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Monetary Policy in a DSGE New Keyesian Model –Case Study for Romania

Georgiana Alina Ionita[1]

Abstract: The paper proposes the analysis of a Basic New Keynesian model with imperfect competition in goods market and price adjustment mechanism for the macroeconomic context of Romania, as an emerging country. Given the vulnerabilities of the economy of Romania at the beginning and during the recent global economic and financial crisis, there is an increased interest to identify models that can explain the main features of Romania macroeconomic data and to put an eye on shocks that are really necessary to describe the stochastic dynamic of macroeconomic variables.

Keywords: monetary policy; exogenous; shocks

JEL Classification: C01; D50; B22; C4

1. Introduction

The model proposed by the current working paper has the purpose to analyze the impact of exogenous shocks to the macroeconomic variables, in the context of conducting a monetary policy rule through a Taylor rule based on targeting inflation and output gap.

The paper is focused on the analysis of impulse response functions in the context of uncertainty affecting the stochastic behavior of macroeconomic variables, through the following shocks: monetary policy shock, technology shock and preference shock, meanwhile conducting monetary policy.

In addition, another objective of the article is to analyze the suitability of the model for the macroeconomic context of Romania, through the following statistics: autocorrelation coefficients, Blanchard-Kahn stability test, variance decomposition

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and the economic interpretation of impulse response functions and orthogonalized shocks in relation with the empirical macroeconomic evidence.

2. The Model

The model assumes imperfect competition of good, as firms produce different goods for which a part of firms they set price, while other keep the price unchanged, as in the article proposed by Gali, J. (2015).

The agents assumed by the model are: household, firms and Central Bank, as the authority responsible with the monetary policy.

2.1. Household

Households maximize the following utility function: $E_0\sum_{t=0}^{\infty}\beta^t U(C_{t,}N_t)$, C_t representing consumption index described as follows: $C_t \equiv \left(\int_0^1 C_t(i)^{1-\frac{1}{\varepsilon}}di\right)^{\frac{\varepsilon}{\varepsilon-1}}$ in relation with the consumption of good i, N_t represents the number of hours worked and β represent the discount factor.

Households are also subject to the following budget constraint: $\int_0^1 P_t(i)C_t(i)di + Q_t B_t \le B_{t-1} + W_t N_t + T_t$, where: $P_t(i)$ is the price of good i at moment "t", N_t = index of hours worked at moment "t", W_t is nominal wage at moment "t", B_t represents acquired one period bond at moment "t", Q_t is the price of bond acquired at moment "t" and T_t = lump-sum income component at moment "t". The demand equation is described by the equation $C_t(i) = \left(\frac{P_t(i)}{P_t}\right)^{-\varepsilon} C_t$, where $P_t \equiv \left[\int_0^1 P_t(i)^{1-\varepsilon}di\right]^{\frac{1}{1-\varepsilon}}$ is the aggregate price index. The optimal condition for consumers behavior is $\int_0^1 P_t(i)C_t(i)di = P_t C_t$. The resulting budget constraint for consumers is described as follows: $P_t C_t + Q_t B_t \le B_{t-1} + W_t N_t + T_t$.

The optimal consumption /savings and labour supply decisions are described by the following utility ratio: $-\frac{U_{n,t}}{U_{c,t}} = \frac{W_t}{P_t}; Q_t = \beta E_t \left\{ \frac{U_{c,t+1}}{U_{c,t}} \frac{P_t}{P_{t+1}} \right\}$.

The utility function for one period is described as follows: $U(C_t, N_t) = \frac{C_t^{1-\sigma}}{1-\sigma} - \frac{N_t^{1+\varphi}}{1+\varphi}$.

2.2. Firms

The production function described by the firms is as follows: $Y_t(i) = A_t N_t(i)^{1-\alpha}$, where A_t represents the total factor productivity, which is identical for all firms.

In logs, the relation between output, employment and technology is described by the following log-linearized Cobb-Douglas production function, as follows: $y_t = a_t + (1-\alpha) n_t$.

Evidence on the effects of technology shocks and its implications are similar to those proposed by Gali, J. (1999) and Basu, Fernald and Kimball (2004), among others. Recent evidence, as well as alternative interpretations are surveyed in Gali and Rabanal (2004).

At one moment t, $1-\theta$ of firms reset their price, while the remaining θ keep the price unchanged.

The aggregate price dynamic is as follows: $\pi_t^{1-\varepsilon} = \theta + (1-\theta)\left(\frac{P_t^*}{P_{t-1}} \right)^{1-\varepsilon}$, while $\pi_t \equiv \frac{P_t}{P_{t-1}}$ defines inflation rate and P_t^* represents the set price by firms reoptimizing. At steady-state, the equation becomes through log linearization $\pi_t = (1-\theta)(p_t^* - p_{t-1})$.

For optimal price setting, the maximization function for firms that set optimal price P_t^* in order to maximize the profit is: $max_{P_t^*} \sum_{k=0}^{\infty} \theta^k E_t \{ Q_{t,t+k} (P_t^* Y_{t+k/t} - \psi_{t+k}(Y_{t+k/t})) \}$ subject to the sequence of

demand constraints: $Y_{t+k/t} = \left(\frac{P_t^*}{P_{t+k}}\right)^{-\varepsilon} C_{t+k}$, where $Q_{t,t+k} \equiv \beta^k \left(C_{t+k} / C_t\right)^{-\sigma} \left(P_t / P_{t+k}\right)$ represents the stochastic discount factor of payoff, ψ_t is the cost function and $Y_{t+k/t}$ represents the output in period t+k for firms resetting the price in period t. The resulting log-linearized form of maximization function is $p_t^* = \mu + (1-\beta\theta)\sum_{k=0}^{\infty}(\beta\theta)^k E_t\{mc_{t+k/t} + p_{t+k}\}$, where $mc_{t+k/t}$ represents the log of marginal cost and μ is the desired gross mark-up.

At equilibrium market clearing condition requires that supply is equal with demand, $Y_t(i) = C_t(i)$ (and respectively, $Y_t = C_t$ in aggregate), where the aggregate output Y_t is composed of a continuum of intermediate goods, $Y_t(i)$ as in the working paper of Kimball (1995), described as $Y_t \equiv \left(\int_0^1 Y_t(i)^{1-\frac{1}{\varepsilon}} di\right)^{\frac{\varepsilon}{\varepsilon-1}}$.

From market clearing condition and consumer's Euler equation, the resulting equilibrium condition is: $y_t = E_t\{y_{t+1}\} - \frac{1}{\sigma}(i_t - E_t\{\pi_{t+1}\} - \rho)$.

Market clearing in case of labor market is:

$$N_t = \int_0^1 N_t(i)di \Leftrightarrow N_t = \int_0^1 \left(\frac{Y_t(i)}{A_t}\right)^{\frac{1}{1-\alpha}} di = \left(\frac{Y_t}{A_t}\right)^{\frac{1}{1-\alpha}} \int_0^1 \left(\frac{P_t(i)}{P_t}\right)^{-\frac{\varepsilon}{1-\alpha}} di .$$

Inflation equation is described as follows: $\pi_t = \beta E_t\{\pi_{t+1}\} + \lambda \hat{mc}_t$, where $\lambda \equiv \frac{(1-\theta)(1-\beta\theta)}{\theta}\Theta$ and $\hat{mc}_t$ is the deviation from steady state of real marginal cost.

The derived equation relating inflation to output gap and inflation from t+1 is described by the following New Keynesian Philips curve: $\pi_t = \beta E_t\{\pi_{t+1}\} + \kappa \tilde{y}_t$, where $\kappa \equiv \lambda(\sigma + \frac{\varphi + \alpha}{1-\varepsilon})$.

An inflation equation identical to the New Keynesian Phillips curve can be derived under the assumption of quadratic costs of price adjustment, as shown in Rotemberg, J. (1982).

The equation of equilibrium related to the output gap for the New Keynesian model is described as follows: $\tilde{y}_t = -\frac{1}{\sigma}(i_t - E_t\{\pi_{t+1}\} - r_t^n) + E_t\{\tilde{y}_{t+1}\}$, where r_t^n is the natural interest rate, defined as follows: $r_t^n \equiv \rho + \sigma E_t\{\Delta y_{t+1}^n\} = \rho + \sigma\psi_{ya}^n E_t\{\Delta a_{t+1}\}$.

3. Equilibrium Dynamics under Monetary Policy Rule

The current article proposes the analysis of equilibrium under a simple monetary policy rule of the form: $i_t = \rho + \phi_\pi \pi_t + \phi_y \tilde{y}_t + \upsilon_t$, where υ_t is an exogenous component with zero mean, ϕ_π and ϕ_y are non-negative coefficients, chosen by monetary authority and ρ is a constant factor.

The equilibrium conditions result from the following system of difference equations:

$$\begin{bmatrix} \tilde{y}_t \\ \pi_t \end{bmatrix} = A_T \begin{bmatrix} E_t\{\tilde{y}_{t+1}\} \\ E_t\{\pi_{t+1}\} \end{bmatrix} + B_T(\hat{r}_t^n - \upsilon_t),$$

where $\hat{r}_t^n \equiv r_t^n - \rho$ and

$$A_T \equiv \Omega \begin{bmatrix} \sigma & 1-\beta\phi_\pi \\ \sigma\kappa & \kappa + \beta(\sigma + \phi_y) \end{bmatrix};$$

$$B_T \equiv \Omega \begin{bmatrix} 1 \\ \kappa \end{bmatrix} \text{ and } \Omega \equiv \frac{1}{\sigma + \phi_y + \kappa\phi_\pi}.$$

3.1. Model Summary

The analyzed model consists of a total number of 25 variables, out of which number of state variables is 6 (variables for which t_0 moment is defined by the model) and the number of control variables is 19 (of which 2 forward looking variables- which appear in equations of the model at "t+1" moment and 17 static variables- which appear in equations of the model at "t" moment). The number of stochastic shocks is 3.

The variables of the model are: inflation, output gap, natural output, output, output deviation from steady state, natural interest rate, real interest rate, nominal interest rate, number of hours worked, real money stock, money growth, money growth annualized, nominal money stock, annualized real interest rate, annualized nominal interest rate, annualized natural interest rate, annualized inflation rate, price level, nominal wage, real wage, consumption, price markup and mark-up gap, monetary policy shock factor and technology shock factor.

All model variables are expressed in deviations from steady state and at steady-state all variables are 0 due to model linearization.

The three shocks of the model are: monetary policy shock, technology shock and preference shock.

3.2. Calibration and Prior Distribution of the Parameters

One important step of estimation of a DSGE model consists of calibration of the model's parameters. As part of the strong econometric approach of estimation, as I used for the current model, the Bayesian approach by using the likelihood function with prior distributions for the parameters of the model, in order to form the posterior distribution. This posterior is afterwards optimized with respect to the model parameters either directly or through Monte-Carlo Markov- Chain (MCMC) sampling methods, as in F.Canova, (2007).

For the calculation of the likelihood function of the observed data series, I have used the Kalman filter, as in Sargent T.J. (1989).

In terms of parameterization most of these parameters are directly related to the steady-state values of the state variables and could therefore be estimated from the means of the observable variables. The standard errors of the innovations are assumed to follow an inverse-gamma distribution with two degrees of freedom.

The quarterly discount factor, β, is set at 0.99, based on the average rate of 3M - 5M bonds issued by state, implying a real return on financial assets of about 4%. The log utility parameter is assumed $\sigma = 1$ and φ=1 (labour supply elasticity), α =1/3 and ε=6, according with the common literature.

The money demand semi-elasticity to the interest, η , is established at 4, θ indicator of price stickiness is set at 2/3, resulting an average contract price duration $(1/2\theta)$ of three quarters. In term of monetary policy rule coefficients, the coefficient of target inflation and of output gap are set as: ϕ_π=1.5, ϕ_y=0.125, while ρ_υ=0.5 represents a moderate persistent interest rate shock.

4. Results

4.1. Equilibrium under an Interest Rate Rule

The analysis of matrix covariance indicates a zero covariance of the three shocks: monetary policy shock, technology shock and preference shock and the standard deviation of preference or discount rate shock.

Variables	eps_a	eps_nu	eps_z
eps_a	0	0	0
eps_nu	0	0.0625	0
eps_z	0	0	0

We have also analyzed the historical variance decomposition of the endogenous variables. Table 2 below illustrates the deviation of the smoothed value of the endogenous variables from their steady state for the specified set of parameters, without taking into consideration the steady-state, based on the contribution of the smoothed shocks to the deviation of smoothed endogenous variables from steady state.

As resulted from the variance decomposition (table 2 below), the most significant shock that influences the each variable is considered the monetary policy shock, in case of equilibrium under an interest rate rule.

Table 2. Variance decomposition (%)

	eps_a	eps_nu	eps_z
y_gap	0	100	0
pi_ann	0	100	0
Y	0	100	0
N	0	100	0
w_real	0	100	0
i_ann	0	100	0
r_real_ann	0	100	0
Nu	0	100	0

Table 3. Coefficients of autocorrelation

Order	1	2	3	4	5
y_gap	0.5	0.25	0.125	0.0625	0.0313
pi_ann	0.5	0.25	0.125	0.0625	0.0312
Y	0.5	0.25	0.125	0.0625	0.0313
N	0.5	0.25	0.125	0.0625	0.0313
w_real	0.5	0.25	0.125	0.0625	0.0313
i_ann	0.5	0.25	0.125	0.0625	0.0313
r_real_ann	0.5	0.25	0.125	0.0625	0.0312
Nu	0.5	0.25	0.125	0.0625	0.0312

The coefficients of autocorrelation (table 3 above) indicate the lack of autocorrelation for the analyzed variables from first order to the 5^{th} order.

In terms of stability of the system of equations, the rank condition this is verified, as there are 2 eigenvalues larger than 1 in modulus for 2 forward-looking variables, which means that the Blanchard-Kahn condition is met.

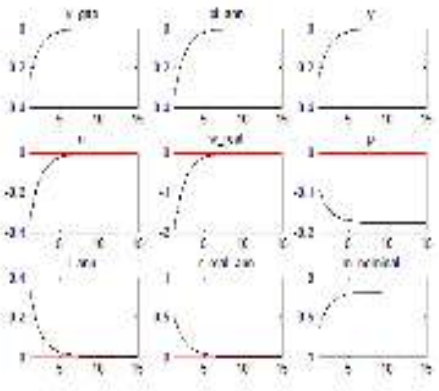
4.2. The Effects of a Monetary Policy Shock

The exogenous interest rate component, υ_t has the form of a process AR(1): $\upsilon_t = \rho_\upsilon \upsilon_{t-1} + \varepsilon_t^\upsilon$, where ε_t^υ indicates the tightening or expansionary monetary policy shock, leading to a rise or decrease of nominal interest rate, given inflation and output gap.

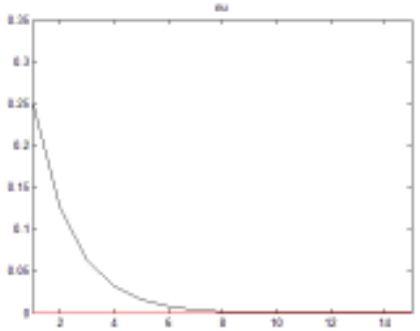
An exogenous increase of the interest rate as results from graph 1 below leads to a persistent decrease of the output gap and inflation. As the natural level of output is not influenced by the policy shock, the response of output matches that of the output gap. The response of the nominal interest rate includes the direct effect of υ_t and the variation induced by lower output gap and inflation.

If the persistence of the monetary policy shock ρ_υ is sufficiently high, the nominal rate will decrease in response to a rise in υ_t, as a result of the downward adjustment in the nominal rate induced by the decline in inflation and the output gap more than offsetting the direct effect of a higher υ_t. As a result, despite the lower nominal rate, the policy shock still has a tightening effect on output, because it is inversely related to the real rate. The figure below represents the dynamic response of an expansionary monetary policy shock of an increase of one standard deviation (25 basis points) in ε_t^υ. This shock, without further change induced by the response of inflation or the output gap, would imply an increase of 100 basis points to the annualized nominal rate.

Moreover, the policy shock generates an increase in the real rate and a decrease of inflation and output and, as a result, central bank has to reduce the money supply.



Graph 1. IFR of a monetary policy shock



Graph 2. Ortogonalized monetary policy shock

As results from the above graph, a negative monetary policy shock of one standard deviation in case of ε_t^{υ} (meaning decrease of the interest rate) as part of an expansionary monetary policy leads a decrease of inflation, wages and of GDP (as a result of the output gap decrease) and finally leads to an increase of the nominal interest rate.

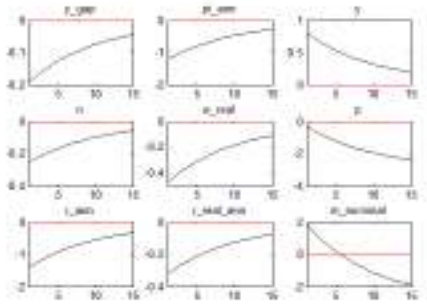
Moreover, the impact of an expansionary monetary policy is the increase of real interest rate, having an impact higher than in case of nominal interest, due to further decrease in expected inflation.

As a result, the authority responsible with the monetary policy should intervene in order to decrease the nominal interest rate, through another monetary policy instrument, by decreasing money supply.

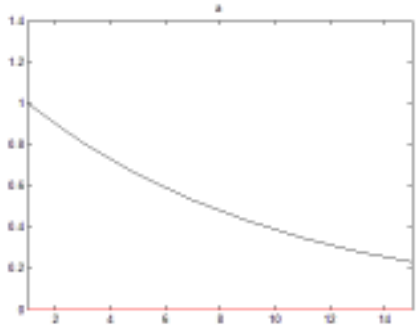
The decomposition of orthogonalized shock as described in graph 2 above is indicated in case of inter-correlated shocks, but the graph analysis is even relevant in case shocks are not correlated. The graphical analysis indicates the responses of GDP variable as a result of a monetary policy shock, without including the effects it has on the rest of the variables in the system, in order to analyze the impact of one single shock at one moment of time, to one single variable. In case of an uncorrelated (orthogonal) monetary policy shock, as described in graph 2 above, the interpretation is that a change in interest rate shock with the size of one standard deviation has an isolated effect of increase with 0.25% of interest rate in log deviation percentages (on OY axis).

4.3. The Effects of a Technology Shock

The technology parameter a_t follows the following AR (1) process: $a_t = \rho_a a_{t-1} + \varepsilon_t^a$ According with the graph 3, a positive technologic shock, $\rho_a = 0.9$ leads to a persistent employment decrease. Moreover, as a result of a positive technologic shock Central Bank diminishes the interest rate and increases the money supply, as part of an expansionary monetary policy. Output increases while employment and real wages decrease. Moreover as can be seen from the graph below, the output gap and inflation fall below zero steady-state.



Graph 3. IFR for a technology shock

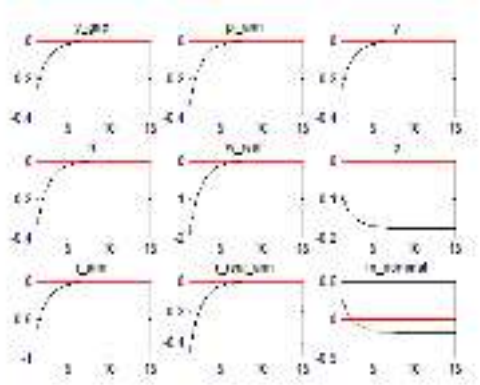


Graph 4. Orthogonalized technology shock

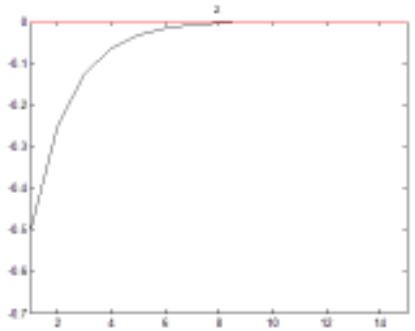
In case of an uncorrelated (orthogonal) technology shock, as described in graph 4 above, the interpretation is that a change in technology shock with the size of one standard deviation has an isolated effect of increase with 1% of GDP in log deviation percentages (on OY axis).

4.4. The Effects of a Preference Shock

In case of a positive preference shock as results from the graph 6 below there is a decrease of output (influenced by the decrease of output gap), decrease of inflation, of real wages, of real interest rate, of employment and a final decrease below steady-state of the nominal interest rate.



Graph 5. IFR for a preference/discount rate shock



Graph 6. Orthogonalized preference shock

In case of an uncorrelated (orthogonal) preference shock, as described in graph 6 above, the interpretation is that a change in preference shock with the size of one standard deviation has an isolated effect of decrease with 0.5% of GDP in log deviation percentages (on OY axis).

5. Conclusions

The New Keynesian model proposed for analysis indicates the significance of the exogenous shocks such as: monetary policy shock, technology shock and preference shock on the behavior of macroeconomic variables such as GDP, as economic welfare indicator, of employment index, inflation, real wages and also on interest rate and money supply, as monetary policy instruments.

The analysis if focused on the impact of conducting macroeconomic policy through the Taylor rule proposed in relation with the welfare analysis, in the context of uncertainty affecting the stochastic behavior of the macroeconomic variables through exogenous shocks.

The model is validated by the results obtained and also by the tests performed, such as: Blachnard-Kahn stability test performed for the equation of the system, analysis of the coefficients of autocorrelation, orthogonalized shocks and variance decomposition. In addition, the results for the impulse response functions for the three shocks are in line with macroeconomic evidence: an expansionary monetary policy leads to a decrease of GDP, wages and inflation and finally lead to an increase of the nominal and real interest rate. As a result, the authority responsible with the monetary policy should intervene in order to decrease the nominal interest rate by decreasing money supply.

In case of a positive technologic shock central bank diminishes the interest rate and increases the money supply, as part of an expansionary monetary policy. Output increases while employment, real wages decrease, output gap and inflation fall below steady-state. In case of a positive preference shock there is a decrease of output (influenced by the decrease of output gap), decrease of inflation, of real wages, of real interest rate, of employment and a final decrease below steady-state of the nominal interest rate. To conclude, the model proposed by the current working paper has achieved the purpose to analyze the impact of exogenous shocks to the macroeconomic variables, in the context of a monetary policy rule based on targeting inflation and output gap.

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Validity of Purchasing Power Parity in BRICS under a DFA Approach

Emmanuel Numapau Gyamfi[1], Adam Anokye Mohammed[2]

Abstract: This study tests the validity of the purchasing power parity (PPP) theory in Brazil, Russia, India, Macao-China and South Africa. We examine real exchange rates of these countries for mean reversion. The Hurst exponent is our mean reversion measure which is evaluated by the Detrended Fluctuation Analysis (DFA) in a rolling window to determine the validity of the PPP theory amongst these countries through time. Our results show persistence in real exchange rates; an indication not supporting the PPP theory in the five countries. The study contributes to the extant literature of the PPP theory in BRICS using the DFA approach in a rolling window through time.

Keywords: Real Exchange rates; Hurst exponent; DFA; Rolling window

JEL Classification: F31; C22

1. Introduction

The Purchasing Power parity (PPP) which is based on the law of one price states that goods in the same basket should be of the same price in two trading countries. This means that if PPP is valid, a unit of currency in one country will have the same value and purchasing power of the other country (Taylor & Taylor, 2004).

In this study, we test the validity of the PPP of 5 countries; Brazil, Russia, India, China and South Africa. These 5 countries known as BRICS are members of the G20 who came together in 2001 with South Africa joining in 2010 to trade amongst themselves. Their trading relationship is based on mutual gains and equality hence the need to test whether a currency in one country is of the same value and of the same purchasing power in another country to avoid unbounded gain from arbitrage in traded goods (Chang et al., 2012). The validity or otherwise of PPP within BRICS has implication for the equilibrium exchange rate and also helps to monitor currency manipulation to gain unfair trade advantage.

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The PPP has been tested for many countries over time. The literature reports of methods such as cointegration tests by Frenkel (1978), Krugman (1978), Telatar & Kazdagli (1998), Doganlar (2006), Nayaran et al. (2009), Liew et al. (2010) etc. Also, researchers such as Adler & Lehman (1983), Edison (1987), Erlat (2004), Alba & Park (2005), Sollis (2005), Tastan (2005), Nayaran & Nayaran (2007), Aslan & Korap (2009), Yildirim et al. (2013), Yilanci et al (2013), Zhou & Kutan (2014) used linear and nonlinear unit root tests to investigate the validity of the PPP.

On the BRICS countries, the PPP has been tested by Chang et al. (2010) who used the momentum threshold tests advanced by Enders & Siklos (2001). Chang et al. (2010) investigated if there were asymmetric adjustment discernible for BRICS. Their study reported that PPP holds for the BRICS countries in the long- run. Also, Chang et al. (2012) employed the Autoregressive Distributed Lag (ADL) test for threshold cointegration to test if the PPP of the BRICS countries is valid in the long-run. It was reported that the PPP holds in the BRICS countries except Brazil. Furthermore, Su et al. (2012) investigated the validity of the long-run Purchasing Power Parity (PPP) for the BRICS countries using linear and nonlinear unit root tests with stationary covariates. It was reported that the PPP is valid for all the BRICS countries.

In this work, the PPP will hold for all the BRICS countries if the real exchange rates (RER) are mean reverting. The Hurst estimate; Hurst (1951) will be used as our mean reversion measure which will be evaluated by the Detrended Fluctuation Analysis (DFA). The superiority of Hurst exponent in testing mean-reversion is acknowledged by Gogas, Papadimitriou and Sarantitis (2013). The Hurst estimates takes values between 0 and 1. That is $H\epsilon$ [0, 1]. Values close to zero ($H<0.5$) indicate anti-persistent series meaning the series is mean-reverting; a situation validating PPP. If $H\geq0.5$, it indicates either the series follows a random walk ($H=0.5$) or a persistent series ($H>0.5$), a situation providing evidence against PPP. The DFA is a method proposed by Peng et al. (1994) to detect long memory and stationarity of time series data over time. The DFA method was chosen for this study amongst other methods for evaluating the Hurst exponent such as the rescaled range analysis, local whittle estimator and the likes because the DFA is robust to stationary and non-stationary data according to Cannon et al. (1997) and Eke et al. (2002). The DFA method was first employed to estimate the Hurst exponent for the full sample data. Second, two rolling windows with different lengths were employed to observe the trends of the Hurst estimates through time.

The rest of the article is organized as follows. Section 2 describes the data and the methodology. Section 3 describes the empirical results and the conclusion is in section 4.

2. Data and Methodology

Monthly data on nominal exchange rates against the US dollar and consumer price indexes (CPI) of Brazil, Russia, India, Macao-China and South Africa were obtained for the period between 1993M01 to 2015M12. The data was obtained from International Financial Statistics (IFS) of the International Monetary Fund (IMF).

Real exchange rate is given as:

$$\mathrm{RER_t} = \ln(\mathrm{S_t}) - \ln(\mathrm{CPI_{US,t}}) + \ln(\mathrm{CPI_{i,t}}) \quad (1)$$

Where $\mathrm{S_t}$ is the nominal exchange rate expressed in US dollars per one unit of foreign currency, $\mathrm{CPI_{US,t}}$ is the consumer price index of US (domestic country) and $\mathrm{CPI_{i,t}}$, the consumer price index of a foreign country.

We construct real exchange rates of the five countries using equation 1 which gives us 276 observations for each country.

The Hurst exponent, our mean reversion measure is evaluated using the detrended fluctuation analysis (DFA) first for the full sample period and second through the rolling window method. We chose two windows of size 138 and 207 to observe the dynamics of the Hurst exponent through time.

Detrended Fluctuation Analysis (DFA)

The Detrended Fluctuation Analysis (DFA) is used in calculating the Hurst exponent, H of the real exchange rates (RER) in absolute form and through time in a rolling window approach.

We follow Peng et al. (1994) who proposed the DFA.

Suppose X(t) is a time series with t = 1,…, N. in this method, the time series is divided into blocks of the same length n.

The ordinary least squares method is used to estimate the trend in each block. In each block, the ordinary least square line is expressed as $X_n(t)$. The trend of the series is removed by subtracting $X_n(t)$ from the integrated series X(t) in each block.

This procedure is applied to each block and the fluctuated magnitude is defined as

$$\sigma_{DFA} = \sqrt{\frac{1}{N} \setminus \sum_{t=1}^{N} (X(t) - X_n(t))^2} \quad (2)$$

This step is repeated for every step n and to estimate Hurst exponent, the following scaling relationship is defined:

$$\sigma_{DFA} \alpha n^H \quad (3)$$

Equation (3), can be written as:

$$\log(\sigma_{DFA}) \alpha H \log(n) \quad (4)$$

This linear relationship between σ_{DFA} and n on a log – log plot support the presence of a power law (fractal) scaling which indicate there is self – similarity in the series. This means the fluctuation over small time scale are related to fluctuations over larger time scales. The slope of the linear relationship estimates the Hurst exponent. The Hurst exponent H ∈ [0, 1] where H = 0.5 means the series follows a random walk, H < 0.5 indicates mean-reversion and H > 0.5 indicates persistence.

3. Empirical Results

Table 1. Hurst Exponent for full sample

Country	Hurst Exponent
Brazil	0.792
Russia	0.899
India	0.685
Macao-China	0.767
South Africa	0.664

Table 1 shows the Hurst results for the full sample for the five countries. Figures 1-3 are the graphical representations of the Hurst exponents of the countries under consideration. The Hurst exponents are greater than 0.5 indicating persistence; a condition giving evidence against purchasing power parity.

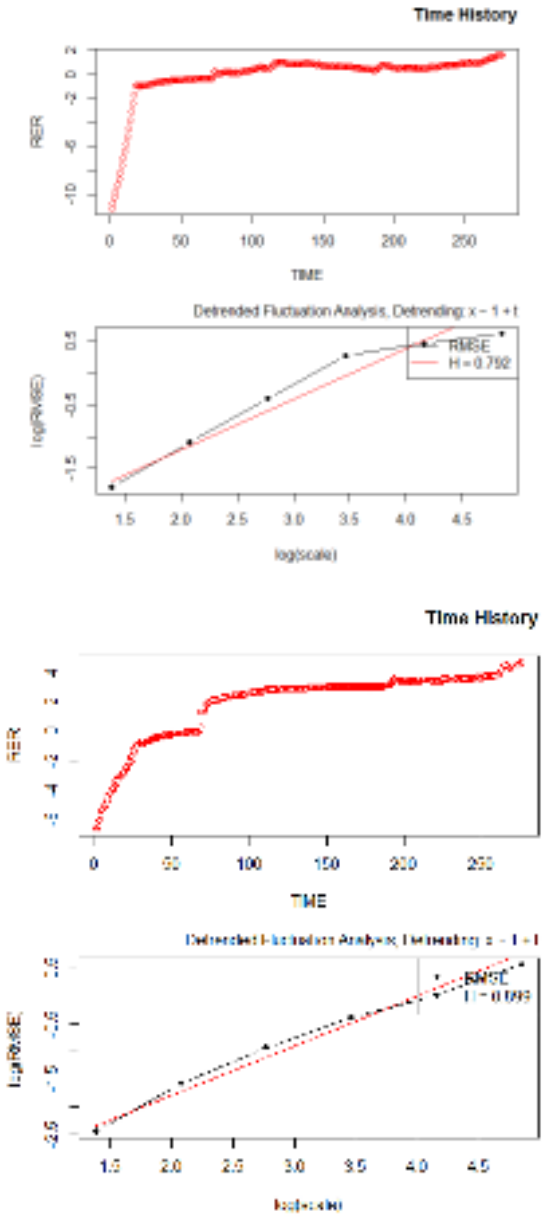

Figure 1. EDA plots of Brazil and Russia

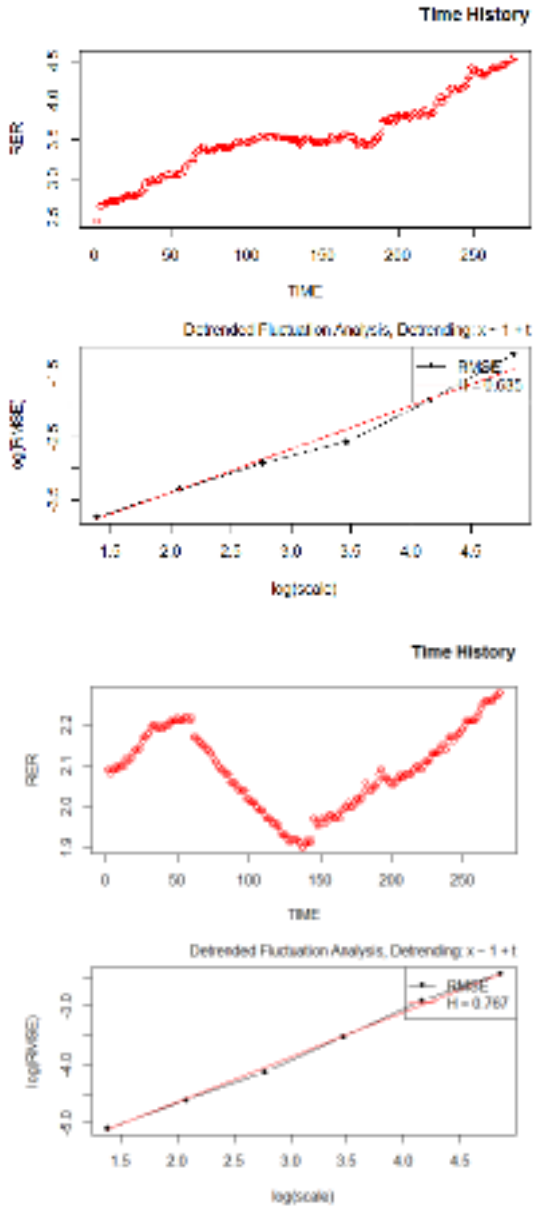

Figure 2. EDA plots of India and Macao-China

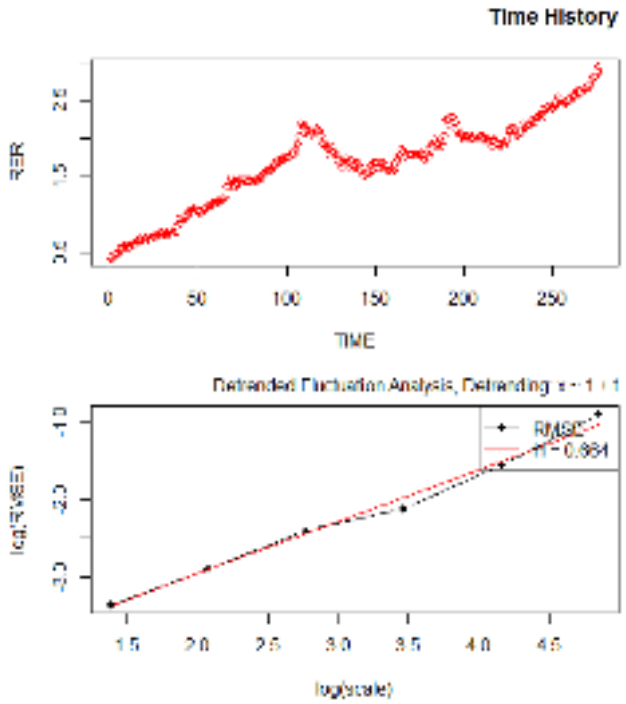

Figure 3. EDA plots of South Africa

Next, we compute Hurst exponents using the rolling window method. We chose two window lengths; 138 and 207 because of the length of our data. These window lengths produced 139 and 70 Hurst exponents respectively. The Hurst exponents computed using the rolling window method are graphically represented in Figures 4-8. It is observed from Figures 4-8 that the Hurst exponents are mostly high (>0.5) for all the countries with values ranging from 0.2 – 0.9 for Brazil, India, Macao-China and South Africa. In Figure 5, Russia had values as high as 1.1 which is out of the range of H. This situation is attributed to small sample size according to Cannon et al. (1997) and Delignieres et al. (2006), who posit that the DFA performs poorly with biased results when sample size is less than 256 observations. The results obtained shows that the real exchange rates of the BRICS countries are mostly persistent with few periods of anti-persistence through time. This means the PPP is mostly violated through time.

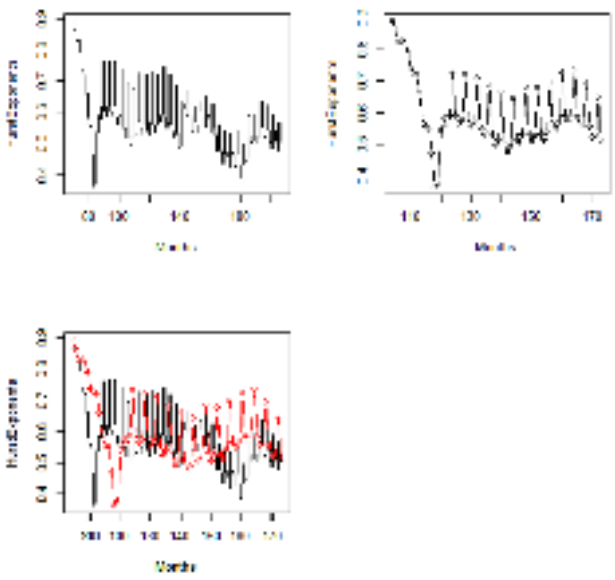

Figure 4. Hurst Exponent Estimates of Brazil for the two rolling window lengths

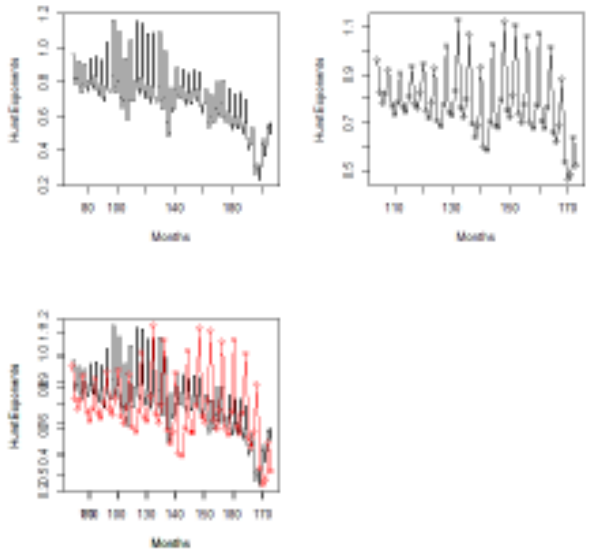

Figure 5. Hurst Exponent Estimates of Russia for the two rolling window lengths

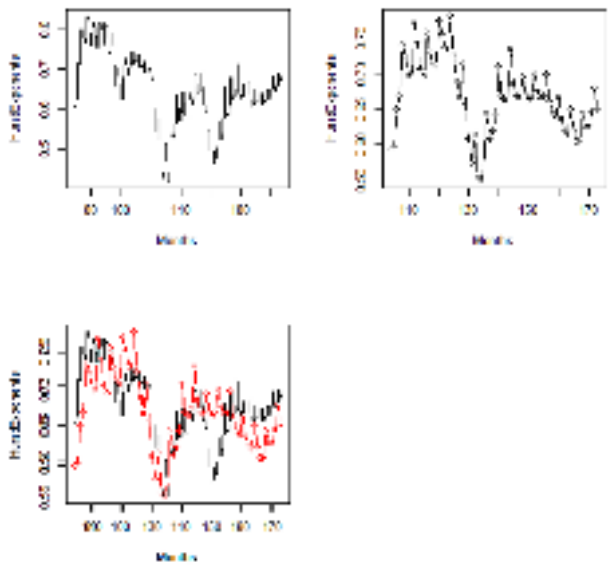

Figure 6. Hurst Exponent Estimates of India for the two rolling window lengths

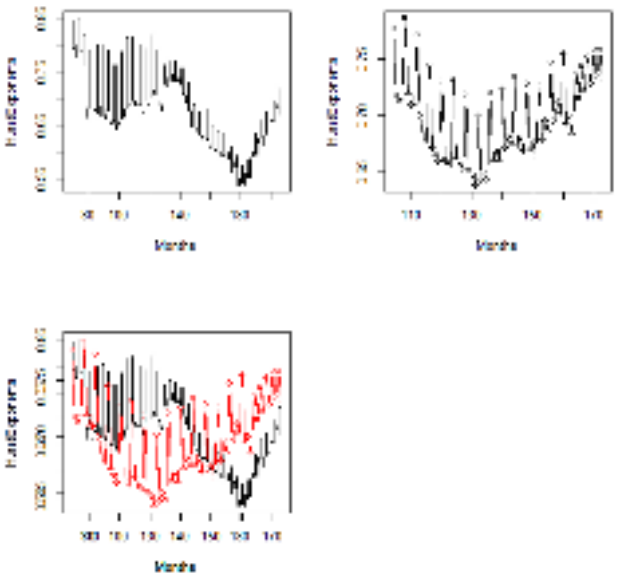

Figure 7. Hurst Exponent Estimates of Macao-China for the two rolling window lengths

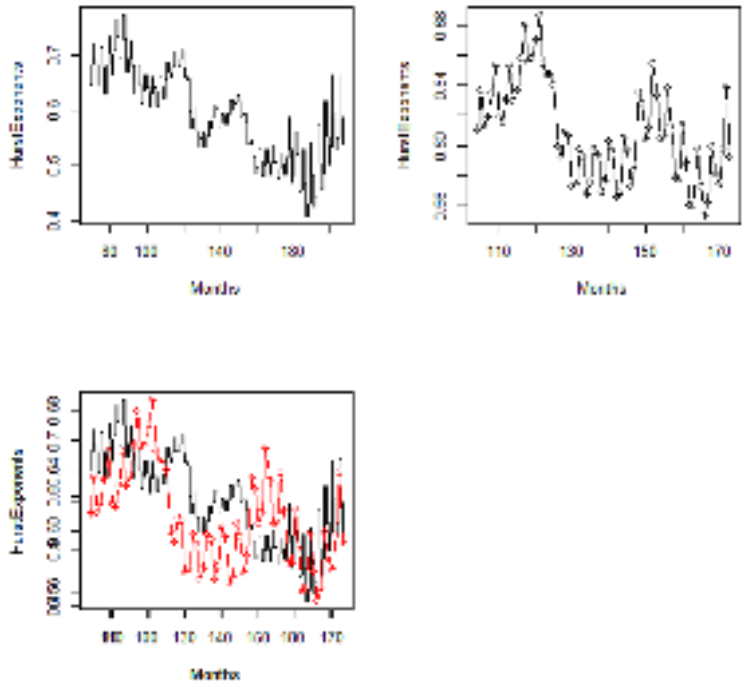

Figure 8. Hurst Exponent Estimates of South Africa for the two rolling window lengths

4. Conclusion

We tested the validity of the PPP theory in BRICS; five countries made up of Brazil, Russia, India, China and South Africa. The Hurst exponent was employed as a measure of mean reversion in real exchange rates which was evaluated by the Detrended Fluctuation Analysis (DFA) in absolute form and in a rolling window approach through time. The Hurst exponents obtained for the full sample and the rolling window samples were mostly greater than 0.5. This means persistence in the real exchange rates; a condition which provides evidence against the PPP theory in the real exchange rates of the five countries. Our findings contradicts the findings of the PPP theory by Chang et al. (2010), Chang et al. (2012) and Su et al. (2012). Our contradictory findings is because of the use of the rolling window approach employed in our analysis and the time span. The rolling window approach helps us tract the trends of the Hurst estimates through time.

We therefore conclude that a major policy implication from our findings is that, in most times, the PPP cannot be used to determine the equilibrium exchange rates for the five BRICS countries. This means that abnormal gains can be made from arbitrage in traded goods.

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Fiscal Evasion in the Republic of Kosovo

Bedri Peci[1]

Abstract: The aim of this research is to analyze and find out the major issue of fiscal evasion in Kosovo. In this analysis we have used the research method of case study. The results of research show that the phenomenon of fiscal evasion and informality in Kosovo can hardly be measured because in essence these phenomena belong to the hidden economy. Fiscal evasion occurs as a result of disorders in the overall economy and is present in many countries, including industrialized countries as well as those with economy under development, and therefore the state of Kosovo is exposed to this phenomenon. This phenomenon is even more developed in countries lacking legal infrastructure, with particular emphasis the readiness of responsible persons for combating this phenomenon in the context of available opportunities. Kosovo has a high level of informality and this is due to insufficient inspection of enterprises and failure to implement applicable laws.

Keywords: Fiscal evasion; informal economy; shadow economy; Kosovo

JEL Classification: H26

1. Introduction

The expression Fiscal evasion is related to all those actions aiming at reducing or eliminating fiscal contribution to the state budget from citizens or entities violating the provisions and specific fiscal norms. Fiscal evasion is non-payment of tax liabilities deriving from the law. This phenomenon has a destructive effect towards fiscal policy causing a significant loss to the state from its fiscal incomes. Tax evasion is often regarded as petty crime that may, to some extent, be socially acceptable. This is also reflected in the observation that tax evasion is often punished with monetary fines rather than actual imprisonment (Pickhardt & Prinz, 2012, p. 4).

Fiscal evasion is also known by many other names such as: underground economy, shadow economy, informal economy and black market economy. Tax evasion mostly appears to direct taxes (the shadow economy), but can also occur to indirect taxes known as smuggling. Smuggling is also illegal phenomenon that occurs with

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the distribution of any secret goods which is subject to turnover tax or customs. Smuggling appears on the turnover tax if sold goods are not registered and if avoid from payment of turnover tax within state borders is made for e.g. the sale of alcoholic beverages from producers directly to consumers without paying turnover tax (Komoni, 2008, p. 109). Failure to pay direct payments is known as shadow economy. This means that part of the economy is known as the "underground activity". Shadow economy is also termed as illegal, unofficial, informal, and black market economy, etc. It is defined as an economy aiming to avoid (flee) tax obligation and its non-inclusion on statistics from economic and political point of view appears in shadowy. Shadow economy appears in crisis situations because it is a convenient terrain for it. More spent than earned; it talks about illegal enrichment, theft, fictitious sales actions that belong to the shadow economy. The forms of the shadow economy appear on exceptional situations such as: wars, social conflicts, crisis, economic blockade, etc. The presence of the shadow economy has serious implications for the performance of the economy and public politics. In these circumstances, assessments and recommendations of policymakers have greater tendency to fail due to poor quality of official statistics (Blackburn, Bose & Capasso, 2012). This economy has a great impact on general economic trends, distorts the official situation and the data are incorrect. The high level of tax evasion is a danger not only for economic development but also for the development of free competition. The notion of the informal economy mainly refers to that part of the national economy that is not subject to tax payment and failure to respect the applicable legal provisions; reducing state revenues from the formal sector from failure to pay the taxes by damaging the economy seriously. So, the notion of the informal economy is a broader concept that includes in itself all activities performed outside fiscal and legal system.

In the long historical context, the policy and tax systems of Kosovo were followed during their evolution by many changes that were made based on the challenges of the political and socio-economic structure of Kosovo (initially as part of a federal system and later followed by the deployment of United Nations Interim Administration Mission in Kosovo (the UNMIK) (Peci, 2016, p. 170). Otherwise, today, the Kosovo tax system includes Corporate Income Tax, Personal Income Tax, Withholding Tax, Real Estate Tax, VAT, Excise Tax, and Customs Duties (Peci, 2009, p. 222). Since the declaration of independence on 17 February 2008 and to date, the Government of the Republic of Kosovo took two tax reforms. The measures taken are only related to reducing the tax rates on the main taxes, with the objective of stimulating foreign investment and allowing taxpayers to pay less tax so as to minimize evasion. Despite this, with the undertaken measures, we can rightly say that tax evasion in Kosovo is not only a serious problem, but it is a growing problem. Kosovo has a high degree of tax evasion and this, according to experts of economic affairs, is due to insufficient inspection of businesses and non-implementation of positive laws. The high level of tax evasion hinders extremely

the economic development, the way of developing free competition, attracting strategic investments in energy, infrastructure, education and health, and exacerbating the cost of people's lives as well. One of the main barriers of running a business in Kosovo is the presence of tax evasion and informality. These two negative phenomena, such as; tax evasion and informality do complicate the fiscal and social stability of the country, thus the greater presence of the informal economy and fiscal evasion means less income in the state budget. Such a thing causes an unfavourable climate for sustainable economic development and the rule of law, on the other hand creates a profitable climate for financial crime, illegal trafficking, circulation of dirty money. Investment and laundering such money encourages informality of the economy, which is a haven of crime and slowly becomes a serious obstacle to further developments threatening public order and citizens. Kosovo, recently, was criticized by the European Commission for a high level of smuggling and tax evasion, but also because of the situation in the north, where since the country's independence, the access of Kosovo institutions on the border with Serbia is impossible. Kosovo faces a high degree of informality in the labour force, where Kosovo businesses do not report at all their total labour force of around 40%. While tax evasion and informal market continue to increase the ratio in the society by deforming the development policy, this means that a number of individuals get rich so enormously and majority of citizens become impoverished, that this phenomenon continues to affect the customs to get corrupted and the business continues to avoid taxes from the state. This is because the law does not act and competent authorities do not impose sanctions, therefore they do not punish. According to the Criminal Code of the Republic of Kosovo, Chapter XXV (criminal offenses against the economy), pursuant to Article 313, tax evasion is considered as a criminal offense, however that was not sufficient to push taxpayers not to take such an action, taking into consideration the penalties (fines) that derive from this code (Salihu, Zhitija dhe Hasani, 2014, pp. 863-865).

Lack of justice threatens us with other catastrophes in economy, urbanization, environment, education, health and elsewhere. Failure to apply the law is the epicentre of tax evasion by increasingly deepening the economic crisis. Therefore, true recovery of the economy can only be achieved by a parallel revival with the justice. We often encounter this quote to Marx: “When the French farmer wants to envisage the devil, it envisages in the form of a tax collector.” Avoiding (fleeing) the payment of taxes or tax evasion can be made for different reasons and different consequences of taxpayers. (Beshi, 2016, p. 244). France, for example, annually loses €100 billion due to fiscal and social fraud (undisclosed social contributions). If this amount would be recovered, this would enable to have regulated a part of the economic challenges that France encounters today.

Fighting tax evasion would bring very good things to the state of Kosovo by increasing the budget revenues and affecting the overall economic development

and social welfare of the country.

In this study we have used the research method of case study, based on theoretical and empirical data. Furthermore, the methodology of this research is based on different papers which talked about fiscal evasion as well as on other secondary sources. In addition to this introduction, the paper deals with two main parts. In the second we have treated the main characteristics of fiscal evasion in Kosovo, whilst in the third part the challenges for fighting fiscal evasion have been analysed. The analysis ends with a summary of conclusions.

To understand how tolerant Kosovars are towards evasion, we can take an example from our daily life. How many of us ask for a bill after they drink a coffee in one of our cafes, how many of us require the parking ticket, taxi bill or invoice from many services or products we consume on daily basis? (Abdixhiku, 2007).

Many studies conducted by economic associations estimated that the barriers of doing business, such as high level of corruption, lack of most favourable fiscal policies and fiscal evasion, affected many investors to not increase their capital in Kosovo. Since 2008, according to the official data of Central Bank of Kosovo, international investments in Kosovo have been decreasing continuously. While in 2007, Kosovo has had about €500 million direct international investments within a year, but in recent years said investments have fallen to around €250 million per year. The balance of foreign direct investments in the three quarters of 2014 was €121.7 million euro, while in the same period of 2013 this amount was €219.6 million euro. This decrease mainly reflects the fact that some foreign companies in Kosovo, during the second quarter of 2014 distributed dividends of a greater amount than their earnings for the relevant period, which reflected a foreign capital reduction in Kosovo. Investments have also fallen due to the damage of Kosovo's image. (Veseli, 2015). Neighbouring countries have advanced much more in absorbing international investments by offering much better conditions than Kosovo. Kosovo has a high level of corruption, investors say; and that is a key element why they do not invest in Kosovo. We have an economy with a high participation of the informal economy that causes an unreal competition, and affects negatively the attraction of foreign investor. Moreover, there is a lack of an attractive promotional strategy to attract foreign investment in Kosovo (Veseli, 2015). An alarming situation in Kosovo causes the liquidation of businesses, so this contributes to increasing the number of unemployment and raising the level of poverty in the country. Only in 2014 were registered 9616 businesses but 1663 got closed. While in 2013, there were 9485 registered businesses and 1515 got liquidated. Unfavourable fiscal policies, high interest loans, lack of a more serious commitment of competent authorities for private sector are some of the reasons for the liquidation of businesses emphasized by economic affairs experts. Another factor that affects the liquidation of businesses in Kosovo is unfair competition and border smuggling. If a company sells or manufactures products and services within

the Kosovo market and pays all taxes to the national budget, however there are other companies that deal with smuggling and tax evasion and do not pay their fiscal obligations to the state, and those are much more competitive than serious companies. Fiscal evasion and informal economy in Kosovo shows an enormous level of this phenomenon in the country.

A conducted research aimed to identifying possible losses that the tax evasion and manpower informality caused to the state budget from the registered businesses. With regards to this question there were 600 businesses surveyed. The questionnaire replicated the standard methodology promoted by the World Bank and EBRD in BEEPS (Business Environment and Enterprise Performance Survey) surveys, when the evasion was concerned or of "World Values Survey", when the social aspects of the topic were treated – as it is the case of fiscal moral (tax morale). The most important result of the survey was related to the perception of the level of tax evasion in the country. According to the managers and businesses' owners surveyed, about 34.4% of sales are not declared – thus are deleted – by the tax authorities of the country. Other results show that around 62% of Kosovo businesses believe that if they decide to avoid tax payment, they can do it very easy and without being caught by the authorities. Moreover, about 68% of businesses believe that the level of fines is low or very low. Lack of supervising factors – such as inspection and fines – produce motives of evasion behaviour. Tax evasion has quite interesting characteristics. E.g. large businesses do fiscal evasion the least. In fact, according to the survey results, there is a linear relation between the business size (measured with the number of workers and sales level) and fiscal evasion; the smaller the business is the more evasive is (Abdixhiku, 2013). As shown in the figure 1, sales not reported due to the tax purposes (cross-tabulation with company size)

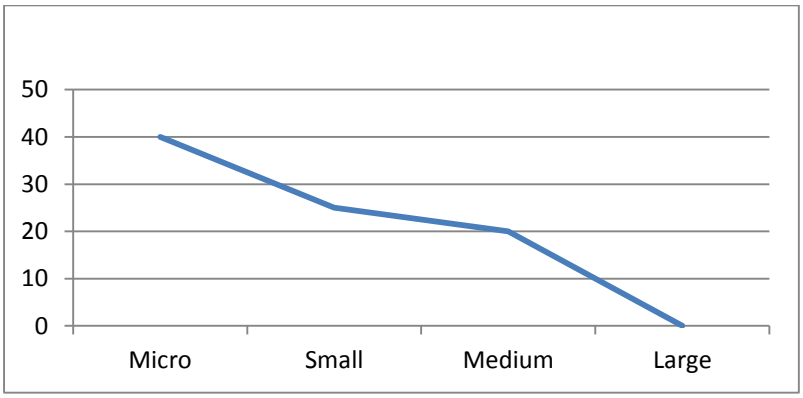

Figure 1. Tax evasion and size of the firm

Source: RIINVEST Institute for Development Research, (2013)16

The sales reported for tax purposes also seem to vary across seven regions of Kosovo. According to the survey results, the region of Gjilan is the most evasive one, with roughly 60 percent of sales being hidden from the tax authorities; followed by the region of Peja with 45 percent of sales evaded; the region of Mitrovica with 44 percent of sales evaded; the region of Ferizaj with 40 percent of sales evaded; the region of Prizren with 33 percent of sales evaded; and the region of Pristina with 27 percent of sales evaded. The last region, which is the most compliant, is the region of Gjakova, with 20 percent of sales evaded (see Figure 2).

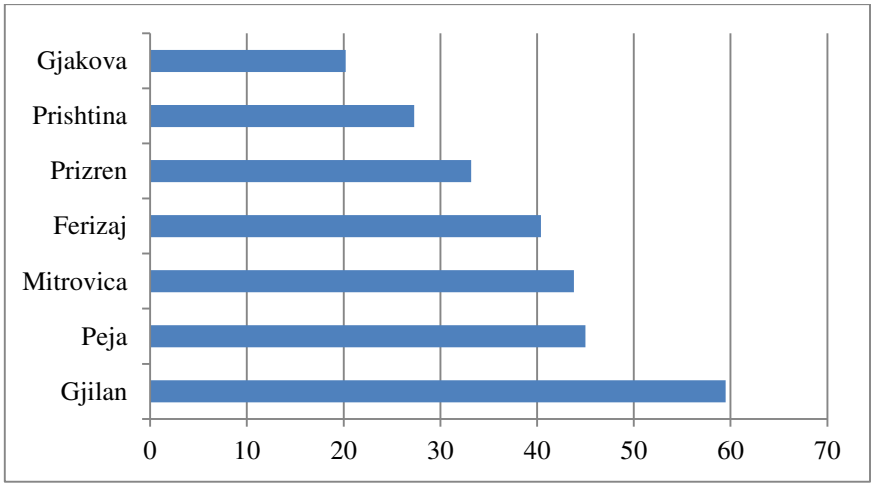

Figure 2. Percentage of non-reported sales by regions

Source: RIINVEST Institute for Development Research, (2013)17

A special focus of the study was the fiscal moral survey or voluntary readiness of tax payment. Outcomes have showed that Kosovo businesses have same fiscal moral with developing countries but far away from developed countries. About 44% of owners in Kosovo believe that, regardless level of public services they do receive, fiscal evasion must be justifiable. So it talks about a total incompliance of business – state relationship (Abdixhiku, 2013).

Morality can exist only when there is a choice. Stated alternatively, where there is no choice there is no morality. If a commanding officer orders a soldier to either kill someone or be killed because of disobeying the order, the soldier is not morally responsible for executing the person who has been chosen for execution, because he has no choice. From the basic premise, one may also state that paying taxes does not raise any moral issues because one does not have a choice. Paying taxes is neither moral nor immoral. It is merely something that one is forced to do" (McGee, 2012, p. 47). Regarding the determinants of tax morale aforementioned with regards to the case of Kosovo, the Kosovo Tax Administration has made a series of reforms being focused on improving the quality of services for consumers,

transparency and process improvement. Since 1999 the Government of Kosovo has made some tax reforms which mainly consisted in the reduction of Corporate Income Tax rate (CIT) and Personal Income Tax rate (PIT). Regarding CIT, government has had as an aim that through reduction of tax norm, to increase the competition capacity of Kosovo vis-à-vis foreign direct investments. In the case of PIT government had as an aim fighting fiscal evasion by stimulating with lower tax burden to move from subjects of shadow economy to the subjects which reach to finish their tax liabilities. So reduction of tax rates on CIT and PIT was a tax incentive, but nevertheless it was insufficient considering numerous incentives that apply to other Balkan states. Number of people involved in business in Kosovo is great even though the possibilities of doing business are small and challenging because government incentives are very limited or to say non-existent (they exist only on paper), but people in Kosovo run a business due to a lack of jobs because the unemployment rate is calculated very high around 40%. (Ukaj, 2012, p. 12).

The survey conducted by Riinvest Institute (2013) was also focused on informality labour force. The questionnaire's outcomes show that an average of 37% of total labour force employed is not declared legally. A special importance in the survey would be given to the Labour Law. Around 41.2 % of interviewed businesses have declared they have never heard about the new Labour Law or its requirements. The other part of businesses, so those that were aware about the law, considered the payment of maternity leave and its duration as serious obstacles in terms of female employment in the private sector. (Riinvest Institute, 2013, pp. 21-28)

Kosovo is still considered as the "champion" country in Europe regarding the unemployment and the high scale of poverty, yet are not seen any elements in terms of fixing this issue as a result of the high scale of unemployment and extreme poverty in double-digit ratio. We are witnesses that currently we are dealing with the phenomenon of people leaving in mass to European countries seeking for job and for a more secured and social life, thinking no return to their origin country.

"High rates of interest for provision of loans are still considered the highest in the region, and it does not stimulate new investments and those existing for renewed investment and make fluctuation (removal) of investments from the country to other countries in the region that offer favourable monetary policies with lower interest rate system compared to what our country offers." (PrizrenPress, 2014).

"I was highly surprised about the number 40 whenever I have been watching the latest survey data by Riinvest on the scanning of the state of Kosovo businesses. This 40 seems to be repeated more often than a simple probability could do it, furthermore occurrences on which they repeated have had a common numerator: disobedience to the requirements of the social system. For example, about 40% of the wages of the workforce in the private sector were hidden from employers, or about 40% of Kosovar businesses had no idea about the minimum wage, or 40% of

businesses were not aware at all about the Labor Law or the benefits for workers. This 40% was everywhere and to make the story more dramatic and interesting, about 40% of sales of Kosovo businesses were not reported for the purposes of tax administration; so, tax evasion in Kosovo reached completely 40%." (Abdixhiku, 2012). In essence, fiscal evasion creates a chain of consequences for businesses, society, institutions and for the country itself. One of the most important challenges of Kosovo in fulfilling the criteria set for integration into the European family remains combating tax evasion.

The Republic of Kosovo should create sufficient resources which are ready to influence the improvement of the image so that the investors and other interested parties reflect the willingness to prevent the deviant phenomena up to a maximum extent, including tax evasion. Strengthening of the judiciary is immediate demand of time in order to apply legislation when the phenomenon occurs, but with more social relevance is to raise awareness into higher level and contribute to the state, for the future of our country.

2. Challenges for Fighting Fiscal Evasion

Tax evasion in Kosovo reaches an amount of a budget, including also the northern Mitrovica, where the tax administration has never been extended there. Therefore, the fight against fiscal evasion brings great profits which must not be neglected.

Fighting this fraud is effectively a complex and difficult job, because machinations sometimes are intelligent and discoverable barely. Then, it must be said that the fiscal fraud is mainly an international problem, avoided amounts are rapidly drawn abroad through fictitious companies and accounts sited in bank heavens. And finally, the means used to fight it are insufficient or better saying, misused (Verner, 2014). Palan, Murphy & Chavagneux, stated that: "We can find examples of people taking advantage of collective goods for private pleasure at every level of society, of course, from the poorest to the richest. The tax haven phenomenon is a massive organized attempt by the richest and most powerful to take advantage of collective goods on a scale rarely seen; and it is, perhaps for the first time, taking place globally" (Palan, Murphy & Chavagneux, 2010, p. 7). In order to limit, respectively prevent tax evasion, different measures are applicable. For example, supply with special customs equipment for detecting smuggled goods, cooperation between financial authorities and other state authorities, such as judicial and police ones (Bungo, 2009, p. 125).

According to Eric Verner (2014), the first and the most urgent measure that must be put in place is related to the redefinition of the regulation for prices of transfers within the multinational societies. They can set transaction prices between societies of the same group and be resident in different countries. Automatic exchange of

information for fiscal purposes between the countries contains the second key measure. That is being put in place, but it will be efficient only when the national administrations would play the game with a total reciprocity. In addition, there should be foreseen sanctions against the countries that refuse to cooperate. The modernisation of the prosecution system and control of fluxes (selling-buying, salaries) is also important. Fiscal harmonisation in Europe could allow accelerating this process. Fraud with "VAT rounded" which means unfair reimbursement of VAT in virtual transactions between the countries – considered as the most important fraud in Europe that will be eliminated rapidly by changing the rules related to VAT among the countries (Vener, 2014).

It should be stressed that not only tax avoidance but also tax evasion by transnational companies happens outside the EU in developing countries, too. And, importantly, while this is often regarded by European publics as a problem of unethical behaviour and unfair personal financial gain, in developing countries it frequently leads to consequences that are a lot more far-reaching. It can put entire public finances at risk.

The tax-to-GDP ratio, an indicator of how effectively taxes are collected, is below 20% in several developing counties. In the EU Member States, it is typically between 30-40%. 15% is considered necessary for a country to finance its basic functioning and services. Recently, a start was made: The European Parliament is currently working on an own-initiative report on "Tax avoidance and tax evasion as challenges for governance, social protection and development in developing countries". Afterwards, it will be time for the Commission to come forward with an action plan to help boost weak administrative capacities of developing countries to deal with the complexity of imposing taxes on transnational companies, the lack of sufficient tax collection infrastructures, and the drain of skilled personnel away from tax administrations. At the same time, it will be equally important to help foster a perception among businesses and citizens that paying taxes is "a good thing" and helps countries, economies, and societies function (Heeger & Meerkamp, 2015).

Kosovo Business Alliance (KBA) gives some recommendations for reducing the informality in Kosovo economy, such as: 1) Identification and inclusion in the scheme of taxation of businesses so far not subject to tax liability; 2) When policy and necessary legislation to limit this phenomenon is drafted, laws and other bylaws should support each other and the work of executive institutions shall be coordinated in order not to stumble its implementation in practice; 3) Coordination of requirements of supervising institutions accountable for insertion into the scheme of social insurance of all businesses and private employees; 4) Another direction where attention should be focused is determination of the ways and concrete measures to attract agricultural employees to be inserted into the scheme of social insurance.

According to Balliu, there are several ways to combat fiscal evasion. First of all the quality of audits needs to be increased. This can be done through an improvement in tax audit methodologies and existing topics, establishing a unique database with the results of inspections made on businesses and individuals. Strengthening of financial control may also help in the reduction of the size of informal economy. We should develop business management tools for a more precise control or a database, including taxpayer's habits (Balliu, 2014, p. 241).

3. Conclusion

No doubt that the fiscal evasion and informal economy have become a global problem with consequences extended to all global economies.

A large number of multinational corporations, banks and criminal networks are using so-called "fiscal heavens" in order to avoid tax payment by benefiting from these "favourable" conditions, such as: banking secrecy, lower rates or non-existence of tax rates for non-residents or lack of mutual cooperation between the countries. It is extremely difficult the calculation of cash amount passing through fiscal heavens or tax evasion. Presence of this phenomenon and extent of its spreading leads to reducing tax revenues and public incomes. Means lost due to the presence of tax evasion in Kosovo is almost the same as budget itself.

Fiscal evasion has a destructive impact on fiscal policy of the state government causing non major loss from its fiscal incomes. This problem occurs not only in our country, but also in the countries with developing fiscal system turning into a phenomenon with global ratio.

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Evaluating the Relative Impact of Monetary and Fiscal Policy in Nigeria using the St. Louis Equation

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Abstract: The controversy existing on the efficacy of monetary and fiscal policy to influence the economy is unending. This study evaluates the relative impact of monetary and fiscal policy in Nigeria from 1986 to 2014 using a modified St. Louis equation. Employing the Ordinary Least Squares estimation method, this study reveals that growth in money supply and export have a positive and significant effect on growth in output of the economy while growth in government expenditure has a negative and insignificant effect. This study provides evidence that monetary policy has a greater growth-stimulating effect on the economy than fiscal policy. It recommends that monetary policy rather than fiscal policy should be relied upon by the Nigerian government as an economic stabilisation tool.

Keywords: Monetary policy; Fiscal policy; St. Louis equation; Nigeria

JEL Classification Numbers: E52; E62

1. Introduction

Monetary policy is mainly concerned with interest rate management and control of money supply in the economy. Fiscal policy on the other hand refers to how government influences economic output through its expenditure and taxation policy. Monetary and fiscal policy are tools that government implement to stabilise the economy and promote economic growth. Failure to implement either monetary or fiscal policy appropriately may lead to increase in inflation and limited economic performance.

Monetary and fiscal policy are the two commonly used macroeconomic tools to influence the economy. The relative impact of monetary and fiscal policy on the economy is a controversial issue among economists. The classical economists (monetarists) are of the opinion that it is only monetary policy that can influence the economy whilst fiscal policy would be ineffective. They argue that the

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economy is self-regulating, hence there is no need for government intervention in the economy. They believe in the ability of the economy to achieve full employment through its own internal mechanisms (Olofin & Salisu, 2014). The notions of the classical economists failed to prevent the Great Depression of 1930s from occurring and this led to the emergence of the Keynesian economists. The Keynesian economists led by John Maynard Keynes suggested that there is need for government intervention in the economy. They see aggregate demand as a key driver of economic growth and argue that government can stimulate aggregate demand by increasing its expenditure in the economy. They see fiscal policy as being largely effective on the economy while monetary policy would be ineffectual. In contrast to both the classical and Keynesian economists, the real business cycle theory suggests that both monetary and fiscal policy are not capable of influencing the economy.

In most countries, monetary policy has been instrumental in the implementation of fiscal policy because monetary authorities are often responsible for financing budget deficits (Laurens & de la Piedra, 1998). Lambertini and Rovelli (2003) argue that monetary and fiscal authorities may not have the same motivation and goals but their policy choices have a crucial impact on aggregate demand in the economy. According to Adefeso and Mobolaji (2010), monetary and fiscal policy are inseparable in macroeconomic management. Therefore, government need to strike a balance by finding an appropriate mix of these policies so that the influence of one on the economy does not neutralise the desired outcome of the other. The influence of monetary and fiscal policy on the economy tend to differ as government implement both policies simultaneously.

The earliest effort to resolve the monetary-fiscal policy debate can be traced to Andersen and Jordan (1968) which developed a model referred to as the Andersen-Jordan (A-J) equation or, as it widely referred to as the St. Louis equation to examine the relative impact of monetary and fiscal policy in the stabilisation of the United States economy. The equation is an estimated relationship (using the Almon lag procedure) between changes in gross national product and changes in money supply and high-employment Federal expenditures (Carlson, 1978). According to Batten and Thorton (1986), the major critiques of the A-J equation are omission of relevant exogenous variables, simultaneous equation bias and failure to identify appropriate measures of monetary and fiscal policy. Other critiques include heteroskedasticity problem, endogeneity problem and the use of the Almon lag procedure. Over the years, the St. Louis equation has witnessed empirical modifications and has been widely used to determine the relative influence of monetary and fiscal policy in both developed and developing economies.

In Nigeria, few studies have employed the St. Louis equation among which are Ajayi (1974), Aigbokhan (1985), Asogu (1998) and Adefeso and Mobolaji (2010). This study attempts to give further evidence on the relative impact of monetary and

fiscal policy in Nigeria using the St. Louis equation. The remainder of this study is as follows: Section 2 provides the literature review, Section 3 centres on the methodology, Section 4 presents the empirical results and Section 5 offers the conclusion.

2. Literature Review

2.1. Prior Studies on Developed and Developing Countries

Andersen and Jordan (1968) specified nominal gross national product as dependent on monetary policy and fiscal policy and found that monetary policy significantly affect the US economy while fiscal policy did not. de Leeuw and Kalchbrenner (1969) criticised Andersen and Jordan's use of money supply and government expenditure to proxy for monetary and fiscal policy respectively. In their study, high employment receipts adjusted for inflation was used to measure fiscal policy while monetary base adjusted for changes in reserve requirements and the adjusted monetary base minus currency in circulation were used to measure monetary policy. The study found both fiscal and monetary policy to be statistically significant on United States, thus contradicting Andersen and Jordan's finding of fiscal policy being irrelevant.

Carlson (1978) estimated the St. Louis equation using the percentage changes in the variables rather than the first difference form used in the A-J equation and still found that fiscal policy does not play a significant role in economic stabilisation. Hafer (1982) observed that once the growth of money is considered, the impact of fiscal policy is inconsequential. Batten and Hafer (1983) criticised the A-J equation for not capturing international trade, hence they included export. Using a sample of 6 developed economies, the study is consistent with Andersen and Jordan (1968) for all the economies.

Batten and Thorton (1986) reaffirmed the findings of Andersen and Jordan and found no evidence to support its critics. Chowdhury (1986) found that fiscal policy affects economic activities in Bangladesh more than monetary policy. In a study of 5 African countries, Bynoe (1994) discovered that monetary policy exert greater effect on these countries than fiscal policy.

Jayaraman (2001) showed that fiscal policy failed to produce a growth-stimulating impact on the economic growth of 4 South Pacific Island countries. Dahalan and Jayaraman (2006) found that fiscal policy is more influential than monetary policy on the economy of Fiji. Contrary to Chowdhury (1986), Rahman (2009) observed that monetary policy plays a greater role than fiscal policy in enhancing the economic growth of Bangladesh. Belliveau (2011) found that monetary policy is more effective than fiscal policy in the United States. Also, the study supported the

notion that monetary and fiscal policy have the ability to influence output and economic stability.

Topcu and Kuloglu (2012) revealed that monetary policy exert a significant positive influence on the Turkish economy in the short run. Conversely, in the long run, no significant impact was observed for monetary and fiscal policy. Moayedi (2013) observed that fiscal policy stimulated growth more than monetary policy in Iran. Adeniji and Evans (2013) found evidence to show that monetary and fiscal policy have been effective in stabilising the economy of 8 African countries. The study also revealed that monetary policy provide greater economic benefits than fiscal policy.

2.2. Prior Studies on Nigeria

Ajayi (1974) employed the Andersen and Jordan's equation and found that monetary policy facilitates economic activities than fiscal policy. On the contrary, Aigbokhan (1985) discovered that fiscal policy is more advantageous in promoting economic activities than monetary policy. Asogu (1998) discovered that money supply is statistically significant while government expenditure and export are not statistically significant, thus suggesting that monetary policy is effective on the economy while fiscal policy is not.

Ajisafe and Folorunso (2002) evaluated the efficacy of monetary and fiscal policies on the economy and revealed that monetary policy has greater impact on the economy than fiscal policy. Adefeso and Mobolaji (2010) examined the efficacy of fiscal and monetary policies on economic growth. The results showed that monetary policy is more beneficial to the economy than fiscal policy.

Aigheyisi (2011) found the economy is influenced by monetary policy than fiscal policy. Sanni, Amusa and Agbeyangi (2012) revealed that monetary policy is more effective on the economy than fiscal policy. Iyeli, Uda and Akpan (2012) discovered that the influence of monetary policy dominates fiscal policy in the economy.

3. Methodology

This study evaluates the relative impact of monetary and fiscal policy in Nigeria from 1986 to 2014. Data were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin (2014) edition. This study adopted a modified version of the St. Louis equation built by Batten and Hafer (1983) which specified nominal gross domestic product (GDP) as the endogenous variable and money supply (MS), government expenditure (GE) and export (EX) as the exogenous variables. Money supply and government expenditure represent the monetary and fiscal policy respectively. The growth rate series of the variables were used in the model for this

study. The growth rate represents the percentage change in the variables from the previous year. Using growth rate series, the equation would not be limited by heteroskedasticity problem unlike when the first difference series of the variables are used (Carlson, 1978). The model for this study is expressed as:

$$\Delta GDP_t = \beta_0 + \beta_1 \Delta MS_t + \beta_2 \Delta GE_t + \beta_3 \Delta EX_t + \mu_t \quad \ldots (1)$$

Where Δ denotes percentage change, ΔGDP_t is growth in nominal gross domestic product or output growth, β_0 is the intercept or constant parameter, $\beta_1, \beta_2, \beta_3$ are the coefficients of the growth in money supply, government expenditure and export respectively and μ_t is the stochastic term.

In choosing the optimal lag length for the model, this study relied on different lag length selection criteria. After setting the maximum lag length to be 4, a lag length of 0 was chosen by all the lag length selection criteria. Andersen and Jordan (1968) used the Almon lag technique to determine a lag length of 3 for each exogenous variables. Elliot (1975) showed that the findings of Andersen and Jordan were supported regardless of the lag length of the exogenous variables. Thus, it can be inferred from Elliot (1975) that a St. Louis equation with zero-lag structure would not yield incorrect estimates. Therefore, a lag length of 0 for the exogenous variables in this study seems appropriate.

The growth rate series of GDP, MS, GE and EX are stationary series, hence the equation was estimated using the Ordinary Least Square (OLS) estimation procedure and relevant diagnostics tests such as F-test, serial correlation LM test, heteroskedasticity test, variance inflation factors test, CUSUM and CUSUMQ tests and Ramsey RESET test were performed on the estimated model. In order to validate that the growth rate series of the variables are stationary, unit root test was performed. Table 1 presents the result of the Augmented Dickey-Fuller (ADF) unit root test performed on the growth rate series of the variables at level.

Table 1. ADF Unit Root Test

Variable	t-statistic	p-value
ΔGDP	-5.806802*[b]	0.0003
ΔMS	-3.567121***[b]	0.0537
ΔGE	-6.249882*[b]	0.0001
ΔEX	-6.126758*[a]	0.0000

Source: Authors' analysis

Notes: * and *** denote stationary at 1% and 10% significance level respectively and [a] and [b] indicate that test equation includes intercept only and intercept and trend respectively.

4. Empirical Results

4.1. Summary Statistics

Table 2. Summary Statistics Result

Statistic	ΔGDP	ΔMS	ΔGE	ΔEX
Mean	22.39508	23.01954	20.21038	24.16654
Median	16.22553	17.95961	21.82235	12.61810
Maximum	78.21597	44.58673	72.30303	152.8994
Minimum	-15.13644	6.540178	-30.14340	-50.16609
Standard Deviation	21.13525	10.86427	21.97898	42.72025
Skewness	0.914606	0.349203	0.114343	1.138089
Kurtosis	3.855503	1.870920	3.601164	4.702773
Jarque-Bera	4.927465***	2.129799	0.499882	9.763843*
Observations	29	29	29	29

Source: Authors' analysis

Note: * and *** indicate that null hypothesis of normal distribution is rejected of normal distribution at 1% and 10% significance level respectively.

From Table 2, it can be seen that all the series are positively skewed. The Kurtosis statistic of ΔGDP, ΔGE and ΔEX exceeds 3, thus implying that they have a fat-tailed distribution while ΔMS has a thin-tailed distribution because its Kurtosis statistic is less than 3. The Jarque-Bera statistic of ΔGDP and ΔEX indicates that they are not normally distributed while ΔMS and ΔGE are normally distributed.

4.2. OLS Estimation

Table 3. OLS Regression Results

Variable	Coefficient	p-value
C	6.508933	0.4176
ΔMS	0.526744	0.0931***
ΔGE	-0.189447	0.2461
ΔEX	0.314052	0.0007*
Model diagnostics		
R^2	0.413538	——
F-statistic	5.876180	0.003517*
Breusch-Godfrey(1)	0.367526	0.5500
Breusch-Godfrey(2)	0.543989	0.5877
Breusch-Pagan-Godfrey	0.368446	0.7764
White	0.112327	0.9521
Ramsey RESET(^2)	0.048414	0.8277

Source: Authors' analysis

Notes: * and *** indicates statistically significant at 1% and 10% significance level respectively. Also, test statistic for Breusch-Godfrey serial correlation LM test, Breusch-Pagan-Godfrey and White heteroskedasticity tests and Ramsey RESET test follow F-distribution.

From Table 3, it can be inferred that growth in MS and EX are positively and significantly related to output growth while the growth in GE is negatively and not significantly related to output growth. The R^2 indicates that growth in MS, GE and EX account for approximately 41.4% change in the nominal GDP while the remaining 58.6% is explained by the stochastic term. The F-statistic shows that the model is statistically significant at 1% significance level. The Breusch-Godfrey serial correlation LM test indicates that the residuals in the model are serially independent at first and second order, thus confirming that the model is free from first and second order autocorrelation. The Breusch-Pagan-Godfrey and White (with no cross terms) heteroskedasticity tests indicate the residuals are independent and identically distributed since the null hypothesis of homoscedasticity is accepted. Using the squares of the fitted values, the F-statistic of the Ramsey RESET test is not statistically significant, thus the hypothesis that the model is correctly specified is accepted.

4.3.Variance Inflation Factors (VIF) Test

Variance inflation factors test was performed to check for multicollinearity. The presence of multicollinearity leads to parameters being inconsistent and having high standard errors which are capable of limiting the validity of the OLS estimation results. The rule of thumb is that if VIF of an exogenous variable is greater than 10, the variable is said to be highly collinear (Kleinbaum, Kupper & Muller, 1988). Table 4 presents the result of the VIF test.

Table 4. Variance Inflation Factors Test

Variable	VIF
ΔlnMS	1.025176
ΔlnGE	1.172751
ΔlnEX	1.146629

Source: Authors' analysis

From Table 4, it can be observed that there is no problem of multicollinearity. This implies that there is no strong linear relationship between the exogenous variables.

4.4. CUSUM and CUSUMQ Tests

The cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of residuals (CUSUMQ) tests were performed to check whether the parameters in the model are stable.

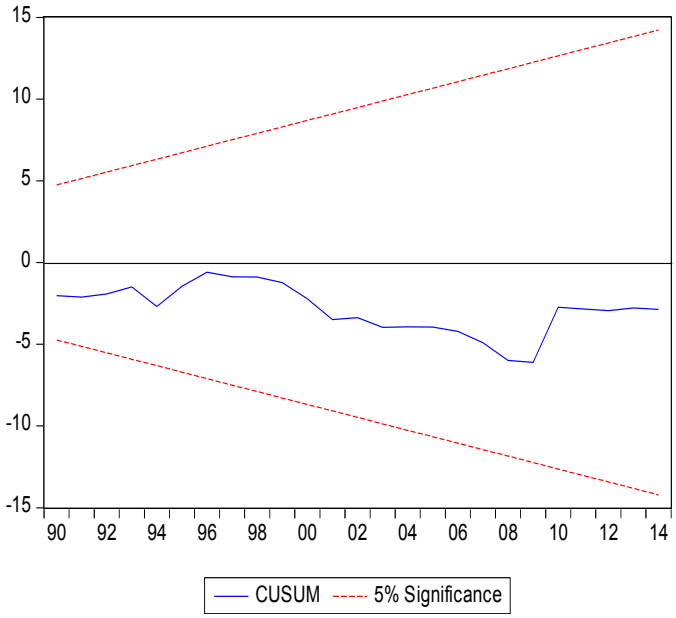

Figure 2. CUSUM Plot

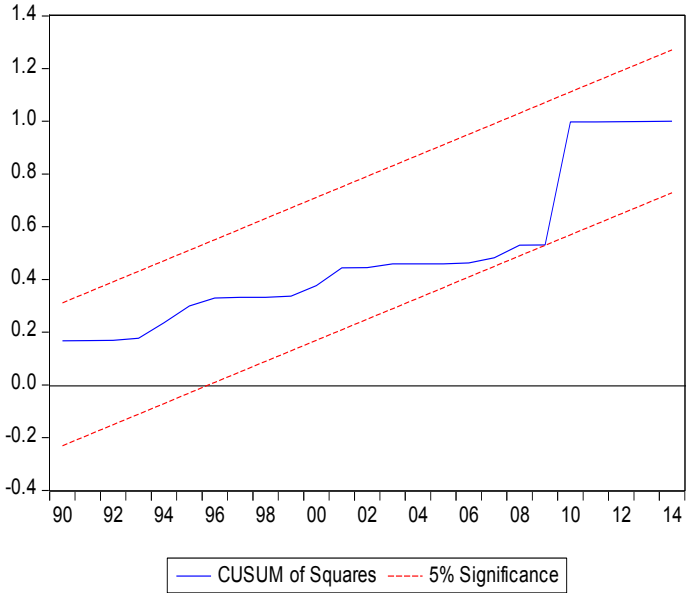

Figure 3. CUSUMQ Plot

It can be seen from Fig. 2 and 3 that the plots of CUSUM and CUSUMQ lie within the 5% critical bound, thus indicating that the parameters in the model are stable. This implies that the model is not affected by structural instability. The stability of

the model further confirms that the shift from military rule to civilian rule in 1999 did not cause structural break in macroeconomic management. To corroborate this assertion, the Chow Breakpoint test was performed. The null hypothesis for the test is that there is no break at the specified breakpoint. The specified breakpoint is 1999. Table 5 reports the result of the Chow Breakpoint test.

Table 5. Chow Breakpoint Test

F-statistic	p-value
1.304619	0.3005

Source: Authors' analysis

Table 5 shows that the F-statistic is not statistically significant, thus the null hypothesis is accepted. This implies that macroeconomic management during the military leadership is not significantly different from that of the democratic leadership. In other words, macroeconomic management remained the same during the period under review.

5. Conclusion

This study evaluated the relative impact of monetary and fiscal policy in Nigeria from 1986 to 2014 using a modified St. Louis equation developed by Batten and Hafer (1983). Following the stance of Carlson (1978), the growth series of the variables were used instead of their first difference form. The regression estimates showed that growth in money supply and export are positively and statistically significant on output growth while growth in government expenditure is negatively and not statistically significant related to output growth. The statistical significance of growth in export disregards the claim of Asogu (1998) and Adefeso and Mobolaji (1998) that export is redundant in the application of St. Louis equation to the Nigerian economy. The significant positive effect of growth in money supply on output growth suggests that the CBN has been effective in promoting economic growth and stabilising the economy. This study showed that monetary policy has a greater growth-stimulating effect on the economy than fiscal policy and this is in line with previous studies such as Ajayi (1974), Asogu (1998), Adefeso and Mobolaji (2010). It provides evidence to support the classical economists' (monetarists) argument that monetary policy would stabilise the economy while fiscal policy would be largely ineffectual. This study recommends that government should rely more on monetary policy in stabilising the economy.

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The Relationship between Spatial Interdependencies in the European Union and the Trade - II

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Abstract: The article treats the links between exports of EU countries and relative distances between them. Mostly there are linear regressions equations that modeling the export relative to the spatial relations between states.

Keywords: graph; European Union; trade; export; import

JEL Classification: F21

1. Introduction

In the previous paper we analyzed the dependence of European Union countries imports on exports depending on their closeness.

Thus, after the construction of a graph of links between countries, we determined the minimum length between these roads, then we built a normalized matrix based on inverse distance (in the sense of graph theory and not actual distances). Considering the situation of global exports of those countries we multiplied (for each individual year) their values with the dependence degree of EU countries obtaining a virtual import value of each country. After this, we performed regression analysis in which we correlate these data with real data virtual obtaining in most cases, links expressing linear dependence of imports to exports of other countries. Finally, we compared the regression coefficients (with meanings of percentage) with actual percentages of UE-exports in each country commenting, finally, differences emerged.

In what follows, we will analyze the reverse dependence of exports on imports of other countries according to their closeness. All theoretical concepts and primary

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results on the degrees of connection matrix between countries are concretely explained in the first part of this article.

2. The Analysis of the Exports of EU Countries

In this section we shall analyze the relations between the import of EU countries and exports of each of them.

In Appendix A.1 and A.2 we have the tables of imports of European Union countries during 2004-2015.

Multiplying the matrix G with the values from tables A.1 and A.2, we find the tables A.3-A.6 in Appendix A.2.

Because not all imports from one country will be transferred to the EU reference country, we shall search if there is a linear dependence between real exports and computed exports (after the results from tables A.3-A.6).

In the case of **Austria**, from Appendix A.7 we can see that is a strong link between the two groups of indicators (R^2=0.9687), having finally:

EX_AT(t)=0.021IM_BE(t)+0.014IM_BG(t)+0.021IM_HR(t)+0.014IM_CY(t)+0.0419IM_CZ(t)+ 0.021IM_DK(t)+0.0084IM_EE(t)+0.0105IM_FI(t)+0.021IM_FR(t)+0.0419IM_DE(t)+ 0.021IM_EL(t)+0.0419IM_HU(t)+0.0105IM_IE(t)+0.0419IM_IT(t)+0.0105IM_LV(t)+ 0.014IM_LT(t)+0.021IM_LU(t)+0.021IM_MT(t)+0.021IM_NL(t)+0.021IM_PL(t)+0.0105IM_PT(t) +0.021IM_RO(t)+0.0419IM_SK(t)+0.0419IM_SI(t)+0.014IM_ES(t)+0.014IM_SE(t)+0.014IM_UK(t)+15293.754

where EX_ means real exports, IM_ means real imports, t – the reference time and the abbreviations for countries are the usual: Austria – AT, Belgium – BE, Bulgaria – BG, Croatia – HR, Cyprus – CY, Czech Republic – CZ, Denmark – DK, Estonia – EE, Finland – FI, France – FR, Germany – DE, Greece – EL, Hungary – HU, Ireland – IE, Italy – IT, Latvia – LV, Lithuania – LT, Luxembourg – LU, Malta – MT, Netherlands – NL, Poland – PL, Portugal – PT, Romania – RO, Slovakia – SK, Slovenia – SI, Spain – ES, Sweden – SE, United Kingdom – UK.

A comparison of regression coefficients and percentages exports into studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 1) indicates that there are no large differences except Croatia (8.90% vs. 2.10%) and Slovenia (8.40% vs. 4.19%). Also, we can see that the real imports of EU-countries from Austria are in general below of those suggested by the regression equation which means that exports are below the potential offered by its geographic position.

The average distance between real data and those from the regression is: 1.32%.

Table 1. The correlation between the coefficients of regression and the real imports of EU-countries in Austria (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	-	-	**Italy**	4.19%	2.50%
Belgium+Luxembourg	4.20%	0.64%	**Latvia**	1.05%	1.20%
Bulgaria	1.40%	2.70%	**Lithuania**	1.40%	0.85%
Croatia	2.10%	8.90%	**Malta**	2.10%	0.53%
Czech Republic	4.19%	3.10%	**Netherlands**	2.10%	0.48%
Denmark	2.10%	1.00%	**Poland**	2.10%	1.80%
Estonia	0.84%	0.74%	**Portugal**	1.05%	0.48%
Finland	1.05%	0.87%	**Romania**	2.10%	3.90%
France	2.10%	1.10%	**Slovakia**	4.19%	2.90%
Germany	4.19%	3.90%	**Slovenia**	4.19%	8.40%
Greece	2.10%	0.97%	**Spain**	1.40%	0.71%
Hungary	4.19%	6.10%	**Sweden**	1.40%	1.20%
Ireland	1.05%	1.60%	**United Kingdom**	1.40%	0.73%

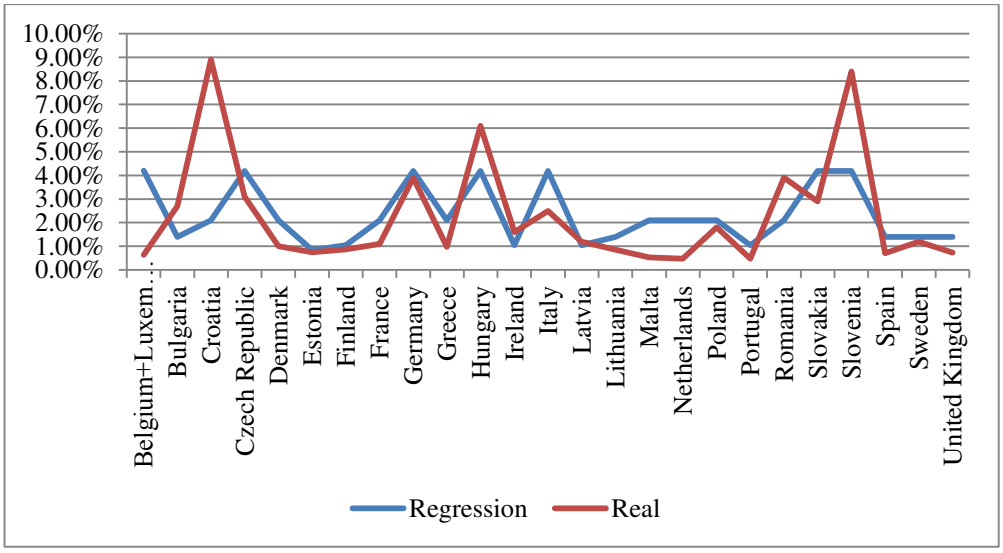

Figure 1. The relationship between imports based on distances and the real imports in 2013 in Austria (in percent)

Because in the upper analysis we have Durbin Watson statistic d=0.8443 therefore a positive autocorrelation of errors for the limits of autocorrelation: (0,0.97) and ρ - the autocorrelation coefficient of errors has value ρ= 0.528085453 we shall make another regression analysis for the set of data: Exports-computed-new(t)=Exports-

computed(t)-ρ·Exports-computed(t-1) and Imports-real-new(t)= Imports-real(t)-ρ·Imports-real(t-1) (table A.8). Finally, we obtain the equation of regression:

EX_AT(t)=0.5281EX_AT(t-1)+0.IM_AT(t)+0.IM_AT(t-1)+0.0228IM_BE(t)-0.0121IM_BE(t-1)+ 0.0152IM_BG(t)-0.0081IM_BG(t-1)+0.0228IM_HR(t)-0.0121IM_HR(t-1)+0.0152IM_CY(t)-0.0081IM_CY(t-1)+0.0457IM_CZ(t)-0.0241IM_CZ(t-1)+0.0228IM_DK(t)-0.0121IM_DK(t-1)+ 0.0091IM_EE(t)-0.0048IM_EE(t-1)+0.0114IM_FI(t)-0.006IM_FI(t-1)+0.0228IM_FR(t)-0.0121IM_FR(t-1)+0.0457IM_DE(t)-0.0241IM_DE(t-1)+0.0228IM_EL(t)-0.0121IM_EL(t-1)+ 0.0457IM_HU(t)-0.0241IM_HU(t-1)+0.0114IM_IE(t)-0.006IM_IE(t-1)+0.0457IM_IT(t)-0.0241IM_IT(t-1)+0.0114IM_LV(t)-0.006IM_LV(t-1)+0.0152IM_LT(t)-0.0081IM_LT(t-1)+ 0.0228IM_LU(t)-0.0121IM_LU(t-1)+0.0228IM_MT(t)-0.0121IM_MT(t-1)+0.0228IM_NL(t)-0.0121IM_NL(t-1)+0.0228IM_PL(t)-0.0121IM_PL(t-1)+0.0114IM_PT(t)-0.006IM_PT(t-1)+ 0.0228IM_RO(t)-0.0121IM_RO(t-1)+0.0457IM_SK(t)-0.0241IM_SK(t-1)+0.0457IM_SI(t)-0.0241IM_SI(t-1)+0.0152IM_ES(t)-0.0081IM_ES(t-1)+0.0152IM_SE(t)-0.0081IM_SE(t-1)+ 0.0152IM_UK(t)-0.0081IM_UK(t-1)+2372.02

In the case of **Belgium**, from Appendix A.4 we can see that is a strong link between the two groups of indicators (R^2=0.9846), having finally:

EX_BE(t)=0.0497IM_AT(t)+0.0248IM_BG(t)+0.0248IM_HR(t)+0.0248IM_CY(t) +0.0497IM_CZ(t)+0.0497IM_DK(t)+0.0198IM_EE(t)+0.0248IM_FI(t)+0.0992IM_FR(t)+ 0.0992IM_DE(t)+0.0331IM_EL(t)+0.0331IM_HU(t)+0.0497IM_IE(t)+0.0497IM_IT(t)+ 0.0248IM_LV(t)+0.0331IM_LT(t)+0.0992IM_LU(t)+0.0331IM_MT(t)+0.0992IM_NL(t)+ 0.0497IM_PL(t)+0.0331IM_PT(t)+0.0248IM_RO(t)+0.0331IM_SK(t)+0.0331IM_SI(t)+ 0.0497IM_ES(t)+0.0331IM_SE(t)+0.0992IM_UK(t)+33128.7758

Also, in the case of **Luxembourg**, from Appendix A.5 we can see that practically is not a link between the two groups of indicators (R^2=0.0018) therefore we will immerse the data into those of Belgium.

A comparison of regression coefficients and percentages exports into studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 2) indicates that there are no large differences except Germany (5% vs. 9.92% - figure 2) and United Kingdom (5.2% vs. 9.92%) for which the imports are much below the distance. Also, we can see that the real imports of EU-countries from Belgium and Luxembourg are below of those suggested by the regression equation which means that imports are below the potential offered by its geographic position.

The average distance between real data and those from the regression is: 1.86 %.

Table 2.The correlation between the coefficients of regression and the real imports of EU-countries in Belgium+Luxembourg (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	4.97%	1.90%	**Italy**	4.97%	4.50%
Belgium+Luxembourg	-	-	**Latvia**	2.48%	1.70%
Bulgaria	2.48%	2.00%	**Lithuania**	3.31%	3.30%
Croatia	2.48%	1.70%	**Malta**	3.31%	1.30%
Czech Republic	4.97%	2.10%	**Netherlands**	9.92%	9.70%
Denmark	4.97%	3.30%	**Poland**	4.97%	2.70%
Estonia	1.98%	1.50%	**Portugal**	3.31%	2.20%
Finland	2.48%	2.70%	**Romania**	2.48%	2.30%
France	9.92%	8.40%	**Slovakia**	3.31%	1.20%
Germany	9.92%	5.00%	**Slovenia**	3.31%	1.70%
Greece	3.31%	3.20%	**Spain**	4.97%	2.90%
Hungary	3.31%	2.30%	**Sweden**	3.31%	4.30%
Ireland	4.97%	2.20%	**United Kingdom**	9.92%	5.20%

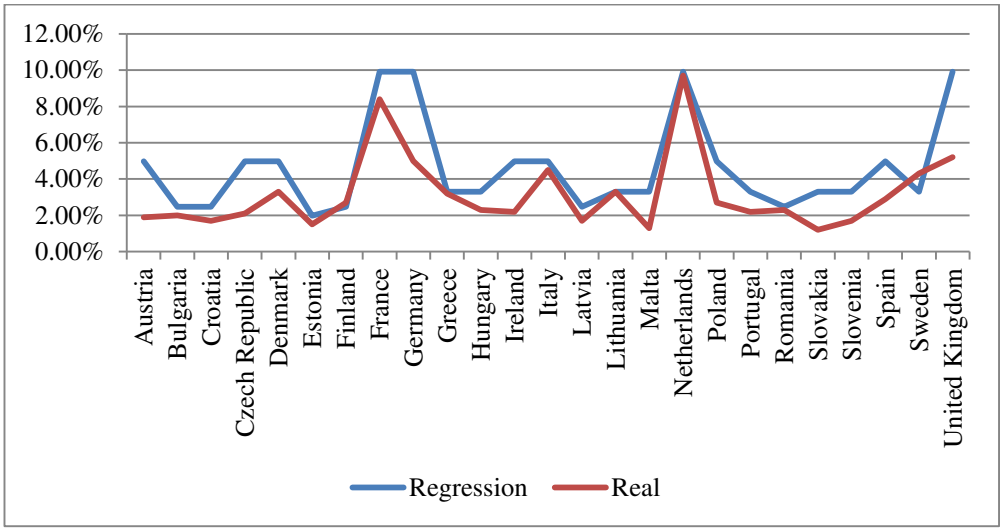

Figure 2. The relationship between imports based on distances and the real imports in 2013 in Austria (in percent)

In the case of **Bulgaria**, from Appendix A.6 we can see that is a strong link between the two groups of indicators (R^2=0.8730), having finally:

EX_BG(t)=0.0108IM_AT(t)+0.0081IM_BE(t)+0.0108IM_HR(t)+0.0162IM_CY(t)
+
0.0081IM_CZ(t)+0.0065IM_DK(t)+0.0046IM_EE(t)+0.0046IM_FI(t)+0.0108IM_
FR(t)+
0.0081IM_DE(t)+0.0325IM_EL(t)+0.0162IM_HU(t)+0.0065IM_IE(t)+0.0162IM_
IT(t)+
0.0054IM_LV(t)+0.0065IM_LT(t)+0.0081IM_LU(t)+0.0108IM_MT(t)+0.0065IM
_NL(t)+
0.0081IM_PL(t)+0.0065IM_PT(t)+0.0325IM_RO(t)+0.0108IM_SK(t)+0.0108IM_
SI(t)+
0.0081IM_ES(t)+0.0054IM_SE(t)+0.0081IM_UK(t)-22905.4187

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 3) indicates that there are no large differences, therefore we can see that the real imports of EU-countries from Bulgaria are closer to those suggested by the regression equation which means that imports depend preferential from the potential offered by its geographic position.

The average distance between real data and those from the regression is: 0.62%.

Table 3. The correlation between the coefficients of regression and the real imports of EU-countries in Bulgaria (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	1.08%	0.32%	**Italy**	1.62%	0.64%
Belgium+Luxembourg	1.62%	0.21%	**Latvia**	0.54%	0.19%
Bulgaria	-	-	**Lithuania**	0.65%	0.21%
Croatia	1.08%	0.33%	**Malta**	1.08%	0.19%
Czech Republic	0.81%	0.23%	**Netherlands**	0.65%	0.13%
Denmark	0.65%	0.14%	**Poland**	0.81%	0.26%
Estonia	0.46%	0.15%	**Portugal**	0.65%	0.28%
Finland	0.46%	0.10%	**Romania**	3.25%	2.70%
France	1.08%	0.20%	**Slovakia**	1.08%	0.25%
Germany	0.81%	0.31%	**Slovenia**	1.08%	0.42%
Greece	3.25%	3.00%	**Spain**	0.81%	0.21%
Hungary	1.62%	0.36%	**Sweden**	0.54%	0.09%
Ireland	0.65%	0.07%	**United Kingdom**	0.81%	0.10%

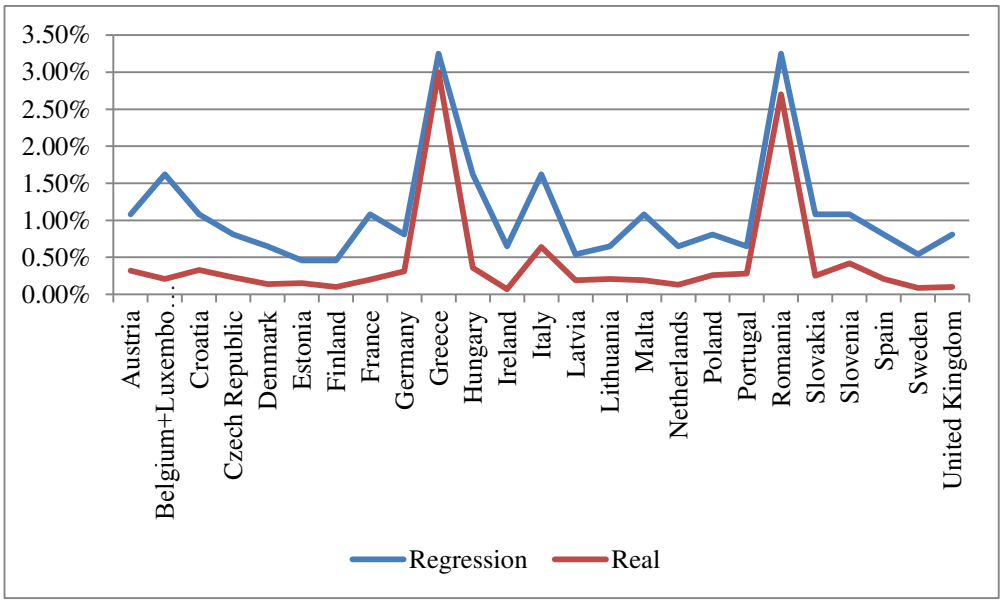

Figure 3. The relationship between imports based on distances and the real imports in 2013 in Bulgaria (in percent)

In the case of **Croatia**, from Appendix A.7 we can see that is a strong link between the two groups of indicators (R^2=0.9170), having finally:

EX_HR(t)=0.0039IM_AT(t)+0.002IM_BE(t)+0.0026IM_BG(t)+0.002IM_CY(t)+0.0026IM_CZ(t)+ 0.002IM_DK(t)+0.0013IM_EE(t)+0.0013IM_FI(t)+0.0026IM_FR(t)+0.0026IM_DE(t)+ 0.0026IM_EL(t)+0.0078IM_HU(t)+0.0016IM_IE(t)+0.0039IM_IT(t)+0.0016IM_LV(t)+ 0.002IM_LT(t)+0.002IM_LU(t)+0.0026IM_MT(t)+0.002IM_NL(t)+0.0026IM_PL(t)+ 0.0016IM_PT(t)+0.0039IM_RO(t)+0.0039IM_SK(t)+0.0078IM_SI(t)+0.002IM_ES(t)+ 0.0016IM_SE(t)+0.002IM_UK(t)-1510.5281

Let note that we have a small autoregression (d=0.7535) and P-Value for the Intercept is 0.16. If we shall try to eliminate the autoregression we shall find again d=0.5860 (much worth) and a P-Value for the Intercept 0.61. Therefore, we shall let the first regression which is much better than the second.

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 4) indicates that there are no large differences except Slovenia (figure 4) which is absolutely normal because of their former membership to Yugoslavia. Also, we can see that the real imports of EU-countries from Croatia are closer to those suggested by the regression equation which means that imports depend preferential from the potential offered by its geographic position.

The average distance between real data and those from the regression is: 0.30 %.

Table 4. The correlation between the coefficients of regression and the real imports of EU-countries in Croatia (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.39%	0.44%	**Italy**	0.39%	0.36%
Belgium+Luxembourg	0.40%	0.05%	**Latvia**	0.16%	0.04%
Bulgaria	0.26%	0.15%	**Lithuania**	0.20%	0.03%
Croatia	-	-	**Malta**	0.26%	1.10%
Czech Republic	0.26%	0.09%	**Netherlands**	0.20%	0.04%
Denmark	0.20%	0.04%	**Poland**	0.26%	0.07%
Estonia	0.13%	0.22%	**Portugal**	0.16%	0.02%
Finland	0.13%	0.04%	**Romania**	0.39%	0.16%
France	0.26%	0.03%	**Slovakia**	0.39%	0.19%
Germany	0.26%	0.11%	**Slovenia**	0.78%	4.00%
Greece	0.26%	0.20%	**Spain**	0.20%	0.02%
Hungary	0.78%	0.28%	**Sweden**	0.16%	0.04%
Ireland	0.16%	0.01%	**United Kingdom**	0.20%	0.04%

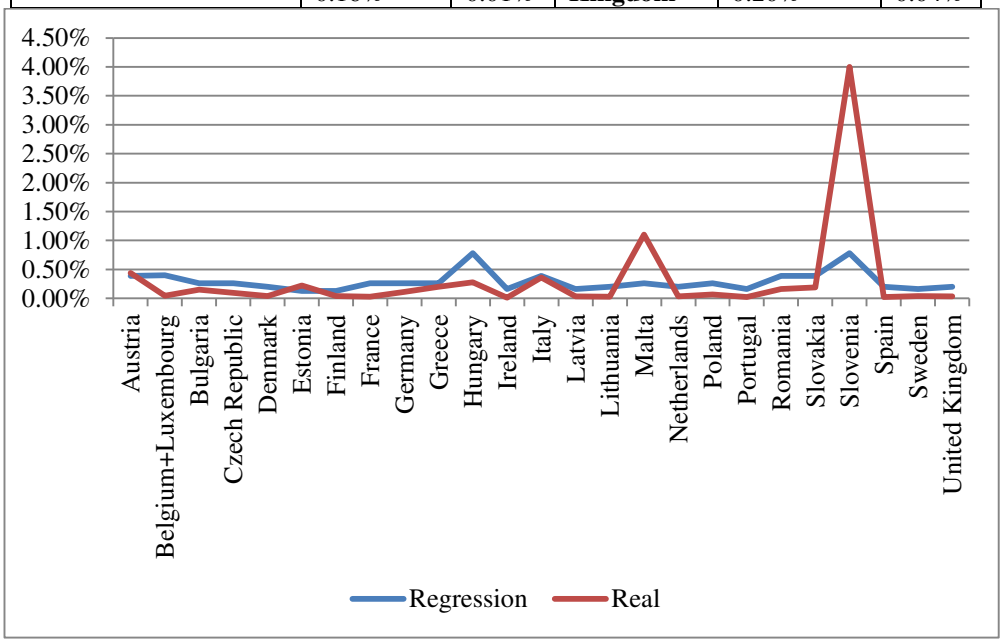

Figure 4. The relationship between imports based on distances and the real imports in 2013 in Croatia (in percent)

In the case of **Cyprus**, from Appendix A.8 we can see that is a weak link between the two groups of indicators (R^2=0.6655), having finally:

EX_CY(t)=0.0005IM_AT(t)+0.0004IM_BE(t)+0.0007IM_BG(t)+0.0004IM_HR(t)+ 0.0004IM_CZ(t)+0.0003IM_DK(t)+0.0002IM_EE(t)+0.0002IM_FI(t)+0.0005IM_FR(t)+ 0.0004IM_DE(t)+0.0014IM_EL(t)+0.0004IM_HU(t)+0.0003IM_IE(t)+0.0007IM_IT(t)+ 0.0002IM_LV(t)+0.0002IM_LT(t)+0.0004IM_LU(t)+0.0005IM_MT(t)+0.0003IM_NL(t)+ 0.0003IM_PL(t)+0.0003IM_PT(t)+0.0005IM_RO(t)+0.0004IM_SK(t)+0.0005IM_SI(t)+ 0.0004IM_ES(t)+0.0002IM_SE(t)+0.0004IM_UK(t)-457.8204

Let note that we have a P-Value for the Intercept 0.25 therefore we will reject the null hypothesis with a probability almost 0.75.

In the case of **Czech Republic**, from Appendix A.9 we can see that is a strong link between the two groups of indicators (R^2=0.9308), having finally:

EX_CZ(t)=0.0804IM_AT(t)+0.0402IM_BE(t)+0.02IM_BG(t)+0.0268IM_HR(t)+0.02IM_CY(t)+ 0.0402IM_DK(t)+0.02IM_EE(t)+0.02IM_FI(t)+0.0402IM_FR(t)+0.0804IM_DE(t)+0.0268IM_EL(t) +0.0402IM_HU(t)+0.02IM_IE(t)+0.0402IM_IT(t)+0.0268IM_LV(t)+0.0402IM_LT(t)+ 0.0402IM_LU(t)+0.0268IM_MT(t)+0.0402IM_NL(t)+0.0804IM_PL(t)+0.02IM_PT(t)+ 0.0268IM_RO(t)+0.0804IM_SK(t)+0.0402IM_SI(t)+0.0268IM_ES(t)+0.0268IM_SE(t)+ 0.0268IM_UK(t)-86039.0944

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 5) indicates that there are many differences (real vs. predicted imports) like Austria (3.90% vs. 8.04%), Belgium+Luxembourg (0.98% vs. 8.04%), Germany (3.90% vs. 8.04%), Poland (3.90% vs. 8.04%) and Slovakia (14% vs. 8.04%) in the last case being absolutely normal because of their former membership to Czechoslovakia.

Also, we can see that the real imports of EU-countries from Czech Republic are under to those suggested by the regression equation which means that imports not use the potential offered by its geographic position.

The average distance between real data and those from the regression is: 2.18%.

Table 5. The correlation between the coefficients of regression and the real imports of EU-countries in Czech Republic (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	8.04%	3.90%	**Italy**	4.02%	1.20%
Belgium+Luxembourg	8.04%	0.98%	**Latvia**	2.68%	1.50%
Bulgaria	2.00%	2.10%	**Lithuania**	4.02%	1.60%
Croatia	2.68%	1.90%	**Malta**	2.68%	0.21%
Czech Republic	-	-	**Netherlands**	4.02%	0.99%
Denmark	4.02%	1.40%	**Poland**	8.04%	3.90%

Estonia	2.00%	1.10%	**Portugal**	2.00%	0.61%
Finland	2.00%	1.10%	**Romania**	2.68%	2.80%
France	4.02%	1.20%	**Slovakia**	8.04%	14.00%
Germany	8.04%	3.90%	**Slovenia**	4.02%	2.30%
Greece	2.68%	0.47%	**Spain**	2.68%	1.10%
Hungary	4.02%	4.00%	**Sweden**	2.68%	1.30%
Ireland	2.00%	0.72%	**United Kingdom**	2.68%	1.20%

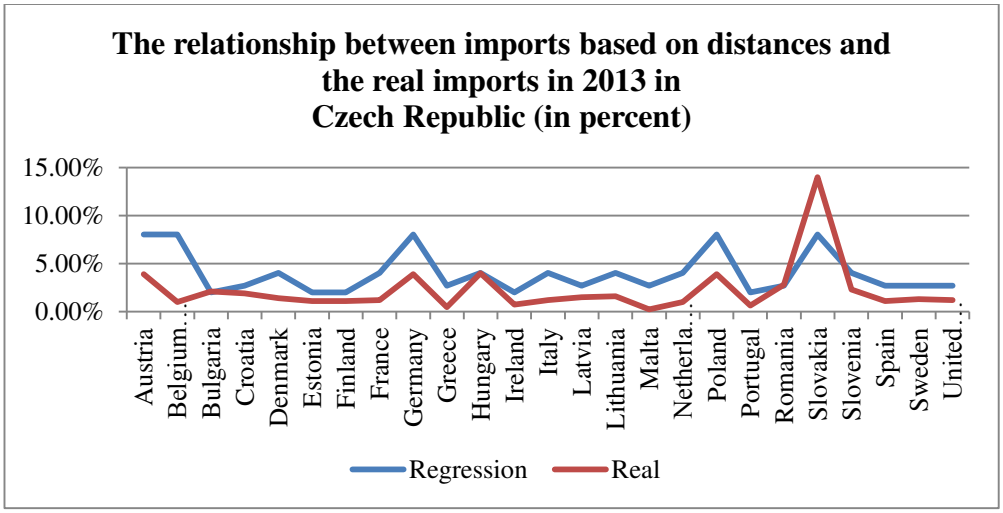

Figure 5. The relationship between imports based on distances and the real imports in 2013 in Czech Republic (in percent)

In the case of **Denmark**, from Appendix A.10 we can see that is a strong link between the two groups of indicators (R^2=0.9581), having:

EX_DK(t)=0.0117IM_AT(t)+0.0117IM_BE(t)+0.0047IM_BG(t)+0.0059IM_HR(t)+ 0.0047IM_CY(t)+0.0117IM_CZ(t)+0.0078IM_EE(t)+0.0117IM_FI(t)+0.0117IM_FR(t)+ 0.0235IM_DE(t)+0.0059IM_EL(t)+0.0078IM_HU(t)+0.0059IM_IE(t)+0.0078IM_IT(t)+ 0.0059IM_LV(t)+0.0078IM_LT(t)+0.0117IM_LU(t)+0.0059IM_MT(t)+0.0117IM_NL(t)+ 0.0117IM_PL(t)+0.0059IM_PT(t)+0.0059IM_RO(t)+0.0078IM_SK(t)+0.0078IM_SI(t)+ 0.0078IM_ES(t)+0.0235IM_SE(t)+0.0078IM_UK(t)+25237.4467

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 6) indicates that there are no large differences (real vs. predicted imports) except Sweden (8% vs. 0.78% - figure 6) which is absolutely normal as a consequence of commercial traditions that have bound these countries.

Unlike the other countries analyzed so far, one can see that in general, real imports are close to those provided by regression analysis, which shows a strong trade policy, taking into account the dependence on proximity.

The average distance between real data and those from the regression is: 0.78%.

Table 6. The correlation between the coefficients of regression and the real imports of EU-countries in Denmark (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	1.17%	0.41%	**Italy**	0.78%	0.57%
Belgium+Luxembourg	2.34%	0.36%	**Latvia**	0.59%	2.00%
Bulgaria	0.47%	0.36%	**Lithuania**	0.78%	1.70%
Croatia	0.59%	1.20%	**Malta**	0.59%	0.60%
Czech Republic	1.17%	0.61%	**Netherlands**	1.17%	0.94%
Denmark	-	-	**Poland**	1.17%	1.20%
Estonia	0.78%	1.20%	**Portugal**	0.59%	0.43%
Finland	1.17%	3.20%	**Romania**	0.59%	0.83%
France	1.17%	0.50%	**Slovakia**	0.78%	0.36%
Germany	2.35%	1.20%	**Slovenia**	0.78%	0.31%
Greece	0.59%	0.94%	**Spain**	0.78%	0.54%
Hungary	0.78%	0.68%	**Sweden**	2.35%	8.00%
Ireland	0.59%	1.40%	**United Kingdom**	0.78%	1.40%

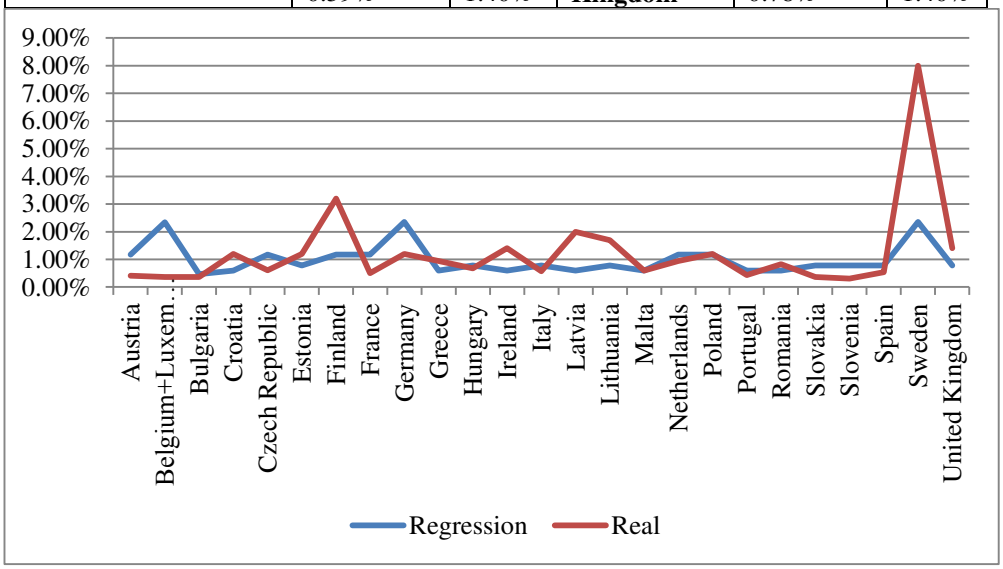

Figure 6. The relationship between imports based on distances and the real imports in 2013 in Denmark (in percent)

In the case of **Estonia**, from Appendix A.11 we can see that is a strong link between the two groups of indicators (R^2=0.9040), having:

EX_EE(t)=0.004IM_AT(t)+0.004IM_BE(t)+0.0028IM_BG(t)+0.0033IM_HR(t)+0.0025IM_CY(t)+ 0.0049IM_CZ(t)+0.0066IM_DK(t)+0.0198IM_FI(t)+0.004IM_FR(t)+0.0049IM_DE(t)+ 0.0028IM_EL(t)+0.004IM_HU(t)+0.0028IM_IE(t)+0.0033IM_IT(t)+0.0198IM_LV(t)+ 0.0099IM_LT(t)+0.004IM_LU(t)+0.0028IM_MT(t)+0.004IM_NL(t)+0.0066IM_PL(t)+ 0.0028IM_PT(t)+0.0033IM_RO(t)+0.0049IM_SK(t)+0.0033IM_SI(t)+0.0033IM_ES(t)+ 0.0099IM_SE(t)+0.0033IM_UK(t)-9027.2563

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 7) indicates that there are no large differences (real vs. predicted imports) except former Soviet Union countries – Latvia (6.70% vs. 1.98%) and Lithuania (2.50% vs. 0.99%) which is absolutely normal as a consequence of commercial traditions that have bound these countries.

Let note that in general, real imports were close, but under to those provided by regression analysis, which shows a trade policy depending on proximity of the EU-countries but not exploring all the possibilities of the minimal distances recovery.

The average distance between real data and those from the regression is: 0.57%.

Table 7. The correlation between the coefficients of regression andthe real imports of EU-countries in Estonia (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.40%	0.03%	**Italy**	0.33%	0.03%
Belgium+Luxembourg	0.80%	0.08%	**Latvia**	1.98%	6.70%
Bulgaria	0.28%	0.09%	**Lithuania**	0.99%	2.50%
Croatia	0.33%	0.07%	**Malta**	0.28%	0.06%
Czech Republic	0.49%	0.05%	**Netherlands**	0.40%	0.07%
Denmark	0.66%	0.43%	**Poland**	0.66%	0.10%
Estonia	-	-	**Portugal**	0.28%	0.04%
Finland	1.98%	2.80%	**Romania**	0.33%	0.02%
France	0.40%	0.05%	**Slovakia**	0.49%	0.07%
Germany	0.49%	0.06%	**Slovenia**	0.33%	0.04%
Greece	0.28%	0.02%	**Spain**	0.33%	0.03%
Hungary	0.40%	0.03%	**Sweden**	0.99%	1.70%
Ireland	0.28%	0.04%	**United Kingdom**	0.33%	0.07%

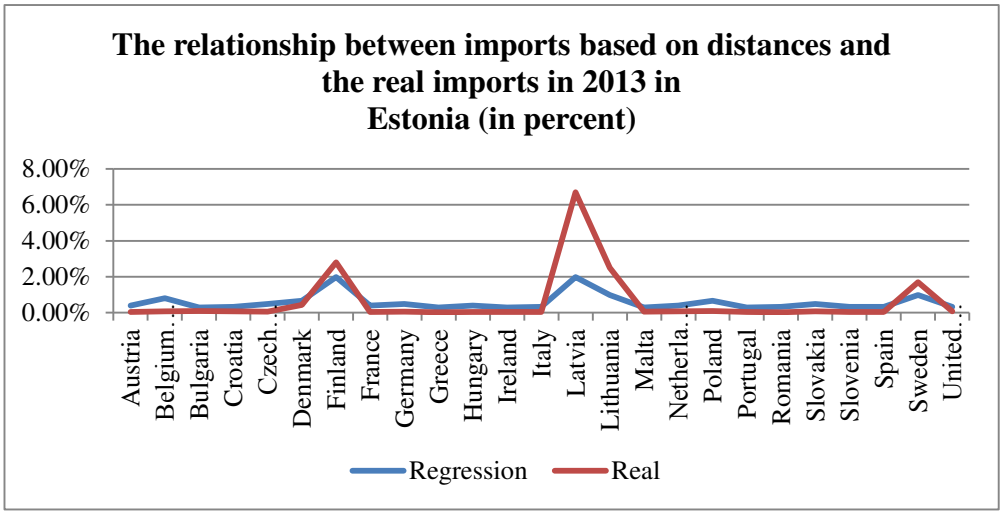

Figure 7. The relationship between imports based on distances and the real imports in 2013 in Estonia (in percent)

In the case of **Finland**, from Appendix A.12 we can see that is a very weak link between the two groups of indicators (R^2=0.1840), having:

EX_FI(t)=0.0042IM_AT(t)+0.0042IM_BE(t)+0.0024IM_BG(t)+0.0028IM_HR(t)
+0.0024IM_CY(t)+0.0042IM_CZ(t)+0.0084IM_DK(t)+0.0169IM_EE(t)+0.0042I
M_FR(t)+0.0056IM_DE(t)+
0.0028IM_EL(t)+0.0034IM_HU(t)+0.0028IM_IE(t)+0.0034IM_IT(t)+0.0084IM_
LV(t)+
0.0056IM_LT(t)+0.0042IM_LU(t)+0.0028IM_MT(t)+0.0042IM_NL(t)+0.0042IM
_PL(t)+
0.0028IM_PT(t)+0.0028IM_RO(t)+0.0034IM_SK(t)+0.0034IM_SI(t)+0.0034IM_
ES(t)+
0.0169IM_SE(t)+0.0034IM_UK(t)+37525.6209

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 8) indicates that there are no large differences (real vs. predicted imports) except Estonia (9.60% vs. 1.69%), Latvia (4.30% vs. 0.84%), Lithuania (1.90% vs. 0.56%) and Sweden (5.60% vs. 1.69%).

In general, real imports were close which shows a trade policy depending on proximity of the EU-countries.

The average distance between real data and those from the regression is: 0.76%.

Table 8. The correlation between the coefficients of regression and the real imports of EU-countries in Finland (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.42%	0.32%	**Italy**	0.34%	0.39%
Belgium+Luxembourg	0.84%	0.59%	**Latvia**	0.84%	4.30%
Bulgaria	0.24%	0.19%	**Lithuania**	0.56%	1.90%
Croatia	0.28%	0.22%	**Malta**	0.28%	0.06%
Czech Republic	0.42%	0.27%	**Netherlands**	0.42%	0.82%
Denmark	0.84%	1.60%	**Poland**	0.42%	0.86%
Estonia	1.69%	9.60%	**Portugal**	0.28%	0.28%
Finland	-	-	**Romania**	0.28%	0.28%
France	0.42%	0.41%	**Slovakia**	0.34%	0.18%
Germany	0.56%	0.64%	**Slovenia**	0.34%	0.27%
Greece	0.28%	0.29%	**Spain**	0.34%	0.34%
Hungary	0.34%	0.29%	**Sweden**	1.69%	5.60%
Ireland	0.28%	0.22%	**United Kingdom**	0.34%	0.62%

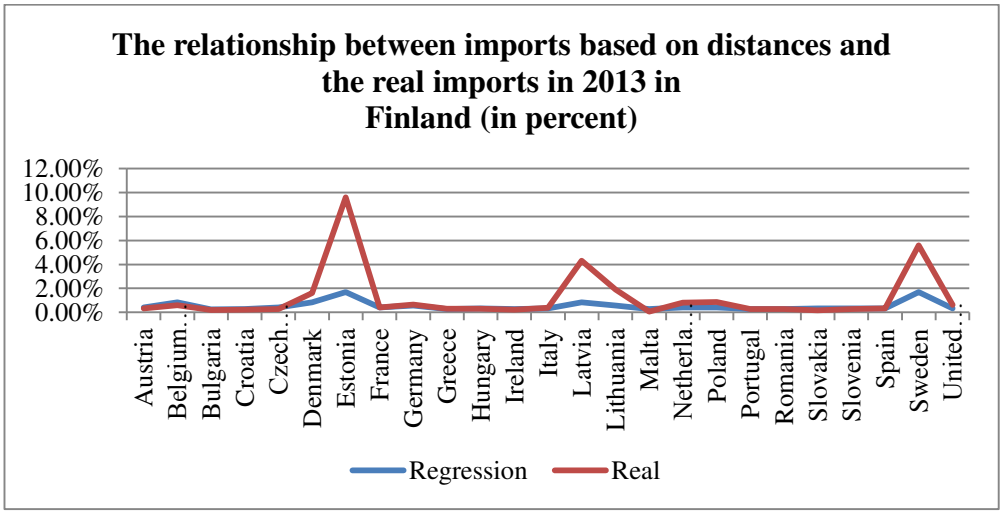

Figure 8. The relationship between imports based on distances and the real imports in 2013 in Finland (in percent)

In the case of **France**, from Appendix A.13 we can see that is a strong link between the two groups of indicators (R^2=0.9311), having:

EX_FR(t)=0.0444IM_AT(t)+0.0889IM_BE(t)+0.0296IM_BG(t)+0.0296IM_HR(t)+ 0.0296IM_CY(t)+0.0444IM_CZ(t)+0.0444IM_DK(t)+0.0178IM_EE(t)+0.0222IM_FI(t)+ 0.0889IM_DE(t)+0.0444IM_EL(t)+0.0296IM_HU(t)+0.0444IM_IE(t)+0.0889IM_IT(t)+

0.0222IM_LV(t)+0.0296IM_LT(t)+0.0889IM_LU(t)+0.0444IM_MT(t)+0.0444IM_NL(t)+ 0.0444IM_PL(t)+0.0444IM_PT(t)+0.0222IM_RO(t)+0.0296IM_SK(t)+0.0444IM_SI(t)+ 0.0889IM_ES(t)+0.0296IM_SE(t)+0.0889IM_UK(t)+158856.3841

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 9) indicates that there are no large differences (real vs. predicted imports) except Belgium+Luxembourg – under the distance between them (11% vs. 17.78%) and, on the other side, Romania (5.80% vs. 2.22%) and Portugal (6.30% vs. 4.44%) over the coefficients of regression.

Let note that in general, real imports were close to those provided by regression analysis.

The average distance between real data and those from the regression is: 1.22 %.

Table 9. The correlation between the coefficients of regression and the real imports of EU-countries in France (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	4.44%	2.80%	**Italy**	8.89%	8.30%
Belgium+Luxembourg	17.78%	11.00%	**Latvia**	2.22%	1.80%
Bulgaria	2.96%	2.90%	**Lithuania**	2.96%	2.70%
Croatia	2.96%	2.20%	**Malta**	4.44%	7.10%
Czech Republic	4.44%	3.30%	**Netherlands**	4.44%	4.20%
Denmark	4.44%	3.20%	**Poland**	4.44%	3.90%
Estonia	1.78%	2.10%	**Portugal**	4.44%	6.30%
Finland	2.22%	3.20%	**Romania**	2.22%	5.80%
France	-	-	**Slovakia**	2.96%	3.00%
Germany	8.89%	7.20%	**Slovenia**	4.44%	4.20%
Greece	4.44%	4.90%	**Spain**	8.89%	10.00%
Hungary	2.96%	4.00%	**Sweden**	2.96%	4.20%
Ireland	4.44%	4.20%	**United Kingdom**	8.89%	6.20%

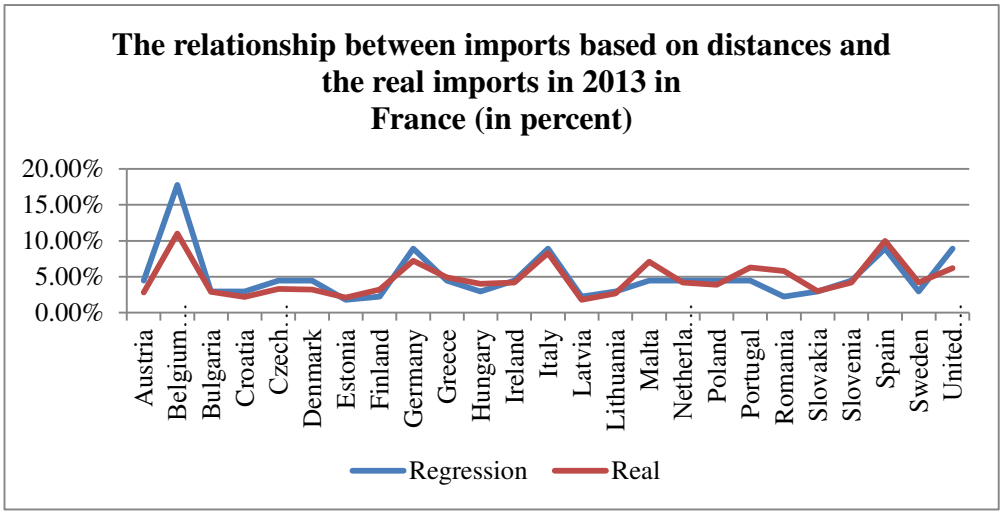

Figure 9

In the case of **Germany**, from Appendix A.14 we can see that is a strong link between the two groups of indicators (R^2=0.9681). The P-Value Analysis reveals for Intercept a great value (0.2002) which indicates a weak evidence against the null hypothesis. In fact, assuming the threshold of 79% we obtain the regression in the table A.19. Finally, we have:

EX_DE(t)=0.4463IM_AT(t)+0.4463IM_BE(t)+0.1114IM_BG(t)+0.1486IM_HR(t)
+
0.1114IM_CY(t)+0.4463IM_CZ(t)+0.4463IM_DK(t)+0.1114IM_EE(t)+0.1486IM
_FI(t)+
0.4463IM_FR(t)+0.1486IM_EL(t)+0.2228IM_HU(t)+0.1486IM_IE(t)+0.2228IM_
IT(t)+
0.1486IM_LV(t)+0.2228IM_LT(t)+0.4463IM_LU(t)+0.1486IM_MT(t)+0.4463IM
_NL(t)+
0.4463IM_PL(t)+0.1486IM_PT(t)+0.1486IM_RO(t)+0.2228IM_SK(t)+0.2228IM_
SI(t)+
0.2228IM_ES(t)+0.2228IM_SE(t)+0.2228IM_UK(t)-83740.245

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 10) indicates that there are many differences (real vs. predicted imports) between countries - Belgium+Luxembourg with a real percent of imports of 14% instead 89.26% (after regression), Czech Republic (26% vs. 44.63%), Denmark with 20% vs. 44.63%, France – 18% vs. 44.63%, Netherlands – 15% vs. 44.63%, Poland – 23% vs. 44.63%. We can easily see that these difference, maybe except

Poland, are encountered in the case of the very developed countries from the European Union, which have themselves a strong import.

Let note that in general, real imports were strong under to those provided by regression analysis, even Germany is the main engine of UE.

The average distance between real data and those from the regression is very high: 11.44 %.

Table 10. The correlation between the coefficients of regression and the real imports of EU-countries in Germany (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	44.63%	38.00%	**Italy**	22.28%	15.00%
Belgium+Luxembourg	89.26%	14.00%	**Latvia**	14.86%	10.00%
Bulgaria	11.14%	10.00%	**Lithuania**	22.28%	10.00%
Croatia	14.86%	14.00%	**Malta**	14.86%	4.20%
Czech Republic	44.63%	26.00%	**Netherlands**	44.63%	15.00%
Denmark	44.63%	20.00%	**Poland**	44.63%	23.00%
Estonia	11.14%	9.30%	**Portugal**	14.86%	11.00%
Finland	14.86%	13.00%	**Romania**	14.86%	18.00%
France	44.63%	18.00%	**Slovakia**	22.28%	16.00%
Germany	-	-	**Slovenia**	22.28%	17.00%
Greece	14.86%	10.00%	**Spain**	22.28%	12.00%
Hungary	22.28%	24.00%	**Sweden**	22.28%	18.00%
Ireland	14.86%	9.20%	**United Kingdom**	22.28%	14.00%

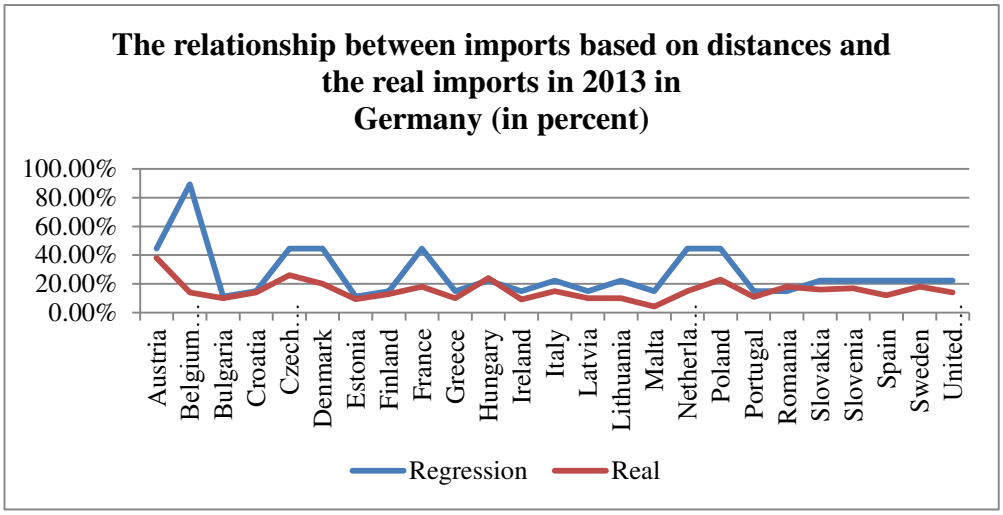

Figure 10

In the case of **Greece**, from Appendix A.15 we can see that is a strong link between the two groups of indicators (R^2=0.8716). We have:

EX_EL(t)=0.0114IM_AT(t)+0.0076IM_BE(t)+0.0228IM_BG(t)+0.0076IM_HR(t)
+
0.0228IM_CY(t)+0.0076IM_CZ(t)+0.0057IM_DK(t)+0.0033IM_EE(t)+0.0038IM
_FI(t)+
0.0114IM_FR(t)+0.0076IM_DE(t)+0.0076IM_HU(t)+0.0057IM_IE(t)+0.0228IM_
IT(t)+
0.0038IM_LV(t)+0.0046IM_LT(t)+0.0076IM_LU(t)+0.0114IM_MT(t)+0.0057IM
_NL(t)+
0.0057IM_PL(t)+0.0057IM_PT(t)+0.0114IM_RO(t)+0.0076IM_SK(t)+0.0114IM_
SI(t)+
0.0076IM_ES(t)+0.0046IM_SE(t)+0.0076IM_UK(t)-15317.9389

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 11) indicates that there are only one major difference (real vs. predicted imports) between countries – Bulgaria were real imports are 5.20% versus 2.28% from the regression.

Let note that in general, real imports were under to those provided by regression analysis, therefore the export of Greece not exploit all the opportunities generated by the distances.

The average distance between real data and those from the regression is low: 0.64 %.

Table 11. The correlation between the coefficients of regression and the real imports of EU-countries in Greece (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	1.14%	0.14%	**Italy**	2.28%	0.64%
Belgium+Luxembourg	1.52%	0.09%	**Latvia**	0.38%	0.11%
Bulgaria	2.28%	5.20%	**Lithuania**	0.46%	0.12%
Croatia	0.76%	0.41%	**Malta**	1.14%	1.90%
Czech Republic	0.76%	0.16%	**Netherlands**	0.57%	0.12%
Denmark	0.57%	0.18%	**Poland**	0.57%	0.20%
Estonia	0.33%	0.11%	**Portugal**	0.57%	0.24%
Finland	0.38%	0.12%	**Romania**	1.14%	1.10%
France	1.14%	0.13%	**Slovakia**	0.76%	0.12%
Germany	0.76%	0.20%	**Slovenia**	1.14%	0.65%
Greece	-	-	**Spain**	0.76%	0.34%
Hungary	0.76%	0.10%	**Sweden**	0.46%	0.16%
Ireland	0.57%	0.08%	**United Kingdom**	0.76%	0.19%

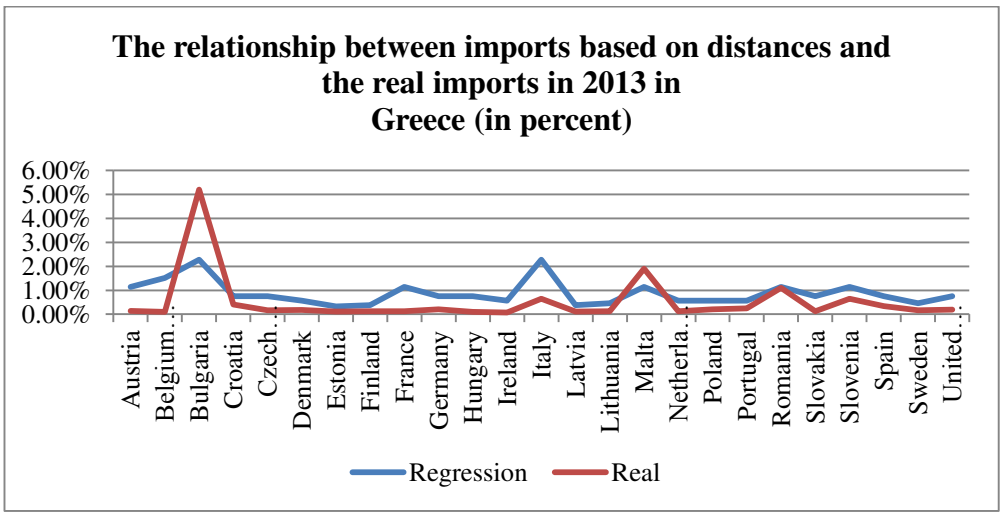

Figure 11

In the case of **Hungary**, from Appendix A.16 we can see that is a strong link between the two groups of indicators (R^2=0.9758). The P-Value Analysis reveals low values under 0.0003 which indicates a very strong evidence against the null hypothesis. Therefore, finally, we have:

EX_HU(t)=0.0583IM_AT(t)+0.0194IM_BE(t)+0.0291IM_BG(t)+0.0583IM_HR(t)+
0.0146IM_CY(t)+0.0291IM_CZ(t)+0.0194IM_DK(t)+0.0117IM_EE(t)+0.0117IM_FI(t)+
0.0194IM_FR(t)+0.0291IM_DE(t)+0.0194IM_EL(t)+0.0117IM_IE(t)+0.0291IM_IT(t)+
0.0146IM_LV(t)+0.0194IM_LT(t)+0.0194IM_LU(t)+0.0194IM_MT(t)+0.0194IM_NL(t)+
0.0291IM_PL(t)+0.0117IM_PT(t)+0.0583IM_RO(t)+0.0583IM_SK(t)+0.0583IM_SI(t)+
0.0146IM_ES(t)+0.0146IM_SE(t)+0.0146IM_UK(t)-25082.8642

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 12) indicates that there are not great differences (real vs. predicted imports) between countries, except Romania with real imports – 8.10% versus 5.83% after regression analysis. We can conclude that exports of Hungary are directed by territorial proximity criterion.

The average distance between real data and those from the regression is: 1.13%.

Table 12. The correlation between the coefficients of regression and the real imports of EU-countries in Hungary (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	5.83%	2.90%	**Italy**	2.91%	1.10%
Belgium+Luxembourg	3.88%	0.40%	**Latvia**	1.46%	1.10%
Bulgaria	2.91%	2.90%	**Lithuania**	1.94%	0.79%
Croatia	5.83%	6.00%	**Malta**	1.94%	0.12%
Czech Republic	2.91%	2.50%	**Netherlands**	1.94%	0.51%
Denmark	1.94%	0.84%	**Poland**	2.91%	1.70%
Estonia	1.17%	1.20%	**Portugal**	1.17%	0.37%
Finland	1.17%	0.40%	**Romania**	5.83%	8.10%
France	1.94%	0.66%	**Slovakia**	5.83%	5.10%
Germany	2.91%	2.20%	**Slovenia**	5.83%	3.30%
Greece	1.94%	0.66%	**Spain**	1.46%	0.75%
Hungary	-	-	**Sweden**	1.46%	0.68%
Ireland	1.17%	0.30%	**United Kingdom**	1.46%	0.67%

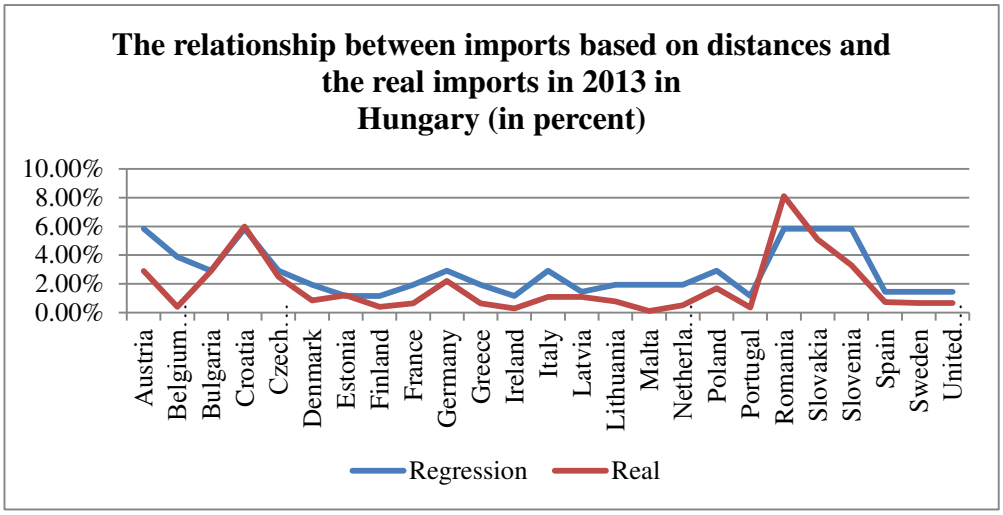

Figure 12

The case of **Ireland**, from Appendix A.17 is less relevant because R^2=0.3920, that is the linear regression analysis explains very slightly the phenomenon. Because P-Values are less then 0.03 the null hypothesis can be rejected with a significant probability (97%). We have also:

EX_IE(t)=0.0048IM_AT(t)+0.0097IM_BE(t)+0.0039IM_BG(t)+0.0039IM_HR(t)
+0.0039IM_CY(t)+0.0048IM_CZ(t)+0.0048IM_DK(t)+0.0028IM_EE(t)+0.0032I
M_FI(t)+0.0097IM_FR(t)+
0.0064IM_DE(t)+0.0048IM_EL(t)+0.0039IM_HU(t)+0.0064IM_IT(t)+0.0032IM_
LV(t)+
0.0039IM_LT(t)+0.0064IM_LU(t)+0.0048IM_MT(t)+0.0097IM_NL(t)+0.0048IM
_PL(t)+
0.0048IM_PT(t)+0.0032IM_RO(t)+0.0039IM_SK(t)+0.0048IM_SI(t)+0.0064IM_
ES(t)+
0.0039IM_SE(t)+0.0193IM_UK(t)+56109.6725

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 13) indicates that there are very little differences (real vs. predicted imports) between countries. We can conclude that exports of Ireland are directed by territorial proximity criterion.

The average distance between real data and those from the regression is: 0.36%.

Table 13. The correlation between the coefficients of regression and the real imports of EU-countries in Ireland (in percent) in 2013

Country	Regression	Real	Country	Regression	Real

Austria	0.48%	0.88%	**Italy**	0.64%	0.75%
Belgium+Luxembourg	1.61%	3.60%	**Latvia**	0.32%	0.24%
Bulgaria	0.39%	0.33%	**Lithuania**	0.39%	0.24%
Croatia	0.39%	0.33%	**Malta**	0.48%	0.23%
Czech Republic	0.48%	0.60%	**Netherlands**	0.97%	1.10%
Denmark	0.48%	1.30%	**Poland**	0.48%	0.67%
Estonia	0.28%	0.30%	**Portugal**	0.48%	0.97%
Finland	0.32%	0.78%	**Romania**	0.32%	0.73%
France	0.97%	1.30%	**Slovakia**	0.39%	0.26%
Germany	0.64%	0.88%	**Slovenia**	0.48%	0.29%
Greece	0.48%	0.62%	**Spain**	0.64%	1.20%
Hungary	0.39%	0.51%	**Sweden**	0.39%	1.20%
Ireland	-	-	**United Kingdom**	1.93%	3.00%

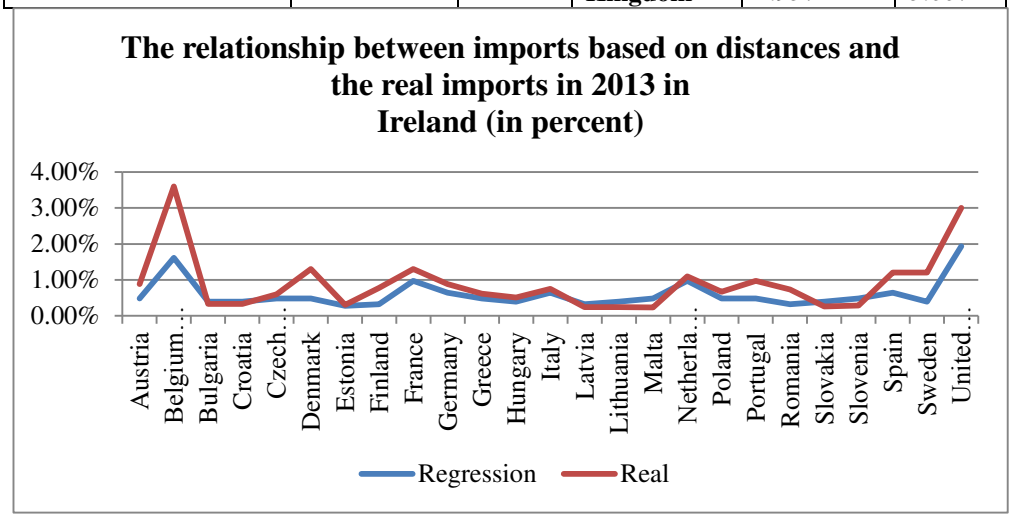

Figure 13

In the case of **Italy**, from Appendix A.18 we can see that is a strong link between the two groups of indicators (R^2=0.9671). On the other hand, P-Values Analysis reveals for Intercept a big value (0.1879) which indicates a small evidence against the null hypothesis. Therefore, finally, we have:

EX_IT(t)=0.1629IM_AT(t)+0.0816IM_BE(t)+0.0816IM_BG(t)+0.0816IM_HR(t)
+0.0816IM_CY(t)+0.0816IM_CZ(t)+0.0542IM_DK(t)+0.0272IM_EE(t)+0.0325I
M_FI(t)+0.1629IM_FR(t)+
0.0816IM_DE(t)+0.1629IM_EL(t)+0.0816IM_HU(t)+0.0542IM_IE(t)+0.0325IM_

LV(t)+
0.0407IM_LT(t)+0.0816IM_LU(t)+0.1629IM_MT(t)+0.0542IM_NL(t)+0.0542IM_PL(t)+
0.0542IM_PT(t)+0.0542IM_RO(t)+0.0816IM_SK(t)+0.1629IM_SI(t)+0.0816IM_ES(t)+
0.0407IM_SE(t)+0.0816IM_UK(t)+27138.5206

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 14) indicates that there are great differences (real vs. predicted imports) between almost all countries: Austria (6.20% vs. 16.29%), Belgium+Luxembourg (3.30% vs. 16.32%), France (7.50% vs. 16.29%), Greece (8% vs. 16.29%), Romania (11% vs. 5.42%) in this last case real imports of Romania being much upper than that of regression.

The average distance between real data and those from the regression is: 3.40%.

Table 14. The correlation between the coefficients of regression and the real imports of EU-countries in Italy (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	16.29%	6.20%	**Italy**	-	-
Belgium+Luxembourg	16.32%	3.30%	**Latvia**	3.25%	3.00%
Bulgaria	8.16%	6.90%	**Lithuania**	4.07%	4.10%
Croatia	8.16%	13.00%	**Malta**	16.29%	18.00%
Czech Republic	8.16%	4.00%	**Netherlands**	5.42%	2.10%
Denmark	5.42%	3.60%	**Poland**	5.42%	5.30%
Estonia	2.72%	2.20%	**Portugal**	5.42%	5.10%
Finland	3.25%	2.60%	**Romania**	5.42%	11.00%
France	16.29%	7.50%	**Slovakia**	8.16%	3.40%
Germany	8.16%	5.10%	**Slovenia**	16.29%	15.00%
Greece	16.29%	8.00%	**Spain**	8.16%	6.20%
Hungary	8.16%	4.40%	**Sweden**	4.07%	3.00%
Ireland	5.42%	1.80%	**United Kingdom**	8.16%	4.00%

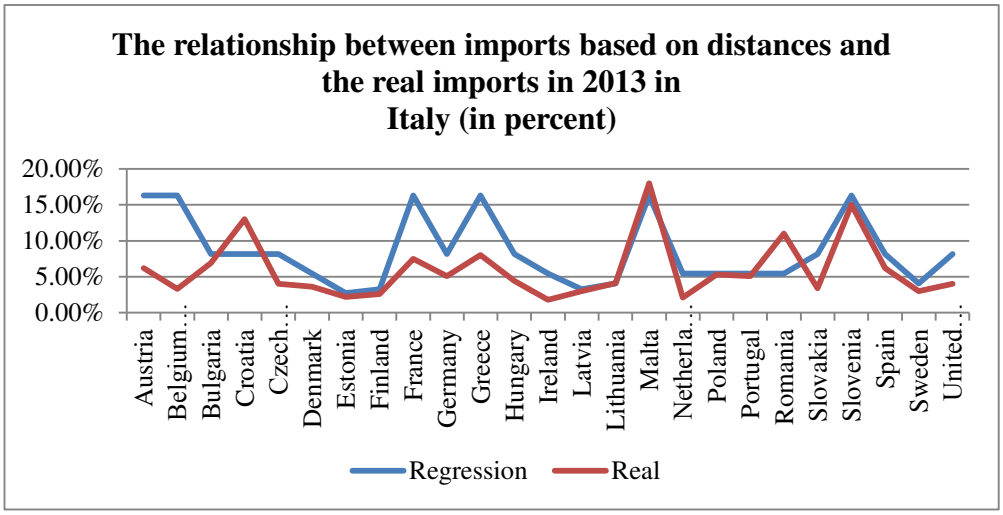

Figure 14

Durbin Watson statistical analysis reveals a positive autocorrelation of errors (d=0.7876 for the limits of autocorrelation: (0,0.97)). Because in the upper analysis we have ρ - the autocorrelation coefficient of errors having value ρ= 0.558744702 we shall make another regression analysis for the set of data: Imports-computed-new(t)=Imports-computed(t)-ρ·Imports-computed(t-1) and Imports-real-new(t)= Imports-real(t)-ρ·Imports-real(t-1) (table A.33). Finally, we obtain the equation of regression:

EX_IT(t)=0.5587EX_IT(t-1)+0.1808IM_AT(t)-0.101IM_AT(t-1)+0.0905IM_BE(t)-0.0506IM_BE(t-1)+0.0905IM_BG(t)-0.0506IM_BG(t-1)+0.0905IM_HR(t)-0.0506IM_HR(t-1)+ 0.0905IM_CY(t)-0.0506IM_CY(t-1)+0.0905IM_CZ(t)-0.0506IM_CZ(t-1)+0.0601IM_DK(t)-0.0336IM_DK(t-1)+0.0302IM_EE(t)-0.0169IM_EE(t-1)+0.0361IM_FI(t)-0.0201IM_FI(t-1)+ 0.1808IM_FR(t)-0.101IM_FR(t-1)+0.0905IM_DE(t)-0.0506IM_DE(t-1)+0.1808IM_EL(t)-0.101IM_EL(t-1)+0.0905IM_HU(t)-0.0506IM_HU(t-1)+0.0601IM_IE(t)-0.0336IM_IE(t-1)+ 0.0361IM_LV(t)-0.0201IM_LV(t-1)+0.0451IM_LT(t)-0.0252IM_LT(t-1)+0.0905IM_LU(t)-0.0506IM_LU(t-1)+0.1808IM_MT(t)-0.101IM_MT(t-1)+0.0601IM_NL(t)-0.0336IM_NL(t-1)+ 0.0601IM_PL(t)-0.0336IM_PL(t-1)+0.0601IM_PT(t)-0.0336IM_PT(t-1)+0.0601IM_RO(t)-0.0336IM_RO(t-1)+0.0905IM_SK(t)-0.0506IM_SK(t-1)+0.1808IM_SI(t)-0.101IM_SI(t-1)+ 0.0905IM_ES(t)-0.0506IM_ES(t-1)+0.0451IM_SE(t)-0.0252IM_SE(t-1)+0.0905IM_UK(t)-0.0506IM_UK(t-1)-5288.7694

In the case of **Latvia**, from Appendix A.19 we can see that is a strong link between the two groups of indicators (R^2=0.8850). On the other hand, P-Values Analysis

reveals for both coefficients of the regression small values which indicates a strong evidence against the null hypothesis. Therefore, finally, we have:

EX_LV(t)=0.0043IM_AT(t)+0.0043IM_BE(t)+0.0028IM_BG(t)+0.0034IM_HR(t)
+
0.0024IM_CY(t)+0.0057IM_CZ(t)+0.0043IM_DK(t)+0.0171IM_EE(t)+0.0085IM
_FI(t)+
0.0043IM_FR(t)+0.0057IM_DE(t)+0.0028IM_EL(t)+0.0043IM_HU(t)+0.0028IM
_IE(t)+
0.0034IM_IT(t)+0.0171IM_LT(t)+0.0043IM_LU(t)+0.0028IM_MT(t)+0.0043IM_
NL(t)+
0.0085IM_PL(t)+0.0028IM_PT(t)+0.0034IM_RO(t)+0.0057IM_SK(t)+0.0034IM_
SI(t)+
0.0034IM_ES(t)+0.0057IM_SE(t)+0.0034IM_UK(t)-11040.2738

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 15) indicates that there are not great differences (real vs. predicted imports) between countries except cases of close neighborhoods: Estonia (4.90% - real vs. 1.71% - regression) and Lithuania (6% - real vs. 1.71% - regression) therefore imports of Latvia are directed by territorial proximity criterion.

The average distance between real data and those from the regression is: 0.60%.

Table 15. The correlation between the coefficients of regression and the real imports of EU-countries in Latvia (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.43%	0.03%	**Italy**	0.34%	0.03%
Belgium+Luxembourg	0.86%	0.05%	**Latvia**	-	-
Bulgaria	0.28%	0.06%	**Lithuania**	1.71%	6.00%
Croatia	0.34%	0.03%	**Malta**	0.28%	0.03%
Czech Republic	0.57%	0.10%	**Netherlands**	0.43%	0.11%
Denmark	0.43%	0.58%	**Poland**	0.85%	0.24%
Estonia	1.71%	4.90%	**Portugal**	0.28%	0.01%
Finland	0.85%	0.45%	**Romania**	0.34%	0.03%
France	0.43%	0.04%	**Slovakia**	0.57%	0.08%
Germany	0.57%	0.07%	**Slovenia**	0.34%	0.05%
Greece	0.28%	0.03%	**Spain**	0.34%	0.02%
Hungary	0.43%	0.03%	**Sweden**	0.57%	0.46%
Ireland	0.28%	0.06%	**United Kingdom**	0.34%	0.12%

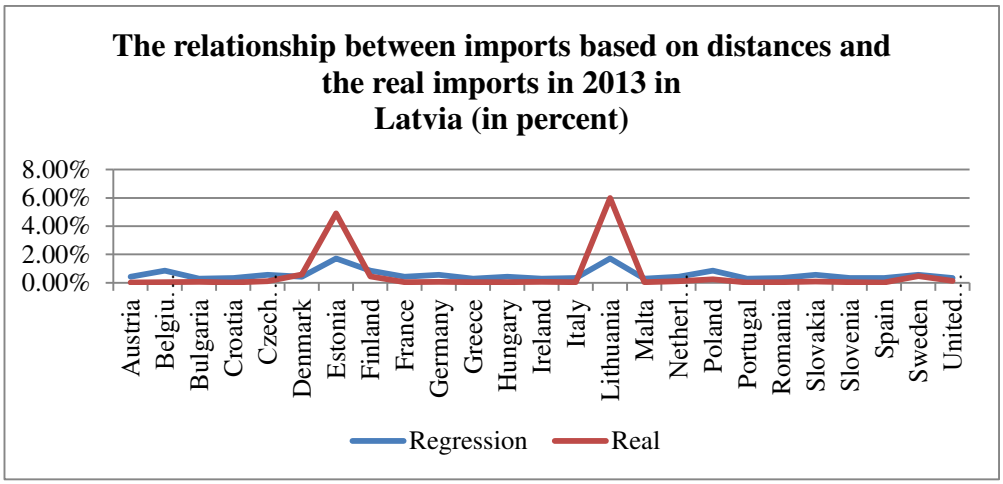

Figure 15

In the case of **Lithuania**, from Appendix A.20 we can see that is a strong link between the two groups of indicators (R^2=0.8827). On the other hand, P-Values Analysis reveals for both coefficients of the regression great values which indicates a strong evidence against the null hypothesis. Therefore, finally, we have:

EX_LT(t)=0.0088IM_AT(t)+0.0088IM_BE(t)+0.0053IM_BG(t)+0.0066IM_HR(t)
+
0.0044IM_CY(t)+0.0132IM_CZ(t)+0.0088IM_DK(t)+0.0132IM_EE(t)+0.0088IM
_FI(t)+
0.0088IM_FR(t)+0.0132IM_DE(t)+0.0053IM_EL(t)+0.0088IM_HU(t)+0.0053IM
_IE(t)+
0.0066IM_IT(t)+0.0265IM_LV(t)+0.0088IM_LU(t)+0.0053IM_MT(t)+0.0088IM_
NL(t)+
0.0265IM_PL(t)+0.0053IM_PT(t)+0.0066IM_RO(t)+0.0132IM_SK(t)+0.0066IM_
SI(t)+
0.0066IM_ES(t)+0.0066IM_SE(t)+0.0066IM_UK(t)-22155.7822

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 16) indicates that there are not great differences (real vs. predicted imports) between countries except cases of close neighborhoods: Estonia (6.20% - real vs. 1.32% - regression) and Latvia (18% - real vs. 2.65% - regression) therefore exports of Lithuania are directed by territorial proximity criterion.

The average distance between real data and those from the regression is: 1.39%.

Table 16. The correlation between the coefficients of regression and the real imports of EU-countries in Lithuania (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.88%	0.07%	**Italy**	0.66%	0.11%
Belgium+Luxembourg	1.76%	0.10%	**Latvia**	2.65%	18.00%
Bulgaria	0.53%	0.17%	**Lithuania**	-	-
Croatia	0.66%	0.07%	**Malta**	0.53%	0.02%
Czech Republic	1.32%	0.18%	**Netherlands**	0.88%	0.18%
Denmark	0.88%	0.66%	**Poland**	2.65%	0.75%
Estonia	1.32%	6.20%	**Portugal**	0.53%	0.11%
Finland	0.88%	0.60%	**Romania**	0.66%	0.12%
France	0.88%	0.14%	**Slovakia**	1.32%	0.10%
Germany	1.32%	0.19%	**Slovenia**	0.66%	0.16%
Greece	0.53%	0.06%	**Spain**	0.66%	0.09%
Hungary	0.88%	0.19%	**Sweden**	0.66%	0.70%
Ireland	0.53%	0.17%	**United Kingdom**	0.66%	0.24%

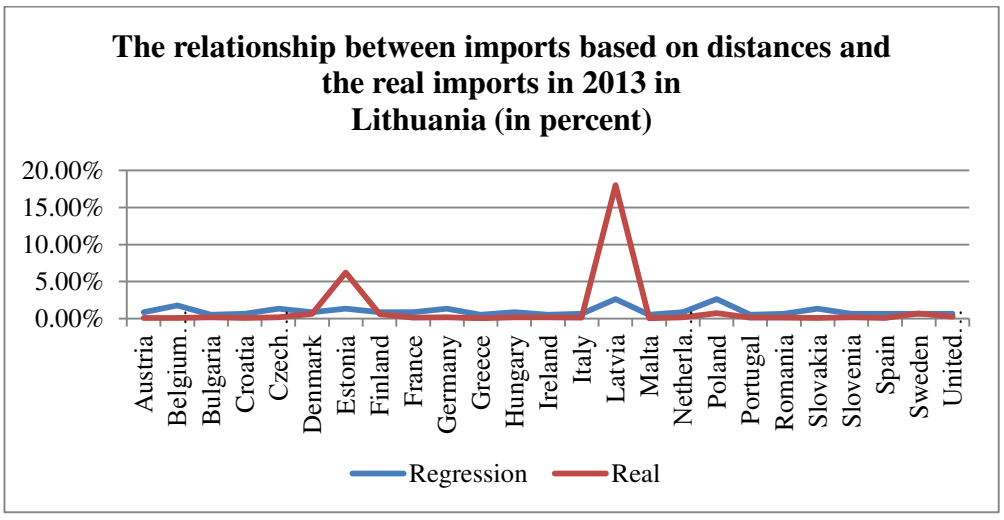

Figure 16

In the case of **Malta**, from Appendix A.21 we can see that is a very weak link between the two groups of indicators (R^2=0.4657). On the other hand, P-Values Analysis reveals for Intercept coefficient of the regression a great value – 0.9185

which indicates an almost null evidence against the null hypothesis. Finally, we have:

EX_MT(t)=0.0007IM_AT(t)+0.0005IM_BE(t)+0.0005IM_BG(t)+0.0005IM_HR(t)+
0.0005IM_CY(t)+0.0005IM_CZ(t)+0.0004IM_DK(t)+0.0002IM_EE(t)+0.0002IM_FI(t)+
0.0007IM_FR(t)+0.0005IM_DE(t)+0.0007IM_EL(t)+0.0005IM_HU(t)+0.0004IM_IE(t)+
0.0015IM_IT(t)+0.0002IM_LV(t)+0.0003IM_LT(t)+0.0005IM_LU(t)+0.0004IM_NL(t)+
0.0004IM_PL(t)+0.0004IM_PT(t)+0.0004IM_RO(t)+0.0005IM_SK(t)+0.0007IM_SI(t)+
0.0005IM_ES(t)+0.0003IM_SE(t)+0.0005IM_UK(t)+85.0799

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 17) indicates that there are not great differences (real vs. predicted imports) between countries except the case of Greece (0.25% vs. 0.07%) therefore imports of Malta are directed by territorial proximity criterion.

The average distance between real data and those from the regression is: 0.03 %.

Table 17. The correlation between the coefficients of regression and the real imports of EU-countries in Malta (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.07%	0.01%	**Italy**	0.15%	0.06%
Belgium+Luxembourg	0.10%	0.01%	**Latvia**	0.02%	0.00%
Bulgaria	0.05%	0.03%	**Lithuania**	0.03%	0.01%
Croatia	0.05%	0.11%	**Malta**	-	-
Czech Republic	0.05%	0.05%	**Netherlands**	0.04%	0.02%
Denmark	0.04%	0.04%	**Poland**	0.04%	0.02%
Estonia	0.02%	0.01%	**Portugal**	0.04%	0.03%
Finland	0.02%	0.00%	**Romania**	0.04%	0.10%
France	0.07%	0.05%	**Slovakia**	0.05%	0.01%
Germany	0.05%	0.06%	**Slovenia**	0.07%	0.06%
Greece	0.07%	0.25%	**Spain**	0.05%	0.03%
Hungary	0.05%	0.02%	**Sweden**	0.03%	0.05%
Ireland	0.04%	0.03%	**United Kingdom**	0.05%	0.03%

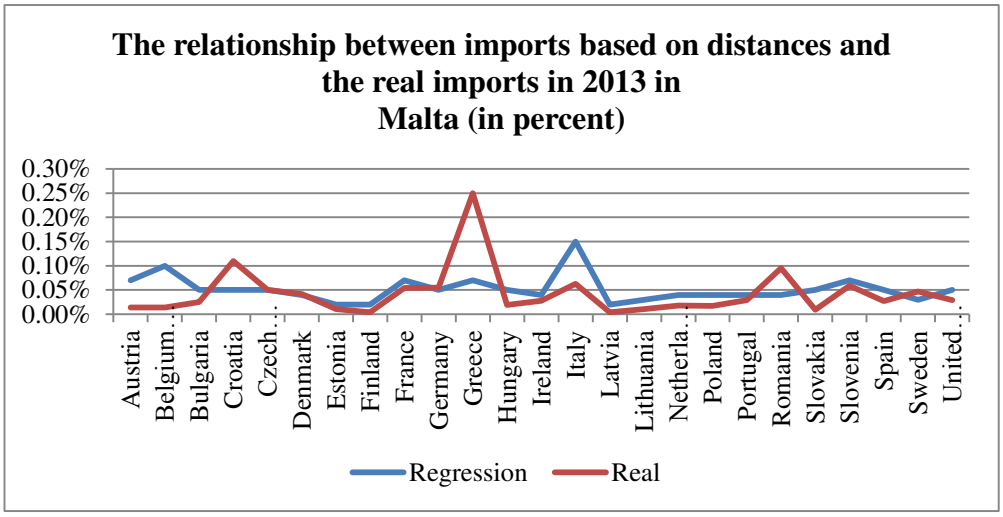

Figure 17

In the case of **Netherlands**, from Appendix A.22 we can see that is a strong link between the two groups of indicators (R^2=0.9550). On the other hand, P-Values Analysis reveals for both coefficients of the regression values under 0.006 which indicates a strong evidence against the null hypothesis. Therefore, we have:

EX_NL(t)=0.118IM_AT(t)+0.2359IM_BE(t)+0.0472IM_BG(t)+0.0591IM_HR(t)+
0.0472IM_CY(t)+0.118IM_CZ(t)+0.118IM_DK(t)+0.0472IM_EE(t)+0.0591IM_F
I(t)+0.118IM_FR(t)+
0.2359IM_DE(t)+0.0591IM_EL(t)+0.0786IM_HU(t)+0.118IM_IE(t)+0.0786IM_I
T(t)+
0.0591IM_LV(t)+0.0786IM_LT(t)+0.118IM_LU(t)+0.0591IM_MT(t)+0.118IM_P
L(t)+
0.0591IM_PT(t)+0.0591IM_RO(t)+0.0786IM_SK(t)+0.0786IM_SI(t)+0.0786IM_
ES(t)+
0.0786IM_SE(t)+0.2359IM_UK(t)-139596.1248

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 18) indicates that there are many and large differences between real and predicted imports: Austria (2.80% vs. 11.80%), Belgium+Luxembourg (20% vs. 35.39%), Czech Republic (3.60% vs. 11.80%), Germany (10% vs. 23.59%), United Kingdom (8.30% vs. 23.59%) which is absolutely normal as a consequence of commercial traditions that have bound these countries.

Unlike the other countries analyzed so far, one can see that in general, real imports were under those provided by regression analysis, which shows a weak trade policy on dependence from proximity.

The average distance between real data and those from the regression is very large: 4.98%.

Table 18. The correlation between the coefficients of regression and the real imports of EU-countries in Netherlands (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	11.80%	2.80%	**Italy**	7.86%	5.80%
Belgium+Luxembourg	35.39%	20.00%	**Latvia**	5.91%	3.50%
Bulgaria	4.72%	2.60%	**Lithuania**	7.86%	5.20%
Croatia	5.91%	3.20%	**Malta**	5.91%	2.70%
Czech Republic	11.80%	3.60%	**Netherlands**	-	-
Denmark	11.80%	7.50%	**Poland**	11.80%	4.10%
Estonia	4.72%	2.40%	**Portugal**	5.91%	3.50%
Finland	5.91%	5.60%	**Romania**	5.91%	3.70%
France	11.80%	5.00%	**Slovakia**	7.86%	1.40%
Germany	23.59%	10.00%	**Slovenia**	7.86%	2.00%
Greece	5.91%	4.80%	**Spain**	7.86%	4.10%
Hungary	7.86%	3.80%	**Sweden**	7.86%	7.90%
Ireland	11.80%	6.20%	**United Kingdom**	23.59%	8.30%

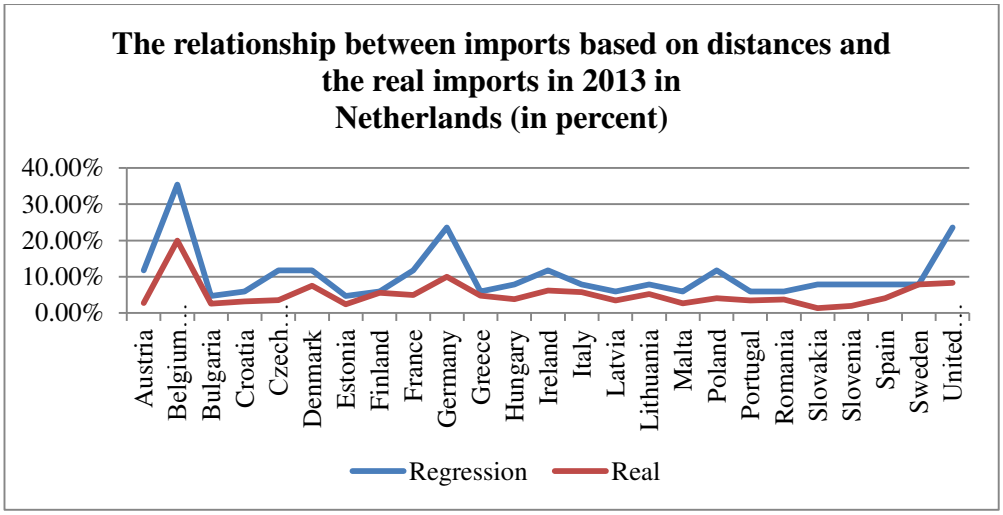

Figure 18

In the case of **Poland**, from Appendix A.23 we can see that is a strong link between the two groups of indicators (R^2=0.8915), having:

EX_PL(t)=0.056IM_AT(t)+0.056IM_BE(t)+0.028IM_BG(t)+0.0373IM_HR(t)+0.0225IM_CY(t)+
0.1122IM_CZ(t)+0.056IM_DK(t)+0.0373IM_EE(t)+0.028IM_FI(t)+0.056IM_FR(t)+
0.1122IM_DE(t)+0.028IM_EL(t)+0.056IM_HU(t)+0.028IM_IE(t)+0.0373IM_IT(t)+0.056IM_LV(t)+0.1122IM_LT(t)+0.056IM_LU(t)+0.028IM_MT(t)+0.056IM_NL(t)+0.028IM_PT(t)+
0.0373IM_RO(t)+0.1122IM_SK(t)+0.0373IM_SI(t)+0.0373IM_ES(t)+0.0373IM_SE(t)+
0.0373IM_UK(t)-122654.2762

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 19) indicates that there are many differences (real vs. predicted imports) like in the case of Belgium+Luxembourg (1.10% vs. 11.20%), Germany (3.90% vs. 11.22%), Slovakia (5.20% vs. 11.22%). For the other countries, one can see that in general, real imports were under those provided by regression analysis, which shows a trade policy based more on need and not on spatial proximity.

The average distance between real data and those from the regression is: 2.59%.

Table 19. The correlation between the coefficients of regression and the real imports of EU-countries in Poland (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	5.60%	2.00%	**Italy**	3.73%	1.90%
Belgium+Luxembourg	11.20%	1.10%	**Latvia**	5.60%	8.70%
Bulgaria	2.80%	2.90%	**Lithuania**	11.22%	9.10%
Croatia	3.73%	2.20%	**Malta**	2.80%	0.52%
Czech Republic	11.22%	7.60%	**Netherlands**	5.60%	1.40%
Denmark	5.60%	3.50%	**Poland**	-	-
Estonia	3.73%	5.70%	**Portugal**	2.80%	0.88%
Finland	2.80%	2.20%	**Romania**	3.73%	4.40%
France	5.60%	1.60%	**Slovakia**	11.22%	5.20%
Germany	11.22%	3.90%	**Slovenia**	3.73%	2.40%
Greece	2.80%	1.00%	**Spain**	3.73%	1.40%
Hungary	5.60%	4.80%	**Sweden**	3.73%	3.30%
Ireland	2.80%	0.91%	**United Kingdom**	3.73%	2.00%

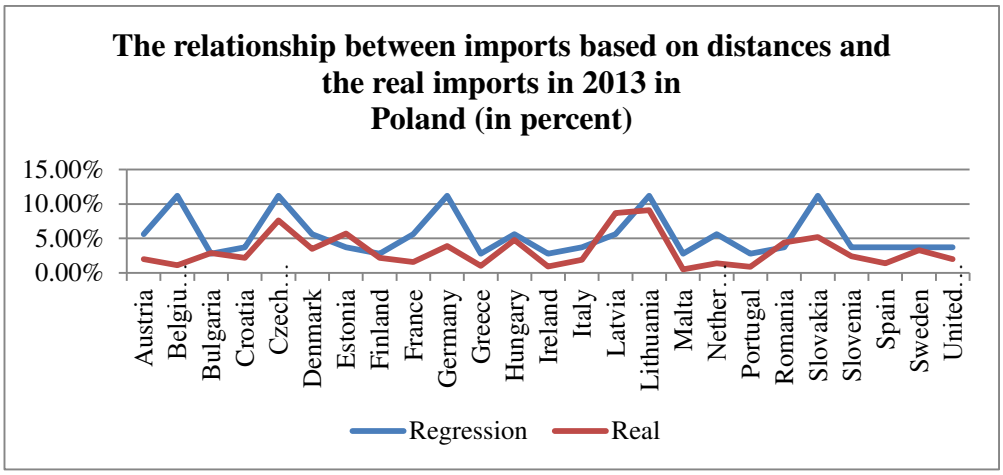

Figure 19

In the case of **Portugal**, from Appendix A.24 we can see that is a strong link between the two groups of indicators (R^2=0.9062), therefore we have:

EX_PT(t)=0.0092IM_AT(t)+0.0123IM_BE(t)+0.0074IM_BG(t)+0.0074IM_HR(t)
+0.0074IM_CY(t)+0.0092IM_CZ(t)+0.0092IM_DK(t)+0.0053IM_EE(t)+0.0062I
M_FI(t)+0.0184IM_FR(t)+
0.0123IM_DE(t)+0.0092IM_EL(t)+0.0074IM_HU(t)+0.0092IM_IE(t)+0.0123IM_
IT(t)+
0.0062IM_LV(t)+0.0074IM_LT(t)+0.0123IM_LU(t)+0.0092IM_MT(t)+0.0092IM
_NL(t)+
0.0092IM_PL(t)+0.0062IM_RO(t)+0.0074IM_SK(t)+0.0092IM_SI(t)+0.0369IM_
ES(t)+
0.0074IM_SE(t)+0.0123IM_UK(t)-13663.5342

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 20) indicates that there are close differences between real and predicted imports.

In general, real imports are under to those provided by regression analysis, which shows an insufficient trade policy on dependence from proximity.

The average distance between real data and those from the regression is small: 0.56%.

Table 20. The correlation between the coefficients of regression and the real imports of EU-countries in Portugal (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	0.92%	0.34%	**Italy**	1.23%	0.45%
Belgium+Luxembourg	2.46%	0.46%	**Latvia**	0.62%	0.14%
Bulgaria	0.74%	0.23%	**Lithuania**	0.74%	0.16%
Croatia	0.74%	0.10%	**Malta**	0.92%	0.21%
Czech Republic	0.92%	0.33%	**Netherlands**	0.92%	0.46%
Denmark	0.92%	0.45%	**Poland**	0.92%	0.29%
Estonia	0.53%	0.18%	**Portugal**	-	-
Finland	0.62%	0.45%	**Romania**	0.62%	0.54%
France	1.84%	1.00%	**Slovakia**	0.74%	0.19%
Germany	1.23%	0.57%	**Slovenia**	0.92%	0.47%
Greece	0.92%	0.31%	**Spain**	3.69%	4.00%
Hungary	0.74%	0.27%	**Sweden**	0.74%	0.39%
Ireland	0.92%	0.31%	**United Kingdom**	1.23%	0.49%

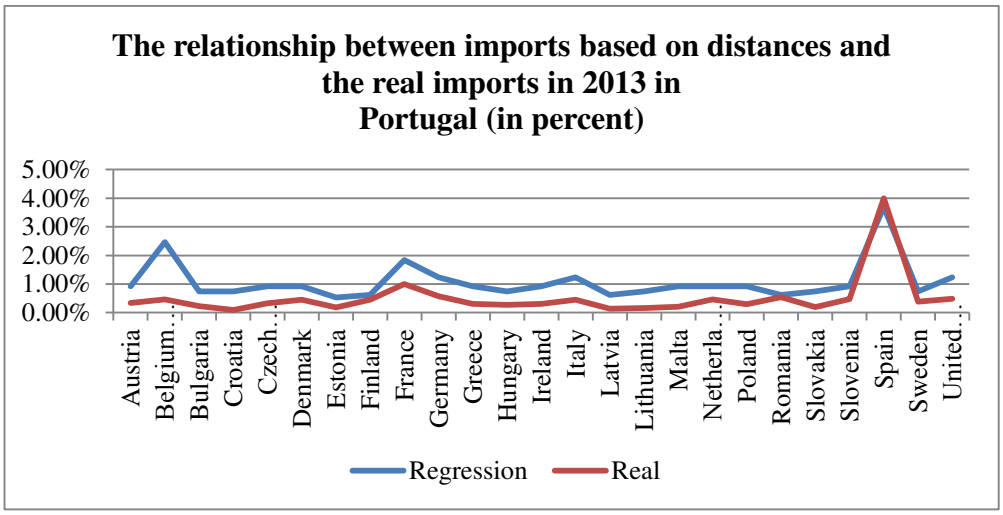

Figure 20

In the case of **Romania**, from Appendix A.25 we can see that is a strong link between the two groups of indicators (R^2=0.8507), having:

EX_RO(t)=0.0337IM_AT(t)+0.0168IM_BE(t)+0.0674IM_BG(t)+0.0337IM_HR(t)
+
0.0224IM_CY(t)+0.0224IM_CZ(t)+0.0168IM_DK(t)+0.0112IM_EE(t)+0.0112IM
_FI(t)+
0.0168IM_FR(t)+0.0224IM_DE(t)+0.0337IM_EL(t)+0.0674IM_HU(t)+0.0112IM
_IE(t)+
0.0224IM_IT(t)+0.0135IM_LV(t)+0.0168IM_LT(t)+0.0168IM_LU(t)+0.0168IM_
MT(t)+
0.0168IM_NL(t)+0.0224IM_PL(t)+0.0112IM_PT(t)+0.0337IM_SK(t)+0.0337IM_
SI(t)+
0.0135IM_ES(t)+0.0135IM_SE(t)+0.0135IM_UK(t)-43168.1268

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 21) indicates that there are no large differences (real vs. predicted imports) except Hungary (2.70% vs. 6.74%) from where one can see that in general, real imports are close to those provided by regression analysis, which shows a trade policy based almost entirely on spatial proximity.

The average distance between real data and those from the regression is: 1.45%

Table 21. The correlation between the coefficients of regression and the real imports of EU-countries in Romania (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	3.37%	0.87%	**Italy**	2.24%	1.40%
Belgium+Luxembourg	3.36%	0.25%	**Latvia**	1.35%	0.17%
Bulgaria	6.74%	6.50%	**Lithuania**	1.68%	0.19%
Croatia	3.37%	0.72%	**Malta**	1.68%	0.36%
Czech Republic	2.24%	1.00%	**Netherlands**	1.68%	0.34%
Denmark	1.68%	0.30%	**Poland**	2.24%	0.76%
Estonia	1.12%	0.35%	**Portugal**	1.12%	0.32%
Finland	1.12%	0.29%	**Romania**	-	-
France	1.68%	0.84%	**Slovakia**	3.37%	1.20%
Germany	2.24%	1.00%	**Slovenia**	3.37%	0.94%
Greece	3.37%	1.20%	**Spain**	1.35%	0.46%
Hungary	6.74%	2.70%	**Sweden**	1.35%	0.42%
Ireland	1.12%	0.25%	**United Kingdom**	1.35%	0.38%

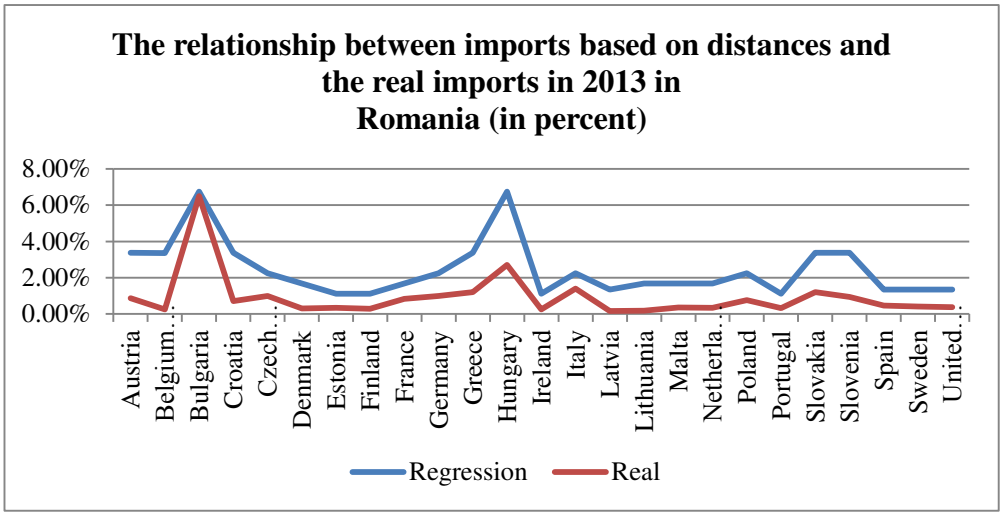

Figure 21

In the case of **Slovakia**, from Appendix A.26 we can see that is a strong link between the two groups of indicators (R^2=0.9166). On the other hand, P-Values Analysis reveals for both coefficients of the regression values under 0.0003 which indicates a strong evidence against the null hypothesis. Therefore, we have:

EX_SK(t)=0.0595IM_AT(t)+0.0198IM_BE(t)+0.0198IM_BG(t)+0.0298IM_HR(t)
+
0.0149IM_CY(t)+0.0595IM_CZ(t)+0.0198IM_DK(t)+0.0149IM_EE(t)+0.0119IM
_FI(t)+
0.0198IM_FR(t)+0.0298IM_DE(t)+0.0198IM_EL(t)+0.0595IM_HU(t)+0.0119IM
_IE(t)+
0.0298IM_IT(t)+0.0198IM_LV(t)+0.0298IM_LT(t)+0.0198IM_LU(t)+0.0198IM_
MT(t)+
0.0198IM_NL(t)+0.0595IM_PL(t)+0.0119IM_PT(t)+0.0298IM_RO(t)+0.0298IM_
SI(t)+
0.0149IM_ES(t)+0.0149IM_SE(t)+0.0149IM_UK(t)-54467.4082

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 22) indicates that there are no large differences between real and predicted imports.

In general, real imports are under to those provided by regression analysis, which shows an insufficient correlation of imports with distances.

The average distance between real data and those from the regression is small: 1.42%.

Table 22. The correlation between the coefficients of regression and the real imports of EU-countries in Slovakia (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	5.95%	2.60%	**Italy**	2.98%	0.82%
Belgium+Luxembourg	3.96%	0.30%	**Latvia**	1.98%	1.10%
Bulgaria	1.98%	1.30%	**Lithuania**	2.98%	0.51%
Croatia	2.98%	1.60%	**Malta**	1.98%	0.23%
Czech Republic	5.95%	6.10%	**Netherlands**	1.98%	0.34%
Denmark	1.98%	0.82%	**Poland**	5.95%	2.40%
Estonia	1.49%	0.46%	**Portugal**	1.19%	0.28%
Finland	1.19%	0.39%	**Romania**	2.98%	2.40%
France	1.98%	0.62%	**Slovakia**	-	-
Germany	2.98%	1.40%	**Slovenia**	2.98%	1.50%
Greece	1.98%	0.28%	**Spain**	1.49%	0.52%
Hungary	5.95%	4.90%	**Sweden**	1.49%	0.71%
Ireland	1.19%	0.17%	**United Kingdom**	1.49%	0.60%

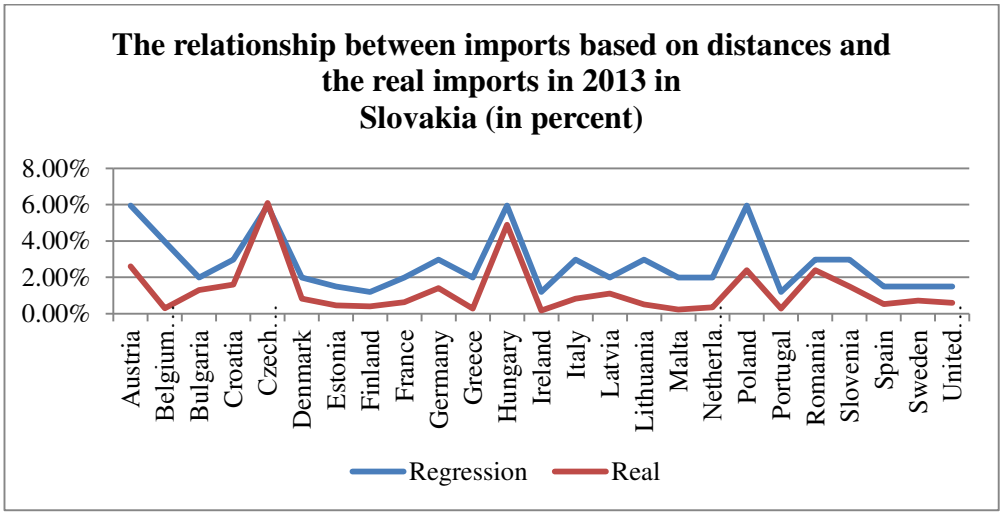

Figure 22

In the case of **Slovenia**, from Appendix A.27 we can see that is a strong link between the two groups of indicators (R^2=0.9414), having:

EX_SI(t)=0.0184IM_AT(t)+0.0061IM_BE(t)+0.0061IM_BG(t)+0.0184IM_HR(t)
+0.0061IM_CY(t)+0.0092IM_CZ(t)+0.0061IM_DK(t)+0.0031IM_EE(t)+0.0037I
M_FI(t)+0.0092IM_FR(t)+
0.0092IM_DE(t)+0.0092IM_EL(t)+0.0184IM_HU(t)+0.0046IM_IE(t)+0.0184IM_
IT(t)+
0.0037IM_LV(t)+0.0046IM_LT(t)+0.0061IM_LU(t)+0.0092IM_MT(t)+0.0061IM
_NL(t)+
0.0061IM_PL(t)+0.0046IM_PT(t)+0.0092IM_RO(t)+0.0092IM_SK(t)+0.0061IM_
ES(t)+
0.0046IM_SE(t)+0.0061IM_UK(t)-13714.9968

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 23) indicates that there are no large differences (real vs. predicted imports) except Croatia (which were a part from the former Yugoslavia) with 10% vs. 1.84% from where one can see that in general, real imports are close to those provided by regression analysis, which shows a trade policy based almost entirely on spatial proximity.

The average distance between real data and those from the regression is: 0.74 %.

Table 23. The correlation between the coefficients of regression and the real imports of EU-countries in Slovenia (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	1.84%	1.30%	**Italy**	1.84%	0.70%
Belgium+Luxembourg	1.22%	0.07%	**Latvia**	0.37%	0.30%
Bulgaria	0.61%	0.64%	**Lithuania**	0.46%	0.30%
Croatia	1.84%	10.00%	**Malta**	0.92%	0.08%
Czech Republic	0.92%	0.50%	**Netherlands**	0.61%	0.09%
Denmark	0.61%	0.31%	**Poland**	0.61%	0.39%
Estonia	0.31%	0.20%	**Portugal**	0.46%	0.09%
Finland	0.37%	0.13%	**Romania**	0.92%	0.62%
France	0.92%	0.24%	**Slovakia**	0.92%	0.60%
Germany	0.92%	0.51%	**Slovenia**	-	-
Greece	0.92%	0.17%	**Spain**	0.61%	0.11%
Hungary	1.84%	1.10%	**Sweden**	0.46%	0.18%
Ireland	0.46%	0.04%	**United Kingdom**	0.61%	0.09%

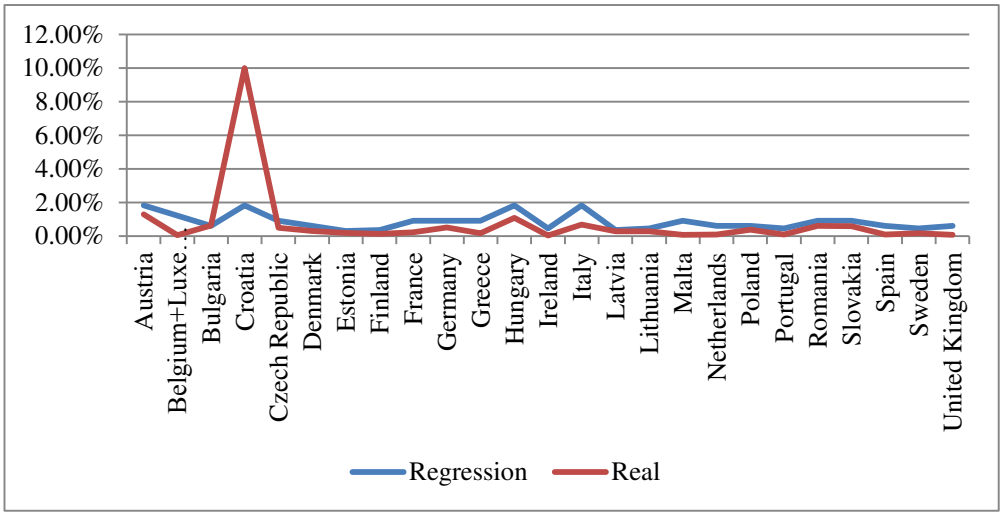

Figure 23. The relationship between imports based on distances and the real imports in 2013 in Slovenia (in percent)

In the case of **Spain**, from Appendix A.28 we can see that is a weak link between the two groups of indicators (R^2=0.8985). On the other hand, P-Values Analysis reveals for both coefficients of the regression values under 0.04 which indicates a strong evidence against the null hypothesis. Therefore, we have:

EX_ES(t)=0.0476IM_AT(t)+0.0713IM_BE(t)+0.0357IM_BG(t)+0.0357IM_HR(t)+0.0357 IM_CY(t)+0.0476IM_CZ(t)+0.0476IM_DK(t)+0.0239IM_EE(t)+0.0286IM_FI(t)+0.1428I M_FR(t)+
0.0713IM_DE(t)+0.0476IM_EL(t)+0.0357IM_HU(t)+0.0476IM_IE(t)+0.0713IM_IT(t)+ 0.0286IM_LV(t)+0.0357IM_LT(t)+0.0713IM_LU(t)+0.0476IM_MT(t)+0.0476IM_NL(t)+ 0.0476IM_PL(t)+0.1428IM_PT(t)+0.0286IM_RO(t)+0.0357IM_SK(t)+0.0476IM_SI(t)+ 0.0357IM_SE(t)+0.0713IM_UK(t)-71457.9694

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 24) indicates that there are no large differences between real and predicted imports except Belgium+Luxembourg (2% vs. 14.26%), France (6.50% vs. 14.28%), Germany (2.60% vs. 7.13%) and the traditional partner Portugal (27% vs. 14.28%) which is absolutely normal as a consequence of commercial traditions that have bound these countries.

In general, real imports are under to those provided by regression analysis, which shows an insufficient trade policy on dependence from proximity.

The average distance between real data and those from the regression is small: 3.32%.

Table 24. The correlation between the coefficients of regression and the real imports of EU-countries in Spain (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	4.76%	1.60%	**Italy**	7.13%	4.40%
Belgium+Luxembourg	14.26%	2.00%	**Latvia**	2.86%	1.20%
Bulgaria	3.57%	5.10%	**Lithuania**	3.57%	1.70%
Croatia	3.57%	1.50%	**Malta**	4.76%	2.10%
Czech Republic	4.76%	1.70%	**Netherlands**	4.76%	1.60%
Denmark	4.76%	1.50%	**Poland**	4.76%	2.20%
Estonia	2.39%	0.85%	**Portugal**	14.28%	27.00%
Finland	2.86%	1.30%	**Romania**	2.86%	2.40%
France	14.28%	6.50%	**Slovakia**	3.57%	1.10%
Germany	7.13%	2.60%	**Slovenia**	4.76%	2.00%
Greece	4.76%	3.10%	**Spain**	-	-
Hungary	3.57%	1.80%	**Sweden**	3.57%	1.40%
Ireland	4.76%	1.60%	**United Kingdom**	7.13%	3.30%

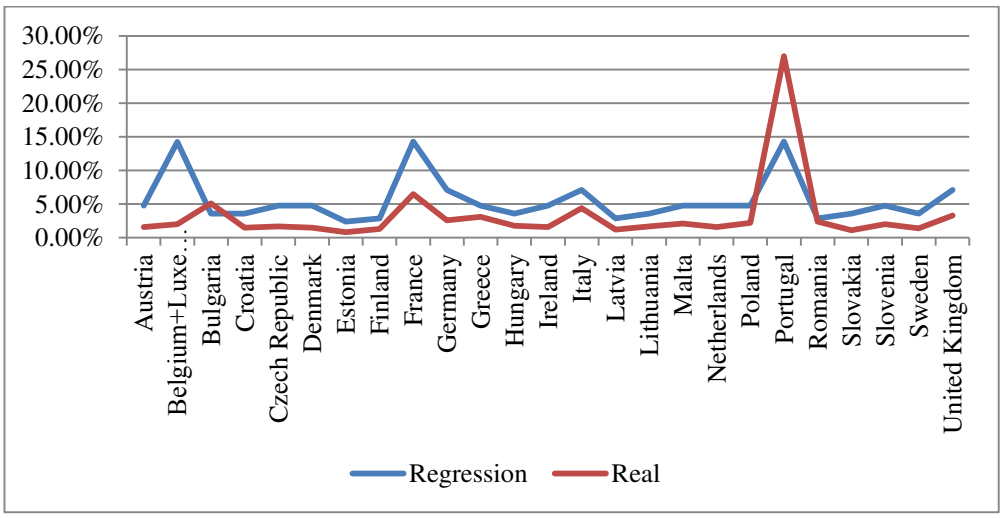

Figure 24. The relationship between imports based on distances and the real imports in 2013 in Spain (in percent)

In the case of **Sweden**, from Appendix A.29 we can see that is a weak link between the two groups of indicators (R^2=0.8346). On the other hand, P-Values Analysis

reveals for both coefficients of the regression values under 0.03 which indicates a strong evidence against the null hypothesis. Therefore, we have:

EX_SE(t)=0.0206IM_AT(t)+0.0206IM_BE(t)+0.0104IM_BG(t)+0.0124IM_HR(t)+0.0104 IM_CY(t)+0.0206IM_CZ(t)+0.0619IM_DK(t)+0.031IM_EE(t)+0.0619IM_FI(t)+0.0206IM _FR(t)+
0.031IM_DE(t)+0.0124IM_EL(t)+0.0155IM_HU(t)+0.0124IM_IE(t)+0.0155IM_IT(t)+ 0.0206IM_LV(t)+0.0155IM_LT(t)+0.0206IM_LU(t)+0.0124IM_MT(t)+0.0206IM_NL(t)+ 0.0206IM_PL(t)+0.0124IM_PT(t)+0.0124IM_RO(t)+0.0155IM_SK(t)+0.0155IM_SI(t)+ 0.0155IM_ES(t)+0.0155IM_UK(t)+32860.698

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 25) indicates that there are no large differences between real and predicted imports except Denmark (12% vs. 6.19%), Estonia (6.60% vs. 3.10%), Finland (11% vs. 6.19%) which is absolutely normal as a consequence of commercial traditions that have bound these countries.

In general, real imports are close to those provided by regression analysis, which shows a trade policy dependent from proximity.

The average distance between real data and those from the regression is small: 1.25%.

Table 25. The correlation between the coefficients of regression and the real imports of EU-countries in Sweden (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	2.06%	0.97%	**Italy**	1.55%	0.87%
Belgium+Luxembourg	4.12%	2.00%	**Latvia**	2.06%	3.20%
Bulgaria	1.04%	0.61%	**Lithuania**	1.55%	3.20%
Croatia	1.24%	0.72%	**Malta**	1.24%	2.20%
Czech Republic	2.06%	0.96%	**Netherlands**	2.06%	1.60%
Denmark	6.19%	12.00%	**Poland**	2.06%	1.90%
Estonia	3.10%	6.60%	**Portugal**	1.24%	0.75%
Finland	6.19%	11.00%	**Romania**	1.24%	0.55%
France	2.06%	1.20%	**Slovakia**	1.55%	0.44%
Germany	3.10%	1.50%	**Slovenia**	1.55%	0.64%
Greece	1.24%	0.64%	**Spain**	1.55%	0.95%
Hungary	1.55%	0.97%	**Sweden**	-	-
Ireland	1.24%	0.95%	**United Kingdom**	1.55%	1.80%

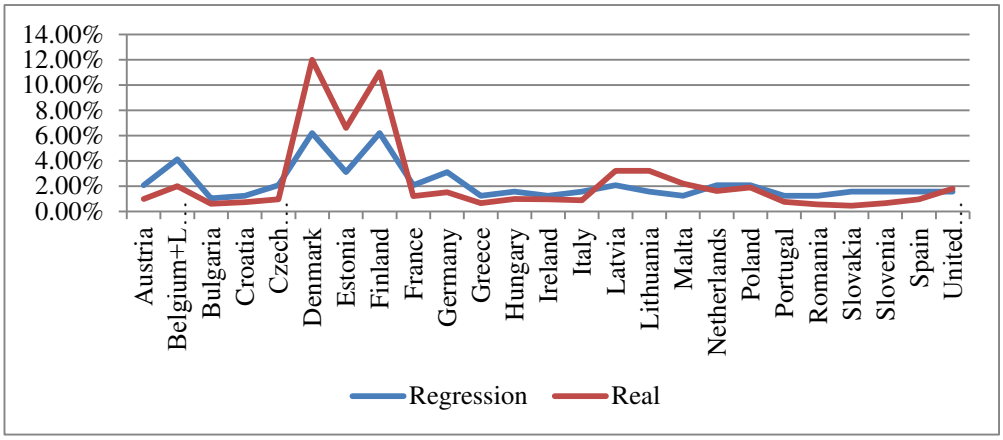

Figure 25. The relationship between imports based on distances and the real imports in 2013 in Sweden (in percent)

In the case of **United Kingdom**, from Appendix A.30 we can see that is a weak link between the two groups of indicators (R^2=0.4903). On the other hand, P-Values Analysis reveals for Intercept coefficient of the regression a high value – 0.6832 which indicates a less evidence against the null hypothesis. However, we have:

EX_UK(t)=0.0623IM_AT(t)+0.1869IM_BE(t)+0.0468IM_BG(t)+0.0468IM_HR(t)+ 0.0468IM_CY(t)+0.0623IM_CZ(t)+0.0623IM_DK(t)+0.0311IM_EE(t)+0.0374IM_FI(t)+ 0.1869IM_FR(t)+0.0934IM_DE(t)+0.0623IM_EL(t)+0.0468IM_HU(t)+0.1869IM_IE(t)+ 0.0934IM_IT(t)+0.0374IM_LV(t)+0.0468IM_LT(t)+0.0934IM_LU(t)+0.0623IM_MT(t)+ 0.1869IM_NL(t)+0.0623IM_PL(t)+0.0623IM_PT(t)+0.0374IM_RO(t)+0.0468IM_SK(t)+ 0.0623IM_SI(t)+0.0934IM_ES(t)+0.0468IM_SE(t)-56019.0344

A comparison of regression coefficients and percentages imports from studied countries (Source: http://atlas.media.mit.edu/en/profile/country - column Real in Table 26) indicates that there are no large differences between real and predicted imports except Belgium+Luxembourg (5.30% vs. 28.03%), France (4.40% vs. 18.69%), Ireland (34% vs. 18.69%) and Netherlands (6.60% vs. 18.69%).

In general, real imports are under those provided by regression analysis, which shows a trade policy dependents weak from proximity.

The average distance between real data and those from the regression is very high: 5.01%.

Table 26. The correlation between the coefficients of regression and the real imports of EU-countries in United Kingdom (in percent) in 2013

Country	Regression	Real	Country	Regression	Real
Austria	6.23%	1.50%	**Italy**	9.34%	2.70%
Belgium+Luxembourg	28.03%	5.30%	**Latvia**	3.74%	2.30%
Bulgaria	4.68%	1.50%	**Lithuania**	4.68%	2.30%
Croatia	4.68%	0.95%	**Malta**	6.23%	4.10%
Czech Republic	6.23%	1.90%	**Netherlands**	18.69%	6.60%
Denmark	6.23%	5.20%	**Poland**	6.23%	2.60%
Estonia	3.11%	3.60%	**Portugal**	6.23%	2.90%
Finland	3.74%	3.10%	**Romania**	3.74%	2.30%
France	18.69%	4.40%	**Slovakia**	4.68%	1.10%
Germany	9.34%	4.10%	**Slovenia**	6.23%	1.40%
Greece	6.23%	2.50%	**Spain**	9.34%	4.00%
Hungary	4.68%	1.80%	**Sweden**	4.68%	5.90%
Ireland	18.69%	34.00%	**United Kingdom**	-	-

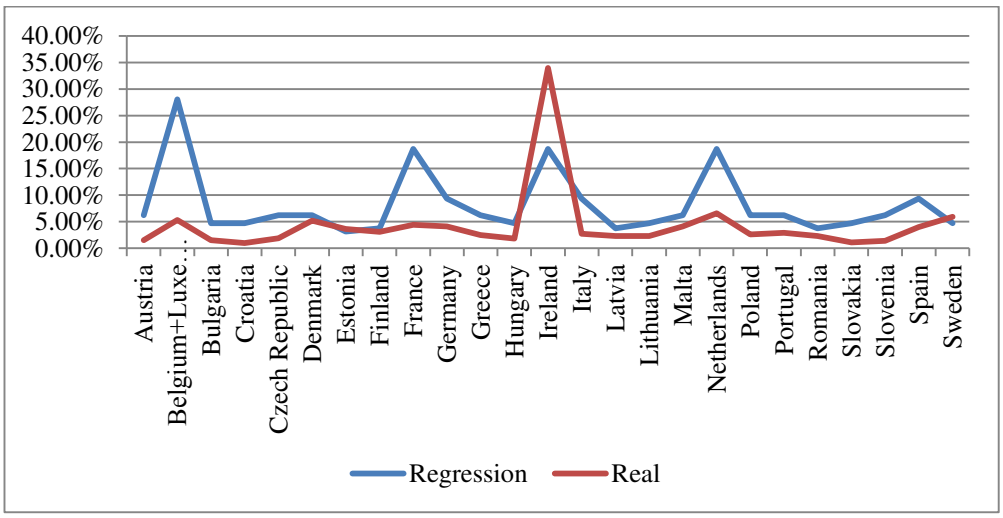

Figure 26. The relationship between imports based on distances and the real imports in 2013 in United Kingdom (in percent)

3. Conclusions

The above analysis reveals a number of interesting issues. Overall, exports of countries that have recently joined the European Union depend heavy on distances which shows still searches and settlements of trade policies.

On the other hand, the highly developed countries of the European Union have long commercial tradition which explains, in most cases, major differences compared to the theoretical results.

Another factor, again demonstrated numerically, is still the tight dependencies between countries that belonged to the now dismantled some states (such as the former Yugoslavia or Czechoslovakia).

4. References

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Appendix A.1

Table A.1. The imports of European Union countries (million of Euro) during 2004-2009

Country/ Year	2004	2005	2006	2007	2008	2009
Austria	96256	102283	109280	118962	125301	102569
Belgium	229574	256153	280053	300298	317043	254367
Bulgaria	11577	12473	15424	21862	25094	16876
Croatia	13241	14900	17105	18833	20817	15218
Cyprus	4420	5073	5518	6286	7237	5617
Czech Republic	56216	61483	74220	86224	96572	75314
Denmark	54787	60749	68100	71526	74356	59602
Estonia	6702	8229	10711	11439	10896	7270
Finland	41353	47234	55253	59616	62402	43655
France	378506	405164	431602	460315	487350	404098
Germany	575090	624465	722112	769779	805730	664143
Greece	44998	46382	52847	60130	64857	52087
Hungary	48580	53446	62331	69730	74069	55750
Ireland	49692	55112	58233	61162	57088	44955
Italy	285064	309032	352465	373340	382050	297609
Latvia	5701	6990	9191	11180	10975	7034
Lithuania	9957	12494	15429	17813	21144	13123
Luxembourg	16115	18170	21611	20452	21864	18160
Malta	2926	2988	3430	3503	3604	3210
Netherlands	256944	292415	331979	359443	394980	317718
Poland	72087	81697	101138	120912	141966	107155
Portugal	44173	51372	56295	59927	64194	51379
Romania	26235	32538	40746	51305	57148	38948
Slovak Republic	23988	27837	35828	44229	50253	39898
Slovenia	14159	16273	19227	23038	25180	19053
Spain	207656	232109	261784	284058	286105	210222
Sweden	80723	89781	101583	111803	114565	85945
United Kingdom	378293	417359	487951	465715	447228	372581

Source: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tet00002

Table A.2. The imports of European Union countries (million of Euro) during 2010-2015

Country/ Year	2010	2011	2012	2013	2014	2015
Austria	119943	137513	138942	138000	137001	140132
Belgium	295072	335447	341787	340093	342215	338750
Bulgaria	19245	23407	25460	25829	26118	26408
Croatia	15137	16281	16214	16581	17154	18558
Cyprus	6464	6234	5678	4754	5089	5016
Czech Republic	95536	109285	110066	108621	116203	126805
Denmark	62648	68724	71548	72728	74783	76957
Estonia	9268	12543	14077	13899	13775	13074
Finland	51899	60535	59517	58407	57769	54251
France	460941	517262	524918	513114	509299	515938
Germany	795666	901487	898857	889416	908575	946454
Greece	50741	48474	49291	46808	48004	43639
Hungary	66514	73592	74078	75379	78978	83487
Ireland	45467	47849	48855	54314	60721	66530
Italy	367390	401428	380292	361002	356939	368715
Latvia	8819	11703	13409	13451	13285	12900
Lithuania	17653	22826	24879	26208	25889	25397
Luxembourg	18713	20733	21437	20266	20099	20878
Malta	3818	4520	5135	4625	5132	5220
Netherlands	386834	426987	456824	444015	443689	456370
Poland	134306	151291	154934	156319	168366	174990
Portugal	58647	59551	56374	57013	58976	60162
Romania	46850	54943	54644	55328	58555	62976
Slovak Republic	49050	57358	60241	61543	61689	66289
Slovenia	22720	25525	24934	25129	25551	26789
Spain	246674	270550	262561	256455	270173	281298
Sweden	112352	127174	127985	120931	122132	124467
United Kingdom	445291	487905	541112	496977	519733	564190

Source: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tet00002

Appendix A.2

Table A.3. The exports of European Union countries (million of Euro) as functions of the imports of the others during 2004-2006

Country	2004 real	2004 computed	2005 real	2005 computed	2006 real	2006 computed
Austria	96256.00	134274.34	102283.00	145144.30	109280.00	163308.32
Belgium	229574.00	168280.37	256153.00	181965.09	280053.00	203640.76
Bulgaria	11577.00	97539.61	12473.00	105496.59	15424.00	117953.41
Croatia	13241.00	104536.66	14900.00	113249.71	17105.00	127103.55
Cyprus	4420.00	109430.71	5073.00	118065.42	5518.00	131799.06
Czech Republic	56216.00	142231.31	61483.00	153721.18	74220.00	172523.57
Denmark	54787.00	159185.12	60749.00	171662.41	68100.00	192578.86
Estonia	6702.00	94182.42	8229.00	102068.89	10711.00	114758.79
Finland	41353.00	107039.52	47234.00	115847.36	55253.00	129609.59
France	378506.00	149152.16	405164.00	161945.60	431602.00	181850.19
Germany	575090.00	110371.47	624465.00	120132.94	722112.00	133499.08
Greece	44998.00	114109.28	46382.00	122738.43	52847.00	136750.83
Hungary	48580.00	99897.71	53446.00	108217.10	62331.00	121529.75
Ireland	49692.00	158847.80	55112.00	172900.92	58233.00	193624.52
Italy	285064.00	109119.50	309032.00	117461.56	352465.00	130580.83
Latvia	5701.00	99156.86	6990.00	107724.98	9191.00	121202.89
Lithuania	9957.00	114355.48	12494.00	124279.42	15429.00	140010.25
Luxembourg	16115.00	179623.09	18170.00	193138.27	21611.00	214993.46
Malta	2926.00	133613.97	2988.00	143637.64	3430.00	159947.50
Netherlands	256944.00	166365.41	292415.00	179651.26	331979.00	200940.53
Poland	72087.00	137614.28	81697.00	148635.53	101138.00	166851.64
Portugal	44173.00	142468.25	51372.00	153135.77	56295.00	170200.75
Romania	26235.00	93921.66	32538.00	101949.70	40746.00	114738.17
Slovak Republic	23988.00	108144.62	27837.00	117494.07	35828.00	132253.33
Slovenia	14159.00	121353.61	16273.00	130722.12	19227.00	146080.18
Spain	207656.00	145190.29	232109.00	155900.29	261784.00	173067.89

Sweden	80723.00	121133.34	89781.00	131094.94	101583.00	146826.96
United Kingdom	378293.00	155518.68	417359.00	167345.76	487951.00	184624.67

Table A.4. The exports of European Union countries (million of Euro) as functions of the imports of the others during 2007-2009

Country	**2007 real**	**2007 computed**	**2008 real**	**2008 computed**	**2009 real**	**2009 computed**
Austria	118962.00	176907.67	125301.00	182930.94	102569.00	149219.17
Belgium	300298.00	215163.02	317043.00	222080.13	254367.00	181641.42
Bulgaria	21862.00	126567.68	25094.00	131005.61	16876.00	107036.55
Croatia	18833.00	137148.87	20817.00	142058.14	15218.00	115848.48
Cyprus	6286.00	141032.66	7237.00	145597.14	5617.00	118779.95
Czech Republic	86224.00	186189.03	96572.00	192543.30	75314.00	157406.40
Denmark	71526.00	207068.28	74356.00	213454.28	59602.00	173774.68
Estonia	11439.00	123046.13	10896.00	127368.57	7270.00	102815.36
Finland	59616.00	138432.60	62402.00	143034.45	43655.00	116305.01
France	460315.00	193481.21	487350.00	198730.65	404098.00	162209.70
Germany	769779.00	142111.11	805730.00	148378.11	664143.00	121704.74
Greece	60130.00	146487.20	64857.00	150842.99	52087.00	122742.87
Hungary	69730.00	131484.30	74069.00	136498.92	55750.00	111404.33
Ireland	61162.00	201134.69	57088.00	207046.45	44955.00	168527.84
Italy	373340.00	138628.06	382050.00	143280.52	297609.00	117638.95
Latvia	11180.00	130242.39	10975.00	135292.63	7034.00	110066.30
Lithuania	17813.00	151113.59	21144.00	157097.81	13123.00	128578.65
Luxembourg	20452.00	229857.47	21864.00	236687.49	18160.00	193862.77
Malta	3503.00	171267.85	3604.00	176259.09	3210.00	143440.19
Netherlands	359443.00	211995.73	394980.00	216980.09	317718.00	177363.49
Poland	120912.00	179959.47	141966.00	186118.49	107155.00	152032.23
Portugal	59927.00	181101.41	64194.00	186714.92	51379.00	153424.26
Romania	51305.00	124088.28	57148.00	128751.78	38948.00	104921.34
Slovak Republic	44229.00	143385.23	50253.00	149224.56	39898.00	121732.08
Slovenia	23038.00	157337.52	25180.00	162381.38	19053.00	132118.07

Spain	284058.00	183146.81	286105.00	188383.85	210222.00	154049.35
Sweden	111803.00	157248.38	114565.00	162512.64	85945.00	132519.16
United Kingdom	465715.00	198856.54	447228.00	205855.63	372581.00	170066.39

Table A.5. The exports of European Union countries (million of Euro) as functions of the imports of the others during 2010-2012

Country	**2010 real**	**2010 computed**	**2011 real**	**2011 computed**	**2012 real**	**2012 computed**
Austria	119943.00	176301.76	137513.00	197272.02	138942.00	203979.11
Belgium	295072.00	214825.56	335447.00	239858.73	341787.00	248155.45
Bulgaria	19245.00	126358.33	23407.00	141589.04	25460.00	146278.39
Croatia	15137.00	136908.53	16281.00	153319.18	16214.00	158237.62
Cyprus	6464.00	139953.11	6234.00	156656.90	5678.00	162000.26
Czech Republic	95536.00	185918.34	109285.00	207610.16	110066.00	214684.39
Denmark	62648.00	206074.27	68724.00	230148.30	71548.00	237437.56
Estonia	9268.00	121928.77	12543.00	136457.66	14077.00	140887.27
Finland	51899.00	138251.06	60535.00	154936.31	59517.00	159716.34
France	460941.00	191839.00	517262.00	215338.68	524918.00	222024.95
Germany	795666.00	143395.27	901487.00	159964.35	898857.00	165724.24
Greece	50741.00	144347.37	48474.00	161491.27	49291.00	166685.95
Hungary	66514.00	131824.11	73592.00	147788.28	74078.00	152822.99
Ireland	45467.00	200087.12	47849.00	224617.18	48855.00	231677.47
Italy	367390.00	138454.59	401428.00	154553.68	380292.00	159445.94
Latvia	8819.00	130629.93	11703.00	146544.07	13409.00	151627.72
Lithuania	17653.00	152392.09	22826.00	170611.14	24879.00	176657.57
Luxembourg	18713.00	228154.77	20733.00	254390.36	21437.00	262500.10
Malta	3818.00	168470.98	4520.00	188193.60	5135.00	194442.21
Netherlands	386834.00	209184.44	426987.00	234304.69	456824.00	240551.39
Poland	134306.00	179769.32	151291.00	201255.02	154934.00	208042.68
Portugal	58647.00	180518.30	59551.00	202036.13	56374.00	208762.94
Romania	46850.00	124211.70	54943.00	139186.32	54644.00	143787.68
Slovak Republic	49050.00	144352.39	57358.00	161699.97	60241.00	167065.44

Slovenia	22720.00	155682.97	25525.00	173990.57	24934.00	179642.25
Spain	246674.00	180736.99	270550.00	201207.35	262561.00	207614.22
Sweden	112352.00	155738.58	127174.00	173854.84	127985.00	179526.99
United Kingdom	445291.00	198967.23	487905.00	220410.04	541112.00	228362.66

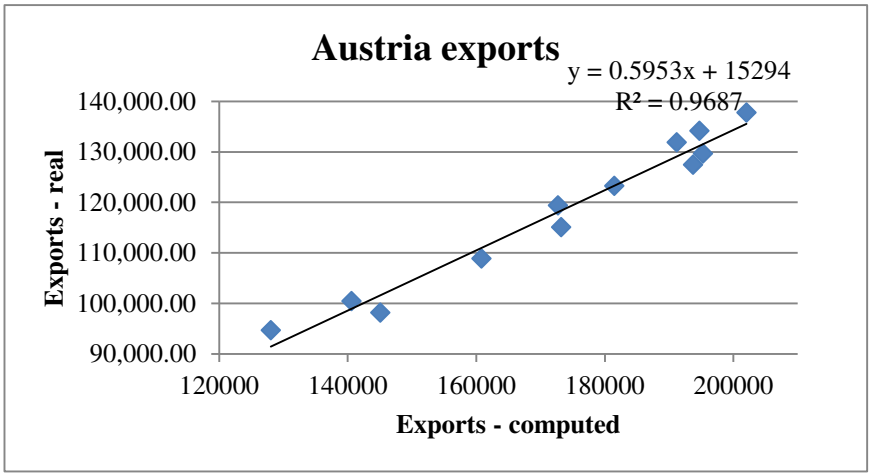
Table A.6. The exports of European Union countries (million of Euro) as functions of the imports of the others during 2013-2015

Country	**2013 real**	**2013 computed**	**2014 real**	**2014 computed**	**2015 real**	**2015 computed**
Austria	138000.00	205349.42	137001.00	209683.58	140132.00	220485.61
Belgium	340093.00	250989.30	342215.00	253562.71	338750.00	267145.90
Bulgaria	25829.00	148260.27	26118.00	150511.44	26408.00	157623.03
Croatia	16581.00	160060.43	17154.00	162783.82	18558.00	170843.60
Cyprus	4754.00	163881.80	5089.00	166062.30	5016.00	173848.59
Czech Republic	108621.00	216712.55	116203.00	220918.33	126805.00	232016.96
Denmark	72728.00	238504.13	74783.00	242830.66	76957.00	255029.18
Estonia	13899.00	141942.38	13775.00	143994.51	13074.00	150277.17
Finland	58407.00	160315.50	57769.00	162367.68	54251.00	169876.07
France	513114.00	225875.98	509299.00	228879.24	515938.00	240843.43
Germany	889416.00	167794.77	908575.00	169350.65	946454.00	175974.53
Greece	46808.00	168576.34	48004.00	170970.21	43639.00	179240.17
Hungary	75379.00	154661.07	78978.00	157694.35	83487.00	165352.31
Ireland	54314.00	237148.90	60721.00	236969.08	66530.00	248703.99
Italy	361002.00	161359.26	356939.00	163139.61	368715.00	171269.81
Latvia	13451.00	153254.29	13285.00	155837.21	12900.00	163126.93
Lithuania	26208.00	178774.20	25889.00	182519.48	25397.00	191946.03
Luxembourg	20266.00	264745.82	20099.00	268802.53	20878.00	282040.33
Malta	4625.00	196446.34	5132.00	199219.80	5220.00	208695.82
Netherlands	444015.00	244839.33	443689.00	247761.74	456370.00	262001.60
Poland	156319.00	209263.92	168366.00	213198.20	174990.00	223979.93
Portugal	57013.00	211739.86	58976.00	214414.45	60162.00	225020.11
Romania	55328.00	145250.28	58555.00	147743.20	62976.00	155037.36

Slovak Republic	61543.00	169041.84	61689.00	172986.95	66289.00	181873.40
Slovenia	25129.00	181301.13	25551.00	184356.69	26789.00	193306.57
Spain	256455.00	209570.21	270173.00	211744.11	281298.00	222302.06
Sweden	120931.00	181227.64	122132.00	184243.03	124467.00	192927.63
United Kingdom	496977.00	228483.51	519733.00	232194.00	414761.00	242093.07

Appendix A.3.

Table A.7. The regression analysis of the real exports of Austria in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.984200185
R Square	0.968650004
Adjusted R Square	0.965515005
Standard Error	2760.52265
Observations	12

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	2354572289	2354572289	308.97931	7.55161E-09

Residual	10	76204852.99	7620485.299			
Total	11	2430777142				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	15293.75398	5920.421406	2.583220506	0.02726525	2102.233023	28485.27493
X Variable 1	0.595316325	0.033867496	17.57780731	7.55161E-09	0.519854841	0.67077781
RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:			0.844346728
Observation	Predicted Y	Residuals				
1	91510.88273	3192.11727				
2	98977.3758	1490.624197				
3	111003.9562	-2090.95621				
4	118095.5726	1291.42736				
5	123320.7414	-61.74142028				
6	101644.9109	-3430.910866				
7	118411.0903	-3332.090293				
8	130612.8128	-3150.812763				
9	131548.013	-1869.013038				
10	129098.328	2786.671969				
11	131197.9968	2975.003195				
12	135555.3194	2199.680601				

Table A.8. The regression analysis of the real exports of Austria, after eliminating the autoregression, in function of imports of the other EU countries (million of Euro)

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.978625399
R Square	0.957707671
Adjusted R Square	0.953008524
Standard Error	2127.036434
Observations	11

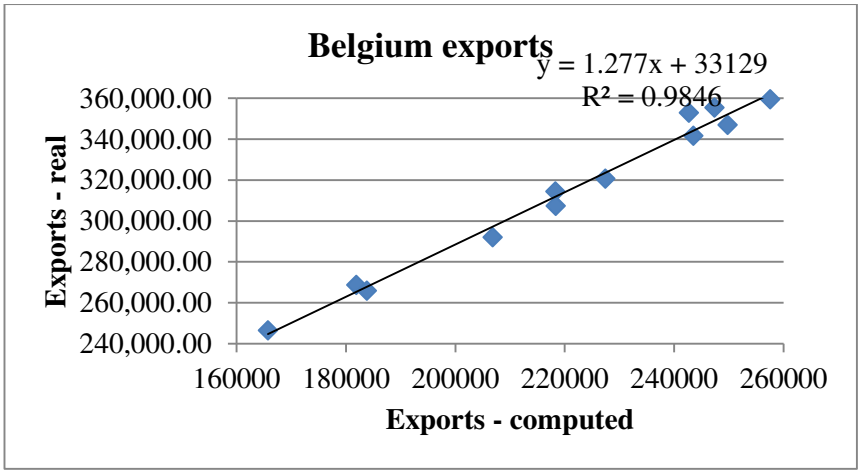
ANOVA

	df	SS	MS	F	Significance F	
Regression	1	922069663.7	922069663.7	203.8045502	1.73225E-07	
Residual	9	40718555.92	4524283.991			
Total	10	962788219.6				
	Coefficients	Standard Error	t Stat	P-value	Lower 43.0%	Upper 43.0%
Intercept	2372.020002	4015.793257	0.590672838	0.569273351	4.545994527	4739.494009
X Variable 1	0.648743087	0.045442876	14.27601311	1.73225E-07	0.621952657	0.675533517

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	1.938372124
Observation	Predicted Y	Residuals		
1	49704.51802	752.2052848		
2	58513.61911	-2656.308447		
3	59320.63454	2550.994473		
4	60933.66368	-721.2017006		
5	34305.55949	-1182.844392		
6	65050.3984	-1836.783122		
7	68698.58951	-2008.135405		
8	62695.8897	-327.7177623		
9	59488.16959	3915.236895		
10	63186.01471	1340.435269		
11	66726.07155	174.1189065		

Appendix A.4

Table A.9. The regression analysis of the real exports of Belgium in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.992286064
R Square	0.984631633
Adjusted R Square	0.983094797
Standard Error	5058.483974
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	16394071764	16394071764	640.6872407	2.12343E-10
Residual	10	255882601.1	25588260.11		
Total	11	16649954365			

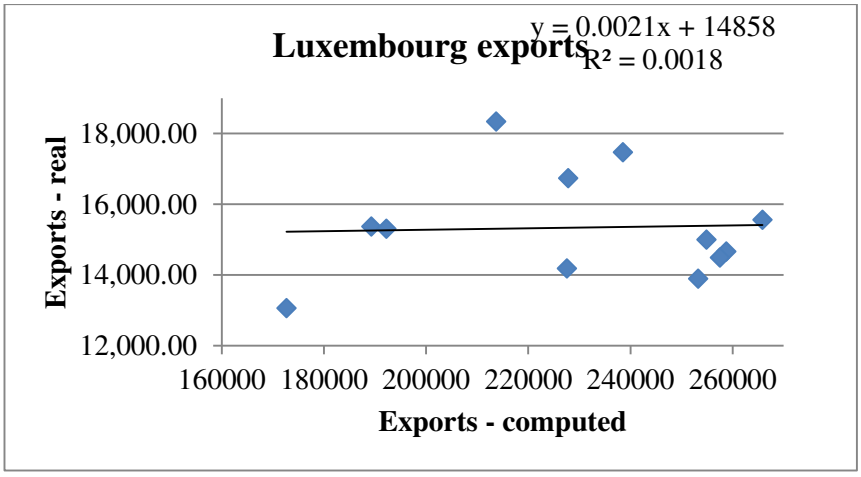
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	33128.77583	11208.48087	2.955688305	0.014393895	8154.724131	58102.82753
X Variable 1	1.276977324	0.050449881	25.31180042	2.12343E-10	1.164567984	1.389386665

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	1.943349066
Observation	Predicted Y	Residuals		

1	244779.9778	1783.022219
2	265403.7234	3331.276561
3	297263.5032	-5176.503186
4	311847.8867	2601.113253
5	323543.1985	-2738.1985
6	267891.122	-1905.12203
7	311958.6645	-4428.66453
8	344073.2523	-2355.252332
9	352120.0483	-5031.048322
10	343071.9872	9884.012819
11	349004.2492	6523.750809
12	362053.3868	-2488.386763

Appendix A.5

Table A.10. The regression analysis of the real exports of Luxembourg in function of imports of the other EU countries (million of Euro)

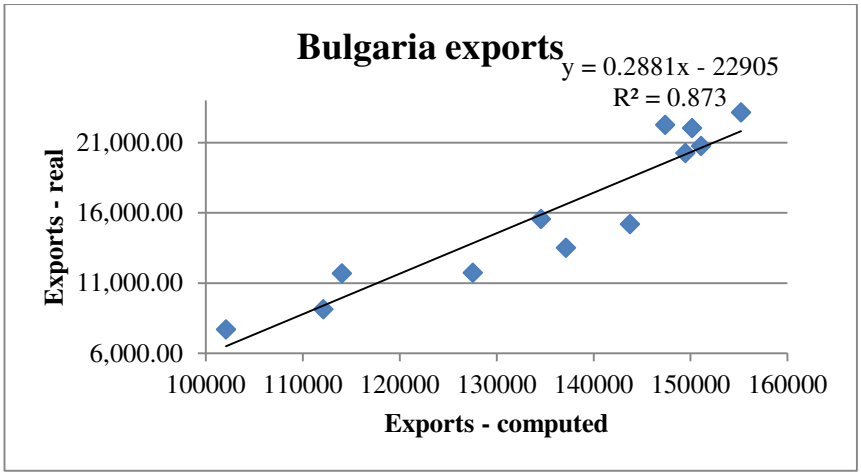


SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.042767701
R Square	0.001829076
Adjusted R Square	-0.097988016
Standard	1594.80033

Error						
Observations	12					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	1	46605.75198	46605.75198	0.018324279	0.895007617	
Residual	10	25433880.91	2543388.091			
Total	11	25480486.67				
	Coefficients	Standard Error	t Stat	P-value	Lower 10.0%	Upper 10.0%
Intercept	14857.87413	3557.059584	4.17701019	0.001896703	14399.40405	15316.34421
X Variable 1	0.002081943	0.015379968	0.135367199	0.895007617	9.96162E-05	0.00406427
RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:			0.994809279
Observation	Predicted Y	Residuals				
1	15217.33961	-2157.339608				
2	15251.88702	114.1129808				
3	15302.75447	3034.245529				
4	15332.15996	1401.840039				
5	15354.46351	2115.536494				
6	15258.07093	40.92906829				
7	15331.58838	-1151.588384				
8	15388.56286	-398.5628621				
9	15396.57736	-737.5773648				
10	15385.16871	-1497.168712				
11	15394.02311	-909.023112				
12	15411.40407	144.5959312				

Appendix A.6

Table A.11. The regression analysis of the real exports of Bulgaria in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.934324544
R Square	0.872962353
Adjusted R Square	0.860258588
Standard Error	2038.736668
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	285617846.6	285617846.6	68.71682298	8.61242E-06
Residual	10	41564472.02	4156447.202		
Total	11	327182318.7			

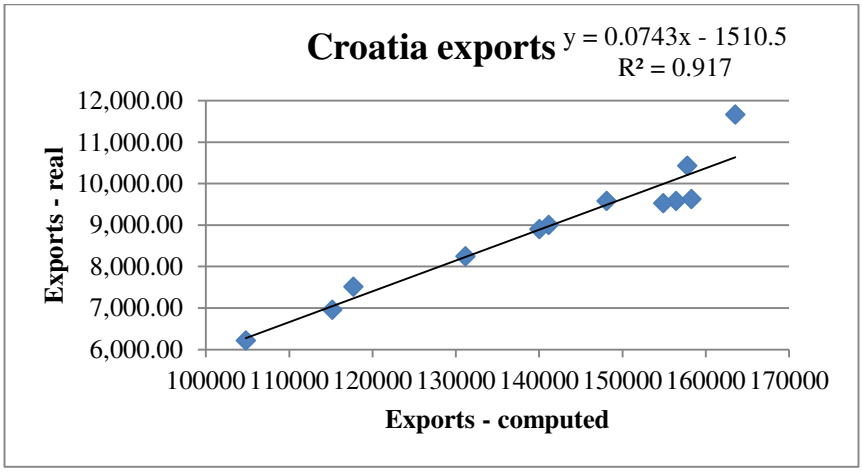
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-22905.41873	4741.031555	-4.831315393	0.000690417	-33469.09534	-12341.74213
X Variable 1	0.28806911	0.034750828	8.289561085	8.61242E-06	0.21063944	0.365498779

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	1.063343154
Observation	Predicted Y	Residuals		

1	6498.653724	1209.346276
2	9394.140049	-238.140049
3	13830.2603	-2082.260301
4	16599.32462	-3087.324617
5	18500.83712	-3296.837121
6	9945.680047	1753.319953
7	15854.86186	-293.8618557
8	20150.17393	114.8260726
9	20618.65496	151.3450411
10	19549.62761	2722.372387
11	20349.97866	1694.021338
12	21807.80712	1353.192876

Appendix A.7

Table A.12. The regression analysis of the real exports of Croatia in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.957581743
R Square	0.916962794

Adjusted R Square	0.908659073
Standard Error	457.168052
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	23079730.39	23079730.39	110.4279436	1.00707E-06
Residual	10	2090026.278	209002.6278		
Total	11	25169756.67			

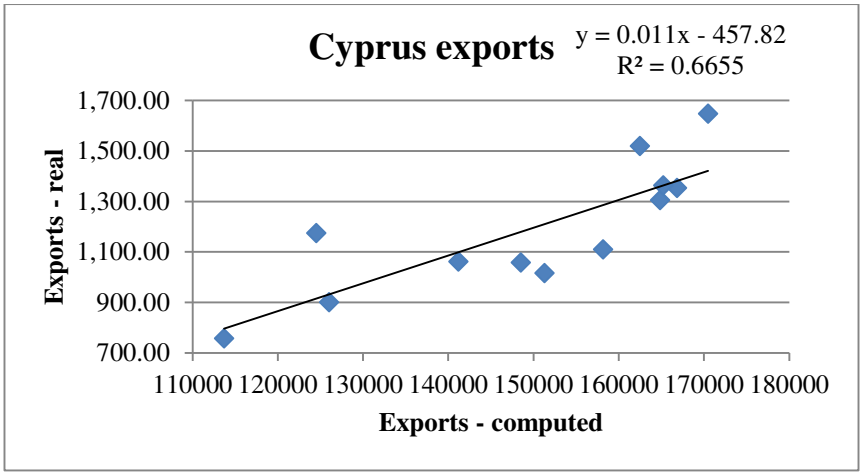
	Coefficients	Standard Error	t Stat	P-value	Lower 83.0%	Upper 83.0%
Intercept	-1510.528066	1003.236114	-1.505655593	0.163071256	-2994.070175	-26.98595746
X Variable 1	0.074253652	0.007066076	10.50847009	1.00707E-06	0.063804644	0.084702659

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 0.753454488

Observation	Predicted Y	Residuals
1	6271.894702	-53.8947018
2	7041.598403	-81.59840267
3	8226.946572	25.05342792
4	8968.097516	35.90248375
5	9486.472654	98.5273455
6	7228.540881	287.4591187
7	8887.397162	17.60283752
8	10104.72861	-522.7286073
9	10241.20533	-612.2053341
10	9989.647328	-458.6473277
11	10203.69313	227.3068682
12	10633.77771	1037.222292

Appendix A.8

Table A.13. The regression analysis of the real exports of Cyprus in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.815806766
R Square	0.665540679
Adjusted R Square	0.632094747
Standard Error	156.2327471
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	485708.2041	485708.2041	19.89900224	0.001214567
Residual	10	244086.7126	24408.67126		
Total	11	729794.9167			

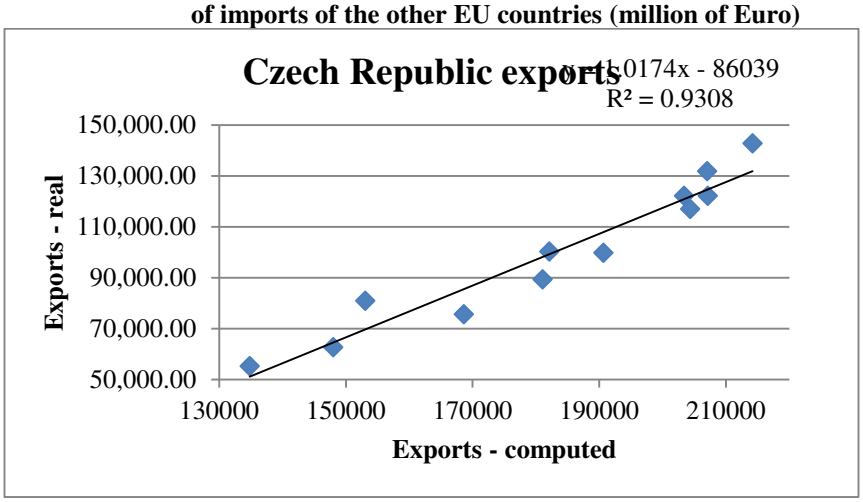
	Coefficients	Standard Error	t Stat	P-value	Lower 75.0%	Upper 75.0%
Intercept	-457.8203583	372.0109404	-1.230663694	0.246610338	-912.1407263	-3.499990333
X Variable 1	0.011023035	0.002471073	4.460829771	0.001214567	0.008005224	0.014040846

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	1.50747398
Observation	Predicted Y	Residuals		

1	795.5241686	-37.52416862
2	914.4836585	260.5163415
3	1098.645612	-36.64561219
4	1209.664549	-192.6645487
5	1285.681602	-175.6816017
6	931.3619091	-30.36190905
7	1179.16789	-121.1678898
8	1359.332119	-53.33211938
9	1381.223977	-27.22397684
10	1333.349063	186.6509375
11	1363.403367	0.596632929
12	1421.162086	226.8379144

Appendix A.9

Table A.14. The regression analysis of the real exports of Czech Republic in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.964782205

R Square	0.930804703
Adjusted R Square	0.923885173
Standard Error	7705.506309
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	7987012248	7987012248	134.5184919	4.02159E-07
Residual	10	593748274.7	59374827.47		
Total	11	8580760523			

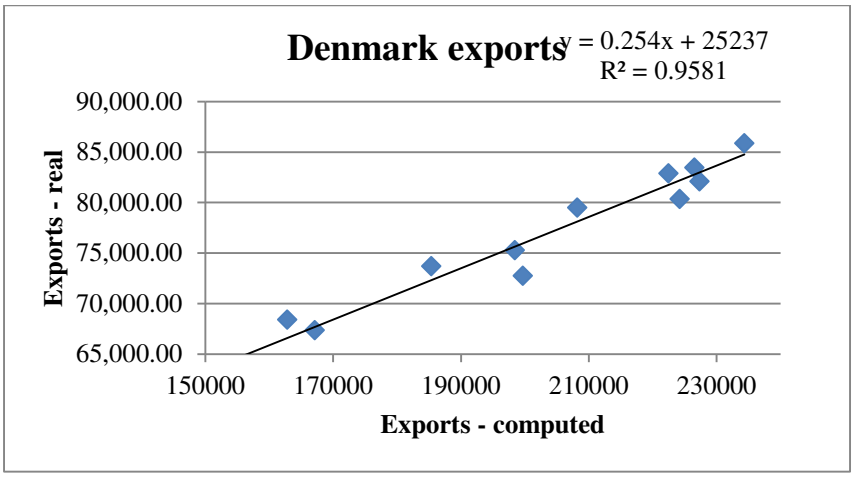
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-86039.09442	16195.15678	-5.312643502	0.000341316	-122124.1525	-49954.03639
X Variable 1	1.017423963	0.087722493	11.59821072	4.02159E-07	0.821966067	1.212881858

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.160581481

Observation	Predicted Y	Residuals
1	51129.85161	4156.148393
2	64558.29126	-1836.291255
3	85520.93848	-9916.938483
4	98173.96881	-8791.968806
5	107951.7895	-8142.789534
6	69670.47022	11312.52978
7	99255.71431	1055.285688
8	121846.1381	-4792.138137
9	124709.0267	-2479.026729
10	120873.2061	1311.793875
11	124609.0241	7189.975872
12	131888.5807	10933.41934

Appendix A.10

Table A.15. The regression analysis of the real exports of Denmark in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.978848543
R Square	0.95814447
Adjusted R Square	0.953958917
Standard Error	1605.052516
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	589734647.9	589734647.9	228.9170553	3.21796E-08
Residual	10	25761935.78	2576193.578		
Total	11	615496583.7			

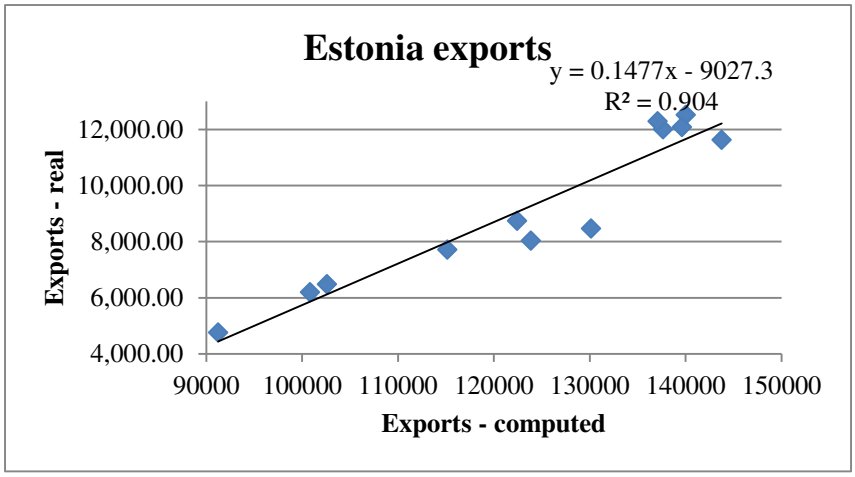
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	25237.4467	3395.827651	7.431898582	2.23119E-05	17671.07118	32803.82222
X Variable 1	0.253974849	0.016786171	15.13000513	3.21796E-08	0.21657293	0.291376768

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	1.268507634
Observation	Predicted Y	Residuals		

1	62897.55096	-980.5509556
2	66594.49267	1808.507333
3	72314.00118	1401.998817
4	75635.30139	-355.3013944
5	78120.53672	1375.463279
6	67681.0885	-299.0885012
7	75957.89263	-3210.892628
8	82184.10891	-1822.108905
9	82969.41692	-879.4169159
10	81743.71906	1161.280943
11	82773.50326	694.4967427
12	84758.38781	1105.612186

Appendix A.11

Table A.16. **The regression analysis of the real exports of Estonia in function of imports of the other EU countries (million of Euro)**



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.950793005

R Square	0.904007338
Adjusted R Square	0.894408072
Standard Error	892.0949659
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	74947318.39	74947318.39	94.17462969	2.09137E-06
Residual	10	7958334.281	795833.4281		
Total	11	82905652.67			

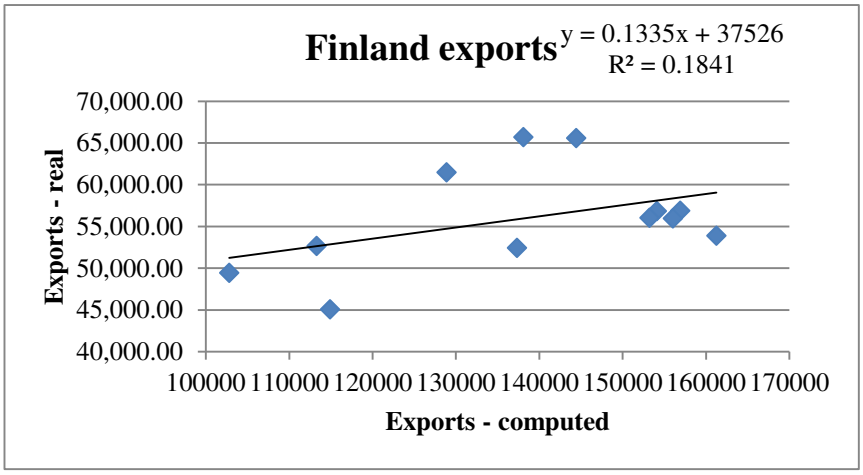
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-9027.256286	1900.454667	-4.75005084	0.000780175	-13261.73317	-4792.779407
X Variable 1	0.14771808	0.015221824	9.704361375	2.09137E-06	0.113801743	0.181634417

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.120941197

Observation	Predicted Y	Residuals
1	4449.987397	317.0126032
2	5868.360153	332.6398473
3	7983.353648	-264.353648
4	9271.648817	-1237.648817
5	10194.74944	-1724.74944
6	6125.628915	361.3710847
7	9058.366067	-315.366067
8	11305.47566	697.5243413
9	11658.02849	862.9715083
10	11223.97516	1065.024838
11	11596.01792	486.9820811
12	12208.40833	-581.4083319

Appendix A.12

Table A.17. The regression analysis of the real exports of Finland in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.429016554
R Square	0.184055204
Adjusted R Square	0.102460724
Standard Error	5771.774637
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	75146032.35	75146032.35	2.255731085	0.16402133
Residual	10	333133824.6	33313382.46		
Total	11	408279856.9			

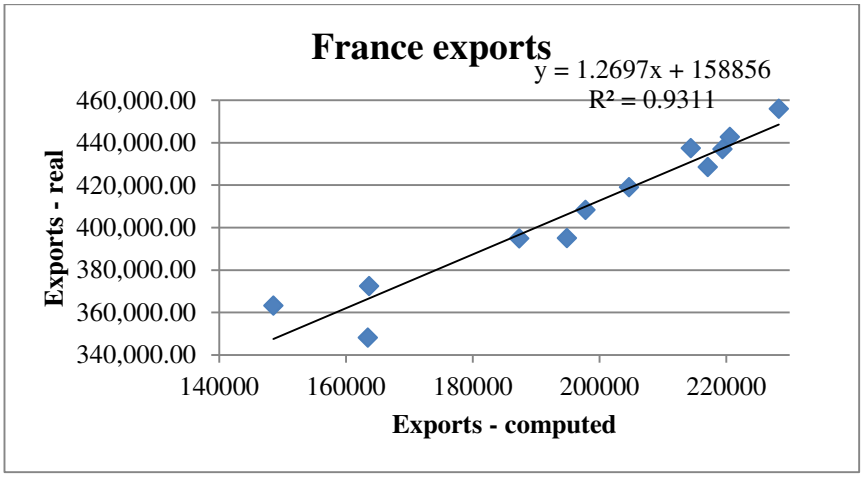
	Coefficients	Standard Error	t Stat	P-value	Lower 83.0%	Upper 83.0%
Intercept	37525.62094	12412.65385	3.023174689	0.012825741	19170.3261	55880.91577
X Variable 1	0.133454299	0.088856439	1.501909147	0.16402133	0.002057245	0.264851353

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.097430679

Observation	Predicted Y	Residuals
1	51245.22333	-1804.223329
2	52645.47388	-4.473877948
3	54723.03702	6765.962976
4	55955.06976	9732.930237
5	56797.42129	8782.578712
6	52856.43576	-7793.435765
7	55852.83977	-3413.839766
8	58088.18993	-1233.189933
9	58466.50084	-1588.500842
10	57974.09718	-1926.097184
11	58347.50899	-2374.508985
12	59043.20224	-5143.202243

Appendix A.13

Table A.18. The regression analysis of the real exports of France in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.964936764
R Square	0.931102958
Adjusted R Square	0.924213254
Standard Error	9446.546343
Observations	12

ANOVA

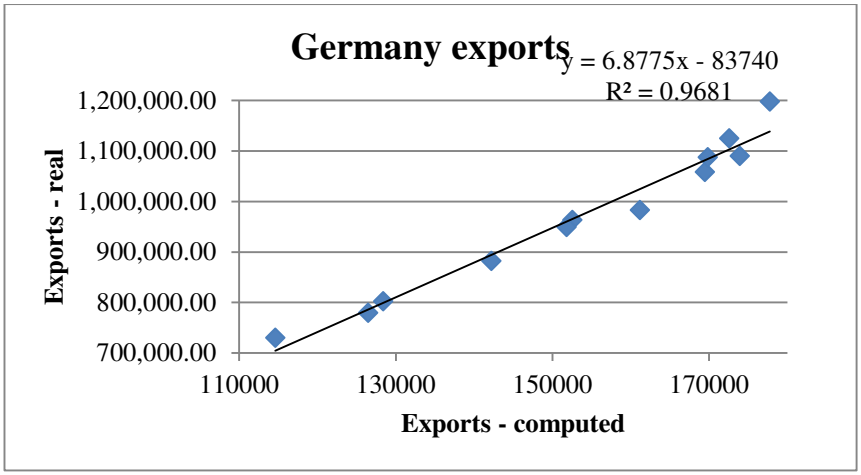
	df	SS	MS	F	Significance F
Regression	1	12059887379	12059887379	135.1441133	3.93514E-07
Residual	10	892372378.2	89237237.82		
Total	11	12952259758			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	158856.3841	21650.23854	7.337396481	2.49002E-05	110616.6464	207096.1217
X Variable 1	1.269691052	0.109219326	11.62515003	3.93514E-07	1.026335228	1.513046875

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	0.893684525
Observation	Predicted Y	Residuals		
1	347424.6522	15783.3478		
2	366645.1084	5749.891629		
3	396701.6286	-1776.628551		
4	409989.5295	-1662.529465		
5	418658.8276	324.1723973		
6	366372.3914	-18337.39143		
7	406224.1718	-11137.17177		
8	434425.1147	-5924.114662		
9	438872.8297	3770.170281		
10	431075.0094	6363.990572		
11	437427.2865	-490.2864568		
12	448653.4503	7336.549656		

Appendix A.14

Table A.19. The regression analysis of the real exports of Germany in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.983927434
R Square	0.968113195
Adjusted R Square	0.964924515
Standard Error	27788.39183
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2.34446E+11	2.34446E+11	303.6093474	8.22256E-09
Residual	10	7721947207	772194720.7		
Total	11	2.42167E+11			

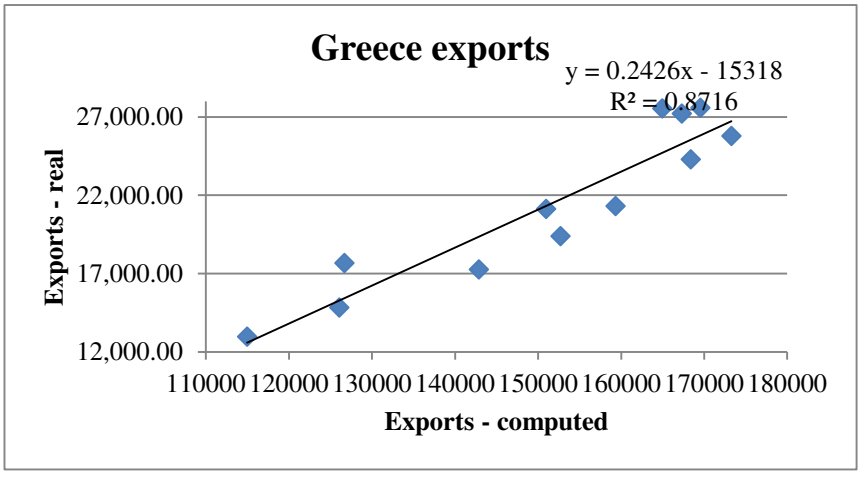
	Coefficients	Standard Error	t Stat	P-value	Lower 79.0%	Upper 79.0%
Intercept	-83740.24497	61069.85943	-1.371220529	0.200290384	-165553.9051	-1926.584824
X Variable 1	6.877499574	0.394705341	17.42438944	8.22256E-09	6.348723367	7.40627578

RESIDUAL OUTPUT		DURBIN-WATSON STATISTIC:	0.978650566
Observation	Predicted Y	Residuals	

1	704309.1029	26134.89705
2	785984.3622	-5995.362187
3	894079.3297	-11547.32971
4	965266.6772	-1228.677202
5	1024528.234	-41273.2341
6	799149.9596	3862.040379
7	960348.0958	-10719.09583
8	1081656.735	-22759.73451
9	1112307.962	-21777.96196
10	1084353.746	3717.254028
11	1102955.182	22078.81848
12	1138797.614	59508.38558

Appendix A.15

Table A.20. The regression analysis of the real exports of Greece in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.933612973

R Square	0.871633184
Adjusted R Square	0.858796502
Standard Error	1919.574472
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	250202081.4	250202081.4	67.90175301	9.07815E-06
Residual	10	36847661.55	3684766.155		
Total	11	287049742.9			

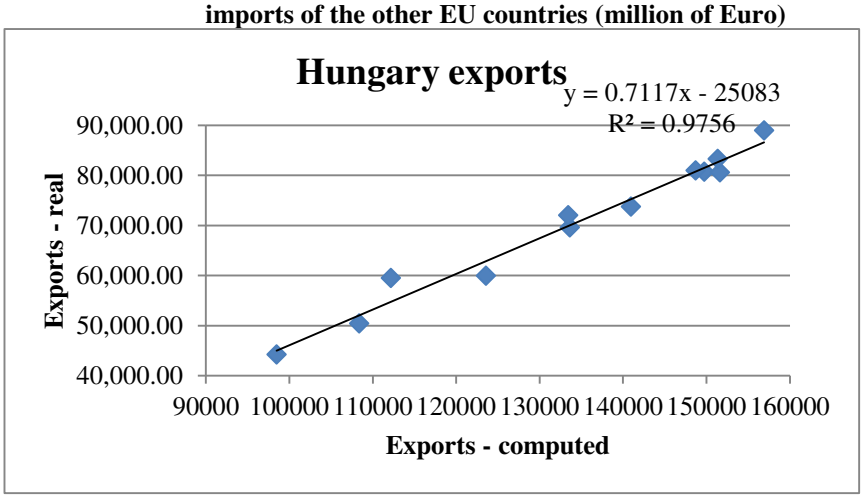
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-15317.93886	4492.726576	-3.40949724	0.006663906	-25328.3575	-5307.520225
X Variable 1	0.242635663	0.029445175	8.240251999	9.07815E-06	0.177027724	0.308243602

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.310137051

Observation	Predicted Y	Residuals
1	12577.16267	392.8373263
2	15272.0175	-446.0175008
3	19346.78016	-2073.780164
4	21733.65997	-2341.659971
5	23336.03074	-2017.030741
6	15414.54654	2259.453458
7	21310.47426	-170.4742585
8	25539.94385	-1244.943847
9	25815.50032	1769.499683
10	24703.11528	2855.884717
11	25271.63248	1949.367522
12	26726.13622	-933.1362231

Appendix A.16

Table A.21. The regression analysis of the real exports of Hungary in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.98771277
R Square	0.975576515
Adjusted R Square	0.973134167
Standard Error	2294.701727
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2103324067	2103324067	399.4419804	2.16076E-09
Residual	10	52656560.15	5265656.015		
Total	11	2155980627			

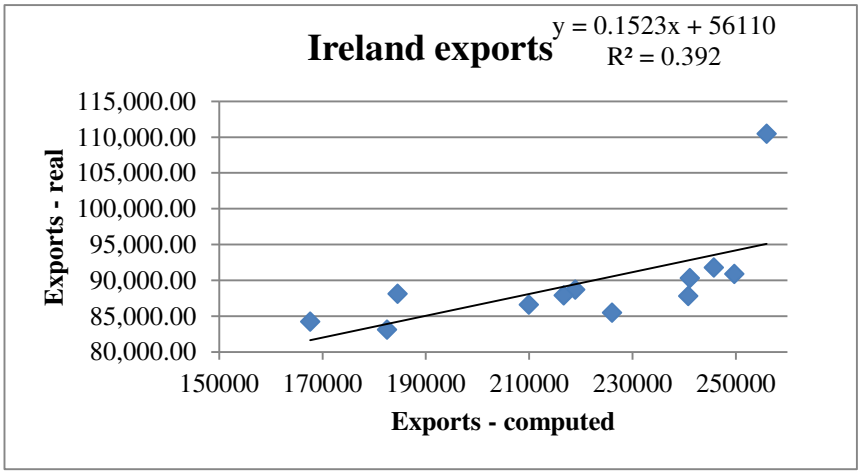
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-25082.86424	4819.717363	-5.20421891	0.000398858	-35821.86375	-14343.86473
X Variable 1	0.711653864	0.035607539	19.98604464	2.16076E-09	0.632315323	0.790992405

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.423748616

Observation	Predicted Y	Residuals
1	44997.07921	-737.0792079
2	52031.29373	-1626.293728
3	62850.31834	-2914.318342
4	69993.78596	-383.7859626
5	75225.08235	-1453.082351
6	54748.92904	4764.070963
7	69879.76478	2144.23522
8	81464.8919	-780.8918952
9	82814.03106	-2202.031057
10	80744.51315	200.486845
11	82625.25775	640.7422466
12	86586.05273	2347.947269

Appendix A.17

Table A.22. The regression analysis of the real exports of Ireland in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.626075259
R Square	0.39197023
Adjusted R Square	0.331167253

Standard Error	5777.701719
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	215198121.1	215198121.1	6.446563146	0.029413122
Residual	10	333818371.5	33381837.15		
Total	11	549016492.7			

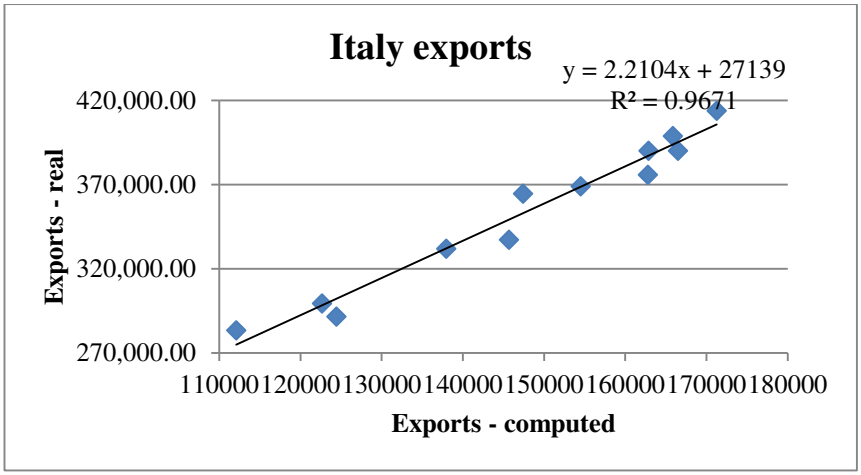
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	56109.67246	13302.51305	4.217975373	0.001777314	26469.82629	85749.51862
X Variable 1	0.152348008	0.060002958	2.5390083	0.029413122	0.018653086	0.28604293

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.129948206

Observation	Predicted Y	Residuals
1	81644.82721	2582.172794
2	84222.7886	3914.211405
3	88087.40966	-1494.409656
4	89463.64234	-777.6423399
5	90546.82144	-5069.821442
6	83912.42828	-798.42828
7	89116.31326	-1241.313257
8	92834.84629	-2504.84629
9	94154.03379	-3266.033785
10	92789.44811	-4967.448107
11	93544.47265	-1752.472647
12	95102.96839	15376.03161

Appendix A.18

Table A.23. The regression analysis of the real exports of Italy in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.983435565
R Square	0.96714551
Adjusted R Square	0.963860061
Standard Error	8426.232211
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	20900849158	20900849158	294.3723971	9.55226E-09
Residual	10	710013892.7	71001389.27		
Total	11	21610863051			

	Coefficients	Standard Error	t Stat	P-value	Lower 81.0%	Upper 81.0%
Intercept	27138.52056	19200.97586	1.413392775	0.187904329	140.128922	54136.9122
X Variable 1	2.210412128	0.128832286	17.15728408	9.55226E-09	2.029261725	2.391562531

RESIDUAL OUTPUT		DURBIN-WATSON STATISTIC:	0.787575325
Observation	Predicted Y	Residuals	

1	274911.0872	8582.912815
2	298296.4296	1277.570353
3	332067.1946	-54.19455608
4	352995.1334	11748.86656
5	368693.8561	322.1438575
6	302182.29	-10449.28996
7	349141.943	-11734.94302
8	387000.2241	-11096.22414
9	395133.3914	-4951.391354
10	387118.8127	3114.187252
11	393779.8455	5090.154512
12	405730.7923	8150.207676

Table A.24. The regression analysis of the real exports of Italy, after eliminating the autoregression, in function of imports of the other EU countries (million of Euro)

SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.98010413
R Square	0.960604105
Adjusted R Square	0.956226783
Standard Error	6233.650561
Observations	11

ANOVA

	df	SS	MS	F	Significance F
Regression	1	8527483336	8527483336	219.4501957	1.25727E-07
Residual	9	349725593.8	38858399.32		
Total	10	8877208930			

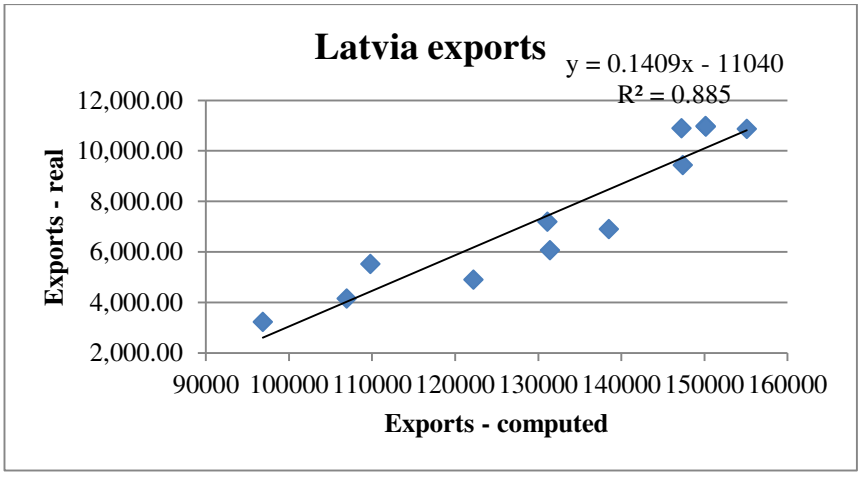
	Coefficients	Standard Error	t Stat	P-value	Lower 33.0%	Upper 33.0%
Intercept	-5288.769383	11689.02623	-0.452455943	0.6616493	-10437.2029	-140.335868
X Variable 1	2.452933644	0.165583788	14.81385148	1.25727E-07	2.380002237	2.52586505

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.80563333

Observation	Predicted Y	Residuals
1	141988.8689	-815.6394282
2	164964.8306	-337.2159613
3	167249.4098	11984.08543
4	171694.2154	-6476.993012
5	88151.17151	-2603.90645
6	181503.5591	-7100.827208
7	194398.2841	-7018.657784
8	179949.8177	197.8138908
9	166012.9356	6207.939071
10	178374.233	2455.145715
11	187506.245	3508.255741

Appendix A.19

Table A.25. The regression analysis of the real exports of Latvia in function of imports of the other EU countries (million of Euro)

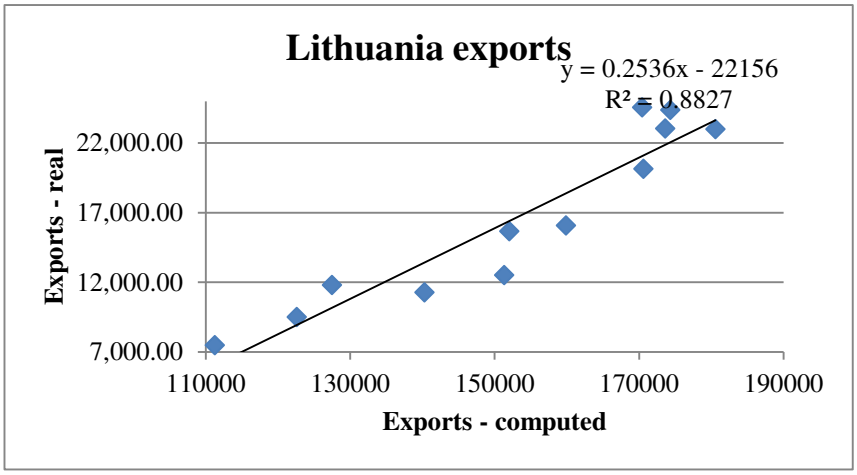


SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.940726109
R Square	0.884965612
Adjusted R Square	0.873462174
Standard	1035.851684

Error						
Observations	12					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	1	82545587.55	82545587.55	76.93052745	5.21402E-06	
Residual	10	10729887.12	1072988.712			
Total	11	93275474.67				
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-11040.27378	2144.982426	-5.147022954	0.000433316	-15819.59246	-6260.955102
X Variable 1	0.140894299	0.016063644	8.771004928	5.21402E-06	0.10510227	0.176686328
RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:			1.24547556
Observation	Predicted Y	Residuals				
1	2603.935791	619.0642091				
2	4025.128133	122.8718666				
3	6176.02755	-1274.02755				
4	7474.267073	-1412.267073				
5	8473.57398	-1576.57398				
6	4426.492315	1095.507685				
7	7428.249586	-237.2495864				
8	9725.059139	-292.0591393				
9	10110.70938	872.2906207				
10	9702.293438	1190.706562				
11	10117.22433	839.7756683				
12	10813.03928	51.9607179				

Appendix A.20

Table A.26. The regression analysis of the real exports of Lithuania in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.93952497
R Square	0.882707169
Adjusted R Square	0.870977886
Standard Error	2223.788491
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	372162097.7	372162097.7	75.25670242	5.75237E-06
Residual	10	49452352.52	4945235.252		
Total	11	421614450.3			

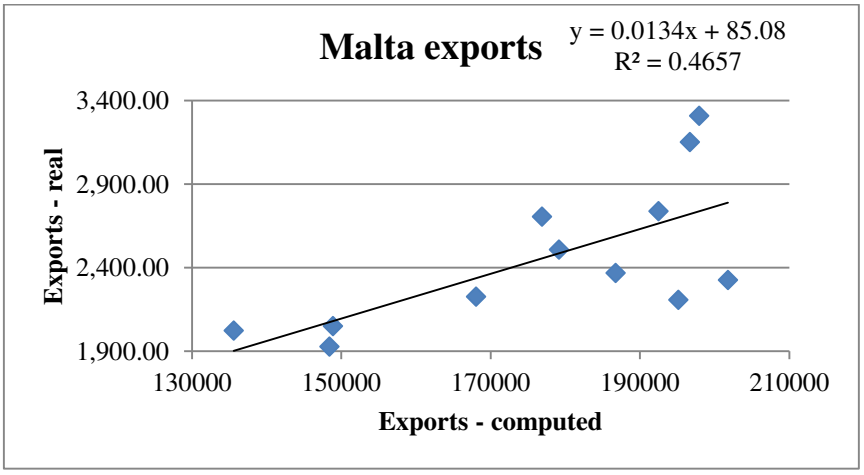
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-22155.78215	4514.777815	-4.907391474	0.000616301	-32215.33401	-12096.2303
X Variable 1	0.253636416	0.029237418	8.675062099	5.75237E-06	0.188491389	0.318781443

RESIDUAL OUTPUT	DURBIN-WATSON STATISTIC:	1.087026461128

Observation	Predicted Y	Residuals
1	6061.091562	1411.908438
2	8934.137772	554.862228
3	13421.83848	-2158.838477
4	16216.80018	-3707.80018
5	18391.8618	-2314.8618
6	10168.0485	1628.951501
7	16404.00161	-753.0016094
8	21113.20807	-962.2080696
9	21877.76461	1169.235391
10	21063.15546	3481.844541
11	22055.12495	2305.875055
12	23639.96702	-655.9670169

Appendix A.21

Table A.27. The regression analysis of the real exports of Malta in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.682393372

R Square	0.465660715
Adjusted R Square	0.412226786
Standard Error	336.9866634
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	989641.5534	989641.5534	8.71470108	0.014483342
Residual	10	1135600.113	113560.0113		
Total	11	2125241.667			

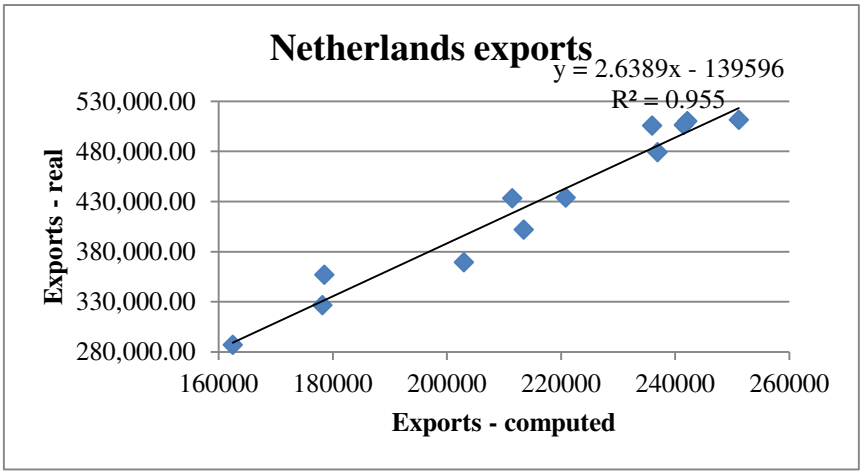
	Coefficients	Standard Error	t Stat	P-value	Lower 8.0%	Upper 8.0%
Intercept	85.07987218	810.7464575	0.104940171	0.918498325	1.57376909	168.5859753
X Variable 1	0.01340127	0.004539622	2.952067255	0.014483342	0.012933693	0.013868847

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 0.779671474

Observation	Predicted Y	Residuals
1	1901.964441	121.0355587
2	2074.085664	-146.0856644
3	2336.763826	-110.7638263
4	2486.06148	21.93851971
5	2587.255007	-220.2550071
6	2080.171717	-31.17171723
7	2455.466917	249.5330834
8	2720.995127	430.0048734
9	2737.699944	570.3000561
10	2664.316331	73.68366923
11	2699.957009	-493.9570087
12	2789.262537	-464.2625368

Appendix A.22

Table A.28. The regression analysis of the real exports of Netherlands in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.977219202
R Square	0.954957368
Adjusted R Square	0.950453105
Standard Error	17480.34108
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	64782846493	64782846493	212.0118921	4.65087E-08
Residual	10	3055623242	305562324.2		
Total	11	67838469735			

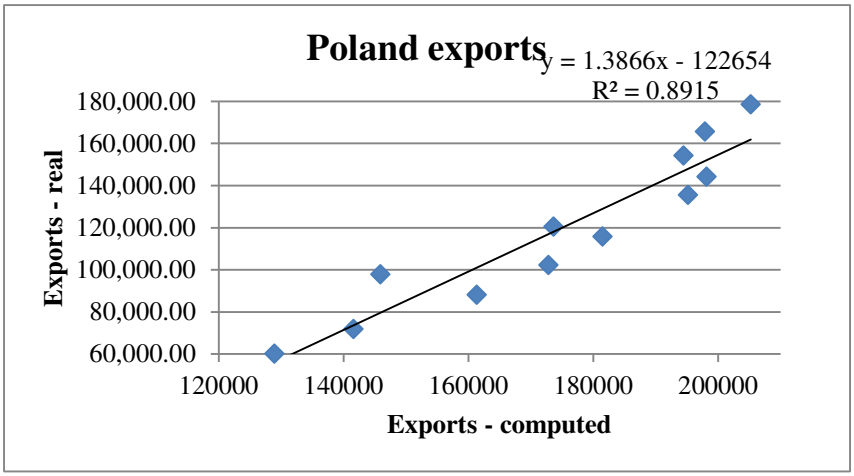
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-139596.1248	39223.56978	-3.558985721	0.005190005	-226991.6845	-52200.56505
X Variable 1	2.638938977	0.18123799	14.56062815	4.65087E-08	2.23511557	3.042762383

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.154539328

Observation	Predicted Y	Residuals
1	289181.9788	-2071.978795
2	330635.1975	-4080.197531
3	396010.0286	-26761.02864
4	423729.2589	-21828.25892
5	443094.0306	-9372.030638
6	331423.0792	25538.92085
7	418366.0113	14806.98871
8	485573.5855	-6334.585521
9	499342.2232	10755.77676
10	483035.1637	22615.83627
11	497724.237	8614.763024
12	523217.2056	-11884.20556

Appendix A.23

Table A.29. The regression analysis of the real exports of Poland in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.944219192
R Square	0.891549882
Adjusted R Square	0.88070487

Standard Error	12865.13173
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	13606426848	13606426848	82.20829031	3.87137E-06
Residual	10	1655116144	165511614.4		
Total	11	15261542992			

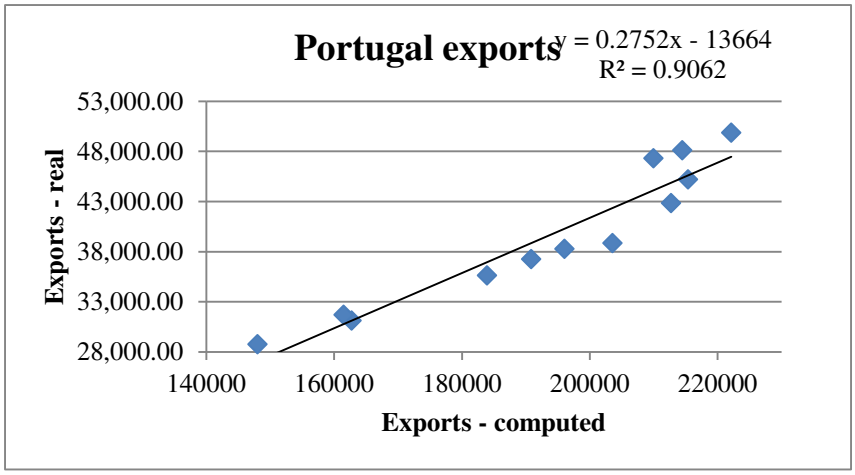
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-122654.2762	26977.34642	-4.546565639	0.0010639	-182763.5499	-62545.00257
X Variable 1	1.386567639	0.152926677	9.066878752	3.87137E-06	1.045825769	1.72730951

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.156972511

Observation	Predicted Y	Residuals
1	56131.97369	4084.026308
2	73710.57318	-1821.57318
3	101099.0555	-12870.05552
4	116976.9189	-14717.91887
5	128984.0677	-13089.06774
6	79656.93783	18208.06217
7	118103.1307	2379.869291
8	147964.806	-12406.80602
9	152112.7647	-7830.764709
10	146964.8689	7379.1311
11	151760.5072	13954.4928
12	161940.3956	16730.60437

Appendix A.24

Table A.30. The regression analysis of the real exports of Portugal in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.95192827
R Square	0.906167431
Adjusted R Square	0.896784175
Standard Error	2279.207787
Observations	12

ANOVA

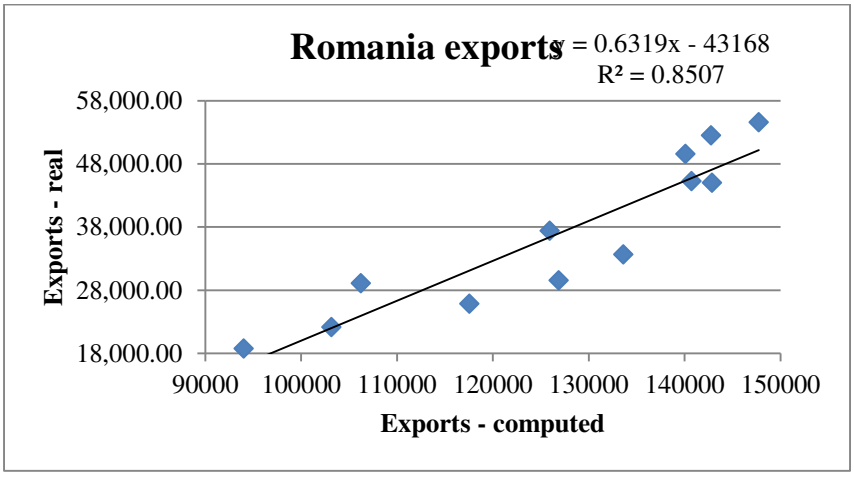
	df	SS	MS	F	Significance F
Regression	1	501675260.3	501675260.3	96.5728047	1.86458E-06
Residual	10	51947881.38	5194788.138		
Total	11	553623141.7			

	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-13663.53419	5457.792629	-2.503490901	0.031259318	-25824.25399	-1502.814385
X Variable 1	0.275240345	0.028008166	9.827146315	1.86458E-06	0.212834262	0.337646427

RESIDUAL OUTPUT		DURBIN-WATSON STATISTIC:	0.948436047
Observation	Predicted Y	Residuals	
1	27082.54824	1685.45176	
2	31130.30706	6.692937875	
3	36961.9426	-1321.942596	
4	40296.91425	-2002.914251	
5	42359.62319	-3512.623193	
6	30785.9924	911.0075993	
7	38863.31666	-1595.316659	
8	44885.31392	-2057.31392	
9	45618.68631	-405.6863133	
10	44126.33316	3176.666835	
11	45374.60042	2730.399577	
12	47472.42178	2385.578223	

Appendix A.25

Table A.31. The regression analysis of the real exports of Romania in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.922339983
R Square	0.850711045
Adjusted R Square	0.835782149
Standard Error	4959.567538
Observations	12

ANOVA

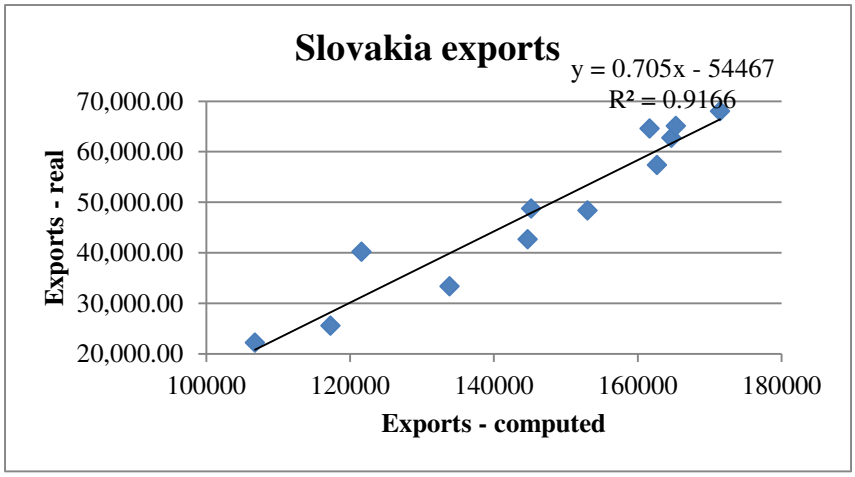
	df	SS	MS	F	Significance F
Regression	1	1401657837	1401657837	56.98419168	1.95065E-05
Residual	10	245973101.6	24597310.16		
Total	11	1647630939			

	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-43168.1268	10710.11997	-4.030592275	0.002397225	-67031.76121	-19304.4924
X Variable 1	0.631915739	0.083710893	7.548787431	1.95065E-05	0.445396245	0.818435232

RESIDUAL OUTPUT			DURBIN-WATSON STATISTIC:	1.07763901
Observation	Predicted Y	Residuals		
1	16240.62884	2512.371163		
2	22017.80473	154.1952663		
3	31104.08323	-5254.083225		
4	37004.67858	-7461.678585		
5	41259.67689	-7580.676892		
6	23968.061	5116.938999		
7	36418.95589	979.0441136		
8	45765.43832	-481.4383219		
9	47105.51043	-2086.510433		
10	45354.04854	4216.951462		
11	47038.91915	5454.080847		
12	50178.19439	4430.805607		

Appendix A.26

Table A.32. The regression analysis of the real exports of Slovakia in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.95739738
R Square	0.916609743
Adjusted R Square	0.908270718
Standard Error	4781.955359
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2513507550	2513507550	109.9180864	1.02883E-06
Residual	10	228670970.6	22867097.06		
Total	11	2742178521			

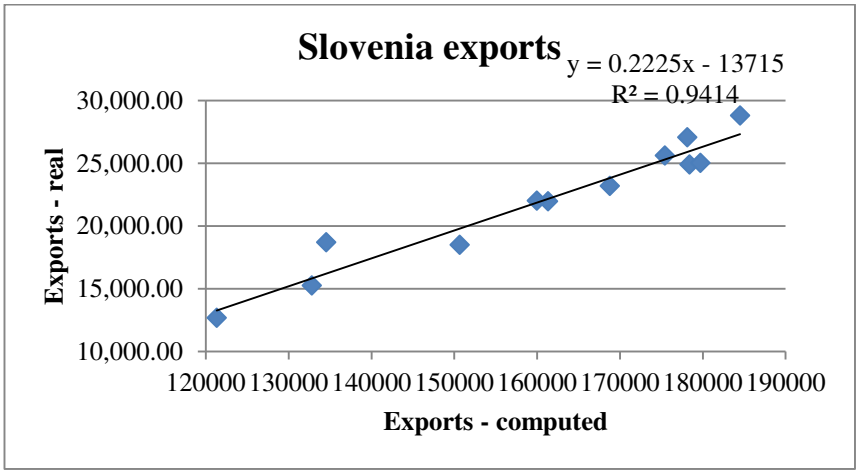
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-54467.40819	9893.527489	-5.505357745	0.000259829	-76511.56117	-32423.25521
X Variable 1	0.705009601	0.06724507	10.48418268	1.02883E-06	0.555178247	0.854840954

RESIDUAL OUTPUT	DURBIN-WATSON STATISTIC:	1.524590464137

Observation	Predicted Y	Residuals
1	20794.72847	1417.271531
2	28206.03615	-2623.036145
3	39883.83632	-6543.836322
4	47556.73781	-4860.73781
5	53434.1138	-5064.113797
6	31249.04088	8958.959115
7	47898.43481	878.5651865
8	60243.95663	-2894.956633
9	61649.04782	1092.952183
10	59507.25685	5058.743149
11	62084.47585	2996.524153
12	66414.33461	1583.66539

Appendix A.27

Table A.33. The regression analysis of the real exports of Slovenia in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.970259019

R Square	0.941402564
Adjusted R Square	0.935542821
Standard Error	1234.242141
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	244735803	244735803	160.6559323	1.74332E-07
Residual	10	15233536.63	1523353.663		
Total	11	259969339.7			

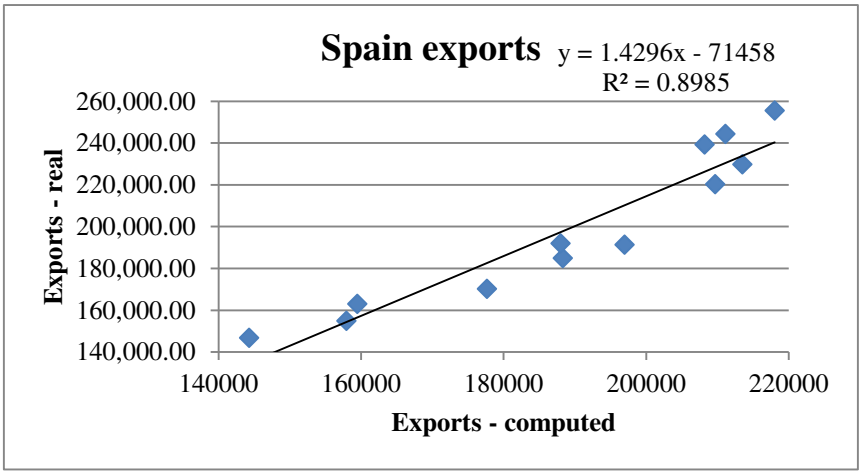
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-13714.99681	2838.919974	-4.831061436	0.00069068	-20040.5047	-7389.488916
X Variable 1	0.222485889	0.017553111	12.67501212	1.74332E-07	0.183375121	0.261596656

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.425212074

Observation	Predicted Y	Residuals
1	13269.79602	-598.7960175
2	15830.55742	-560.5574248
3	19800.5133	-1299.513303
4	22175.69033	-195.6903314
5	23837.05253	-633.0525336
6	16218.41262	2476.587375
7	21869.26052	157.7394832
8	25970.30063	-1055.300631
9	26268.51404	-1235.514042
10	25312.65904	302.3409575
11	25917.82956	1157.170441
12	27335.41397	1484.586027

Appendix A.28

Table A.34. The regression analysis of the real exports of Spain in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.947880996
R Square	0.898478382
Adjusted R Square	0.888326221
Standard Error	12495.218
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	13817732424	13817732424	88.50118862	2.77413E-06
Residual	10	1561304728	156130472.8		
Total	11	15379037153			

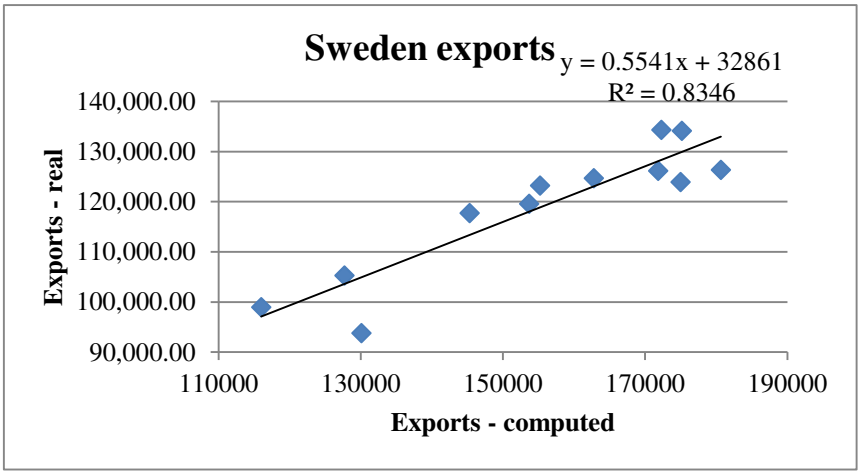
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	-71457.96937	29009.12347	-2.463292951	0.033487171	-136094.3244	-6821.614304
X Variable 1	1.429564886	0.151960012	9.407507035	2.77413E-06	1.090976878	1.768152893

RESIDUAL OUTPUT	DURBIN-WATSON STATISTIC:	0.914929148140

Observation	Predicted Y	Residuals
1	134763.1127	11964.88733
2	154316.8727	498.1272737
3	182478.1144	-12267.11444
4	197712.7158	-12891.71581
5	210142.7968	-18754.79678
6	156469.9547	6520.045304
7	197287.0343	-5375.034271
8	228258.0286	-8035.028581
9	233743.3405	-3941.340526
10	226138.3841	13175.61587
11	230363.3488	13923.65121
12	240258.2966	15182.70342

Appendix A.29

Table A.35. The regression analysis of the real exports of Sweden in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.913538903
R Square	0.834553328
Adjusted R Square	0.81800866

Standard Error	5565.085133
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	1562210963	1562210963	50.44243655	3.2864E-05
Residual	10	309701725.4	30970172.54		
Total	11	1871912689			

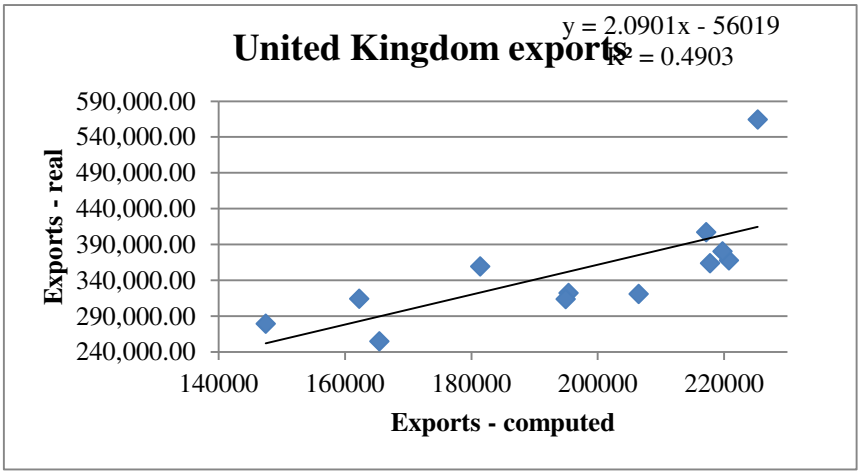
	Coefficients	Standard Error	t Stat	P-value	Lower 95.0%	Upper 95.0%
Intercept	32860.69799	12234.0614	2.68600074	0.02285607	5601.510457	60119.88552
X Variable 1	0.554061705	0.078011765	7.102283897	3.2864E-05	0.38024066	0.72788275

RESIDUAL OUTPUT DURBIN-WATSON STATISTIC: 1.347442

Observation	Predicted Y	Residuals
1	97116.83515	1833.164845
2	103603.5735	1662.426487
3	113356.8048	4350.195185
4	118848.127	4330.873005
5	123058.3366	1586.663381
6	104939.1448	-11176.14479
7	118010.2638	1586.736197
8	128309.6947	6003.305326
9	129910.1185	4230.881469
10	128065.1872	-1908.187244
11	129817.1691	-5896.16914
12	132941.7447	-6603.744719

Appendix A.30

Table A.36. The regression analysis of the real exports of United Kingdom in function of imports of the other EU countries (million of Euro)



SUMMARY OUTPUT	
Regression Statistics	
Multiple R	0.700181537
R Square	0.490254185
Adjusted R Square	0.439279603
Standard Error	59196.87448
Observations	12

ANOVA

	df	SS	MS	F	Significance F
Regression	1	33702738823	33702738823	9.617620595	0.011227133
Residual	10	35042699480	3504269948		
Total	11	68745438303			

	Coefficients	Standard Error	t Stat	P-value	Lower 31.0%	Upper 31.0%
Intercept	-56019.03444	133307.3296	-0.420224714	0.683208016	-110759.7973	-1278.271604
X Variable 1	2.090141757	0.673972104	3.101228885	0.011227133	1.813384678	2.366898836

RESIDUAL OUTPUT	DURBIN-WATSON STATISTIC:	1.092209265143

Observation	Predicted Y	Residuals
1	252154.4342	27111.56576
2	283068.3206	31067.67943
3	323053.3385	36063.66147
4	352378.4036	-29991.40361
5	375518.4257	-54490.42571
6	289742.4776	-35038.47763
7	351364.2877	-37598.28773
8	399117.7983	-35202.79826
9	405411.3405	-37422.3405
10	397853.2416	9206.758407
11	403252.1196	-22970.11955
12	414925.8121	149264.1879

The Importance of Association for Smart, Sustainable and Inclusive Development of Rural Area

Daniela Trifan[1], Daniela Ecaterina Zeca[2]

Abstract: The paper presents a case study on economic growth and improved results by association of small agrifarms. The study subject was *BRAICOOP* Agricultural Cooperative, founded in 2009, which bunching up farmers with less 6,000 ha surface area and now increased to 17 000 ha and more than 46 members. The paper emphasis advantages of association for practicing modern and scientific agriculture, and shows the benefits of applying technology on large, but optimal surfaces. Following the study, results that a maximum efficiency of production increased profits by over 40%. Adapting to the farmers' needs, an agrochemical analysis laboratory was founded under cooperative, in 2014. The present study reveals that so gathered farmers aware the importance of scientific approach based on technologies and analysis.

Keywords: cooperatives; economic efficiency; agricultural economics

JEL Classification: D02

1. Introduction

Romania "Agricultural Cooperatives Law" defines agricultural cooperatives as "an autonomous association representing individuals and / or legal, as appropriate, legal entity of private law, constituted on based freely expressed consent of the parties, in order to promote the interests of cooperative members in accordance with cooperative principles, which are organized and operate under this law "(Law 566/2004). Advantages associations of farmers in cooperatives are numerous, the most important being:

- timely delivery of raw materials needed for production at prices as low as possible;

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- reducing the number of intermediaries in the supply chain and reducing the risk of not having the disposal of products;
- opening prospective helping streamline production (agricultural consulting, analyzes agrochemicals, marketing services and so on).

Agriculture is one of the major branches of the Romanian economy. The Romanian contribution of agriculture, forestry, fisheries in gross domestic product stands around 4.5% of GDP, while for EU Member States is approximately 1.7% (MARD, 2015). The paper presents a BRAICOOP Agricultural Cooperative case study, the economic analysis and the possibilities for further development.

2. Benefits of Small Farms Association in Cooperatives

Role and importance of cooperatives are obviously increasingly in the global financial and economic crisis. In many countries, cooperatives have more effective crisis response than investor-owned firms. The resilience of cooperatives is increasingly recognized, and makers and opinion-makers are keen to understand how cooperatives can play a role in addressing the dramatic consequences of the global crisis and the reform that contributed to its generation (http://www.euricse.eu).

One-third [1]of European agricultural holdings are in Romania, with an average area of 3.6 hectares, according to recent Eurostat data, provided by the agricultural census conducted in 2013-2014 in all Member States. Thus, in 2013, in the European Union there were about 10.8 million agricultural properties, of which more than a third (33.5%) is in Romania. Applying two criteria farms are divided into 7 categories, depending on the size surfaces exploited and evolution of the number of farms in 2013 compared to 2005 (Figure 1).

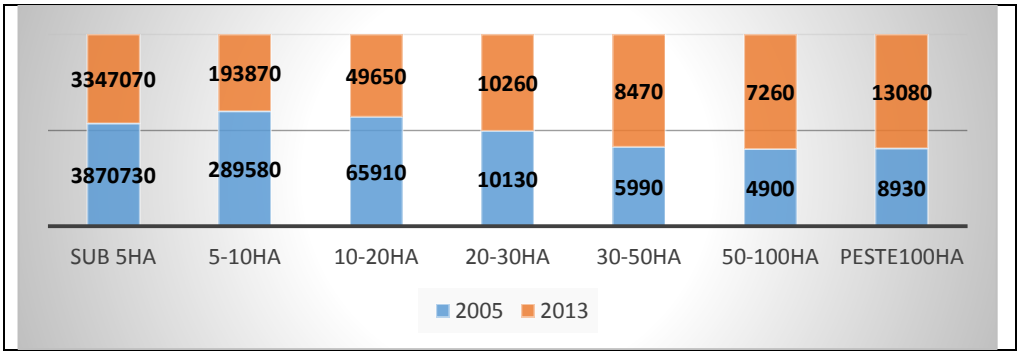

Figure 1. Evolution of the number of farms in Romania, depending on the size of cultivated land in 2013 compared to 2005

[1] 3.34 million - in 2013.

Common Agricultural Policy (CAP) imposed and developed by the European Union is integrated and powerful, consisting of two pillars of support for agriculture: Pillar I - direct payments and Pillar II - rural development. Targeted on these objectives of the CAP is outlined a long-term food security; supporting agricultural holdings so that they can provide quality agricultural products and diversified closely with consumer demand; achieving viable rural communities where farming to occupy an important role in terms of providing jobs and ensuring economic, environmental and social balanced territorial development (Glogovetan, 2014). By applying the common agricultural policy, are taken into account both smart growth, increasing intensive agricultural production by technical progress, innovation, training the workforce and protecting the environment and sustainable growth, by keeping the balance between economic growth and protection environment, which can be achieved by practicing sustainable management of natural resources, preservation rural landscapes and mitigation of climate change and increase vitality of rural areas, developing local markets, shortening the chain commercial outlets for agricultural products, restructuring the agricultural sector and maintaining farmers' incomes according the sub-measure 9.1. of the RDP.

Why farmers should be organized as cooperatives ?

- Production members can be planned according to the contract with customers;
- Group of producers can invest more easily in modern technology;
- Armed with the necessary facilities for grading, packing and storage of products, cooperative members benefit from them, without own investment, leading to increased profits;
- Cooperatives can apply for funds for revamp and research, to restart the issues facing members;
- Farmers can get financial aid and preferential loans, with the EU legislation;
- Easier procurement of pesticides and seed material at more favorable, negotiated prices for higher amounts tendered possibility.

3. *BRAICOOP* Agricultural Cooperative – Case Study

3.1. Short description of BRAICOOP Agricultural Cooperative

BRAICOOP Agricultural Cooperative was founded in 2009 as an independent association with the aim of integrating economic activity carried out by members. Agricultural Cooperative is under Law 566/2004 enforce, as amended by Law 134/2006 and Law 32/2007. BRAICOOP is a cooperative at European level, active in the production and marketing of cereals.

Joining the BRAICOOP is voluntary. BRAICOOP members retain ownership and choose their leader from among themselves. Decisions regarding association issues are taken democratically. Internal regulations not imposed from outside, but at BRAICOOP are determined by vote of the members in the General Assembly. The Association provides better exploitation of resources, land, better procurement of inputs to its members, and better use of agricultural products - all these services are consistent with the objectives of the association and all are oriented in the interest of its members. Since 2014 the BRAICOOP started agrochemical laboratory analysis of soil, plant, fertilizer and water, and all members can benefit from.

In 2015, BRAICOOP Agricultural Cooperative purchased a basic building, mechanical workshop, warehouse and land at Baldovineşti, Braila County.

It is intended to store agricultural products and fertilizers, to establish laboratory for quality seeds, silo dryer and here BRAICOOP will implement the new great project. Current BRAICOOP Agricultural Cooperative activity is to provide marketing services, productions and the acquisition of pesticides necessary for members by organizing auctions. It also provides expert advice in agriculture and agrochemical informative mappings carried both members and third parties by own chemical and phytopathology analysis laboratory.

The time evolution of the company has been one upward both by increasing from year to year the number of cooperative members, the services provided for them, and by setting up the laboratory and purchasing base in Baldovineşti in to make major investments, conditioning and storage of agricultural products, but also for further research and development, and land holding which may be set up experimental plots. So, graphs bellow summarizes the results of production and financial developments for the main crops in the BRAICOOP.

In 2015, total agricultural output amounted to 32.955 million tons. Corn occupy - 30% in the structure of culture, wheat - 28% sunflower - 18%, barley - 16% Soybean - 6%, the rest consists of rape, pea, sorghum and triticale.

Evolution of corn production was rising, but the chart shows that the differences between the production and the quantity of production increased in recent years, which mean that the price of corn was decreasingly compared to 2012 year (Figure 2).

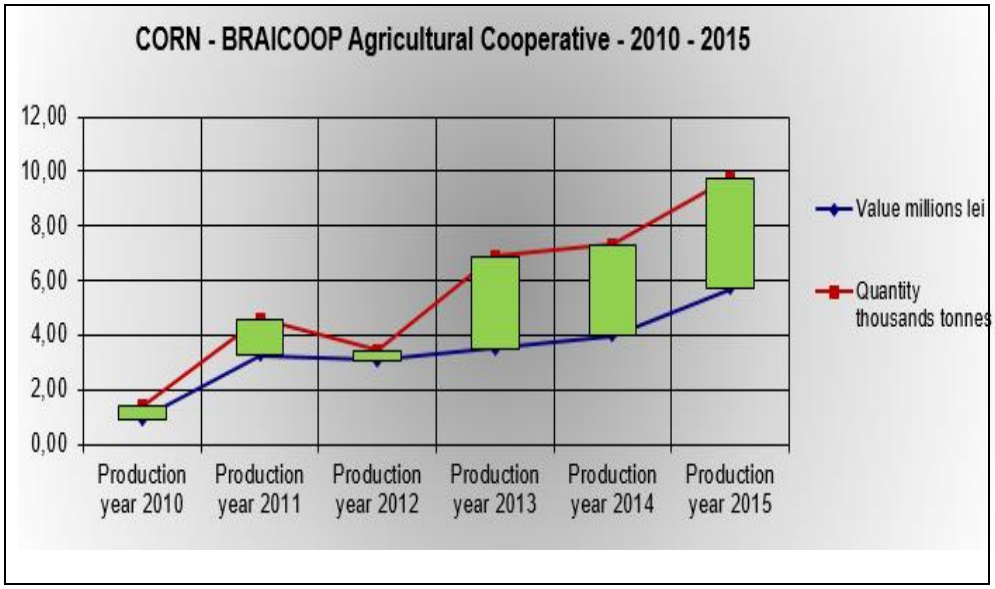

Figure 2. Evolution of value and quantity production for corn, in BRAICOOP

Evolution of wheat production was also increasing, and the differences between the volume sold and the price received from the sale was still increasing, the price is still lower, corroborated with rising productions (Figure 3).Thus, from 2010 to 2012, the price of wheat has been increasing at the national level from 0.59 lei/kg to 0.91 lei/kg, then the trend has been downward, to 0.73 lei/kg.

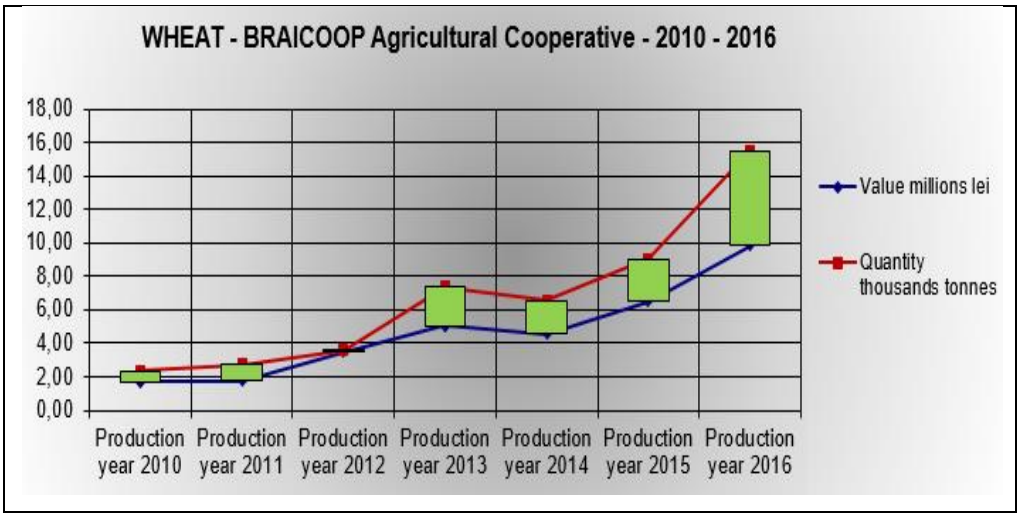

Figure 3. Evolution of value and quantity production for wheat in *BRAICOOP*

However, BRAICOOP Agricultural Cooperative managed to get a price level increased compared to the national average of 0.72 lei/kg in 2010, to 0.97 lei/kg in 2012 and in 2016 obtained a price of 0.71 lei/kg.

Evolution of production and the amount collected by BRAICOOP Agricultural Cooperative for sunflower crop in the period 2010 - 2015, is outlined that 2014 was unfavorable in terms of climate for sunflower (Figure 4).

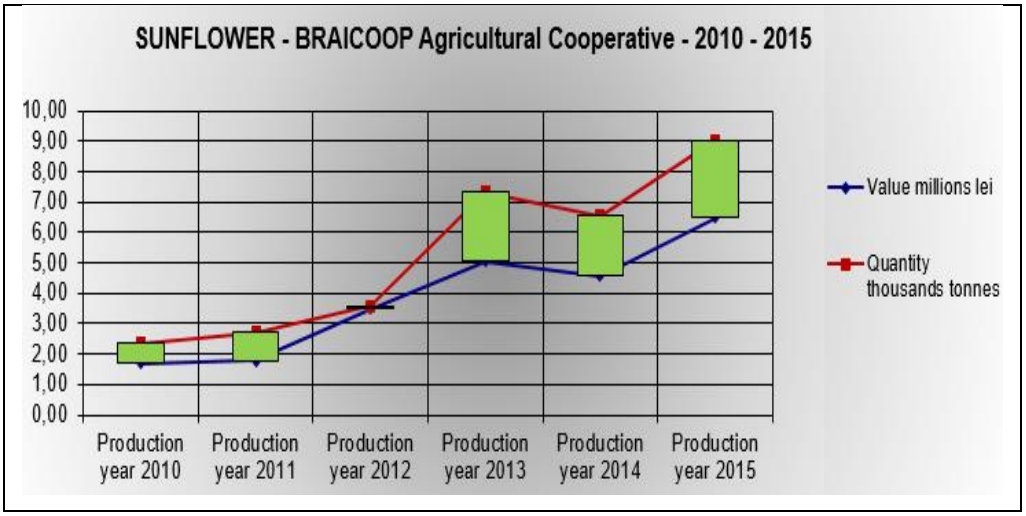

Figure 4. Evolution of production for sunflower in BRAICOOP

Barley production was growing at BRAICOOP, although the price has declined over the past 3 years (Figure 5), from 0, 86 lei/kg in 2013 to 0, 58 lei/kg in 2016.

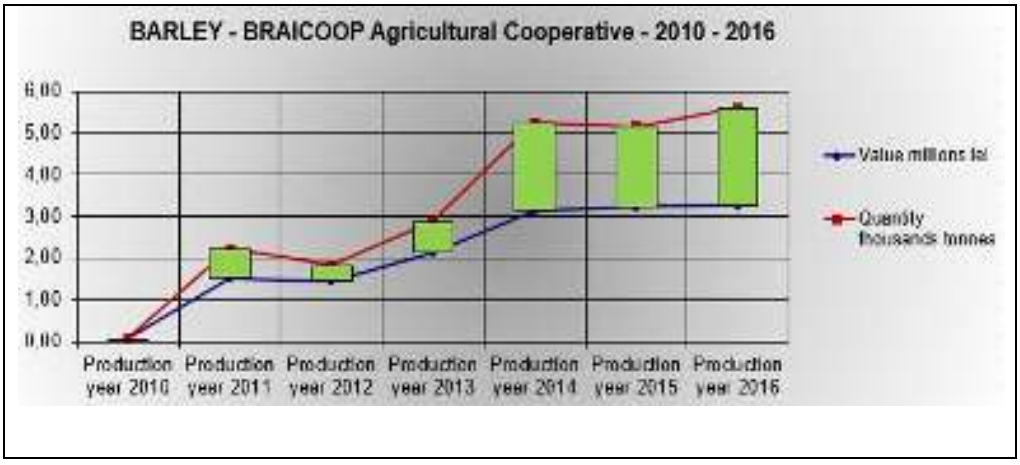

Figure 5. Evolution of production for barley in BRAICOOP

The same upward curve was recorded for soybean production in BRAICOOP Agricultural Cooperative, also (Figure 6).

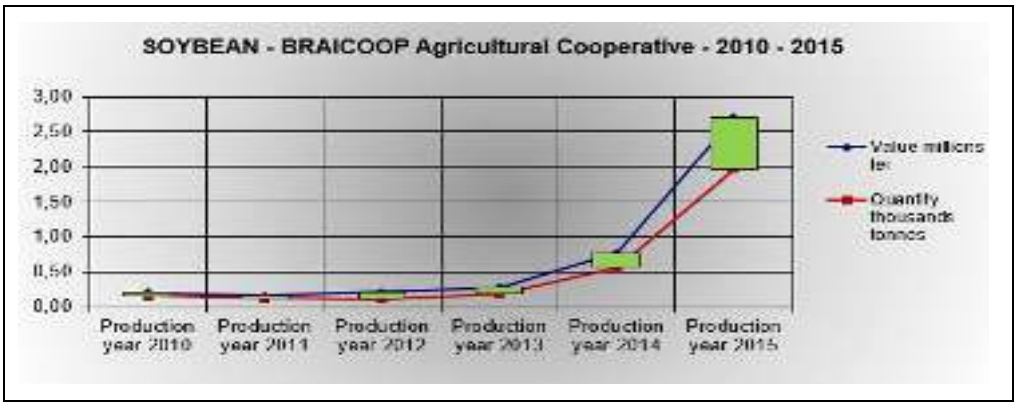

Figure 6. Evolution of production for soybean in BRAICOOP

3.2. Economic Analysis of BRAICOOP Agricultural Cooperative

Studies indicate that less than 50 years will require more food than currently at a rate of 70%. It is very clear that the system will have improved food manufacturers starting with producers and ending with consumers.

These imperatives must not remain an expression of willpower or just statistics, but realistic solutions must be found at:

- climate change;
- water scarcity;
- consumer preferences;
- materials production and market volatility;
- Poverty rural population.

The private sector is trying to find solutions to these issues manage risks and cope with situations above. These issues require innovative ways or remodeled older solutions, but focused on a strategic approach.

In the case study, that we present, we have taken into account the financial and accounting data on a period of four years to substantiate the idea of cooperatives in the efficient use both of material and human resources and assets.

Table 1. BRAICOOP, Excerpt of balance, 2012-2015

	FIXED ASSETS	CURRENT ASSETS	CASH-FLOW	LIABILITIES > 1 Y	JOINT STOCK	OWN CAPITAL
2012	7521	518196	185743	79645	133000	444072
2013	4719	951200	929590	53840	121900	915279
2014	77007	1768529	451224	41261	129600	1323031
2015	1384550	831460	203737	30162	149100	1929093

It is noteworthy, both in below Figure 7 and above Table 1 that BRAICOOP cooperatives has led an increase in own capital and fixed assets, that leading to the idea that small entities coagulated into cooperatives are best capitalized and become competitive on the market.

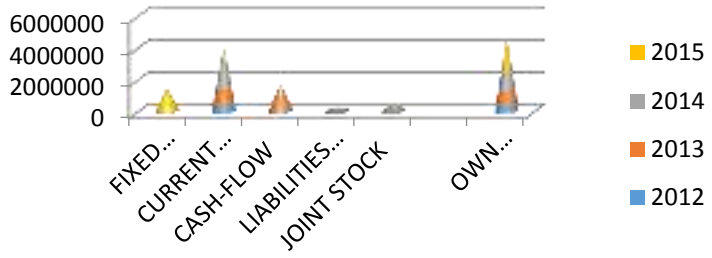

Figure 7. Small entities coagulated into cooperatives are best capitalized

As we can see, Figure 8, the trend has been growing both net profit and expenses.

Spending has doubled since 2015 compared to 2012 was made a major investment in fixed assets over which all members agreed BRAICOOP.

It is a fact that such an investment would not have been possible if members of the cooperative evolved as individual on the market.

Investing ensure a normal flow on the value chain and empowers each member individually, making it more competitive.

Table 2. BRAICOOP results, 2012-2015

	NET PROFIT	GROSS PROFIT	REPORTED THROUGHPUT	TURNOVER	INCOME	EXPENSES
2012	187125	221549	116510	14639728	14641084	14419535
2013	482407	573303	303635	20886997	20888060	20314757
2014	400052	474571	786042	20116430	20120738	19646167
2015	499449	593127	1198957	30719899	30721051	30127924

ROA measures the performance of the company's net asset after calculating the tax- analyzes multiannual.

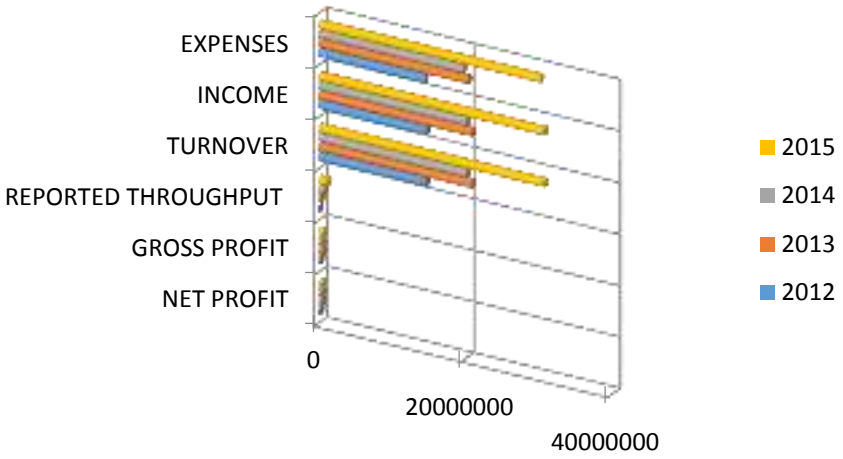

Figure 8. Evolution of income and expenditure trends to BRAICOOP

$$ROA = (NP/ OC) \times 100$$

It is indicated that a multi-annual analysis to find uptrend. This is not happened in 2014, 2015 because the new acquisition, but will be in the next years.
The yield for obtaining operating revenue expenditure, for the period under review 2012-2015, is the highest level in financial year 2013 and lowest in 2015 (Table 4).

Table 3. ROA BRAICOOP

	ROA
2012	41.94951
2013	52.59109
2014	26.38171
2015	25.49178

Table 4. rRe, BRAICOOP

	rRe
2012	0.015270603
2013	0.028168685
2014	0.024010641
2015	0.019728864

"Leverage Ratio on short, medium and long term with a value greater than one means high leverage ratios. A value exceeding 2.33 express a very high degree of indebtedness, the company being able to be even in the state of imminent bankruptcy, if the result exceeds several times the 2.33 threshold.

If BRAICOOP "leverage ratio" is less in 2012- 2015 (Table 5) express that the total indebtedness of the company in relation to equity is one under, loans made no constitute a threat.

Table 5. Ra, BRAICOOP

	Ra
2012	0.179352
2013	0.058824
2014	0.031187
2015	0.015635

Analyzing (Table 6) in which is expressed BRAICOOP efficient use of assets, namely their contribution to getting results, according to the formula:

$$Ra = \frac{Pb}{At} \cdot 100 = \frac{Pe + Pf + Pex}{Ai + Ac} \cdot 100.$$

it results that in 2013 was implemented the most effective use of the BRAICOOP assets and 2015 the least efficient.

The explanation derives from the fact that the years 2014 and 2015 were years with major investments were made in infrastructure, as follows:

- In 2014 was established Laboratory for agrochemical mapping, which is tooled with the latest generation of equipment;

- In 2015 was acquired based on Baldovinesti, which will be processed and stored agricultural products harvested by cooperative members.

Table 6. Ra BRAICOOP

Year	Ra
2012	0.496666
2013	0.625004
2014	0.312959
2015	0.302731

Economic rate of rentability of assets can be expressed as a ratio between the total result for the year or total gross profit (Pr) and total assets (At), consisting of assets (Ai) and current assets (Ac) values as year-end trial balance:

$$Ra = \frac{Pr}{At} \cdot 100 = \frac{\sum qp - \sum qc}{AI + AC} \cdot 100$$

$$Ra = \frac{\sum qp}{At}\left(1 - \frac{\sum qc}{\sum qp}\right) \cdot 100 = E_{At}\left(1 - C_{/1\,leu\,CA}\right)$$

The analysis model proposed above indicates that the economic rate of return of the asset is influenced by two direct factors: total assets and cost effective for 1 leu turnover, whose influences maybe determined by the method *chain substitutions*.

To increase the rate, BRAICOOP can act to increase efficiency using total assets and reduce costs to 1 leu turnover.

4. Conclusion

• Agricultural Cooperative is a European model and optimal functional and entering such an associative structure increases the profitability of any farmer.

• By calculating the difference in cost per hectare of wheat, between farmer cooperatives and other non-integrated in the form of associative value are smaller by at least 50 euro, only the tax exemption. Adding the price differences in inputs negotiated if the cooperative and much higher sale prices of products, leading to a much higher gain in the end.

• In addition to much lower production costs, where cooperative members, plus advisory services provided by agrochemical analysis laboratory, with which members can practice a scientific and sustainable agriculture.

• Another advantage of integration of farmers in cooperatives is the possibility of accessing European funds by the cooperative, through which they can diversify and develop infrastructure more easily and efficiently than a simple farm.

• Creating partnerships beneficial to members (partnerships with educational institutes for the transfer of innovation), and creating of permanent and seasonal jobs.

5. References

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Factors Influencing Pricing Decision: Evidence from Non-Financial Firms in Nigeria

Luqman Olawale[1], Okewale Joel[2]

Abstract: This study examines the significant factors influencing pricing decision in Nigeria. The study is based on the appraisal of the factors that influence pricing decision using 100 non-financial companies listed on the Nigeria Stock Exchange (NSE) in 2013. The cross sectional data was obtained from annual reports of the sampled firms which were analyzed based on OrdinaryRegression model. The results revealed that cost of sales has an insignificant positive effect on pricing policy, while company's objective and consumer perception has significant positive relationship on pricing policy. On the external determinants, market demand and availability of close substitute has a significant negative effect on pricing policy while macroeconomic trend and market segment has insignificant negative effect on pricing policy. This study therefore suggests among others that, effort should be made on reducing cost of production in order to maximize profit.

Keywords: Cost of Sales; Company's Objective; Market Demand; Macroeconomic Trend; Consumer Perception

JEL Classification: G32; M21

1 Introduction

Every business organization today is faced with challenges of maximizing shareholders returns and to also remain competitive in the ever changing market. The profit maximization motive and the task to remain in the market pose a burden of duties on managers. One of this huge function is pricing decision. The ultimate goal of any pricing decision is the achievement of the organization set objectives. The objectives of organizations may varies depending on the nature of the business. However, for every profit oriented business, their major goal is profit maximization which can highly be influence by pricing policies.

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Profit maximization can be achieve through different means, firms may focus on cost reduction, increase in market share, entering of new market, setting of high price, etc for their profit maximization objective. In the strategic management school of thought, the business level strategy of any organization can be cost leadership or product differentiation targeted at achieving organization set objectives. The cost leadership strategy can be achieve through minimization of cost than the competitors while on the other hand, product differentiation strategy is targeted at producing high quality product. In the economic theory, it has been argued that irrespective of the type of business level strategy adopted by an organization, the consumers cost leadership product differ from the consumer of product differentiation product.

Pricing as one of the 4 p's in marketing mix is the process of attaching a monetary value to a product or service. Price can also be describe as the consideration given and received by the customer and seller respectively in the exchange of goods and services. Thus, pricing policy is a crucial decision for any business organization. Business organisation survival and profitability depends on its pricing decisions, thus price is the only element in the marketing mix that produces revenue and thus ensures profitability (Kotler and Keller, 2006). Effective pricing decision is tool for achievement of organization set objectives and may be a sufficient conditions to meet the long term organizational goals. Pricing policy, if properly planned and evaluated can be a competitive weapon in the ever-dynamic market. However, it is evident that management has a big responsibility before them in setting and adopting the most advantageous pricing policy.

Hilton, (2005), observed that both the market forces of demand and supply and the cost of production have a significant effect on determining prices. Equally explained that there are other variables that influence pricing decisions which includes; manufacturer pricing objectives, economic situations, level of competition, and availability of close substitute. Thus, price management is a crucial element in marketing mix and competitive strategy and a key determinant of organization performance. Similarly, price is the measure by which consumer (industrial and household) judge the value of an offering, and it strongly impacts brand selection among competing alternatives (Shipley and Jobber, 2001). A rational consumer compare prices before taking buying decision. However, it is pertinent to note that, the price of any commodity should be able to justify it value.

There are varying opinions in literatures as regards pricing decisions, the issue of different companies with the same product of the same quality in the same market offering different prices is still an unresolved issue as there are different argument on the determinants of pricing policy. Although, there are similar factors in literature as regards the determinant of pricing decision. Many organization failure is as a result of inability to offer and take effective pricing decisions. The fact that

pricing decisions is a strategic decisions, many organizations still stumbling around in identifying appropriate factors that influence price.

To the best of our knowledge, most studies on pricing policy are carried out in developed economy, (Cabrales and Martin, 2007; Balaji and Ragavhan, 2007; Ros 2010; Volpe, 2011) while few studies has been carried out in emerging economy (Avlonitis and Indounas, 2005; Popa and Ciobanu, 2014). However, in Nigeria, few studies on pricing policy exist (Obigbemi, 2010) while, to the best of our knowledge all of this studies in Nigeria lack quantitative empirical result. Thus, this call for more research in this area to provide empirical results to fill the knowledge gap.

This present study tends to examine the determinants of pricing policy in Nigeria non-financial sector using 100 listed non-financial firm on Nigerian Stock Exchange in 2013.

2. Theoretical Framework

Sije and Oloko (2013) citing Donald (1985) posited that, when the relative price of something goes up the quantity demanded of that thing will go down. It does not mean that the cheaper goods will be demanded nor does it say that changes in commodity prices change what is demanded (Donald, 1985). The income and prices that consumers face limit their choices, but within these limits the exact amounts of goods (or bads) they choose are a matter of taste (Donald, 1985). A consumer's taste for two goods such as a guitar lesson and beer can be described as a hill of utility (Donald, 1985). It is not always true that subsidies to a price or gifts of goods increase the amount consumed (Donald, 1985).

The way in which a consumer facing the usual offer reacts to a fall in price splits naturally into two parts. On the transport axis, the substitution effect is the move from a relatively lower price to a higher price, the substitution effect is the move from the start to the free point, the income effect being the move from the free point to finish (Donald, 1985 cited in Sije and Oloko, 2013). The real point is that the increase in transport for example bought after a fall in price depends on two features of consumer's indifference map (Donald, 1985). It depends, first on how sensitive he is at a given real income to changes in price, the substitution effect that is how great the curvature of an indifference curve (Donald, 1985) is. Secondly, depends on how sensitive he is at a given price to changes in real income, the income effect that is how much more transport he buys as he moves up to the higher indifference curve (Donald, 1985).

2.1 Determinants of Pricing Decision

The essential factors that influence pricing decision can be categories into two main heading; the internal factors and the external factors. The internal factors includes; cost of production, channels of distribution and the company objective while the external factors includes; market demand, market competition, macroeconomics trends, market segment and consumer perceptions. These factors are consider below;

Internal factors

The internal factors are factors that can be control, determine and process by the organization. This factors are mostly in relation with the organisation business level strategy and greatly influenced by the nature of busniess. The internal factors are;

a. **Cost of Production:** In any pricing decision, the cost of production is major factor that determine the price. This is the cost incurred by the organisation in the production of goods or service. The cost include the fixed cost and variable cost, the cost is mostly refer to as total cost. The cost of production is largely influence by the supplier cost, macroeconomic trends and the nature of business. In an economy with high inflation rate, the cost of production will rise except where the organisation is monopoly of its supply.

b. **Channels of Distribution:** The cost of distribution and the channel of distribution is also a good determinant of pricing policy. It must be considered if the product will be supplied directly to the final consumer or has to pass through the various channels of distribution. For a product that has to pass through the wholesaler, to the retailer and then to the final consumer, the profit of these middle men must be considered, so that the final price set by the retailer will not affect demand negatively. For some product, producer may need to set standard cost to control for any form of hyper price setting by the wholeseller or the retailer.

c. **Company's Objectives:** The company's objective is also another determinant of pricing decision. Some organisation set a cost plus pricing. In such case, a percentage is added to the cost of production in order to arrive at the price. The arguement here is that, the company's objective is profit maximization and therefore a pricing decision must be one that will consider the profit maximization objective. When pricing decisions are made, they must be in line with the overall company objectives, as this is what will inform what the pricing objective really is, so that the pricing decisions made will not be against the company's objective.

External factors

The external factors are those factors that are not within reach of the organisation. They are external because there are many parties that determine and control these factors. The business organization is a party to the external factor and cannot

control or determine the aggregate indicators of these factor. The external factors includes;

a. **Demand:** For a new product, there is need to price such product strategically in such a way that it penetrates the market, even if it will be at par with the total cost, while for a highly demanded product, an increase in price may not really have a high effect on the demand for such products, so is the need for management when making pricing decisions to consider the demand for the product. Some companies who receive order from customers may decide to reduce their price per unit or increase their discount, when it is noted that demand from a customer is high, and this may be on the other way round, depending on other factors considered by the management.

b. **Nature of market competition:** The nature of market competition must also be considered when pricing decision is made. For a business that is in a monopolistic market, competition may not really affect the pricing decision, but a business in the oligopolistic market or a free market, where competition is tense, this has to be considered before price is set. In a situation where the market leader dictates the price and others follow, the price of the market leader must also be considered and in a situation where the price of substitute goods will affect the price of the product, this is very important.

c. **Macroeconomic trends:** The macroeconomic trends of the country must also be put into consideration when pricing decisions are made. In an unstable economy, where cost of living increases, without a change in the income of the people, an increase in the price of a product may affect demand for that product, so also when there is an increase in the income of the people, increase in the price of a product may not necessarily affect the demand for that product at that point in time.

d. **Market segment:** When a producer knows his customers, he will be able to set his prices accurately. The market segment must be carefully identified and the amount they will be willing to pay for the product identified. For the producers of cars, there are different models for different set of people, thus producing varieties for different set of people. There are some products which are mainly for the elites, while some are for the masses.

e. **Consumer behavior and perception:** Consumers attitude and perception about the product must be considered, when making pricing decisions. The company should consider if an increase in price will lead to an increase or a decrease in demand, and vice versa.

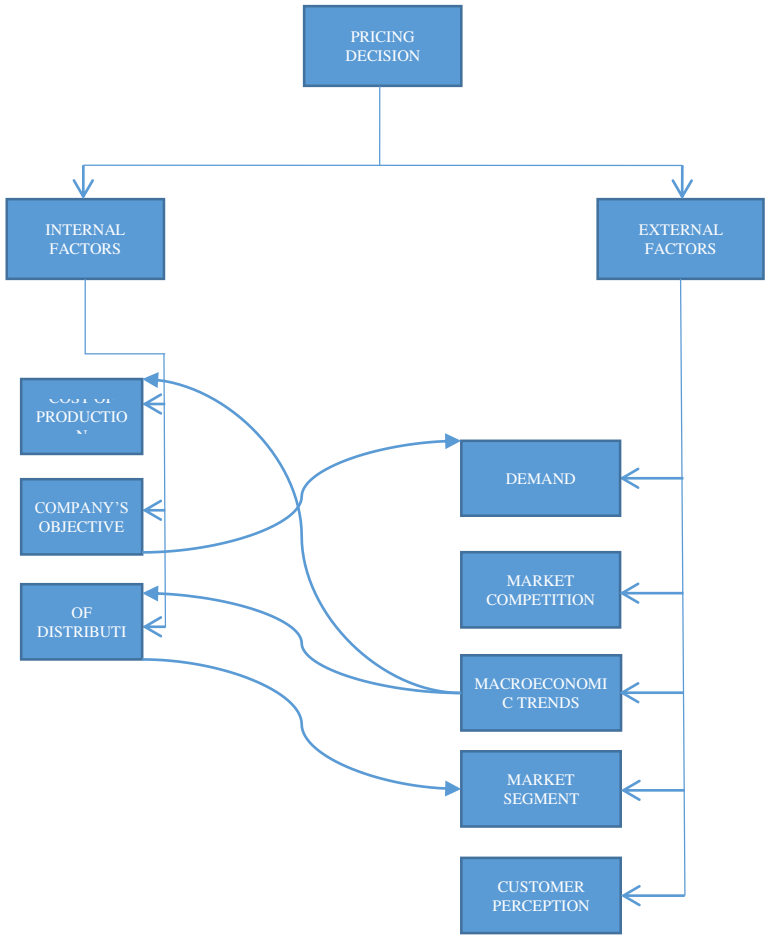

Figure 1. Authors Compilation; Conceptual model on determinants of pricing policy

2.2 Empirical Literature Review

Huang, Hahn and Jones (2004) examine the Determinants of Price Elasticities for Store Brands and National Brands of Cheese using six stores within the period of 2000-2002. The results show that several factors affect price sensitivities and also that shoppers in lower-income stores are more price sensitive than those in higher-income stores. They also suggest that higher market shares have not reduced the price elasticity for store brands.

Kajisa and Akiyama (2004) examine rice pricing policies in Thailand, Indonesia, and the Philippines from 1960-1990. The findings of the study confirms that price stabilization has been a major policy achievement, it also reveals that stabilization

was not necessarily enjoyed or experienced during the study period. The study reveals that political factors such as entry into the GATT, increase in per capita GDP and achievement of rice self-sufficiency are the major determinants of rice pricing policy, but the ways in which these determinant have impacted policy differs among these countries.

Katta and Sethuraman (2005) studied the problem of designing a profit maximizing pricing-scheduling policy for a capacity-constrained firm with a heterogeneous customer base by considering the problem of pricing policy developed for customers arriving at a service facility, with the objective of profit maximizing, when the value of service and time-sensitivity of a customer are private information. The main conclusion they arrive at is that under certain conditions it might be beneficial to pool customers of different characteristics together and treat them equally; this happens because customers themselves select their service class.

Avlonitis and Indounas (2005) explored the pricing that service companies pursue along with the different pricing methods adopted by 170 companies in 6 different sectors in Greece. The data were collected with interview and analysed strictly using qualitative technique. The study reveal that the pricing method adopted by vast majority of the sampled firmd are cost-plus and the pricing is base on market average price and the study also reveals that pricing objectives and pricing method are highly related.

Balaji and Ragavhan (2007) examined the influence of psychological pricing on price rigidity of the retail sector in USA from 1989-1997. The company make use of 10 brand which were analysed using ANOVA. The findings shows a significant difference in the pricing strategies that various brands adopt. The study was concluded that brand drives pricing strategy and that differential pricing strategies is not followed by the stores at the individual level. This observation indicates that pricing strategy is not driven by the store level demand and is determined at a more aggregate level.

Cabrales and Martin (2007) examined price determination in pharmaceutical markets using data from countries and six years period from 1998-2003.The study revealed that market power and the quality of the product has a significantly positive impact on prices. The study shows that the U.S. companies prices are not significantly higher than those of countries with similar income levels.

Ros (2010) examined the main determinants of pricing in the Mexican domestic airline sector using 10 airlines. The data were analysed using ordinary least square (OLS) was used for analysis. The results of the study reveals that the existence of at least one low-cost carrier on a route is associated with prices that are approximately 30 percent lower.

Moura and Junior (2010) studies the frequency of price changes from a survey data on 281 Brazilian companies 2007 and the analysis was carried out using OLS regression. The study revealed that wage duration, the degree of competition, product specialization, the elasticity of demand and economic sector dummies mostly explained price change duration. The empirical results do not refute time dependent models since those are consistent with different price durations across firms; however they refute somewhat commonly used macroeconomic modeling for monetary policy evaluation.

Obigbemi (2010) investigate the impact of change in price on the sales turnover of selected SMEs in Ogun and Lagos State, Nigeria. A qualitative technique was adopted with 200 respondents. The data were analysed using student t-test. The study revealed that there is a relationship between change in cost of sales and turnover and further suggest that frequent and adequate monitoring of SMEs and that the service of price expert should be employed when making pricing decisions by SMEs.

Breitenfellner, Cuaresma and Keppel (2010) examined some thirty potential determinants of crude oil prices for a 26 years period which ranges from 1983-2008. The findings of the study suggest that the significance of individual factors varies over time. i.e. no single factor dominates or remain unchanged during the entire period under review.

Volpe (2011) Evaluating the Performance of U.S. supermarkets by considering pricing strategies, competition from hypermarkets, and private labels. The ordinary least square regression was used in the study to analyse the data. The findings of the study is that performance was significantly improved for stores operating near competitors with similar pricing strategies.

Srinivasan (2012) examined the fundamental determinants of share price in India. The study makes use of panel data consisting of annual time series data over the period 2006-2011 and cross-section data which takes into consideration 6 major sectors of the Indian economy which includes the manufacturing, energy, IT, industrial, pharmaceutical and commercial banking sector making use of the fixed effects model as well as the random effects model to explore the fundamental determinants of share price of different industry groups in India. The findings show that earning per share and price-earnings ratio has been the major determinants of share prices of the above mentioned industries. The findings also indicate that size is a significant factor in determining the share prices of all sectors under consideration except manufacturing.

Stevens (2012) presents the dynamic price-setting problem of a firm that cannot observe market conditions for free. The finding of the study is that, firm optimally selects only infrequently accept policy reviews, and that between the reviews, the firms implements a simple pricing policy that consists of a small set of prices.

Yazdani, Khorsand, Mahdizade and Sharami (2013) assess pricing strategies and goals in industrial marketing by define pricing, also the price setting procedure in industrial marketing is expressed, identifying barriers and factors influencing pricing and pricing strategy. The study classified the factors affecting price into internal and external factors and also highlight four adjusting prices policies as follows; geographical pricing, price discounts and cost deductions, advance pricing and discriminatory pricing.

Sarumathi (2013) focuses on economic concepts in pricing, the factors determining the E- pricing policies and strategies where the only element in the marketing mix that produces revenue is price, and that is the aggregate of all the values that customers exchange for the utility that they enjoy from using the product or service. The managerial tasks involved in pricing product include establishing the pricing objectives, identifying the price governing factors, ascertaining their relevance and importance, determining product value in monetary terms and formulating price policies and strategies and also that the demand and competitive ability of firms are affected by price of the product. The study revealed the factors determining the price of company product and categorizes them into internal factors (the desirable market positioning of the firm, the characteristics of the product, cost of sales, marketing cost and turn around rate of the product etc) and external factors (Bargaining power of the customers, bargaining power of the major suppliers, competitors' pricing policy, government controls, social considerations etc). Popa and Ciobanu (2014) identify the financial factors that impact on the functionality and profitability of SMEs (Small and Medium-sized Enterprises) in Romania using a sample of 35 SMEs from 2009-2012. The ordinary least square was used in analyzing the data and the results shows that managerial decisions on investment can effect decisively the profitability of Small and Median Enterprises especially in a period of economic instability.

3. Research Methodology

This study examines the determinants of pricing policy in Nigeria using 100 non-financial companies listed on the Nigeria Stock Exchange (NSE) in 2013. Therefore, the research is designed to use the quantitative research method and collecting the secondary data from financial statements of the selected firms. The cross sectional data were analyzed based on regression model. The data involved are the ratio of profit after tax to revenue as a proxy for pricing decision which serve as the dependent variable, while cost of sales and company's objectives are proxies for internal determinant and the control variables are demand, macroeconomic trends, market competition, market segment and consumer perception.

3.1 Population and Sample Size

The study population consist of all non-financial firms listed on Nigeria Stock Exchange in 2013. The researcher exclude financial sector due to their distinguish recognition of cost and profit, and they are highly regulated. However, the researchers purposively select 100 companies cut across ten sectors on the basis of accessibility to the needed data and information.

3.2 Variables

As stated earlier, the main aim of the present study is to analyze the determinants of pricing policy in Nigeria non-financial firms. In order to achieve this purpose; pricing policy is a function of; cost of production, distribution cost, company's objective, demand, macroeconomic trends, market competition, market segment and consumer perception. As far as this study is concern, the dependent variable pricing policies is proxy on the proportion of revenue that is profit. While the explanatory variables are the internal factors and the control variables are the external factors. The internal factors are proxies on cost of sales, and profit after tax. We eliminate distribution cost in the model due to the fact that, majority of firms included in the sample operate with low or no distribution cost due to the nature of the operations. The external factors are proxies on inventory which represent demand, this is because demand directly affect the level of inventory in any organisation while other external factors are dummy variables which are more explained in the variable description table below.

Table 1. Description of variables used in the analysis

Variables	**Description**
Dependent Variable	
Pricing Decision (PD)	The ratio of net profit after tax to revenue (turnover)
Independent Variables	
Cost of production (COP)	Natural logarithm of cost of sales
Company's objectives (OBJ)	Natural logarithm of profit after tax
Control Variables	
Demand (DD)	Natural logarithm of closing inventory
Market competition (Dummy 1)	Equal to 1 when there is available of close substitute. Zero when there no substitute and ½ when there are many substitutes.
Macroeconomic trend (Dummy 2)	Equal to 1 if highly affected by inflation, exchange rate, and high interest rate. ½ if lowly affected and equal to 0 if not affected at all.
Market Segment (Dummy 3)	International market =1. Local market = ½. State or regional market = 0.
Consumer perception (Dummy 4)	Strong preference = 1. Preference = 0.5. Weak preference = 0

3.3 Model Specification

The study aimed at examining the determinants of pricing policy in Nigeria. The main independent variables of the study are cost of production, company's objective. While the control variables of the study are demand, market competition, macroeconomic trend, market segment and consumer perception. The models have been developed in consistent with conceptual model on the determinants of pricing policy.

Thus, the econometrics models for this study is as follows;

$PDi = \beta_0 it + \beta_1 COSi + \beta_2 OBJ_i + ei$

$PDi = \beta_0 it + \beta_1 COSi + \beta_2 OBJ_i + \beta_3 INV_i + \beta_4 Dummy1_i + \beta_5 Dum2_i + \beta_6 Dum3_i + \beta_7 Dum4_i + ei$

Where i, is the firm included in the study and $\beta_0 - \beta_7$, are regression parameters, e is the error term.

4. Data Analysis

Table 2. Descriptive Statistics

	Mean	Median	Minimum	Maximum	Standard deviation	Observations
PD	0.05	0.04	-1.92	5.96	0.69	100
COS	6.51	6.49	2.61	8.81	1.02	100
PAT	2.93	5.20	-8.15	8.32	4.89	100
INV	5.72	5.80	2.50	7.61	1.08	100
DUM1	0.60	0.50	0.00	1.00	0.37	100
DUM2	0.53	0.50	0.00	1.00	0.34	100
DUM3	0.60	0.50	0.00	1.00	0.58	100
DUM4	0.46	0.50	0.00	1.00	0.6	100

Source: Authors Computations

The above table shows the descriptive statistics of the variables used in this study. In table 1 above, Pricing decision (PD) has a mean value of 0.05 and a median of 0.04 with a minimum value of -1.92 and a maximum value of 5.96, while the standard deviation show a value of 0.69. The negative minimum value is due from a firm which make loss in the period under the sample. Cost of sales (COS) has a mean value of 6.51 and median of 6.49 with a minimum value of 2.61 and maximum value of 8.81 while the standard deviation is 1.02. Company's objective (PAT) has a mean value of 2.93 and median of 5.20 with a minimum value of -8.15 and a maximum value of 8.32 while the standard deviation is 4.89, the negative minimum value is due from a firm which make loss in the period under the sample. Demand (INV) has a mean value of 5.72 and a median of 5.80 with a minimum

value of 2.50 and maximum value of 7.61 while the standard deviation is 1.08. Availability of close substitute (DUM1) has a mean value of 0.60 and standard deviation of 0.37, macroeconomic trends (DUM2) has a mean value of 0.53 and a standard deviation of 0.34, market segment (DUM3) has a mean value of 0.60 and a standard deviation of 0.58 while consumer perception (DUM4) has a mean value of 0.46 and a standard deviation of 0.36.

Table 3. Correlation

	PD	**COS**	**PAT**	**INV**	**DUM1**	**DUM2**	**DUM3**	**DUM4**
PD	1.00	0.07	0.39	0.01	-0.13	-0.10	-0.04	0.09
COS		1.00	0.38	0.81	-0.02	0.13	-0.09	0.01
PAT			1.00	0.39	0.13	0.00	-0.05	0.00
INV				1.00	0.03	0.00	-0.05	0.10
DUM1					1.00	0.31	0.02	0.26
DUM2						1.00	0.09	0.22
DUM3							1.00	0.10
DUM4								1.00

Source: Authors Computations

Table 2 above shows the correlation matrix among the variable. It was observed that the two explanatory variables has a positive correlation with each other and with the dependent variable. Demand (INV) also has positive correlation with all the variables except market segment (DUM3) which shows a negative correlation. There is problem of multicolinearity between cost of sales (COS) and demand (INV) which show a high positive correlation. Availability of close substitute (DUM1) has a negative correlation with pricing decision (PD) and cost of sale (COS) and positive correlation with all other variables. Macroeconomics trend (DUM2) also has a negative correlation with pricing decision (PD) and positive correlation with all other variables. Similarly, market segment (DUM3) has a negative correlation with pricing decision (PD), cost of sales (COS), company's objectives (PAT) and demand (INV) but a positive correlation with all other variables. While consumer perception (Dum4) a positive correlation with all the variables.

Table 4. Regression Model

	Model 1	**Model 2**
C	0.32	0.58
	(0.43)	(0.45)
COS	-0.07	0.07
	(0.07)	(0.11)
PAT	0.06*	0.07*
	(0.01)	(0.01)
INV		-0.18***
		(0.10)
DUM1		-0.40**
		(0.19)
DUM2		-0.17
		(0.21)
DUM3		-0.03
		(0.10)
DUM4		0.37**
		(0.19)
R squared	0.16	0.25
Adj. R squared	0.14	0.19
S.E regression	0.64	0.62
F statistic	9.54	4.44
Prob. value	0.000	0.000
Obs	100	100

**Significant at 1%, **Significant at 5%, and ***Significant at 10%*

The figures in parentheses represent the standard error of the variables while the other shows the positive or negative coefficient and magnitude of the variables in explaining the dependent variable.

Table 3 above shows the two regression models, the result was based on OLS regression. In model 1 above, insignificant negative effect on pricing decision (PD) with a coefficient value of 0.07, while company's objective (PAT) have a significant positive relationship with pricing decision (PD) with a coefficient of 0.01, this implies that a unit change in company's objective will increase pricing decision (PD) by 6%.

In model 2 above, all the variables were regressed together. Cost of sales (COS) have an insignificant positive effect on pricing decision (PD). Company's objective (PAT), and consumer's perception (DUM4) have a significant positive relationship with pricing decision (PD) significant at 1%, and 5% respectively with a

coefficient values of 0.07, and 0.38 respectively. This implies that, a unit change in PAT and DUM4 will leads to increase in pricing decision (PD) by 7%, and 37% respectively. This is in line with the work of Avlonitis and Indounas (2005) who also posited that company's objective and consumer perceptions have positive effect on pricing decision. On the other hand, demand (INV) and availability of close substitute (DUM1) have a significant negative effect on pricing decision (PD), significant at 10% and 5% respectively with a coefficient values of 0.18 and 0.39 respectively. This means that a unit change in INV and DUM1 will decreases pricing decision (PD) by 185 and 39% respectively. This is in line with work of Balaji and Ragavhan (2007) who also establish a negative relationship with between market demand and pricing strategies, similarly, Moura and Junior (2010) reveals that degree of competition is a determinant in pricing decision. Macrocosmic trends (DUM2) and market segment (DUM3) have an insignificant negative effect on pricing decision (PD).

However, this study reveals that cost of sales has an insignificant positive effect on pricing policy, while company's objective and consumer perception has a significant positive relationship on pricing policy. On the other hand, market demand and availability of close substitute has a significant negative pricing policy while macroeconomic trend and market segment has an insignificant negative effect on pricing policy.

5. Conclusion

This study examined the determinants of pricing policy in Nigeria using 100 non-financial companies listed on the Nigeria Stock Exchange (NSE) in 2013. The cross sectional data was obtained from 2013 annual reports of the sampled firms. The data were analyzed based on regression model. The data were analyzed with the ratio of profit after tax to turnover as a proxy for pricing decision which serve as the dependent variable, while cost of sales and company's objectives are proxies for internal determinants of pricing policy and the external determinats are demand, macroeconomic trends, market competition, market segment and consumer perception. The results revealed that cost of sales has insignificant positive effect on pricing policy, while company's objective and consumer perception has significant positive relationship on pricing policy. On the other hand, market demand and availability of close substitute has significant negative pricing policy while macroeconomic trend and market segment has insignificant negative effect on pricing policy.

It can be deduced that company objective has significant positive influence on pricing decision while the level of demand has significant negative influence on pricing decision in Nigeria. As expected, availability of close substitute has negative significant influence on pricing decision while consumer perception

significantly influence pricing decision positively in Nigeria. This study therefore suggests that, hirms should make effort on reducing cost of production by focusing on cost minimization objectives in order to maximize profit. Corporate organisation should also strategize and focus on consumer perceptions about their product and the preference of the consumers should be put into consideration.

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The Influence of Relationship Proneness on Relationship Satisfaction and Relationship Commitment: Empirical Evidence from Domestic Tourists in Cape Town, South Africa

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Abstract: In South Africa, small tourism enterprises lie at the heart of the industry and form a major part of the tourism sector. There are the cornerstones of tourism development in local economies. This study assessed the influence of relationship proneness on relationship satisfaction and relationship commitment among domestic tourism clients within the Cape Town Metropolitan Area of South Africa. In spite of the increasing research on small tourism enterprises, they seem to be a paucity of studies that have investigated the influence of relationship proneness on relationship satisfaction and relationship commitment. The study utilised a quantitative research design using a structured questionnaire. The design was suitable to solicit the required information relating to relationship proneness, relationship satisfaction and relationship commitment. The findings indicate that relationship proneness has a positive influence on relationship satisfaction, relationship proneness has a positive influence on relationship commitment and relationship satisfaction exerts a positive influence on relationship commitment. All the posited three hypotheses were supported. The empirical study provided fruitful implications to academicians by making a significant contribution to the relationship marketing literature by systematically exploring the influence of relationship proneness on relationship satisfaction and relationship commitment. This study therefore, stand to immensely contribute new knowledge to the existing body of relationship marketing literature in Africa – a context that is often most neglected by some researchers in developing countries.

Keywords: Relationship Proneness; relationship commitment; relationship satisfaction; small tourism enterprises

JEL Classification: O55; R11

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1. Introduction

In today's post-modern era the ability to build a competitive network through relationships can be seen as one of the company's core competencies. According to Johann (2014, p. 98) a company which develops a better marketing network and builds mutually profitable relationships gains competitive advantage in the market. Marketing scholars have suggested that firms should leverage firm–customer relationships to gain privileged information about customers' needs and thereby serve them better than competitors (Ndubisi, Malhotra & Wah, 2009). Verhoef (2003) reported that a relationship is important for firms since establishing and maintaining relationships with customers will foster customer retention, customer share development and increased profit. According to Mostert and De Meyer (2010, p. 28) relationships hold benefits for the organisation and its customers and organisations should increasingly focus on building relationships with customers in an effort to better their results by identifying, satisfying, and retaining their most profitable customers. Lombard (2009, p. 410) stipulate that in any form of relationship between customer and service provider the attitude of the customer towards such a relationship is likely to be of importance, thus the stronger the customer perceives the importance of relationships in general, the more likely the customer is to develop a stronger relationship with the service provider. Therefore, the purpose of the current study is to investigate the influence of relationship proneness on relationship satisfaction and relationship commitment.

2. Cape Town

Kayster (2014) points out that Cape Town is a popular global and local tourist destination because of its natural beauty, cultural and historical characteristics. The British newspaper, The Guardian, and the United States of America publication, The New York Times, rated the city the top holiday destination for 2014 (Sapa, 2014). In addition, Cape Town is South Africa's second most visted city after Johannesburg with an estimated 389 012 visitor arrivals at the Cape Town International Airport in July 2015 (Airports Company of South Africa, 2015). The major motivators for travel to Cape Town have been identified as nature culture and heritage purposes (City of Cape Town 2013). Moreover, Ezeuduji, November and Hautpt (2016) points out that Cape Town is emerging as a leading business and events destination in South Africa.

3. Research Problem

According to Rogerson, (2015) net declines in numbers of domestic tourism trips are evidenced in other parts of the country. The declining municipalities for domestic tourism are all situated in the Western Cape, Northern Cape or Free State provinces. Most striking are the declines recorded in the two metropolitan destinations of Cape Town and Mangaung (Bloem-fontein) (Rogerson, 2015). The largest decline is shown in Cape Town and explanations for Cape Town's demise as a domestic tourism destination are related in part to its weak performance for VFR travel, which is the core component of domestic tourism (Rogerson, 2015). In addition Singh and Krakover (2015) suggest another cause for neglect of domestic travel results from "the popular assumption that tourists invariably originate from distant lands and other cultures" with the consequence that domestic travellers sometimes are discounted as tourists. Scheyvens (2002) as well as Canavan, (2013) also concurs that within tourism scholarship domestic tourists are given far less attention than their inter-national counterparts. The context for this research is mainly focusing on how domestic tourists build up rapports with small tourism enterprises. Therefore, this research paper presents some good news for Cape Town domestic tourism.

4. Literature Review

The review of literature plays a crucial role in the current research. Therefore, in this section efforts are directed to explore or assess the findings of the studies conducted by various scholars in the same field.

4.1. Relationship Proneness

The relationship proneness of a buyer is viewed as the behavioral tendency of a buyer to actively maintain and enhance a relationship with one particular seller (Wulf & Odekerken-Schröder). Researchers use the term relationship proneness to reflect the consumer's relatively stable and conscious tendency to engage in relationships with sellers of a particular product category (Feng, Zhang & Ye, 2015) Relationship proneness has been associated with an interest for stable exchanges, and has been measured in terms of "willingness to be a regular customer" and "a steady customer", and for "going the extra mile" to buy at the same shop (De Wulf et al., 2001).

4.2. Relationship Satisfaction

Homburg & Rudolph (2001) define satisfaction as a relationship constructs describing how a supplier fills the expectations of a customer in the following areas: characteristics of the product, information related to product, services, taking orders, complaints management, interactions with commercial and with internal

staff. Thus, satisfaction appears as a concept highly integrated in the relationship. Relationship satisfaction refers to the extent to which an individual customer is satisfied with the relationship with a firm (Verhoef, 2003). De Wulf et al. (2001) consider the relationship satisfaction placed in affective theory. It is defined as a consumer's affective state resulting from an overall appraisal of his or her relationship with a retailer (Anderson & Narus, 1990).

4.3 Relationship Commitment

Anderson and Weitz (1992) states that commitment to a relationship entails a desire to develop a stable relationship, a willingness to make short term sacrifices to maintain the relationship, and a confidence in the stability of the relationship. In addition, Rauyruen and Miller (2007) further elucidates that commitment as "a psychological sentiment of the mind through which an attitude concerning continuation of a relationship with a business partner is formed". Relationships are built on the foundation of mutual commitment, and the commitment level has been found to be the strongest predictor of the voluntary decision to pursue a relationship (Ibrahim & Najjar 2008). Relationship commitment is a deeply held commitment to rebuy or repatronize from a preferred retailer consistently, despite situational influences that might encourage switching behavior (Oliver, 1997).

4.4. Small Tourism Enterprises

The vast majority of tourism enterprises around the globe are deemed to be small, belong to the indigenous population, and are family run (Morrison & Teixera, 2004, p. 167).The role of Small tourism enterprises in tourism is pervasive, since most travellers would come into contact with small tourism enterprises operating in a destination (Thomas & Thomas, 2006). Small tourism enterprises are important for retaining the economic benefits of tourism within a region and can act as the entry point for spending in the local area (Hawkins, 2004); they are a key component in regional economic development. Rogerson (2004, p. 7) agrees and adds that small tourism enterprises are numerically the largest component of the South African tourism economy and, thus, warrant close research attention.

5. Conceptual Model

Drawing from the literature review and the postulated hypotheses, a conceptual model was developed (Figure 1). The model consists of three research variables: one predictor –relationship proneness; one mediator relationship satisfaction and one outcome variable – relationship commitment.

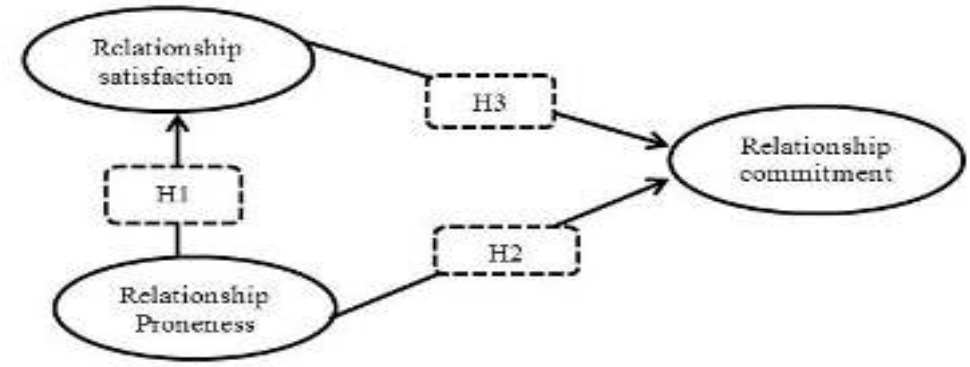

Figure 1. Conceptual Model

5.1. Research Hypothesis Development

Based on the literature review, the following research hypotheses have been formulated to examine the relationships.

H1: relationship proneness positively influences relationship satisfaction;

H2: relationship proneness positively influences relationship commitment;

H3: relationship satisfaction positively influences relationship commitment.

6. Research Methodology

The study utilized a quantitative research design using a structured questionnaire. The design was suitable to solicit the required information relating to relationship proneness, relationship commitment and relationship satisfaction. The approach enables to examine the causal relationships with the constructs used in the study.

6.1. Sample and Procedure

The sample of the study comprised domestic tourists from the Cape Town metropolitan area of South Africa. A non-probability convenience sampling method was chosen for the purposes of this study since the characteristics of this method have particular appeal to financial and time constraints. Every attempt was made to ensure geographical representation of the sample.

7. Target Population and Data Collection

The target population for the study was domestic tourism clients or customers in the Cape Town Metropolitan area who have ever had any form of business with small tourism enterprises. Participation by the clients of these small tourism enterprises was purely voluntary. Students from the AAA School of Advertising, Cape Town campus were recruited and trained to serve as data collectors. A total of 200 questionnaires were collected from respondents. A covering letter accompanied the questionnaire stipulating the purpose of the study. In addition, the covering letter ensured respondents anonymity and confidentiality. A total of 151 questionnaires were eventually used for the analysis as 49 were discarded due to incomplete responses on the questionnaire.

8. The Questionnaire Layout and Questions Format

A four-section questionnaire was designed to collect data from the participants. Section A comprised of multiple choice questions pertaining to the respondents' demographic factors such as gender, population group, age and type of small tourism enterprise that a domestic tourist is frequently in a relationship or in business with. Section B assessed relationship proneness and consisted of questions adapted from Feng, Zhang and Ye (2015). Section C measured relationship commitment and consisted of questions adapted from Wei, McIntyre & Soparno (2015). Section D of the questionnaire comprised questions on relationship satisfaction that where adapted from the study of Wei, McIntyre & Soparno (2015). In this research study, all the responses for Sections B, C and D were measured by a five-point Likert scale whereby, strongly agree=5 ,strongly disagree=1 and 3= neither agree or disagree.

9. Data Analysis and Results

A Microsoft Excel spread sheet was used to enter all the data and in order to make inferences of the data obtained, the Statistical Packages for Social Sciences (SPSS) and the Smart PLS software for Structural Equation Modeling (SEM) technique was used to code data and to run the statistical analysis. Additionally, these statistical packages were used for testing and confirming relationships among hypothesised variables.

10. Sample Composition

Of the 151 participants in this study, 60 percent (n=90) were male while 40 percent (n=61) were female. This gender composition tends to suggest that in Cape Town men are substantially more likely to be engaged in business with small tourism enterprises than women. The age structure of the sample, indicated that only 34% (n=51) of the respondents were under the age of 30 years, 32% (n=48) were aged between 30 and 39 years, 25.0% (n=38) represented the 40–49 year age group, 8% (n=12) represented the 50–59 year age group and a meagre 1% (n=2) of the sample were 60 years of age and above. The majority 34% (n=51) of the respondents were aged 30–39 years. Therefore it seems that the domestic tourists in the Cape Town metropolitan are greatly concentrated within the age bracket of 30–39 years. Lastly the respondents had to indicate the type of small tourism enterprise they are frequently in a relationship or in business with. Findings indicate that the majority of the respondents 55% (n=83) are in business with tourism accommodation enterprises, of the 151 respondents 23% (n=34) indicated that there are in business with those enterprises that mainly focus on food and beverage services, 11% (n=17) indicated that they are in business with small tourism enterprises that specialize in recreation and entertainment, 8% (n=12) admitted that they are in a relationship with or they frequently make use of transport services provided by small tourism enterprises that specialize in transport. Lastly a small number of the respondents 3% (n=5) specified that they engage with other type of small tourism enterprises such as those which are involved in the manufacturing of metal products as well as those with are involved in sculpturing of statues for tourism purposes.

Table 2. Scale reliabilities and accuracy statistics

Research constructs	Descriptive Statistics*		Cronbach's test		C.R.	AVE	Item Loadings
	Mean	SD	Item-total	α Value			
Relationship Proneness (RP)							
RP1	3.70	1.051	0.513	0.769	0.865	0.683	0.872
RP2			0.510				0.871
RP3			0.655				0.729
Relationship Commitment(RC)	3.55	1.170					
RC1			0.650	0.763	0.862	0.676	0.832
RC2			0.673				0.791
RC3			0.749				0.842
Relationship	4.36	1.767					

Satisfaction(RS)							
RS1			0.520	0.819	0.890	0.731	0.804
RS2			0.749				0.830
RS3			0.823				0.926

RP1 to RP3 = relationship proneness scale items; RC1 to RC3 = Relationship commitment scale items; RS1 to RS3 = relationship satisfaction items. AVE = Average variance extracted. CR = Composite reliability. SD = Standard deviation

Reliability was assessed through Cronbach alpha values and Composite reliabilities All reliability values (Cronbach and composite rialiabilities) ranged from 0.763 to 0.890 (Table 2) these were above the recommended 0.7 (Nunnally 1978) suggesting excellent acceptable levels of research scale reliability. The study checked for both convergent and discriminant validity of the measurement instruments. To ascertain convergent validity, the factor loadings were considered in order to assess if they were above the recommended minimum value of 0.5. Table 2 shows that the factor loading for the research construct ranged from 0.729 to 0.926 and therefore above the recommended 0.5 (Anderson & Gerbing 1988) indicating acceptable individual item convergent validity as 69 % or more of each item's variance was shared with its respective construct. The factor loadings for scaleitems (Table2) were above the recommended 0.5, which indicated that the instruments were valid and converging well on the constructs that they were expected to measure. Moreover discriminant validity was established by checking if the AVE values. The AVE estimates in Table 2 reflected that the overall amount of variance in the indicators were accounted for by the latent construct (Neuman, 2006:59). All AVE values were above 0.4, thus acceptable according to the literature (Fraering & Minor 2006:249). AVE values indicated indexes between 0.676 and 0.731. Therefore, these results provided evidence for acceptable levels of research scale reliability.

11. Correlation Analysis

One of the methods used to ascertain the discriminant validity of the research constructs was the evaluation of whether the correlations among latent constructs were less than 0.60. These results are reported in Table 3.

Table 3. Latent variables correlations

Research constructs	Construct correlation		
	RP	RS	RC
Relationship Proneness (RP)	1.000		
Relationship Satisfaction (RS)	.562**	1.000	
Relationship Commitment (RC)	.456**	.534**	1.000

Note: **Correlation is significant at the 0.01 level (2 tailed)

A correlation value between constructs of less than 0.60 is recommended in the empirical literature to confirm the existence of discriminant validity. As can be observed from Table 3, all the correlations were below the acceptable level of 0.60. A significant and medium correlation was revealed with the RP and RS association ($r=0.562$; $p<0.01$). A strong positive linear relationship between RC and RP was also shown at ($r=0.456$, $p<0.01$) level of significance, indicating that relationship proneness influences relationship commitment, and lastly, there was a positive strong relationship between RS and RC at ($r=0.534$, $p<0.01$), thus confirming that relationship commitment influences relationship satisfaction.

12. Structural Equation Modeling (SEM) Approach

In order to statistically analyze the measurement and structural models, this study used Smart PLS software. PLS is an SEM technique based on an iterative approach that maximizes the explained variance of endogenous constructs (Hair, Sarstedt, Hopkins & Kuppelwieser 2014) In SEM, the measurement model refers to the linkages between the latent variables and their manifest variables and the structural model captures the hypothesized causal relationships among the research constructs (Chin & Newsted, 1999). In addition to that, Smart PLS combines a factor analysis with near regressions, makes only minimal assumptions, with the goal of variance explanation (high R- square) (Anderson, Schwager & Kerns, 2006). Furthermore, Smart PLS supports both exploratory and confirmatory research, is robust to deviations for multivariate normal distributions, and is good for small sample size (Hair, Ringle, & Sarstedt, 2013). Since the current study sample size is relatively small (151) Smart PLS was found more appropriate and befitting the purpose of the current study.

13. Path Model Results and Factor Loadings

Below is Figure 2, indicating the path modeling results and as well as the item loadings for the research constructs.

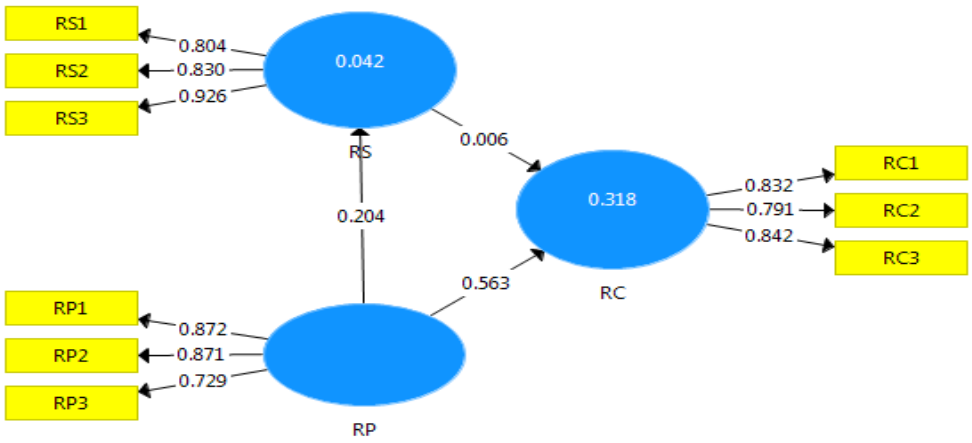

Figure 2. Path Model

14. Path Modeling & Hypotheses Testing

Table 4 presents the results of the structural equation modeling followed by a discussion.

Table 4. Results of structural equation model analysis

Path	Hypothesis	Path coefficients (β)	T-Statistics	Decision on Hypotheses
Relationship Proneness (RP) → Relationship Satisfaction (RS)	**H1**	0.204[a]	3.336	Accept/ Significant
Relationship Proneness (RP)→Relationship Commitment (RC)	**H2**	0.563[a]	7.049	Accept/ Significant
Relationship Satisfaction (RS) → Relationship Commitment (RS)	**H3**	0.086[a]	1.360	Accept/ Significant

[a]Significance Level p<.10; [b]Significance Level p<.05; [c]Significance Level p<.01.

Table 4 presents the three hypothesised relationships, path coefficients, the t-statistics and the decision criteria. The value of the t-statistic indicates whether the relationship is significant or not. A significant relationship is expected to have a t-

statistics that is above 2. Drawing from the results provided in Table 4, three of the hypothesised relationships (H1, H2 and H3) were statistically significant.

16. Discussion

The first hypothesis stated that relationship proneness has a positive influence on relationship satisfaction. In this study, this hypothesis was supported. It can be observed in Figure 2 and Table 4 that relationship proneness exerted a positive influence (r =0.204) and was statistically significant (t=3.336) in predicting relationship satisfaction. This result suggests that higher the level of relationship proneness the higher the level of relationship satisfaction. The second hypothesis suggested that relationship proneness has a positive influence on relationship commitment. This hypothesis was supported in this study. Figure 1 and Table 4, indicate that this relationship H2 was supported. Relationship proneness exerted a positive influence (r= 0.563) on relationship commitment and was statistically significant (t= 7.049). This result denotes that relationship commitment is positively and significantly related to relationship satisfaction. Thus higher levels of relationship proneness will lead to higher levels of relationship commitment. The third hypothesis, which advanced that relationship satisfaction exerts a positive influence on relationship commitment was supported and accepted in this study. It is reported in Figure 1 and Table 4 that H3 relationship satisfaction employs a positive (r=0.086) influence on relationship commitment and that this influence is statistically significant (t=1.360). Thus higher levels of relationship satisfaction will lead to higher levels of relationship commitment.

17. Limitations and Future Research Direction

Although this study makes significant contributions to both academia and practice, it was limited in some ways, and therefore some future research avenues are suggested. First, the data were gathered from Cape Town Metropolitan area of South Africa and the sample size of 151 is relatively small. Perhaps, the results would be more informative if the sample size is large and data gathered from the other Metropolitan areas in South Africa. In addition since this study used a quantitative approach, future studies could also use a mixed method approach so that in depth views from domestic tourists can also be captured. Future studies can also extend the current study conceptual framework by studying the effects of a larger set of variables. For instance, the influence of relationship quality, relationship value, relationship cultivation, perceived relationship benefits, and relationship longetivity could be investigated.

18. Recommendations to Marketing Managers or Owners of Small Tourisms Enterprises

In formulating relationship strategies, small tourism enterprises therefore should consider customers as the 'ultimate object of loyalty', which they must earn, in the form of consumer to firm relationships. The researchers recommend marketing managers or owners of small tourisms enterprises to resort to relationship marketing so as to improve the business performance of their enterprises. Van Tonder (2016) reviews relationship marketing as such can be viewed as a business strategy aimed at establishing and sustaining long -term relationships with customers that are mutually rewarding and which are achieved through having conversations with customers, treating customers as individual persons and fulfilling promises. In a study that was conducted by Maziriri & Chinomona (2016) in order to examine how relationship marketing, green marketing and innovative marketing influence the business performance of Small, Medium and Micro Enterprises (SMMEs) in Southern Gauteng, South Africa. Their study's results reviewed that relationship marketing exerted a positive influence and was statistically significant in predicting business performance and this result suggested that higher the level of relationship marketing the higher the level of business performance in the SMMEs. Taking into account, Maziriri & Chinomona's (2016) findings it can be noted that small tourism enterprises who wish to build up strong lasting rapports with domestic tourists as well as increasing their business performance should engage in a high level of relationship marketing.

19. Conclusions and Managerial Implications

The study validates that factors such as relationship proneness and relationship satisfaction are instrumental in stimulating the relationship commitment of domestic tourism clients with their tourism enterprises within the Cape Town metropolitan area. The study further validates those small tourism enterprises that are engaged in rapport building with their domestic tourism clients enhance customer satisfaction, customer loyalty and ultimately enhancing high business performance. The study has both theoretical and managerial implications. Theoretically, this study makes a noteworthy progression in marketing theory by methodically examining the interplay between relationship proneness on relationship satisfaction and relationship commitment. In this manner, the study is an important contributor to the existing literature on this subject. The study also underwrites a new direction in the research on relationship marketing by opening up a discussion on the importance of rapport building (between domestic tourists and small tourism enterprises) in the development and improvement in developing countries such as South Africa.

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Audit Firm Tenure and Audit Quality Implied by Discretionary Accruals and Modified Opinions: Evidence from Turkey

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Abstract: Accounting scandals and bankruptcies across the world have raised concerns about the financial statement audit quality. Though, prior results documented mixed results, some argue that auditors become more familiar with the client and therefore independence is impaired when audit firm tenure gets longer. Consequently, some regulators set a limit on the number of years an audit firm may audit the same client. This study examines the association between audit firm tenure and audit quality in Turkey. We used three measures to proxy audit quality such as propensity to issue modified audit reports and discretionary accruals determined by two models. We found some evidence that audit quality does not increase with limited audit firm tenure. Given the additional costs associated with audit switch, it is concluded that there are minimal benefits of mandatory firm rotation. The results of this study will be useful for the regulators who are in charge to improve the audit quality.

Keywords: mandatory rotation; audit tenure; audit quality

JEL Classification: M41; M42

1. Introduction

Mandatory rotation of audit firm or partner becomes a controversial subject after the accounting and auditing scandals in the world such as Enron, WorldCom, Parmalat, Xerox, Tyco, Adelphia, Health South, Royal Ahold NV et cetera. Sarbanes Oxley Act of 2002 considered audit firm tenure as a potential area that needed to be investigated because the consecutive years of auditor-client relationship has the potential to impair auditor independence. There are increasing calls for audit committees to consider voluntary firm rotation as a means of

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enhancing audit quality[1]. These calls for voluntary audit firm rotation presuppose that audit quality increases when a new audit firm is retained. Several countries currently have mandatory audit firm rotation regulation. Italy has required audit firm rotation since 1975, Brazil since 1999, and Singapore has required audit firm rotation for local banks since 2002. Numerous other countries including Austria, Canada, Greece, Spain and Slovakia previously required mandatory audit firm rotation (Corbella et al., 2015). In December 2012, the Netherlands issued the Dutch Audit Profession Act, limiting audit firm tenure to eight-year effective from 1 January 2016. Furthermore, according to rules published in the Offical Journal of the European Union, listed companies, banks, and insurance companies must change their audit firms after 10 years (EU Regulation, No: 537/2014). This period can be extended to 20 years if the audit is put out for bid, or 24 years in instances of joint audits. Some argue that the quality of audits increase when a newly appointed auditor with fresh and skeptical eyes evaluates the financial statements. Assigning the same personnel on a same audit client over a long period of time believed to impair independence because of self-interest and familiarity threats (Eilifsen, Messier, Glover & Prawit, 2010). This research paper seeks some evidence whether long audit firm tenure give rise to decreases in audit quality.

In Turkey, a policy of mandatory firm tenure is in place. According to the new Independent Audit Communiqué issued in December 2012 by Turkish Public Oversight Accounting and Auditing Standards Authority (POA), in an audit of the public interest entity, a firm shall not be the auditor for more than seven years for the last ten years (Official Gazette, 25809). In the cooling-off period the firm shall not participate in the audit of the entity, provide quality control for the engagement, consult with the engagement team or the client regarding technical or industry-specific issues, transactions or events, or otherwise directly influence the outcome of the engagement. Therefore, an empirical evaluation should be undertaken whether this policy is beneficial.

This study examines if there is a change in audit quality associated with firm tenure. We used three measures to proxy audit quality such as propensity to issue modified audit reports and discretionary accruals determined by two models. We traced the length of firm tenure for all listed companies in Turkey for 2014.

Our findings show that audit quality does not increase when audit firm tenure is limited. This result does not support recent legislations requiring mandatory audit firm rotation in Turkey. We propose that other precautions such as quality control activities by the oversight board may need to be considered to overcome concerns about audit quality. We expect that, the findings of this study contributes the regulation of the (POA) with regard to audit-firm rotation.

[1]See NYSE (2003) and TIAA-CREF (2004), among others.

The remainder of this paper is organized as follows. Section 2 outlines previous research. Section 3 presents research model and data. This is followed by the results for each of the three audit-quality measures in Section 4. Conclusions, limitations and contributions are presented in final section of the paper.

2. Literature Review

Prior studies have documented mixed results between audit tenure and audit quality relationship. Carey and Simnett (2006) investigated Australian companies and found evidence of decreased audit quality measured by the auditor's propensity to issue a going-concern audit opinion and just meeting (missing) earnings benchmarks, associated with long partner tenure. They also show that decrease in audit quality belongs to non-Big 6 auditors. Junaidi et al. (2012) show that the length of relationship between auditors and clients has a significantly negative effect on the propensity to issue going-concern opinions. Machida and Hayashi (2012) found that audit quality is reduced in cases of long term audit tenure. In addition, they do not find significant difference between audit partner rotation and audit firm rotation when evaluated based on going-concern opinions. Mgbame et al (2012) investigates the association between the tenure of an auditor and audit quality. Their analysis show that there is a negative relationship between auditor tenure and audit quality. Chi and Huang (2005) examines how audit tenure affects earnings quality by investigating the effect of audit-firm and audit-partner tenure on the level of discretionary accruals. They find that familiarity helps to produce higher earnings quality, but excessive familiarity results in lower earnings quality. They argue that the cut-off point of the positive and negative effects of familiarity is nearly five years.

On the other hand, Johnson et al. (2002) find that relative to medium audit-tenures of four to eight years, short audit-firm tenures of two to three years are associated with lower –quality financial reports. In contrast, they found no evidence of reduced financial- reporting quality for longer audit-firm tenures of nine or more years. Geiger and Raghunandan (2002) investgated the relationship between audit tenure and auditing failures. Their result indicate that there were significantly more audit reporting failures in the earlier years of the auditor-client relationship than when auditors had served these clients for longer tenures. Manry et al. (2008) found evidence that for small companies, regardless of the level of engagement risk, audit quality actually may increase as audit partner tenure increases. They found no significant relationship between partner tenure and audit quality for large low-risk or high-risk companies or for smaller companies with shorter tenure. Myers et al. (2003) examine the relationship between audit tenure and audit quality. They used discretionary accruals and the current accruals to proxy for audit quality. They found that auditors place greater constraints on both income

increasing and income decreasing accruals as the audit tenure lengthens. Their findings show that audit quality does impair with tenure. In addition, Carcello and Nagy (2004) examined the relation between audit firm tenure and fraudulent financial reporting. They found no evidence that audit quality increases when a new audit firm is retained. Rather, they found that fraudulent financial reporting is more likely when auditor tenure is three years or less. Ghosh and Moon (2005) examined perceptions of investors, independent rating agencies, and financial analysts on the relationship between auditor tenure and audit quality. They found positive association between investor perceptions of earnings quality and tenure. They document that investors and information intermediaries perceive auditor tenure as improving audit quality. Jackson et al (2008) find that when audit quality is measured by propensity to issue a going-concern opinion, audit firm tenure has positive effect on audit quality. They also find that audit quality is unaffected when measured by discretionary expenses. George (2009) investigated the effect of the auditor-client consecutive years of relationship on financial reporting quality. He found that the financial statement fraud is most likely to occur in the initial years of auditor engagement. The longer audit firm tenure is associated with lower probability of fraudulent financial reporting. Rohami et al (2009) examined the relationship between audit firm tenure and audit reporting quality in Malaysia. They found a positive relationship between audit firm tenure and audit reporting quality. Knechel and Ann Vanstraelen (2007) investigated the relationship between auditor tenure and audit quality for Belgium companies. They used the propensity to issue a going concern opinion as a measure of audit quality. Using a sample of stressed bankrupt companies, and stressed non-bankrupt companies, their findings reveal that auditors do not become less independent over time nor do they become better at predicting bankruptcy. Krauss et al (2014) found that audit engagement tenure wouldn't be a significant factor with regard to audit quality for a comparative sample of firm observations from Germany and the United States.

3. Research Model and Data

In this study, we search for a possible association between audit firm tenure and audit quality. To examine this relationship, we use two models of discretionary accruals and propensity to issue modified (emphasis of matter paragraph for going concern, qualified, adverse, and disclaimer) audit opinions as a measure of audit quality. A substantial body of prior research used discretionary accruals and going concern opinions as proxies for audit quality (Manry, Mock & Tunner, 2008; Chan, Lin & Lin, 2008; Jackson, Moldrich & Roebuck, 2008; Carey & Simnett, 2006, Knechel & Vanstraelen, 2007).

First, the cross-sectional version of modified Jones model (Dechow, Sloan & Sweeney, 1995) is used to estimate discretionary accruals. However, due to the fact

that performance-matched discretionary accrual measures enhance the reliability of the inferences from earnings management research (Kothari, Leone & Wasley 2005), we control for the company's prior performance and measure discretionary accruals (DA) as follows:

$$DA_t = TAC_t - [\emptyset_1 (1/TA_{t-1}) + \emptyset_2 (\Delta SALES_t - AR_t) + \emptyset_3 + \emptyset_4 ROA_{t-1}]$$

Where;

TAC_t = Total accruals (earnings before extraordinary items minus net cash flow from operations)

TA_{t-1} = Total assets

$\Delta SALES_t$ = Change in net sales

ΔAR_t = Change in net accounts receivable

PPE_t = Net property, plant, and equipment

ROA = The rate of return on total assets

t = The event period

TAC_t, Δ $SALES_t$, ΔAR_t, and PPE_t are scaled by lagged total assets, TA_{t-1}. The coefficients, $\emptyset_1$, $\emptyset_2$, $\emptyset_3$, and $\emptyset_4$ are the parameters from estimating the following model by industry-year, consistent with Chan, Lin, Lin, 2008.

$$TAC_t = \emptyset_1 (1/TA_{t-1}) + \emptyset_2 (\Delta SALES_t - AR_t) + \emptyset_3 PPE_t + \emptyset_4 ROA_{t-1} + \varepsilon_t$$

Second, we used Larcker and Richardson (2004) model of discretionary accruals. This model adds book-to-market ratio (BM) as a proxy of expected growth in the operations of firms and cash flows from operations (CFO) to avoid the effect of extreme firm performance on accruals since the Modified Jones Model determine wrongly discretionary accruals in extreme firm performance. The Larcker and Richardson Model is as follows;

$$TAC_t = \emptyset_0 + \emptyset_1 (\Delta SALES_t - AR_t) / TA_{t-1} + \emptyset_2 PPE_t / TA_{t-1} + \emptyset_3 CFO_t / TA_{t-1} + \emptyset_4 BM_t + \varepsilon_t$$

Where:

TAC_t = Total accruals (earnings before extraordinary items minus net cash flow from operations)

TA_{t-1} =Total assets

$\Delta SALES_t$ = Change in net sales

ΔAR_t = Change in net accounts receivable

PPE_t = Net property, plant, and equipment

CFO_t = Cash flows from operations in the period

BM_t = Book to Market ratio in the period

t = The event period

We test the association between DA and audit firm tenure with the following regression equation;

$$DA = \beta_0 + \beta_1 FT + \beta_2 BIG4 + \beta_3 OPINION + \beta_4 SIZE\ \varepsilon_t$$

FT = Audit firm tenure

BIG4 = a dummy variable equal to 0 if the company is audited by a Big 4 audit firm, and 1 otherwise

OPINION = a dummy variable equal to 0 if the auditor's opinion is unqualified opinion and 1 otherwise

SIZE = logarithm of year-end book value of total assets

Third, we use auditor's propensity to issue a modified opinion in order to measure audit quality. We control some variables that influence the modified audit opinions. If the probability of issuing modified audit reports is inversely related to long audit firm tenure, this shows that long firm tenure impairs audit quality. The following logistic regression model estimates the auditor's probability of issuing a modified opinion:

$$OPINION = \beta_0 + \beta_1 BIG4 + \beta_2 FT + \beta_3 SIZE + \varepsilon_t$$

The data for this study is collected from the published financial statements and audit reports of non-financial companies listed on the Borsa Istanbul in 2014. For sample companies we trace back the audit reports to get firm tenure and modified audit reports. Excluding non-financial companies and companies with missing data, the sample results in an observation of 234 Turkish listed companies.

4. Results

Table 1 presents the results of Modified Jones Model estimating the relationship between discretionary accruals (a proxy for audit quality) and audit firm tenure. We found no support that discretionary accruals are lower in the earlier years of firm tenure. For the model, FT (firm tenure) is not significant. The model suggest that there is no association between long audit tenure and audit quality.

Table 1. Regression Results for Modified Jones Model

Variables	Coefficient	t-value	p-value
Experimental Variable			
FT	-,058	-,770	,442
Control Variables			
OPINION	-,149	-2,044	,042
BIG 4	-,115	-1,444	,150
SIZE	,048	,634	,527
Constant		1,812	,072
Adj. R^2	,018		
Dependent Variable: DA			

The results of Larcker and Richardson Model presented in Table 2 shows that there is a negative and significant relationship between FT (firm tenure) and audit quality on the level of discretionary accruals. This finding reveals that audit quality increases with long audit firm years. The results suggest that familiarity helps to produce higher audit quality.

Table 2. Regression Results for Larcker and Richardson Model

Variables	Coefficient	t-value	p-value
Experimental Variable			
FT	-,136	-,1845	,067
Control Variables			
OPINION	-,258	-3,617	,000
BIG 4	-,056	,716	,475
SIZE	,012	-,167	,868
Constant		1,883	,061
Adj. R^2	,059		
Dependent Variable: DA			

Table 3 shows the results of logistics regression between FT (firm tenure) and audit quality, when proxied by the propensity to issue a modified audit opinion. The model does not find significant relationship between audit firm rotation and audit quality. Therefore, we found no evidence of reduced audit quality for longer audit firm tenures.

Table 3. Regression Results for Modified Opinions

Variables	B	S.E.	Wald	Sig.
Experimental Variable				
FT	-,112	,143	,613	,434
Control Variables				
BIG 4	,532	,517	1,059	,303
SIZE	,000	,000	3,454	,063
Constant	-1,345	,682	3,892	,048
Dependent Variable: OPINION				

5. Conclusion

This paper investigated the relationship between audit firm tenure and audit quality for non-financial traded companies in Turkey. Using three proxies of audit quality, we found some evidence that there is an increase in audit quality conditional on the length of audit firm tenure in Turkey. This finding suggest that audit quality does not deteriorate with audit firm tenure or audit quality increases when a new audit firm is retained. According to this results we can conclude that Turkish capital market will not benefit from mandatory audit firm rotation.

The examination of multiple proxies of audit quality provides greater confidence in the relationship between audit quality and audit firm tenure. In addition, we suggest that other initiatives such as more effective quality control or penalizing activities by the oversight board may need to be considered to address concerns about audit quality. Future research may investigate the relationship between audit quality and mandatory partner rotation in Turkey.

Our results should be interpreted cautiously as our study is subject to several limitations. First, the maximum audit engagement length in our sample is limited to seven years since there have been a mandatory audit-firm rotation regime in Turkey since 2010. Therefore we were unable to show the potential impact of long-term audit tenure on our empirical results.

Despite the application of mandatory audit-firm rotation in Turkey since 2010, the relation between audit firm tenure and audit quality has received little attention in academic research. We believe that our findings add to the growing body of literature on mandatory audit firm rotation. The results of this study will be useful for the regulators (POA) to improve the audit quality in Turkey.

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Review on Policy Developments of FDI in India

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Abstract: India has been witnessing an extensive amount of foreign capital flowing to the market over the past twenty years after drastic changes made on its FDI policy. The aim of this research is to evaluate the policy developments of FDI during different stages since its independence and its impact on capital inflows. This research attempts also to uncover lessons that can be learnt from the case of India. A qualitative approach has been adopted for this research. The narrative analysis used in this study is based on secondary data that have been drawn from a pool of diverse sources including various databases, journal publications and books.

Keywords: Inward; competition; MNC; restrictions; advantages

JEL Classification: F; F30; F35; F39

1. Introduction

Right after its independence, the Indian government nationalized the core industries that were perceived to be vital during the industrial stage, to aid economic growth and development. Investments in such industries were restricted for foreign investors. Exemptions were lifted only in cases when government did not possess required knowledge, technology, expertise and machinery to run projects through its domestic agents. In addition, import-substitution policies via excessive restrictions and high tariffs were placed to prevent the flow of imported goods so that infant industries could develop, mature and become self-sustainable and able to withstand foreign competition. During this time, harsh bureaucratic controls were imposed on trade, production and investment as a result, inward FDI was very limited. However, after the 1990s' reforms, the overall impact of the

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policy framework changes that led to liberalizing the market for FDI, were very impressive because of the FDI boom, specifically in the last decade.

The general picture of FDI inflow to India shows that the government has been able to institute various policies and frameworks to ease the way of doing business and thus attract foreign investors. Many other developing economies have failed to persuade foreign investors to invest their capital in their own domestic markets because of unfriendly FDI policies. Hence, the objectives of this research are: to assess the role of Indian government policies in the success of attracting large sums of FDI inflows and to explore the lessons that can be learnt for developing economies from India's success. The following sections are divided in four phases that analyze FDI evolution, the situation associated with foreign investments and the impact on inflows. This strategy has been pursued because each phase carries out critical developments on FDI policy that has ultimately dictated the nature and amount of inward FDI in the immediate future.

Findings in this paper reveal that changes of FDI policies, especially after the reforms and liberalization of 1991 played an enormous role in the increased inflows. India managed to become among the most favorable FDI destinations from being one of the least attractive in the global scale. This research reveals several lessons learnt from the case of India which includes: market size does not ultimately determine the level of inward FDI, developing countries may seek the support of international institutions and experts to lay down appropriate reforms, import substitution policies can be useful only in the short-run, and the FDI liberalization process needs to follow a proactive pattern.

2. Ambitious Inward FDI (1943 -1961)

The year 1943 marks a milestone in the Indian economy. It is the time when FDI policies start to be dictated and influenced by indigenous Indian politicians and businesses regardless of the country still being ruled by the UK government. During this phase, the number of Multi-National Corporations (MNCs) was very limited accounting for not more than 14 across the whole country (Nayak, 2008). The majority of investments were from the UK and the total amount of FDI in the mid-1948 reached R.s 2,560 million. A sizeable number of MNCs were resource-seekers engaged in the raw materials and extractive industries, because of the abundance of cheap available resources (Kumar, 1995). This FDI motive of foreign investors is supported by UNCTAD (1998) and Dunning and Lundan (2008), who state that low cost resources are of paramount importance for MNCs' to sustain their operations and enhance their competitive level in the global market. Thus, India's market was attractive because of location distinctive advantages, as described by Dunning's (1973, 1998) OLI paradigm. This was a result of comparative advantages and market imperfections.

Right after independence, the Indian government encountered numerous problems relating to both industrial and economic growth and thus the need for foreign capital in domestic industries inevitably increased. In response, the government enacted the Industrial Policy Resolution (1948) to accelerate and support development through FDI and also to obtain the necessary technical, industrial, and scientific knowledge (Kumar, 1994). While the MNCs were provided guarantees of unconstrained remittances similar to domestic enterprises relating to dividends and profits, fair treatment and compensation, the actual legislation ensured that majority of ownership and the control of foreign capital still remained under the locals' hands. During this phase, twenty-seven foreign companies (Nayak, 2008) entered the Indian marketplace because changes in the FDI policy still did not prevent MNC's to generate profits. The comparative advantages of MNCs over the local enterprises were enormous as they lacked adequate knowledge in research, expertise and technology to support the needs of the emerging local industries.

While the Indian government acknowledged the need and had ambition to ensure systematic increase in FDI inflows to promote development, many domestic producers faced difficulties to compete in the market with MNCs and felt the need for protective measures to prohibit the entrance of foreign companies in the area where locals lacked capability to counter their dominance. Therefore, the import substitution policy (Kumar, 1994) was launched to protect development of the domestic manufacturing sector and other heavy industries and replace foreign imports with domestically manufactured goods.

As a result, very high tariffs and restrictions were put in place to reduce the flow of imported goods. The profit margins of MNCs that were engaged in exporting their products from home countries to India, decreased drastically due to the protective measures. As a result, they had to switch their strategies and instead seek FDI to ensure access to India's marketplace. Endorsement of this tactic is supported by the research done from Lipsey (2003) who states that protection of domestic industries through barriers on imports, is inclined to push MNCs to engage in horizontal FDI.

Moreover, the sectors of the economy perceived to be strategic for India were nationalized through a five year plan (1951-1955) aimed to aid development and industrialization (Nayak, 2008). This included insurances, airlines, mining, power, oil and petroleum. Besides inviting both foreign and domestic companies to expand their investments in the core industries, deemed to accelerate social development and economic growth, the Indian government asked MNCs to include domestic companies to participate in their equity in order to be able to further continue their operations (Davenport & Slim, 1992). As a result, a few companies such as General Motors, Ford and Pepsi found such requests to be unacceptable and thus decided to exit India.

The second five year plan was introduced from 1956-1961 to further support the industrial development process. When this plan was compiled, many prestigious economists were engaged from all over the world including Nobel Laureates Jan Tingergen and Ragnar Frisch from Norway and Netherlands respectively and others from US programs with the aim of supporting India's development (Bhagwati, 1993). The idea was to create advantages in the internal market (Kumar, 1995) where local firms in heavy industries can become self-sufficient through development , which eventually ought to strengthen and enhance their capabilities to compete with MNCs, not only domestically but also in other foreign markets. To this end, protection measures were further strengthened in many of the industries where goods/and products could be locally manufactured. Particular attention was made to programs of infrastructure development and of those relating to human resources specifically in the engineering, scientific, technical and technological fields (Kumar, 1994).

However, in the preceding years, 1957-1958, Indian autarkic policies and bureaucratic ways of conducting business in reference to foreign companies had severe consequences for the country's foreign exchange reserves. The crisis that occurred in the balance of payments (Kumar, 1995) made the government reconsider its strategy and seek ways to encourage FDI in order to increase foreign exchange reserves and further support industrial growth. The concrete actions that followed, led to an increased liberalization of FDI policy. The concessions and incentives made included openness in the manufacturing industries, such as of heavy electric equipment, drugs, synthetic rubber and fertilizers.

The literature shows a general consensus on the perceived relevance of trade openness and liberalization to attract foreign investors in the host countries (Oman, 2000; Cohen, 2007). FDI developments in India during this period do not support such findings at this stage. Despite nationalization of core industries, perceived strategic limitations were set for MNCs in reference to domestic capital participation and rigid restrictions and tariffs on imports. The levels of FDI inflows from 1948 to 1961 increased 143 percent from INR 2,558 million to INR 5,285, and the number of joint venture rose 14-fold during this period (Nayak, 2008).

This phenomenon can be explained by Asiedu (2002), where he emphasizes that some MNCs favor markets that impose barriers on imports as it provides opportunities to maximize profits in the domestic markets. Given the size of its marketplace, India at this stage was a heaven for foreign investors. Apart from protectionist measures on imports, domestic competitiveness was relatively low, local manufacturers had inadequate infrastructure and very poor technological capabilities.

3. Controlled Inward FDI (1962-1977)

The strategy that was put in place to protect infant domestic industries from experienced MNCs in order for indigenous firms to mature and also to create a viable domestic base, turned out to be fruitful. At this point in time, some expertise was developed in engineering. Domestic firms also acquired certain types of knowledge, to some extent, for processing and product adoption. These findings support other research (Crespo & Fontoura, 2006; Abraham et al., 2010) that emphasize the profound positive spillover effects of FDI on domestic firms. Such externalities occur either through increased competition or close relationships with MNCs that enables local firms to replicate the business culture of their foreign counterparts. It can also result in job mobility for local employees from MNCs into domestic firms.

But, the Indian government was not satisfied with the level of development and decided that protection of infant industries should be further extended because local firms were not able to stand foreign competition. Thus, the Foreign Exchange Regulation Act (FERA) was formally ratified in 1973, placing restrictions on foreign equity (Kumar, 1995). This allowed foreign companies to possess only 40 percent of the equity, with the remainder having to be transferred to the local counterparts. Only limited companies operating in specific activities were excluded and granted special permission to have more equity ownership.

In addition, the size of MNCs' operations and pricing strategies was limited through enacted legislation called Monopolies and Restrictive Trade Practices Act (MRTP) (Kumar, 1994). The idea was to regulate trade, control monopolistic behaviors and restrict the economic power of foreign companies in the Indian marketplace. As a consequence, many companies including IMB and Coca Cola decided to cease their operations and leave the country. The decreased number of joint ventures and overall reduction of FDI inflows was a blow to the Indian economy. Immediately, upon the reinforcement of both legislations, the FDI trend from 1962 to 1968 was negative and volatile from 1969 to 1977 (Nayak, 2008). These findings are in line with the research done by Brewer (1992) and Dunning and Lundan (2008). They argued that policies which undermine the profit-maximizing strategy of MNCs and those that limit their bargaining power, create negative imperfections and thus ultimately lead to a decrease of FDI inflows.

However, some of the MNCs repositioned themselves in the market to ensure the policy changes do not hinder their operations to a large extent. Facing such a serious position, the government decided to provide incentive packages for export based companies. It examined the increasingly significant importance of export processing zones (EPZs) for inward FDI, to attract export based MNCs. It was the first country in Asia to have built the first EPZ in 1965, which was located in Kandla and the second one in Santa Cruz in 1972. As a result, a considerable

number of MNCs from Japan, USA, and the European Union entered India (Nayak, 2008).

The overall developments of the controlled FDI flow during this stage can be judged from two perspectives. The drastic decrease of inward FDI and departure of many MNCs in response to the government's FDI policies can be considered a negative consequence in the short-run. However, on the long-term basis, pursuing a strategy to strengthen the local base (Kumar, 1995) showed positive results. Domestic companies were able to consolidate their operations, build up local ownership advantages acquire gradually the technology, expertise and know-how of many different business aspects. As a result, this not only changed the pattern of FDI inflows, but also had a significant positive effect on the outward FDI of domestic companies. Therefore, it can be said that maneuvering FDI policies has also laid down strong foundations for domestic companies to mature and withstand competition from MNCs based in well-developed industrial countries.

4. Cautious Inward FDI (1978-1990)

The State sponsored protection of domestic firms started to erode the country's industrial development pace. Firms were unable to purchase advanced technological equipments and machinery and thus domestic companies were lagging behind in comparison with MNCs (Kumar, 1994). The quality of their products appeared to be lower, more expensive and quite restricted in range. Therefore, domestic firms lost their competitive edge and were unable to keep up with their foreign counterparts because their manufactured products became unattractive for exports.

The characteristics of this period relate to the change of attitude by India's government towards foreign investors. The idea behind the reforms was to strengthen the competition of Indian companies in the international markets through the increased presence of more MNCs in India. The previous rigid restrictions of high tariffs and restrictions on imports along with limitations on domestic capital participation started to noticeably relax to some extent (Balasubramanyam & Mahambare, 2003). The new incentive package offered included tax incentives, special infrastructure for 100 percent export based MNCs, reduction of tariffs and import taxes, expediting clearance and ease in the FDI approval procedures without having a local business partner. Part of the plan for infrastructure development covered establishment of other EPZs to attract a larger number of foreign investors (Kumar, 1995). However, as argued by Bhagwati (1993), the reforms were limited and did not bring expected results because of the associated widespread bureaucratic controls imposed by the government relating to production, trade and investment.

The policy changes that were underway during this timeframe aimed to have significant implications for trade liberalization and ultimately, positively influenced inward FDI, the number of joint ventures and technological transfers. The picture of the overall FDI inflows reflects a fluctuating pattern. The downturn occurred from 1982-1983. However, from this point onward, the trend reversed with a slight decline in 1988. FDI rose from $ 79.16 million (1980) to $236.69 million (1990) (table 1). The joint ventures between MNCs and Indian counterparts more than doubled during this period from 307 (1978) to 703 (1990) (Nayak, 2008). Indian domestic companies were able to acquire advanced technology from industrial countries and diversify their products. The Indian outward FDI rose in the USA, Western Europe, the Middle East and Africa (Kumar, 1995).

Table 1. FD Inflows from 1980 to 1990 ($ millions)

1980	79.16
1981	91.92
1982	72.08
1983	5.64
1984	19.24
1985	106.09
1986	117.73
1987	212.32
1988	91.25
1989	252.1
1990	236.69

Source: UNCTAD Stat (2012)

5. Globalized Inward FDI (1991-2011)

This period is a turning point in the history of India's FDI developments. In the early 1990s, the issue of the foreign exchange market crisis was so critical for India that it almost put the country on the brink of bankruptcy because of enormous deficits in fiscal and current accounts, high inflation rates, rising debts to finance obligations and inadequate maintenance of the foreign exchange market (Ghosh, 2006). To avoid the worst and put the situation on the right track, India in 1991 appointed Manmohan Singh (Khandare & Babar, 2012), a non-political figure as a Finance Minister to lead the reform of India's economy.

The phase of liberalization that finally reversed the unsatisfactory FDI trends in India and changed the investment climate, had been implemented through critical programs supported by both the World Bank and IMF in a bid to obtain loans to

overcome the serious foreign exchange market crisis. Further liberalization of its market was required as a trade-off to obtain loans and access development programs. This process carried risks as well because if India was unable to live up to its promises for reform, investors were ready to exit the country. However, if the government pushed hard on reforms, it was likely to cause turbulence and severe reactions from internal oppositions (Ghosh, 2006).

The concrete implications of reforms that India had to abide by included an allowance of up to 51 percent of equity for thirty-four industries that were on the priority list, extensive reduction of tariffs on imports, abolishment of industrial licensing excluding only a few industries and immediate approval of FDI for the majority of the Indian economic sectors (IMF, 2005). In addition, there were also other incentives in property and sales taxes, capital grants, direct financial support and state sponsored assistance to aid investors through feasibility studies for project analysis of their specific areas of interests (Oman, 2000). Throughout this period, to ensure that India retained and enhanced competitiveness, the government continuously conducted systematic revisions of the existing FDI guidelines and enacted updated regulations to further liberalize the market (DIPP, 2012b).

These new reforms had very significant positive implications in the following years. The introduced FDI policy changes opened the door for many prestigious MNCs to target India's marketplace because of the favorable investment incentives and institutional environment to conduct business there. Many structural reforms that were initiated and instituted along with new approaches that eased the FDI approval procedures and relaxed extensive bureaucratic conduct turned out to be rewarding. While the total inflows from 1980 to 1990 (table 1) was about $1,284 million, the inward FDI from 1991-2000 increased more than 14-fold to account more than $18,516 million. Moreover, in the next 10 years, FDI inflows boomed with the largest amount received in India's history (table 2).

Table 2. FD Inflows from 1991 to 2010 ($ millions)

1991	75	2001	5477.638
1992	252	2002	5629.671
1993	532	2003	4321.076
1994	974	2004	5777.807
1995	2151	2005	7621.769
1996	2525	2006	20327.76
1997	3619	2007	25349.89

1998	2633	2008	42545.72
1999	2168	2009	35648.78
2000	3587.9897	2010	24639.92

Source: UNCTAD Stat (2012)

The characteristics of the increased number of registered foreign companies in India during this period was the return of MNCs like Ford, General Motors and IBM that had ceased their operations and left the country in previous decades due to imposed restrictions on foreign investors. In addition, the largest number of MNCs that entered the marketplace from 1991 to 2000 was from the European Union and Asia. They accounted for about 65% of total inflows (Nayak, 2008) whereas, in the previous years, companies from the UK and USA were the majority.

The overall findings derived from the post reform era of trade liberalization are supported by other research (Rolfe et al., 1993; Blomstrom & Kokko, 1998; Pradhan, 2000; Tian, 2007). New changes triggered an FDI boom, strengthened India's credibility, enabled the government to develop local industries and raised the competitive level for all actors involved in the market. Domestic firms benefited greatly from the new composition of foreign investors as they were exposed to new business strategies and organizational skills, while cooperating with their foreign counterparts through joint ventures and other forms of partnerships. The Indian labor force engaged with MNCs also managed to acquire a different and pertinent set of skills and capabilities from their experiences.

6. Current FDI Policy

According to the most recent consolidated Indian policy, 100 percent of FDI is allowed in the majority of sectors under the automatic route. The nature of conditions to which foreign investors may be subject prior to approval include requirements concerning the minimum lock-in periods or capitalizations. On the other hand, the only prohibited sectors for non-resident investors are: multi-brand retailing, lottery, manufacturing of tobacco related products, atomic industry, railways, chit fund, trading in transferable rights and Nithi company (DIPP, 2012a).

All these highly protected sectors are considered of national interest by the Indian government. Entrance of MNCs not only may create a monopoly in some of the highly protected industries, but it can also lead to allocation of enormous economic powers to limited foreign investors (Kumar, 1994). Liberalization of these sectors carries both risks and benefits. While relaxations of the FDI policy will ultimately

increase inflows, it can also create disturbances for local businesses and can drag them into bankruptcy if they are not able to withstand competition from their foreign counterparts. The most recent proposed significant change in the FDI policy relates to the retail sector which was aimed at attracting many large multi-brand MNCs across the world.

The proposed retail policy changes that were initially approved at the end of 2011, were supposed to allow MNCs to own a maximum of 51 percent. However, the decision was abolished because of the harsh criticism from opposition political parties and concerns raised by small shop owners throughout the country (Hu et al., 2012). Currently, investments are allowed only into single brand product retailing, allowing investors to own up to 100 percent of the equity. However, MNCs engaged beyond 51 percent are obliged to source 30 percent of their products from locals whose products are made in India (DIPP, 2012a).

7. Conclusion

Changes of FDI policies in India, especially after the reforms and liberalization of 1991 played an enormous role in the increased inflows. The historical FDI developments in India show how a government can maneuver with its FDI policy to strengthen domestic firms, develop core industries, protect areas of national interest and still ensure systematic flow of inward FDI. The overall picture of FDI developments in India, from its independence until now, depicts critical key lessons that can be learnt for other developing countries:

Firstly, India's experience shows that market size does not necessarily determine the levels of inward FDI. Despite its huge market, foreign investors ceased their operations in India when they deemed that unfriendly government policies would undermine their profit-making capabilities and limit their economic power to a large extent. However, appropriate reforms and policy relaxations had the opposite effect. This shows that economies can become successful regardless of their size only if respective governments are capable of coming up with efficient FDI policies that would maximize the levels of inflows while ensuring that MNCs presence does not create a disturbance in the markets and threaten the existence of domestic firms. Secondly, developing countries should seek the support of international institutions and experts if needed to speed up their reforms and catch up with other countries that are succeeding in this direction. The access to development programs helped India to arrive at this stage.

Thirdly, this case study shows that import-substitution policies can aid development of infant local industries and domestic firms in the short-run. Policies that are aimed at the establishment of a strong local base proved to be significantly important. However, this approach is not sustainable in the long-run. Exposure to

competition and not government protectionism measures ultimately helps local companies to catch up with their foreign counterparts in terms of technology, efficiency, knowledge and expertise. Fourthly, India's experience implies that the process of FDI liberalization ought to follow a proactive pattern rather than a reactive one. The relaxation of policies should be planned ahead and occur systematically, because if they emerge in response to a severe crisis, it may limit the bargaining and negotiation power of a government if the need for international support arises.

The main limitation for this paper is the single case approach endorsed for this study, as depicted by Stark and Torrance (2005) and Bryman (2008), which may relate to the issues of generalization. Sometimes, a single exploratory experience may not provide sufficient grounds and be used for all other scenarios. However, findings in this paper can greatly contribute for FDI policy-makers to be more cautious and more pragmatic in order to achieve desired goals and objectives. Further research on this matter for other countries will be vital to advance the role of FDI policy developments.

8. References

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