

## THE FISCAL EFFECTS OF ECONOMIC IMMIGRATION ON SUBNATIONAL GOVERNMENT FINANCE IN POLAND<sup>1</sup>

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### Abstract

The aim of the paper is to analyse the effects of economic immigration on subnational government finance (SNG) in Poland. The goal to achieve is to answer the following research question: what are the fiscal effects of immigration on SNG budget revenues and expenditures. To answer this question, logarithmic models were developed. The analysis refers to the years 2007-2016. In this respect, data from Statistics Poland - referring to budget revenues and expenditures of communes, cities of district status, districts and voivodeships - were used. As far as immigration statistics are concerned, data from the Ministry of Family, Labour and Social Policy were used. The results indicate an increase in both revenues and expenditures of SNG as a result of immigration. Such results can be explained inter alia by the nature of migration - research were focused on economic immigration. Results confirm that the level of employment of foreigners is one of the determinants shaping the fiscal effect of immigration. Moreover, the impact of economic immigration on SNG budget revenues and expenditures depends on the structure of this budget. This explains the differentiated results of the analysis of the impact of immigration on SNG in different countries. The positive correlation between immigration and SNG revenues in Poland can be associated with a high share of subnational governments in personal income tax revenues as this tax is one of the main categories of SNG revenues. Furthermore, results show that the impact of immigration on local government budgets in Poland is modest. This confirms the conclusions drawn by other authors (e.g. Auerbach and Oreopoulos), that in the long term, immigration cannot be considered as a potential instrument for resolving fiscal imbalances.

**JEL classification:** F22, H72

**Keywords:** economic immigration, subnational government finance, budgets' revenues and expenditures

Received: 11.12.2018

Accepted: 10.03.2019

<sup>1</sup> This paper was presented at the 9th RSEP International Social Sciences, Conference organized by Review of Socio-Economic Perspectives, Rome, Italy, 13th-15th November, 2018.

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## INTRODUCTION

International migration brings a number of consequences not only in the economic, but also in the social and political dimension. The effects of migration are felt by both sending and receiving regions. Taking the latter approach – from the destination region point of view - a number of areas affected by the inflow of foreigners can be identified, such as the labour market or demographics, as well as fiscal effects. Due to the multi-faceted nature of migration, this paper will focus on the latter. Studies on the effects of economic immigration on local finances remain scarce, which is one of the reasons for undertaking the analysis.

The motivation to undertake this research was also the increase in the scale of immigration to Poland. While Poland has wide experience as an emigration country, as a result of - among other things - globalization processes and accession to the European Union, Poland is more and more affected by the inflow of a foreign labour force. Due to the problems with satisfying the demand for labour in Poland, there is justification for the liberalization of access to the Polish labour market on the one hand, and on the other a discussion on the economic, social and political consequences of immigration has just started. One of the topics under discussion is the question of the balance of benefits and costs of immigration from the receiving region point of view. The analysis undertaken in this study is a contribution to this discussion, focusing on one of the areas of the consequences of immigration, i.e. the fiscal effects considered in the context of local government revenues and expenditures. The main goal of the analysis is to answer the following research question: what are the fiscal effects of immigration on SNG budget revenues and expenditures. To answer this question a regression analysis was carried out, both in terms of the impact of immigration on revenues as well as expenditures. Results reveal a positive impact of immigration on both categories.

## LITERATURE REVIEW

There are a number of studies on the consequences of immigration from the receiving region point of view. Due to the complexity of migration, these studies focus on a selected area affected by the inflow of foreigners - one of them is the fiscal aspect. In this respect, the main

point of consideration remains the fiscal burden related to the inflow of immigrants who, on the one hand, take up employment (or run a business) and pay taxes, and on the other hand, use public services and may be recipients of transfer payments (including social benefits). It should be noted, however, that the vast majority of studies undertake analysis from the perspective of government finances.

Most studies on the fiscal consequences of immigration have been undertaken in relation to the main hosting countries in the world. Studies carried out in the United States undermine public fears that immigrants represent a fiscal burden for the country. These studies additionally indicate that the fiscal effect of immigration will be determined by the demographic structure of immigrants and this effect will be different at the level of central, federal and local budget. The studies that were conducted in the 1990s by the United States Department of Health and Human Services demonstrated that the fiscal effect of immigration was more favourable from the point of view of the federal budget than national and local budgets, due to the fact that immigrants - less educated and with more children than U.S. citizens - often benefited from public services (especially education) financed from the central and local budget. At the same time, due to their age (immigrants were younger than U.S. citizens) they paid more money into the Social Security Fund - a source of income for the federal budget (Bodvarsson & Van den Berg, 2013, p. 177).

Symptomatically, studies in certain hosting regions, based on different methodologies or carried out over different periods of time, give often different results. For example, in the case of Canada, the study of Grubel and Grady (2012, p. 1) shows that the average fiscal burden per immigrant is about 6,000 USD. Studies by Javdani and Pendakur (2014, p. 778) indicate a much lower burden - at a level of about 450 USD. The studies cover different periods - the first one - 1987-2004, the second - 1970-2004. Different study results for different periods are explained, among other things, by a change in the Canadian immigration policy, which has reduced the emphasis on employment opportunities for immigrants. It follows that the fiscal effect of immigration will be determined, among other things, by the situation of immigrants in the labour market of the receiving region.

Dustmann, Frattini and Halls (2010, p. 1) analysed the consequences of immigration from the countries

that joined the European Union in 2004, showing that immigrants were 59% less likely to benefit from state benefits than UK citizens. What is important, the authors of the report pointed to a crucial circumstance which could have influenced the above result - these were the characteristics of the migrants themselves, who were younger and better educated than the British citizens. The employment rate among immigrants was also higher than among UK citizens. However, research has shown that even if immigrants had the same demographic characteristics as UK citizens, they would still be 13 per cent less likely to receive benefits. Similar conclusions - that the fiscal effect of immigration is determined by the age structure of immigrants - are reached by Storesletten (2000, p. 301). In his research (focused on the fiscal consequences of immigration to Sweden) Storesletten showed that from a government budget point of view, immigrants aged 20-30 years contribute the most to the increase in net fiscal benefits. On the other hand, the youngest and oldest immigrants are a burden to this budget. The methodology used by Storesletten is not based on an analysis of financial flows, but on the current value of the discounted costs and benefits associated with immigration in the long run – under the assumption that they change with the life expectancy of the immigrant. Similarly, Lee and Miller (2000, p. 350) point out that the higher the share of immigrants of working age, the more beneficial the fiscal effect of immigration will be. Determination of the discount rate for future costs and benefits is still a moot point. It is also necessary to stress that these studies relate to permanent immigration - in the case of seasonal immigration, this approach may not be appropriate. If immigrants stay in the hosting region only for a limited period of time and without a family, the impact of immigration on the finances of this region can be measured without taking into account future transfers, as immigrants - in the spirit of an immigration policy aimed at temporary stays - are expected to return to their region of origin after a certain period of residence/employment in the hosting country.

Studies on the fiscal effects of immigration in the context of local government finances (SNGs' cost and benefits of immigrations) are much less frequent. Such studies were conducted by Chan (2018) in relation to local finances in the US. Results show a decrease in both local revenues and expenditures due to immigration. This study focuses on the impact of immigration on local government revenues and expenditures, without discounting future

financial flows. In addition, the author of the studies explains the results obtained through the prism of the structure of local revenues: the decrease in revenue is mainly due to a decrease in property tax revenues, which in turn is the result of a decrease in their value in regions experiencing strong immigration. A methodology similar to the one used by Chan was also used in this paper, where the explanation variable of the model is not the change in the logged stock of immigrants, but the logarithm of immigration - thus migration flows were used instead of migration stock.

While many studies on the impact of economic immigration on the economic development of the country and regions have already been carried out in Poland, and their examples can be found in the works of authors such as: Klimek (2015, 2016), Golinowska (2004), Lesińska (2012), there are no studies on the impact of immigration on the revenues and budgetary expenditures of local government units. It should be added that the local government in Poland - as a post-socialist country - is a relatively new structure, the origins of which date back only to the 1990s, and the local government reform carried out in this period is an example of one of the most spectacular and successful reforms in the country. As a result, a modern, three-tier system of territorial self-government was formed, which consists of: 1) 2 478 communes (municipal level), including 66 cities of district status; 2) 380 districts (intermediary level); 3) 16 voivodeships (regional level).

The economic position of the subnational government sub-sector in Poland is well illustrated by the following indicators: SNG's budget revenue to the GDP is at the level of 13.1%, SNG's budget revenues to the total public sector (general government) revenues - 34.0% (OECD average is respectively: 15.9% and 42.4%); SNG's budget expenditures to the GDP - 12.9% and SNG's budget expenditures to total expenditures of the Polish public sector - 31.3%, with the OECD average at the level of - respectively - 65.2% and 40.4% (OECD, 2018).

There are therefore two key aspects of the fiscal consequences of immigration, i.e. the revenue and expenditure aspects. From the point of view of the first of them, not only the size, but also the legally determined structure of budget revenues of local government in Poland is important. A special role is played in this respect by personal income tax, which is a classic example of a "piggybacked" tax (Spearman, 2007, p. 226), i.e. a tax for

which a specific public-law entity (in Poland: commune, district and voivodeship) receives a part of the revenues from tax revenues granted to another public-law entity (the state) (Ruśkowski & Salachna, 2004, p. 84). In Poland there are two taxes of this type, i.e. personal income tax (PIT) and corporate income tax (CIT), but the first one is of a great fiscal significance in the context of the local government's budget revenues in connection with economic immigration. This is due to - not only - the fact that immigrants most often do not run their own businesses and are employed, but also to the high share of Polish local government in receipts from state personal income tax (for instance, in 2018, the share of communes in PIT revenues was at the level of 37.98%, in the case of districts it was 10.25%, and voivodeships - 1.6%). For example, in Poland in 2016, the total budget revenues from this tax amounted to over PLN 89 billion (including: state budget - PLN 48 billion, budgets of local governments - about PLN 41 billion). For comparison, the total budget revenues of the local government obtained in the same period from three taxes related to real estate, i.e. property tax, agricultural tax and forestry tax, were almost two times smaller (ca. PLN 22.6 billion) (Ministry of Finance, 2017). This illustrates the great fiscal importance of the tax analyzed in local government budgets. What is worth underlining, is that this tax is paid by foreigners employed in Poland, who may be treated by tax law as residents or non-residents<sup>1</sup>.

The literature emphasizes that in addition to revenue aspects, there are other less favourable fiscal effects of immigration on local budgets. Immigration may, to a greater or lesser extent, have a “pro-expenditure” impact on the budgets of local governments, forcing local government decision-makers to increase financial outlays on social assistance and welfare, health care, public safety, etc. (Markowski, 2008, pp. 44-45). As a consequence, this

1 Residents are persons who have a center of vital interests - personal or economic - on the territory of Poland. In order to determine whether a foreigner resides in Poland and is a Polish tax resident, it is important whether: 1) his closest family is in Poland, 2) the foreigner runs a permanent business here 3) they reside on the territory of Poland for more than 183 days a year (however, it does not have to be a continuous residence). A person having the status of a resident is subject to the so-called unlimited tax obligation, i.e. all income earned by them is subject to taxation, regardless of the place and source of their acquisition, i.e. regardless of the country in which it was obtained. In turn, non-residents are persons who do not have a place of residence in Poland within the meaning of tax regulations. They are subject to a limited tax obligation, which means that taxation applies only to their income earned on the territory of Poland from: 1) work performed on the territory of Poland on the basis of a service relationship, employment relationship, home-based work and cooperative work relationship, regardless of the place of payment of remuneration; 2) business activity conducted in the territory of Poland; 3) real estate located in the territory of Poland (this also applies to the sale of such real estate).

may lead to an increase in current (operational) budgetary expenditures, which in turn has a negative impact on the operating results of the budget in the longer term and, as a consequence, a decrease in the operating surplus. This is all the more important because, in accordance with the legal regulations in force in Poland from 2014 on the so-called Individual Debt Indicators (Indywidualne Wskaźniki Zadłużenia - IWZ) of local government units, the level of the aforementioned surplus determines the possibility of indebtedness and the implementation of investment programmes by the local government.

## RESEARCH METHODOLOGY

In the scope of research, thirty-four econometric models with one explanatory variable were estimated. In the first group of seventeen models, an explained variable was the variable “revenues”, while the explanatory variable was - “immigration”. In the second group of seventeen models, an explained variable was the variable “expenditure”, while the explanatory variable was the variable “immigration”. The models were estimated separately for each voivodeship on the basis of time data from the period 2007-2016 (n = 10). For the analysis of the impact of immigration on the aggregated revenues of local government units in individual voivodeships of Poland, logarithmic models were developed, the general form of which is expressed by the equation:

$$R_t = \alpha_1 \ln(I_t) + \alpha_0 + \varepsilon_t \quad (1)$$

where

$R_t$  = explained variable (revenues of local government units),

$I_t$  = explanatory variable (immigration - inflow),

$\alpha_0, \alpha_1$  = structural parameters,

$\varepsilon_t$  = random component,

$t$  = 2007-2016

For the analysis of the impact of immigration on the aggregated expenditures of local government units in individual voivodeships of Poland, an analogous model was developed with the change of the explained variable:

$$E_t = \alpha_1 \ln(I_t) + \alpha_0 + \varepsilon_t \quad (2)$$

where

$E_t$  = explained variable (expenditures of local government units),

$I_t$  = explanatory variable (immigration - inflow),

$\alpha_0, \alpha_1$  = structural parameters,  
 $\varepsilon_t$  = random component,  
 $t$  = 2007-2016.

To estimate the parameters, the classical least squares method was used. That requires certain assumptions to be met, including assumptions of no linear dependence, that the random component has a constant variance, and that error terms should be normally distributed. The fulfillment of these assumptions was verified in the GRETL program using the following tests: White, Durbin-Watson and Doornik-Hansen. The application of the logarithmic form of the model was associated with the results of the non-linear test that was carried out. The test indicated that there are grounds for rejecting a linear form and applying figures in power form (a logarithm variable). The aim of the study was to determine the strength and direction of the impact of migration on revenues and expenditure in individual voivodships and to compare this impact between voivodships, hence the authors decided to estimate the models for each voivodship separately, based on time series.

Out of 34 models, ten models have been verified negatively in terms of statistics (in the case of model of revenues: the Mazowieckie, Podlaskie, Pomorskie, Warminsko-Mazurskie and Zachodniopomorskie voivodships, and in the case of model of expenditures: the Kujawsko-Pomorskie, Podlaskie, Pomorskie, Warminsko-Mazurskie and Zachodniopomorskie voivodships, the

Durbin-Watson test showed autocorrelation of the random component), therefore, their results have not been interpreted.

Data on immigration were expressed as logged inflow of economic immigrants in voivodship  $i$  over the period  $t$ . Data on immigration refer to seasonal immigration. In Poland, the liberalization of access to the labour market is focused mainly on the acquisition of temporary employees. In their case a work permit is not required - they take up employment in Poland on the basis of a special declaration of the Polish employer who wish to employ a foreigner. On this basis, the majority of immigrants take up work in Poland - for example, in 2016 the share of immigrants taking up employment in Poland on the basis of a declaration constituted 90.42% of the total number of employed immigrants. In the case of data on revenues and budget expenditures of local government units, they were aggregated within individual voivodships, by summing up budget revenues (expenditures) of communes, districts, cities of district status and voivodships with local-government rights. Revenues (expenditures) are expressed in Polish zloty (PLN).

In data collection on immigration to Poland, statistics of Ministry of Family, Labour and Social Policy were used. Data on revenues and budgetary expenditures of local government units were obtained from the Statistics Poland (Statistics Poland, 2017). Descriptive statistics are presented in Table 1.

**Table 1: Basic descriptive statistics of variables**

Voivodship	Variable	Min	Max	Mean	Coefficient of variation (in %)
Dolnoslaskie	immigration	2314 (2007)	134862 (2016)	36405	108.85
	revenues	10697.99 (2007)	16379.77 (2016)	13698.2	14.12
	expenditures	10417.80 (2007)	15965.53 (2016)	14139.42	12.56
Kujawsko-pomorskie	immigration	301 (2007)	48517 (2016)	10017.9	161.27
	revenues	6665.89 (2007)	11267.45 (2016)	9015.07	16.21
	expenditures	6704.50 (2007)	10809.74 (2016)	9221.27	14.22
Lubelskie	immigration	842 (2007)	75114 (2016)	27504.7	78.5
	revenues	6422.73 (2007)	10937.29 (2016)	8950.27	16.86
	expenditures	6393.40 (2007)	10914.22 (2014)	9195.924	16.38
Lubuskie	immigration	1834 (2007)	67648 (2016)	15490.1	131.71
	revenues	3 493.7 (2007)	5 420.2 (2016)	4432.679	13.49
	expenditures	3 354.6 (2007)	5 188.2 (2016)	4488.534	12.94

<b>Lodzkie</b>	immigration	800 (2007)	99398 (2016)	19067.5	157.44
	revenues	7911.53 (2007)	13346.69 (2016)	10677.41	15.11
	expenditures	7936.80 (2007)	12906.88 (2016)	10946.6	13.83
<b>Malopolskie</b>	immigration	720 (2007)	101407 (2016)	20926.4	149.08
	revenues	10614.17 (2007)	18093.80 (2016)	14271.21	15.45
	expenditures	10737.80 (2007)	17750.19 (2016)	14539.48	14.02
<b>Mazowieckie</b>	immigration	7155 (2007)	369463 (2016)	156728.5	70.62
	revenues	22943.14 (2007)	35876.07 (2016)	28675.95	14.63
	expenditures	22401.00 (2007)	34390.76 (2016)	29169.88	11.59
<b>Opolskie</b>	immigration	677 (2007)	23812 (2016)	6676	106.41
	revenues	3302.94 (2007)	5094.28 (2016)	4193.871	12.09
	expenditures	3350.30 (2007)	4951.38 (2016)	4255.293	11.14
<b>Podkarpackie</b>	immigration	543 (2007)	11162 (2016)	4399.3	87.34
	revenues	6564.05 (2007)	10866.33 (2016)	9105.857	15.24
	expenditures	6457.20 (2007)	10394.40 (2016)	9235.569	14.93
<b>Podlaskie</b>	immigration	495 (2007)	9483 (2016)	3094.5	93.64
	revenues	3673.04 (2007)	6316.66 (2014)	5226.588	17.08
	expenditures	3545.50 (2007)	6167.47 (2016)	5265.633	16.77
<b>Pomorskie</b>	immigration	1254 (2007)	67395 (2016)	12393.8	165.39
	revenues	8157.81 (2007)	13571.84 (2016)	10828.86	16.23
	expenditures	7911.70 (2007)	13065.40 (2016)	11039.63	14.31
<b>Slaskie</b>	immigration	871 (2007)	85694 (2016)	16808.1	146.55
	revenues	14971.09 (2007)	23404.64 (2016)	19228.48	13.79
	expenditures	14569.60 (2007)	22746.12 (2016)	19583.42	13.21
<b>Swietokrzyskie</b>	immigration	692 (2007)	28599 (2016)	8676.4	94.30
	revenues	3921.93 (2007)	6476.59 (2016)	5519.76	14.29
	expenditures	3816.50 (2007)	6264.12 (2016)	5662.611	15.43
<b>Warminsko-mazurskie</b>	immigration	141 (2007)	8997 (2016)	1909.7	141.64
	revenues	4939.34 (2007)	7990.77 (2015)	6674.378	15.99
	expenditures	4857.20 (2007)	7899.21 (2016)	6780.086	14.99
<b>Wielkopolskie</b>	immigration	2196 (2007)	126972 (2016)	26718.4	144.94
	revenues	11236.51 (2007)	18781.34 (2016)	14677.33	15.05
	expenditures	11010.80 (2007)	18222.88 (2016)	14925.23	13.45
<b>Zachodniopomorskie</b>	immigration	962 (2007)	55604 (2016)	10171	163.97
	revenues	5864.00 (2007)	9900.35 (2016)	7903	15.95
	expenditures	5648.50 (2007)	9190.92 (2016)	8050	14.47
<b>Poland</b>	immigration	21797 (2007)	1314127 (2016)	376987.3	102.47
	revenues	131380.19 (2007)	213668.93 (2016)	173079.42	14.93
	expenditures	129113.00 (2007)	206034.56 (2016)	176498.67	13.46

Source: Own calculations

For the estimation of structural parameters of the model, the ordinary least squares method was applied, using the Statistica 12.5PL package. In the verification of the models, the significance level was assumed to be  $\alpha = 0.05$ . An appropriate determination coefficient was used, assuming that its acceptable level is at least 45%. The analyses were carried out for the years 2007-2016. The results of the analysis for all Polish voivodeships are presented in Table 2.

## FINDINGS AND DISCUSSION

In the scope of the impact of immigration on the revenues of local government units, in the case of 11 out of 16 voivodeships in Poland and the model for Poland, the models passed the statistical verification stage (in the case of the Mazowieckie, Podlaskie, Pomorskie, Warminsko-Mazurskie and Zachodniopomorskie voivodeships, the Durbin-Watson test showed autocorrelation of the random component). Detailed statistics are presented in Table 2. Therefore, the conclusions refer to 11 voivodeships and the model for Poland, covering total immigration to all voivodeships and total revenues of all local self-government units in 16 voivodeships.

In the case of 11 voivodeships, immigration had a positive impact on the revenues of local government units. However, this impact is diversified in individual voivodeships, whereas the scale of immigration to individual regions of Poland should be emphasized. In the light of the results obtained, the 1% increase in immigration led to the highest increase in the budget revenues of local government units located in the Slaskie voivodeship - by PLN 20.4 million. Referring this amount to the total revenues of the local government in the analysed voivodeship (PLN 23 billion in 2016), it can be observed that while the impact of immigration on revenues is positive, it is not a strong one. Taking into account the revenues of all local government units and total immigration to all voivodeships (model for Poland), one can also observe a positive but limited impact of immigration on the increase in the revenues of local government: the increase in immigration by 1% is accompanied by an increase in revenues of approximately PLN 217 million - which in 2016 accounted for less than 0.5% in relation to the total amount of budgetary revenues of local government units in Poland.

In the scope of the impact of immigration on the expenditures of local government units, in the

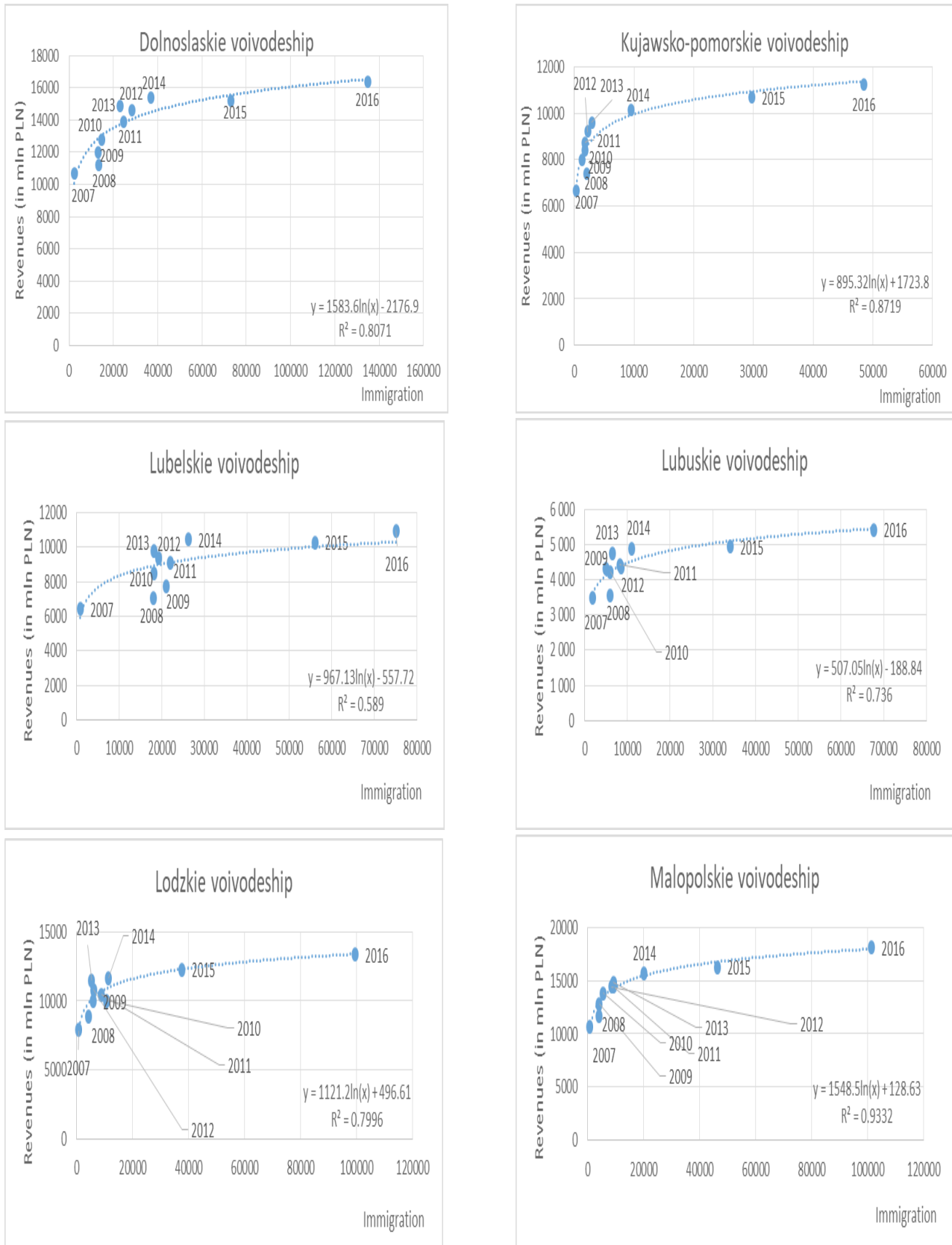
**Table 2: Effect of immigration on SNG budget revenues\***

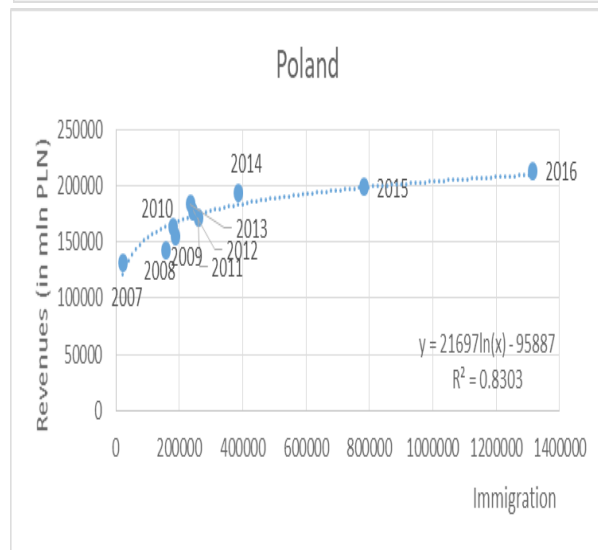
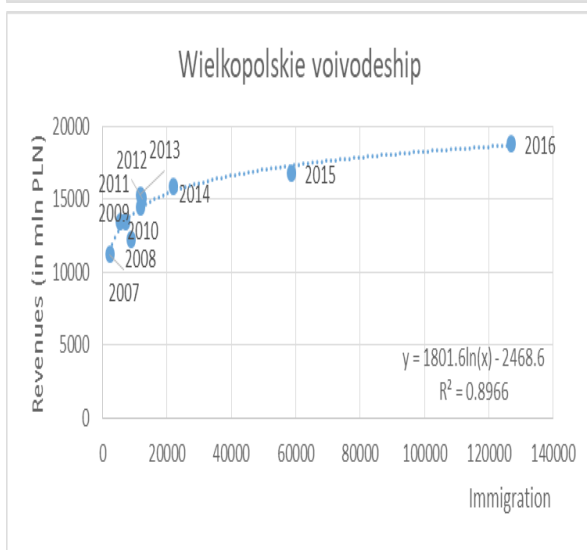
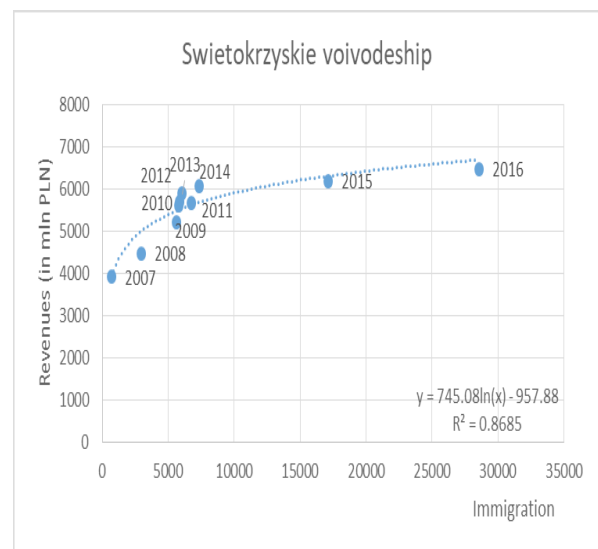
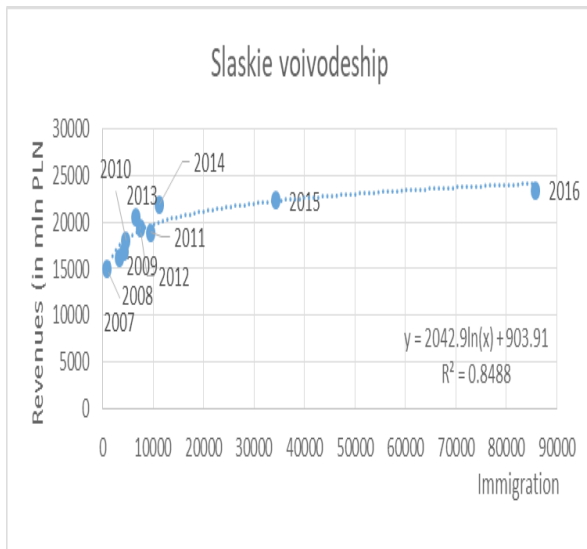
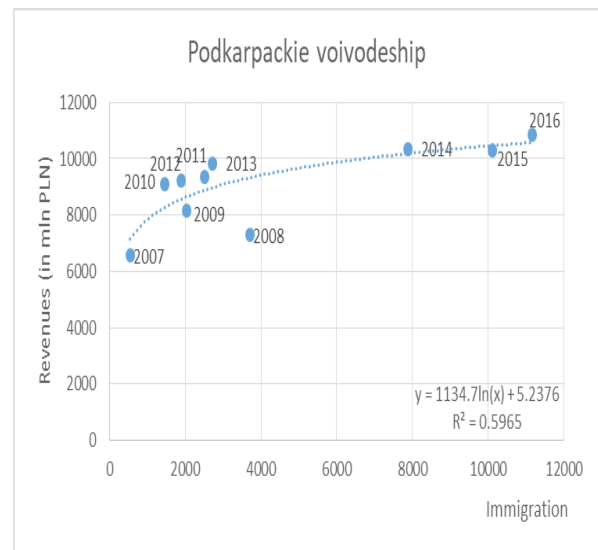
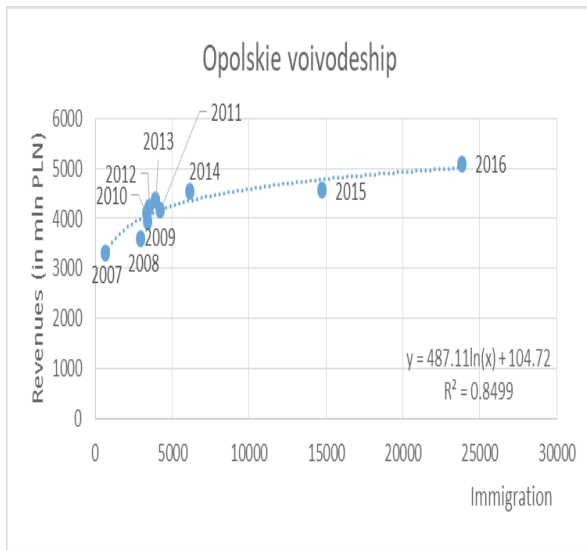
Voivodeship	Ln immigrants	Standard error	N	t-statistic	P value
Dolnoslaskie	1583.65	273.762	10	5.785	0.0004
Kujawsko-pomorskie	895.317	121.314	10	7.380	0.0001
Lubelskie	967.13	285.642	10	3.386	0.0096
Lubuskie	507.05	107.377	10	4.722	0.0015
Lodzkie	1121.162	198.438	10	5.650	0.0005
Malopolskie	1548.478	146.524	10	10.568	0.0000
Mazowieckie	3164.74	773.879	10	4.089	0.0035
Opolskie	487.108	72.365	10	6.731	0.0001
Podkarpackie	1134.717	329.950	10	3.439	0.0088
Podlaskie	579.253	297.075	10	1.950	0.0870
Pomorskie	1218.647	336.059	10	3.626	0.0067
Slaskie	2042.886	304.809	10	6.702	0.0002
Swietokrzyskie	745.082	102.521	10	7.268	0.0001
Warminsko-mazurskie	661.877	197.186	10	3.357	0.0099
Wielkopolskie	1801.58	216.301	10	8.329	0.0000
Zachodniopomorskie	979.168	200.820	10	4.878	0.0012
Poland	21696.7	3468.54	10	6.255	0.0002

\*at 5% significance

Source: Own calculations based on Statistics Poland (2017), Ministry of Family, Labour and Social Policy (2018)

Figure 1: Immigration and SNG revenues – regression results





Source: Own calculations based on Statistics Poland (2017), Ministry of Family, Labour and Social Policy (2018)

case of 11 out of 16 voivodeships in Poland and the model for Poland, the models passed the statistical verification stage (in the case of the Kujawsko-Pomorskie, Podlaskie, Pomorskie, Warminsko-Mazurskie and Zachodniopomorskie voivodeships, the Durbin-Watson test showed autocorrelation of the random component). Detailed statistics are presented in Table 3. Therefore, conclusions refer to 11 voivodeships and the model for Poland, covering total immigration to all voivodeships and total expenditure of all local self-government units.

In the case of 11 voivodeships, immigration resulted in an increase in expenditures of local government units. The highest increase in expenditure as a result of immigration took place in the Mazowieckie voivodeship

- an increase in immigration by 1% led to an increase in expenditures of local government units by 29 million PLN, which constituted no more than 0.1% of the total budgetary expenditures of these units in the Mazowieckie voivodeship in 2016. From the perspective of Poland (taking into account the expenditure of all local government units and total immigration to all voivodeships), immigration results in an increase in budgetary expenditures, but this is a weak increase: the increase in immigration by 1% is accompanied by an increase in expenditures by approximately PLN 200 million - which in 2016 accounted for less than 0.1% in relation to the total budgetary revenue of local government in Poland.

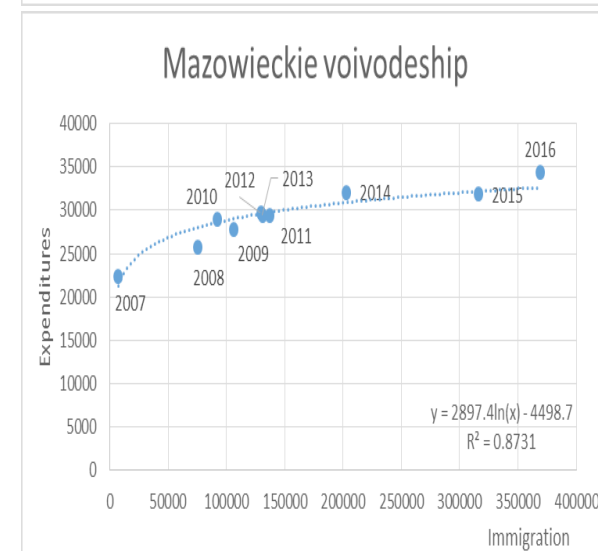
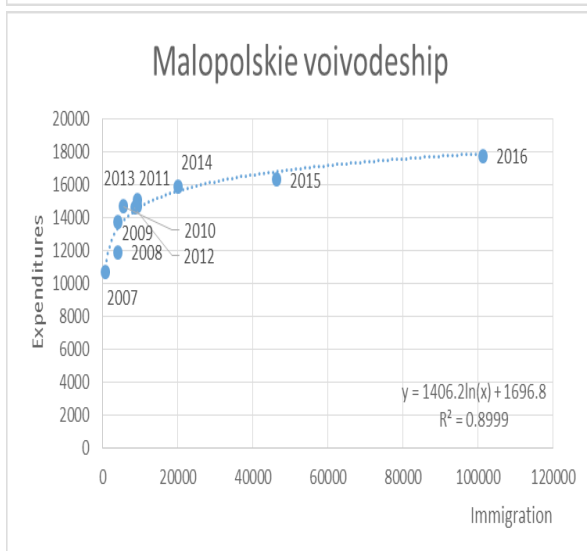
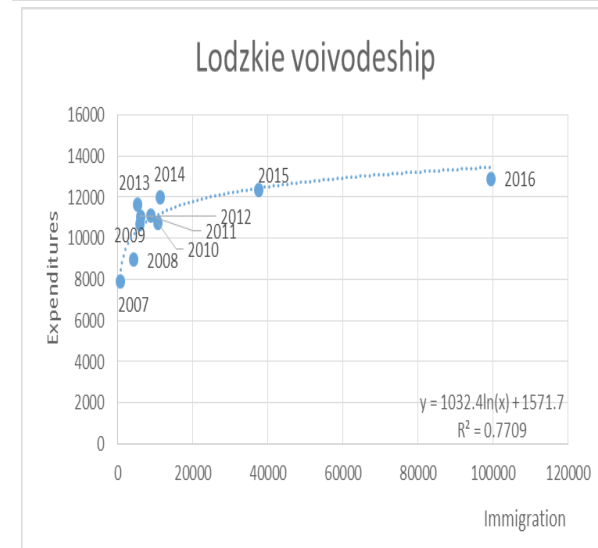
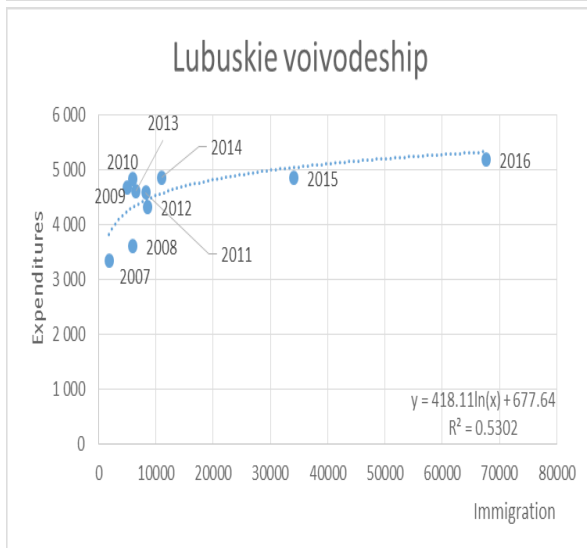
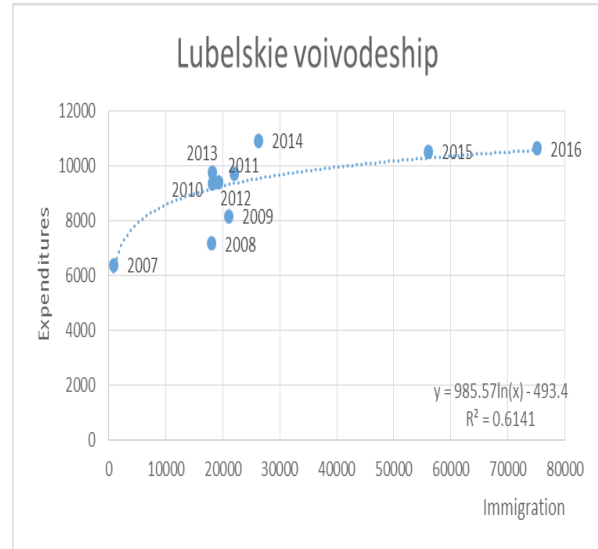
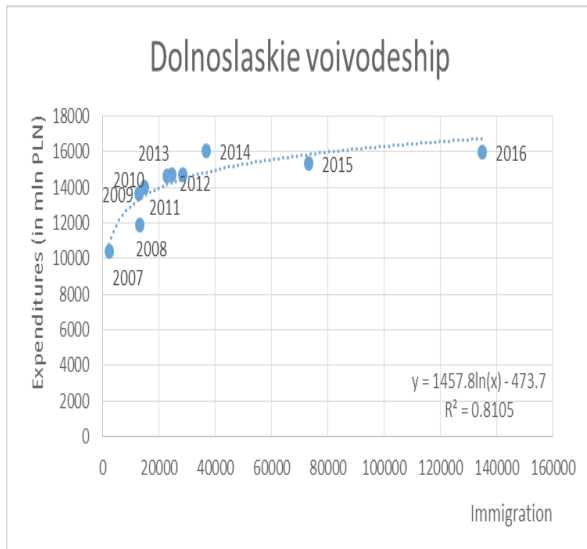
**Table 3: Effect of immigration on SNG budget expenditures\***

Voivodeship	Ln immigrants	Standard error	N	t-statistic	P value
Dolnoslaskie	1457.759	249.180	10	5.850	0.0004
Kujawsko-pomorskie	741.302	154.294	10	4.807	0.0013
Lubelskie	985.575	276.238	10	3.568	0.0073
Lubuskie	418.112	139.148	10	3.005	0.0169
Lodzkie	1032.413	198.999	10	5.188	0.0008
Malopolskie	1406.153	165.808	10	8.481	0.0000
Mazowieckie	2897.45	390.606	10	7.418	0.0001
Opolskie	413.773	95.166	10	4.348	0.0025
Podkarpackie	976.142	383.392	10	2.546	0.0344
Podlaskie	561.842	296.422	10	1.895	0.0946
Pomorskie	994.151	342.935	10	2.899	0.0199
Slaskie	1902.672	363.378	10	5.236	0.0008
Swietokrzyskie	753.107	164.640	10	4.574	0.0018
Warminsko-mazurskie	559.423	214.159	10	2.612	0.0310
Wielkopolskie	1479.028	316.434	10	4.674	0.0016
Zachodniopo-morskie	785.019	244.663	10	3.209	0.0125
Poland	20050.9	3102.60	10	6.463	0.0002

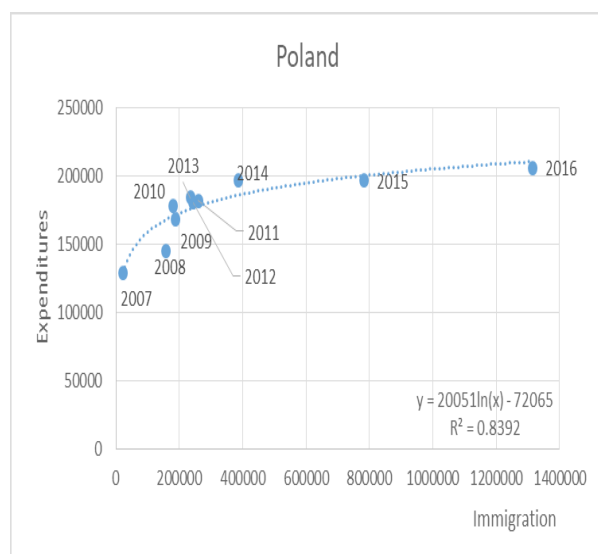
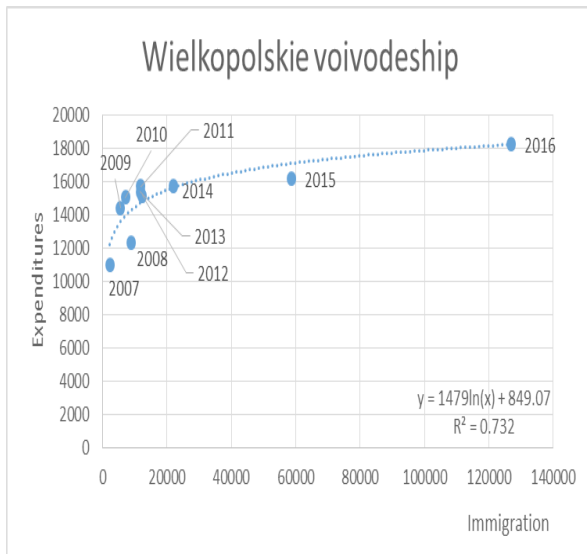
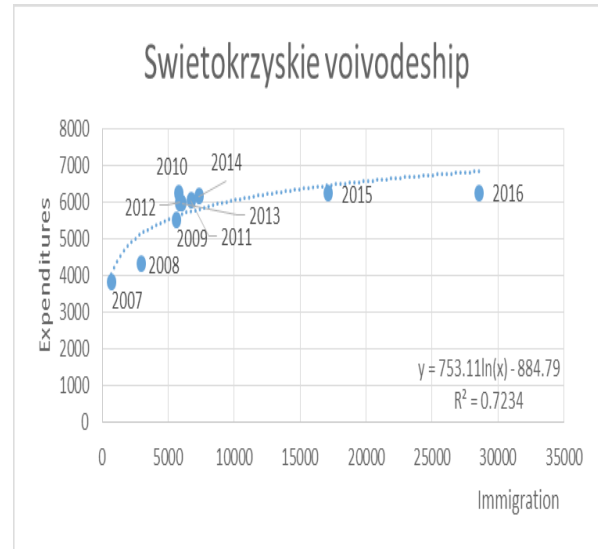
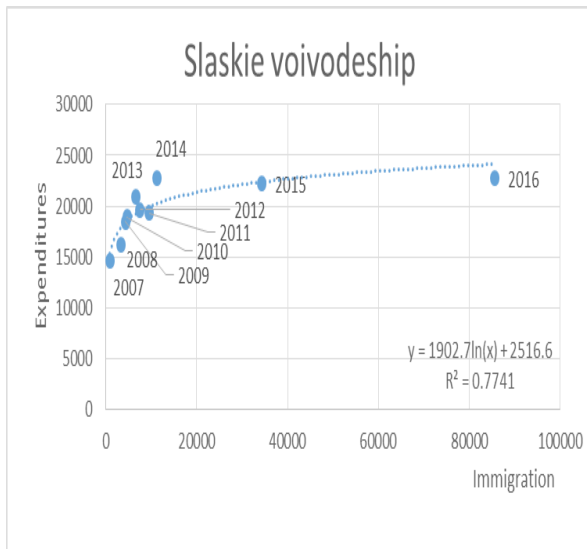
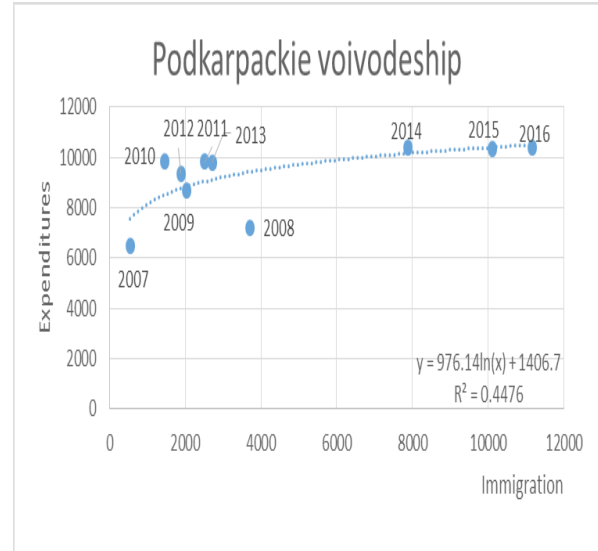
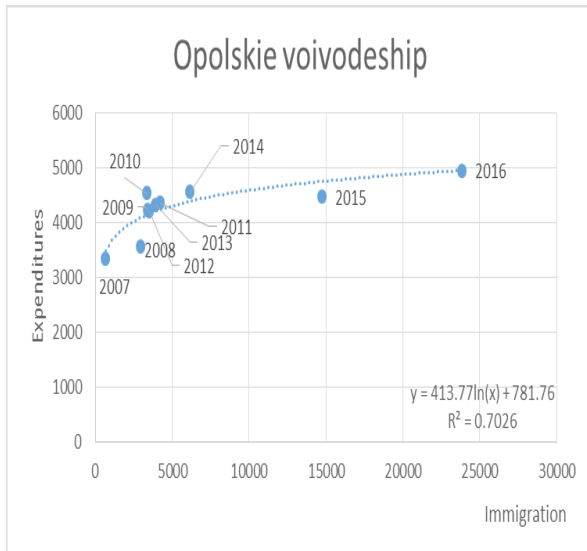
\*at 5% significance

Source: Own calculations based on Statistics Poland (2017), Ministry of Family, Labour and Social Policy (2018)

Figure 2: Immigration and SNG expenditures – regression results



4



Source: Own calculations based on Statistics Poland (2017), Ministry of Family, Labour and Social Policy (2018)

## CONCLUSIONS

The simultaneous increase in the revenues and expenditures of local governments as a result of immigration prompts us to search for answers to the question of the balance of the impact of immigration on local government budgets. In most of the analysed voivodeships - with the exception of Lubelskie and Swietokrzyskie voivodeships only - immigration resulted in a higher increase in revenues than expenditures of the local governments, thus the balance was positive. At the same time, it should be stressed once again that the impact of immigration on local government budgets in Poland is small. In this context, immigration can only be perceived to a limited extent as a tool for improving the budgetary situation of the local government sub-sector in Poland. Similar conclusions are reached by Auerbach and Oreopoulos (1999), who examined the fiscal impact of immigration to the U.S. since 1995 using a forecast up to 2070. Taking into account the changes in revenues and budgetary expenditures along with the age of immigrants, the authors come to the conclusion that in the long term, immigration cannot be considered either as the main source of fiscal imbalances or as a potential instrument for resolving these imbalances.

Conclusions regarding the fiscal effects of immigration in the context of increasing budgetary expenditures of local government units in Poland require even greater caution. While it is not difficult to assess the impact of immigration on the level of local government revenues, in the case of expenditures, such an assessment would require additional studies covering not only the size but also the detailed composition of expenditures. Only then would it be possible to assess which categories of

expenditures have increased and whether this increase can be clearly attributed to increased immigration. Such an analysis would also make it possible to reveal whether immigrants contributing to an increase in budgetary revenues also participate in local expenditures. However, the analysis of the structure of expenditure remains outside the framework of this study and, at the same time, encourages further research.

Analysis reveals an increase in both revenues and expenditures of local governments as a result of immigration to Poland. It should be stressed that the magnitude of this impact was limited. However, in the vast majority of voivodeships, the balance of this impact was positive (the increase in expenditures was smaller than the increase in revenues). The results can be explained by the structure of local government revenues and the nature of immigration to Poland. In the latter dimension, it should be noted that the research focused on economic immigration. Such concentration is justified - in Poland, the increase in immigration in recent years has been associated with the liberalization of access to the Polish labour market for temporary immigrants who may take up seasonal employment, returning to their country of origin after a period of employment. The predominance of economic immigration is one of the factors determining the fiscal effect of immigration, due to the high level of employment of immigrants. However, while temporary economic immigration may have a positive impact on local budgets, such immigration is not the answer to all the challenges, e.g. the demographic challenges facing Poland. Possible change in the character of immigration to Poland in the nearest future - will be a premise for further research.

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