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**EVALUATION OF THE EFFECT OF
INTEGRATION OF LITHUANIA
INTO EU ON LITHUANIAN
ECONOMY IN 2002-2006 (*EX-POST*)**

SUMMARY

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Introduction

The integration of Lithuania into the European Union (EU) determined faster economy development possibilities of national economy, however, it also anticipated certain risks. Possible expected integration benefits and related dangers were examined in 2002 (in the study – *Systematization and analysis of financial, economic and social outcomes of Lithuania's integration into the EU*¹, carried out on request of the European Committee under the government of the Republic of Lithuania.) Then it was established that the greatest possible benefit from Lithuania's integration into the EU could be a creation of common market and free movement of goods as well as the EU financial support. The greatest risk to experience a negative effect of integration was related to the free movement of persons.

A couple of years have passed after the actual full integration of Lithuania into the EU in 2004, and the data of 2004–2006 allows to at least preliminary evaluate the actual effect of possible integration. At the moment the EU financial resources and their benefit are highly discussed, however, this is only one component of integration. Evaluating integration requires taking into account the other sources of integration effect. The total evaluation of the effect of Lithuania's integration, which would consider the actual post-integration period, still had not been carried out. The presented research was prepared in order to review and quantitatively evaluate the effect of integration on the economics of Lithuania, concerned with all primary integration conditioned freedoms and the EU financial support effects. Analysis of this kind is actual both in evaluation of the past achievements and considering the effect of integration in the future, as well as the possible economic policy changes (mostly regarding the EU financial resources.) We assume that this study is relevant for the majority of governmental institutions and organizations (Government of the Republic of Lithuania, Ministry of Agriculture, Ministry of Finance, etc.); it allows evaluating the possibilities that Lithuania took advantage of and to what extent, what else could be relevant in the future...

Though certain effect of Lithuania's integration into the EU has already showed up earlier, since 1995, when former countries of the European Union had cancelled ex-parte tariff barriers for a part of goods of Lithuania's industry, but the EU old-timers used to broadly apply non-tariff measures in order to reject our products. Since the year 2004 is an official date of Lithuania's integration into the EU, when all the barriers for goods and services were annulled, we limit the evaluation of qualitative integration effect in this research to a period of 2004–2006, however, we review the dynamics of economic indices starting from 2002 and earlier.

Research objectives

This research strives to evaluate the benefit of integration into the EU (regarding participation in domestic market with the help of the EU financial support, etc.) during the period of 2004–2006, presenting it as changes of values of primary macroeconomics indices, to single out the most important areas of changes and estimate the qualitative expressions of these changes. The research seeks to evaluate the level of taking advantage

¹ E. Piesarskas et. al. (2003.) *Systematization and analysis of financial, economic and social outcomes of Lithuania's integration into EU*. Vilnius: Engrimas, 114 p.

of opportunities as well. Besides, this research compares actual results of integration into the EU and the ones expected in the previous study of 2002.

The most important task of this research is to answer the following questions:

- What are the general practical integration outcomes for Lithuanian economy during the period under examination?
- What opportunities (financial resources, free movement of goods, etc.) had the greatest influence on the economical development?
- What is the scale of effect of separate products?
- What structural changes were determined by integration into the EU?
- What influence the integration had on prices?

Generalization of evaluation studies on the effect of integration into the EU

- All considered researches² on the effect of integration in the EU forecasted Lithuania only positive effect of economic accession into the EU. Lithuanian and foreign scientific studies predicted greater yearly increase of Lithuanian GDP in the longer term – from 0.6 to 2.1%. The majority of calculations of scientific researches revealed that CEE countries sustain greater benefit of integration into the EU, whereas ES-15 sustain only insignificant increase of welfare.
- The first macroeconomic origin researches of the EU development to the East mostly analyzed the influence of trade changes. Scientific studies estimated the effect of trade barriers elimination on Lithuania and predicted the increase of Lithuanian GDP from 0.18 to 4.44 billions Lt in the long term.
- Having surveyed the most famous researches of integration into the EU, we can generalize which factors were considered mostly:
 - Elimination of trade barriers;
 - EU financial support;
 - Changes on labour market;
 - FDI changes;
 - Structural reforms;
 - Total efficiency changes of production factors.
- Conclusions of researches in case predicted sufficiently big increase of export scale³ in Lithuania:
 - a. One of the mostly reasoned calculations (Lejour, 2006) showed long-term increase of 70.51% of trade flows thanks to the EU membership. On the basis of 2004 export volumes Lithuanian export would additionally grow by 18.2 billions Lt.
 - b. EKT (2002) predicted that due to integration into the EU in the period of 2002–2009 export would increase by 1.9.

² Examined researches, which analyzed Lithuania and the region, to which Lithuania belongs.

³ In 2001–2003 the annual increase of the Lithuanian total export amounted 13.37%, in 2004–2006 – 20.73%. During the period of membership in the EU a small increase of export scale was fixed (mostly export to the EU account.)

- Prognoses of the migration effect :
 - c. In his research Fritz Breuss (2001) revealed the following migration direction: East → West. The prognoses of the migration effect in this research—the annual change of GDP until 2010 in Eastern Europe approximately -0.15%.
 - d. In 2001 research of *ex-ante* effect of expansion to the East the European Commission announced that if 0.25% of country population leaves the country, this greatly influences national economy (-0.18% GDP in a year, -0.2% GDP in 5 years and -0.21% GDP in 10 years.)
 - e. The research of Barell et. al. 2007 estimated that due to migration in 2005 Lithuania experienced a -0.19% change of annual GDP, in 2006 it was -0.33%, in 2007 -0.41%, and in 2008 Lithuanian GDP would be -0.48% lower. Prognoses for 2009 are -0.56% and for 2015 -0.82% growth of GDP.

The effect of integration into the EU on migration and its influence on economic growth of the country is probably one of the loosely evaluated EU membership sources. This could be explained by the fact that the same ex-ante migration researches provoked movement limitations of EU15 labour force and only 4 of EU15 countries ventured to open their labour markets to emigrants from CEE countries.

- FDI effect prognoses:
 - a. Fritz Breuss (2001) predicted that the growth of FDI in CEE countries would speed up the annual increase of GDP from 0.5% to 1%.
 - b. Results of research by Borota T. (2005) and others: if FDI part as a component of GDP of the country increases by 1%, then GDP of the new EU members and candidates increases from 0.7282 to 0.8064%.
- Effect of the EU budgetary means:
 - a. in the *ex-ante* research of expansion to the East carried out in 2001 the EU predicted that a support of 1% of GDP of the country would in a year additionally determine 0.14%, in 5 years – 0.08%, in 10 years – 0.05%
 - b. One of the best known macroeconomic models in Europe , which predicts the EU support effect on the economy of the country, is HERMIN model. By 2020 this study predicted from 83.32% to 90,86% bigger Lithuanian GDP (compared with a scenario without any EU support.) If estimated according to GDP scale of 2004, the benefit that comes from Cohesion funds by 2010 would make 55.4 billions Lt.

It is important to remember that the majority of researches and forecasts has not considered the effect of the EU support resources; therefore, their results advanced the effect of the EU funds. The EU financial support, like FDI, mostly influences the growth of the country not by means of financial remittances, but by means of new competences and technologies. Therefore, it is important to evaluate all the EU financial support outcomes in order to establish how much EU funds did really contribute to the growth of the Lithuanian economy.

Applied evaluation methodology

An attitude for evaluation of effects of integration in the EU applied in this study is very much appropriate for subsequent evaluation: here the effects of integration are identified not only by the moment of manifestation (before and after integration), but also considering a significant difference of growth of the economies of regions (countries), which are still in the process of integration and the ones not integrating into the EU, when common factors conditioning economical growth, various structural changes and etc. are considered. With this objective in mind the designed (panel data) econometric model allows reviewing the actual statistical significance of various EU integration sources, also evaluating sensibility to integration of various parameters. The expansion of the research by a sector section increases the number of data on the basis of which parameters of models are evaluated, therefore, we can hope that the actual effect is established more precisely than using only modular Lithuanian data of just a couple of years.

The general evaluation scheme is close to the attitude of Lejour A.M., Solanic V., Tang, P.J.G. (2006)⁴, which estimates the effect of integration by stages: first of all, by means of application of gravity models the primary effect of various integration effect sources (e.g. creation of common market) on corresponding indices (e.g. export), which determine the growth of economy, is evaluated; next, when this primary effect is incorporated into the equation of the general domestic product growth, the final integration effect on GDP growth is calculated. Yet, the Lejour and et. al. methodology mentioned in the presented research is not only broadened (the effect of integration is investigated not only regarding common market, but regarding other integration sources as well), but also more adapted to Lithuania (the majority of the primary effect equations are made expressly for Lithuania.)

This research composes four models of sources of the primary integration effect on the GDP growth: creation of common market and free trade (export), a free movement of capital (direct foreign investments), free movement of labour (migration) and the EU financial supports (volumes of allocated resources.) The total effect of Lithuania's integration into the EU is calculated as a sum of all these final effects of this primary integration effect sources. The final effect is figured out by applying the already formed equation of the GDP growth. Additional econometric models are also designed while evaluating the effect of integration on inflation and structural economic changes.

⁴ Lejour A.M., Solanic V., Tang, P.J.G. (2006.) *EU Accession and Income Growth: An empirical approach*. CPB Discussion Paper No72, CPB Netherlands Bureau for Economic Policy Analysis.

General Evaluation Scheme concerning the Influence of the Integration into EU

Primary influence recourses:

- development of common market and free trade (export model)

$$\ln(X_{jt}/Y_{it}) = c_j(D_j) + \beta_1 \ln(Y_{jt}/Y_{it}) + \beta_2 t + \delta ES_{jt} + \varepsilon_{jt}, \quad (1)$$

where:

$c_j(D_j)$ – individual influences of j -state, which depend on the distance between j -state (D_j) and other characteristics that are not influenced by time

EU_{jt} – fictitious variable of integration into EU (equal to 1 since 2004 if j -state is a member of EU, otherwise it is equal to 0).

t – variable of time

X_{jt} – export of Lithuanian goods into j -state

Y_{jt} – GDP of j -state (Y_{it} – Lithuanian GDP)

ε_{jt} – model bias

- free capital movement (model of direct foreign investments)

$$\ln(F_{jt}/Y_{it}) = c_j(D_j) + \gamma_1 \ln(F_{jt}^{out}/Y_{it}) + \gamma_2 YN_{jt}/YN_{it} + \gamma_3 \Delta \ln(F_{jt-1}/Y_{it-1}) + \gamma_4 \ln(t) + \lambda ES_{jt} + u_{jt}, \quad (2)$$

kur:

F_{jt} – direct foreign investments in Lithuania from the j -state

F_{jt}^{out} – general FDI volume of foreign state in other states

YN_{jt} – GDP for one resident of j -state (USD)

y_{it} – pace of GDP increase in Lithuania at a time moment t

u_{jt} – model bias

- free workforce movement (model of migration)

$$\ln(M_{jt}/N_{it}) = c_j(D_j) + \eta_1 (YPC_{jt-1} - YPC_{it-1}) + \eta_2 \Delta U_{it} + \eta_3 t + \eta_4 t^2 + \mu ES_{jt} + v_{jt}, \quad (3)$$

where:

M_{jt} – ratio of Lithuanian emigrants into j -state and residents of Lithuania

YPC_{jt} – purchasing power of one resident's income in j -state

ΔU_{it} – change of unemployment level in Lithuania

v_{jt} – model bias

- regarding financial assistance from EU (volume of assimilated finance - ESF) (*)

Equation of GDP increase:

$$y_{it} = c_i + \alpha_1 X_{it}/Y_{it} \cdot \ln(N_{US}/N_{it})_{t-1} + \alpha_2 G_{it}/Y_{it} + \alpha_3 n_{it-1} + \alpha_4 F_{it}/Y_{it} + \alpha_5 (YP_{DE}/YP_{it})_{t-1} + \theta ESF_{it}/Y_{it-1} + \xi_{it} \quad (4)$$

where:

c_i – individual influence of state increase, which does not depend on time

ESF_{it} – volume of assimilated EU financial support in i -state

G_{it} – volume of government expenses in i -state (without ESF_{it})

N_{it} – population of i -state ($i=US$ – USA)

YP_{it} – purchasing power of income in i -state ($i=DE$ – Germany)

X_{it} – nominal export of i -state

Y_{it} – nominal GDP in i -state

y_{it} – pace of GDP increase in i -state

ξ_{it} – model bias

Influence of EU integration (IEUI) due to:

see:

- Free trade (LP): (1) and (4);
- Free capital movement (LKJ): (2) and (4);
- Free workforce movement (LDJ): (3) and (4);
- EU financial support (ESF): (*) and (4);

Restrictions and associated risks

- Influence of integration may be partly restricted by various late effects (e. g. assimilation of financial funds);
- Which date should be considered the beginning of integration? This research measures the influence of integration since 2004;
- It is essential that the states under research (their economy) would be as similar to Lithuanian as possible. However, some different states have also integrated into EU, therefore, it is impossible to make a control-group of non-integrated states, which would be very similar in economy structure and problems;
- Research limited only by a group of intermediate economy states;
- Some states of the group under research did not manage to receive all necessary data, and the data of other states are not absolutely trustworthy or/and reasoned (especially the results of 2006);
- Short period of post-integration.

Econometric Models for the Evaluation of Integration Influence

Model of Economy Increase

$$\begin{aligned}
 y_{jt} = & -16.82 + 0.03 X_{jt}/Y_{jt} \cdot \ln(N_{US,t-1}/N_{j,t-1}) + 3.50 n_{j,t-1} + 0.07 YP_{DEU,t-1}/YP_{j,t-1} + 0.50 GN_{j,t-1}/Y_{j,t-1} + \\
 & (4.09) \quad (0.01) \qquad (1.10) \qquad (0.02) \qquad (0.14) \\
 & + 0.99 ESF_{jt}/Y_{j,t-1} + 0.06 F_{j,t-2}/Y_{j,t-2} + u_{jt} \\
 & (0.45) \qquad (0.03)
 \end{aligned}$$

$$R^2 = 0.46, DW = 1.48.$$

where:

- y_{jt} - pace of GDP increase in j -state
- X_{jt}/Y_{jt} – a part of goods and services export in j -state at a time moment t
- $N_{US,t}/N_{j,t}$ – ratio of USA population and the population of j -state
- n_{jt} – percentage change of population
- $YP_{DEU,t}/YP_{jt}$ – ratio between Germany (DEU) and j -state on the basis of purchasing power parity
- GN_{jt}/Y_{jt} – part of government expenses in GDP without ES financial support
- ESF_{jt}/Y_{jt} – a part of assimilated EU financial support in comparison to GDP
- F_{jt}/Y_{jt} – a part of accumulated foreign direct investment GDP
- u_{jt} – remainder of evaluated model (incl. a part of individual influences).

Note. The econometric model of increase equations has been evaluated on the basis of data received from sixteen states of intermediate economy (eight of them entered EU in 2004): Albania, Belarus, Bulgaria, Check Republic, Estonia, Georgia, Kirghizia, Croatia, Latvia, Lithuania, Poland, Macedonia, Romania, Slovakia, Slovenia, and Hungary.

Model of Goods Export

$$\begin{aligned}
 \ln(X_{jt}/Y_{jt}) = & -7.33 + 0.57 \ln(Y_{j,t-1}/Y_{l,t-1}) + 0.05 t + 0.33 ES_{jt} + 0.11 NES_{jt} + u_{jt} \\
 & (0.42) \quad (0.21) \qquad (0.02) \quad (0.13) \quad (0.13)
 \end{aligned}$$

$$R^2 = 0.90, DW = 0.94.$$

where:

- X_{jt}/Y_{jt} – ratio between export of Lithuanian goods into j -state and Lithuanian GDP time moment t .
- Y_{jt}/Y_{lt} – GDP ratio between Lithuania and foreign state
- ES_{jt} – fictitious variable of the integration into EU, which is equal to 1 since 2004 for the members of the EU, and which is equal to 0 for the rest.
- NES_{jt} – fictitious variable for the states, which are not the members of EU. Variable is equal to 1 since 2004 for the nonmembers of the EU, and which is equal to 0 for the rest.

- u_{jt} - remainder of evaluated model (incl. a part of individual influences).

Note. Econometric model of export has been evaluated on the basis of Lithuanian export data into 42 states. The export into those states involved more than 95 percent of the whole goods export in 2006.

FDI Model

$$\ln(F_{jt}/Y_{jt}) = -2.84 + 0.18 \ln(F_{jt}^{out}/Y_{jt}) + 0.14(Y_{jt}/N_{jt})/(Y_{lt}/N_{lt}) + 0.81\ln(t) + 0.36\Delta\ln(F_{jt-1}/Y_{jt-1}) + 0.03ES_{jt} + u_{jt}.$$

(0.71) (0.09) (0.05) (0.18) (0.07) (0.10)

$$R^2 = 0.96, DW = 1.44.$$

- Y_{jt}/Y_{lt} – ratio between accumulated FDI of the foreign country and Lithuanian GDP
- F_{jt}^{out} – general portfolio of accumulated FDI in foreign country (to all states, millions of LTL)
- Y_{jt}/N_{jt} – GDP for one resident (millions of USD)
- Δ the first row difference: $\Delta Z_t = Z_t - Z_{t-1}$
- ES_{jt} - fictitious variable of the integration into EU, which is equal to 1 since 2004 for the members of the EU, and which is equal to 0 for the rest.
- u_{jt} - remainder of evaluated model (incl. a part of individual influences).

Note. Econometric model of FDI has been evaluated on the basis of data from 30 states (the greatest foreign investors in Lithuania).

Model of Emigration

$$\ln(M_{jt}/N_{jt}) = -20.15 + 1.48(YPC_{jt-1} - YPC_{lt-1}) \cdot 10^{-3} + 0.10 \Delta U_{jt} + 2.63t - 0.13t^2 + 0.40 ES_{jt}^0 +$$

(2.07) (0.05·10⁻³) (0.03) (0.32) (0.02) (0.08)

$$+ 0.41 \ln(IM_{jt-1}/N_{jt-1}) + u_{jt},$$

(0.05)

$$R^2 = 0.96, DW = 1.81$$

where:

- M_{jt}/N_{jt} – the ratio between the number of emigrants from Lithuania into the j -state and the number of Lithuanian population
- IM_{jt}/N_{jt} – the ratio between the number of immigrants from j -state into Lithuania and the number of Lithuanian population
- $YPC_{jt} - YPC_{lt}$ – the difference between the volume of income for one resident in foreign j -state and Lithuania according to the parity of purchasing power
- ΔU_{jt} – the change of unemployment level in Lithuania
- ES_{jt} - fictitious variable of the integration into EU, which is equal to 1 since 2004 for the members of the EU, and which is equal to 0 for the rest.
- u_{jt} - remainder of evaluated model (incl. a part of individual influences).

Note. Econometric model of migration is made up on the basis of annual data from the Lithuanian Statistics Department for the period of 2001 - 2006 about the emigrants, who have officially emigrated from Lithuania.

Model of Immigration

$$\ln(IM_{jt}/N_{jt}) = -11.03 + 2.09 \ln(YPC_{lt-1}) - \ln(YPC_{jt-1}) + 0.16 \Delta U_{jt} + 0.72 ES_{jt}^O + 0.17 ES_{jt}^N + 0.11 NES_{jt} + u_{jt},$$

(0.42) (0.57) (0.06) (0.18) (0.14) (0.12)

$$R^2 = 0.86, DW = 0.69$$

where:

- M_{jt}/N_{jt} – the ratio between the number of immigrants from the j -state into Lithuania and the number of j -state population
- $YPC_{jt} - YPC_{lt}$ – the difference between the volume of income for one resident in foreign j -state and Lithuania according to the parity of purchasing power
- $\square U_{lt}$ – the change of unemployment level in Lithuania
- ES_{jt} – fictitious variable of the integration into EU, which is equal to 1 since 2004 for the members of the EU, and which is equal to 0 for the rest.
- NES_{jt} – fictitious variable for the states, which are not the members of EU. Variable is equal to 1 since 2004 for the nonmembers of the EU, and which is equal to 0 for the rest.
- u_{jt} – remainder of evaluated model (incl. a part of individual influences).

Note. The data about the immigration into Lithuania from 25 foreign states was taken from the publication “Demografijos metraštis” which is issued by the Statistics Department.

Model of Inflation

$$\Delta \ln P_{jt} = 1.02 + 0.02 \Delta^2 \ln P_{jt-1} + 0.004 \Delta y_{jt-1} - 0.21 \ln P_{jt-1} + 0.42 t \gamma_{jt-1} \cdot 10^3 + 0.006 ES_{jt} + u_{jt},$$

(0.06) (0.01) (0.001) (0.01) (0.16·10³) (0.01)

$$R^2 = 0.87, DW = 1.73$$

where:

- P_{jt} – the index of consumption prices
- $\square P_{jt} \cdot 100$ – inflation, $\square^2 P_{jt} \cdot 100$ – the change of inflation (acceleration)
- $\square y_{jt}$ – change of GDP increase (acceleration)
- t – variable of linear trend
- ES_{jt} – fictitious variable of the integration into EU, which is equal to 1 since 2004 for the members of the EU, and which is equal to 0 for the rest.
- u_{jt} – remainder of evaluated model (incl. a part of individual influences).

Note. The econometric model has been evaluated on the basis of data received from 15 states of intermediate economy (eight of them entered EU in 2004): Albania, Bulgaria, Check Republic, Estonia, Georgia, Kirghizia, Croatia, Latvia, Lithuania, Poland, Macedonia, Romania, Slovakia, Slovenia, and Hungary.

Evaluation results of the effect of Lithuania's integration into the EU on Lithuanian economy in 2004-2006 (*ex-post*)

In evaluation of the size of the effect of integration four effect sources were examined: the common market and the free movement of goods and services, the effect of financial resources, the free movement of capital and the free movement of labour.

The extent of the effect of the EU financial support in GDP

The European Union support undoubtedly had a positive and significant effect on the examined economies: in general, one per cent of allocated support in comparison with GDP, of examined eight new European Union countries, that year conditioned about 1 percentage point of GDP growth. The discussed size of the EU fund is medium, its specific value in a specific country differs depending on the structure of the EU funds. In order to evaluate this possibility, instead of one common index of the EU funds three different types of it are included in the equation of growth: part of GDP resources intended for structural support, part of GDP resources intended for cohesion and part of GDP intended for agriculture.

Though there are not too many observations and, accordingly, evaluations may be not completely precise, the conducted analysis shows that the return of resources intended for structural intervention in the period of 2004-2006 of almost integrated into the EU countries was the highest; the effect of resources intended for cohesion on the growth of economy was smaller, and resources intended for agriculture were the least efficient rates in the course of the increase of economy growth during the period of 2004-2006. However, these conclusions would not necessarily be valid in the future, inasmuch as since the second half of the year 2007 the conjuncture of agricultural products in the world had changed substantially. Notwithstanding this fact, this present analysis shows that it is essential to increase the efficiency of use of resources allotted to agriculture.

Regarding the actual structure of support given to Lithuania, during the period of 2004-2006 the effect of the EU financial support on GDP correspondingly makes about 0.4, 0.5 and 2.2 of percentage point.

Influence of a common market and free trade on GDP

The process of Lithuanian integration into the EU related to the source of this integration effect is heterogeneous. Since 1995 the old European Union countries *ex-parte* eliminated tariff barriers for Lithuanian industry goods (except agricultural and some other specific sorts of goods.) However, only in 2004 after the accession to the EU all tariff and non-tariff barriers were cancelled not only for goods, but for services as well. Empirical determination of the actual effect of the first stage is practically impossible, since there is practically no system data of national accounts earlier than 1995. Moreover, there is no statistics of export services by countries. Consequently, the presented evaluation covers only that part of the EU effect regarding creation of common market, which is concerned with the second integration stage and manifests through the changes of export of goods.

A change of an export part of the primary integration effect regarding the creation of common market shows that since 2004 the ratio of export of Lithuanian goods to individual EU countries with Lithuania's GDP, under other equal conditions, was higher by approximately 1.4 compared with non-integration scenario rate. The final integration effect on the growth of GDP regarding

GDP change of primary export part in 2004-2006 correspondingly amounted 1.7, 1.8 and 1.9 of percentage point.

Effect of the free movement of labour on GDP

Having carried out an empiric analysis of the effect of the EU integration on emigration extent, it was established that emigration to the EU countries, if measured by the general number of Lithuanian citizens, since 2004 under other equal conditions was higher by about 1.5 compared with non-integration scenario. On the basis of this primary effect the change rates of the number of citizens in both integration and non-integration scenarios are established (due to upside-down “U” letter shape emigration the number of citizens of integration scenario in 2004-2006 declined faster than in non-integration scenario, but in 2007 the process was already slower than in non-integration scenario.) When the latter are applied in the equation of GDP growth, the final effect of the EU integration related to the free movement of labour regarding emigration wave is evaluated as well: in 2004-2006 the “input” of emigration into GDP growth rates correspondingly made -0.3, -0.1 and 0.1 of percentage point.

As it was predicted in evaluation study in 2002, the determined effect through emigration is quite small. If we considered remittances sent by emigrants, then a pure effect of economic integration, stimulated by emigration could be positive. However, we have no such statistic data.

Effect of integration on inflation

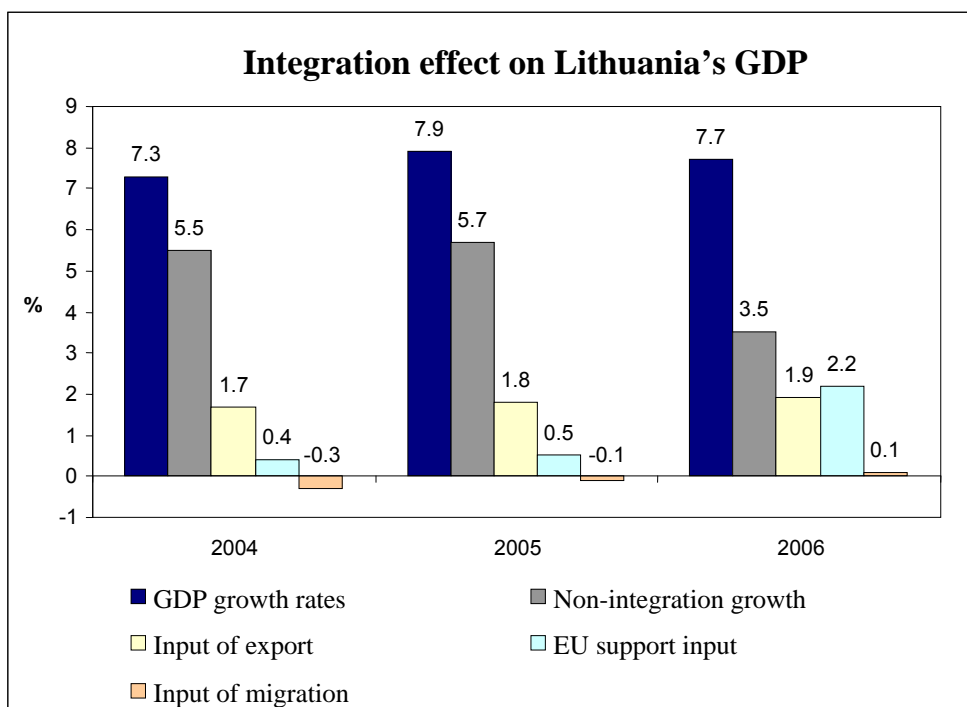
Having composed an empiric evaluation model of the effect of integration it was determined that integration did not have any statistically significant direct influence on the change of inflation processes. Yet faster growth of GDP conditioned by integration causes higher inflation, especially during the transition period (which lasts up to five years approximately), when speeding-up or slowing-down of the economical growth causes the corresponding inflation expectations.

During the period of 2004-2006 approximately 0.6 percentage point of inflation part was related to the speeding-up of GDP conditioned by integration. But its dynamics is far from being equal: if in 2004 there was practically no increase of inflation, then in 2005 and 2006 inflation was higher compared with non-integration scenario, correspondingly 1 and 0.8 of percentage point, and in 2007 it already formed 1.9 percentage point.

Generalization of evaluation of integration effect on Lithuanian GDP and values of its sources

Having compared the results of this research with economic and other outcomes of integration into the EU predicted in evaluation report of 2002, several conclusions could be drawn. Qualitatively, the results in both cases are absolutely compatible: the greatest effects of integration into the EU are related with the creation of the common market and the EU financial support; the migration effect on the growth of economy is very restricted; however, nobody managed to determine any significant effect of direct foreign investments so far. When carrying out other researches of integration effect in the future, it would be purposeful not to restrict by common index of direct foreign investments but to generally analyse the effect of integration on foreign financial income and examine the influence of the latter on the rates of economical growth: at least in Lithuania the dynamic changes of foreign loans during the period under examination were much higher than the ones of direct foreign investments.

Growth rates of the Lithuanian GDP in 2004-2006 and the input of resources of the effect of integration into the EU



Quantitatively, the current evaluation shows that, if estimated by the effect on GDP growth rates, the benefit of integration, is much higher than it was expected in 2002. It was predicted then that due to all the effects the growth rates of GDP in 2004-2006 would exceed the growth rates of GDP of non-integration scenario by approximately 1.3 of percentage point. Our current evaluation shows the possible average input of integration of this period into the growth rates of GDP to be much higher. The picture above illustrates the actual growth rates of GDP in 2004-2006 and the input of singled out EU effects of resources in percentage points and their relative importance.

Additional evaluation of the effect of integration into the EU

The conducted econometric research was based on panel data, therefore, the results in a greater degree reflect an average effect of integration on new the EU members. It is hardly possible to verify it qualitatively in regard of Lithuania due to the lack of statistic data (shortness of time lines), however, qualitative comments help to better perceive the tendencies of economy development of the country in the recent years.

First of all it is necessary to emphasize that during the period of 2001-2003, when there where no doubts about the forthcoming accession of Lithuania to the EU, the integration benefit was notable: expansion of export to developed countries accelerated, level of emigration increased and foreign investors become more active, although privatization process was already weaker (in countries which belong to the so called first wave group – the Czech Republic, Hungary, Estonia, etc., – these phenomena showed up even earlier.) A strategic introduction of foreign investors into banks' sector which fundamentally changed terms of credit and made premises for modernization of production and jump of inner consumption was especially important. Considering the basic features of development Lithuanian economics in the period of 2004-2007, a strong integration influence may be distinguished:

Economy structure changes. Improved business and household expectations, reduced bank loan interests and the EU support encouraged expansion of construction, consequently this activity became dynamic and, according to preliminary facts, part of it last year exceeded 9% in GDP structure, perfect perspectives (no customs on the border with the EU members, weighty

financial support) opened in transportation sector, relative weight of which in Lithuania (about 10%) is much higher than the average in the EU. Support to agriculture and export subsidies to the third countries held up the decrease of the latter sector and food industry part in GDP, in 2007 it already showed some signs of growth. Not too long ago the downfall of agriculture was almost a positive phenomenon which encouraged to aim the labour force and financial resources to more productive sectors. However, lately a shortage of food begins to show up in the world, therefore, there are great perspectives for the mentioned activities, what is also proven by the excellent indices of food processing industry of the last year. Unfortunately, hopes that processing industry would evolve in the direction of consolidation of the sector of high and medium-high technologies (HMHT) were false: there is a great lack of adequate direct foreign investments (FDI.) Notwithstanding the support given by the EU, the available potential of tourism services is still not fully used (beautiful nature, low density of citizens, etc.), however, the situation should improve after the accession to the Schengen area, particularly if the government treats this issue seriously.

Foreign investments. After the accession to the EU FDI flows to Lithuania became substantially smaller than the majority of analytics thought. FDI volumes directed to share capital (not including the resources received after the government sold the equity stake of *Mažeikių nafta*) are particularly poor, whereas HMHT sector had almost not received them at all. The major cause is that economic policy of the country was not oriented to attracting the FDI. Still, a flow of all foreign investments to Lithuania has increased significantly over the last three years, the greater part of it was loans. The volume of the latter in 2006 approached 10 billion litas or 12% GDP, according to preliminary evaluation it could reach 15 billions litas last year. These resources activated domestic consumption; a great part of it was used for modernization of production and advance of work productivity, this was especially essential regarding the emerged lack of labour force. These recourses indirectly increased the income of country treasury and consequently provided conditions for consolidation of public sector. The effect of integration was conclusive for growth of volume of foreign investments and manifested through the reduction of interests of loans, improved expectations, flood of portfolio investments.

Emigration. When considering the negative outcomes of integration, emphasis is usually put on the leave of citizens abroad, which was particularly intensive in 2004. Although the emigration process is not researched enough, analytics unanimously agree that it already reached a horrendous scale – having in mind the amount of Lithuanians who live abroad temporarily and those who permanently left for other countries; usually a figure of 400 thousand citizens is mentioned. Thus Lithuania lost about one fifth part of labour force, however, from economic point of view an integrated effect of this phenomenon on economy development of the country was rather more positive than negative: the former very high level of unemployment was reduced several times; labour income boomed not only in big cities but in periphery as well, social tension was reduced; monetary flows gained abroad stimulated economy growth and raised the living standards in Lithuania. Although the latter almost do not come in the view of state statistics, undoubtedly they are sizeable. Specialists of central bank of Poland determined that last year one emigrant of this country made approximately more than 2 thousand euro of remittances accounted in payments balance of the country, but they think this is only *the tip of the iceberg*. Assuming that the real sum was a least twice as big and applying this evaluation to Lithuania, we get the conclusion that in 2007 the Lithuanian emigrants had sent 5-6 billion litas or substantially more than the whole EU support, and the real deficit ratio of an operating account with GDP is roughly 6 percentage points smaller than announced. Still, a negative influence of emigration develops each year and this phenomenon is a real danger. Though it is said that the amount of goers is already compensated by the comers, but lately the most common emigrants is youth – the most efficient part of the labour force, moreover, brain exodus became more intense – more and more Lithuanians leave for other countries to study and stay to live there after graduation .

Inflation. A direct effect of integration on the index of consumption prices (ICP) was small and manifested by a onetime impulse in May 2004 regarding the change of import customs and later small changes due to excise increase. However, there is almost no doubt that an indirect effect was sizeable. It was Lithuania's integration into the EU that conditioned a sudden jump of consumption, as an outcome of which the offer did not follow the demand and this allowed producers to level up prices. The already mentioned speedy growth of wages increased cost of production, particularly in service sector. Moreover, due to strict EU requirements part of cheap goods (Russian pharmaceuticals, etc.) abandoned the Lithuanian market, and people felt this effect despite ICP did not reflect that.

Export. There is no doubt regarding the conclusions derived by econometric methods about the especially strong positive effect of integration on export of the country. We will provide several additional comments, which emphasize the particularity of Lithuania as transit country. Somewhat unexpectedly the growth of goods transportation was particularly fast in the eastern direction after Lithuania's accession to the EU. Last year part of CIS region in total export of goods almost reached a quarter, i.e. in three years it increased by half. This growth was encouraged by the mentioned subsidies and prevailing favourable conditions for reexport (for export of non-Lithuanian origin goods.) Not only cars (this business is run by a range of towns) but also great amounts of machinery and equipment, food products, products of chemical industry are resold. However, lately the export of goods of Lithuanian companies is also rapidly developing, last year the indices of all primary groups of goods increased significantly, except textile and mineral products. A decline of export of the latter was challenged by the interrupted supply of crude oil from Russia through a pipeline *Drużba*. If we do not consider mineral products, according to preliminary facts, the export of Lithuanian goods in 2007 has increased almost by a quarter which is a great achievement.

Conclusions

A change of values of primary macroeconomic indices of Lithuania has altered during post-integration period (2004-2006.) Inasmuch as 2004 is distinguished as the year of Lithuania's accession to the EU, apparent structural brake could be related with integration influence. However such unambiguous allocation is not correct regarding the possibility of other potential changes not related with integration structural changes neither inside Lithuania (e.g. regarding the change of degree of market monopolization, former Seimas election), nor regarding possible influence on the change of global conditions (e.g. until 2003 global flows of direct foreign investment into raising markets declined due to earlier financial and currency markets crises in those countries, and since 2004 the flow of direct foreign investments has recovered again.) Even analysing time dimension it is quite tricky to separate out the effect of integration and the total structural changes, particularly in transition-economy countries. In order to more precisely identify the effect of integration, this research invoked panel data⁵ models, which identify integration effects not only according to the moment of manifestation (before and after integration), but also considering the significant difference fact of growth (and other processes) of economy between integrating and non-integrating countries, when taking into account total factors conditioning the economical growth, various structural changes, etc.

The results of econometric patterning show that integration effect on economic indices of Lithuania and other countries which entered the EU in 2004 was significant during the period of 2004-2006. First of all, the EU financial support had a weighty direct and indirect effect on the growth of GDP and changes of efficiency structure of economy work. Integration into the EU also extended the openness of the country (the export part of GDP has increased) and encouraged migration, so (indirectly) speeding up the growth of GDP as well (the migration influence is not homologous.) There was no direct effect of integration into the EU on the inflation process (except a onetime impulse due to the change of import customs), however, there was a direct one through a faster growth of economy conditioned by integration. A significant effect of integration into the EU on the direct foreign investments has not been established. Among the analyzed factors the importance of the latter in the equation of GDP growth is at the same time the smallest and significant only on the level of ten per cent significance scale.

The qualitative evaluation reveals that the EU financial support undoubtedly had a positive effect: the EU financial support increased by one percentage point compared to GDP, while the rates of GDP growth in the examined eight new European Union countries increased by 1 percentage point on average. Lithuania's GDP growth rates due to the EU financial support in the period of 2004-2006 were higher approximately by 1 percentage point compared with the ones, which would have been reached without integration. Evaluating the data of the current period, the greatest effect is noticed by resources of structural funds, the smaller is from resources intended for cohesion, and the smallest is from resources intended for agriculture. The EU support not only determined the acceleration of GDP growth but also the increase of work productivity. However, considering the influence of integration on work productivity and trade conditions this increase could so far be related with the process rather than with product innovations, i.e. integration as yet encouraged the more efficient production of the alike products but had not conditioned the manufactured production to climb "technological ladder", which relates to production of more expensive products of higher quality, better acknowledgement of trade mark of Lithuanian goods in foreign markets, etc.

⁵ This data structure is also called *emaciation*.

Regarding the effects of accession of the EU common market and creation of the free trade, the rate of Lithuania's export into the EU with GDP increased approximately by 1,4 times compared with non-integration scenario, so this accelerated the rates of Lithuania's GDP growth during the period 2004-2006 by approximately 1.8 percentage point. A statistically significant effect of trade deflection from the third countries has not been established, so from this point of view the integration into the EU is considered very successful.

The integration into the EU in 2004-2006 also had a great influence on emigration process, which, with a delay of one year, encouraged immigration flows. After the accession to the EU a wave of emigration had noticeably increased only to the older countries of the EU. Integration of emigration processes to the new ten EU countries (expansion of 2004) or to third countries has not changed. Having considered an effect of remigration a meaningful impulse of integration on immigration from the third countries has not established as well. The indirect effect of integration on the growth of GDP during the period of 2004-2006 due to the primary effect on migration makes approximately -0.1 percentage point. Yet, this effect does not include the effect of remittances by emigrants, therefore, even the pure effect of emigration growth conditioned by integration could be positive. We could not consider this aspect because of lack of statistical data.

The comparison of econometric patterning results of this research with the ones predicted in preliminary evaluation report of EU integration outcomes of 2002 allows drawing some generalizations. Qualitatively, the conclusions in both cases are almost the same: the major effects of the EU integration are related with creation of the common market and the EU financial support, while the effect of migration on the growth of economy is very restricted; though a significant effect of direct foreign investments has not been established so far. From a quantitative point of view the current evaluation shows that estimating by the effect on GDP growth rates the benefit of integration is much higher than it was expected in 2002. Then it was predicted that due to all the effects the growth rates of GDP in 2004-2006 would exceed the growth rates of GDP of non-integration scenario by approximately 1.3 percentage point. Our current research shows that during this period the integration input into GDP growth rates is much higher and in the course of the period of 2004-2006 the integration determined faster GDP growth by approximately 2.7 percentage point. The corresponding input of the EU integration sources into yearly growth rates is the following:

- creation of the common market and the free trade – approximately 1.8 percentage point;
- the EU financial support – approximately 1 percentage point;
- the free movement of persons – approximately -0.1 percentage point.

This faster expansion of economy, conditioned by integration, caused bigger inflation as well: in the period of 2004-2006 due to additional integration impulse on GDP growth the inflation was higher by approximately 0.6 percentage point. It should be noted that this increase is not a specific effect of integration but only a natural result of faster economic growth.

Following the review of studies conducted in other countries we may notice that later studies mention usually greater effect of integration to the EU on new members. One of the possible reasons, applicable in comparing conclusions of the present research with the ones presented in 2002 study, could be that in evaluation of 2002 the Lithuanian integration was examined as an example of one individual country. Yet, as many as 10 new members accessed the EU, 8 of which were transition-economics countries and even 3 of them were neighbouring countries to Lithuania with which we maintain intensive trade and financial links. A correspondingly negative effect of integration into the EU showed in all new member states and the total effect was greater than taking any individual candidate integrating into the EU.

At the same time it must be admitted that the post-integration period is very short. Though the research applied contemporary methods of econometric analysis and a maximum of information, little data, however, does not provide a possibility to obtain very precise evaluations. Moreover, a

short post-integration period does not reveal all of possible effects, part of (particularly 2006) data presented in official (particularly international) statistics are not final yet. Therefore, the results should be considered preliminary (leading.) Notwithstanding this fact these inaccuracies are unlikely to substantially modify the main conclusion: Lithuania's integration into the EU in 2004-2006 conditioned a significant and greater impulse for the growth of Lithuanian economy than it was predicted in the preliminary evaluation of 2002, and primary sources of economical growth are the entrance to the common market, the free trade and the EU financial support.