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**Working Paper**

## Evaluation of the Factors that Have the Most Significant Influence on Lithuanian Export

Institute of Economic Research Working Papers, No. 97/2017

**Provided in Cooperation with:**

Institute of Economic Research (IER), Toruń (Poland)

*Suggested Citation:* Remeikiene, Rita; Gaspareniene, Ligita; Sadeckas, Alius (2017) : Evaluation of the Factors that Have the Most Significant Influence on Lithuanian Export, Institute of Economic Research Working Papers, No. 97/2017, Institute of Economic Research (IER), Toruń

This Version is available at:

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**Article prepared and submitted for:**

**9<sup>th</sup> International Conference on Applied Economics Contemporary  
Issues in Economy, Institute of Economic Research, Polish  
Economic Society Branch in Toruń, Faculty of Economic Scienc-  
es and Management, Nicolaus Copernicus University, Toruń,  
Poland, 22-23 June 2017**

**Toruń, Poland 2017**

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# Evaluation of the Factors that Have the Most Significant Influence on Lithuanian Export

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## Abstract

**Research background:** Export is an important part of economics not only in a country's, but also in international level. Over the last two decades, development of export has been one of the fastest and most acceptable strategies of economic progress. Export is also one of the ways to improve a country's balance of payments, reduce trade deficits, and raise the general life standards.

Scientific literature does not contain any unambiguous models developed for evaluation of the impact of the influential factors on the volumes of exports in the countries with similar economic conditions. Hence, *the scientific problem* for this research is formulated as follows: which factors have the most significant impact on export and how does this impact manifest?

**Purpose of the article:** is to conduct evaluation of the influential factors affecting Lithuanian export leaning on the theoretical aspects of export determinants.

**Methodology/methods:** The methods of the research include comparative and systematic analysis of the scientific literature, correlation and regression analysis.

**Findings & Value added:** Mathematical estimations have revealed that GDP per capita and general state's revenue from taxes and social contributions can explain the trends of Lithuanian export by 99.1 percent over the period 2007 – 2015. Crediting of private sector also showed a very strong correlation with Lithuanian export; the negative medium-strong correlation was estimated between the export and general tax level, while the positive medium-strong correlation was captured between the export and minimum wages.

**JEL Classification:** J11; O15

**Keywords:** *export, factors, evaluation, Lithuania.*

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## Introduction

**Topic relevance.** Lithuanian exports have been increasingly focusing on foreign markets, as export of goods and services makes businesses more profitable, encourages business expansion and internationalization, fastens good returns on investments and accelerates job creation, thus contributing to Lithuania's economic growth. In accordance with the Guidelines of Lithuanian Export Development for 2014-2020, it can be stated that "in recent years, Lithuania's export growth rate has been faster than the average in the European Union Member States." In 2012 Lithuanian export appeared to be the main driver of economic growth and accounted for 84.1 percentage of GDP (p. 3). The export growth is a major factor in the economic recovery of Lithuania and is regarded as one of the factors of sustainable economic growth (Kalėdienė, Miliauskas, 2011, pp. 40-51).

Attention should be drawn to the fact that Lithuanian export growth has been affected not only by the macroeconomic situation of other countries but also by the competitiveness of business itself. To maintain competitiveness, productive investments in machinery and equipment are especially needed. Conditions for access to the market provide an opportunity to export more products and services to users in foreign markets.

Scientists have been persistent in analysing export as a phenomenon, which can be helpful to countries in the recession. As a result, the analysis of scientific literature can provide various results of export and the factors affecting it. For example, Navickas (2008, pp. 1-184), Sekliuckienė (2009, pp. 1-135), Burinskienė (2014, pp. 103-110), Langvinienė *et al.* (2010, pp. 1-215), Melnikas (2014, pp. 1-464) were involved into the research on the development of the export concept as well as on the significance of the process for the overall national economy.

Factors that can have the most significant influence on export were studied by Langvinienė *et al.* (2010, pp. 1-215), Pucar (2012, pp. 248-261), Pridotkienė (2011, pp. 273-279), Sabonienė (2014, pp. 450-457), Vijeikis (2012, pp. 223-237) and others. Models of export analysis were designed by Bernatonytė (2010, pp. 1-274).

Scientific literature does not provide any straightforward answer about the factors of the impact on exports in the states with similar economic conditions, thus serving the purpose of formulating a **research problem**: what factors affect export and how it influences the process of the present scientific analysis?

**Research object:** factors that influence on the volumes of exports.

**Research aim:** to conduct evaluation of the influential factors affecting Lithuanian export after having analysed the theoretical aspects of export factors evaluation.

**Research objectives:** to analyse the theoretical aspects of export factors evaluation; to develop a methodology of evaluating factors that affect export; to empirically evaluate the impact of influential factors on Lithuanian exports over the period 2007 - 2015.

**Research methods:** comparative and systematic analysis of the scientific literature, correlation and regression analysis.

Research Methodology

To develop the empirical research methodology, firstly, the aim of the empirical study is formulated, as follows, to identify the impact of economic factors on the volume of Lithuanian exports over the period 2007 - 2015. To achieve the aim of the empirical research, mathematical methods (correlation analysis based on estimating Pearson correlation coefficient and multiple regression analysis) were applied to identify the factors that affect the dynamics of the export volumes of Lithuania.

*In the first stage*, in order to identify which economic factors, in numerical terms, make the most significant impact on export trends in Lithuania, a few quantitative methods were selected, such as *correlation analysis* and *multiple regression*. Correlation analysis is helpful to identify whether the variables are dependent, i.e., one variable is decreasing in the dependence on the increase of the other variable or vice versa; what the strength of the relationship is between the variables; or whether correlation (not accidental) is statistically significant. In order to ensure appropriateness of evaluating the impact of the economic environment factors on exports from Lithuania, firstly, it was verified whether there is a correlation between *corruption freedom index, business freedom index, unemployment rate, GDP per capita, foreign direct investment, corruption perception index, general labour force, general state's revenue from taxes and social contributions, inflation, credit-ing private sector, general tax level, minimum wages and volumes of exports* in Lithuania over the period 2007 - 2015.

The aim of the empirical part is to verify the hypothesis of normality factors that are influential to represent economic environment and exports.

A condition of normality is considered to be satisfied if p value is <0.05.

Having estimated the correlation SSPS (*Statistical Package for the Social Sciences*), the program is further subjected to multiple regression, that is applied only to those factors that have r value higher than 0.6.

Empirical evaluation of factors influencing Lithuanian export

Stage 1. Firstly, the hypothesis about normality of all variable distributions was tested. As a result, p-values (asymptotic significance) are larger than 0.05, and therefore it is concluded that the distributions are normal and can be used to investigate the relations using Pearson correlation coefficient.

The estimation of Pearson correlation coefficient (what factors had an impact on the export level in 2007-2015) is presented in Table 2. It is considered that Y, as a dependent variable, is an expression of export volumes, in Euros, thousands; while all other indicators, X are independent variables.

Table 2. Pirson correlation coefficient values (designed by the authors of the article)

No.	Factors	Pirson correlation coefficient
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X1.	Business freedom index.	-0,267
X2.	Unemployment rate, percentage, of the overall labour force.	0,209
<b>X3.</b>	<b>GDP per capita, EUR.</b>	<b>0,926 (p = 0.000)</b>
X4.	Foreign direct investment, net flows, in dollars.	-0,363
X5.	Corruption freedom index.	0,483
X6.	General labour force, percentage.	-0,524
<b>X7.</b>	<b>General state's revenue from taxes and social contribution (GDP percentage).</b>	<b>-0,804 (p=0.009)</b>
X8.	Inflation in consumer prices, percentage.	-0,586
<b>X9.</b>	<b>Crediting private sector, percentage, based on GDP.</b>	<b>0,937 (p=0.000)</b>
<b>X10.</b>	<b>General tax level, as a percentage of commercial profits</b>	<b>-0,782 (p=0.013)</b>
<b>X11.</b>	<b>Minimum wages, EUR/month.</b>	<b>0,779 (p=0.013)</b>

As it is apparent from the estimation results, statistically significant values with a p-value less than 0,05, and *r* coefficient values larger than 0,6, had an impact on the exports over the period 2004 - 2015 and are as follows:

- GDP per capita, EUR (*r*=0.926);
- General state's revenue from taxes and social contribution(percentage of GDP) (*r*=-0.804);
- Crediting private sector, percentage, of GDP (*r*=0.937);
- General tax level, percentage of commercial profits (*r*=-0.782);
- Minimum wages, Eur. /month. (*r*=0.779).

Stage 2. Herein the variables named in Stage 1 will be included into multiple regression model (X3, X7, X9, X10 and X11) (See: Table 3).

**Table 3.** Multiple regression model

Model	R – Determination coefficient	Sig.
X3, X7, X9, X10 and X11	0,997	0,000

In order to estimate the statistical significance of each variable included in the model, p values are checked (See: Table 4).

**Table 4.** Values (p) of multiple regression model

Model	Sig.
X 3 GDP per capita, EUR.	0,019
X 7 General state's revenue from taxes and social contributions (percentage of GDP).	0,004
X 9 Crediting private sector, percentage of GDP.	0,078
X 10 General tax level, percentage of commercial profits.	0,290
X 11 Minimum wages, EUR/month.	0,996

Coefficients X 9, X 10 and X 11 are statistically insignificant, as their p values (Sig.) are larger than 0,05, thus, they should be removed from the equation and the research should be done again (Table 5).

**Table 5** Multiple model with X3 and X7 included

Model	R – Determination coefficient	Sig.
X3, X7	0,991	0,000

It can be stated that all values are statistically significant and different from 0, thus, the equation is as follows:

Export =  $4 \cdot 10^7 + 2228.074 \cdot \text{GDP, per capita} - 1533479 \cdot \text{General state's revenue from taxes and social contribution}$ .

Standardized coefficients (0,697 and -0,433) reveal that GDP has a larger impact on export than general state's revenue from taxes and social contribution.

The estimations of correlation and regression models led to the formulation of the following empirical findings:

- 1) Pearson correlation coefficient values showed the strongest correlation, in terms of linearity, between the following variables: a very strong positive correlation between the export and GDP per capita, EUR; thus, an improving economic situation has an impact on the rise in volumes of export from Lithuania and vice versa;
  - A strong negative correlation between exports and general state's revenue from taxes and social contributions. It can be assumed that the increase in income, collected from taxpayers, have an impact on the export volume (decrease and increase). Rise in taxes has an adverse impact on businesses eager to export;
  - A very strong positive correlation between exports and crediting private sector, percentage of GDP. It can be expected to increase export if better conditions for crediting are provided to small and medium-sized businesses, especially. In many cases, businesses need external financing in order to develop export to foreign markets. Unfortunately, the situation in Lithuania is hardly conducive to the export development. Commercial banks are reluctant to credit private businesses, so non-bank financing is often the case used (issuing corporate bonds, using peer-to-peer funding and so on).
  - A moderate negative correlation between the export and general tax level. When taxes are rising, a larger part of businesses are not able to pay them, so exports to international markets decrease and vice versa;
  - A moderate positive correlation between the export and minimum wages. This connection is associated with the GDP growth rates in the economy, as living standards are improving and export volumes from the country are increasing.
- 2) Multiple regression analysis revealed that 99.1 per cent of the changes in the volume of exports can be explained by GDP per capita, and the general state's revenue from taxes and social contributions (percentage of GDP). Since crediting private sector, general tax level and minimum wages were statistically insignificant in the model, the indicators were removed from the model.

## Conclusions

Mathematical estimations revealed that GDP per capita, and general state's revenue and social security contributions, 99, 1 percentage, clarified the export trends over 2007-2015. Other factors, though not completely, but also had an impact on the export:

- a very strong positive relationship between export and crediting private sector;
- a moderate negative relationship between export and a general tax level;
- a moderate positive relationship between exports and minimum wages.

The empirical study allows us to offer the following **recommendations**:

- First of all, it should be more focused on improving the business environment. The revealed strong correlation between crediting private sector and export trends showed that the volume of exported production is highly dependent on favourable credit options. In the current situation, commercial banks tend to severely restrict crediting, so companies are forced to look for new non-bank financing opportunities (issuing corporate bonds, using peer-to-peer financing, crowd financing and so on.). As a result, there is an increase in interest rates and borrowing risks.
- As the new Labour Code amendments have not been adopted as yet, there is confusion in the regulation of the labour market, so the entrepreneur (exporter) has doubts about the further development of exports.
- The tax level also has its impact on exports, i.e., it has been estimated that increase in taxes influence the volume of exports, making it decrease or increase. It is proposed to transfer best practice from the UK, where the entrepreneur, having decided to operate, is exempt from paying taxes for one year. Beginners could be subject to enjoy tax relief.
- Finally, export trends are due to the country's general economic situation, which is described by minimum wages and GDP per capita. At present, the minimum wages in Lithuania is one of the lowest in the EU (20nd out of 22 countries). The minimum wage does not exist in developed countries (Denmark, Italy, Cyprus, Austria, Finland and Sweden). Thus, it is the government that sets a minimum wage which is required to be paid by the employer, despite the nature of the activity. It means that the employer, regardless of the quantity of work performed and its nature, is required to pay wages, meanwhile, low wages do not motivate employees to perform work with quality at all.

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