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IMPACT OF EXPORTS ON THE GDP GROWTH IN POLAND IN YEARS 2009–2014

Abstract

The hypothesis of the paper is as follows: there is a significant, from the point of view of the theory and empirical studies, impact of export growth on economic growth in Poland, and it is most likely a two-way relationship. In our research we implemented econometric model VAR. Results of estimation confirmed hypothesis which we formulate in research.

JEL Classification Codes: **F310**.

Keywords: Gross Domestic Product, export, foreign exchange, trade.

Introduction

Currently, we are witnessing a very dynamic process of internationalization of economic life around the world. Determining factor in this process is the desire to increase the level of prosperity of the population of individual countries and regions in continual and escalating competitive struggle. An example of this situation is the intense competition of various economic agents in the domestic and international market. Export is a dynamic category, subject to constant changes occurring in the rules and solutions on a global scale. According to one of the views that can be seen in the economic literature, foreign trade determines the economic development of countries. The development of the international

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competitiveness of Poland, and more specifically its competitive advantage in international trade is an essential element of economic growth of our country. The aim of the study was to investigate whether there is, and if so, to what extent the Polish export influences the economic growth in Poland.

1. Export and its impact on GDP

Undoubtedly, the participation of the country in the international economic exchange can bring its national economy all sorts of benefits. It also seems that it may become an important factor in economic development. Hence, the state authorities, taking into account the characteristics of the national economy and establishing its objectives and directions for development, can shape the country's participation in the global trading system. We can distinguish here three approaches to that engage in international exchange: isolation, protectionism and the idea of free trade.

The world trading system should be understood as a historically shaped set of international treaties and agreements that serve the stability and transparency of trade between countries. The rules of these agreements are based on the foundations of the free-trade ideas and their overarching goal is to reduce the national protectionist tendencies (Dugiel, 2013, p. 9).

In the literature, exports are defined as export of the good produced or substantially processed in the country in order to sell them and provide services to citizens of other countries (Rymarczyk, 2002, p. 17). The global trading system cannot be considered as a single plane, because it was created by three mutually impacting on each other dependencies: international trade, national regulations and international agreements (Dugiel, 2013, p. 9). All transactions included in the foreign trade are carried out in order to meet the needs of consumers and conditions accepted by both parties.

The design of basic measure of the effects country population's work, which is GDP that includes the „net exports” suggests that the excess of imports over exports is slowing „growth”. Foreign trade plays an important role in the growth and economic development of the country. The issue of co-existence and interaction between these two categories has long been bothering theoreticians and reveals a multitude of publications on this subject. Over the years, the subjects was taken by among others: A. Smith, D. Ricardo, E. Heckscher, B. Ohlin, P. Samuelson, G. Haberler and I. Kravis, with particular emphasis on the benefits of international trade for the participating countries (Misala, 2001, p. 9-144).

The importance of foreign trade in theories of economic growth is very often highlighted as well considered as its „spiritus movens”. Foreign trade should be compiled and analyzed together with the macroeconomic data, because it affects the country's macroeconomic situation causing at the same time effects such as

the effect of the accumulation of capital, the income effect and the substitution effect. When the above-mentioned effects are cumulative, this means that the final impact of foreign trade on economic growth is gradually strengthened by the economic development of the country. Proper understanding of the benefits of international exchange is very important in determining the concept of the commercial policy of the country, which is usually a compromise between what is desired by the criterion of maximizing the benefits of trade, and what is possible due to the existing conflicts of interest group (Rymarczyk, 2002, p. 277).

In the context of the implications flowing from the very structure of commodity exports for economic growth, there are extremely important observations made by J. Bhagwati (1966, p. 156-239), who drew attention to the negative aspect of the relationship between exports and economic growth. It can occur when a significant place in the structure of export is taken by commodities. If the country is a major supplier of the goods on international markets, a big jump in the volume of deliveries, with an unchanged fixed demand will cause a decline in world prices of exported goods. This will lead to deterioration in the terms of trade of the exporting country, which in turn will lead to a decline in the overall prosperity of the country. It should be understood that the share of individual components in the total value of exports could have serious implications for economic growth in the long term. It should be noted that fewer problems are caused when changing directions and the value of exports than the change in its structure, as the latter may require a deep and long-lasting structural changes.

2. Polish goods export

In recent years, Polish exports due to the relatively lower labor costs, favorable zloty exchange rate and modernization of manufactured goods, has begun to do well on the difficult competitive in foreign markets. More and more Polish companies are successful in sales, ahead of competitors in Europe and beyond. The time of the global economic crisis has given Polish entrepreneurs the chance to spread their products, which were characterized by high quality and low prices.

The share of exports in total GDP of Poland in the period was significant (Fig. 1). The relationship of these two values is characterized by economy and allows specifying to what extent it is pro-export. Moreover, it is an indicator showing the degree of openness of the national economy. The higher it is, the better the prospects are faced by a given economy. For Poland, it is estimated that this share in the period 1999–2013 increased 2.41-fold (Dominika Brzęczek-Nester, 2015, p. 19). Although it is not as large as in developed countries of Western Europe, it still largely creates the size of the GDP, which is the most common and most widely recognized measure of prosperity and a barometer of the economy.

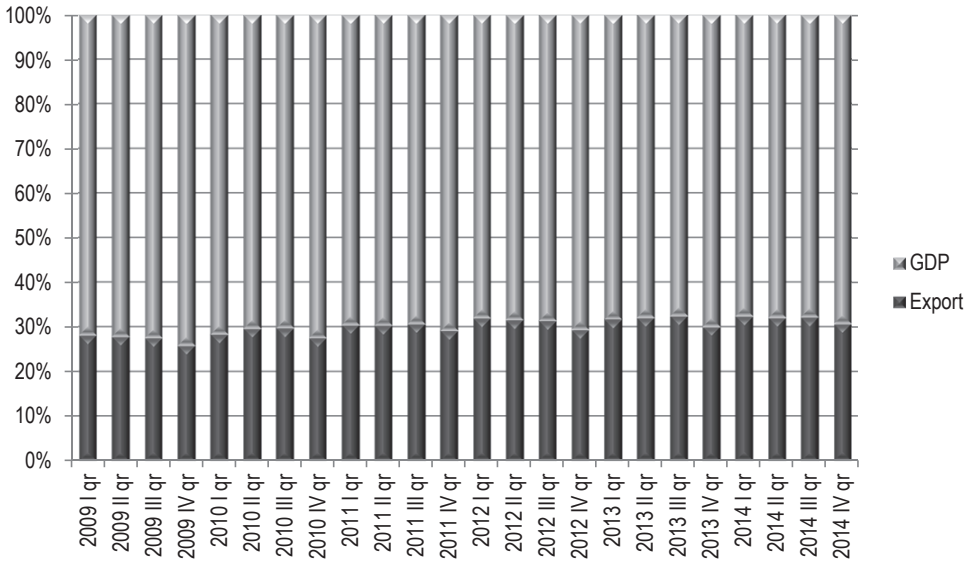


Figure 1. The share of exports in Polish GDP in 2009–2012 (quarterly data)

Source: own calculations based on data from the database: Central Statistical Office in Poland, <http://stat.gov.pl> (accessed: 15.01.2016).

Analysis of the commodity structure of Polish exports by sections nomenclature SITC in 2014 shows that the largest group consisted of machinery and transport equipment and manufactured goods classified mainly by raw materials and other industrial products. These three groups accounted for a total of 71.5% of total exports. The other large groups were food and live animals, and chemicals and related products (Fig. 2).

Important to examine the impact of exports on GDP Polish is also recognizing its major foreign trade partners (Fig. 3).

From the graph, which shows the direction of exports, we can draw at least three conclusions:

- the largest Polish trade partner in the analyzed period were Germany, and their share in total exports was several times higher than other countries,
- the share of exports to other countries outside of Germany, the total exports were shaped differently but retained the tendency of growth in the long term,
- apparent disproportion between the leader recipient of Polish exports and other trading partners implies the need to consider needs to diversify recipients of Polish exports in the course of further research.

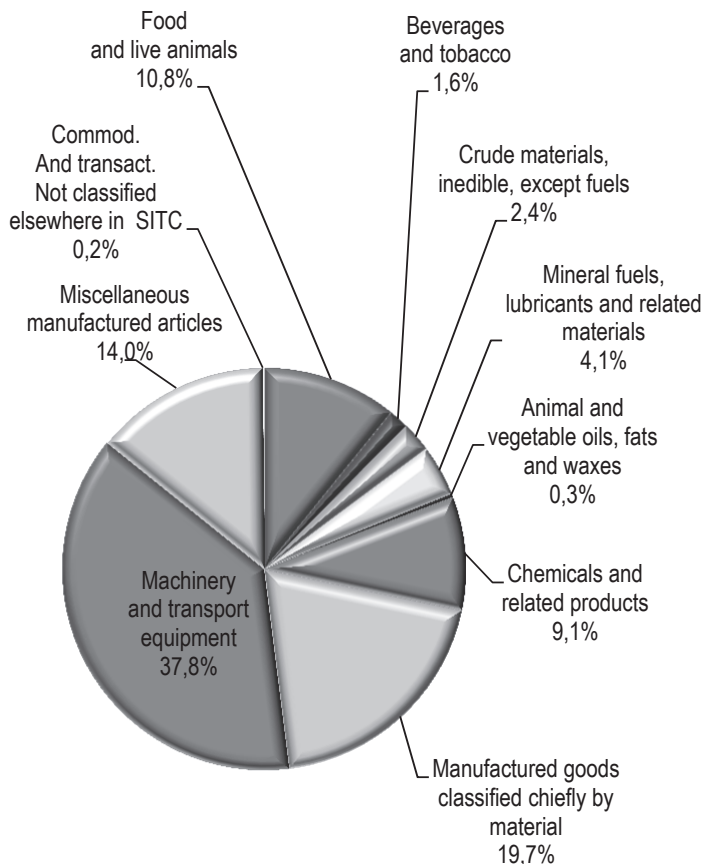


Figure 2. The structure of Polish exports by sections nomenclature SITC in 2014

Source: own calculations based on data from the database: Statistical Yearbook of Foreign Trade 2015.

Research conducted by Slawomir Ireneusz Bukowski and Joanna Garlińska-Bielawska using econometric analysis shows that exports to Germany, the main trade partner Polish, significantly affects the economic growth in Poland, and its influence is strong and long-lasting (Bukowski, 2014, p. 58) .

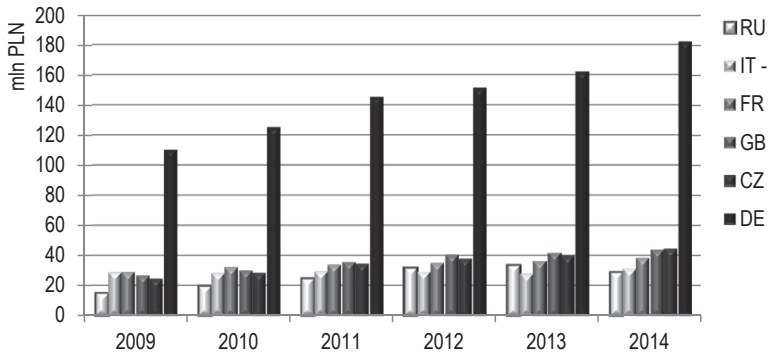


Figure 3. The value of Polish exports by the largest recipients 2009–2014

Source: own calculations based on data from the database: Central Statistical Office in Poland, <http://stat.gov.pl> (accessed: 15.01.2016).

3. Statistical data and model

In a study on the impact of exports on the GDP we used statistical data on the quarterly export and Poland's GDP at current prices collected by the Central Statistical Office. Unfortunately, the data on a quarterly basis at constant prices were not available. The results are therefore an approximation and give a contribution to further testing. The data are seasonally adjusted using the X12-ARIMA and covered the period 2009–2014. The analysis applied the model VAR:

$$\ln y_{1t} = \mu_1 + \alpha_1 \ln y_{1t-1} + \beta_1 \ln y_{2t-1} + \varepsilon_{1t} \quad (1)$$

$$\ln y_{2t} = \mu_2 + \alpha_2 \ln y_{1t-1} + \beta_2 \ln y_{2t-1} + \varepsilon_{2t} \quad (2)$$

where:

y_{1t} – GDP at current prices

y_{2t} – exports at current prices

4. Results of model estimation

VAR model estimation results presented in Table 1, 2, and 3 are statistically significant, as can be seen in the results of the estimation model by using the program GRETL. The results are shown in the following tables. Analysis of the content of the tables indicates a statistically significant relationship between exports and economic growth in Poland, as well as between the GDP growth in Poland and exports. On the one hand, export growth stimulates GDP growth in Poland, on the other hand – GDP growth in Poland stimulates the growth of exports. The results of the estimation of the first equation indicate that export growth by 1 percentage point causes GDP growth in Poland by 0.65 percentage points. The

results of the estimation of the second equation shows that Poland's GDP growth by 1 percentage point results in an increase in exports by 0.98 percentage points.

Table 1.

VAR system, lag order 1
 OLS estimates, observations 2009:2–2014:4 (T = 23)
 Log-likelihood = 89.427788
 Determinant of covariance matrix = 1.43825e-006
 AIC = -7.0807
 BIC = -6.6857
 HQC = -6.9813
 Portmanteau test: LB(5) = 36.9799, df = 16 [0.0021]

Equation 1: l_y1t

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	23.8883	7.45127	3.2059	0.0047	***
l_y1t_1	-0.527841	0.238112	-2.2168	0.0390	**
l_y2t_1	0.651618	0.332216	1.9614	0.0647	*
Mean dependent var	26.69154		S.D. dependentvar	0.104741	
Sum squaredresid	0.062704		S.E. ofregression	0.057448	
R-squared	0.740199		Adjusted R-squared	0.699178	
F(3, 19)	18.04433		P-value(F)	8.68e-06	
rho	-0.205959		Durbin-Watson	2.236983	

F-tests of zero restrictions:

All lags of l_y1t F(1, 19) = 4.9141 [0.0390]

All lags of l_y2t F(1, 19) = 3.8472 [0.0647]

Equation 2: l_y2t

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	11.0943	3.39206	3.2707	0.0040	***
l_y1t_1	-0.395102	0.108396	-3.6450	0.0017	***
l_y2t_1	0.976974	0.151235	6.4600	<0.0001	***
Mean dependent var	25.85443		S.D. dependentvar	0.160056	
Sum squaredresid	0.012995		S.E. ofregression	0.026152	
R-squared	0.976943		Adjusted R-squared	0.973303	
F(3, 19)	268.3517		P-value(F)	1.00e-15	
rho	0.116570		Durbin-Watson	1.648616	

F-tests of zero restrictions:

All lags of l_y1t F(1, 19) = 13.286 [0.0017]

All lags of l_y2t F(1, 19) = 41.731 [0.0000]

*** the variable is significant at a level of significance 0,01;

** the variable is significant at a level of significance 0,05;

* the variable is significant at a level of significance 0,1.

Source: own calculations using the program GRET.L.

Table 2. Decomposition of variance for l_y1t

period	std. error	l_y1t	l_y2t
1	0.0522138	100.0000	0.0000
2	0.0592115	93.6109	6.3891
3	0.0596621	92.4377	7.5623
4	0.0602485	91.2786	8.7214
5	0.0604578	90.7013	9.2987
6	0.0606152	90.3257	9.6743
7	0.0607022	90.1061	9.8939
8	0.0607572	89.9712	10.0288
9	0.0607901	89.8898	10.1102
10	0.0608103	89.8403	10.1597
11	0.0608225	89.8102	10.1898
12	0.0608299	89.7919	10.2081
13	0.0608345	89.7807	10.2193
14	0.0608372	89.7739	10.2261
15	0.0608389	89.7698	10.2302
16	0.0608399	89.7673	10.2327
17	0.0608405	89.7658	10.2342
18	0.0608409	89.7648	10.2352
19	0.0608412	89.7643	10.2357
20	0.0608413	89.7639	10.2361

Source: own calculations using the program GRETL.

Table 3. Decomposition of variance for l_y2t

period	std. error	l_y1t	l_y2t
1	0.0237694	6.6255	93.3745
2	0.035822	19.6480	80.3520
3	0.0395541	17.7137	82.2863
4	0.0420654	17.7166	82.2834
5	0.0434145	17.4813	82.5187
6	0.0442421	17.4079	82.5921
7	0.0447314	17.3514	82.6486
8	0.0450283	17.3218	82.6782
9	0.0452076	17.3032	82.6968
10	0.0453165	17.2923	82.7077
11	0.0453827	17.2856	82.7144
12	0.0454229	17.2816	82.7184
13	0.0454473	17.2792	82.7208
14	0.0454622	17.2777	82.7223
15	0.0454712	17.2768	82.7232
16	0.0454767	17.2763	82.7237
17	0.0454801	17.2759	82.7241
18	0.0454821	17.2757	82.7243
19	0.0454834	17.2756	82.7244
20	0.0454841	17.2755	82.7245

Source: own calculations using the program GRETL.

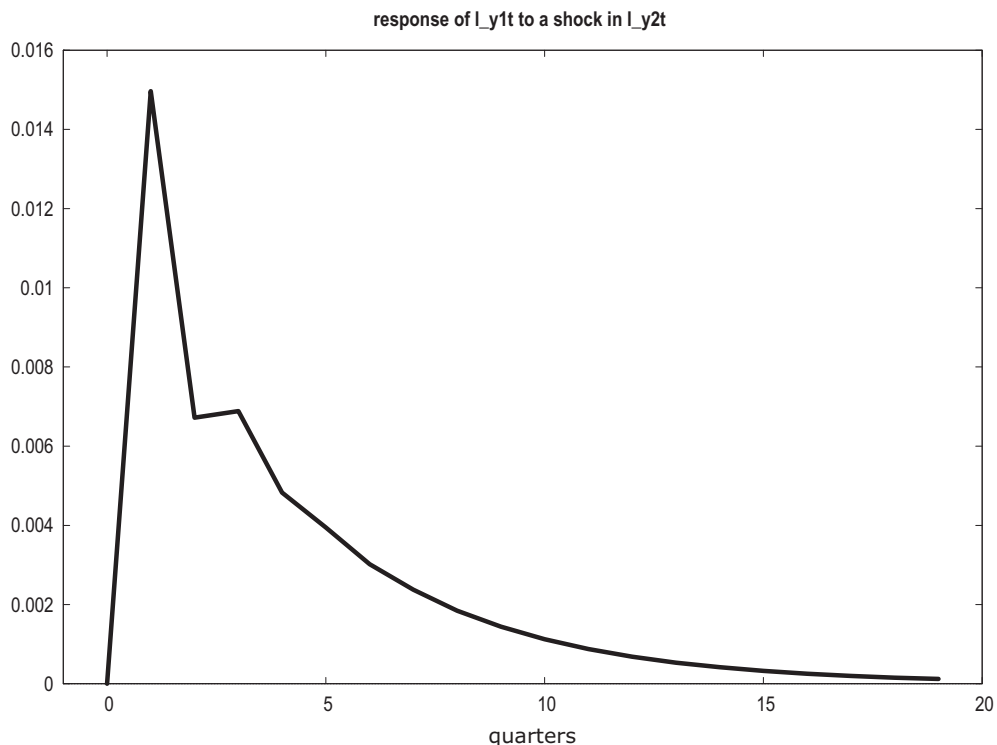


Figure 4. The response of GDP growth impulse in the form of export growth

Source: own calculations using the program GRETL.

It is worth noting that the impact of GDP growth on the export growth is stronger than the effect of export growth on GDP growth. In addition, both the descriptive analysis, and analysis of the results of the econometric model indicates that exports are a very important factor of economic growth.

Analysis of variance decomposition indicates that the GDP growth to a greater extent explained in the analyzed period export growth than GDP growth (Table 2 and 3).

The analysis of the response function of GDP growth impulse in the form of export growth (Fig. 4) shows that export growth causes an increase in GDP over the two quarters in the period considered and a decrease of the impact of this increase in subsequent quarterly periods.

Conclusions

Descriptive and econometric analysis performed using the VAR model confirms the fact that GDP growth is an important factor in the growth of Polish exports. The study shows the importance of exports as a driver of economic growth in Poland. The relationship between GDP and exports is reversible. The impact of GDP growth on exports is stronger than vice versa. The impact of exports on GDP growth in Poland is statistically significant, strong and, above all, long-lasting. The results of this study imply the need for further study on the influence of Polish exports for its economic growth and the pace of its response to changes in economic conditions. Noticeable is also a need to deepen the research strategy of diversification of Polish foreign recipients.

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