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DOES TRADE LIBERALIZATION CAUSE FDI INFLOW OR VICE VERSA? THE CASE OF CROATIA

ABSTRACT

In the last ten years Croatia has achieved significant breakthroughs in global and regional trade liberalization. Simultaneously, it has built a stimulating investment framework and attracted big amounts of FDI per capita. The aim of the study is to determine whether there is a relationship between trade and FDI inflow in Croatian economy and in what directions. Using the cointegrating vector approach and the VECM model, it has been established that there is no direct connection between FDI and trade flows. The results imply unidirectional casual relationship that runs from import to FDI and the one that runs from export to import. This could be explained by the unfavourable structure of Croatian export as well as the brownfield investment domination in Croatian economy.

JEL: F13, F14, F21, F31.

***Key words**: export, import, FDI, cointegration, VECM model*

1. Introduction

Croatia is facing many development challenges which are the consequence of the transition process, but are also the result of intensification of international activities and integration efforts. Croatia can be seen as a country that has missed the first wave of the EU enlargement to the countries of Central and East Europe, while at the same time it is the most advanced in the group of countries of the South East Europe regarding the economic development, trade liberalization, relations with the EU, political and democratic changes, level of corruption, etc. But despite the above mentioned, Croatia is still facing a very high foreign trade deficit, which means that it failed to find the way to increase export and to change its structure.

On the other hand, in the past ten years Croatia has received high amounts of foreign direct investment (FDI) per capita, which obviously have not resulted in changes in the real sector, which is not surprising considering the majority of foreign capital went into service sector. The aim of this study is to investigate whether the processes of trade liberalization and foreign capital inflows are related and if so, in what way. The research will establish the

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determinants of trade (export and import) and capital flows in order to determine whether they overlap and to what extent.

The implications of regional trade liberalization on Croatian foreign trade will be examined, as well as its implication on the increase in investment. In the first part we will explain a theoretical connection between trade and FDI flows, but we will also discuss the literature review on this topic.

The second part presents the framework and elements of Croatian trade liberalization, and the third part analyzes the investment climate in Croatia. The first framework is important because it determines the conditions of placing Croatian products on the most significant export markets as well as the conditions for import products entering Croatia, so that there is a direct connection with the export and import size. The other framework is the indispensable policy of attracting FDI, not just size-wise, but in terms of structure as well. Political and economic stability, functioning of the rule of law and level of corruption are just some of the elements of this policy. Along with the critical review and the summary of the most important elements of these two policies, the study will analyze the most significant data on Croatian foreign trade and the FDI inflows into Croatian economy.

The Republic of Croatia became a full member of WTO in 2000, it signed the Stabilization and Association Agreement (SAA) with the European Union in 2001 and became a member of CEFTA in 2003. All these activities have had an influence on the growth of confidence of the investors in Croatia, which is mostly reflected in the higher FDI inflows from the countries of Western Europe that were the biggest investors in Croatia. The forming of regional trade agreements may affect the inflow of FDI depending on the investor's motives: if the predominant motive is market enlargement, then the regional association of countries will influence the growth of FDI, if the prevailing motive is ownership or internalization advantages they are not expected to impact on the growth of FDI.

If we consider Croatia, it is interesting to see how signing the SAA with the EU would affect the inflow of capital from investors from other countries (primarily developed European states).

The fourth part presents the analysis of the relationship between trade and investment flows in Croatia. The analysis was carried out by using Granger causality methodology to test the relationship between FDI inflows and exports, and FDI inflows and imports. Since the variables are not stationary, the analysis was supplemented with the cointegration approach and vector error correction model (VECM), which are recommended when investigating the relationship between non-stationary variables.

2. Theoretical Background

The liberalization process on multilateral level referred mainly to the trade of goods while the liberalization of capital movements took place slowly. Therefore, in the beginning the prevailing opinion was that trade preceded the movement of capital in terms of business decisions on how to supply a particular market (whether it is better to export to a specific market or move production within the country). We are interested in the effects of FDI inflows on host country economy. In theory, there are opinions and arguments that FDI inflows can substitute import through opening of foreign companies on the market of host country. As a result, there is an improvement of current account balance, positive impact on domestic production and employment growth. But also, because of increased production it can reach growth of import inputs (raw materials, materials, intermediary products), which then entails the opposite effects from those mentioned in the previous case. Dynamic positive long-term effects of FDI should be pointed out as well, they are manifested through the transmission of technology, job training and management practices that affect the growth of

competitiveness. Conversely, the latest researches have established connections between trade and capital (FDI) flows, where FDI creates the possibility of creating new forms of trade, fosters exports, import substitution, or greater trade in intermediary inputs, especially affiliate producers. (Markusen, 1997; Goldberg&Klein, 1997).

The problem of interdependence of trade liberalization and the FDI inflow is examined on the example of many countries and regional integration, and we will start with the selected results of existing researches defining the interdependence of trade and FDI in different countries or groups of countries.

Researches regarding the relationship between trade and investment movement are mostly focused on the question of whether these movements are substitute (are expected to move in opposite directions) or complementary (are expected to move up and down together). The answer to this question is often a contradictory one, because it depends on the particularities of each country as well as the characteristics of its economy. (Jensen, 2005).

In fact, through these differences, the complexity of the theory of multinational enterprises and FDI reveals itself, which rests on the market imperfection. There are many determinants of movement of capital among countries, from the domestic market size, economic growth, risk, corruption, to openness and belonging to a particular trade block. Dunning introduced an eclectic paradigm, known as the OLI paradigm (Dunning, 1992) pointing out three important elements that must be present in order to motivate the investors to invest in a particular country: ownership, internalization and foreign market (location) advantages. There are so many different implications of FDI on the export and import depending on its motives. Horizontal FDI replaces trade: instead of exports, companies begin production in a foreign country and thus have less trading costs (Horstmann and Markusen, 1992). So it comes to reducing trade - so called tariff-jumping FDI. On the other hand, the vertical FDI impact on the division of production in less intensive segments that use different factors of production - each segment is located in the country that is abundant in the required factor (Heplman, 1984). Since these parts should be connected, they affect the growth of trade, which is facilitated by reducing or eliminating trade restrictions, and such FDI are complementary with the trade trends. Multinational companies in this situation can operate much more efficiently.

Zarotiadis& Mylonidis (2006) analyzed the relationship between trade and FDI in the UK and they confirm the predominant finding in literature, which suggests that trade and FDI are complements.

Pontes (2005) concludes that the relationship between FDI and trade costs is non-monotonic and is positive for high values of trade costs, where FDI and trade behave as complements. But it becomes negative for low values of trade costs, with trade and FDI then behaving as substitutes.

Apart from these distinctions there are different aspects of researching interdependence of trade and capital movement. Ponce (2006) distinguishes between direct (only trade and FDI are observed, other variables are ignored) and indirect relationship of these variables (more variables are included through which the mutual causality of trade and FDI is achieved). In indirect connection, he includes the following variables: exchange rate, current account deficits, inflation, and the size of country and proves that the country of Latin America that signed more free trade agreements – or the most relevant free trade agreements (with the largest economies in the world) – increased their effectiveness in attracting FDI. Through the implementation of these free trade agreements, these governments could enhance scale economies and increase the level of certainty for foreign investors (favorable rational expectations), which are vital in order to attract FDI flows.

Zakharov and Kušić (2003) underline the importance of high FDI inflows as they are crucial for the successful transition and especially for the catching-up process of the Western Balkans while trying to reach the levels of the most advanced transition economies.
Aizenman and Noy (2005) investigated the intertemporal linkages between FDI and disaggregated measures of international trade. They found that the strongest feedback between the sub-accounts is between FDI and manufacturing trade: most of the linear feedback between trade and FDI (81%) can be accounted for by Granger-causality from FDI gross flows to trade openness (50%) and from trade to FDI (31%).

Hisarciklilar et al. examine the relationship between growth, foreign direct investment and trade and in the long run they observed no significant relationship between these variables for most Mediterranean countries. FDI in these countries has been mostly import substituting and the integration to the EU wouldn't enhance FDI inflows and growth in this region.

Biglaiser and deRouen (2006) found a positive relationship between the degree of "openness" and the amount of FDI. However, the values of the estimated coefficients were very low and statistically nonsignificant in all their estimated models. The reason is that the connection between these two variables is complex, and their relationship is mostly affected with the country entrance to a certain form of preferential trade agreement and unilateral reduction of customs duties that can not be seen in the indicator of openness.

Fontagne (1999) pointed out the complexity of relationship between trade and direct investment. Empirical work shows that until the mid 1980s, international trade generated FDI and after this period, the cause-and-effect relationship seems to have been reversed: FDI influences trade. The nature and extent of the relationship (complementarity or substitution) can differ from one country to another.

Bevan and Estrin (2004) proved the positive relationship between FDI and the openness of the economy i.e. FDI is encouraged if the trade regime of the host economy is liberal and because, given internalization advantages for investing firms, multinational firms have a higher propensity to export. Trade and openness work together; trade liberalization enhances FDI, and openness increases the spillover benefits from FDI. On the other hand, big FDI inflow influences on the trade increase, total factor productivity improvement, and on the higher growth rates.

3. Croatian Foreign Trade Policy Liberalization

The Republic of Croatia is a part of the South Eastern Europe region, and it is important to point out the processes and achievement of multilateral and regional trade liberalization. On global scene, Croatia requested to access the GATT in as early as 1993. On 30th November 2000 Croatia became a full member of WTO, which has determined its foreign trade policy. Joining the WTO is a guarantee of compliance with the global "rules of the game" and a proof of a transparent foreign trade policy.

For a small country such as Croatia, regional trade liberalization is very important. This is why Croatia has been interested in signing the agreement with the European Union from the moment it achieved its independency. This process was disturbed by the political situation in the countries of former Yugoslavia and Croatia had actually lost a decade in the relations with the European Union. It signed the Stabilization and Association Agreement (SAA) in 2001 within the context of a specific policy which the EU established toward the Western Balkan countries in 1999 (The Stabilization and Association Process, SAP). Although, before signing the SAA, through a number of decrees, the EU formed a preferential trade policy towards Croatia, the SAA provides a broader dimension because it involves cooperation and regional cooperation, the right of establishment, political dialogue,

cooperation in justice and home affairs, Croatia has a possibility of unrestricted placement of almost all products on the EU market, except fish and fish products, wine, sugar, baby beef. According to the SAA, Croatia is given 6 years for a gradual liberalization of its foreign trade system for the industrial products from the EU (i.e. since 1 January 2008 Croatia has not been limiting imports from the EU). Agricultural products are under a specific regime which guarantees a six-year transitional period. However, unlike industrial products, where after the transitional period all products have to be liberalized, when agricultural products are concerned, certain tariff protection is expected even after the transitional period. It is important to point out that there remains the possibility of applying protective measures in case of higher increase in imports that may threaten the stability of the domestic market.

The third aspect of liberalization refers to the trade relations with the Southeast Europe countries. This liberalization comes after peace and stability have been achieved in the region's countries. Stability Pact (SP) for South-Eastern Europe in 1999 played a very important role in a long-term prevention strategy. (Stability Pact, http://www.stabilitypact.org/about/default.asp)

In 2001 the Memorandum of Understanding on Trade, Liberalization and Facilitation in South Eastern Europe[1] was signed by Albania, Bosnia & Herzegovina, Croatia, Macedonia, Serbia and Montenegro, Bulgaria and Romania. The principle aim of the Memorandum was to boost regional stability by triggering the process of building trust through intensive trade interaction. In this way, 32 bilateral agreements were made in a very short time (3 years), which, although containing similar main guidelines, varied in a few significant fields (coverage of agricultural goods, public procurement and services). The implementation of these agreements was quite complex and different regarding the coverage of goods and tariff reduction in specific product categories. So, they could not influence trade growth, but they helped improve political and economic relations between the countries and a single agreement would yield even more benefits.

The decision was made that a number of bilateral agreements between the Southeast Europe countries is to be replaced by joining CEFTA (Central European Free Trade Agreement). In December of 2006, Albania, Romania Bulgaria, Croatia, Macedonia, Montenegro, Kosovo, Moldova and Serbia signed the Agreement on the CEFTA Enlargement. Some of its goals have been: trade liberalization; increase of mutual trade and direct investments in SEE; business operation facilitation, improvement and strengthening of overall trade and economic relations in the region. (Official Gazette 6/2007)

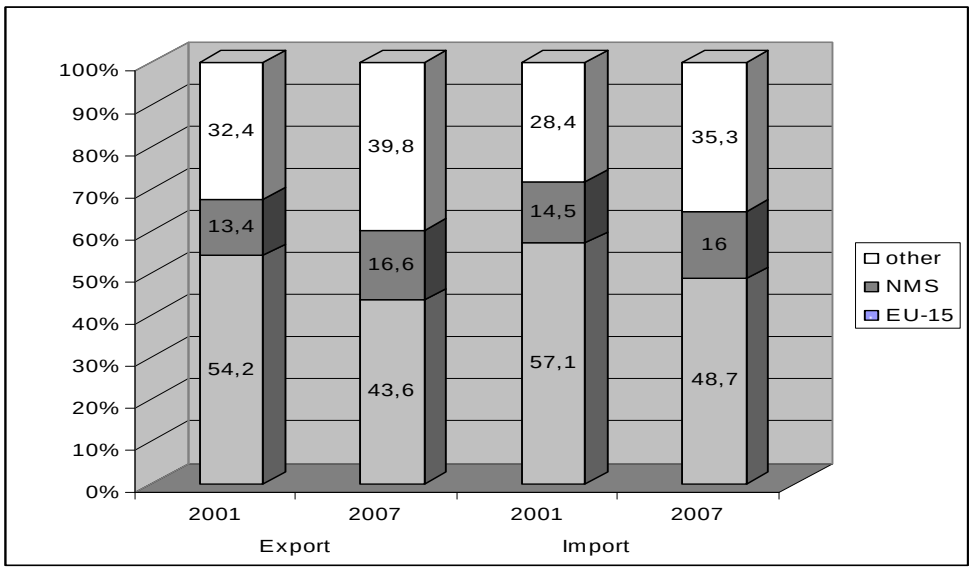
In July 2007, the new CEFTA Agreement comes into force and the creation of the free trade area is scheduled for 31 December 2010 at the latest. This is why there are two reasons for not being able to determine the effects on the Croatian foreign trade: the time of its functioning is too short and the number and structure of the CEFTA countries[2] have since changed.

[1] Moldova accepted the Memorandum later as well.

[2] Before 2006 CEFTA's members were all CEE countries which entered the EU in 2004 along with Bulgaria and Romania. Croatia became a full member of CEFTA in 2003.

Figure 1

Croatian foreign trade regional structure in 2001 and 2007



Source: Statistical Yearbook of Croatia 2002, Foreign Trade in Goods of the Republic of Croatia, 2007 Final Data (First release), Central Bureau of Statistics, Available at: http://www.dzs.hr.

Figure 1 shows that the largest part of Croatian external trade is carried out with the European Union member countries. Looking at the entire EU, its share in the Croatian exports fell from 67.6% (2001) to 60.2% (2007), a share of the imports decreased from 72.5% to 64.7%. So, despite the increasing number of member states, the EU share in the Croatian exports and imports was reduced. With respect to the two EU enlargement phases, it is more precise to compare the shares of EU-15 ("old" member states) and shares of new member states. The share of the EU-15 in Croatian export and import decreased to about 9 percentage points, while trade with the new Member States and other countries is increasing. This is primarily the result of the growth of trade with Slovenia, Bosnia and Herzegovina and Serbia. The share of the member countries of "CEFTA 2006" in Croatian export increased from 19.1 to 22.3% in 2007 compared to 2006, while the import share increased by only 0.22 percentage points and represents only 5% of the total Croatian import. Finally, it can be concluded that the regional trade liberalization led to the growth of trade, especially export to the CEFTA countries, while liberalization of trade with the EU did not affect a significant trade growth, i.e. trade with the EU grew at lower rates than the total trade growth. The most important countries for Croatian export in 2007 are: Italy (19%), Bosnia and Herzegovina (14.4%), Germany (10%), Slovenia (8.3%) and Austria (6.1%), while Croatia imports mostly from: Italy (16%), Germany (14%), Russia (10%), China (6.2%), Slovenia (5.9%) and Austria (5.3%).

4. Investment Flows and Investment Policy in Croatia

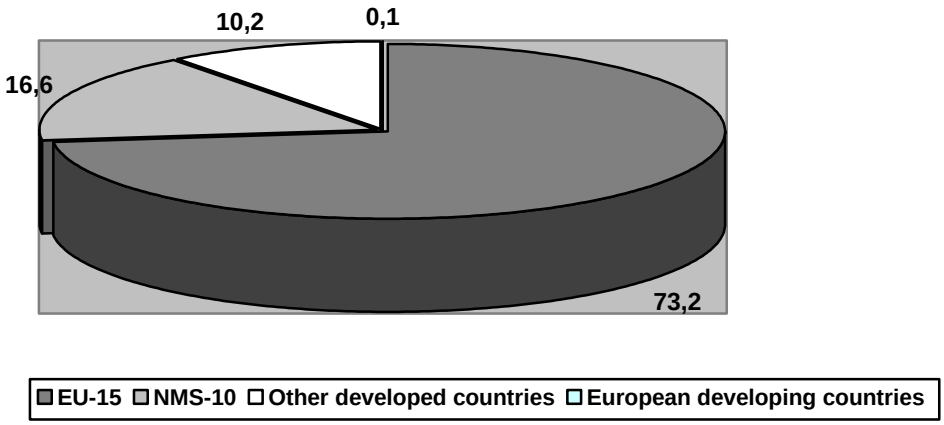
The data on FDI inflow in Croatia show that regarding the FDI per capita it belongs to the top of the European transition countries (WIIW, 2008). The legislative framework which regulates the policy of attracting FDI is a very important determinant of country's eligibility. The Croatian Parliament passed the first Law on Foreign Investments Stimulation in 2001, which brought certain benefits to foreign investors: support to employment and re-training of

employees, differential exemption of profit tax depending on the volume of investments and number of employees; cession of the land and real estate; and the like. The new law was passed in 2006 (in effect since January 1, 2007) and it provides foreign investors with significant benefits: tax relief and customs privileges. (Official Gazette No. 138/2006) It increased the number of incentives, changed the height limit for granting tax relief: investors enjoy additional benefits if they invest in the counties with high unemployment rate. Profit tax rate in Croatia is 20%, which makes it very attractive since the rate in the majority of developed countries is much higher. The Agency for Promotion of Exports and Investment was founded in 2002, its primary goal being: providing full service to investors in the realization of investment projects, proposing measures for improving venture environment and presentation of Croatia abroad as a desirable investment location (http://www.apiu.hr).
The policies of attracting FDI, that is, the investment climate are very complex and include many segments of economic and political reality that are included in The Investment Reform Index (IRI).

Based on the detailed index and sub index presentation, there are strong and weak sides of investment climate in Croatia. Policy dimensions that are more advanced are: trade policy; investment policy, human capital, tax policy, anti-corruption and business integrity. Less advanced policy dimensions are: regulatory reform, investment promotion and facilitation, competition policy (Investment Reform Index 2006),

Figure 2.

Foreign Direct Investments in Croatia from 1993 to 2007 by countries (in %)

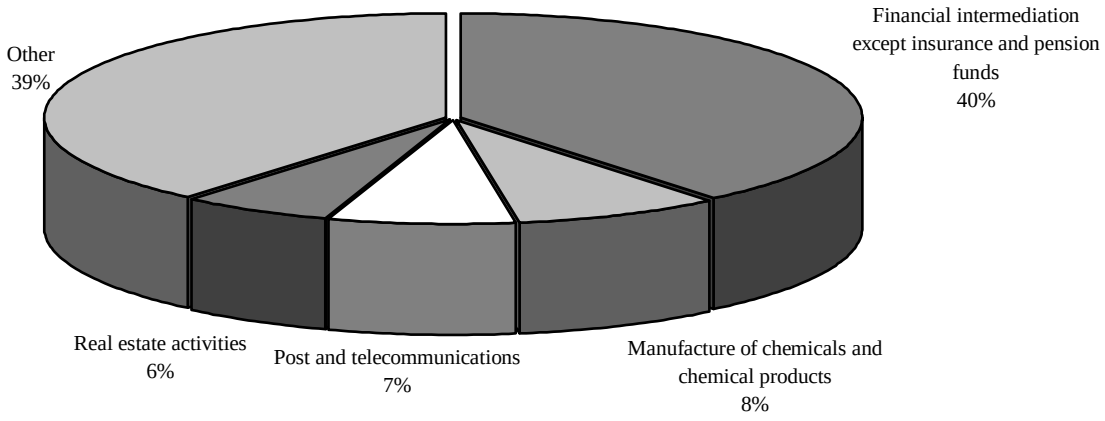


Source: Croatian National Bank, Statistics on FDI, Available at: http://www.hnb.hr.

Figure 2 shows that the EU Member States are the largest investors in the Croatian economy. Considering old and new members together, their share is 90%. The largest investors are: Austria, Netherlands, Germany, France and Hungary. Compared with significance for exports and imports, the share of EU countries in FDI in Croatia is significantly higher.

Figure 3

Foreign direct investment in Croatia by activities in the period 1993-2007

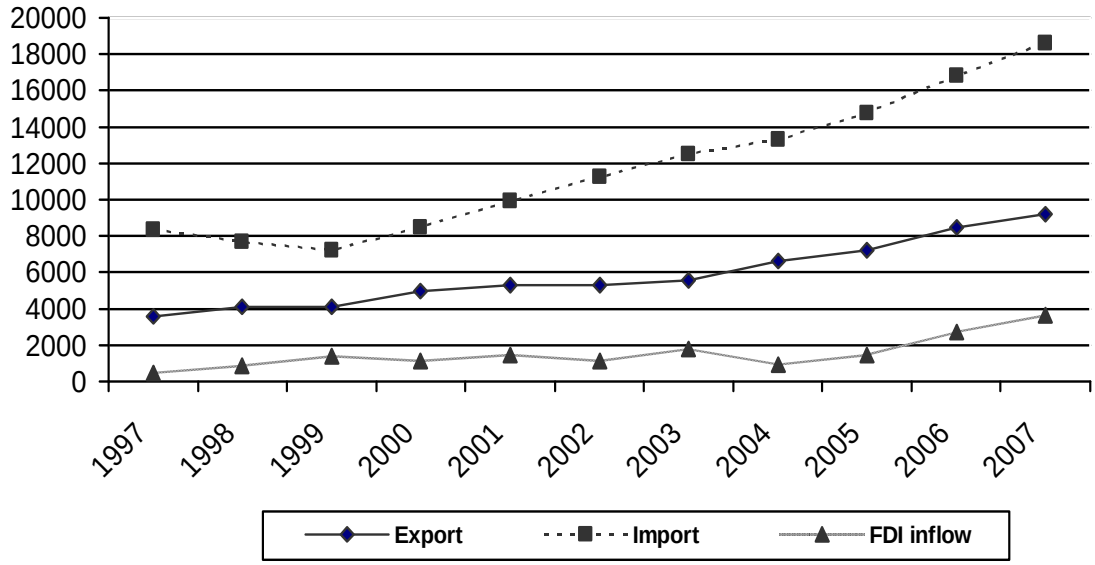


Source: Croatian National Bank, Statistics on FDI, Available at: http//www.hnb.hr

It is clear that themajority of FDI inflows in Croatia has gone to the service sectors (financial intermediation, post and telecommunication) which are oriented to supply the domestic market (consumption). Only a small part of foreign capital was invested in domestic production (chemical industry, manufacture of coke, manufactures of food products and beverages, etc.) and this is the reason why the Croatian production (export) structure wasn't changed in the observed period.

Figure 4.

Export, import and FDI inflow in Croatia in the period 1997-2007 in EUR mn



Source: Croatian National Bank, Statistics on FDI, Available at: http://www.hnb.hr, Statistical Yearbook of Republic of Croatia 2008, Central Bureau of Statistics, Available at: http://www.dzs.hr.

Figure 4 shows the movements of export and import and the FDI inflows into Croatian economy. It is obvious that the value of export and import is much higher than that of FDI and their higher growth is especially noticeable at import which reached 18,6 billion euros in 2007. The FDI inflow does not show a continuous growth tendency, it varies from one year to another, which is mostly affected by the privatization of big Croatian companies. Since 2005 the FDI inflow has had a tendency to grow and has passed to the level of 2 billion euros per year and in 2007 it reached the amount of 3,6 billion euros. In the last three years we can see a growing tendency in all three variables, however, a longer time period will be considered in further analysis in order to determine whether there is interdependence between the three.

5. Relationship between trade liberalization and FDI flows

5.1. Methodology

Granger causality test

A method often applied to investigate causal relationships between variables empirically is Granger-causality analysis. The basic principle of Granger-causality analysis (Granger, 1969) is to test whether or not lagged values of one variable help to improve the explanation of another variable from its own past.

We use the Granger causality methodology to test for the relationship between FDI inflows and exports, and FDI inflows and imports. In a bivariate framework, the variable x is said to cause the variable y in the Granger sense if the forecast for y improves when lagged variables for x are taken into account in the equation, ceteris paribus. Testing causality involves using an F-test (or Wald test). The appropriate formulation of a Granger-type test of causality (which must be applied to stationary series) is:

$$X_t = \beta_0 + \beta_1 X_{t-1} + \ldots + \beta_j X_{t-j} + \theta_1 FDI_{t-1} + \ldots + \theta_j FDI_{t-j} + \mu_t \quad (1)$$

$$FDI_t = \delta_0 + \delta_1 FDI_{t-1} + \ldots + \delta_j FDI_{t-j} + \gamma_1 X_{t-1} + \ldots + \gamma_j X_{t-j} + \nu_t \quad (2)$$

$$M_t = \varphi_0 + \varphi_1 M_{t-1} + \ldots + \varphi_j M_{t-j} + \alpha_1 FDI_{t-1} + \ldots + \alpha_j FDI_{t-j} + \sigma_t \quad (3)$$

$$FDI_t = \psi_0 + \psi_1 FDI_{t-1} + \ldots + \psi_j FDI_{t-j} + \xi_1 M_{t-1} + \ldots + \xi_j M_{t-j} + \tau_t \quad (4)$$

$j = 1, 2, \ldots, N$

where:

- X is exports,
- FDI is foreign direct investment inflows,
- M is imports;
- μ_t, ν_t, σ_t, and τ_t are error terms with zero mean.

In equation (1), the null hypothesis 'FDI does not Granger cause X' ($\theta_1 = \ldots. = \theta_j = 0$) is tested using a standard F-test (Wald test). It is rejected if the θs are jointly significantly different from zero. Similarly, in equation (2) the null hypothesis 'X does not Granger cause FDI' ($\gamma_1 = \ldots = \gamma_j = 0$) is rejected if the γs are jointly significantly different from zero. The same procedure applies for equations (3) and (4).

A single-equation specification cannot fulfil the aim of this study. Instead, we set up a Vector Auto Regression (VAR) system, which treats all variables symmetrically. Sims (1980) was the first to introduce the VAR technique in econometric modelling to analyze the dynamic impact of random disturbances on the systems of variables. In a standard VAR

model, each endogenous variable in the system is modelled as a function of its own past lags and the past lags of other endogenous variables.

$$X_t = a_1 + \sum_{j=1}^{k} b_{1j} X_{t-j} + \sum_{j=1}^{k} c_{1j} M_{t-j} + \sum_{j=1}^{k} d_{1j} FDI_{t-j} + e_{1t}$$

$$M_t = a_2 + \sum_{j=1}^{k} b_{2j} X_{t-j} + \sum_{j=1}^{k} c_{2j} M_{t-j} + \sum_{j=1}^{k} d_{2j} FDI_{t-j} + e_{2t}$$

$$FDI_t = a_3 + \sum_{j=1}^{k} b_{3j} X_{t-j} + \sum_{j=1}^{k} c_{3j} M_{t-j} + \sum_{j=1}^{k} d_{3j} FDI_{t-j} + e_{3t}$$

where *X*, *M* and *FDI* are exports, imports and FDI, respectively; *a*, *b*, *c*, and *d* are parameters; the *e*'s are error terms; and *k* is the order of the VAR, *i.e.*, the maximum number of lags in the system. For the $\{FDI_t\}$ equation to be unaffected by exports, all the b_{3j} must be equal to zero; and for the $\{FDI_t\}$ equation to be unaffected by imports, all the c_{3j} must be equal to zero. Similar logic applies to $\{X_t\}$ and $\{M_t\}$.

Before estimating the VAR system, it is important to determine the trending nature of data series using standard statistical techniques. Macroeconomic time series generally tend to have unit roots, i.e. they are not stationary or their variances increase with time. OLS (ordinary least squares) may generate spurious correlation when regressing levels of non-stationary time-series variables that contain trend components. In such situations, Granger causality test results may be misleading.

Unit root test

Prior to testing the long run and non-causality, it is necessary to establish the order of integration presented. An Augmented Dickey Fuller (ADF) was carried out on the time series levels and difference forms. According to Johansen's (1988) technique, to avoid spurious results in the causality testing we need to proceed as follows: firstly, to determine the order of integration of the series. Secondly, to identify the possible long-term relationships among the integrated variables included in the system. In the absence of cointegration vector, with I(I) series, valid results in Granger causality testing are obtained by simply first differentiating the VAR model. With cointegration variables, Granger causality will further require inclusion of an error term in the stationary model in order to capture the short term deviations of series from their long-term equilibrium path.

The reason we used ADF test is that it takes into account possible autocorrelation of errors. If the errors are autocorrelated, OLS method would not be efficient.

The ADF test equation is:

$$\Delta Y_t = \delta Y_{t-1} + \sum_{j=1}^{k} \delta j \Delta Y_{t-j} + \varepsilon_t$$

In essence, the ADF test is the testing of whether the estimate (obtained by the ordinary least squares method) of the parameter δ from the equation is significantly negative. Namely, in the case when the parameter δ is less than zero it follows that the parameter ρ is less than one and, consequently, the time series is integrated of order zero, i.e. it is stationary. If the parameter δ is equal to zero, the observed series has the characteristics of the process of the random walk. This process is a non-stationary stochastic process of the first order of

integration.[3] The number of lags *k* should be relatively small in order to preserve the degrees of freedom, but large enough to remove the autocorrelation of errors. In addition to the ADF test, we used the PP test since it proposes an alternative method of controlling serial correlation and increases the power of the test, which is one of the main flaws of the ADF test. In addition to these two tests we also used the KPSS test which is slightly different than the previous one since it assumes that the series is stationary. The test can be described as follows:

Assume a time series process y_t which has the following behaviour:

$y_t = \delta t + \psi_t + \varepsilon_t$ and $\psi_t = \psi_{t-1} + \omega_t$ where $\omega_t \text{ niid } (0, \sigma^2)$

The null hypothesis to be tested is $H_0 : (\psi_t = k)$ where k is a constant.

Basically, this is a test for parameter constancy against the alternative that the parameters follow a random walk. The KPSS test is useful as it serves as a confirmatory test.

Cointegration approach

If the time series are non-stationary, the stability condition for VAR is not met, implying that the Wald test statistics for Granger-causality are invalid. In this case, the cointegration approach and vector error correction model (VECM) are recommended to investigate the relationships between non-stationary variables.

Engle and Granger (1987) pointed out that when a linear combination of two or more nonstationary time series is stationary, then the stationary linear combination, the so called cointegrating equation, can be interpreted as a long-run equilibrium relationship between the variables. In a VECM, long and short-run parameters are separated, which gives an appropriate framework for assessing the validity of the long-run implications of a theory, as well as for estimating the dynamic processes involved.

The short-run dynamics of the model is studied by analyzing how changes in each variable in a cointegrated system respond to the lagged residuals or errors from the cointegrating vectors and the lags of the changes of all variables.

In this study, two cointegration vectors (ranks) are possible since we have three endogenous variables in the system. Dummy variable indicates the signature of SAA. If one cointegration relationship exists, then the following VECM model is used to analyse causality.

$$\Delta X_t = \alpha_1 + \alpha_x ect_{t-1} + \sum_{j=1}^{k-1} \beta_{1j} \Delta X_{t-j} + \sum_{j=1}^{k-1} \gamma_{1j} \Delta M_{t-j} + \sum_{j=1}^{k-1} \delta_{1j} \Delta FDI_{t-j} + \theta_1 D_{01} + \varepsilon_{1t}$$

$$\Delta M_t = \alpha_2 + \alpha_m ect_{t-1} + \sum_{j=1}^{k-1} \beta_{2j} \Delta X_{t-j} + \sum_{j=1}^{k-1} \gamma_{2j} \Delta M_{t-j} + \sum_{j=1}^{k-1} \delta_{2j} \Delta FDI_{t-j} + \theta_2 D_{01} + \varepsilon_{2t}$$

$$\Delta FDI_t = \alpha_3 + \alpha_{fdi} ect_{t-1} + \sum_{j=1}^{k-1} \beta_{3j} \Delta X_{t-j} + \sum_{j=1}^{k-1} \gamma_{3j} \Delta M_{t-j} + \sum_{j=1}^{k-1} \delta_{3j} \Delta FDI_{t-j} + \theta_3 D_{01} + \varepsilon_{3t}$$

[3] $Y_t = \rho Y_{t-1} + \varepsilon_t$ is an autoregressive equation. In the null hypothesis the parameter ρ is equal to1. In case this hypothesis is accepted, the variable has the characteristics of the process of the random walk. ρ can be rewritten to $\rho = 1 + \delta$.

5.2. Empirical testing and results

The data is observed at quarterly intervals from 1997:Q1 to 2008: Q3 for the Croatian economy. The data on export and import of goods and FDI inflow were obtained from the Bulletin of CNB. Figure 1 plots each time series expressed in the natural logarithm. The plot reveals that the moments of the distribution (mean and Variance) are changing over time, suggesting series to be non-stationary. Plots of the first difference of logged variables in Figure 2, which refers to growth rates of the variables, show no definite pattern over time, thus indicating the first difference to be stationary. However, a formal test is required to confirm time series properties. Table 1 reports the results of Augmented Dickey Fuller (ADF), Phillip Perron (PP) test and KPSS test of unit root by lag length chosen based on minimum values of Akaike criterion (AIC) and Hannan-Quinn (HQ). The tests are performed on both the level and first differences of the logged variables.

Table 1

Unit root test in levels

	ADF		PP		KPSS	
	C,T	**C**	**C,T**	**C**	**C,T**	**C**
FDI	-5.357	-4.229	-5.361	-4.171	0.096	0.631
EXPORT	-0.524	-0.524	-3.627	0.798	0.186	0.865
IMPORT	-1.834	1.759	-4.719	0.030	0.201	0.872
Test critical values for C,T*:			1% level		-4.170	
			5% level		-3.510	
			10% level		-3.185	
Test critical values for C*:			1% level		-3.592	
			5% level		-2.931	
			10% level		-2.603	

* The critical values refer to ADF and PP tests.

As shown in Table 1, export and import have unit roots, whereas FDI is stationary[4]. Export and import show random walk with drift, i.e. they must be first differenced in order to become stationary since they are integrated of order one I (1).

Table 2

Unit root test in 1st difference

	ADF		PP		KPSS	
	C,T	**C**	**C,T**	**C**	**C,T**	**C**
FDI	-4.721	-4.792	-22.808	-22.775	0.346	0.422
EXPORT	-7.593	-7.232	-28.786	-16.105	0.168	0.287
IMPORT	-3.159	-2.088	-49.873	-18.410	0.226	0.342

[4] ADF and PP test not shown in Table 1. imply that FDI exhibit a pure random walk (without constant and trend), whereas KPSS test implies that FDI is a random walk with drift at 5% level of significance.

Although unit root tests have given mixed results about the nature of FDI series we decided to run a cointegration test. After confirming that variables export and import are I(1) in levels, the next step is to conduct the cointegration test by applying maximum likelihood estimation procedure developed by Johansen & Jeselius (1990, 1992). Before carrying out the co-integration analysis, it is important to ascertain that appropriate lag length has been chosen so that residuals are uncorrelated, normally distributed and homoskedastic. The optimal lag selection test confirms lag order of 3 based on diagnostic test since VAR with fewer lags exhibit autocorrelation. Information criteria do not give a consistent result: minimum Akaike's Final Prediction error (FPE), Hannan-Quinn information (HQ) and LR values suggest VAR (4), whereas Schwartz Information Criteria (SIC) suggest VAR (2). Our selection of VAR (3) model was guided by estimating the underlying VAR model and applying standard diagnostic tests to ensure the validity of the model.[5]

The Johansen - Jeselius (1992) methodology is used to test the cointegration between variables. The results from the cointegration analysis suggest that the null hypothesis of no cointegrating vector can be rejected at 5% using both trace test (λ_{trace}) and maximum eigen-value test (λ_{max}). This indicates no cointegrating vector among the three I(1) variables and hence one can conclude that variables are not cointegrated, i.e. are not tied in the long run relationship. We used the Pantula principle which operationalises a joint test of the number of cointegrating vectors and the choice of deterministic components in the VECM.

[5] Diagnostic tests and information criteria are presented in appendices.

Table 3

Cointegration tests with no deterministic trend and restricted constant

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.278697	30.27976	35.19275	0.1539
At most 1	0.172444	15.90515	20.26184	0.1789
At most 2	0.158191	7.576894	9.164546	0.0991

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.278697	14.37461	22.29962	0.4283
At most 1	0.172444	8.328253	15.89210	0.5090
At most 2	0.158191	7.576894	9.164546	0.0991

The table below provides the summary of cointegrating relationship according to all five assumptions.

Number of cointegrating relations

Data Trend:	None	Linear	Linear	Quadratic
Test Type	Intercept No Trend	Intercept No Trend	Intercept Trend	Intercept Trend
Trace	0	0	0	0
Max-Eig	0	0	0	0

The Granger- causality test is validated only on the assumption that variables are stationary. In our analysis, since variables are integrated of order one, the Granger- causality tests are applied to the first differences of the logarithm of the variables, which are stationary. The standard Granger causality test is employed for examining the causality. With no cointegration, the coefficient α which represents the error correction mechanism (ECM) in the

above equations is assumed to be zero and using standard Granger causality method is not mis-specified.
The following table represents the Granger causality test involving three series based on the Wald test to determine the joint significance of the restrictions under the null hypothesis.

Dependent variable: FDI

Excluded	Chi-sq	Prob.
EXPORT	2.947313	0.3998
IMPORT	6.516906	0.0890
All	15.30565	0.0180

Dependent variable: EXPORT

Excluded	Chi-sq	Prob.
FDI	1.729361	0.6304
IMPORT	5.607462	0.1324
All	9.546779	0.1451

Dependent variable: IMPORT

Excluded	Chi-sq	Prob.
FDI	0.564786	0.9044
EXPORT	9.116283	0.0278
All	11.67912	0.0695

The results imply a unidirectional casual relationship that runs from import to FDI (only at 10% level of significance) and one that runs from export to import.

Although import is significant only at a 10% level, one may conclude that because FDI inflow in Croatia was primarily oriented to the service sector (telecommunications, financial intermediation, trade and real estate activities), and only the manufacture of chemicals and chemical products is the category that for years has been one of the main recipients of FDI and also one of the main “import industries”, the result implies that FDI is not a substitute for import, i.e. it does not have a positive impact on current account balance and domestic production (although production might have increased, the import of raw materials and intermediary products have offset the positive impact). But, the results imply that exports have a positive and significant effect on import on the 5% level of significance. This can be explained by the fact that Croatia is exporting goods with low value added and importing products with high value added whose price has increased over the years and contributed to increasing the gap between export and import.

6. Conclusion

Croatia has achieved significant progress regarding multilateral as well as regional trade liberalization. Trade liberalization is, of course, accompanied by the increase of trade (export and/or import), which, in Croatia, is manifested in a high increase of import and a growing trade deficit. Establishing the legislative and institutional basis, Croatia created a favourable framework for the FDI inflow. Whereas the incentive framework is (was) not directed enough toward attracting investments into new production, but rather toward the model of buying the existing companies during the privatization process. Therefore the amount of FDI does not necessarily guarantee its positive influence on economy, especially on production and export. The role of the enlarged EU is more important for foreign investments in Croatian economy than for Croatian export which, in recent years, has been increasingly directed to the less demanding markets of the CEFTA countries. This is affected by the Croatian export production structure for which there is no demand on the EU market. On the other hand, the entrance of 10 CEE countries in the EU supplied the EU market with the products that Croatia can offer. The above stated facts influenced the results where no FDI influence was found on either export or import.

FDI seems to have no direct link with trade. Firstly, it is primarily oriented to the service sector which is used by local consumers. Secondly, the analysis was done using aggregate data so it is possible that FDI causes increased export in some industries but that might have been overseen. Thirdly, the structure of FDI inflow is completely inadequate, i.e. the majority of investments were oriented toward existing industries in order to increase efficiency and expand capacity or investment in financial sector (increasing the capital of the foreign banks) due to a restrictive monetary policy whose aim is to bring to a halt the increasing foreign debt. Unfortunately, very few were invested in new industries oriented to export and employment.

The above mentioned researches presented different situations of interdependence of trade and investment flows, thereby the results of this research can be compared with the research of Hisarciklilar et al. (the Mediterranean countries research, there is no relationship between FDI and trade) as well as with the first part of Fontagne's research (trade affects FDI). However, due to the FDI structure in Croatia, the beginning of the second phase, where FDI affects trade (export), is nowhere in sight.

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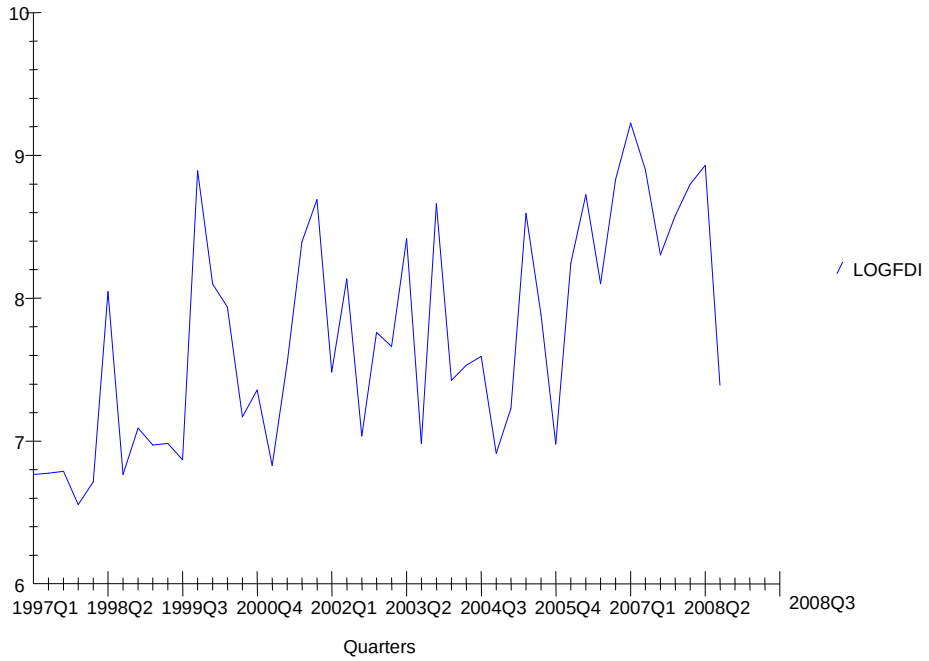
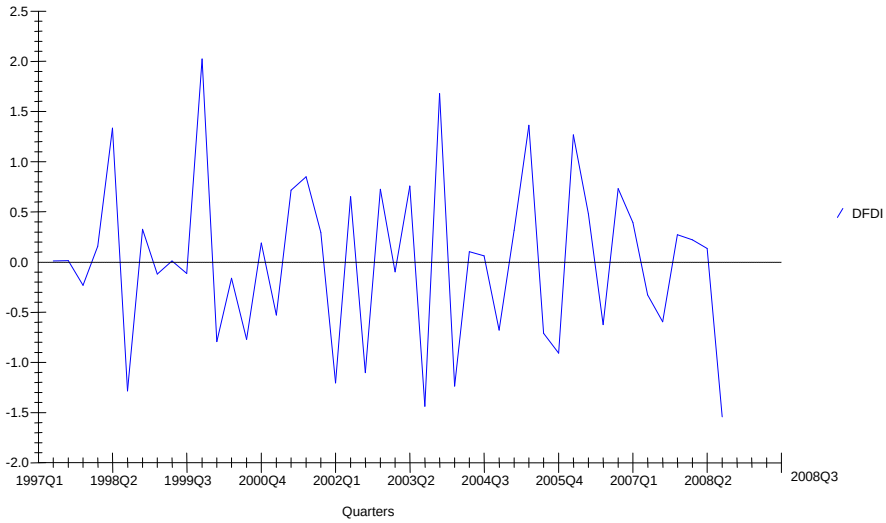
APPENDICES

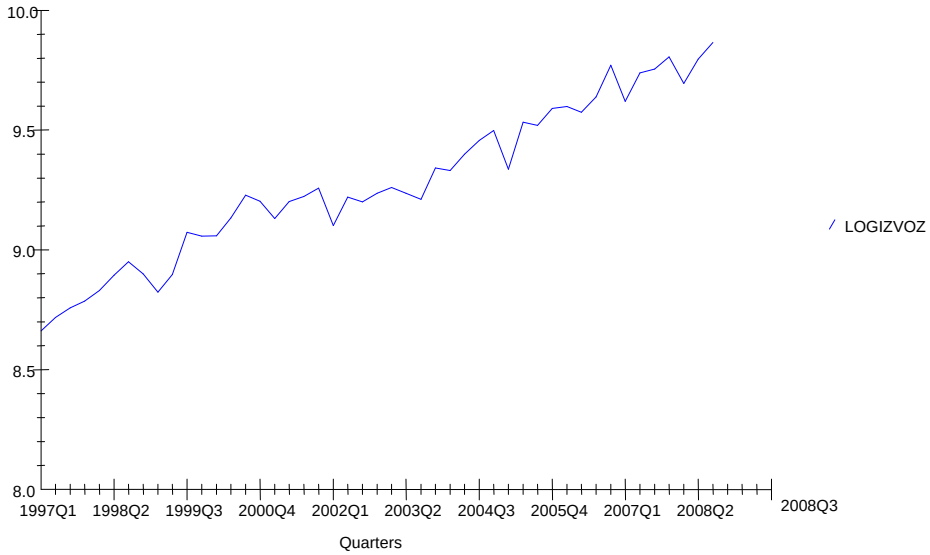
1. PLOT OF SERIES IN LEVELS AND 1ST DIFFERENCES

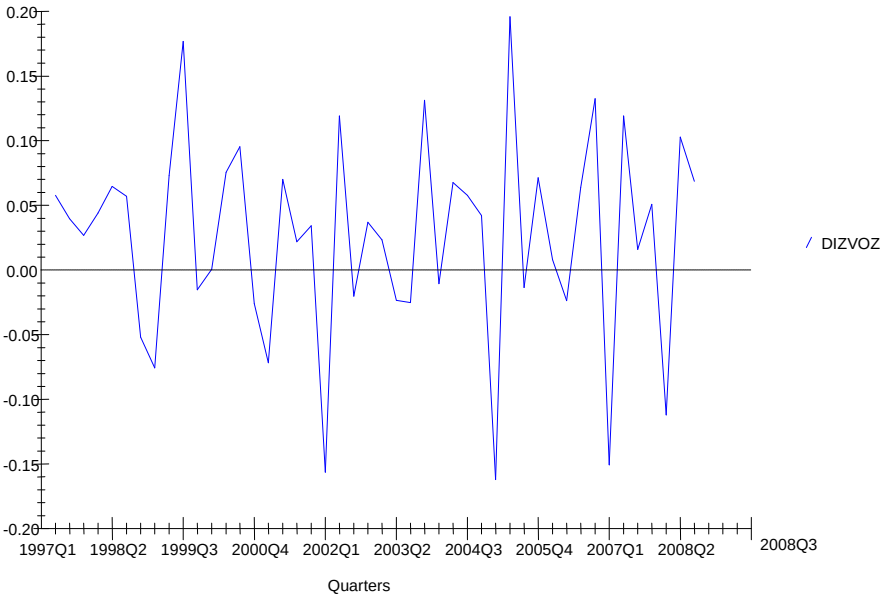
FDI



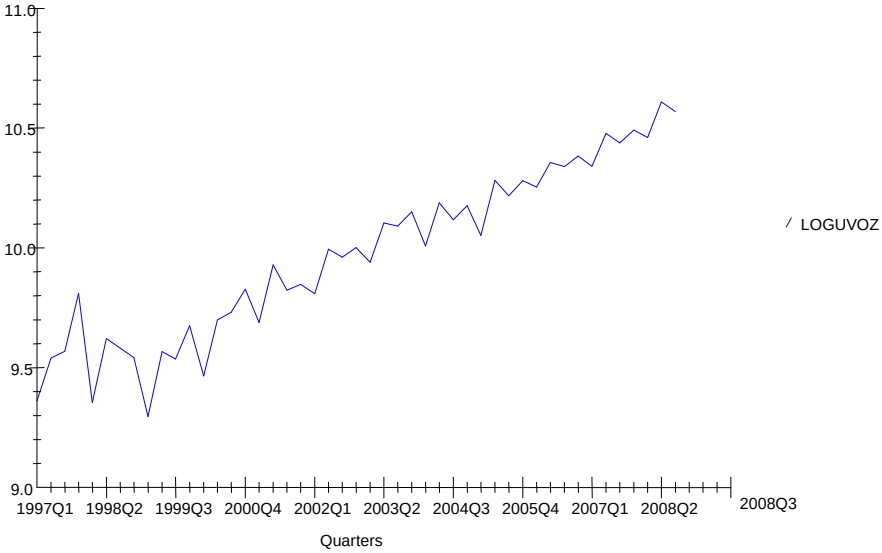


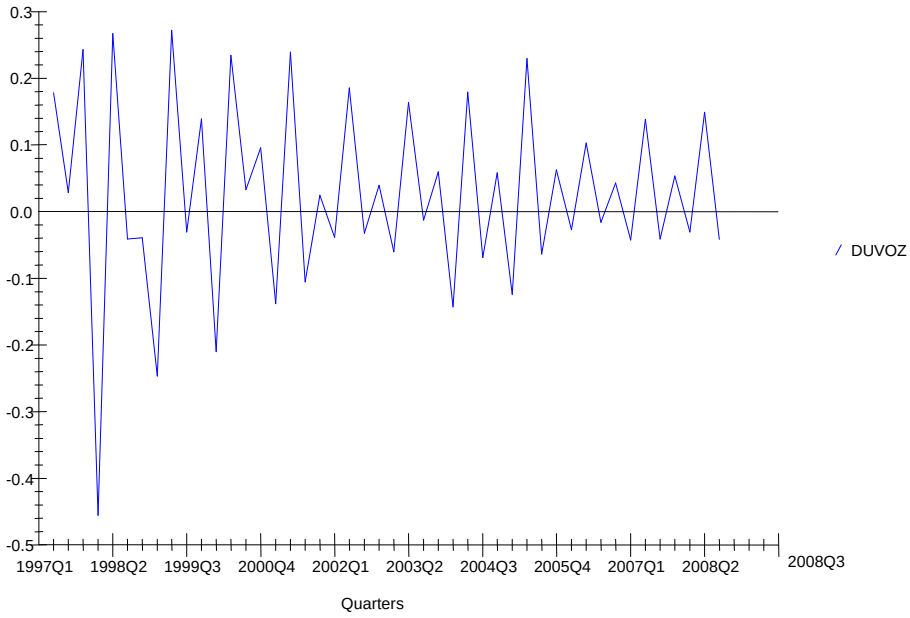
EXPORT


10.0
9.5
9.0
8.5
8.0
1997Q1
1998Q2
1999Q3
2000Q4
2002Q1
2003Q2
2004Q3
2005Q4
2007Q1
2008Q2
2008Q3
Quarters
LOGIZVOZ


0.20
0.15
0.10
0.05
0.00
-0.05
-0.10
-0.15
-0.20
1997Q1
1998Q2
1999Q3
2000Q4
2002Q1
2003Q2
2004Q3
2005Q4
2007Q1
2008Q2
2008Q3
Quarters
DIZVOZ

IMPORT


11.0
10.5
10.0
9.5
9.0
1997Q1
1998Q2
1999Q3
2000Q4
2002Q1
2003Q2
2004Q3
2005Q4
2007Q1
2008Q2
2008Q3
Quarters
LOGUVOZ


0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
1997Q1
1998Q2
1999Q3
2000Q4
2002Q1
2003Q2
2004Q3
2005Q4
2007Q1
2008Q2
2008Q3
Quarters
DUVOZ

2. VAR DIAGNOSTICS

VAR Residual Serial Correlation LM Tests

H0: no serial correlation at lag order h

Lags	LM-Stat	Prob
1	31.05371	0.0003
2	23.05298	0.0061
3	5.849779	0.7549
4	11.77995	0.2260
5	7.810240	0.5534
6	10.68797	0.2977
7	7.137369	0.6228
8	10.57857	0.3057

VAR Residual Normality Tests

Orthogonalization: Residual Covariance (Urzua)

H0: residuals are multivariate normal

Component	Skewness	Chi-sq	df	Prob.
1	0.360643	1.091603	1	0.2961
2	0.031474	0.008314	1	0.9273
3	0.152932	0.196294	1	0.6577
Joint		1.296211	3	0.7300

Component	Kurtosis	Chi-sq	df	Prob.
1	1.930009	2.250006	1	0.1336
2	1.480512	4.927708	1	0.0264
3	2.292321	0.845997	1	0.3577
Joint		8.023712	3	0.0455

Component	Jarque-Bera	df	Prob.
1	3.341609	2	0.1881
2	4.936023	2	0.0848
3	1.042291	2	0.5938
Joint	23.88051	25	0.5263

VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

Joint test:

Chi-sq	df	Prob.
109.5448	114	0.6005

INFORMATION CRITERIA

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1163.312	NA	8.36e+19	54.38660	54.63235	54.47722
1	-1118.581	79.05916	1.59e+19	52.72470	53.33907	52.95126
2	-1098.489	32.70800	9.60e+18	52.20879	53.19178*	52.57129
3	-1092.414	9.042169	1.12e+19	52.34483	53.69644	52.84326
4	-1070.974	28.91869*	6.55e+18*	51.76623*	53.48648	52.40061*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

UZROKUJE LI LIBERALIZACIJA TRŽIŠTA DOTOK IZRAVNIH STRANIH ULAGANJA ILI JE OBRNUTO? SLUČAJ HRVATSKE

SAŽETAK

U posljednjih deset godina Hrvatska je postigla značajne rezultate u globalnoj i regionalnoj liberalizaciji tržišta. Istovremeno, stvorila je poticajni okvir za ulaganja te privukla veliki broj izravnih stranih ulaganja po glavi stanovnika. Cilj ovog rada je odrediti postoji li veza između trgovine i dotoka izravnih stranih ulaganja u hrvatsko gospodarstvo te u kojim smjerovima. Koristeći kointegracijski vektor i VECM model, ustanovili smo da nema izravne veze između izravnih stranih ulaganja i tokova na tržištu. Rezultati ukazuju na jednosmjernu uzročnu vezu koja ide od uvoza ka izravnim stranim ulaganjima, te onu koja ide od izvoza ka uvozu. To se može objasniti nepovoljnom strukturom hrvatskog izvoza kao i dominacijom brownfield investicija u hrvatskom gospodarstvu.

JEL: F13, F14, F21, F31.

***Ključne riječi**: izvoz, uvoz, izravna strana ulaganja, kointegracija, VECM model*