|---|---|---|
| Bulgaria | 3.3 (for life insurance)<br>2.2 (only particular classes of non-life)<br>3.3 (for all classes of non-life)<br>3.3 (for reinsurance)<br>there are different limits if the company performs particular classes of non-life insurance | According to Solvency I and preparation for Solvency II |
| Slovenia | 3.0 (for life insurance)<br>2.0 (for non-life)<br>3.0 (additional limitation for some non-life insurance classes)<br>3.0 (for reinsurance) | |
| Croatia | 3.0 (for life insurance)<br>2.0 (only particular classes of non-life)<br>3.0 (for all classes of non-life)<br>3.0 (for reinsurance) | |
| Romania | 2.3 (for life insurance)<br>3.3 (for all classes of non-life) | |
| Serbia | 4.0 (for life insurance)<br>4.5 (for all classes of non-life)<br>4.5 (for reinsurance)<br>there are different limits if the company performs particular classes of non-life insurance | Under the first directives of the European Economic Community from the 1970s |
| Albania | 2.7 (for life insurance)<br>5.9 (for all classes of non-life)<br>4.4 (for reinsurance)<br>there are different limits if the company performs particular classes of non-life insurance | |
| FYRM | 3.0 (for life insurance)<br>2.0 (for non-life)<br>3.1 (additional limitation for particular non-life insurance classes)<br>4.5 (for reinsurance) | |
| BiH | 1.5 (for life insurance)<br>2.6 (for all classes of non-life)<br>1.5 (for reinsurance)<br>there are different limits if the company performs particular classes of non-life insurance | |
| Montenegro | 0.8 (for life insurance)<br>2.3 (for all classes of non-life)<br>2.0 (for reinsurance)<br>there are different limits if the company performs only particular classes of non-life insurance<br>5.1 for all classes | |
| Kosovo | 3.0 (for all classes of insurance) | The calculation is not adapted to EU directives (20 percent of minimum capital requirement) |

Note: Minimum capital requirements for countries are converted into EUR at the exchange rate of 7 December 2011

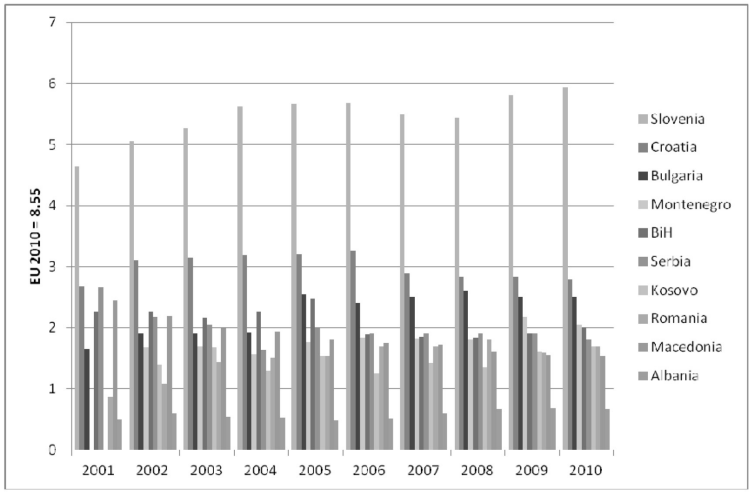
*Source:* National insurance laws and by-laws

**Figure 2.** Total premiums in the period 2001-2010 (EUR millions)




*Sources:* Compiled by the authors from official national insurance supervisory authority or insurance association reports

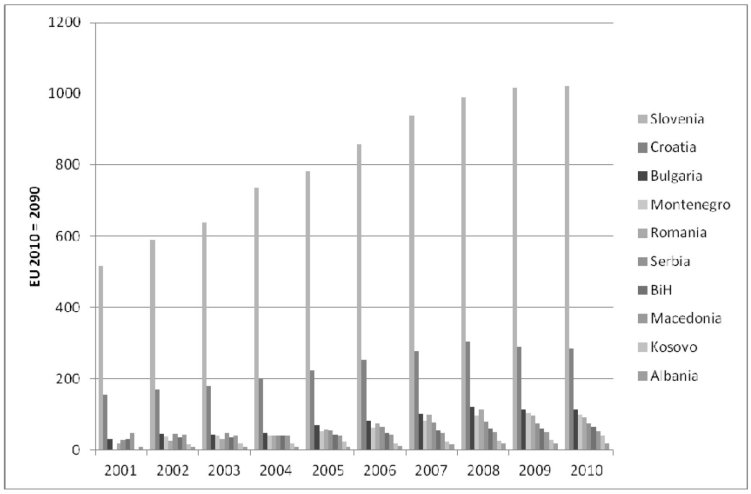
**Figure 3.** Insurance penetration in the period 2001-2010 (percent)




*Sources:* Compiled by the authors from official national insurance supervisory authority or insurance association reports

In 2010, the average insurance density –the amount of premiums per capita– in these countries was EUR 134.68. The fact that in the EU in 2010 the insurance density was EUR 2,090 shows that development is in a very critical phase. Trends in insurance density are reported in Figure 4. At the beginning of 2001, an extremely low level was reported. Except for Slovenia (EUR 1,022), Croatia (EUR 284) and Bulgaria (EUR 114), all other countries still have the features of poor markets with insurance density below EUR 100.

**Figure 4.** Insurance density in the period 2001-2010 (EUR)

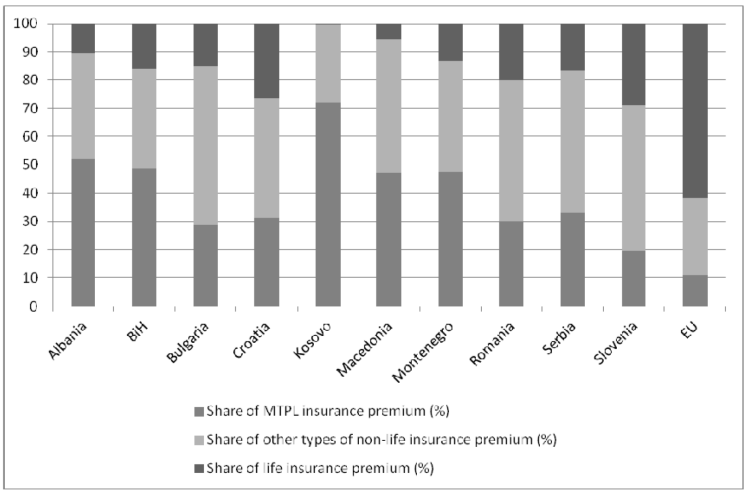



*Sources:* Compiled by the authors from official national insurance supervisory authority or insurance association reports

### *4.2.5 Shares of life and MTPL insurance*

In 2010, in these SEE countries, the average share of life insurance in the total premiums was 22.14 percent. In comparison with a share of 61.6 percent of life insurance at EU level, the absence of an insurance-oriented culture becomes clear. The low share of life insurance is the result of macroeconomic instability, consumer unfamiliarity with financial transactions, and a low level of specialisation in the available insurance products. As shown in Figure 5, Slovenia (28.8 percent) and Croatia (26.5 percent) are the only countries in the sample with a share of life insurance above 20 percent.

**Figure 5.** Shares of life and MTPL insurance in 2010 (percent)




*Sources:* Compiled by the authors from official national insurance supervisory authority or insurance association reports

Similarly, the shares of MTPL insurance in the total premiums confirmed the absence of an insurance-oriented culture. The dominant market share of compulsory MTPL insurance, with an average of 28.9 percent, shows a very low level of interest in voluntary non-life insurance products. In 2010, the share of MTPL insurance was extremely high in Kosovo, Albania, BiH, Montenegro and FYRM, with a peak exceeding 40 percent of the total market (Figure 5).

### *4.2.6 European integration efficiency*

European integration efficiency is the level of integration of the SEE post-communist countries into the EU. The level of European integration can be estimated on the basis of the official information provided by the EU on the monitoring of the progress made by candidate and potential candidate countries. A simple ranking of these SEE post-communist countries has been determined as reported in Table 3. This is necessary for later calculation of correlation coefficients. As Slovenia, Romania, Bulgaria and Croatia are already EU members, their integration process is already completed. Slovenia joined the EU in 2004 and it adopted the Euro in 2007 while Bulgaria and Romania became EU members in 2007. Croatia joined the EU more recently, in July 2013.

FYRM has been a candidate country for EU membership since the end of 2005, while Montenegro is a candidate country and applied for EU membership at the end of 2008 with the prospect of joining the EU in the medium term. Albania applied for

EU membership in 2009 and Serbia at the end of the same year. Both countries were potential candidates in 2010, with Albania being in the accession process for a longer time. For this reason in Table 3, Albania has a better ranking than Serbia in terms of integration level. However, in 2012 Serbia reached the status of candidate country, while Albania was recommended as a candidate country by the European Commission under the condition of complying with some final requirements. BiH is a potential candidate for EU membership. The country does not meet yet the political criteria, because of the lack of institutional stability and a weak political drive. Kosovo is a potential candidate for EU membership. However, the Copenhagen political criteria are far from being achieved in the light of the problems in international recognition and cooperation. Therefore, Kosovo ranks tenth in terms of European integration level (EU Commission, 2010).

## 5. Outcomes and discussion

After the previous analysis of insurance market development and market transition efficiency indicators, the relations between the insurance markets' development and the two following processes in the SEE post-communist countries:

- process of economic development of the national economies, and
- process of EU integration

have been investigated.

### *5.1 Relationship between the efficiency of transition of insurance markets and the level of economic development*

With the Spearman coefficient, the correlation between the efficiency of transition (development) of insurance markets and the level of economic development rank can be identified. Ranks for these countries are reported in Table 2. The economic development ranking is based on the GDP per capita (from Figure 1), while the transition of insurance markets is based on the six previously analyzed indicators of development.

### *5.2 Relationship between the efficiency of transition of insurance markets and efficiency in the European integration process*

The relationship between the transition efficiency of insurance markets and the level of EU integration is investigated in terms of correlation between the rank of countries in the EU integration process and each of the insurance market transition indicators, as reported in Table 3. The correlation coefficients show if the progress in the EU integration is expected to be followed by better results in insurance market development and vice versa, based on the indicators used for the analysis.

**Table 2.** Ranking correlation between GDP per capita and development of insurance market

| Country | Ranking | | | | | | |
|---|---|---|---|---|---|---|---|
| | GDP per capita | Legal and institutional environment | Solvency standards | Insurance penetration | Insurance density | Share of life insurance | Share of MTPL insurance |
| Slovenia | 1 | 1 | 2.5 | 1 | 1 | 1 | 1 |
| Croatia | 2 | 4 | 2.5 | 2 | 2 | 2 | 4.5 |
| Romania | 3 | 2.5 | 4 | 7.5 | 4.5 | 3 | 2.5 |
| Montenegro | 4 | 9 | 9 | 4.5 | 4.5 | 7 | 7 |
| Bulgaria | 5 | 2.5 | 1 | 3 | 3 | 6 | 2.5 |
| Serbia | 6 | 5 | 5 | 6 | 6 | 4 | 4.5 |
| FYRM | 7 | 8 | 7 | 9 | 8 | 9 | 7 |
| BiH | 8 | 6 | 8 | 4.5 | 7 | 5 | 7 |
| Albania | 9 | 7 | 6 | 10 | 10 | 8 | 9 |
| Kosovo | 10 | 10 | 10 | 7.5 | 9 | 10 | 10 |
| **Correlation** | **-** | **0.72** | **0.67** | **0.71** | **0.94** | **0.83** | **0.85** |

**Table 3.** Ranking correlation between level of integration into the EU and development of insurance markets

| Country | Ranking | | | | | | |
|---|---|---|---|---|---|---|---|
| | Level of integration to the EU | Legal and institutional environment | Solvency standards | Insurance penetration | Insurance density | Share of life insurance | Share of MTPL insurance |
| Slovenia | 1 | 1 | 2.5 | 1 | 1 | 1 | 1 |
| Bulgaria | 2.5 | 2.5 | 1 | 3 | 3 | 6 | 2.5 |
| Romania | 2.5 | 2.5 | 4 | 7.5 | 4.5 | 3 | 2.5 |
| Croatia | 4 | 4 | 2.5 | 2 | 2 | 2 | 4.5 |
| FYRM | 5 | 8 | 7 | 9 | 8 | 9 | 7 |
| Montenegro | 6 | 9 | 9 | 4.5 | 4.5 | 7 | 7 |
| Albania | 7 | 7 | 6 | 10 | 10 | 8 | 9 |
| Serbia | 8 | 5 | 5 | 6 | 6 | 4 | 4.5 |
| BiH | 9 | 6 | 8 | 4.5 | 7 | 5 | 7 |
| Kosovo | 10 | 10 | 10 | 7.5 | 9 | 10 | 10 |
| **Correlation** | **-** | **0.78** | **0.80** | **0.47** | **0.77** | **0.60** | **0.84** |

### *5.3 Main findings*

Results from Table 2 and Table 3 are summarized in Table 4, showing relationships between these processes. Values of the Spearman coefficients show a very strong correlation between the two ranking comparisons, transition of insurance markets and the level of economic development as well as between the transition of insurance markets and the level of EU integration. Table 4 points out that some aspects of the transition of insurance markets (insurance penetration, insurance density and shares of life insurance) tend to depend on the level of economic development, while other aspects (legal and institutional framework as well as solvency standards) tend to depend more on the level of EU integration. The main reasons for the very low level of insurance market development and their relationship with the two previously mentioned processes may be explained as follows.

**Table 4.** Comparison between ranking correlation coefficients for GDP per capita and level of integration into the EU

| | Legal and institutional environment | Solvency standards | Insurance penetration | Insurance density | Share of life insurance | Share of MTPL insurance |
|---|---|---|---|---|---|---|
| GDP per capita | 0.72 | 0.67 | 0.71 | 0.94 | 0.83 | 0.85 |
| Level of integration to the EU | 0.78 | 0.80 | 0.47 | 0.77 | 0.60 | 0.84 |
| Difference | **-0.06** | **-0.13** | **0.24** | **0.17** | **0.23** | **0.01** |

First, many problems remain with the supervision of the insurance sector. In general, insurers have inadequate tariffs for many types of insurance or, if the tariffs are indeed adequate, premium individualization is very popular on the market. Most countries do not have databases for proper actuarial calculations, because historical data series are not adequate or the market is very small. The existence of a large number of small insurers compounds the premium calculation and prevents any control of the supervisory authority over tariffs. Namely, according to official reports of supervisory authorities, there were 127 active insurance companies with less than three percent of the respective national insurance markets in 2010. Frequently, supervisory solvency control does not achieve its basic goal – i.e. early identification of insurers with an inadequate level of solvency. The delay with which supervisors respond to an insurer's solvency problem sometimes makes any actions ineffective. Therefore, significant efforts by supervisory authorities have to be made in order to establish well-regulated markets. Supervision provides the conditions for the efficient

operation of insurers, minimizing their insolvency risk through: capital requirements, technical reserves control and control over investment of reserves. Currently the implementation of all these three sectors of supervision is questionable and needs to be improved in several countries. Customer protection, aimed at increasing the level of confidence in insurers, is generally increasing. It is typically achieved by: the licensing of insurers, the licensing of intermediaries, giving approval on conditions for every type of insurance contract and controlling an insurer's transactions on the market. However, supervisory authorities generally have insufficient staff, they are insufficiently involved in the insurer operations control and sometimes they have problems in applying a transparent process to the withdrawal of licenses. Therefore, the implementation of new regulations is very difficult and it will be even more difficult in the future, when rules will have to be fully in line with the new EU standards (Solvency II).

Additionally, some insurance companies, with their unprofessional behavior, significantly hamper market development and the work of supervisors. Reinsurance policies are very often undefined, causing frequent insolvencies and delays in indemnification. As a result, the loss of confidence in the insurance sector is obvious. Too many insurers concentrating on relatively small and undeveloped markets keenly compete on insurance policy prices to conquer small market shares. Insurers are mostly focused on the basic products only, without investing in their differentiation or in new products. Compulsory MTPL insurance accounts for 28.9 percent of the region total premiums. A small share of life (22.1 percent) and other types of non-life products (49 percent) are the best indicators of the lack of insurance culture due to poor consumer familiarity with insurance functions and low sophistication of the insurance products offered. As these are average data for the region, the structure of the insurance products in some countries is drastically worse (Figure 5). Unfortunately, insurers and their associations seem unable either to stimulate the demand for insurance products or to actively promote education to ensure proper management. Educational programs have just started being offered by universities or market players, but the training of highly skilled staff, especially for actuarial jobs, takes some time. Additionally, unfair competition is widespread in many forms, such as pricing products below the required premium, the concealment of some unfavourable terms in insurance contracts, the assignment of unreasonable bonuses to the insured to retain their loyalty, preferences for some insurance brokers irrespective of any economic reasons, or the spreading of false information about competitors, etc. Unfair competition results in a low level of cooperation among insurers to solve the problems of the market, affecting the role of the associations in promoting market development as well as in negotiating with the regulators.

With the progress in the transition process, SEE post-communist countries have become aware of the important economic role of insurance and other risk management

techniques. In spite of this – as a consequence of a state-owned economy, a strong national social security system as well as a lack of education in risk management – pure industrial risks and personal risks are often not perceived. The property of many public companies is still almost unprotected from pure risks and personal risk management and insurance culture are also undeveloped.

Finally, countries at a late stage in the EU integration process still have many unsolved political problems which impose a huge burden on the development of their economies. Financial consolidation of many economic entities has slowed down and their insolvency has been increasing and exerting great pressure on the whole economy. High unemployment rates result in poor spending capacity of the population. The privatization process of the previously state-owned companies, which was ridden with irregularities, has slowed down, hampering the implementation of economic reforms. Foreign direct investments are not as intensive as governments expected. All these factors contribute to create a very adverse environment for insurance market development (Rüstmann, 2001). Additionally, poor and insufficiently regulated financial markets affect insurers' transactions, which have to focus strictly on a proper reserve funds investment. The change in the structure of the population with an increasing 'elderly population' shows that the reform of social insurance systems cannot be further delayed. The current global economic crisis involving several economic areas (banking, real estate, car sales, industrial production, etc.) also slowed down insurance sector development. Life insurance premiums fell as a consequence of a lower consumer income, an increased unemployment rate and pessimistic expectations of future financial stability. The insurance sector in the SEE markets stagnated during 2008 and 2009. Data for 2010 show some first signs of recovery and, hopefully, this trend will be more evident in the long term.

## 6. Conclusion

The European integration process is one of the most important political and economic issues for SEE post-communist countries. This analysis shows that the more integrated with the EU the countries are, the more developed their insurance markets are. An expected higher level of EU integration in the future will result in an enhanced competitiveness and a wider availability of insurance products. As the establishment of a single EU insurance market offers insurers the opportunity to sell their products in the whole of the EU region, SEE post-communist markets offer good growth opportunities for Western insurers, some of which are already active in the region. On the other hand, domestic insurers are not yet competitive enough in the old EU members' markets.

Social insurance systems still play a dominant role in SEE post-communist countries. Industrialized countries have already reformed such systems years ago, as they were aware that they were not sustainable because of the demographic trends. The

SEE region, with its poor economies and high unemployment rates, had no alternative but to start with the reforms. However, the process is rather slow. The pension system reforms are generally based on the introduction of three pillars, where the development of the second (fully funded plans with defined contributions) and the third (voluntary private funded plans, savings plans, life insurance, etc.) pillars requires important legal preconditions. On the other hand, the low standard of living and undeveloped financial markets make the transition to the new pension scheme very slow and difficult, even if the level of pensions provided by the existing system forces people to save additional funds for their retirement. That represents an opportunity for the development of new life insurance products. Additionally, in most SEE countries health insurance systems inherited from the past are characterized by a wide range of benefits, but with a poor quality of service. Problems with inefficiency and irregularities of the existing state health insurance already require the development of a private health insurance system. Of course, many legal and institutional barriers have to be removed to support voluntary health insurance and private providers of health services.

At the same time, as changes in pension and health insurance systems increase people's awareness of the importance of personal risk management, companies start perceiving the importance of risk management and insurance products in the sector of personal as well as property and liability risks. Education in risk management contributes to the development of the insurance culture and it is becoming common in formal education and in universities. Many higher education institutions offer specialized programs in risk management, insurance and actuarial sciences, ensuring training also for actuarial profiles. Insurers, for which the skills of their employees are one of their main sources of competitive advantage, offer training programs to train their staff to provide high quality service and to assist clients in managing risks. Insurers' associations must play a very active role in training, as they have an interest in providing more regulations of insurers, increasing the level of confidence in the sector. This is particularly necessary considering the fact that there are so many small insurers operating in the markets.

During the transition period, important changes have been implemented to create a proper regulatory environment for insurance companies. The capacity of the supervisory authorities is improving, but they are not strong enough to fully implement all the EU Directives. Therefore, SEE post-communist countries still have different capital adequacy requirements, reflecting the specific conditions of their markets and the financial potential of their companies. Some projects have been implemented, with the support of the European Commission, in financial sector regulation development, with the insurance sector as a special area of interest. Solvency II, the new regulatory framework, is a new challenge for the insurance market, but unfortunately only a few countries of the SEE region are seriously preparing for it.

The process of integration of SEE post-communist countries into the EU is not completed and it will be a core political and economical issue for these countries in the coming years. On the other hand, the insurance markets of these countries are still in transition and their expansion is expected. While this research is focused on the end of the first decade of this century, the relationships between these two processes as well as trends of correlation coefficients will still be interesting fields of research in the coming years. However, some additional assumptions have to be taken into consideration. Namely, as this research confirmed, SEE is a region of "two speeds" with Slovenia leading the region and BiH and Kosovo, as countries that suffered from war, lagging behind. Future research should also be focused on the application of the new Solvency II regime to insurance markets of SEE countries as well as the consequences of the recent economic crisis, like Panagiotou (2013) and Schich (2010) explained.

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# DEPOSIT INSURANCE IN TIMES OF FINANCIAL CRISIS

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**Abstract**
The role of deposit insurance and the design features of deposit insurance systems are undergoing important changes in light of the 2008/9 global crisis. Changes were made in order to restore the public confidence in the banking system, stop widespread bank runs during the crisis and increase the stability of the financial system. The purpose of this paper is to present the changes in deposit insurance around the world as a result of the financial crisis of 2008. Three main changes will be observed: the raising of the maximum level of deposit insurance coverage, the elimination of coinsurance and changes in the speed of depositor's payout. Effects of these changes will be analyzed, and special emphasis will be laid on the deposit insurance system of the Republic of Macedonia.
The changes in deposit insurance can affect the moral hazard problem, the premium assessment base and the potential financial commitment of the deposit insurance institution. Changes in the deposit insurance regulations of the Republic of Macedonia did not affect the premium assessment base, but the potential financial obligation of the deposit insurance institution was increased. Regarding the moral hazard problem mitigation, Deposit Insurance Fund - Skopje should consider risk-based premium introduction.

**JEL Classification:** G01, G20, G21
**Keywords:** Financial Crisis, Deposit Insurance, Financial Stability

**Any reference to the Republic of Macedonia refers to the Former Yugoslav Republic of Macedonia (FYROM), which is officially the name for the country accepted by the United Nations.**

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## Introduction

A deposit insurance system (DIS) refers to the set of specific functions (whether performed by a dedicated legal entity or not) inherent in providing protection to bank depositors, and their relationship with other financial system safety net participants to support financial stability[1]. An effective DIS is an important pillar of the financial safety net and plays a key role in contributing to the stability of the financial system and protection of depositors (Financial Stability Board, 2012).

The role of deposit insurance and deposit protection is undergoing important changes in light of the 2008/9 global crisis. Assumptions about the role of deposit protection in maintaining financial stability have evolved and its role in the safety net has been clarified and strengthened. The main purpose of deposit insurance, as a part of the global financial stability framework, before the crisis, was protection of the small depositor, who doesn't understand and monitor the risk taken by the financial institutions. After the crisis, maintaining and strengthening the stability of the financial system was set as the primary goal of the deposit insurance and protection of the small depositor as secondary (Bernet and Walter, 2009).

The crisis resulted in greater convergence in practices across jurisdictions and an emerging consensus about appropriate features of the deposit insurance system. These include higher (and in case of the EU, more harmonized) coverage levels; the elimination of coinsurance; the adoption of ex-ante funding by more jurisdictions; and the strengthening of information sharing and coordination with other safety net participants. The mandates of deposit insurers also evolved, with more of them assuming responsibilities beyond a pay-box function to include involvement in the resolution process.

The purpose of this paper is to present the changes in deposit insurance in various countries of the world as a result of the financial crisis of 2008. Three main changes will be observed: the raising of the maximum level of deposit insurance coverage, the elimination of coinsurance and changes in the speed of depositors' payout. Effects of these changes will be analyzed, and special emphasis will be laid on the deposit insurance system of the Republic of Macedonia.

## Raising the maximum level of coverage

The crisis revealed the importance of effective deposit insurance as a key element of the global financial stability framework. A loss of confidence was observed during the crisis. In response to this anxiety, some authorities increased the coverage of their

1. A financial safety net typically consists of prudential regulation and supervision, emergency lender of last resort, problem bank insolvency frameworks, and deposit insurance. In many jurisdictions, a department of the government (e.g. ministry of finance or treasury) is also included in the safety net.

deposit insurance scheme or even provided an explicit deposit blanket guarantee. The adoption of higher deposit insurance coverage level was made in order to prevent the transmission of panic from debt investors to depositors. The increase of deposit insurance coverage helped restore public confidence in the banking system, stopped widespread bank runs during the crisis and increased the stability of the financial systems.

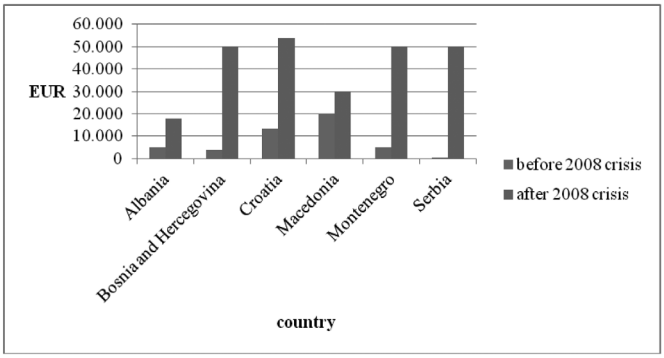
Before the crisis the minimum deposit insurance coverage level in EU was set at EUR 20,000 (Directive 94/19/EC). In 2009, with the new Directive 2009/14/EC, amending Directive 94/19/EC, the coverage level – the previous provision on the minimum coverage limit (EUR 20,000) was replaced by the following limits:

- By June 30th 2009, the EU member states shall ensure that the coverage of the aggregate deposits of each deposit shall be at least EUR 50,000 in the event of deposits being unavailable;
- By December 31st 2010, the EU member states shall ensure that the coverage of the aggregate deposits of each deposit shall be at EUR 100,000 in the event of deposits being unavailable.

The EU countries have adjusted the coverage level with the new directive and four EU countries (Denmark, Austria, Slovakia and Slovenia) have even set unlimited deposit insurance coverage (European Commission, 2011).

In the United States, the maximum amount of insurance coverage was raised (temporarily) from USD 100,000 to USD 250,000 in October 2008. In the same period Australia and New Zealand have introduced explicit deposit insurance schemes with unlimited deposit insurance coverage and deposit insurance coverage of NZD 1,000,000 respectively (Schich, 2008).

**Chart 1: Deposit insurance coverage before and after 2008 crisis[2]**




*Source*: Author

2. The data on deposit insurance coverage have been collected from the web sites of the national institutions for deposit insurance of the selected countries and the national laws on deposit insurance.

Chart No 1 shows changes in deposit insurance coverage in the countries in the region as a result of the 2008 financial crisis. All the countries presented in the chart (except for Albania and Macedonia) have increased their deposit insurance coverage to a maximum of 50,000 EUR. The increase was made not only for the purpose of restoring public confidence in the banking system, but also for adjusting the national regulations with the EU regulations, since all these countries are aspirants for EU membership.

Deposit insurance coverage in Republic of Macedonia before the increase of December 2010, was EUR 20,000 i.e. it was adjusted to the demands of EU Directive 94/19/EC. The crisis did not directly affect the stability of the Macedonian financial system, no deposit withdrawal was detected, and the deposits of the physical persons even had a permanent growth during the crisis years. But still the deposit insurance coverage was increased to EUR 30,000 and that increase was a step forward to adjusting the Macedonian regulations on deposit insurance with the new EU Directive 2009/14/EC. The changes in the Law on Deposit Insurance Fund with article 22 provide for full compliance with EU Directive 2009/14/EC regarding the insurance coverage from the date of the accession of the Republic of Macedonia to the European Union.

Three basic problems can occur from the increase of deposit insurance coverage:

1) High deposit insurance coverage can initiate moral hazard;
2) Increase of the deposit insurance coverage can increase the premium assessment base;
3) Increase of the deposit insurance coverage can increase the potential financial commitment of the deposit insurance institution.

Moral hazard refers to the fact that if people don't have to face consequences, they tend to take on more risk than they should (Sit, 2007). Increase of the deposit insurance coverage can give rise to moral hazard both on the part of depositors, who may reduce their monitoring and "policing" efforts, as well as on the part of banks, which may perceive a lessening of the threat of market discipline. Therefore deposit insurance coverage level should be capable of preserving market discipline and minimize the problem of moral hazard.

One of the criteria used for evaluating the level of coverage is the amount of deposits or number of depositors that it covers. In theory, a limit that covers at least 80 percent of depositors and 20 percent of deposits is generally considered adequate. Another criterion is the value of the deposit insurance coverage as a proportion of GDP per capita. IMF suggests that deposit insurance coverage should vary from 1 to 2 GDP per capita (Garcia, 1999).

The ratio of coverage level to per capita GDP among the countries of the world has significantly changed since the 2008 crisis. Before the crisis the average ratio for Europe was 1.4 and since the crisis it has risen to 4.8. In the Asia/Pacific region the

average ratio before the crisis was 2.2, and since the crisis has risen to 26.8. The ratio of coverage level to per capita GDP in USA has risen as well from 2.1 before the crisis to 5.4 after the crisis (Hoelscher, 2011). The value of this ratio in the Republic of Macedonia is much higher than the European average. In 2009 it was 6.1, and since the increase in 2010 the value of this ratio has risen to 8.7[3].

Regarding the deposits that it covers, deposit insurance coverage of the Republic of Macedonia, even before the increase of 2010, has covered around 99 percent of the deposits (Gosev, 2008).The increase in EU coverage to EUR 100,000 will effectively cover over 98 percent of all depositors and 60 percent of the value of deposits. Many of the newer EU members with relatively small financial systems will have 100 percent deposit coverage for all depositors. The US made the temporary USD 250,000 limit permanent and will fully cover 99.8 percent of depositors and 78 percent of the value of deposits. These post-crisis levels of protection are significantly higher than the often-cited 80/20 "rule of thumb" used prior to the crisis (Hoelscher, 2011).

The financial crisis has led to a re-evaluation of the methodology for determining appropriate coverage levels. Since the crisis, the role of deposit insurance in promoting financial stability has taken precedence over concerns about contributing to moral hazard. In the midst of a crisis, one should not be overly concerned with moral hazard. Restoring the depositors' confidence should be the first priority.

Although a high coverage level reduces the incentives for depositors to run, adequate controls are needed to ensure a proper balance between financial stability and market discipline. National authorities that have not done so should consider adopting compensatory measures that are commensurate to the level of coverage in order to mitigate the risk of moral hazard. Such measures could include, for example, more intensive supervision, the introduction of risk-based premiums, the exclusion of certain categories of deposits from coverage (e.g. deposits held by more sophisticated depositors such as financial institutions), and timely intervention and resolution by deposit insurers or other safety net participants. The IADI and other relevant bodies should provide more guidance on the types of instruments and good practices that can help mitigate moral hazard (Financial Stability Board, 2012).

Another consequence of the deposit insurance coverage increase, mentioned above, is an increase in the extent of the premium assessment base. The premium assessment base is the foundation used to determine the contributions made to the deposit insurance fund by member institutions. The most common assessment bases are insured, insurable and total deposits.

Insurable deposits are defined as all deposits in all categories that are insured, including amounts in excess of the limit on insurance claims. For example if the

3. The data for GDP per capita for 2009 and 2010 used for ratios calculation are available at http://www.finance.gov.mk/files/u9/MKindikatori_Septemvri_2012_3.pdf .

insured limit for a demand deposit is USD 50,000 a USD 90,000 deposit would be fully counted in insurable deposits, but only USD 50,000 would be included in insured deposits. Insured deposits are the amount of deposits that are protected within the limit of insurance claims. Calculating premiums on the basis of insurable deposits means that premium would be charged on deposits which are not covered. Total deposits would accentuate this issue, since some categories of deposits may not be covered at all (IADI, 2009).

An increase of the deposit insurance coverage limit will have an effect on the premium assessment base only in cases when insured deposits are used as a base for premium calculation. Where deposit insurance premium is calculated on insurable or total deposits, higher deposit insurance coverage will not increase contribution to the deposit insurance fund by member institutions i.e. deposit insurance costs of the financial institutions will stay the same.

The European Commission has estimated the impact on EU banks that the increase in deposit insurance coverage level will have. The estimation scenario results indicate that the average percentage decrease of banks' operating profits at EU level is 4 percentage points when the level of coverage is set at EUR 100,000 (European Commission, 2011). The deposit insurance system of the Republic of Macedonia uses insurable deposits as a base for premium calculation, so the increase in deposit insurance coverage will have no effect on the banks' contribution.

Another consequence of the deposit insurance coverage increase, mentioned above, is increase in the potential financial commitment of the deposit insurance institution. The increase in deposit insurance coverage will lead to an increase in the amount of deposits that are covered with insurance. An estimation made by the European Commission about the effects of the increase in deposit insurance coverage in the EU to EUR 100,000 indicates that it increases the amount of covered deposits to 17.5 percent. The average increase for the EU 12 is 48.8 percent, and the average increase for the EU 15 is 17.5 percent (European Commission, 2011).

The potential financial obligation of the deposit insurance institution for depositors' reimbursement will rise with the increase in the amount of covered deposits. Re-evaluation of the adequacy of the deposit insurance fund will be needed, especially in deposit insurance systems where the increase in the amount of covered deposits is significant. Maybe there will be a need for changes in the funding mechanism, including additional sources of funding etc.

Around 99 percent of the deposits in the Republic of Macedonia were covered by insurance before the increase in the deposit insurance coverage (Gosev, 2008). Changes in the deposit insurance coverage will lead to an insignificant increase in the potential financial obligation of Deposit Insurance Fund Skopje.

**Elimination of co-insurance**

With the co-insurance arrangements there is full protection of the depositors up to a certain ceiling, beyond which (excessive) deposits are subject to co-insurance, requiring the depositor to bear part of the cost in case of a banking failure (Schich, 2008).While there is no co-insurance in the USA, in the EU, the original Directive 94/19/EC stipulated that the member states may decide that depositors should bear a certain percentage of losses themselves in case of a bank failure. According to its provision, the member states might limit the coverage level to a specified percentage of deposits, which had to be equal to or exceed 90% of aggregate deposits until the amount to be paid under the guarantee reached the minimum coverage limit (i.e. EUR 20,000). In other words, the directive allowed for 10% co-insurance, i.e. the EU member states which had decided to apply 10% co-insurance had to set the minimum coverage limit at EUR 22,222 in order to reach the minimum required level is EUR 20,000.

In practice, prior to the outbreak of financial turmoil in 2008, co-insurance was applied to deposits of individual customers in 12 countries of the EU – mostly in the new member states (Cyprus, Czech Republic, Estonia, Hungary, Lithuania, Malta, Poland, Slovakia), but in a few old ones as well (Germany, Ireland, Netherlands, United Kingdom). There was mostly coinsurance of 10 percent. In some cases, deposits not exceeding the coverage limit were insured at 90 percent, while in other cases – in order to protect small depositors – deposits were insured partly at 100percent and partly at 90 percent (e.g. in Poland, it was 100 percent for amounts up to EUR 1,000, and 90 percent for amounts between EUR 1,000 and EUR 22,500) (Szelag, 2009).

The deposit insurance system of the Republic of Macedonia has applied coinsurance of 10 percent till 2010. The deposits with amounts up to EUR 10,000 were 100 percent covered by insurance, and deposits with amounts between EUR 10,000 and EUR 20,000 were only 90 percent covered by insurance. With amendment of the Law on the Deposit Insurance Fund of 2010, the coinsurance was excluded.

The EU has excluded the coinsurance arrangement with Directive 2009/14/EC. The coinsurance was excluded in order to strengthen public confidence in the banking system. If people are not convinced that their money deposited in a bank is fully safe, they will be more ready to withdraw this money (to prevent it from being lost) at the first whispers of bank troubles – even if they are not necessarily true (or they are just rumours). And a bank run might involve another bank run, and such a contagion effect could threaten the stability of the entire banking system (Szelag, 2009).

Two basic problems may appear with the elimination of coinsurance:

1) The elimination of co-insurance may increase the moral hazard problem;
2) The elimination of co-insurance will increase the potential financial commitment of the deposit insurance institution.

The method of co-insurance aims to reduce moral hazard risk on the part of depositors and banks. If depositors expected full compensation for losses, then they too would no longer need to consider the risk associated with the particular banks in which they placed their money. This, in turn, would have serious and potentially damaging consequences for the whole banking system as it would favor institutions which, for example, offered unrealistically high rates of interest, at the expense of more prudent ones. And it would encourage managers who wanted to attract deposits to adopt riskier strategies.

Although using co-insurance to encourage consumers to invest their savings in healthy institutions was attractive in theory, its effect in practice was not as expected. On the other side, since the crisis, the role of deposit insurance in promoting financial stability has taken precedence over concerns about contributing to moral hazard. Therefore abandoning co-insurance in order to restore public confidence is considered as necessary and justified.

The elimination of co-insurance will increase the potential financial commitment of the deposit insurance institution for the amount of costs that was previously borne by the depositors in case of a bank failure. Because the co-insurance in the deposit insurance system of the Republic of Macedonia was 10 percent and it was applied only to deposits between EUR 10,000 and EUR 20,000, the potential financial obligation of the deposit insurance institution will be increased less than 10 percent. The average potential financial obligation of deposit insurance funds in the EU will not be significantly increased due to co-insurance elimination, because co-insurance was not applied in each country and it was not higher than 10 percent.

**Changes in payout speed**

The crisis pointed to the importance of quickly re-assuring depositors about access to their funds. Payout delays, particularly in a crisis, created incentives for preemptive runs by depositors. The slowness of payout is one of the major factors which could contribute to undermining depositors' confidence. In reviewing design features of deposit insurance systems, many countries have focused on the payout period. It was considered that the previously acceptable payout periods were unlikely to be sufficient.

With regard to the speed of payout, there is a substantial difference between the US and the EU. In the US, the reimbursement is near immediate, i.e. maximum a few days after a bank/thrift failure; usually, most depositors are reimbursed within 1-2 business days after the closure of the failed institution (Szelag, 2009). On the other hand, EU Directive 94/19/EC stipulated that the deposit guarantee schemes in the EU –after making a determination by the competent authorities (within maximum 3 weeks) that a given credit institution had failed to repay deposits which were due and payable– should have been able to pay duly verified claims by depositors

in respect of unavailable deposits within 3 months. In exceptional circumstances, a deposit guarantee scheme might apply for an extension of the above time limit. The competent authorities might allow for no more than two further extensions of 3 months each. That means that maximum payout period allowed by Directive 94/19/EC was 9 or almost 10 months.

With the new Directive 2009/14/EC European Commission has made changes in the payout period and the new payout period was set according to the following rule: 5+20+10 working days, i.e. (Szelag, 2009):

- Competent authorities shall make determination at the latest 5 working days after first becoming satisfied that a credit institution has failed to repay deposits which are due and payable;
- Deposit guarantee schemes shall be in a position to pay duly verified claims by depositors in respect of unavailable deposits within 20 working days of the date above determination;
- In exceptional circumstances, a deposit guarantee scheme may apply to the competent authorities for an extension of the time limit, which may not exceed 10 working days.

The deposit insurance regulation of the Republic of Macedonia, regarding the period for depositors' reimbursement, fully complied with Directive 94/19/EC, and since 2010 has complied with the new Directive 2009/14/EC. There is only exception for the period required for making determination for the activity of the credit institution by the competent authorities.

Shortening the payout period requires additional reforms in deposit insurance systems. Adequate payout arrangements – such as early information access, robust information technology infrastructure, sufficient staff resources or engagement of outside agents – have to be put in place to handle depositors' reimbursement. Changes are required in the funding mechanism as well. Secondary funding sources can help ensure the deposit insurer meets its funding needs. In contrast, unclear or informal standby arrangements that may require additional approval before draw-down could jeopardize the speed of handling a depositors' payout or bank resolution and impede the effectiveness of the deposit insurance system in maintaining financial stability.

Changes in the deposit insurance system, that a fast payout requires, entail potential financial costs for banks and consumers. The European Commission has made estimation of those costs, focusing on costs for tagging deposits, data cleansing and the creation of Single Customer View (SCV)[4]. The estimation indicates that the costs would decrease banks' operating profits in the EU by around 1 percent. From the consumers' point of view, average decrease in the interest rate would be around 0.02 percentage points (European Commission, 2011).

4. SCV is defined as a single, consistent view of an eligible claimant's aggregate protected deposits.

## Conclusion

The role of deposit insurance and the design features of deposit insurance systems are undergoing important changes in the aftermath of the 2008/9 global crisis. Changes were made in order to restore public confidence in the banking system, stop widespread bank runs during the crisis and increase the stability of the financial system. In addition to fulfilling the purpose they were introduced for, the changes can have other effects as well. This paper endeavors to identify the other potential effects, to analyze them and to give recommendations for the purpose of easier system adjustment and negative effects minimization. For the sake of greater paper articulacy, effects of every particular change have been identified and analyzed in particular previous chapters and this chapter gives a summary of the concluding remarks from the overall analysis.

Increase in deposit insurance coverage can initiate moral hazard, increase the premium assessment base and increase the potential financial commitment of the deposit insurance institution. Elimination of co-insurance can have the same effects as the increasing of deposit insurance coverage apart from the effect on the premium assessment base. Shortening the payout period requires additional reforms in deposit insurance systems which will entail potential financial costs for banks and consumers.

Since the crisis, the role of deposit insurance in promoting financial stability has taken precedence over concerns about contributing to moral hazard. Because the increasing of deposit insurance coverage and elimination of co-insurance play an important role in reducing the depositors' incentive to run, the moral hazard problem should be mitigated with other compensatory measures, such as more intensive supervision, introduction of risk-based premiums, exclusion of certain categories of deposits from coverage and timely intervention and resolution by deposit insurers and other safety net participants.

The deposit insurance premium assessment base will be increased with the increase of deposit insurance coverage in systems where insured deposits are used as premium calculation base. Where deposit insurance premium is calculated on insurable or total deposits, higher deposit insurance coverage will not increase contribution to the deposit insurance fund by member institutions i.e. deposit insurance costs of the financial institutions will stay the same.

The potential financial commitment of the deposit insurance institution will rise with the increase in the amount of deposits that are covered by insurance and for the amount of costs that was previously borne by the depositors in case of a bank failure. This will require re-evaluation of the adequacy of the deposit insurance fund, especially in deposit insurance systems where the increase in the amount of covered deposits is significant. Maybe there will be a need for changes in the funding mechanism, including additional sources of funding etc.

Reduction of the payout delay will require adequate payout arrangements – such as early information access, robust information technology infrastructure and sufficient staff resources or engagement of outside agents. Changes are required in the funding mechanism as well. Secondary funding sources can help ensure the deposit insurer meets its funding needs.

Increasing of the deposit insurance coverage of the Republic of Macedonia did not increase the premium assessment base because the deposit insurance premium is calculated on the base of insurable deposits. The potential financial commitment of the Deposit Insurance Fund Skopje was insignificantly increased because even before the increasing of the deposit insurance coverage the deposits were around 99 percent covered by insurance. On the other hand, potential financial obligation of the deposit insurance institution due to co-insurance elimination should have been increased less than 10 percent. With regards to the moral hazard problem, the deposit insurance system of the Republic of Macedonia has integrated compensatory elements for moral hazard mitigation. Introduction of risk-based premium should be considered as a step forward in mitigating the moral hazard.

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# USING GRAVITY MODELS FOR THE EFFECTIVE DETERMINATION OF SOCIOECONOMIC LOCALITY: LOCAL LABOUR MARKETS IN CENTRAL MACEDONIA

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**Abstract**

The discussion about the effectiveness of active policy measures that consider spatial socioeconomic aspects has become especially important in light of recent socio-economic developments. The paper presents an alternative methodology for the determination of spatial boundaries for any socioeconomic locality, based on the gravity models tradition. We apply the described methodology to the Region of Central Macedonia and show that there are significant discontinuities between administrative spatial segregation on the one hand and socioeconomic on the other. The latter provides evidence for the inappropriateness of simply following the administrative boundaries and reveals the usefulness of our proposal.

**JEL Classification:** R12, R58, J68

**Keywords:** Spatial Socioeconomic Policy, Local Labour Market, Gravity Model

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## 1. Introduction

The use of administrative areas as geographical units does not provide a valid insight into the functional reality of the territory. Administrative boundaries are not necessarily appropriate, either for scientific research or for policy making (Casado-Diaz, 2000). Commonly, employment and housing networking does not coincide with existing administrative units. Local district boundaries usually have a historical background that does not automatically correspond to current links and relations. The development of new transport or social infrastructure or new retail, commercial, industrial, residential and leisure facilities continuously redefines the current spatial socioeconomic structure (Duncan, 2010). Moreover, Ballas and Clarke (2000) pointed out that the use of specialized geographic tools increases the efficiency of applied socioeconomic policy. Given the recent socio-economic developments within the systemic crisis, the scientific interest in active policy measures with respect to local socioeconomic aspects has been amplified. The main purpose of a spatial planning framework is to ensure that policies cover local socioeconomic needs, counteract regional inequalities and favour a more balanced regional economic development (Duncan, 2010)[1]. In other words, it is of great importance to develop methodologies that ensure an efficient determination of each socioeconomic locality. This is especially the case in planning and applying locally specified, active employment policies. Spatial dimensions contribute a lot to the understanding of the labour market and thereby to the development of well adjusted measures.

The gravity model has been one of the most popular empirical methodologies for studying spatial interactions in economics over the last fifty years (Cieślik, 2009 and Rose, 2000). It imitates Newton's law of universal gravitation (1687): the socioeconomic mass of two agglomerations (measured for instance by the population or by locally produced income) along with their distance determine the magnitude of their relations in terms of goods, services and production factors. Gravity models "*... are simple in structure, fit the data well, and are in principle consistent with a wide range of theoretical underpinnings*" (Deardorff, 1998) and they provide "*some of the clearest and most robust findings in empirical economics*" (Leamer E. & Levinsohn J.,1995).

The main purpose of this paper is to present an innovative methodology for the determination of spatial boundaries for any socioeconomic locality, based on the gravity models tradition. Thereby, we provide an instrument for a more efficient preparation of spatially oriented measures (see also in Zarotiadis and Stamboulis, 2011). As an

1. *"In my mind, direct links between the European Union and regional and local authorities are more needed than ever"* (Martin Schulz - President of the European Parliament, www. 11/03/2013 - Reuters.com).

indicative example, we apply the presented methodology to a specific Greek Region and we show that there are significant discontinuities regarding administrative spatial segregation on the one hand and the actual socioeconomic segregation on the other.

The next section presents the proposed normative algorithm for empirical regionalization. The third section deals with the pilot application in the Region of Central Macedonia. We present the results on a map, contrasted with the picture of administrative segmentation and we go into the main differences. To conclude, the last section summarises the discussion and comments on policy implications.

## 2. Algorithm for empirical regionalization

The algorithm we present provides the optimal spatial segregation of socioeconomic locality (for instance, as we will see in the pilot application, of local labour markets), based on the quantitative consideration of the socioeconomic mass of various agglomerations, the distance, administrative constraints, infrastructure as well as other socioeconomic parameters. It proceeds through the following steps:

i) Determine an elementary or augmented log-linear formulation of a gravity model:

$$ln(Mob_{i,j}) = ln(b) + a_1 ln(p_i) + a_2 ln(p_j) + a_3 ln(distance_{i,j}) + a_4 lnF + \varepsilon_{i,j} \quad (1)$$

where $Mob_{i,j}$ is a measure for the magnitude of the relation between any pair of considered agglomerations ($i,j = 1,2,...,N$, $i \neq j$ and $N$ is the number of considered agglomerations); $p_i$ and $p_j$ is the significance (the socioeconomic mass) of any agglomeration; $distance_{i,j}$ shows the distance between them; $F$ is a vector of various dummy variables representing the different physical, technical and administrative boundaries that exist between $i$ and $j$. (Note that $a_4$ is the vector of relevant coefficients.)

ii) Based on the estimated coefficients $b$, $a_1$, $a_2$, $a_3$ and $a_4$, calculate the estimated relation for each pair of considered agglomerations in the region of interest, $eMob_{i,j}$[2]. Construct the double entry matrix $A$:

$$A = \begin{matrix} 0 & eMob_{1,2} & .... & eMob_{1,v} & .... & eMob_{1,N} \\ eMob_{2,1} & 0 & .... & eMob_{2,v} & .... & eMob_{2,N} \\ eMob_{3,1} & eMob_{3,2} & 0. & eMob_{3,v} & .... & eMob_{3,N} \\ ..... & ..... & .... & 0 & .... & ..... \\ eMob_{\kappa,1} & eMob_{\kappa,2} & .... & eMob_{\kappa,v} & 0 & eMob_{\kappa,N} \\ .... & .... & .... & .... & .... & 0 \\ eMob_{N,1} & eMob_{N,2} & .... & eMob_{N,v} & .... & eMob_{N,N} \end{matrix}$$

2. There is a precondition for this step: the estimated equation has to be significant enough and unbiased. Otherwise, the usefulness of $eMob_{i,j}$ can be doubtful. There are no generally valid rules for having a significant, unbiased, estimated equation, depending on the type of data and the applied econometric model and method.

iii) Calculate the relative significance, $R_{i,j} \in (0,1)$, of each $eMob_{i,j}$ by dividing it by the sum of all $eMob_{i,j}$. For instance, if we measure $Mob_{i,j}$ by the number of employees that move from one agglomeration to the other (as we do in the pilot application we present below), $R_{i,j}$ represents the relative significance of the estimated mobility between i and j, related to the overall mobility in the wider area.
Construct the double entry matrix B:

$$B = \begin{array}{|cccccc|c|} \hline R_{1,1} & R_{1,2} & .... & R_{1,v} & .... & R_{1,N} & R_{1,\cdot} \\ R_{2,1} & R_{2,2} & .... & R_{2,v} & .... & R_{2,N} & R_{2,\cdot} \\ R_{3,1} & R_{3,2} & .... & R_{3,v} & .... & R_{3,N} & R_{3,\cdot} \\ ..... & ..... & .... & ..... & .... & ..... & .... \\ R_{\kappa,1} & R_{\kappa,2} & .... & R_{\kappa,v} & .... & R_{\kappa,N} & R_{\kappa,\cdot} \\ .... & .... & .... & .... & .... & .... & ... \\ R_{N,1} & R_{N,2} & ... & R_{N,v} & .... & R_{N,N} & R_{N,\cdot} \\ \hline R_{\cdot,1} & R_{\cdot,2} & ... & R_{\cdot,v} & ... & R_{\cdot,N} & \mathbf{1} \\ \hline \end{array}$$

iv) Calculate $eR_{i,j} = R_{\cdot,j} \; R_{i,\cdot}$.
$eR_{i,j}$ represents the indicative mobility between the two agglomerations $i$ and $j$. In a way, $eR_{i,j}$ stands for the mobility that would arise only due to the total relative repulsion of each departure city ($R_{i,\cdot}$) and the total relative attraction of each arrival city ($R_{\cdot,j}$), without having any additional reasons that give rise to an intensified dependence of $i$ and $j$. In other words, we treat the two variables (city of departure, city of arrival) as being independent.
Construct the double entry matrix C:

$$C = \begin{array}{cccccc} eR_{1,1} & eR_{1,2} & .... & eR_{1,v} & .... & eR_{1,N} \\ eR_{2,1} & eR_{2,2} & .... & eR_{2,v} & .... & eR_{2,N} \\ eR_{3,1} & eR_{3,2} & .... & eR_{3,v} & .... & eR_{3,N} \\ ..... & ..... & .... & ..... & .... & ..... \\ eR_{\kappa,1} & eR_{\kappa,2} & .... & eR_{\kappa,v} & .... & eR_{\kappa,N} \\ .... & .... & .... & .... & .... & .... \\ eR_{N,1} & eR_{N,2} & ... & eR_{N,v} & .... & eR_{N,N} \end{array}$$

v) Construct matrix $D = B - C$
If an element ($R_{i,j}$ - $eR_{i,j}$) of matrix $D$ is positive (negative), the interaction from departure agglomeration $i$ and arrival agglomeration $j$ is (not) gravitational. (The closer to one an element is, the more gravitational is the relation.)

From this point on, the following steps are provisional and may be adjusted according to the characteristics of the specific study. In general, we should proceed with the most appropriate form of clustering analysis. For instance, in the pilot application presented in the following section, we first picked out the most *intense* pairs of agglomerations (the

highest $R_{i,j}$ - $eR_{i,j}$). Note that at this point of the clustering procedure, we did not consider the biggest city of the specific Region (in terms of population). Thereafter, pairs were combined into groups by considering the strongest mutual gravitational interactions[3]. Next, we can also proceed with consolidating groups that were characterized by the higher number of mutual gravitational interactions. Finally, we include the biggest agglomeration (city) of the Region to the group that has the mightiest mean mutual gravitational interaction with this city.

## 3. A pilot application to the Region of Central Macedonia

The study we present in this part of the paper provides a good example of how we can use the described methodology. Moreover it shows what could be the resulting differentiations compared to the actual administrative segregation of the region, even when we do not use a very detailed analysis of agglomerations, as is the case, for reasons of simplicity, in the following.

We used data from the Greek Social Data Bank (GSDB) in the National Centre of Social Research (EKKE) on the mobility of employees between the municipalities (133) of the Region of Central Macedonia. As we mentioned before, for reasons of simplicity we restricted our sample to the agglomerations whose population is over 20,000 inhabitants: Alexandreia Imathias (AI), Aridaia (A), Edessa (E), Giannitsa (G), Katerini (Ka), Kilkis (Ki), Naousa (N), Serres (S), Thessaloniki (T) and Veroia (V). Additionally, we included also Irakleia Serron (IS), Litohoro (L), Poligiros (P) and Nea Moudania (NM) in order to have a more effective representation of the whole geographical area.

The Pearson-test showed that none of the various conceivable dummy variables (if the city is an administrative centre, existence of administrative border, if there is a main road connection or not) should be included in the model. Therefore, we formulated the following equation:

$$ln(Mob_{i,j}) = ln(b) + a_1 ln(p_i) + a_2 ln(p_j) + a_3 ln(distance_{i,j}) + \varepsilon_{i,j} \quad (2)$$

OLS regression gave the results presented in the following table[4]:
Estimated coefficients are significant and confirm the theoretical assumptions: as expected pair-wise labour mobility is being positively affected by the size of the two cities and negatively by their distance. $R^2$- and F-statistic, as well as the results of the regression specification error test, indicate that the model is well specified and provides a satisfactory explanatory ability.

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3. As a rule of thumb, at least half of the existing mutual relations had to be gravitational in order to allow the combination of two groups. The specific restriction was applied in order to ensure a minimum internal consistency.
4. We applied White-correction in order to remove heteroskedasticity. Estimation is free of multi-collinearity.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| **ln (distance$_{i,j}$)** | -2,71 | 0,19 | -13,95 | 0,00 |
| **ln ($p_i$)** | 1,15 | 0,06 | 20,27 | 0,00 |
| **ln ($p_j$)** | 1,12 | 0,04 | 25,78 | 0,00 |
| **Constant** | -10,35 | 1,22 | -8,47 | 0,00 |
| | | | | |
| **R-squared:** | 0,90 | **Mean dependent var:** | | 3,01 |
| **Adjusted R-squared:** | 0,89 | **S.D. dependent var:** | | 2,06 |
| **S.E. of regression:** | 0,68 | **Akaike info criterion:** | | 2,13 |
| **Sum squared resid:** | 27,85 | **Schwarz criterion:** | | 2,26 |
| **Log Likelihood:** | -64,19 | **Hannan-Quinn criterion:** | | 2,18 |
| **F-statistic:** | 173,04 | **Burbin-Watson statistic:** | | 1,69 |
| **Prob (F-statistc):** | 0,00 | | | |

Based on the above estimations, we constructed the four matrices of our methodology, following the procedures mentioned above:

**Table A.**

| | AI | A | V | G | E | IS | T | Ka | Ki | L | N | NM | P | S | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AI | 0 | 2 | 42 | 76 | 4 | 0 | 260 | 10 | 3 | 0 | 7 | 0 | 0 | 1 | 406 |
| A | 2 | 0 | 7 | 8 | 36 | 0 | 49 | 1 | 1 | 0 | 5 | 0 | 0 | 0 | 109 |
| V | 43 | 7 | 0 | 35 | 20 | 0 | 296 | 13 | 2 | 1 | 144 | 1 | 0 | 2 | 563 |
| G | 77 | 8 | 34 | 0 | 21 | 0 | 457 | 8 | 4 | 0 | 10 | 1 | 0 | 2 | 622 |
| E | 4 | 36 | 20 | 21 | 0 | 0 | 91 | 2 | 1 | 0 | 23 | 0 | 0 | 1 | 200 |
| IS | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 1 | 0 | 0 | 0 | 0 | 47 | 96 |
| T | 291 | 55 | 323 | 503 | 101 | 55 | 0 | 439 | 452 | 22 | 75 | 159 | 103 | 277 | 2853 |
| Ka | 11 | 1 | 13 | 8 | 2 | 0 | 405 | 0 | 2 | 30 | 3 | 1 | 0 | 2 | 478 |
| Ki | 3 | 1 | 2 | 4 | 1 | 1 | 407 | 2 | 0 | 0 | 0 | 1 | 0 | 6 | 428 |
| L | 0 | 0 | 1 | 0 | 0 | 0 | 19 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| N | 7 | 5 | 141 | 10 | 23 | 0 | 67 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 257 |
| NM | 0 | 0 | 1 | 1 | 0 | 0 | 141 | 1 | 1 | 0 | 0 | 0 | 9 | 1 | 155 |
| P | 0 | 0 | 0 | 0 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 100 |
| S | 1 | 1 | 2 | 2 | 1 | 49 | 255 | 2 | 7 | 0 | 1 | 1 | 0 | 0 | 322 |
| Sum | 439 | 116 | 585 | 667 | 210 | 106 | 2587 | 509 | 474 | 54 | 269 | 172 | 113 | 340 | 6639 |

**Table B.**

| | AI | A | V | G | E | IS | T | Ka | Ki | L | N | NM | P | S | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AI | 0,00 | 0,00 | 0,01 | 0,01 | 0,00 | 0,00 | 0,04 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,06 |
| A | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,02 |
| V | 0,01 | 0,00 | 0,00 | 0,01 | 0,00 | 0,00 | 0,04 | 0,00 | 0,00 | 0,00 | 0,02 | 0,00 | 0,00 | 0,00 | 0,08 |
| G | 0,01 | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,07 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,09 |
| E | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,03 |
| IS | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 | 0,01 |
| T | 0,04 | 0,01 | 0,05 | 0,08 | 0,02 | 0,01 | 0,00 | 0,07 | 0,07 | 0,00 | 0,01 | 0,02 | 0,02 | 0,04 | 0,43 |
| Ka | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,06 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,07 |
| Ki | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,06 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,06 |
| L | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 |
| N | 0,00 | 0,00 | 0,02 | 0,00 | 0,00 | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,04 |
| NM | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,02 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,02 |
| P | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,02 |
| S | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,01 | 0,04 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,00 | 0,05 |
| Sum | 0,07 | 0,02 | 0,09 | 0,10 | 0,03 | 0,02 | 0,39 | 0,08 | 0,07 | 0,01 | 0,04 | 0,03 | 0,02 | 0,05 | 1,00 |

**Table C.**

| | AI | A | V | G | E | IS | T | Ka | Ki | L | N | NM | P | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AI | 0,000 | 0,001 | 0,005 | 0,006 | 0,002 | 0,001 | 0,024 | 0,005 | 0,004 | 0,000 | 0,002 | 0,002 | 0,001 | 0,003 |
| A | 0,001 | 0,000 | 0,001 | 0,002 | 0,001 | 0,000 | 0,006 | 0,001 | 0,001 | 0,000 | 0,001 | 0,000 | 0,000 | 0,001 |
| V | 0,006 | 0,001 | 0,000 | 0,009 | 0,003 | 0,001 | 0,033 | 0,006 | 0,006 | 0,001 | 0,003 | 0,002 | 0,001 | 0,004 |
| G | 0,006 | 0,002 | 0,008 | 0,000 | 0,003 | 0,002 | 0,037 | 0,007 | 0,007 | 0,001 | 0,004 | 0,002 | 0,002 | 0,005 |
| E | 0,002 | 0,001 | 0,003 | 0,003 | 0,000 | 0,000 | 0,012 | 0,002 | 0,002 | 0,000 | 0,001 | 0,001 | 0,001 | 0,002 |
| IS | 0,001 | 0,000 | 0,001 | 0,001 | 0,000 | 0,000 | 0,006 | 0,001 | 0,001 | 0,000 | 0,001 | 0,000 | 0,000 | 0,001 |
| T | 0,028 | 0,007 | 0,038 | 0,043 | 0,014 | 0,007 | 0,000 | 0,033 | 0,031 | 0,003 | 0,017 | 0,011 | 0,007 | 0,022 |
| Ka | 0,005 | 0,001 | 0,006 | 0,007 | 0,002 | 0,001 | 0,028 | 0,000 | 0,005 | 0,001 | 0,003 | 0,002 | 0,001 | 0,004 |
| Ki | 0,004 | 0,001 | 0,006 | 0,006 | 0,002 | 0,001 | 0,025 | 0,005 | 0,000 | 0,001 | 0,003 | 0,002 | 0,001 | 0,003 |
| L | 0,000 | 0,000 | 0,001 | 0,001 | 0,000 | 0,000 | 0,003 | 0,001 | 0,001 | 0,000 | 0,000 | 0,000 | 0,000 | 0,000 |
| N | 0,003 | 0,001 | 0,003 | 0,004 | 0,001 | 0,001 | 0,015 | 0,003 | 0,003 | 0,000 | 0,000 | 0,001 | 0,001 | 0,002 |
| NM | 0,002 | 0,000 | 0,002 | 0,002 | 0,001 | 0,000 | 0,009 | 0,002 | 0,002 | 0,000 | 0,001 | 0,000 | 0,000 | 0,001 |
| P | 0,001 | 0,000 | 0,001 | 0,002 | 0,000 | 0,000 | 0,006 | 0,001 | 0,001 | 0,000 | 0,001 | 0,000 | 0,000 | 0,001 |
| S | 0,003 | 0,001 | 0,004 | 0,005 | 0,002 | 0,001 | 0,019 | 0,004 | 0,003 | 0,000 | 0,002 | 0,001 | 0,001 | 0,000 |

Based on the results of table D, we may proceed with the appropriate form of clustering analysis. In order to provide a complete pilot application of the proposed methodology, we first picked out the most *intense* pairs of agglomerations (the highest $R_{i,j}$ - $eR_{i,j}$) and we combined pairs into groups according to the mutual gravitational interaction. We also proceeded with consolidating groups, getting finally a picture which, despite the fact that that we restricted our sample to relatively big agglomerations, reveals significant differences compared to the current administrative structure. According to our estimates the prefecture of Thessaloniki and that of Kilkis should be treated as a single labour market. The same is true for Pella and Imathia –in fact they could also be included in the socioeconomic area formed around Thessaloniki. The prefectures of Serres, Pieria and Chalkidiki can be treated as separate markets.

**Table D.**

| | AI | A | V | G | E | IS | T | Ka | Ki | L | N | NM | P | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AI | 0,000 | -0,001 | 0,001 | 0,005 | -0,001 | -0,001 | 0,015 | -0,003 | -0,004 | -0,000 | -0,001 | -0,002 | -0,001 | -0,003 |
| A | -0,001 | 0,000 | -0,000 | -0,001 | 0,005 | -0,000 | 0,001 | -0,001 | -0,001 | -0,000 | 0,000 | -0,000 | -0,000 | -0,001 |
| V | 0,001 | -0,000 | 0,000 | -0,003 | 0,000 | -0,001 | 0,012 | -0,005 | -0,006 | -0,001 | 0,018 | -0,002 | -0,001 | -0,004 |
| G | 0,005 | -0,000 | -0,003 | 0,000 | 0,000 | -0,001 | 0,032 | -0,006 | -0,006 | -0,001 | -0,002 | -0,002 | -0,002 | -0,005 |
| E | -0,001 | 0,005 | 0,000 | 0,000 | 0,000 | -0,000 | 0,002 | -0,002 | -0,002 | -0,000 | 0,002 | -0,001 | -0,000 | -0,001 |
| IS | -0,001 | -0,000 | -0,001 | -0,001 | -0,000 | 0,000 | 0,002 | -0,001 | -0,001 | -0,000 | -0,001 | -0,000 | -0,000 | 0,006 |
| T | 0,015 | 0,001 | 0,011 | 0,033 | 0,002 | 0,001 | 0,000 | 0,033 | 0,037 | -0,000 | -0,006 | 0,013 | 0,008 | 0,020 |
| Ka | -0,003 | -0,001 | -0,004 | -0,006 | -0,002 | -0,001 | 0,033 | 0,000 | -0,005 | 0,004 | -0,002 | -0,002 | -0,001 | -0,003 |
| Ki | -0,004 | -0,001 | -0,005 | -0,006 | -0,002 | -0,001 | 0,036 | -0,005 | 0,000 | -0,001 | -0,003 | -0,002 | -0,001 | -0,002 |
| L | -0,000 | -0,000 | -0,000 | -0,001 | -0,000 | -0,000 | 0,000 | 0,004 | -0,001 | 0,000 | -0,000 | -0,000 | -0,000 | -0,000 |
| N | -0,002 | 0,000 | 0,018 | -0,002 | 0,002 | -0,001 | -0,005 | -0,003 | -0,003 | -0,000 | 0,000 | -0,001 | -0,001 | -0,002 |
| NM | -0,002 | -0,000 | -0,002 | -0,002 | -0,001 | -0,000 | 0,012 | -0,002 | -0,002 | -0,000 | -0,001 | 0,000 | 0,001 | -0,001 |
| P | -0,001 | -0,000 | -0,001 | -0,002 | -0,000 | -0,000 | 0,008 | -0,001 | -0,001 | -0,000 | -0,001 | 0,001 | 0,000 | -0,001 |
| S | -0,003 | -0,001 | -0,004 | -0,005 | -0,001 | 0,007 | 0,020 | -0,003 | -0,002 | -0,000 | -0,002 | -0,001 | -0,001 | 0,000 |

## 4. Conclusions

Administrative boundaries usually have a historical background that does not automatically correspond to current links and relations. Therefore, it is not necessarily the appropriate way to determine socioeconomic localities.

At the same time, the recent systemic crisis and the resulting deficiencies amplify the importance of spatially specified, active policies. Locally accustomed planning and applications are the most secure way to counteract regional inequalities and to favour a more balanced regional economic development. This is especially the case when we deal with active employment policies. Spatial dimensions contribute greatly to the understanding of the labour market and thereby to the development of well adjusted measures.

Consequently, it is of great importance to develop methodologies that ensure an efficient determination of each socioeconomic locality. This is exactly the contribution of the present paper: based on the tradition of the gravity model, we develop an innovative algorithm that considers current demographic data, various socioeconomic relations, measurable or not, spatial dimension and transport infrastructure, in order to provide an objective segregation of local economies and societies.

In the second part of the paper we proceed with a pilot application of the developed methodology using labour mobility data from the main cities in the region of Central Macedonia. Despite the fact that we use a less detailed analysis of agglomerations, excluding from our sample those that have less than 20,000 inhabitants, and although we lack similar applications that would provide us with a set of comparable estimates simplifying the decision upon the clustering analysis, the results of our methodology prove the existence of significant discontinuities between the socioeconomic and the administrative segregation of the area. This verifies the inappropriateness of simply

following the administrative boundaries and reveals the usefulness of our proposal. As far as optimal determination of socioeconomic locality is a prerequisite for effective planning, the developed methodology could be an important contribution for the enhancement of applied policies in the future.

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# THE TRADE BALANCE OF GREECE IN THE EURO ERA

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**Abstract**
The current article examines the trade balance of Greece in the Euro era, in general, and in particular within the Member States of the Euro Zone (EZ). It was found that in the Euro-era, the Greek trade balance has deteriorated in general and particularly within the Member States of the EZ, while losses in competitiveness of the Greek economy have been observed. The structure of production and foreign trade affect the trade deficit and competitiveness of the Greek economy. Moreover, the more rapid rates of inflation in Greece, compared with its trading partners, led to a revaluation of the real exchange rate in the country, affecting its export performance.

**JEL Classification:** F14
**Keywords:** Trade Balance, Greece, Euro Zone

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## 1. Introduction

According to the European Commission, although the degree of openness has been rising over the past 15 years, Greece remains a relatively closed economy. Based on the sum of exports and imports as a percentage of GDP, trade openness has increased significantly from around 43% of GDP in 1995 to almost 60% in 2008; however it still remains relatively low compared with the average of the Euro area as a whole (approximately 88% of GDP in 2008). This increase reflects an uneven development in exports and imports. It is linked to a strong and stable domestic demand and a steady decline in competitiveness (import penetration increased by 10 percentage points, from about 26% of GDP in 1995 to nearly 36% in 2008, while the share of total exports in GDP increased by approximately 7 percentage points from 17% to 24% over the same period). The growth of trade is not driven by increased integration of Greece into the Euro Zone. Although the Euro area remains the largest trading partner of the country, its share in total trade has declined. Trade in goods and services in the Euro area accounted for less than half of total trade in 2008, compared with nearly 58% in 1995. The real growth in exports of goods and services exceeded 10% on average over the period 1995-2000, it became temporarily negative in 2001 and 2002 (-40% on average) before retrieving a positive real growth of over 6 %, on average, between 2003 and 2008. Export growth was consistently lower than that of imports, mainly from the late 1990's onwards. The market share in exports showed a downward trend, falling from 0.22% in 1995 to 0.16% in 2002 and then stagnated at around 0.17% (European Commission, 2010, p. 68-73, 143).

The course of Greece's exports of goods as a percentage of GDP presents the following trend: in 1961, exports of goods were 8%, which is about as much as in 2004. In 1971, exports fell to 5.7%, in 1981 increased to 19%, whilst they declined to 11% in 1991 and 7.8% in 2004. The period of intensive growth in exports was that of 1973-1981, when the exports of goods increased almost ten-fold, showing an average annual growth of 34% in current prices. Until 2004, and while exports of goods show a small annual increase, they show a steady decline as a percentage of GDP. This downturn was reversed after 2004 showing a strong recovery in 2005, while it is estimated that as a percentage of GDP they amounted to 8.8% in 2006, contributing 1.04% to the growth of the economy in 2006 (Eurobank, 2008). In 2008 exports accounted for 7.2% of GDP, a figure which ranks Greece second lowest (26th) in the EU, followed by Cyprus (6.3%) (SEVE, 2009, p. 7, 18).

The trade balance of Greece in the Euro era, is the subject (focus) of this article. This article examines the exports, imports and the trade balance of Greece (2000-2008) in total, with the EU (27) and with third countries, particularly the Member States of the Euro Zone (EZ). Quantitative secondary data related to the specific time period are registered and analyzed. This period is selected for the reason that Greece joined the European Economic Monetary Union (EMU) on 1 January 2001

and since 1 January 2002 it has adopted the Euro as its official currency and because the consequences of the economic crisis for the Greek economy had not erupted at that time.

This article investigates the effects of foreign trade within the Member States of the Euro Zone, the shares of the Member States in exports, imports and trade balance, as well as the deficit, the sectoral composition of foreign trade and some of the factors affecting the trade balance deficit and the competitiveness of the Greek economy. The basic research questions are the following: Has the export performance of the country improved since the accession of Greece to the EZ, or not? Has the Greek trade balance worsened or not in general and in particular, within the Member States of the EZ? Were there any gains or losses in competitiveness for the Greek economy? In which degree, does the structure of production and foreign trade, such as inflation differentials, have an impact on the deficit in the trade balance and competitiveness of the Greek economy?

## 2. Literature Review

An examination of the effects of factor productivity on trade indicates that the argument of an open economy that promotes trade, which in turn helps to extend the boundaries of productivity, is highly correlated with the leader export economies. It is found that export labour-intensive industries are competitive, therefore the labour-intensive developing economies should move up the technological ladder, otherwise the increased competition could undermine their exports. In developing economies, the productivity of labour-intensive industries should be improved as exports are rising. The opening up of the economy through trade is a prerequisite in order to improve productivity, which is a necessary and sufficient condition for development. Otherwise, the competitive and comparative advantage of a labour-intensive export economy could be eroded. In industrialized economies, which have achieved a high technological level, national policies should focus on improved productivity and technology (Kui-Wai Li, Siegfried Bender, 2007, p. 141-143). Although as far as this process is concerned, progress has been made in the developed countries, of Northern Europe, it is proceeding slowly in the countries of the South and especially in Greece.

One of the factors that influence the extent of competition in a market is the relative openness of an economy. The extent of this factor influences the strengthening of competition and good practice dissemination, while it facilitates technology transfer and the access to knowledge. What's more, market openness facilitates the identification and the opening of new markets, as well as the increase of profits and the creation of new products. International practice has shown that small economies are often strongly linked with the international economic environment which is, however, not observed in the case of Greece. Thus, the Greek economy

could be described as relatively closed in terms of trade. Furthermore, by observing the historical development of specific indicators, a clear upward trend is reported, which is particularly strong in the case of imports. The difference between these two rates indicates the trade deficit of Greece, which is continuing and expanding (Anastasopoulos G., 2004, p. 57, 59).

An investigation of the case and whether liberal trade policies promote trade openness, has revealed that the link between different types of trade restrictions and openness to trade is weak, not always statistically significant and there is no clear evidence that the removal of trade barriers always leads to the improvement of trade liberalization. The data reveal a variety of experiences. Openness in trade is not uniform, universal or clearly linked to trade liberalization. This means that if countries liberalized trade prematurely, it could lead to a lower level of exposure and probably to economic disaster. This is why the political liberalization should be implemented gradually. Under certain circumstances, trade liberalization can indeed lead to the expansion of trade. Moreover, it is noted that liberalization is not the only policy option for countries that wish to expand trade. Most countries have developed their competitiveness behind protective measures, and then either propelled exports or allowed free trade. This means that there is no single trade policy that will benefit all countries operating under different conditions (Turan Subasat, 2008, p. 58-59).

In another paper, the importance of the variety and quality in intra-European trade was investigated along with the role of technological innovation and international technological diffusion, excluding the documented role of income and the size of the country, whereas the role of geographic distance was examined. It was found that the characteristics of the country are important in explaining the pattern of the variety and quality in intra-trade flows. The largest EU countries sell a higher number of varieties and value in comparison to smaller EU countries, but they sell at a lower price. Richer countries, which are mostly capital intensive, export higher quality products in all areas. Data on the distance between countries, which are mainly reflected in transport and in the unified European market context, show that distance reduces the number of varieties traded within sectors and the overall value of commercial varieties, but increases the average quality of varieties that are tradable. The research and development costs tend to increase the variety of intra-trade. Finally, it appeared that technological spillovers are increasing both the variety of intra-Community trade and the quality of traded goods. Technological innovation and international technological spillovers are important sources of competitiveness of nations (Jan Van Hove, 2010, p. 56-57).

The investigation of the structures of demand and vertical intra-industry trade with special reference to North-South trade showed that a more unequal (equal) income distribution in the South (North) increased the share of vertical intra-industry trade, while this result depends on the distribution of income between countries. The

positive effect after changing the method of allocation of income of the share of vertical intra-industry trade weakens, when the demand for varieties produced by the partner is lacking due to large differences in the average per capita income (Joakim Gullstrand, 2006, p. 446-447).

A study on the role of Foreign Direct Investment (FDI) on economic growth and trade balances of the ten emerging European economies prior to EU membership, noted the importance of structural reforms in emerging economies. It was concluded that countries with high growth rates could attract inflows of FDI in their economies, while another impact of FDI inflows is that they have a negative impact on the country's trade balance, and they play a significant role in changing the composition of trade in most emerging European countries (Hossein Varamini, Svetlana Kalash, 2010, p. 18-19).

Fidrmuc's (2005, p. 232-233) study on the structure of trade during the accession and the eastward enlargement of the EU, examined the factors of trade between industrial sectors in the EU15 countries in the OECD. It was found that differences in per capita income, which are used as a substitute for financing by the countries, determine the structure of trade. The total EU-15 has no significant effect on intra-industry trade in the EU-15. Thus, the country's size and distance from markets are the most important factors determining the intra-industry trade (Jarko Fidrmuc, 2005, p. 232-233).

From an analysis of the spatial externality effects on regional development, based on theories of economic geography and endogenous growth (increasing returns to scale), in the case of a group of integrated area (the Euro) and the Mediterranean countries for the period 1995-2004, it was pointed out that due to the significant presence of spatial dependence, increasing labour productivity in one country could contribute to its neighbours through spatial externalities. Also, the educational level facilitates the absorption capacity of foreign technology and thus, it leads to productivity increase. The rate of technological gap is negative and shows that there are some countries that cannot reach the leader country (Germany), in terms of labour productivity. The external effects (financial and technological externality) are increasing returns to scale, implying that the increase in inputs leads to a more proportionate increase in production. Also, externalities are voided geographically and thus encourage inequality of regional development. The diffusion of technology from north to south is a source of reducing these inequalities and requires the investment of productive resources in the South (Amina Naceur Sboui, 2010, p. 45).

The pressure for the internationalization of capital in conjunction with the specific mode of building the EU, create a dissymmetry between negative (removal of all measures taken by the Member States restricted the free movement of persons, goods, services and capital) and positive integration, which has become structural in the last 40 years. The main institutions of the EU, such as the European Commission and

the Court, do work by further promoting negative integration. They prohibit state interference and impose penalties for anything that can be interpreted as opposed to a negative conclusion. The logic of European integration is such that market liberalization has precedence over state intervention. Thus, the negative integration is incorporated by conditions on the daily functioning of the EU, the positive integration – adoption of measures and creation of institutions of Europe-wide regulation -depends on the formation of consensus among multiple stakeholders who are involved in European decision-making. In fact, the negative integration removes power from nation states to restore the damage caused by the operation of the market, while this loss for the national state is not addressed at the supranational level (Horafas Vangelis, 2009).

An investigation into the whether national regulations are widespread in intra-community trade indicates that they are behind the border measures that reduce the volume of trade between EU Member States or restrict it completely. These arrangements increase the cost of exports and create strategic advantage to domestic producers, disrupt the internal market and, in short, preclude the existence of a genuine single market. The benefits of such a single market are not fully recoverable and the EU's external competitiveness is compromised. Liberalization of the EU market creates benefits but also entails costs. Member States, using national regulations, try to adjust these costs by protecting their producers and defending their national interests as a way to restore the loss of economic sovereignty (Maria Helena Guimaraes, 2010, 48-49).

The internal market in Europe has worked in favour of the interaction between development, trade and national economies. The contribution of the single market is equal to about 10% of the annual potential growth of EU. Nevertheless, the positive influence is weakened together with efforts made, aiming at completing the internal market for goods and setting up the internal market for services. In intra-European trade, in both processed products and services sectors, there has been a gradual reduction from 2001 and beyond. Another indication of inadequate integration of the single market is severe price fluctuations within the EU, which as far as price convergence is concerned, is far from the levels achieved in the U.S.A. However, there is a number of obstacles to free movement of goods, still hampered by a patchwork of national regulations, which are often applied arbitrarily and in clear violation of the principle of mutual recognition, which is the cornerstone of the internal market. The cost of not applying the principle of mutual recognition is estimated at about 150 billion (European Commission, 2004, p. 36-37, 41).

From the investigation of specialization in the foreign trade and international competitiveness of Greece, Portugal, Spain, Turkey and the EU-12, it is revealed that the first three countries have tried to exploit the economic benefits from their participation in the EU and to eliminate the short-term economic drawbacks of their

participation in the Common Market, through the Structural Funds. Turkey, on the other hand, had to face on its own the negative economic impact because of the fact that the country was not allowed the free export of agricultural products in the EU, in which it has a comparative advantage. The Greek economy was not fully able to exploit the economic benefits as a member of the single market. Since 1981, Greece has failed to alter the structure of exports of labour-intensive sectors to more up-to-date products. On the other hand, mainly Portugal and Spain have significantly improved their economic performance since 1986. The results show that the Turkish economy indicates remarkable performance in the export of commodities, it is challenging the economies of Greece and Portugal and it is trying to reach Spain in the coming decades (Bahri Yilmaz, 2008, p. 18).

A study on the foreign trade of Greece, after joining the EU and particularly the commercial developments that occurred during the 1990's, found that Greece had suffered significant loss of competitiveness in those sectors in which it had traditionally a comparative advantage, a fact that is reflected in the trade deficit. Two explanations can be given for this development: The first is related to the fact that the demand for Greek exports in export markets has high income elasticity, making Greek exports vulnerable to cyclical fluctuations. Especially in the 1990's, two periods of economic slowdown were observed in Europe. This could partially explain the perceived stagnation of Greek exports during this period, in conjunction with the opening of transition economies to foreign trade, namely countries producing highly competitive products to the Greek ones (for example textiles and agricultural products), and the conflicts that took place in the Balkans, which disrupted land transport. The second explanation is related to the fact that Greek exports are particularly sensitive to fluctuations in the real exchange rate. In the 1990's, Greece aimed at reducing inflation through an ever closer relationship to the German Mark. To the extent that changes in the nominal exchange rate did not fully compensate for a declining but still positive inflation differential against the EU average, this policy was bound to lead to a real appreciation of the Greek drachma. In fact, the high sensitivity of Greek exports to changes in real exchange rates is itself a reflection of the fact that Greek production is still concentrated in low-tech, highly competitive areas where increases in relative prices or the emergence of cheaper close substitutes (such as those produced by the transition economies) lead to significant losses in market share (Michael G. Arghyrou, Evelyn Bazina, 2002, p. 17-18).

An analysis of Greek exports and an estimation of the impact on export performance of the country, caused by EU accession, concluded that joining the EU not only failed to improve the export performance of the country, but also had a slight negative effect on Greek exports. As a small open economy with production concentrated on low–technology and high-competition areas, the country faces a price elastic demand for exports in the long term. The supply of exports is also price elastic and is mainly

determined by changes in the capacity of the Greek economy and export subsidies. The elimination of export subsidies had little effect on export prices. According to the relevant literature, one of the main reasons for the deterioration of Greek export performance after joining the EU, is that export subsidies during the period covered were not used for growth and diversification of products or new skills in production. These could help the country to create new comparative advantages in its products and gain market power in international trade. Instead, export subsidies alone were used to increase the income of exporters. These developments may explain the problems facing the Greek economy, particularly after the mid-1980s, despite the large amount of net funds received by the country from the EU budget (Koukouritakis Minoas, 2006, p. 165).

## 3. The external trade of Greece 2000-2008

### *3.1 Exports and imports of Greece 2000-2008*

During the period 2000-2008, there was an increase in total Greek exports of 36.25%, while exports to the EU (27) increased by 40.79% and to third countries by 28.84%. More than 2/3 of exports to the EU were bound for the Euro Zone countries, in which exports increased by 1/3. The EU share of Greek exports rose by 61.98% in 2000 to 64.05% in 2008, while the share of third countries declined from 38.02% to 35.95%, respectively. In 2000, Greek exports to Member States EZ accounted for 44.26% of total exports and 71.42% of exports to the EU (27), while in 2008 their share in total exports decreased by 0.84% (43.42%) and 3.63% (67.79%) in exports to the EU (27) (Table1).

In 2009, Greece's position in the EU-27 exports remained in the 21st place and the classification of the EZ remains 14th overall in 16 countries. The same year, Greece and Cyprus display the lowest degrees of openness in the EU-27. In particular, the contribution of Greek exports to Gross Domestic Product (GDP) of the country is only 6.1% of GDP, while in 2006 the index shows a progressive decline. In contrast, in European economies such as Belgium, Holland, Hungary, Czech Republic, Slovakia, Slovenia and Ireland, exports contribute over 50% of the GDP. The European average openness indicator for 2009 is 29.8%, so it can be inferred that the Greek economy has a long way to go to become internationally competitive and outward looking, at least in the EU-27 (Eurostat, 2009).

In 2000, among the 20 major export markets of Greece, there were six Euro Zone countries in the following order and based on the value of exports: Germany first followed by Italy, France 8th, Spain 11th and Holland and Belgium being in the 12th and15th place respectively. Similarly, in 2008, there were eight countries in the EZ with the following ranking: Italy first, Germany second, Cyprus fourth, eighth France, Spain 10th, 13th Netherlands, Slovenia and Belgium 17th, 18th (ELSTAT).

**Table 1.** Greek Exports to EU (27), Euro Zone and Third Countries 2000-2008 (mill. Euro)

| Area | Exports | | | | | Variation |
|---|---|---|---|---|---|---|
| | 2000 | 2002 | 2004 | 2006 | 2008* | 2008/2000 |
| EU (27) | 7.885 | 6.699 | 7.902 | 10.558 | 11.102 | 40.79 |
| *% of total* | *61.98* | *60.83* | *64.21* | *63.89* | *64.05* | |
| Euro Zone | 5.632 | 4.023 | 5.338 | 7.256 | 7.527 | 33.64 |
| *% of total* | *44.26* | *36.52* | *43.37* | *43.90* | *43.42* | |
| *% EU (27)* | *71.42* | *60.05* | *67.55* | *68.72* | *67.79* | |
| Third Countries | 4.837 | 4.314 | 4.404 | 5.967 | 6.232 | 28.84 |
| *% of total* | *38.02* | *39.17* | *35.79* | *36.21* | *35.95* | |
| Total | 12.722 | 11.013 | 12.306 | 16.525 | 17.334 | 36.25 |

*Source:* Eurostat, * ELSTAT, data processing

The total Greek imports increased and reached 67.36% (2008/2000), imports from the EU Member States rose to 41.67% and from third countries to 114.86%. The share of EU Member States in Greek imports decreased from 64.90% in 2000 to 54.94% in 2008, while the share of third countries increased from 35.10% to 45.06%, respectively. Half of the imports come from the Euro area Member States, representing approximately 4/5 of imports from the EU (27) and increased by 44.87% in 2008 compared with 2000. Imports from Member States of the EZ represent 52.41% of total imports in 2000 and 81.70% of imports from the EU (27), while in 2008 their share in total imports decreased by 7.04% (45.37%) and the share in total imports from the EU (27) was increased by 1.88% (83.58%) (Table 2).

**Table 2.** Greek Imports from EU (27), Euro Zone and Third Countries 2000-2008 (mill. Euro)

| Area | Imports | | | | | Variation |
|---|---|---|---|---|---|---|
| | 2000 | 2002 | 2004 | 2006 | 2008* | 2008/2000 |
| EU (27) | 23.526 | 18.594 | 25.518 | 29.014 | 33.330 | 41.67 |
| *% of total* | *64.90* | *55.69* | *60.16* | *57.26* | *54.94* | |
| Euro Zone | 19.001 | 15.353 | 21.236 | 23.964 | 27.527 | 44.87 |
| *% of total* | *52.41* | *45.98* | *50.06* | *47.29* | *45.37* | |
| *% EU (27)* | *81.70* | *82.56* | *83.21* | *82.59* | *83.58* | |
| Third Countries | 12.724 | 14.792 | 16.897 | 21.654 | 27.339 | 114.86 |
| *% of total* | *35.10* | *44.31* | *39.84* | *42.74* | *45.06* | |
| Total | 36.250 | 33.386 | 42.415 | 50.668 | 60.669 | 67.36 |

*Source:* Eurostat, * ELSTAT, data processing

All extroversion indicators of the Greek economy fell during the period 2008/2000, with the exception of imports of goods which increased slightly. Concerning the GDP, total exports show the largest decline in exports of goods, and similarly the

total imports, showing the largest decrease in imports of services. The highest decrease appears in the services imports and exports of goods and services. These developments reflect the deterioration in competitiveness and weaken the position of Greece in the international market (Table 3).

**Table 3.** Indicators of extroversion of the Greek economy (% GDP) (2000, 2008)

| n/α | Indicator | 2000 | 2008 | Variation |
|---|---|---|---|---|
| 1 | Total Exports | 25.00 | 23.56 | -5.76 |
| 1α | Exports of goods | 10.53 | 9.69 | -7.97 |
| 1β | Exports of services | 14.50 | 13.87 | -4.34 |
| 2 | Total Imports | 38.64 | 36.47 | -5.61 |
| 2α | Imports of goods | 30.10 | 30.22 | 0.39 |
| 2β | Imports of services | 8.53 | 6.24 | -26.84 |
| 3 | Exports and imports of goods | 40.64 | 39.91 | -1.79 |
| 4 | Total exports and imports | 63.68 | 59.90 | -5.93 |

*Source:* ELSTAT, data processing

Out of 16 countries of the EZ (2008/2000), seven countries increased their share in world exports, with the greatest increase being registered by Germany, the Netherlands and Slovakia, while nine countries decreased their share, of which six, including Greece, are countries of the South. As a result, in the era of the Euro, the countries that have the major benefits are the developed countries of the North, while southern countries show losses in international competitiveness (Table 4).

The intra-industry trade between northern and southern (Greece, Spain, Portugal, South Italy) areas is very limited. The northern regions tend to be specialized in the production of complex industrial goods and skilled labour and to develop between them the intra-industry trade, while the southern areas tend to be specialized in the intensive natural raw materials and unskilled labour and generally in low-and medium-tech sectors. As European integration develops it acquires certain structural features, which may be important sources of instability. The law of comparative advantage is transformed into its opposite, namely the law of absolute advantage, conversion, which, combined with economies of concentration, is leading to the development of strong and possibly self-sustaining production and polarization in income distribution between countries and regions ( Mariolis T., 2009).

**Table 4.** Share of the EZ countries in world exports, 1990, 2000, 2008

| n/α | Country | 1990 | 2000 | 2008 | Variation 2008/2000 |
|---|---|---|---|---|---|
| 1 | Austria | 1.181 | 1.047 | 1.121 | 0.074 |
| 2 | Belgium | NA | 2.914 | 2.919 | 0.005 |
| 3 | France | 6.236 | 5.068 | 3.719 | -1.349 |
| 4 | Germany | 11.770 | 8.536 | 8.946 | 0.410 |
| 5 | Ireland | 0.682 | 1.198 | 0.778 | -0.420 |
| 6 | Spain | 1.593 | 1.783 | 1.741 | -0.042 |
| 7 | Italy | 4.893 | 3.721 | 3.357 | -0.364 |
| 8 | Cyprus | 0.027 | 0.015 | 0.010 | -0.005 |
| 9 | Luxembourg | 0.181 | 0.130 | 0.157 | 0.027 |
| 10 | Malta | 0.032 | 0.038 | 0.018 | -0.020 |
| 11 | Netherlands | 3.872 | 3.606 | 3.946 | 0.340 |
| 12 | Portugal | 0.471 | 0.377 | 0.345 | -0.032 |
| 13 | Slovenia | NA | 0.135 | 0.211 | 0.076 |
| 14 | Slovakia | NA | 0.184 | 0.440 | 0.256 |
| 15 | Finland | 0.763 | 0.713 | 0.597 | -0.116 |
| 16 | Greece | 0.233 | 0.182 | 0.159 | -0.023 |

*Source:* Unctad stat

### *3.2 The trade balance of Greece 2000-2008*

Throughout the period 2000-2008, the trade balance deficit in Greece was increasing (84.18%). The corresponding increase in the deficit is 42.11% in the EU countries, despite the increase of their share of exports (2.07%) and the reduction of their share of imports (-9.96%) and 167.61% with third countries. The deficit in trade with EU countries accounted for 66.48% of the total deficit in 2000 and 51.29% in 2008. The 9/10 of the deficit of trade with EU countries comes from the EZ and it grew by 49.59% (2008/2000) (Table 5).

The data of the external trade of Greece with the EZ (2008-2000), show that exports to the EZ represent approximately 2/5 of total exports, whereas whole imports represent half of the country's total imports. In the era of the Euro (2008/2000), while exports to the EZ rose by about 1/3 and imports by more than 2/5, the deficit rose by 50%. Moreover, during the same period, while the countries' share of the EZ in Greek exports in the EU27 fell by over three percentage points and imports increased by nearly two points, the share of the deficit rose by five points. The highest degree of variation in the trade deficit by the equivalent of exports and imports shows the difference in value between exported and imported products in Greece and the countries of the EZ and the subsequent deficit of competitiveness of the Greek economy.

**Table 5.** Trade balance Greece with EU (27), Euro Zone and Third Countries 2000-2008 (mill. Euro)

| Area | Trade balance (X-M) | | | | | Variation |
|---|---|---|---|---|---|---|
| | 2000 | 2002 | 2004 | 2006 | 2008* | 2008/2000 |
| EU (27) | -15,641 | -11,895 | -17,616 | -18,456 | -22,228 | 42.11 |
| *% of total* | *66.48* | *53.17* | *58.50* | *54.05* | *51.29* | |
| Euro Zone | -13,369 | -11,330 | -15,988 | -16,708 | -20,000 | 49.59 |
| *% of total* | *56.82* | *50.64* | *53.10* | *48.93* | *46.15* | |
| *% EU (27)* | *85.47* | *95.25* | *90.75* | *90.52* | *89.97* | |
| Third Countries | -7,887 | -10,478 | -12,493 | -15,687 | -21,107 | 167.61 |
| *% of total* | *33.52* | *46.83* | *41.50* | *45.95* | *48.71* | |
| Total | -23,528 | -22,373 | -30,109 | -34,143 | -43,335 | 84.18 |

*Source:* Eurostat, * ELSTAT, data processing

### *3.3 The foreign trade of Greece with the Member States of the Euro Zone*

Greece's exports to the Euro area Member States rose more than 1/3 from 2000 to 2007. Increase was marked in the exports to twelve (12) countries, showed a decline of exports to Luxembourg and Malta, and remained stable in the Netherlands. Increase over the average was recorded for exports to Slovenia, Slovakia, Cyprus, France, Ireland, Spain, Portugal and Italy (Table 6).

**Table 6.** Exports of Greece in Euro Zone 2000-2007 (mill. Euro)

| Country | Exports | | | | | | | | Variation |
|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2007/2000 |
| Austria | 115 | 94 | 79 | 104 | 127 | 124 | 133 | 148 | 28.69 |
| Belgium | 214 | 161 | 116 | 181 | 195 | 189 | 216 | 279 | 30.37 |
| France | 491 | 500 | 391 | 514 | 519 | 578 | 732 | 719 | 46.43 |
| Germany | 1,736 | 1,660 | 1,142 | 1,553 | 1,611 | 1,723 | 1,875 | 1,984 | 14.28 |
| Ireland | 42 | 48 | 27 | 46 | 47 | 39 | 68 | 60 | 42.85 |
| Spain | 412 | 432 | 275 | 444 | 410 | 496 | 667 | 584 | 41.74 |
| Italy | 1,363 | 1,255 | 929 | 1,297 | 1,233 | 1,449 | 1,864 | 1,857 | 36.24 |
| Cyprus | 552 | 570 | 531 | 551 | 568 | 721 | 890 | 1,125 | 103.80 |
| Luxembourg | 6 | 6 | 2 | 5 | 8 | 4 | 4 | 4 | -33.33 |
| Malta | 148 | 158 | 113 | 61 | 27 | 16 | 24 | 30 | -79.72 |
| Netherlands | 347 | 344 | 259 | 316 | 329 | 331 | 360 | 347 | 0.00 |
| Portugal | 86 | 90 | 67 | 78 | 88 | 81 | 95 | 118 | 37.20 |
| Slovakia | 14 | 21 | 28 | 22 | 27 | 16 | 29 | 42 | 200.00 |
| Slovenia | 24 | 33 | 27 | 34 | 50 | 38 | 201 | 210 | 775.00 |
| Finland | 82 | 62 | 37 | 74 | 99 | 91 | 98 | 97 | 18.29 |
| Total | 5,632 | 5,434 | 4,023 | 5,280 | 5,338 | 5,896 | 7,256 | 7,604 | 35.01 |

*Source:* Eurostat, data processing

Greece's imports from the Euro zone increased by 2/5 in 2007 compared with 2000. The number of import countries reached thirteen (13) countries, while there is a decline in imports from Malta and Portugal. Imports from Luxembourg, Cyprus, Slovakia, Slovenia, Austria, Belgium, Spain and Ireland increased above the average (Table 7).

**Table 7.** Imports of Greece from Euro Zone 2000-2007 (mill. Euro)

| Country | Imports | | | | | | | | Variation |
|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2007/2000 |
| Austria | 337 | 333 | 256 | 394 | 449 | 459 | 579 | 714 | 111.86 |
| Belgium | 1,042 | 1,103 | 1,439 | 1,444 | 1,578 | 1,570 | 1,770 | 2,129 | 104.31 |
| France | 2,726 | 2,524 | 1,879 | 2,656 | 2,711 | 2,506 | 3,013 | 3,094 | 13.49 |
| Germany | 5,147 | 4,995 | 4,029 | 4,999 | 5,657 | 5,616 | 6,360 | 7,147 | 38.85 |
| Ireland | 351 | 333 | 212 | 327 | 363 | 394 | 433 | 526 | 49.85 |
| Spain | 1,284 | 1,307 | 1,274 | 1,445 | 1,627 | 1,723 | 1,799 | 2,010 | 56.54 |
| Italy | 5,102 | 4,977 | 3,804 | 4,966 | 5,439 | 5,402 | 5,811 | 6,491 | 27.22 |
| Cyprus | 87 | 97 | 80 | 116 | 202 | 296 | 414 | 608 | 598.85 |
| Luxe/rg | 12 | 41 | 32 | 137 | 182 | 260 | 300 | 280 | 2.233,33 |
| Malta | 29 | 19 | 19 | 2 | 19 | 8 | 3 | 5 | -82.75 |
| Netherlands | 2,199 | 2,130 | 1,844 | 2,097 | 2,361 | 2,411 | 2,607 | 2,778 | 26.33 |
| Portugal | 118 | 114 | 84 | 101 | 113 | 113 | 111 | 117 | -0.84 |
| Slovakia | 34 | 63 | 58 | 65 | 70 | 70 | 130 | 177 | 420.58 |
| Slovenia | 25 | 30 | 32 | 40 | 45 | 52 | 77 | 87 | 248.00 |
| Finland | 508 | 355 | 311 | 474 | 420 | 391 | 557 | 522 | 2.75 |
| Total | 19,001 | 18,421 | 15,353 | 19,263 | 21,236 | 21,271 | 23,964 | 26,685 | 40.43 |

*Source:* Eurostat, data processing

Throughout the period under investigation (2000-2007), the trade balance of Greece among the other Euro zone members is negative and amounts to a cumulative 118.7 billion Euro, while it has a trade surplus with only three countries, Cyprus, Malta and Slovenia. Greece's trade with six Euro zone countries, Italy, Germany, France, Holland, Belgium, and Spain, produced 95.28% of the cumulative deficit (113.1 billion Euro) (Table 8).

Between 2000 and 2007, the share of Greek exports increased in eight Euro area countries (France, Ireland, Italy, Cyprus, Portugal, Slovakia, and Slovenia) and decreased in the remaining. Similarly, Greece has increased its share of imports in eight countries (Austria, Belgium, Ireland, Spain, Cyprus, Luxembourg, Slovenia and Slovakia). In 2007, four Euro zone countries represent about ¾ of the deficit, both Germany and Italy about ¼ each, while France and the Netherlands together represent ¼ (Table 9).

**Table 8.** Trade Balance Greece-Euro Zone 2000-2007 (mill. Euro)

| Country | Trade Balance | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2000-07 |
| Austria | -222 | -239 | -177 | -290 | -322 | -335 | -446 | -566 | -2,597 |
| Belgium | -828 | -942 | -1,323 | -1,263 | -1,383 | -1,381 | -1,554 | -1,850 | -10.524 |
| France | -2,235 | -2,024 | -1,488 | -2,142 | -2,192 | -1,928 | -2,281 | -2,375 | -16,665 |
| Germany | -3,411 | -3,335 | -2,887 | -3,446 | -4,046 | -3,893 | -4,485 | -5,163 | -30,666 |
| Ireland | -309 | -285 | -185 | -281 | -316 | -355 | -365 | -466 | -2,562 |
| Spain | -872 | -875 | -999 | -1,001 | -1,217 | -1,227 | -1,132 | -1,426 | -8,749 |
| Italy | -3,739 | -3,722 | -2,875 | -3,669 | -4,206 | -3,953 | -3,947 | -4,634 | -30,745 |
| Cyprus | 465 | 473 | 451 | 435 | 366 | 425 | 476 | 517 | 3,608 |
| Luxe/rg | -6 | -35 | -30 | -132 | -174 | -256 | -296 | -276 | -1,205 |
| Malta | 119 | 139 | 94 | 59 | 8 | 8 | 21 | 25 | 473 |
| Netherlands | -1,852 | -1,786 | -1,585 | -1,781 | -2,032 | -2,080 | -2,247 | -2,431 | -15,794 |
| Portugal | -32 | -24 | -17 | -23 | -25 | -32 | -16 | 1 | -168 |
| Slovakia | -20 | -42 | -30 | -43 | -43 | -54 | -101 | -135 | -468 |
| Slovenia | -1 | 3 | -5 | -6 | 5 | -14 | 124 | 123 | 229 |
| Finland | -426 | -293 | -274 | -400 | -321 | -300 | -459 | -425 | -2,898 |
| Total | -13,369 | -12,987 | -11,330 | -1,3983 | -15,898 | -15,375 | -16,708 | -19,081 | -118,731 |

*Source:* Eurostat, data processing

**Table 9.** Share of Euro Zone countries to Exports (X), Imports (M) and Trade Balance (X-M) of Greece (2000- 2007).

| Country | X % | | M % | | X – M % | |
|---|---|---|---|---|---|---|
| | 2000 | 2007 | 2000 | 2007 | 2000 | 2007 |
| Austria | 2.04 | 1.94 | 1.77 | 2.67 | 1.66 | 2.96 |
| Belgium | 3.79 | 3.67 | 5.48 | 7.97 | 6.19 | 9.69 |
| France | 8.71 | 9.45 | 14.34 | 11.59 | 16.71 | 12.44 |
| Germany | 30.82 | 26.09 | 27.08 | 26.78 | 25.51 | 27.05 |
| Ireland | 0.74 | 0.79 | 1.84 | 1.97 | 2.31 | 2.44 |
| Spain | 7.31 | 7.68 | 6.75 | 7.53 | 6.52 | 7.47 |
| Italy | 24.20 | 24.42 | 26.85 | 24.32 | 27.96 | 24.28 |
| Cyprus | 9.80 | 14.79 | 0.45 | 2.27 | +3.47 | +2.70 |
| Luxe/rg | 0.10 | 0.05 | 0.06 | 1.04 | 0.04 | 1.44 |
| Malta | 2.62 | 0.39 | 0.15 | 0.02 | +0.89 | +0.13 |
| Netherlands | 6.16 | 4.56 | 11.57 | 10.41 | 13.85 | 12.74 |
| Portugal | 1.52 | 1.55 | 0.62 | 0.44 | 0.23 | +0.00 |
| Slovakia | 0.24 | 0.55 | 0.17 | 0.66 | 0.14 | 0.70 |
| Slovenia | 0.42 | 2.76 | 0.13 | 0.32 | 0.00 | +0.64 |
| Finland | 1.45 | 1.27 | 2.67 | 1.95 | 3.18 | 2.22 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

*Source:* Eurostat, data processing

The trade deficit of Greece with the countries of the Euro Zone rose by 42.49% during the period 2000-2007. Increase of the deficit occurred in trade with eleven (11) out of fifteen (15) countries. 9/10, roughly, of the cumulative trade deficit (2000-2007) was produced by Greek transactions with five (5) EZ developed countries (Germany, Italy, France, Holland, Belgium), while half of the total deficit was produced only from trade with two countries, Germany and Italy. It appears that in the era of the Euro, Greece's deficit, like that of other weaker economies, creates surpluses in developed countries, thus enhancing the uneven growth in the Euro area. The trend has been reinforced by policies to curtail domestic demand applied to the EZ and especially in Germany (Table 10).

**Table 10.** Change in Trade Balance Greece - Euro Zone 2007/2000 (%) and percentage distribution of the total deficit (%)

| Country | Trade Balance Variation % | Distribution of Total Deficit |
|---|---|---|
| | 2007/2000 | 2000-07 |
| Austria | (154.95)* | 2.18 |
| Belgium | (123.42) | 8.86 |
| France | (6.26) | 14.03 |
| Germany | (51.36) | 25.82 |
| Ireland | (50.80) | 2.15 |
| Spain | (63.53) | 7.36 |
| Italy | (23.93) | 25.89 |
| Cyprus | 11.18 | +3.03 |
| Luxe/rg | (4,500) | 1.01 |
| Malta | -78.99 | +0.40 |
| Netherlands | (31.26) | 13.30 |
| Portugal | -96.87 | 0.14 |
| Slovakia | (575) | 0.39 |
| Slovenia | 12,200 | +0.19 |
| Finland | (0.23) | 2.44 |
| Total | (42.49) | 100 |

*Source:* Eurostat, data processing, *( ) deficit

From analyzing the data (Table 11), it can be concluded that Greece is in a more difficult position in comparison to the four major trading partners in the EA in all indicators of external trade to GDP, excluding the balance of trade services. In particular, regarding the trade balance in goods to GDP (2008/2000), Greece, while noting a decline of approximately three percentage points, holds the first place in the deficit, which exceeds 16% of GDP. Germany has more than doubled its trade surplus (change of 143%) and the Netherlands increased its trade surplus by about 1/3. France has a decline in the trade deficit as far as GDP is concerned, while Italy also shows a slight deterioration.

**Table 11.** Indicators of Foreign Trade of Greece and the four largest trade partners in the Euro Area, (% GDP), (2000, 2008)

| Indicator | Greece | | Germany | | France | | Italy | | Netherlands | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2008 | 2000 | 2008 | 2000 | 2008 | 2000 | 2008 | 2000 | 2008 |
| Current account | -12 | -13.8 | -1.6 | 6.6 | 1.1 | -3.3 | -0.1 | -3.1 | 6.4 | 4.4 |
| Trade Balance of goods and services | -13.5 | -10.2 | 0.4 | 6.2 | 0.9 | -2.5 | 0.9 | -0.6 | 5.5 | 8.3 |
| Trade Balance products | -19.4 | -16.6 | 3.0 | 7.3 | -0.2 | -2.7 | 0.9 | -0.1 | 5.7 | 7.4 |
| Balance of Trade services | 5.9 | 6.4 | -2.7 | -1.0 | 1.1 | 0.2 | 0.1 | -0.4 | -0.1 | 0.9 |
| Net foreign assets | -44.5 | -88.4 | 0.3 | 20.9 | 9.6 | -4.2 | 11.0 | NA | -14.8 | 42.8 |

*Source:* European Commission, 2010

### *3.4 Factors influencing the trade balance deficit in the Euro era*

#### *3.4.1 The sectoral composition of foreign trade*

Looking at the sectoral composition of Greek Foreign Trade (2008) in relation to four (4) countries of the EZ, with the largest amount of trade transactions (Germany, Italy, France, Netherlands) and after examining 99 branches with a two-digit code, it could be concluded that: In Greek external trade with Germany, out of the 89 branches, 73 (82%) are in deficit and 16 (18%) are surplus. In the case of Italy out of the 86 branches, 72 (84%) are in deficit and the 14 (16%) are surplus while in France out of the 75 branches, 61 (81%) are in deficit and 14 (19%) surplus. Finally, in the case of the Netherlands out of the 74 branches, 66 (89%) are overdrawn and 8 (11%) surplus.

Of the twenty six (26) sectors that have a surplus in at least one of the four countries, three branches are in surplus with all four (4) countries, six are in surplus with the three countries, five are in surplus with two, whereas twelve sectors are in surplus with one country and approximately half of the branches (46) are in deficit with the four countries (Table 12).

We investigated the Revealed Comparative Advantage Index (RCA) of the 14 sectors in surplus with at least 2 out of the 4 countries of EA (Germany, France, Italy and the Netherlands).

$$RCA = Xi / SXi: Mi / SMi$$

Where:

Xi = exports of goods (with s / n 1-14 in Table 13) in 4 markets
Mi = imports of the same sectors in their respective markets,
SXi = total exports of each sector in all EU countries and
SMi = total imports of the same goods from all EU countries

**Table 12.** Surplus and deficit as branches in foreign trade Greece with Germany, Italy, France and Netherlands (2008)

| Surplus branches | Showing a deficit branches |
|---|---|
| *With 4 countries:*<br>salt, sulfur, earths, stone, plaster, cement- cotton- aluminum and aluminum articles.<br>*With three countries:*<br>fish, crustaceans, mollusks, aquatic invertebrates- fruits, nuts, peel of citrus fruits, melons, fats- oils, waxes, animal herbal preparations- vegetables, nuts, fruit-Zinc, articles-ship supply confidential<br>*With two countries:*<br>vegetables, roots and tubers- seeds, oleaginous fruit, industrial crops, hay-tobacco, tobacco substitutes- ores, slag and ash- copper and copper articles.<br>*With one country:*<br>cereal preparations- meat, fish, shellfish, etc. - beverages, spirits and vinegar-inorganic Chem. Products, compounds of precious metals- wood, charcoal, wood charcoal- wood pulp etc. waste paper- wadding, felt etc. articles thereof, apparel- clothing accessories, knitted or other textile articles, etc. - Articles of iron or steel-airships spacecraft - collections of art objects and antiques. | *With 4 countries:*<br>meat and edible offal - milk, eggs, honey - animal products- coffee, tea and spices- flour products, malt, starches, inulin- sugar confectionery- cocoa and preparations- cereal preparations, types of sugar manufacture, miscellaneous edible preparations-residues etc. food, animal feed- mineral fuels, oils, waxes, bituminous materials- organic chemicals-pharmaceuticals- fertilizers- tanning, dyeing extracts, pigments - essential oils, retinoids, perfumery- soap, lye, artificial waxes, paste plaster -albuminoidal materials, glues, enzymes -photographic or cinematographic products- various products of chemical industries-plastics and articles thereof- rubber and rubber articles - leather articles, travel goods, etc. - fur, fur, artificial fur-paper and paperboard, articles of paper-products of publishers, press, etc. - man-made filaments or man-made staple fibbers- carpets and floor coverings of textile materials- impregnated, coated, etc. - apparel, clothing accessories, knitted or crocheted- footwear, gaiters- articles of stone, plaster , cement, etc. pottery-glass and glassware- pearls, precious, semi precious stones, coins- iron, iron and steel- tools, cutlery, spoons, etc. - various articles of base metals- nuclear reactors, boilers machinery- engines, electrical appliances and materials, etc. - automobiles, tractors, bicycles, etc. - instruments, Optical photograph – watchmaker-furniture, bedding, lighting-toys, entertainment or sports-various articles. |

*Source:* ELSTAT, data processing

By processing the data, the values of index RCA were yielded, as they are presented in table 13; the values of RCA index show the following: none of the 14 branches has a comparative advantage over the 4 countries of the Euro zone, with which Greece has the largest amount of transactions. A branch (s/n 13) does not have a comparative advantage in any country. Two branches (s/n 3, 8) have a comparative advantage in trade over three countries, the first in France, Italy and Holland and the second in Germany, France and Italy. Six branches (s/n 1, 4, 6, 10, 11, 14) have a comparative advantage in trade over two out of the four countries, the first three with France and Italy, and the next three with Germany and Italy. Five branches (s/n 2, 5, 7, 9, 12) have a comparative advantage in trade over one country only, the first three in Germany, the fourth in Italy and last one in the Netherlands.

It appears that of the three branches that are in surplus with the 4 countries mentioned above (s/n 1, 2, 3), only the latter has a comparative advantage in three of them. Of the six that are in surplus in three countries (s/n 4, 5, 6, 7, 8, 9), only one (s/n 8) has a comparative advantage in all three countries. Of the five that are in surplus in two countries (s/n 10, 11, 12, 13, 14), only three (s/n 10, 11, 14) have a comparative advantage in both countries.

**Table 13.** Index of Revealed Comparative Advantage (RCA) (2008)

| s/n | Branches (with two-digit code, CN) | RCA Index | | | |
|---|---|---|---|---|---|
| | | Germany | France | Italy | Netherlands |
| 1 | salt, sulfur, earths, stone, plaster, cement | 0.66 | 1.81 | 1.86 | 1.00 |
| 2 | cotton | 2.00 | 0.50 | 0.76 | 0.44 |
| 3 | aluminum and articles thereof | 0.21 | 1.60 | 1.52 | 1.50 |
| 4 | fish, crustaceans, mollusks and aquatic invertebrates | 0.66 | 1.57 | 3.06 | 0.16 |
| 5 | fruits, nuts, peel of citrus fruit, melons | 2.45 | 0.50 | 0.06 | 0.88 |
| 6 | fats, oils, waxes animal vegetable | 0.66 | 1.07 | 3.50 | 0.13 |
| 7 | preparation of vegetables, seeds, fruits | 1.07 | 0.49 | 0.80 | 0.40 |
| 8 | Zinc, articles there of | 58.00 | 26.66 | 13.57 | 0.05 |
| 9 | Confidential ship supply | 0.21 | 0.00 | 10.00 | 0.00 |
| 10 | vegetables, roots and tubers | 3.43 | 0.08 | 1.22 | 0.04 |
| 11 | seeds, oleaginous fruit, industrial crops, straw | 2.25 | 0.25 | 1.48 | 0.00 |
| 12 | tobacco, manufactured tobacco substitutes | 0.33 | 0.33 | 0.00 | 3.50 |
| 13 | ores, slag and ashes | 0.34 | 0.00 | 0.02 | 0.00 |
| 14 | Copper and articles thereof | 2.50 | 0.66 | 5.42 | 0.00 |

*Source:* ELSTAT, data processing

Based on the comparative advantage index uncovered in Greece with the four largest trading partners EZ in seven sectors (one-digit code), it appears that none of the seven sectors shows an advantage with four or three countries. Two branches (s/n 1, 2) have a comparative advantage in two of the 4 countries, the first with Germany and Italy and the second with Germany and the Netherlands. Three branches (s/n 4, 5, 7) have a comparative advantage in one country, the first and third with Germany and the second with France. One branch (s/n 6) has a disadvantage in trade with 4 countries. It can be concluded that even traditional export industries in Greece are lagging behind in competitiveness in trade at least two of the 4 major trading partners EA, while the ascending branch of the chemical and allied products has a comparative advantage in only 4 countries (Table 14).

**Table 14.** Index of Revealed Comparative Advantage (RCA) Greece with 4 major trading partners in EZ (2008)

| s/n | Branches (with one-digit code) | Index RCA | | | |
|---|---|---|---|---|---|
| | | Germany | France | Italy | Netherlands |
| 1 | Food and live animals | 1.10 | 0.29 | 1.28 | 0.22 |
| 2 | Beverages and Tobacco | 1.22 | 0.40 | 0.33 | 1.85 |
| 3 | Oils and fats of animal or vegetable origin | 0.75 | 1 | 3.36 | 0.17 |
| 4 | Chemicals and related | 1.09 | 0.45 | 0.80 | 0.42 |
| 5 | Manufactured goods classified mainly by raw material | 0.68 | 1.60 | 0.74 | 0.66 |
| 6 | Machinery and transport equipment | 0.54 | 0.42 | 0.52 | 0.42 |
| 7 | Miscellaneous manufactured articles | 1.18 | 0.75 | 0.37 | 0.42 |

*Source:* ELSTAT, data processing

The Revealed Comparative Advantage index (RCA) (exports of goods throughout the world) of Greece with the four main trading partners in ZTE shows that Greece has a comparative advantage compared with the 4 countries in categories of low, middle to low-tech, and at a disadvantage compared with 4 countries, in the dynamic range of products of medium to high-tech, high tech and information technology and communications (table 15).

**Table 15.** Index of Revealed Comparative Advantage (RCA) (exports of goods throughout the world), 2007

| n/α | Product Category | Greece | Germany | France | Italy | Netherlands |
|---|---|---|---|---|---|---|
| 1 | Low-tech | 1.6 | 0.6 | 1.0 | 1.4 | 0.9 |
| 2 | Middle to low-tech | 1.6 | 0.9 | 0.8 | 1.0 | 1.4 |
| 3 | Middle to high-tech | 0.6 | 1.3 | 1.2 | 1.1 | 0.8 |
| 4 | High-tech | 0.2 | 0.7 | 0.9 | 0.3 | 1.0 |
| 5 | Information and Communication Technology | 0.3 | 0.5 | 0.4 | 0.2 | 1.2 |

*Source:* European Commission, 2010.

It is characteristic that even the agricultural trade balance, which until 1981 (accession to the EEC) was in surplus, then became unprofitable. During the period 2005-2008, the change in the rural balance deficit was 15.07%, while the overall trade balance was 11.59%. This is due to the fact that Greece exports herbal products (primary stage), with low added value, while she imports livestock products with high added value. The major part of agricultural trade is conducted with EU member countries. About 75% of imports from EU countries and 68% of exports are also directed to them. The rate of increase of imports from the EU is faster than that from the third

countries, a development that leads to continuous increase in the share of imports from the EU and to an increasing rural deficit (Chymis A., Reziti J., 2010, p. 41, 42).

On the sectoral composition of foreign trade of Greece, it has been noted that in the era of the Euro, the country's comparative advantages are still mostly concentrated in labour intensive industries, low and intermediate technology, while the country still lags behind in dynamic high-tech industries. Even in traditional sectors where the country has experience and expertise, it seems to have lost its comparative advantage. This development, in the intensely competitive environment of the EA, highlights the weaknesses and structural problems of the country's productive base, low productivity of fixed capital and hindrances to research and technology. Greek production, despite the country's participation in the group of the most developed economies in the EU and despite the use of almost four Community Support Frameworks, continues to show characteristics similar to emerging economies.These economies have stronger comparative advantages, as they have not acquired yet the characteristics of developed countries in terms of production structure and foreign trade. This gap and the incomplete identity of a developed country, exacerbate the conditions of foreign trade, resulting in trade deficit.

The combination of high economic growth, the persistent fiscal imbalances and the deterioration of the competitiveness over the past decade have worsened the external balance of the Greek economy, with the current account deficit peaking at 14.75% of GDP in 2007, before declining to 13.75% of GDP in 2008 from a position close to balance in the mid 1990's. The widening of the external imbalances happened mainly due to a growing deficit of trade, which reached approximately 17% of GDP in 2008 (almost 6 percentage points more than that of 1995). In particular, the performance of merchandise exports has been disappointing over the last decade, while imports have grown significantly, driven by high domestic demand. Regarding the specificity of the product, the share of low technology and labour-intensive products remains important, though declining. The share of exports with high added value (high technology) has been slightly higher in the last few years, though it still remains much lower than in the Euro area (European Commission, 2010, p. 68-73).

In its report, the IMF analyzes the constant market shares (CMS) of Greek exports during the period 1992-2005, recognizing the profound transformations that have occurred over the last twenty years in Greek exports, both in terms of (geographical) markets, and in terms of products. This analysis seeks to allocate the trade flows between the three different outcomes: a) results of world trade (world trade effects), ie changes due to the overall growth of international trade, b) allocation of markets (market distribution effects), ie. effects due to geographic specialization of a country in specific markets and c) results of the composition of exports (commodity composition effects), namely the effects due to the specialization of a country in specific sectors / categories. The difference between these results and the

overall change in exports is attributed to the changes in export competitiveness of the country, either positive (when the balance is positive) or negative. For the period 2000-2005, the IMF analysis found that 80-90% of export growth in the country is due to the effects of world trade, namely that the observed increase in Greek exports is mainly due to the total increase of the volume of international trade. The geographical location of Greece and its access to the rapidly growing markets of the Balkans, also leads to a positive result because of the geographical distribution of markets, which represents 35-40%, approximately, of the export growth. On the negative side, however, the specificity of the products had a negative impact on the country's exports, leading to a drop of 15%. The remaining (negative) percentage is attributed to a loss of competitiveness. In this way the IMF report confirms that the export performance of the country mainly depends on demand, coupled with the recovery of the global economy rather than improving the competitiveness of the Greek economy (IMF, 2007).

### *3.4.2 Differences in Inflation between Greece and Euro Zone*

The trade deficit, apart from the composition of foreign trade and the structural weaknesses of the economy, is due to the inflation differential between Greece and the Euro Zone. During the period 2001-2008 the average annual inflation rate in Greece was highest at 0.9 to 1.4% of inflation in the Euro area (Table 16).

**Table 16.** Greece Euro-Zone Inflation (HICP) 2001-2008

| | 2001-03 | 2004 | 2005 | 2006 | 2007 | 2008 |
|---|---|---|---|---|---|---|
| Greece | 3.7 | 3.0 | 3.5 | 3.3 | 2.9 | 4.2 |
| Euro-zone | 2.3 | 2.1 | 2.2 | 2.2 | 2.0 | 3.3 |
| Difference | 1.4 | 0.9 | 1.3 | 1.1 | 0.9 | 0.9 |

*Source:* Bank of Greece Governor's Report 2009

Specifically, with regard to inflation, after entering the Euro Zone, Greece recorded an inflation rate, which consistently exceeds the average of that of other Member States. This is mainly due to: a) Factors associated with differences in the rate of increase in production costs of products. Characteristically, in Greece, the average annual growth (2001-2006) in per capita nominal wage of employees was 6.40% and the labour cost per unit 3.16%. The corresponding rates in Germany were 1.53% and 0.00%, in France 2.88% and 1.95%, in Ireland 5.73% and 3.65% and in Sweden 3.57% and 1.54%). b) Differences in the rate of growth of domestic demand between Greece and other countries of the EZ. The combination of low interest rates, the lifting of credit restrictions and increases in bank liquidity, boosted overall demand in the economy and fuelled inflationary pressures. c) The introduction of the Euro

(2002), is estimated to have contributed to an increase in inflation of 0.5%. d) The distortion of competition in Greece, the existence of monopolistic and oligopolistic markets, enabling companies to increase product prices (Anastasatos T., 2008, p. 26, Alpha Bank, 2007, p. 40-41, 47).

*3.4.3. The real exchange rate in Greece in the Euro era*

As shown in Table 17, Greece has had a large loss of competitiveness, which cumulatively for the period 2001-2009, amounted to 18.6% based on the CPI and to 26.6% on labour costs per unit of product of the total economy. The growth rates of prices and wages in Greece remained consistently higher than the corresponding Euro area, resulting in substantial appreciation of the real effective exchange rate (based on external trade of Greece with 28 major trading partners). This development has exacerbated the level of competitiveness of Greek manufacturing and its ability to respond to changes in domestic and external demand (Bank of Greece, 2009, p. 143, 157).

But the claim that the Greek economy has deteriorated because of wage increases is questionable. It is argued that the requirements for employees in Greece have been increased by approximately the same rate as the average of competitor countries and that the Euro is solely responsible for the deterioration of price competitiveness. It is reported that the productivity of labour in Greece (1995-2009) had converged to the average EU-15 more closely than the purchasing power of the average wage had converged. While the convergence of productivity had risen to about 18 percentage points, the real average earnings per worker had risen to about 14 percentage points. Moreover, it is noted that the unit labour costs in manufacturing industry (involved with a large weight to foreign trade) declined (by 100 in 1999) to 94.5 in 2009 versus the Euro and 94.4 to the European Union of 27 (INE, 2010, p. 172, 177).

According to the European Commission, all the four indicators of the real effective exchange rate (based on: the GDP deflator, private consumption, export price and unit costs throughout the economy) had an appreciating trend against the corresponding indices for 35 industrial Members since 2000. Between 2000 and 2008, the appreciation is around 16% on the price deflator for exports and 13% based on the GDP deflator. The persistently high inflation seems to be mainly the result of non-competitive behaviour and rigidities in product and labour markets. The appreciation of the cost per unit is based on the real effective exchange rate for the whole economy (over 14% in 2008 to 2000, compared to 35 industrial countries), resulting in much higher wage increases than in the Euro and the 35 industrialized countries, despite rapidly rising productivity, which exceeded that of the Euro area. The persistently higher inflation and the loss of competitiveness may also be related to imperfections in the functioning of product markets, as evidenced by the rapidly developing increases. In sum, most estimates of equilibrium exchange rates suggest

that the real effective exchange rate in Greece is overvalued in relation to long-term equilibrium (European Commission, 1/2010, p. 68-73).

**Table 17.** Indices of nominal and real Effective Exchange Rate (EER) of Greece, 2001-2009

| Year | Nominal EER | Real EER | |
|---|---|---|---|
| | | Based on CPI | Based labor cost / unit* |
| 2001 | 1.9 | 1.1 | 0.5 |
| 2002 | 2.3 | 2.6 | 4.0 |
| 2003 | 5.0 | 5.4 | 3.9 |
| 2004 | 1.7 | 1.9 | 4.2 |
| 2005 | 1.0 | -0.2 | 0.4 |
| 2006 | 0.1 | 0.7 | 1.6 |
| 2007 | 1.3 | 1.6 | 2.3 |
| 2008 | 2.5 | 2.6 | 4.9 |
| 2009 | 1.2 | 1.5 | 2.3 |
| Cumulative (%) Change 2001-2009 | 15.7 | 18.6 | 26.6 |

*Source:* Bank of Greece Governor's Report 2009, p. 152, * the whole economy

In the annual report on the competitiveness of the Greek economy (2007), it is noted that despite strong growth and healthy rates of productivity growth over the last decade, the Greek economy is experiencing an important extension of the current account deficit. Many domestic demand factors that contributed to the growth trend of the economy, contributed both to charging the external balance and the formation of a significant lack of competitiveness (low interest rates, direct benefits from financial liberalization, investment in Olympic Games). The same report, citing the IMF report (2007) records a significant appreciation of the Greek real exchange rate, after entering the Euro Zone. It is estimated that while the actual rate ranged Greece, roughly in equilibrium levels at the time of entry into the EMU, it has since diverged from this and at early 2006 it was overvalued by 18% compared to the level justified by fundamentals. The more rapid rates of inflation in Greece, compared with its trading partners, led to an appreciation of the real exchange rate in the country. Moreover, the IMF considers as the main factors responsible for the significant real currency appreciation and increasing the deficit, the following: a) the boom in lending that followed the financial liberalization and the decline in real interest rates which occurred from late 1990 and b) the fiscal expansion that followed the country's entry into EMU (Ministry of Development, 2007, p. 191-193 and IMF, 2007).

The participation in monetary union potentially brings benefits and costs, both short-term, and long term. Important benefits are the stabilization of inflation, lower

interest rates, easier financing of public and external debt, the elimination of exchange risk on trade with other member states of the Euro Zone, and the consequent boost in intra-European trade; and as a result the stabilization of the expectations about the course of the exchange rate against other currencies. The price of this stability is the denial of policy tools that could be used to offset macroeconomic shocks. Monetary and exchange rate policy is now designed not on the basis of national circumstances, but according to pan-European needs. Thus, as depreciation against the other partners is not feasible, inflation differentials are accumulated and translated into real currency revaluation, thereby affecting the competitiveness of the economy (Tasos Anastasatos, 2008, p. 1-3, 26-27).

Moreover, the lack of the EMU completion - monetary union without a common economic policy, non-optimal currency area-, the restrictive policies which apply to domestic demand in most developed countries of EA and particularly in Germany and the differences in tax rates affect negatively foreign trade in the Euro Zone, operate against the weaker economies in the South and in favour of the developed economies of the North. The result of this is that trade deficits accumulate in the southern countries like Greece, which are surplus to the powerful and dynamic economies of the North. Therefore, the functioning of EMU as an incomplete monetary integration, has contributed so far in bringing the economies of member countries up, but it works, through its foreign trade as a mechanism to transfer wealth from poorer to richer leader countries and reinforces the uneven growth of powerful economies in favour of the strong and against the weak. Without mechanisms for redressing these imbalances, government deficits and trade deficits increase, resulting in the so-called twin deficits to inflate the debts of poorer nations.

## 4. Regression model to measure the degree of influence of the variables on the trade balance

### *4.1 Data and Methodology*

Part of the data used in this analysis, constitute the body of the development of the model. In particular, the data refers to the trade balance, exports, imports, and the share of Euro Zone countries in exports and imports, inflation as well as the estimated Revealed Comparative Advantage index (RCA). The examined period spans from 2000 to 2007. Therefore the methodology used the above variables which identify the trade balance, incorporating any effects on formation of the balance. This methodology includes information and determinants which are depicted in the model as follows:

$$TB_t = a + \beta_1 IMP_{it} + \beta_2 EXP_{it} + \beta_3 X_{it} + \beta_4 M_{it} + \beta_5 I_{it} + \beta_6 RCA_{it} + \varepsilon_{it}$$

Where $TB_t$ the trade balance of Greece, $IMP_{it}$ the imports, $EXP_{it}$ the exports, $X_{it}$ the share of Euro Zone countries to exports, $M_{it}$ the share of Euro Zone countries to imports, $I_{it}$ the inflation and $RCA_{it}$ the Revealed Comparative Advantage index (of 14

sectors with overcapacity at least by 2 of the 4 countries of ZTE - Germany, France, Italy and the Netherlands), under the formation of dichotomous dummy variable. Finally, where $\varepsilon_{it}$ is the white noise error. When using the deterministic variables in the above model, logarithmic values were used to avoid any econometric problems (heteroscedasticity), although using prices rather logarithms gives us a more economically rational response (Kothari and Zimmerman, 1995: 157). Regarding the dichotomous dummy variable (slope dummy) of the model, it takes the value 0 when Greece has a comparative advantage over another country of the Euro zone, and 1 otherwise. However, the existence of SOMETHING MISSING HERE, slope dummy differentiates the determination of variables in the model, transforming the model as follows:

$$TB_t = a + \beta_1 IMP_{it} + \beta_2 IMP_{it} * RCA_{it} + \beta_3 EXP_{it} + \beta_4 EXP_{it} * RCA_{it} + \beta_5 X_{it} + \beta_6 X_{it} * RCA_{it} + \beta_7 M_{it} + \beta_8 M_{it} * RCA_{it} + \beta_9 I_{it} + \beta_{10} I_{it} * RCA_{it} + \beta_{11} RCA_{it} + \varepsilon_{it}$$

The implementation of the model was based on panel data analysis, considering it as the most appropriate for cross-sections controls. In addition, we tested the variables of the model on two levels. At the first level of analysis, we tested the degree of impact on the trade balance, by using only the variables of exports, imports, inflation and comparative advantage. In contrast, in the second level we did not count imports and exports, but the share of Euro zone countries in exports and imports. Finally, the model was examined in both variable and fixed periods and cross-section controls, giving differing results, especially for inflation.

### *4.2 Results Analysis of the Model*

The test results of the model are described in the following tables. In particular, we note that in the case of vagueness of the period and cross-section control the results appear to be in line with the theory, as well as the results of the first level of analysis of the present paper (section 3.4) while all variables are statistically significant (IMP, EXP p<1%, RCA p<10%) except the inflation (table 18). Moreover, the explanatory power of the model equals to AdjR2= 95.21% as well as AC (Akaike Criterion) = 1.1976. Finally, we observe a negative impact of imports and a positive impact of exports on the trade balance. In contrast, while selecting fixed periods we observe that inflation is statistically significant at the level of p<10%, with AdjR2= 97.42% and AC (Akaike Criterion) = 0.7315 (table 18).

Regarding the second level of control (using of shares of imports and exports rather than imports and exports), we find similar results to those of the first level of analysis. In particular, during the vagueness (of the dummy variable) all variables, except inflation, are statistically significant (IMP, EXP, RCA p<1%), while the explanatory power of the model equals to AdjR2= 94,35% and AC (Akaike Criterion) equals to 1.3639. At the same level we observe the results while selecting certain

periods, inflation appears to be significantly enhanced over the previous analysis level. Specifically, all variables are statistically significant for p<1%, except inflation where it is p<10% (table 19). Moreover the explanatory power of the model equals to AdjR2= 98,08% while AC (Akaike Criterion) equals to 0,7484.

**Table 18.** The model only with imports and exports

$$TB_t = a + \beta_1 IMP_{it} + \beta_2 IMP_{it} * RCA_{it} + \beta_3 EXP_{it} + \beta_4 EXP_{it} * RCA_{it} + \beta_9 I_{it} + \beta_{10} I_{it} * RCA_{it} + \beta_{11} RCA_{it} + \varepsilon_{it}$$

| Dependent Variable: LN_TRADE_BALANCE<br>Method: Panel Least Squares | | | | Dependent Variable: LN_TRADE_BALANCE<br>Method: Panel Least Squares<br>Cross-section fixed, Period fixed | | | |
|---|---|---|---|---|---|---|---|
| Variable | Coefficient | t-Statistic | Prob. | | Coefficient | t-Statistic | Prob. |
| LN_INFLATION | 0.059221 | 0.254261 | 0.7999 | | 0.306143 | 1.713392 | 0.0980* |
| LN_INFLATION*DUM_RCA | -0.109416 | -0.439025 | 0.6617 | | -0.365056 | -1.786187 | 0.0782* |
| LN_IMPORTS | -0.906293 | -7.073607 | 0.0000*** | | -0.553296 | -4.359073 | 0.0000*** |
| LN_IMPORTS*DUM_RCA | 2.401219 | 16.78259 | 0.0000*** | | 1.880544 | 10.41250 | 0.0000*** |
| LN_EXPORTS | 2.060686 | 13.27454 | 0.0000*** | | 1.746277 | 10.08108 | 0.0000*** |
| LN_EXPORTS*DUM_RCA | -2.446201 | -14.77171 | 0.0000*** | | -1.510316 | -5.546710 | 0.0000*** |
| DUM_RCA | 1.060212 | 1.976815 | 0.0510* | | 0.012556 | 0.010504 | 0.9916 |
| C | -2.728435 | -5.777816 | 0.0000*** | | -3.522462 | -4.205741 | 0.0001*** |
| R-squared | 0.955512 | Mean dependent var | 5.869287 | R-squared | 0.981214 | Mean dependent var | 5.869287 |
| Adjusted R-squared | 0.952164 | S.D. dependent var | 1.938476 | Adjusted R-squared | 0.974266 | S.D. dependent var | 1.938476 |
| F-statistic | 285.3521 | Akaike info criterion | 1.197605 | F-statistic | 141.2178 | Akaike info criterion | 0.731541 |
| Prob(F-st) | 0.000000 | Schwarz criterion | 1.404743 | Prob(F-st) | 0.000000 | Schwarz criterion | 1.456525 |
| | | Durbin-Watson | 1.860126 | | | Durbin-Watson stat | 1.897050 |

*** significance level 1%

** significance level 5%

* significance level 10%

**Table 19.** The model only with shares of Euro Zone countries to exports and imports

$$TB_t = a + \beta_1 X_{it} + \beta_2 X_{it} * RCA_{it} + \beta_3 M_{it} + \beta_4 M_{it} * RCA_{it} + \beta_5 I_{it} + \beta_6 I_{it} * RCA_{it} + \beta_7 RCA_{it} + \varepsilon_{it}$$

| Dependent Variable: LN_TRADE_BALANCE<br>Method: Panel Least Squares | | | | Dependent Variable: LN_TRADE_BALANCE<br>Method: Panel Least Squares<br>Cross-section fixed, Period fixed | | | |
|---|---|---|---|---|---|---|---|
| Variable | Coefficient | t-Statistic | Prob. | | Coefficient | t-Statistic | Prob. |
| LN_INFLATION | 0.203236 | 0.799058 | 0.4263 | | 0.342342 | 1.741039 | 0.0859* |
| LN_INFLATION*DUM_RCA | -0.213168 | -0.783371 | 0.4354 | | -0.407645 | -1.978921 | 0.0516* |
| DUM_RCA | 3.663480 | 7.490538 | 0.0000*** | | 4.089127 | 9.941701 | 0.0000*** |
| LN_SHARE_M | -0.793720 | -5.781168 | 0.0000*** | | -0.579996 | -4.577489 | 0.0000*** |
| LN_SHARE_M*DUM_RCA | 2.332702 | 15.17412 | 0.0000*** | | 1.950263 | 10.28676 | 0.0000*** |
| LN_SHARE_X | 1.911480 | 11.76728 | 0.0000*** | | 1.688653 | 10.44068 | 0.0000*** |
| LN_SHARE_X*DUM_RCA | -2.325381 | -13.37854 | 0.0000*** | | -1.273308 | -4.743489 | 0.0000*** |
| C | 1.003747 | 2.113423 | 0.0372** | | 0.269522 | 0.586940 | 0.5591 |
| R-squared | 0.947461 | Mean dependent var | 5.869287 | R-squared | 0.980893 | Mean dependent var | 5.869287 |
| Adjusted R-squared | 0.943507 | S.D. dependent var | 1.938476 | Adjusted R-squared | 0.973826 | S.D. dependent var | 1.938476 |
| F-statistic | 239.5882 | Akaike info criterion | 1.363945 | F-statistic | 138.7986 | Akaike info criterion | 0.748493 |
| Prob(F-st) | 0.000000 | Schwarz criterion | 1.571084 | Prob(F-st) | 0.000000 | Schwarz criterion | 1.473477 |
| | | Durbin-Watson | 0.662788 | | | Durbin-Watson stat | 1.987015 |

*** significance level 1%

** significance level 5%

* significance level 10%

Overall we observe that the test results of the model are in accordance with theory, confirming a negative impact of imports on the trade balance, as opposed to exports. Furthermore, the Revealed Comparative Advantage index (RCA), has a negative effect and appears to play a key role in shaping of the level of the trade balance, as we observe that it affects all variables at statistically significant levels. Finally, inflation is statistically significant on the first level of analysis and strengthens the significance of the second level of analysis, when we choose specific periods.

## Conclusions

Regarding the export performance of Greece in the Euro area, based on the results of the external trade of Greece with EA (2008-2000), it can be concluded that while exports to the EZ rose by about 1/3 and imports over 2/5, the deficit rose by 50%.

Throughout the period under investigation, the trade balance of Greece compared to the other Euro Zone members was negative and increasing. Greece's trade transactions with five countries in the Euro Zone, namely Italy, Germany, France, Holland and Belgium, produced about 9/10 of the cumulative deficit.

In the Euro era, the Greek economy has reported losses, since the outward indicators of the Greek economy fell during the period 2008/2000 with the exception of imports of goods which increased slightly. As for GDP, total exports fell and the highest decrease was noted in export goods. These developments reflect the deterioration of competitiveness and weaken the position of Greece in the international market. Moreover, out of 16 EZ countries (2008/2000), only the developed northern countries increased their share in world exports, while the southern ones, including Greece, decreased their share especially in southern countries. Subsequently, in the era of the Euro and at a global level, mainly the developed countries of the north have a benefit, while the southern countries have losses in international competitiveness.

The structure of production and foreign trade affect the trade balance deficit and competitiveness of the Greek economy. As shown by the Index of Revealed Comparative Advantage (RCA) (exports of goods throughout the world) of Greece and the four main trading partners in the EZ, Greece has a comparative advantage in the categories of low, middle to low range technology, while it has a disadvantage in the dynamic range of products of medium to high-tech, high tech and information technology and communications.

This development, in the intensely competitive environment of the EZ, highlights the weaknesses and structural problems of the country's productive base, low productivity of fixed capital and the lag in research and technology. Greek production, despite the country's participation in the group of most developed economies in the EU and despite the use of almost four Community Support Frameworks, continues to show features of an emerging economy, where they have stronger comparative advantages, while it does not have features of a developed country in terms of production structure and ?? foreign trade. This gap and the incomplete identity of a developed country, exacerbate the conditions of foreign trade, thus producing the trade deficit.

The lack of competitiveness, apart from the structural weaknesses of the sectoral composition of foreign trade, is due to the inflation differential between Greece and the EZ. The faster rates of inflation in Greece, compared with its trading partners, led to a revaluation of the real exchange rate in the country. Given that the monetary and exchange rate policy is not any longer designed according to the needs of the Euro and depreciation against other partners is not feasible, the inflation differentials accumulate and translate into real currency revaluation, thereby affecting the competitiveness of the economy.

Therefore, the functioning of EMU, as an incomplete monetary integration, has contributed so far to bringing the economies of member countries up, but it also operates, through its foreign trade, as a mechanism of wealth transfer from poorer to richer leader countries and reinforces the uneven growth in favour of the powerful economies against the weaker ones. Without mechanisms to restore these imbalances, government deficits are added to trade deficits, resulting in the so-called twin deficits that inflate the debts of poorer nations.

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Book Review

# *The Law and Policy of Harmonisation in Europe's Internal Market*

edited by Isidora Maletić

Published by Edward Elgar Publishing Limited, Cheltenham, UK, 2013, pp. 215

reviewed by Nikolaos Tsounis*

The book focuses on the interpretation of the legal aspects of European Economic Integration regarding the creation of the single market. It does not tackle issues of the single currency or fiscal alignment but sheds light on what is the heart of the EU structure: the single internal market. Isidora Maletic's book would be interesting for lawyers interpreting the treaty on the creation of the single market and for economists who would like to understand the legal aspects of the creation of the single market.

The book attempts to address, successfully, many legal questions that were still open concerning the interpretation of Article 114 of the Treaty on the Functioning of the European Union, which is the principal Treaty on European market building through harmonization. It provides also interpretations of Article 114 regarding provisions that allow Member States, to protect certain major interests, not national, but rather of general importance e.g. the protection of the public health and the protection of the environment.

The book takes the view that market harmonisation is attained through 'positive' and 'negative' integration, the former being the adaptation of measures by the legislation of the Member States in alignment with European legislation in order to promote market harmonization, while the latter refers to the deregulatory effects on the Member State laws imposed by the European judiciary in order to abolish measures that inhibit the functioning of the Single Market. Several examples of both aspects of the integration process are presented with particular attention paid to the interpretation of the cases of negative harmonization; the role of the Member States, the Commission, the Legislature and that of the Courts is analysed and presented.

It is an essential book for everyone seeking to understand the process of market harmonization of the European Union. Potential readers are students, academics, judges, government representatives, policy-makers, European Union officials and anyone generally interested in the dynamics of EU market harmonisation.

* Professor, Technological Educational Institute of Western Macedonia, Greece.

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Book Review

# *Energy Management in Business*
# *The Manager's Guide to Maximizing and Sustaining Energy Reduction*

edited by Kit Oung

Published by Gower Publishing Limited, UK, 2013 pp. 248

reviewed by Eleni Sfakianaki*

The book deals with the popular topic of energy management. This is an interesting and important topic since we tend to take energy for granted, although there are certain limitations to the resources that energy is produced from: our environment. Being successful in reducing energy consumption is part of being sustainable. However energy reduction and energy saving are not simply savings in fuel bills.

Issues such as energy costs and energy efficiency and the need for energy reductions are thoroughly examined in the first part of the book with proposals on how to achieve energy reductions and how to overcome obstacles to increasing energy efficiency. Moving beyond a cost-cutting approach to maximize value and profitability requires changes in the traditional philosophy of any business. Although the benefits of lower energy consumption are very tempting (for example lower energy costs, tax avoidances, improved CO2 footprints and overall better promotion and competitiveness) it seems that business practices are not there yet. The philosophy of energy management is not yet part of the everyday business activities on both the employee and the more operational and technical levels. A change in the mindset of both senior management and employees is required.

A detailed examination of the various tools and techniques used by consultants and contractors for assessing and recommending energy reductions is presented in the second part of the book. It is undisputed that technology has offered a great deal and indeed has assisted in the improvement of several methodologies. It is evident that there are now even more advanced devices and techniques that can help to control energy costs and increase energy efficiency but this is not enough. The emphasis must be placed on the people that will use the devices, will apply the techniques and monitor the results and will adopt the overall philosophy of energy savings. Otherwise all efforts will only reduce the problem but never optimize the solutions. It is, again, people that will detect the next limitation and will try to solve it with a new combination of detectors etc.

* Assistant Professor, Hellenic Open University, Greece

The third part of the book examines how to gain quick results by understanding failures and presenting the maintenance cycle in order to avoid common mistakes. These improvements require small or no capital costs and can be implemented with no delays. How to choose the right consultant in order to help the business achieve its targets is also demonstrated, although it is emphasized that what could work for one business environment is not necessarily the best choice for another.

Towards the last part of the book the importance of the commitment of the senior management towards energy management is emphasized. Making the results of an energy reduction program last requires a management system that changes the mentality of the employees but also the everyday practices on the manufacturing/ operational level. In this respect the management systems and how they should be implemented to ensure long-term energy reduction are examined. More specifically ISO 50001, the new energy management systems standard, is presented, which aims at long-term sustainable energy performance improvement. This ISO is based on the principle of continuous improvement also used in other standards such as ISO 9001 or ISO 14001. The book however notes that any energy management system should involve the whole company and be integrated into daily operations to ensure sustainable energy reductions.

This book is a very useful contribution providing an overview of the reality in the business environment today. Several surveys demonstrate that towards the end of 2010, the majority of respondents had not started to reduce the energy consumed in their business but expect some form of regulation to enforce energy reduction. Within this context the book is an important contribution to analyzing techniques and methodologies available, how to gain quick results by improving everyday practices, and provides useful information on how to select the right technique and the right consultant. It also offers great help by providing a number of case studies, sometimes a bit too technical, but useful to the manager and even more so to the engineer involved in this area. Anyone with an interest in the energy sector will be able to follow and understand the basic principles presented in the book.

In this respect the book certainly provides a framework for thought and implementation. It satisfies its initial purpose of introducing and analyzing the topics of energy management and present energy reduction opportunities in the business context. It is therefore an excellent source for practitioners, academics, students and anyone in general who wishes to gain a deeper understanding of energy management and the benefits/risks that businesses face.

call for papers

**10th INTERNATIONAL CONFERENCE**

**of ASECU**

organized by
Babeș - Bolyai University
Faculty of Economics and Business Administration
Cluj Napoca, Romania

# ALTERNATIVE ECONOMIC POLICIES AND INSTITUTIONAL REFORMS 1IN SOUTH AND EASTERN EUROPE TOWARDS POST-CRISIS PROSPERITY

May 16-17th, 2014
in Cluj Napoca, Romania

Deadline for abstracts: November 15th, 2013

Deadline for full-papers: February 15th, 2014

http://www.econ.ubbcluj.ro/asecu2014
asecu2014@econ.ubbcluj.ro

# call for papers

## General information

We welcome submissions addressing the ASECU 2014 International Conference theme:

## Alternative Economic Policies And Institutional Reforms in South And Eastern Europe Towards Post-Crisis Prosperity

The conference objectives are:

- Analyzing alternative economic policies meant to stimulate post-crisis prosperity;
- Assessing the existing institutional reforms in South and Eastern Europe and proposing ways for improvement;
- Debating the alternative models of economic growth and development particular to emerging economies;
- Determining the main challenges for the financial sector and searching for ways to overcome them;
- Establishing mechanisms to support small and medium sized entities and enhance their role within the economy;
- Analyzing the role of the financial reporting process in the post-crisis recovery process;
- Assessing the particularities of the post-crisis business environment in South and Eastern Europe;
- Searching for new business opportunities while aiming for sustainable development.

Accepted papers will be published in the conference proceedings only after their presentation in the Conference.

The Editorial Board of *South Eastern Europe Journal of Economics (SEEJE)*, the official journal of ASECU, after having the agreement of the authors, plans to publish selected conference papers following a blind refereeing process.

The conference official language is English.

## Conference Topics

- Economic policies meant to stimulate post-crisis prosperity;
- Institutional reforms in South and Eastern Europe;
- Particularities of the post-crisis business environment;
- Means of promoting sustainable development.

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## Important Dates

| | |
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| November 15th, 2013 | Deadline for submission of abstracts; |
| December 15th, 2013 | Notification for abstracts acceptance; |
| February 15th, 2014 | Deadline for submission of full papers and application forms; |
| March 31st, 2014 | Announcement of the detailed conference program (at www.econ.ubbcluj.ro/asecu2014) |

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(All submissions are refereed):

Submissions of abstracts have to meet the following criteria:

- Abstracts, written in English, should contain two pages;
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- The second page should include the name(s) of author(s), title and abstract of not less than ***300*** and not more than ***500*** words, up to 6 key words and JEL classification.
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The articles should be written as follows:
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