

Effect of Foreign Direct Investments in Transportation, Storage and Remote Connections on the Current Account of Lithuania's Balance of Payments During Years 2002-2009

Algis Sileika, Zita Tamasauskiene, Dovile Karulaitiene

Siauliu universitetas

Architektu str. 1, LT-78366 Siauliai, Lithuania

E-mail: algis.sileika@dsti.lt; zita.tamasauskiene@smf.su.lt; dovileputvinskaite@yahoo.co.uk

Abstract

The present article seeks to evaluate the effect of foreign direct investments in transportation, storage and remote connections on the current account of Lithuania's balance of payments. In order to achieve this aim, a review of the results of theoretical aspects and empirical investigations in foreign countries is performed. The main trends and consequences of possible effect are distinguished. Applying econometric statistical methods (Granger causality test, correlation regression analysis), dependence among researched variables is quantitatively evaluated.

Keywords: foreign direct investments, balance of payments, current account balance, negative effect, positive effect, factor analysis.

Introduction

Scientific problem of the article, its novelty and relevance. In current conditions strongly influenced by globalization, a country becomes partly isolated if it does not possess a proper and constantly being developed infrastructure. This concept includes the system of land transport, seaways, aviation as well as sphere of remote communications (beginning with a possibility to contact by a mobile phone and ending with a possibility to run business in a virtual space). Therefore investments in this sphere are encouraged and targeted. The deficit of Current account of Lithuania's balance of payments (thereinafter CABP) most often is associated with a negative balance of international trade, which mainly consists of the deficit of goods trade. It is acceptable to solve this situation by attracting to the state foreign direct investments, the effective use of which should in theory positively influence the status of deficit of current account. The empirical research carried out by foreign authors reveal that coming of international capital might increase state's competitive ability on the international arena and thus would increase volumes of foreign tra-

de. However, the question of how separate types of foreign direct investments (thereinafter FDI) influence a current account and its separate parts is rarely raised, and in works by Lithuanian scholars it is not raised at all. Lithuania receives fair injections in the form of FDI into the sphere of telecommunications, but simultaneously the need to import appropriate devices (computers, software, mobile phones, etc.) greatly increases. As Lithuanian economic operators almost do not invest in this sector abroad, it happens that received finances are spent inside the state, a new product is not created and that negatively affects the condition of current account.

Research subject: foreign direct investments in the analyzed sphere and Lithuanian CABP.

Research aim: to indicate the effect of foreign direct investments in transportation, storage and remote connections on the Lithuania's CABP for the researched period.

To achieve this aim the following **research objectives** were set:

1. To overview empirical researches on FDI effect on balance of payments.
2. To analyze FDI in transportation, storage and remote connections as well as Lithuania's CABP for a period of years 2002-2009 and indicate the factors that determined its changes.
3. To evaluate effect of FDI in the researched sphere on a general condition of Lithuania's CABP.

Research methods: in order to present the analysis results in an objective way, statistical data of bank of Lithuanian and recent studies in this sphere are used. The methods of scientific literature analysis and generalization as well as logical comparative analysis, synthesis, correlation regression analysis and Granger causality test are applied in the article.

Review of empirical researches on FDI effect on balance of payments

FDI effect on the condition of foreign countries' balance of payments was analyzed by various authors in different periods: Modigliani, Brumberg (1955), Ando, Modigliani (1963), Tomsik (2009), Hossain (2008), Lipsey (2007), Kokko (2006), etc. The outcomes of the performed studies are not unambiguous. The review of various authors' works suggests that FDI has a strong effect on condition and stability of CABP. The importance of this effect especially brought out during the last three decades. Global imbalance of balances of payments might be explained by different level of political stability and economical development in various countries (Ali, Shukui, Selvarathnam Xiaolin, Saboor, 2008).

As a very relevant question of FDI effect on recipient country export and international trade balance was raised by Lipsey (2007). By FDI capital supported enterprises start to export their production because most of these companies are export-oriented (Hossain, 2008). Talking about the link between FDI and export, first of all it is necessary to emphasize the positive FDI effect on positive balance of Chinese international trade, which results in surplus of current account. However, it should be emphasized that positive balance of payments of current account will depend only on the state's ability to properly use great flows of foreign capital as well as on the further export development of working companies based on FDI (Organization for Economic Co-operation and Development, 1999 and 2000).

FDI effect on the condition of balance of payments was analyzed by Hossain (2008), who explored situation in Bangladesh. He determined constantly strengthening positive correlation link between FDI and export, and this in a long-term perspective might have a positive effect on the balance of state's trade. A rapid increase in FDI in telecommunications sector is noticed. According to the author, FDI effect on the Bangladesh's balance of payments might be ambivalent. Positive effect displays through the export account, and negative – through the accounts of import and income.

The researches on three European Union states based on the theory of life cycle performed by Tomsik (2008) revealed that FDI positively influences the volumes of Czech net export, but it also has impact on the increase in net import. During the investigation it was also indicated that in Poland FDI decreases the net import, while in Hungary it decreases the net export. Accordingly, the results are quite controversial, and this suggests that in different countries FDI effect on the CABP might also be different.

While analysing the links between FDI benefit to the recipient state and its trade policy, Lipsey (2007) determined a dual possible FDI effect. Negative effect is associated with applying import change policy.

The empirical researches carried out in other countries show that FDI might increase import volumes in recipient countries (Hossain, 2008, Kokko, 2006). One of the reasons is that most of the companies supported by FDI capital are forced to import goods and services that are necessary to start and implement the activity and that cannot be purchased inside the state.

Most articles and works, especially earlier than of 2007, emphasize positive FDI effect on state economy and various spheres of domestic economics. After carrying out a detailed analysis of results of investigations performed by most scholars, Lipsey (2007) emphasizes that only some of the authors demonstrate a negative FDI effect on a recipient country.

However, there are authors (Kokko, 2006) who emphasize that FDI effect depends on how a recipient country is able to master, use and funnel foreign financial injections. According to Kokko (2006), in most cases FDI effect on recipient country export is quite small. It might also depend on the development level of a country that receives investments. Although countries that are in developing process receive greater interest from foreign investors, more developed countries most often receive investments into those spheres where advanced technologies are created.

One of the motives of international investment is that countries having capital surplus invest in the states where there is a need of capital because in the future they expect benefit from their investments (Macdougall, 1960). This fact suggests that a country, which receives FDI, in the future, when those investments start bringing the benefit, will unavoidably face a payment of dividends to the investors, and that will have a negative reflection on income column of CABP. The period from investment till benefit might depend on investing country and an amount of investment itself (Kokko, 2006). The investors of big and strong countries, such as the USA, simply have more possibilities to create successful investment strategies.

Recently the repatriation question of FDI income becomes more and more relevant. This question is emphasized by Hunya, Schwarzhappel (2009), Tomsik (2008), Tomsik, Plojhard, Srholec (2002), etc. The tendency is noticed that many countries that receive investments face an increasing negative balance of current account income section. According to Hunya and Schwarzhappel (2009), in some European countries the amount of repatriated income of 2008

even exceeded the amount of FDI inflow. This negative direct effect of FDI on the balance of payments was partly countered by the foreign trade surplus generated by foreign affiliates.

Research methodology

Effect of FDI in transportation, storage and remote connections (thereinafter TSRC) on Lithuania's CABP during the analyzed period was studied by applying various methods. First of all, statistical data of Lithuania's balance of payments was analyzed. While analyzing the data, the statistical information of Bank of Lithuanian and Department of Statistics to the Government of the Republic of Lithuania was used. Gathered and systemized data was analyzed in various aspects. The dynamics and comparative indices analysis was done, which allowed to compare change and development rates of investigated indices as well as to highlight tendencies.

For generalization of FDI and current account change tendencies a synthesis method was used. Factor analysis was used to distinguish the main factors that had influence on analyzed data change and quantitative measurement of effect of these factors. This analysis helped to expand a structural analysis and allowed evaluating the effect on general results of each factor separately.

In order to determine relations between components of FDI in TSRC and CABP, a correlation regression analysis was used, and significance of obtained results was reviewed applying Student criterion. Correlation gives a response to the question if there is a link between features and what is its direction and strength. A link between two features might be direct or reverse. According to Danilenko (2009), applying a factor analysis a dependence of being observed variables is sought. If variables do not correlate, a factor analysis is meaningless; therefore it is important to ensure that the being observed variables correlate among themselves. Consequently, variables that correlate among themselves are selected from the data while independent ones are eliminated. Data applicability for factor analysis is evaluated using the Kaiser-Meyer-Olkin (KMO) measure:

$$KMO = \frac{\sum \sum_{i \neq j} r_{ij}}{\sum \sum_{i \neq j} r_{ij} + \sum \sum_{i \neq j} \tilde{r}_{ij}}. \quad (1)$$

If KMO measure is small, a factor analysis of the being investigated variables is inefficient. When the value of KMO measure is smaller than 0.6, correlation of pairs of variables is not explained by the being investigated variables, therefore a factor analy-

sis of the being investigated variables is unacceptable (Tai-Fen Kung, Chih-Kao Nieh, 2009).

In order to determine causality between amounts of FDI in the being analyzed sphere and CABP change, Granger causality test was done. According to Gotessman (2009), Hood (2008), Hurlin and Venet (2003), the core of causality analysis is to answer if y_t influences x_t , x_t influences y_t , if there is a mutual interaction between x_t and y_t , and if there is no interaction between x_t and y_t . Although logical causality, according to Rudzakis and Kvedaras (2003), cannot be examined statistically, it is reasonable to think that the real reason happens earlier than a consequence. That is how statistical Granger causality test is grounded: it is examined if the values of one variable are informative to forecast the values of another variable. If it happens, the first variable is considered to be the reason of the second one. With reference to Hamilton (1994) and Maddala (1992), it is considered that in case of two time lines $\{y_t\}$ and $\{x_t\}$ x_t is not a reason of y_t , if y_t in regression from y_t and x_t lags x_t and coefficients are equal to zero. Two conditions have to be fulfilled: (a) x should bring statistically significant input into y forecast; (b) y should not bring statistically significant input into x forecast.

Performing Granger causality test equations are formed (Granger, 1969):

$$y_t = \alpha_0 + \sum_{i=1}^m \alpha_i y_{t-i} + \sum_{i=1}^m \beta_i x_{t-i} + \varepsilon_t, \varepsilon_t \sim N(0, \delta^2); \quad (2)$$

$$x_t = \alpha_0 + \sum_{i=1}^m \alpha_i x_{t-i} + \sum_{i=1}^m \beta_i y_{t-i} + u_t, u_t \sim N(0, \delta^2). \quad (3)$$

Estimates α_0 , α_i and β_i are found applying the least squares method. For describing change trajectory a function which has the minimal sum of deviation squares is chosen:

$$S(\alpha_0, \alpha_i, \beta_i) = \sum_{i=1}^m (y_t - \alpha_0 - \alpha_i x_{t-i} - \beta_i y_{t-i})^2 \rightarrow \min. \quad (4)$$

If in the equation (2) a group of late variables x_{t-i} is statistically significant – coefficients are not equal to zero, and in the equation (3) a group of late variables y_{t-i} is statistically insignificant, the conclusion is drawn that x_t influences y_t (Karpuskiene, 2009). Conversely, if in the equation (3) a group of late variables y_{t-i} is statistically significant, and in the equation (2) a group of late variables x_{t-i} is statistically insignificant, the conclusion is drawn that y_t influences x_t . If in both equations (2) and (3) late groups x_{t-i} and y_{t-i} are statistically signifi-

cant, the conclusion is drawn that x_t and y_t are associated with interdependence, and if in equations (2) and (3) late groups x_{t-i} and y_{t-i} are statistically insignificant, then x_t and y_t are not interdependent. To confirm or reject existence of relations between variables, the following hypotheses are formulated: $H_0 : \sum \beta = 0$ (x_t does not influence y_t) and $H_1 : \sum \beta \neq 0$ (x_t influences y_t). To test these hypotheses, the F-test is applied, as shown below (Comincioli, 1995):

$$F_h = \frac{(RSS_R - RSS_{U_U}) / k}{RSS_U / n - (k + m + 1)}. \quad (5)$$

If $F_h > F_{k, n-(k+m+1)}$, H_0 is rejected and the conclusion is drawn with chosen significance level that x_t influences y_t . If $F_h < F_{k, n-(k+m+1)}$, H_0 cannot be rejected and conclusion is drawn with chosen significance level that x_t does not influence y_t .

Seeking to check relations between the being investigated FDI and condition of current account, data applied for factor analysis must be stationary, standardized and seasonally adjusted (Danileko, 2009, Bahadur, 2006, Marcellino, etc., 2003). As annual data is used for investigation, the procedure of eliminating seasonal influence is not applied. Stationarity of data is ensured by using differentiation procedure, i.e. eve-

ry value of time line is changed by the difference of present and prior values. Applying this procedure the data average and dispersion are constant rates and do not depend on impulse in time. The data is standardized that variables with great deviation would not be prevailing and would not distort results. The data of investigation is standardized by subtracting the average of time line and dividing by dispersion. The average of transformed data equals zero, and dispersion equals one.

All data of performed calculation is generalized, their abstraction, concretization were used, graphic and verbal analyses were carried out. Graphic method was employed to display change of the being investigated indices over time and interrelations of indices. The data changes are graphically presented using diagrams.

FDI and current account dynamics and tendencies

In Lithuania persistent increase in foreign investments is noticed, that means that a state becomes attractive to foreign investors. Although the results are improving, this flow is not sufficient yet, therefore it is very important to improve state's image on international level, to seek stable political and economical situation so that investors would consider Lithuania a reliable state and would be interested to invest in its companies and other spheres.

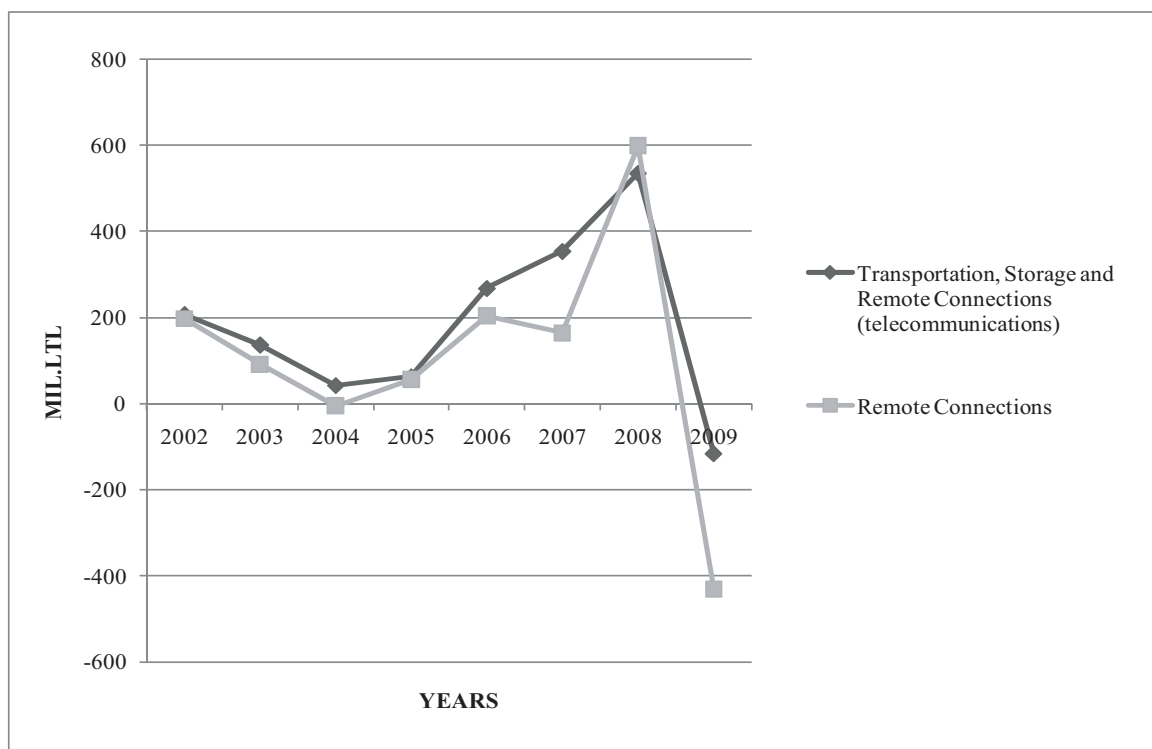


Fig. 1. Foreign direct investments in Lithuania in TSRC.

Source: created by the authors with reference to the Bank of Lithuania data

During the analysed period (years 2002-2009) FDI in TSRC varied very unevenly. From 2002 to 2004 their decrease was noticed – from more than 200 mil. LTL to less than 50 mil. LTL. Almost at the same time FDI flow in remote connections decreased and in 2004 it was hardly invested in this sphere, even though it is the main component of selected economic activity. Exactly in those years it was invested mostly in land transport, pipeline and water as well as in the work of travel agencies. This tendency during the next year was not maintained and FDI in those spheres significantly decreased and became even negative (investments were withdrawn from Lithuania).

If during years 2004-2005 increase in FDI in TSRC was quite low, in 2006 great rise was noticed. That could have been influenced by improved economic situation of the state, increased consumption (also of services), and that could have influenced the increase in foreign investments. FDI flow in TSRC in Lithuania (116.07 mil. LTL) during 2009 showed the leak of foreign investments from Lithuania and FDI was 78.3% smaller than in 2008, while FDI in remote connections decreased even more.

The dynamics of FDI in remote connections sphere having been analyzed, further analysis reveals how varied other kinds of investments' flows from Lithuania. Figure 2 illustrates Lithuanian FDI flows in TSRC during years 2002-2009.

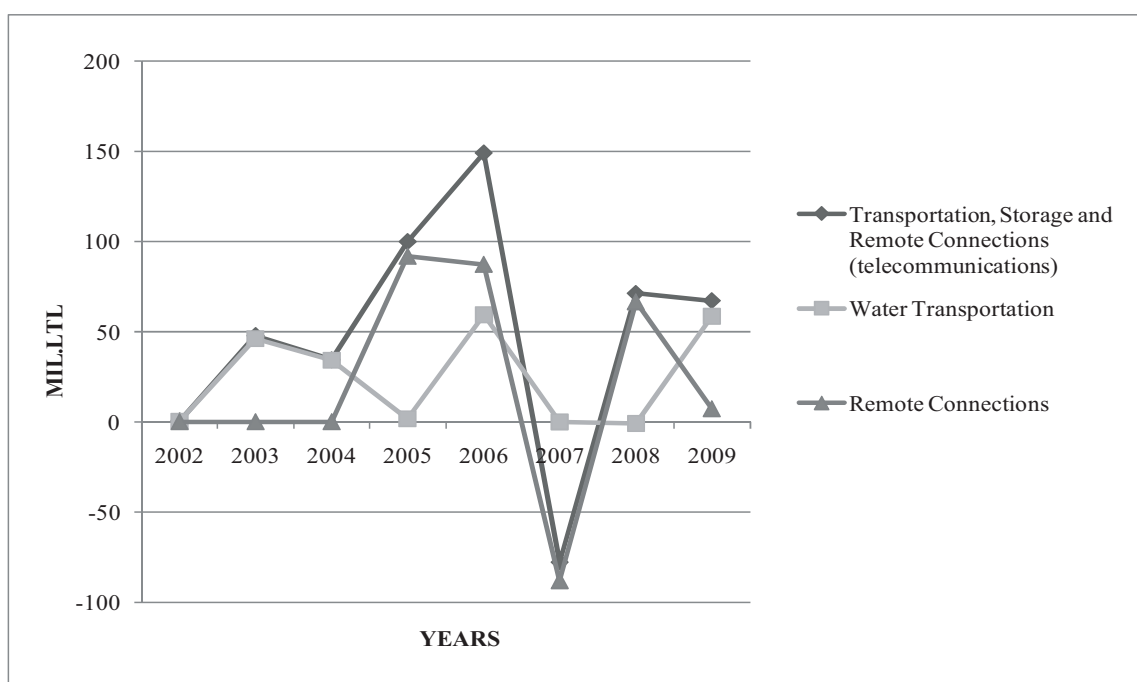


Fig. 2. Lithuanian FDI abroad in TSRC.

Source: created by the authors with reference to the Bank of Lithuania data

The data presented in Figure 2 shows that during the analyzed period Lithuanian FDI in TSRC increased to that of 2007. During 2003-2004 their decrease is noticed – from almost 48 mil. LTL to 35 mil. LTL. It is noticed that in 2004 and during 2007-2008 Lithuania did not invest abroad in remote connections, so during this period almost all investments comprised of investments in water transport. Also, a positive sum of investments in this sphere in Lithuanian current account does not necessarily mean that those investments are Lithuanian. Lithuania receives a lot of FDI in this sphere; therefore it is possible that since 2005 companies became able to invest abroad themselves.

A great part of investments in water transport in the whole structure of the researched economic sphere

might be influenced by close cooperation of Lithuanian companies with neighbour states, and specifically in this case with Kaliningrad region. The amount of Lithuanian investments in water transport during 2003-2004 could be associated with “2K” – the project joining ports of Klaipeda and Kaliningrad.

Since 2005 a reverse process is noticed – the amount of Lithuanian investments in remote connections slightly decreased, but investments in water transport sector greatly increased. General investments in the investigated sphere of economic activity, the amount of which in 2006 increased by 50 mil. LTL, were influenced not only by the rise of amount of investments in water transport, but also by the fact that decrease in flows of investments in telecommunications was compensated by the sector of land trans-

port and pipelines. Investments from Lithuania in this sector in 2006 comparing with the previous year increased more than twice and reached 2.5 mil. LTL. Approximately 30% of all Lithuanian investments in TSRC in 2009 was FDI in water transport, which comprised 58.64 mil. LTL. This is associated with successful work of Klaipeda seaport, with increasing amounts of loading.

As the goal of this research is to determine effect of FDI in TSRC on Lithuania's CABP, having performed the dynamic study of foreign investments in the being analysed economic sphere, a further analysis of how varied condition of the current account and balances of its separate items is necessary. Table 1 presents data of current account in 2002-2009.

Table 1

Lithuanian CABP structure during years 2002-2009 (mil.LTL)

	2002	2003	2004	2005	2006	2007	2008	2009
I. CURRENT ACCOUNT	-2670.59	-3854	-4811.73	-5114.93	-8808.87	-14325.43	-13259.23	3528.63
A. Goods and services	-2880.01	-3252.85	-4367.97	-5218.94	-8550.5	-13182.69	-12116.61	-624.98
<i>a. Goods</i>	-4867.76	-5140.76	-6630.86	-8145	-11522.04	-14 773.33	-13337.07	-2679.13
<i>b. Services</i>	1987.75	1887.91	2262.89	2926.06	2971.54	1590.64	1220.46	2054.15
B. Income	-642.33	-1490.74	-1708.83	-1730.15	-2253.09	-4069.93	-3661.04	398.63
1. Work income	194.79	139.48	380.35	501.53	535.33	429.49	277.7	130.6
2. Investments income	-837.12	-1630.22	-2089.18	-2231.68	-2788.42	-4499.42	-3938.74	268.03
C. Current transfers	851.75	889.59	1265.07	1834.16	1994.72	2927.19	2518.42	3754.98

Source: created by the authors with reference to the Bank of Lithuania data

From years 2002 to 2008 Lithuanian CABP balance was negative. During this period the deficit of the current account was growing (a slight decrease is noticed only during the last year) – during the whole period this quantity increased 5 times and constituted 10234.48 mil. LTL. The most significant increase in absolute level was noticed in 2006-2007, which constituted 5516.56 mil. LTL. In 2008, comparing with 2007, decrease in current account was noticed. Upturn of current account condition in 2008 was influenced by successful results in 2007. Almost all quantity of current account was influenced by the quantity of international trade balance. The deficit of the latter emerged because negative balance of goods trade was significantly bigger than positive balance of services. The current account deficit was also increased by negative income quantity, which in turn was determined by decreasing income balance of investments. Consequently, a positive quantity of Lithuanian CABP was comprised of services, articles of work income and current transfers, while negative one was made by balances of goods trade and investments income, which determined a negative current account.

In 2009 for the first time during fifteen years surplus Lithuanian CABP was recorded, which had the balance of 3528.63 mil. LTL. Comparing with 2008, a change of current account balance comprised 16.79 mil. LTL. Formation of current account surplus was determined by decrease in goods trade balance deficit by almost 80% as well as increase in services balance surplus by almost 70%. In 2009 foreign trade deficit comprised only 624.98 mil. LTL, com-

paring with 2008 it decreased by 11.49 billion LTL (94.84%). Export of goods decreased by 14.79 billion LTL (26.64%), while import – by 25.44 billion LTL (almost 37%). Decrease in goods export was influenced by decreased export of oil, oil products and similar material (by 37%), manure (by 49%), road vehicles, including vehicles with airbags (by 39%). Decrease in import was determined by decreased import of oil and oil products (by 38%), natural and unnatural gas (by 35%), road vehicles (by 68%).

Review of factorial analysis results

Defining Granger causality between FDI in TSRC and Lithuanian CABP, the equations are formed:

$$y_t = 1.744 + \sum_{i=1}^m 1.001 \cdot x_{t-i} + \sum_{i=1}^m 0.001 \cdot y_{t-i} + \varepsilon_t, \varepsilon_t \sim N(0, \delta^2); \quad (6)$$

$$x_t = 1.744 + \sum_{i=1}^m 1.001 \cdot x_{t-i} + \sum_{i=1}^m 0.001 y_{t-i} + u_t, u_t \sim N(0, \delta^2). \quad (7)$$

As in the equation (6) the group of late variables x_{t-i} is statistically significant (coefficients are not equal to zero), and in the equation (7) the group of late variables y_{t-i} is not statistically significant (coefficients are likely to be equal to zero), the conclusion might be drawn that FDI (x_t) influences current account balance (y_t).

In order to prove if FDI in TSRC have impact on Lithuanian current account, Granger causality test

and correlation regression analysis were done. Relations between FDI and separate parts of current account (international goods, services trade, income) during the period of years 2002-2009 were investigated. Granger causality test results are presented in

Tables 2, 3, 4. For investigation stationary and standardised data (no autocorrelation, normal distribution, etc.) was used. Statistics used for test is Fisher statistics.

Table 2

Granger causality test results of FDI in TSRC and FDI income

Hypothesis	F-statistics	Significance level (p significance) F-statistics
FDI in TSRC in Lithuania is not the reason of dividends income balance	3.064	0.1553.064
FDI in TSRC in Lithuania is not the reason of reinvestments income balance	11.008	0.02911.008
FDI in TSRC in Lithuania is not the reason of interests income balance	0.871	0.4030.871
Lithuanian FDI in TSRC abroad is not the reason of dividends income balance	2.170	0.2152.170
Lithuanian FDI in TSRC abroad is not the reason of reinvestments income balance	3.310	0.1433.310
Lithuanian FDI in TSRC abroad is not the reason of interests income balance	3.056	0.1553.056

Source: created by the authors

As there is no institution that presents data about FDI income from concrete type of economic activity, it becomes very complicated to determine the relationship between investigated FDI and income account balance. The relationship between Lithuanian FDI quantity change and general (not distinguished according to types of economic activity) income from FDI amount during years 2002-2009 is studied. As it has already been settled in the previous section, income balance was influenced by investments income balance, therefore it is sought to determine inves-

tigated FDI effect on the investments income balance as well as on general revenue balance.

The data of the calculation done showed that there is a causal relationship between FDI in the researched sphere in Lithuania and dividends and reinvestments income balance as well as FDI abroad and reinvestments and interests balance. Therefore, a conclusion is drawn that the whole income account is affected by investigated investments indirectly, only through its certain parts. The scheme illustrating income account is formed, where the percentages of income account components are indicated.

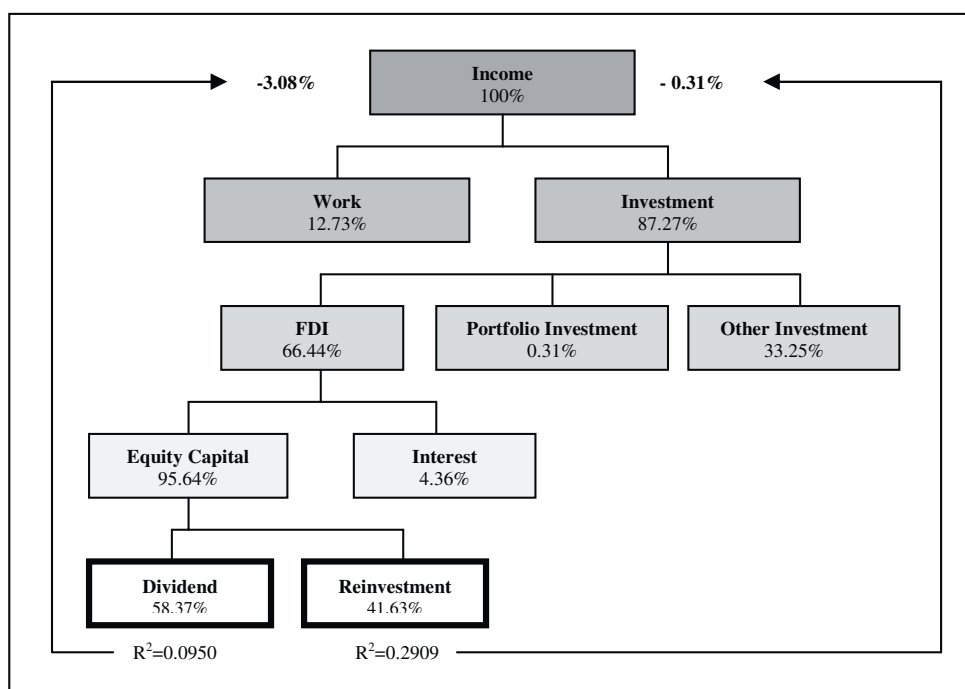


Fig. 3. Income account structure of Lithuanian balance of payments, after taking into consideration average percentage weights (during the years 2002-2009) and evaluation of FDI effect.

Source: created by the authors

The scheme presented in Figure 3 is studied from the bottom. The underlined investments income is that by which a link of FDI in transport, storage and telecommunications was determined. The majority of equity capital income (58.37%) comprises income of dividends. The obtained determination coefficient showed that 9.50% change in dividends income balance might be explained by change in FDI in the researched sphere, therefore it is thought that FDI might explain 5.55% of equity capital income variation. The quantity of equity capital comprises almost the whole quantity (95.64%) of FDI income balance, therefore 5.31% of this quantity change could be explained by change in the amount of FDI in TSRC. FDI income comprises 66.44% of all investments income balance. 3.53% of the latter change is explained by the amount of researched investments change. Finally, investments income comprises 87.27% of all income balance, of which 3.08% change in amount could be explained by the change in amount of FDI in TSRC.

Having taken the analogous review of percentage of reinvestments income in the whole scheme, it is obtained that only 0.31% of income balance change might be explained by the changed amount of FDI in the researched sphere of economic activity. General FDI effect on the change of income account balance comprises 3.39%.

FDI in TSRC that come to Lithuania have influence not only on income account, i.e. income that departs from the state, but also on the account of goods and services. It is noticed that exactly the goods and services comprise the majority of current account balance and they mostly affect it. Therefore it is important to explore how FDI in TSRC influence the balance of foreign goods and services trade as well as what impact the emergence of these investments to the state has on concrete goods and services associated with TSRC, on their trade balance, because all this might affect the account balance of goods and services (during the years 2002-2009) and at the same time it might affect the current account balance.

Table 3

Granger causality test results of FDI in TSRC and international goods trade balance components

Hypothesis	F-statistics	Significance level (p significance)
FDI in remote connections in Lithuania is not the reason of remote connections (telecommunications) and sound recording and reproducing devices and equipment trade balance (TB).	3.250	0.146
FDI in land transport in Lithuania is not the reason of road vehicles (including vehicles with airbags) TB.	5.055	0.089
FDI in air transport in Lithuania is not the reason of travel goods, handbags and similar things TB.	2.389	0.197
FDI in courier activities in Lithuania is not the reason of postal items, which are not classified according to the features, TB.	24.954	0.008
FDI in land transport in Lithuania is not the reason of industrial transport equipment TB.	5.384	0.081
FDI in land transport in Lithuania is not the reason of cars TB.	2.391	0.197
Lithuanian FDI in remote connections abroad is not the reason of remote connections (telecommunications) and sound recording and reproducing devices and equipment trade balance (TB).	1.309	0.316
Lithuanian FDI in land transport abroad is not the reason of road vehicles (including vehicles with airbags) TB.	8.091	0.047
Lithuanian FDI in air transport abroad is not the reason of travel goods, handbags and similar things TB.	1.969	0.255
Lithuanian FDI in courier activities abroad is not the reason of postal items, which are not classified according to the features, TB.	1.510	0.307
Lithuanian FDI in land transport abroad is not the reason of industrial transport equipment TB.	6.467	0.064
Lithuanian FDI in land transport abroad is not the reason of cars TB.	5.661	0.076

Source: created by the authors

Having applied Granger test it was found that the reasons of international goods trade balance (of

certain articles) might be FDI in remote connections, water transport, post and courier activity in Lithua-

nia and Lithuanian FDI in land transport abroad. There is no causality between other investigated variables. On the grounds of proved hypotheses a correlation regression analysis is carried out. In order to have a clearer understanding of how in general goods structure the goods, which were used to research economic relationship between FDI in concrete sphere, are distributed, figures are presented below, which il-

lustrate these goods in general goods structure (figures present only those groups of goods that were used to investigate the relationship). In Figure 4 groups of the goods are presented according to standard international trade classification (SITC), while in Figure 5 they are presented according to broad economic categories (BEC).

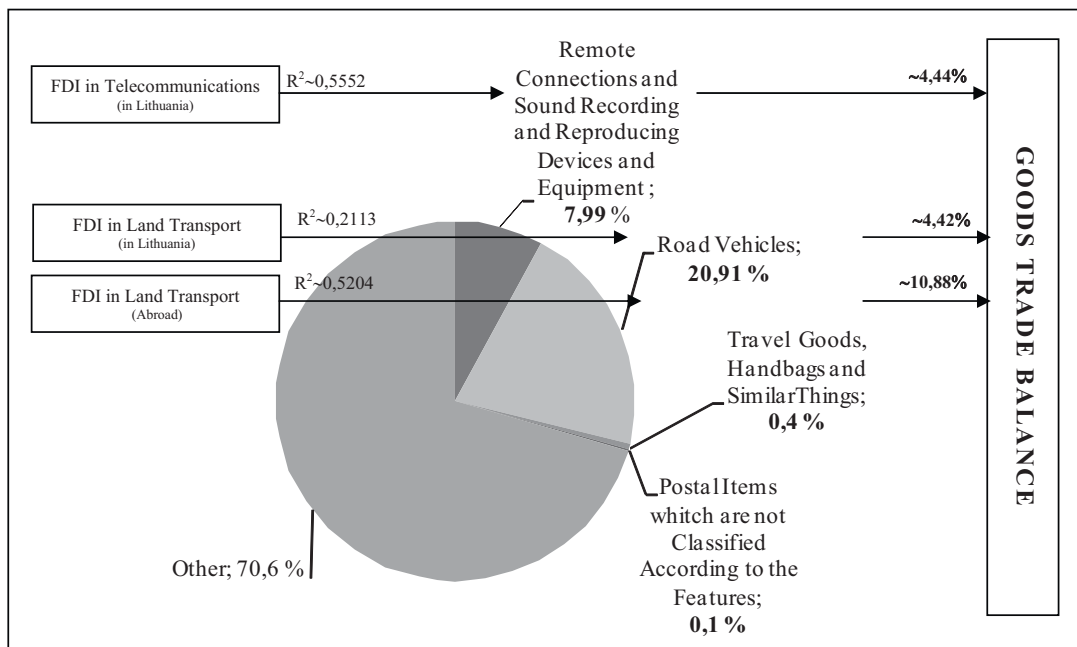


Fig. 4. Lithuanian foreign goods trade balance structure (using average sizes) according to the standard international trade classification SITC during the years 2002-2009 and evaluation of FDI effect.

Source: created by the authors with reference to the data of Lithuanian Statistics Department and the Bank of Lithuania

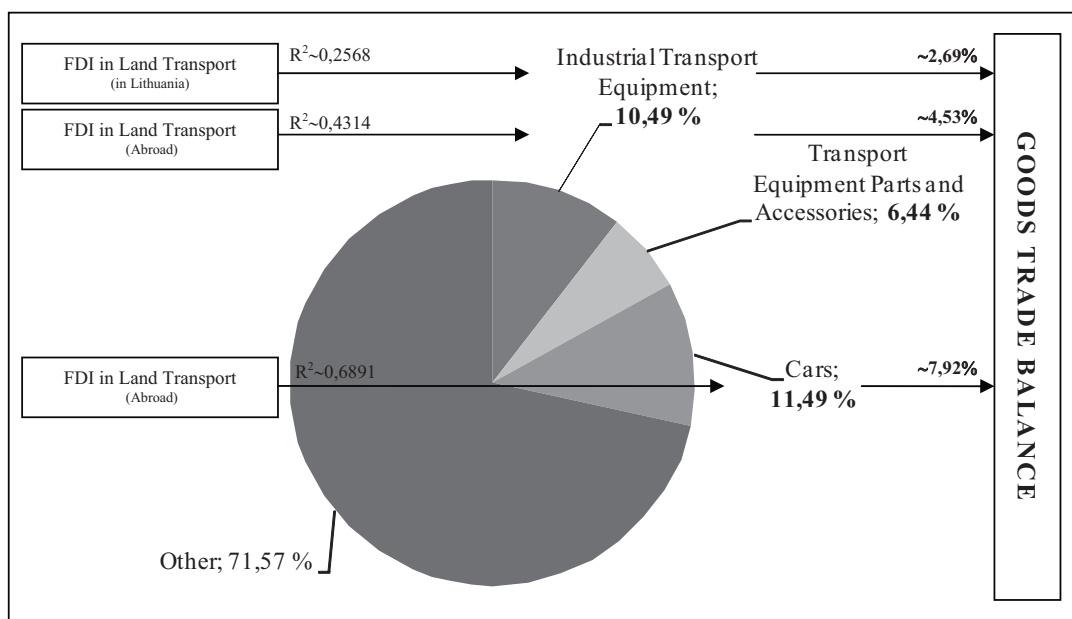


Fig. 5. Lithuanian foreign goods trade balance structure (using average sizes) according to macroeconomics categories classification BEC during the years 2002-2009 and evaluation of FDI effect.

Source: created by the authors with reference to the data of Lithuanian Statistics Department and the Bank of Lithuania

A significant part of goods trade balance (see Figure 4) – 20.91% – is comprised of road vehicles (including road vehicles with airbags). The investigated relationship between road vehicles and FDI in land transport (in Lithuania and abroad) showed that FDI has a significant influence on change of balance of these goods, because while finances come into transport sector, the import of vehicles increases as they are not produced in the state, and at the same time increases the deficit of foreign road vehicles trade. In 2009 when state economy became slow due to global crisis, FDI flows in land transport in Lithuanian balance of payments were not recorded, and the more significant decrease in import rather than export, which in turn was determined by weakened domestic consumption, conditioned a formation of road vehicles surplus. As road vehicles comprise one fifth of all goods trade balance and about 21.13% of its variation are conditioned by FDI in land transport in Lithuania, and even 52.04% by Lithuanian FDI change abroad, it might be thought that those investments accordingly determine about 4.42% and 10.88% of foreign goods trade balance change. Remote connections and sound recording and reproducing devices and equipment make a significantly smaller part of all goods trade balance – approximately 7.99% (years 2002-2009). Accordingly, this group of goods has a rather smaller impact on goods trade balance than that discussed before. The attention should be paid to that investigated relationship between FDI in remote con-

nections and the balance of remote connections and sound equipment was strong, and 55.52% of this balance change were determined by FDI in remote connections, therefore a conclusion might be drawn that FDI had an impact on negative trade balance of this group. Evaluating percentage of telecommunications and sound recording and reproducing devices and equipment in the whole structure of goods trade it was found that it did not have a very significant effect on goods trade balance because equipment of remote connections and sound recording comprises a quite small part of it. Only about 4.44% of all goods trade balance variation might be explained by the change in amount of FDI in remote connections.

The data in Figure 5 shows that industrial transport devices and cars comprise almost the same part of goods trade structure. FDI in land transport in Lithuania determine about 2.69% of goods trade balance variation, and Lithuanian investments in this sphere abroad generally through parts of industrial transport devices and cars articles determine about 12-13%.

The research into FDI in TSRC effect on goods trade balance showed that influence is not substantial and mostly reflects through the trade balances of vehicles and remote connections as well as sound recording and reproducing devices and equipment. It is also important to find out how FDI in TSRC affect services balance because the latter is positive and has a tendency to increase, but not as rapidly as goods trade balance.

Table 4

Granger causality test results of FDI in TSRC and international services trade balance components

Hypothesis	F-statistics	Significance level (p significance)
FDI in water transport in Lithuania is not the reason of water transport services trade balance (STB)	4.264	0.108
FDI in air transport in Lithuania is not the reason of air transport STB	1.331	0.313
FDI in land transport in Lithuania is not the reason of land transport (road and railway) STB	0.470	0.531
FDI in additional and subsidiary transport activity; travel agency activity in Lithuania is not the reason of travels STB	4.434	0.103
FDI in remote connections in Lithuania is not the reason of connections STB	1.454	0.294
Lithuanian FDI in water transport abroad is not the reason of water transport STB	0.554	0.498
Lithuanian FDI in land transport abroad is not the reason of land transport (road and railway) STB	1.878	0.242
Lithuanian FDI in additional and subsidiary transport activity; travel agency activity abroad is not the reason of travels STB	4.787	0.094
Lithuanian FDI in remote connections abroad is not the reason of connections STB	0.281	0.624

Source: created by the authors

In order to determine how FDI in TSRC affect services balance, economic relations between separate parts of FDI in the investigated sphere and different services balances were analyzed. After measuring of separate FDI effect on different services groups, the

conclusions might be drawn about how FDI in TSRC influence services balance, and at the same time the whole account of goods and services. The results of Granger test show that causal relationship exists bet-

ween water transport, travelling services balances and FDI in water transport and additional and subsidiary

transport activity in both foreign in Lithuania and Lithuanian abroad.

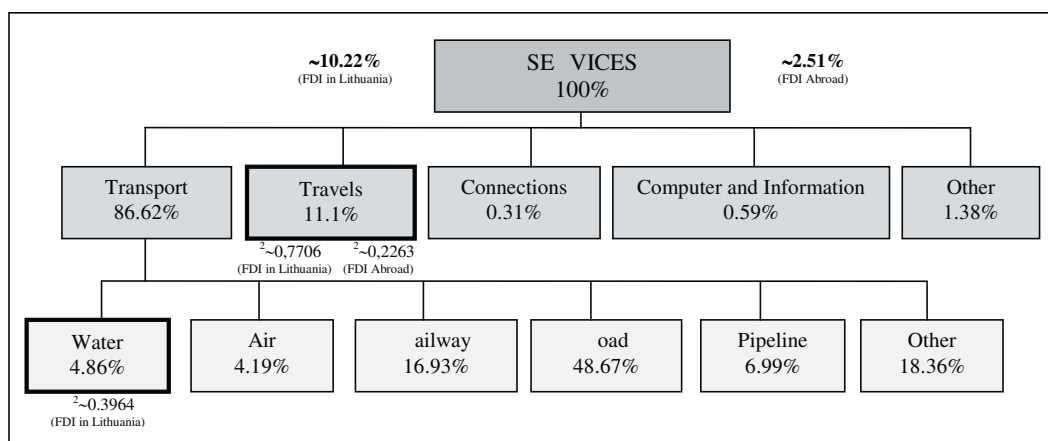


Fig. 6. International services trade account structure of Lithuanian balance of payments, after taking into consideration average percentage weights (during the years 2002-2009) and evaluation of FDI effect.

Source: created by the authors

Discussing the data illustrated in Figure 6 it might be thought that even 86.62% of services balance are comprised of transport services. The analyzed relationship between FDI in transport and those services (see Table 4) showed that only FDI in water transport sector in Lithuania might be considered a reason of water transport services balances (among other variables the existence of causal relationships are not identified). Water transport services in the whole transport services balance approximately comprise 4.86%. However, bearing in mind that transport services comprise a very big part of all structure of services balance, in this case impact of FDI in water transport is noticeable, despite the fact that by absolute sum these investments are not big (even though they have tendency to increase). Having evaluated the coefficient of determination it was measured that 1.67% of all services balance change might be explained by FDI in water transport variation.

Furthermore, quite a big part of services balances structure was comprised of travelling services – 11.1%. However, after completion of the analysis of relationship power between FDI in travel agencies activity and travelling services balance, it emerged that while investments in this sphere are increasing the surplus of travelling services balance is decreasing. On the grounds of determination coefficient and depending on which part in services balance structure is comprised of services of travel agencies, the conclusion might be drawn that FDI in additional and subsidiary activity, travel agencies activity in Lithuania might be 8.55%, and FDI abroad – 2.51% of all services balance. It is noticed that the major part of travelling services is comprised of personal travels – 52.71%, and in 2008 it was as much as 83.7%. That shows insufficient competitive ability of Lithuania as a tourism state.

Conclusions

FDI emergence in TSRC raises the competitive ability of the state, encourages economy growth and development, and stimulates the increase in foreign trade volume. However, analyzing scientific literature and empirical studies done by foreign authors it is noticed that the majority emphasizes efficiency of foreign investments use. Their emergence in the state might both help to solve problems with balance of payments and conversely – affect the negative balance of current account in the direction of increase.

The dynamics analysis showed that during the investigated period FDI flow was very uneven. The biggest part of these investments was comprised of FDI in remote connections (telecommunications). The dynamics analysis of current account showed that during almost the entire investigated period Lithuanian current account was negative. The positive part of the account was comprised of services, work income and current transfers, while negative – of goods trade and investments income balances, which determined that the current account was negative. Since 2008 the deficit of current account decreased, while in 2009 the surplus balance was recorded.

After analysis of the statistical causality of current account balance (during the years 2002-2009) it was settled that FDI in TSRC might be considered the reason of Lithuanian CABP change. After additional study of relationships between separate types of FDI and articles components of balance of payments it was measured that FDI in the researched sphere affect Lithuanian foreign trade balance in both directions – positive and negative. The analysis of correlation of relationships revealed that FDI in remote connections and land transport, which comprise the ma-

major part of all investigated investments coming to Lithuania, have negative impact on goods trade balance because import of telecommunication equipment and road vehicles, industrial transport devices and cars is encouraged. FDI in water transport in Lithuania have positive effect on water transport services balance and encourage the export of these services, however, general impact of FDI in TSRC on services account balance is negative. It is determined by FDI in additional and subsidiary transport activity, travel agencies activity both in Lithuania and abroad, and import of personal travels is encouraged. Negative FDI effect on income balance is noticed through the income in the form of dividends (the results of the research are not very accurate due to inaccessibility of all necessary data). Generally, FDI in the investigated sphere determine about 4.31% (evaluating FDI effect in Lithuania) and 6.66% (evaluating Lithuanian FDI effect abroad) of all Lithuanian current account variation. The impact is not very significant due to a small part of investigated investments in the whole FDI structure.

References

1. Ali, A., Shukui, T., Selvarathman, S., Xiaolin, X., Sa- boor, A. (2008). Political Stability and Balance of Pay- ment: an Empirical Study in Asia. *American Journal of Applied Sciences*. Available online at http://findarticles.com/p/articles/mi_7109/is_7_5/ai_n28552384/.
2. Ando, A., Modigliani, F. (1963). The 'Life Cycle' Hy- pothesis of Saving: Aggregate Implications and Tests. *American Economic Review*, 53 (1), 55-84.
3. Bahadur, G. C. S. (2006). Stock Market and Econo- mic Development: a Causality Test. *The Journal of Ne- palese Business Studies*, 3 (1), 36-44.
4. Comincioli, B. (1995). The Stock Market as a Lea- ding Economic Indicator: An Application of Granger Causality. Available online at http://digitalcommons.iwu.edu/cgi/viewcontent.cgi?article=1071&context=econ_honproj.
5. Danilenko, S. (2009). Makroekonominių procesų poveikio akcijų rinkai tyrimas. Available online at <http://www.ktu.lt/lt/mokslas/zurnalai/ekovad/14/1822-6515-2009-731.pdf>.
6. Gotessman, S. (2009). Determining Granger Causali- ty in Multi-channel EEG Recording with Support Vec- tor Regression. Available online at <http://www.docstoc.com/docs/20367887/Determining-Granger-Causality-in-multi-channel-EEG-recordings-with>.
7. Granger, C. W. J. (1969). Investigating Casual Rela- tions by Econometric Methods and Cross-spectral Methods. *Econometrica*, 37, 424-438.
8. Hamilton, J. D. (1994). *Time Series Analysis*. Prince- ton University Press, Princeton, New Jersey.
9. Hood, M. V. (2008). Two Sides of the Same Coin? Employing Granger Causality Test in a Time Series Cross-Section Framework. *Political Analysis*, 16 (3), 324-344.
10. Hossain, M. A. (2008). Impact of Foreign Direct Invest- ment on Bangladesh's Balance of Payments: Some Po- licy Implications. Available online at <http://www.ban- gladesh-bank.org/research/policynote/pn0805.pdf>.
11. Hunya, G., Schwarzappel, M. (2009). *Wiiw Databa- se on Foreign Direct Investment in Central, East and Southeast Europe, 2009: FDI in the CEECs under the Impact of the Global Crisis: Sharp Declines*. Vienna.
12. Hurlin, C., Venet, B. (2003). Granger Causality Test in Panel Data Models with Fixed Coefficients. Availa- ble online at http://www.dauphine.fr/euroisco/Granger_v1.pdf.
13. Karpušienė, V. (2009). *VAR modeliai / Vector Auto- regressive Models*. Vilniaus universitetas, Ekono- mikos fakultetas.
14. Kokko, A. (2006). The Home Country Effects of FDI in Developed Economies. European Institute of Japa- nese Studies. Available online at <http://swopec.hhs.se/eijswp/papers/eijswp0225.pdf>.
15. Lipsey, R. E. (2007). Measuring the Impacts of FDI. Available online at http://www.oenb.at/de/img/lipsey_tcm14-49015.pdf.
16. Macdougall, G. D. A. (1960). The Benefits and Costs of Private Investment from Abroad: A Theoretical Ap- proach. *Economic Record*, 36, 13-35.
17. Maddala, G. S. (1992). *Introduction to Econometrics, 2nd ed*. Prentice Hall.
18. Marcellino, M., Stock, J. H., Watson, M. W. (2003). Macroeconomic Forecasting in the Euro Area: Coun- try Specific versus Euro Wide Information. *European Economic Review*, 47, 1-18.
19. Modigliani, F., Brumberg, R. (1955). *Utility Analysis and the Consumption Function: An Interpretation of Cross Section Data*. In K. K. Kurihara (ed.) *Post Key- nesian Economics*.
20. Organization for Economic Co-operation and Deve- lopment (1999). OECD Benchmark Definition of Fo- reign Direct Investment. Available online at <http://www.oecd.org/dataoecd/10/16/2090148.pdf>.
21. Organization for Economic Co-operation and Deve- lopment Directorate for Financial, Fiscal and Enter- prise Affairs (2000). Main Determinants and Impacts of Foreign Direct Investment on China's Economy. OECD. Available online at <http://www.oecd.org/data- oecd/57/23/1922648.pdf>.
22. Rudzkiš, R., Kvedaras V. (2003). Lietuvos eksporto tendencijos ir ekonometriniai modeliai. *Pinigų studij- jos 2003 04, Ekonomikos teorija ir praktika*, 29-51.
23. Tai-Fen Kung, Chih-Kao Nieh. (2009). Applica- tion of Semantic Differential Technique to Evalua- te Kansei Image in Architectural Design. Availa- ble online at <http://www.iasdr2009.org/ap/Papers/Orally%20Presented%20Papers/Behavior/Applica- tion%20of%20Semantic%20Differential%20Tech- nique%20to%20Evaluate%20Kansei%20Ima- ge%20in%20Architectural%20Design.pdf>.
24. Tomsik, V. (2009). *Balance in Emerging Markets: The Analysis of Foreign Direct Investments*. International Finance Conference, Kolkata, India.
25. Tomsik, V., Plojhard, M., Srholec, M. (2002). *For- eign Direct Investments Effects on the Balance of Pa- yments*. Newton Holding, a.s.

Tiesioginių užsienio investicijų į transportą, sandėliavimą ir nuotolinius ryšius poveikis Lietuvos mokėjimų balanso einamajai sąskaitai 2002–2009 m.

Santrauka

Šiandieninėmis stipriai globalizacijos veikiamomis sąlygomis šalis tampa sąlyginai izoliuota, jei neturi tinkamos ir nuolat plėtojamos infrastruktūros. Šiai sąvokai priskiriama tiek sausumos susisiekimo sistema, jūrų keliai, aviacija, tiek nuotolinių ryšių sfera (nuo galimybės susisiekti mobiliuoju telefonu iki galimybės patį verslą vykdyti virtualioje erdvėje). Todėl investicijos į šią sritį yra skatinamos ir siektinos. Lietuvos mokėjimų balanso einamosios sąskaitos deficitas dažniausiai yra siejamas su neigiamu tarptautinės prekybos balansu, kurio daugiausia sudaro prekybos prekėmis deficitas. Tokią situaciją priimtina spręsti į šalį pritraukiant tiesiogines užsienio investicijas, kurių efektyvus panaudojimas teoriškai turėtų teigiamai veikti einamosios sąskaitos deficito būklę. Užsienio autorių atlikti empiriniai tyrimai rodo, kad tarptautinio kapitalo atėjimas gali padidinti šalies konkurencingumą tarptautinėje arenoje ir taip išaugtų užsienio prekybos mastai. Tačiau retai, o lietuvių mokslininkų darbuose visai nekeliamas klausimas, kaip atskiros tiesioginių užsienio investicijų rūšys veikia einamąją sąskaitą ir atskiras jos dalis. Lietuva gauna nemažai injekcijų tiesioginių užsienio investicijų pavidalu į telekomunikacijų sritį, tačiau kartu itin išauga poreikis importuoti atitinkamus įrenginius (kompiuterius, programinę įrangą, mobiliuosius telefonus ir pan.). Kadangi Lietuvos ūkio subjektai beveik neinvestuoja užsienyje į šį sektorių, todėl gaunamos lėšos yra suvartojamos šalies viduje, nesukuriamas naujas produktas, o tai neigiamai atsiliepia einamosios sąskaitos būklei.

Straipsnyje siekiama įvertinti tiesioginių užsienio investicijų į transportą, sandėliavimą ir nuotolinius ryšius poveikį Lietuvos mokėjimų balanso einamajai sąskaitai. Šiam tikslui pasiekti atliekama teorinių aspektų ir empirinių tyrimų užsienio šalyse rezultatų apžvalga, išskiriamos pagrindinės galimo poveikio kryptys ir pasekmės.

Užsienyje atliktų tiesioginių užsienio investicijų poveikio mokėjimų balansui empirinių tyrimų rezultatai yra gana prieštaringi. Taigi galima teigti, kad skirtingose šalyse tiesioginių užsienio investicijų poveikis mokėjimų balanso einamajai sąskaitai taip pat gali būti skirtingas. Teigiamas poveikis pasireiškia per eksporto sąskaitą, o neigiamas – per importo ir pajamų sąskaitas. Tačiau tiesioginių užsienio investicijų poveikis priklauso tik nuo to, kaip primanti šalis geba įsisavinti, panaudoti ir nukreipti finansines užsienio injekcijas.

Dinaminis tyrimas parodė, kad tiriamu laikotarpiu tiesioginių užsienio investicijų srautas buvo labai netolygus. Didžiausią šių investicijų dalį sudarė TUI į nuotolinius ryšius (telekomunikacijas). Einamosios sąskaitos dinamikos analizė atskleidė, kad beveik visą analizuojamą laikotarpį Lietuvos einamoji sąskaita buvo deficitinė. Teigiamą

sąskaitos dydį sudarė paslaugų, darbo pajamų ir einamųjų pervedimų straipsniai, neigiamą – prekybos prekėmis ir investicijų pajamų balansai, kurie ir lėmė, kad einamoji sąskaita buvo deficitinė. Nuo 2008 m. einamosios sąskaitos deficitas mažėjo, o 2009 m. užfiksuotas perteklinis saldo. Perviršio susidarymą lėmė prekybos prekėmis balanso deficito sumažėjimas beveik 80 proc. ir paslaugų balanso pertekliaus didėjimas beveik 70 proc. bei einamųjų pervedimų perviršio padidėjimas beveik 50 proc., kurių daugiausia sudarė Europos Sąjungos paramos fondų lėšos.

Išnagrinėjus tiesioginių užsienio investicijų ir einamosios sąskaitos saldo statistinį priežastingumą (2002–2009 m.), nustatyta, kad tiesiogines užsienio investicijas į transportą, sandėliavimą ir nuotolinius ryšius galima laikyti Lietuvos mokėjimų balanso einamosios sąskaitos balanso kitimo priežastimi. Papildomai išnagrinėjus ryšius tarp atskirų tiesioginių užsienio investicijų rūšių ir mokėjimo balanso straipsnių sudedamųjų dalių, nustatyta, kad tiesioginės užsienio investicijos į tiriamą sritį Lietuvos užsienio prekybos balansą veikia tiek teigiamai, tiek neigiamai linkme. Koreliacinių ryšių analizė parodė, kad tiesioginės užsienio investicijos į nuotolinius ryšius ir sausumos transportą, kurios sudaro daugiausia visų tiriamų į Lietuvą ateinančių investicijų, turi neigiamos įtakos prekybos prekėmis balansui, kadangi skatinamas telekomunikacinės įrangos ir kelių transporto priemonių, pramoninių transporto įrenginių ir lengvųjų automobilių importas. Tiesioginės užsienio investicijos į vandens transportą Lietuvoje daro teigiamą poveikį jūrų transporto paslaugų balansui ir skatina šių paslaugų eksportą. Tačiau bendras tiesioginių užsienio investicijų į transportą sandėliavimą ir nuotolinius ryšius poveikis paslaugų sąskaitos balansui yra neigiamas. Jį lemia tiesioginės užsienio investicijos į papildomą ir pagalbinę transporto veiklą; kelionių agentūrų veiklą tiek Lietuvoje, tiek užsienyje skatinamas asmeninių kelionių importas. Neigiamas tiesioginių užsienio investicijų poveikis pajamų balansui pastebėtas per pajamas dividendų pavidalu (tyrimo rezultatai nėra labai tikslūs dėl visų reikalingų duomenų neprieinamumo). Bendrai tiesioginės užsienio investicijos į tiriamą sritį lemia apie 4,31 proc. (vertinant tiesioginių užsienio investicijų Lietuvoje poveikį) ir 6,66 proc. (vertinant Lietuvos tiesioginių investicijų užsienyje poveikį) visos Lietuvos einamosios sąskaitos variacijos. Poveikis nėra labai žymus dėl nedidelės analizuojamų investicijų dalies visoje tiesioginių užsienio investicijų struktūroje.

Pagrindiniai žodžiai: tiesioginės užsienio investicijos, mokėjimų balansas, einamosios sąskaitos saldo, neigiamas poveikis, teigiamas poveikis, faktorinė analizė.

The article has been reviewed.

Received in June, 2010; accepted in August, 2010.