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Model of financing regional development - Polish versus Western European regions

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Zaleski J., Mogiła Z., Poproch A.

Model of financing regional development – Polish versus Western European regions.

Abstract

In this paper we concentrate on the two different Polish NUTS-2 regions. The first one is Dolnośląskie – a representative of the group of relatively affluent regions, the other one is Podlaskie – a voivodeship that belongs to the group of regions marked by a relatively low level of development. The paper includes the analysis of historical data and presents the forecasting method of financial resources allocated for regional development. Subsequently, the forecasts are presented with special emphasis upon own resources of the regions, central budget funding, EU funds as well as private investment including foreign direct one. The main conclusions and insights are contrasted with the results of desk research on selected Western European countries.

1. Introduction

The Policy of regional development consists of two crucial components: objectives and the system of their achieving. Financial resources comprise one of the main parts of the latter. The aim of the paper is to present the system of financing the socio-economic regional development in Poland after its accession to the European Union in 2004 which has opened up an opportunity to significantly augment development funds for the Polish regions - primarily through the Cohesion Policy. It must be emphasized that Poland has become the largest national beneficiary of EU Cohesion Policy expenditure in the financial perspective 2007-2013 and it is expected to be the leader in this regard within the new EU Financial Framework 2014-2020. This has created a great opportunity for the Polish regions to accelerate and improve the long-term quality of their socio-economic development. In this paper we concentrate on the two different regions. The first one is Dolnośląskie – a representative of the group of relatively affluent regions (112.5% of GDP per capita of the national average; 66% of GDP per capita in PPS of the EU average), characterised by high investment attractiveness, large human and social capital stocks as well as other endogenous potentials that predestine this region to be one of the leaders of socio-economic development in Poland. The other region in question is Podlaskie – a voivodeship that belongs to the group of regions marked by a relatively low level of development as approximated by GDP per capita (72.7% of the national average; 45% of GDP per capita in PPS of the EU average) and which is included in the problem NUTS-2 regions in Poland covered by a special support

programme under cohesion policy. An integral and obligatory part of any strategy is financial framework which in the case of regional development strategies takes very often the form of general estimations. The paper includes the analysis of historical data and presents the forecasting method of financial resources allocated for regional development in Poland. The method is based on estimates of both public and private investment that might be undertaken to stimulate the regional development. The forecasts are carried out for various sources of investment: own resources of the regions, central budget funding, EU funds as well as private investment including foreign direct one. Subsequently, the results of the forecasts are presented by source of investment.

2. The method of forecasting the potential to finance regional development

This part identifies the basic sources of funding and presents the method of forecasting funds designed to finance the development of Polish regions in the period 2013-2025. This is done on the example of two Polish regions with extremely different characteristics: Dolnośląskie Voivodeship (Lower Silesia) and Podlaskie Voivodeship. The calculations took into account the division into public and private funds. Public funding included EU funds, own resources of the local administrative units of these two regions (NUTS-2, NUTS-4, and NUTS-5), development funds from the state budget, and resources spent by the special purpose agencies and funds. In estimating private funds, a subgroup of expenditure in the form of foreign direct investment was distinguished. It should be emphasised that the forecasts obtained are designed to quantify the overall maximum capacity to finance development, as determined by the assumptions made. The calculation uses historical data obtained from multiple sources i.a. from Regional Clearing Chambers, Local Data Bank of the Polish Central Statistical Office, information from Ministry of Regional Development, reports on implementation of the State budget. The table below shows this data.

Table 1. The potential to finance the region's development with public funds (in million PLN).

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Dolnośląskie										
Investment expenditure - regional government	96.8	69.8	78.5	90.8	156.4	252.7	269.1	316.7	781.3	478.1
Investment expenditure - counties	109.7	83.2	93.2	90.9	75.6	161.7	162.0	198.5	277.0	270.3
Investment expenditure - city counties	373.1	309.7	258.9	336.7	379.9	652.2	942.3	1200.4	1416.6	968.2
Investment expenditure - municipalities	521.1	476.6	468.3	609.0	643.5	1005.3	991.7	1203.2	1297.1	1723.1
Investment expenditure - central government	204.4	229.4	252.6	295.6	325.4	311.1	388.5	449.3	468.9	494.0
EU funds (NDP 2004-2006 & NSRF 2007-2013)	0.0	0.0	0.0	335.1	532.9	1081.6	1544.1	852.8	1918.6	3047.8
Podlaskie										
Investment expenditure - regional government	43.2	36.9	30.3	41.7	42.0	117.5	106.9	103.9	339.0	154.5
Investment expenditure - counties	49.8	41.4	45.6	68.1	76.4	85.3	54.4	81.1	179.0	175.3
Investment expenditure - city counties	121.9	88.2	97.6	165.4	182.5	192.5	221.8	285.7	432.4	656.3
Investment expenditure - municipalities	191.5	188.7	229.6	228.1	264.8	321.8	255.9	294.3	526.2	645.9
Investment expenditure - central government	223.6	251.0	276.3	323.3	355.9	340.2	424.9	491.4	512.9	540.4
EU funds (NDP 2004-2006 & NSRF 2007-2013)	0.0	0.0	0.0	20.9	242.7	514.0	582.5	412.2	766.0	1213.0

Source: Regional Clearing Chambers, Local Data Bank of the Polish Central Statistical Office, Ministry of Regional Development, reports on implementation of the State budget.

2.1. Public funds

In this part of the paper overall maximum public capacity to finance development in the regions in question is presented by the following sources: EU funds, own resources of the NUTS-2 regions, own resources of local administrative units (counties, city counties, municipalities), central budget funding and special purpose agencies and funds.

2.1.1. Resources from the European Union funds

To determine the amount of European Union funding for Podlaskie Voivodeship in the new financial perspective 2014-2020, an assumption was made that €72.9 billion would be allocated to Polish regions under the Structural Funds and €28.5 billion under the Common Agricultural Policy, in keeping with the information published on the websites of the Ministry of Regional Development and the Ministry of Agriculture and Rural Development after the decisions made at the European Union budget summit on 8 February 2013.

To divide structural funds between the Polish regions, the calculations were based on the data on funding under the National Strategic Reference Framework 2007-2013 (NSRF) and used the same system of allocation (with preferences for the economically weaker regions), according to which Dolnośląskie will receive 7.6% of European Union funds earmarked for Poland, while Podlaskie 4.3%. Following the allocation of funds between the regions, it is

estimated that Dolnośląskie will receive €5.5 billion (7.6% of €72.9 billion), whereas Podlaskie €3.1 billion (4.3% of €72.9 billion).

Table 2. Estimated forecasts of Cohesion Policy payments in the 2014-2020 financial perspective¹.

	Total nominal value for 2015-2022 (in million euro)	Total value per capita for 2015-2022 (in euro)
Dolnośląskie	5 541	1 900
Podlaskie	3 100	2 574
Poland	72 900	1 892

Source: Authors' calculations based on the information obtained from the Ministry of Regional Development, the data on NSRF 2007-2013 funding, and CSO data.

EU funds were divided into individual years of the period 2014-2022 in accordance with the time profile of NSRF 2007-2015 transfers; due to the fact that in 2007 there were no NSRF transfers, it was also assumed that there would be no transfers in the first year of the new financial perspective - 2014. As regards the next years (2023-2025) included in the forecast of the financial framework, it was assumed that the yearly value of EU transfers in Dolnoslaskie would be $\frac{1}{2}$ ² of the yearly average of the EU transfers in the period 2015-2022 and in Podlaskie the analogous value would be the yearly average in the period 2015-2022³. An assumption was also made that 39%⁴ (€2.6 billion – PLN 10.3 billion) in the case of Dolnośląskie and 31%⁵ (€1.3 billion – PLN 5.3 billion) in the case of Podlaskie would be allocated in the budgets of the regional governments of these voivodeships to finance programmes equivalent to the Regional Operational Programmes (ROP) and the regional components of the Human Capital Operational Programme (HCOP). Other resources include funding for the national Sectoral Operational Programmes provided directly from the state

¹ The total value per capita was calculated in relation to the 2011 population (a forecast of the Polish Central Statistical Office (CSO)).

² Due to phasing-out. Since the relation of the 2007-2013 EFRD funds to the 2000-2006 funds in the Spanish phasing-out regions range from 38% to 57%, it was assumed that in Dolnośląskie the analogous relation will amount to 50%. Dolnośląskie was classified as a phasing-out region after 2020 due to the results of macroeconomic simulations carried out using HERMIN modeling framework. The results showed that the GDP per capita (in PPS) of Dolnoslaskie will exceed 75% of the EU average. The results are included in the report commissioned by the Polish Ministry of Regional Development (http://www.mrr.gov.pl/rozwoj_regionalny/ewaluacja_i_analazy/oddzialywanie_makroekonomiczne/strony/oddzialywanie_makroekonomiczne_funduszy_unijnych.aspx). A detailed description of the HERMIN modeling framework can be found in (Bradley, Untiedt 2010).

³ In the case of Podlaskie, forecasts that were carried out using macroeconomic HERMIN model indicate that GDP per capita of this region (in PPS) in 2020 will be lower than 75% of the EU average. The results are included in the report commissioned by the Polish Ministry of Regional Development (http://www.mrr.gov.pl/rozwoj_regionalny/ewaluacja_i_analazy/oddzialywanie_makroekonomiczne/strony/oddzialywanie_makroekonomiczne_funduszy_unijnych.aspx). Hence, it is not assumed that the region will be under the phasing-out procedure. Unlike Dolnośląskie, Podlaskie will still belong to the group of regions under the relatively strong financial support from the EU.

⁴ The current share of the Dolnośląskie Voivodeship Regional Operational Programme and of the regional component of the HCOP in funding allocated to the NSRF is 39% - information from Ministry of Regional Development, 2012.

⁵ The current share of the Podlaskie Voivodeship Regional Operational Programme and of the regional component of the HCOP in funding allocated to the NSRF is 31% - information from Ministry of Regional Development, 2012.

budget and allocated to the respective region (PLN 16.1 billion for Lower Silesia and PLN 11.8 billion for the region of Podlasie).

EU funding earmarked for a programme equivalent to the current Rural Development Programme to be spent on the individual regions was estimated based on the data published on the website of the Ministry of Agriculture and Rural Development, according to which PLN 5.8 billion (€1.5 billion) would be allocated to Lower Silesia, whereas Podlasie would receive PLN 7.9 billion (€2.0 billion). This gives an annual average amount of PLN 0.64 billion for Dolnośląskie and PLN 0.88 billion for Podlaskie during the period 2014-2022 (in accordance with the n+2 rule). As in the case of structural funds for 2023-2025, it was assumed that in Dolnośląskie the yearly funds would be ½ of the yearly average in the period 2014-2022 (namely PLN 0.32 billion) and in Podlaskie the analogous value would be the yearly average in the period 2014-2022 (namely, PLN 0.88 billion). These estimates give a total amount of PLN 6.8 billion (on average PLN 0.52 billion per year) in Dolnośląskie and PLN 10.6 billion (on average PLN 0.81 billion per year) in Podlaskie in the period 2013-2025.

2.1.2. The investment potential of the regional government (NUTS-2)

To determine the investment potential of the regions in question, the data from the Local Data Bank of the Polish Central Statistical Office were used (total revenue, investment/capital expenditure, and the ratio of debt to total revenue). Based on these data, regression models were constructed in which investment/capital expenditure was the explained variable, whereas total revenue and the ratio of debt to total revenue were the explanatory variables. The equation of the model is as follows:

$$IE = \alpha_0 + \alpha_1 \times TR + \alpha_2 \times \frac{TL}{TR}, \quad [1]$$

where:

IE – investment expenditure,

TR – total revenue,

TL – total liabilities.

Table 3. Coefficients of the regression models for the NUTS-2 regions (Dolnośląskie and Podlaskie).

Coefficients	Dolnośląskie (NUTS-2 region)	Podlaskie (NUTS-2 region)
α_0	-139 162 996	14 222 140
α_1	0,521	0,2465
α_2	2 197 574	0,0
R^2	0,901	0,768
Standard error	82 483 971	25 452 896

Source: Own calculations.

The obtained regression parameters were used to estimate maximum capital expenditure in the future years, deriving the amount of total revenue from long-term financial forecasts⁶ (LTFF) for the regions and applying the possibly highest ratio of debt to total revenue which, according to the Public Finance Act of 30 June 2005 r. (Art. 170 para. 1), may not exceed 60%⁷. The relatively high value of the standard error is largely determined by a small number of observations (12) used in the estimation process. Since the forecasts analysed did not take into account the EU's future financial perspective 2014-2020 as regards EU funding, the above-mentioned amounts were added to estimated regional capital expenditure⁸: PLN 10.4 billion⁹ for Lower Silesia and PLN 5.2 billion for Podlasie under programmes corresponding to the present ROPs and HCOP, calculated as 39% and 31%, respectively, of funds from the projected European funding to be transferred from 2015, inclusive¹⁰.

Table 4. Forecast of the investment potential of the regional governments (in PLN billion).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2013-2025
Dolnośląskie														
Investment expenditure	1.21	0.63	0.47	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	6.38
EU funds (ROP + HCOP) in the new financial perspective 2014-2020	0.00	0.00	0.04	0.37	0.58	1.22	1.49	1.83	1.69	1.42	0.54	0.54	0.54	10.27
TOTAL	1.21	0.63	0.51	0.78	0.99	1.63	1.9	2.24	2.1	1.83	0.95	0.95	0.95	16.65
Podlaskie														
Investment expenditure (IE)	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.12	1.45
EU funds (ROP + HCOP) in the new financial perspective 2014-2020	0.00	0.00	0.01	0.17	0.33	0.53	0.65	0.79	0.74	0.62	0.48	0.48	0.48	5.29
TOTAL	0.10	0.10	0.11	0.27	0.44	0.64	0.76	0.91	0.85	0.74	0.60	0.60	0.60	6.73

Source: Authors' calculations based on the data from the Regional Clearing Chambers, the LTFF for Dolnośląskie, and the authors' estimates.

⁶ Long-term financial forecasts made available by the Regional Clearing Chambers.

⁷ isap.sejm.gov.pl/Download?id=WDU20091571240&type=3

⁸ EU funds were divided into individual years of the period 2014-2022 in accordance with the time profile of NSRF 2007-2015 transfers.

⁹ The exchange rate of EUR 1 = PLN 4.0 was applied for the years covered by the forecast.

¹⁰ From 2015. since an assumption was made that in 2014 no payments would be made.

2.1.3. The investment potential of local administrative units (counties, city counties, municipalities)

Investment expenditure of counties (*powiats* NUTS-4), city counties (cities with *powiat* rights), and municipalities (*gminas* NUTS-5) of Dolnośląskie and Podlaskie Voivodeships was estimated based on the same model as in the case of the regional government, namely:

$$IE = \alpha_0 + \alpha_1 \times TR + \alpha_2 \times \frac{TL}{TR}, \quad [2]$$

where:

IE – investment expenditure,

TR – total revenue,

TL – total liabilities.

Table 5. Coefficients of the regression models for counties, city counties, municipalities.

Coefficients	Counties in Dolnośląskie	Counties in Podlaskie
α_0	--146 680 886	-48 703 245
α_1	0,204	0,1938
α_2	1 194 142	979 442
R ²	0,9421	0,7815
Standard error	23 201 050	17 451 245
Coefficients	City counties in Dolnośląskie	City counties in Podlaskie
α_0	-616 538 462	-324 132 598
α_1	0,446	0,4102
α_2	944 558	4 082 182
R ²	0,7173	0,933
Standard error	237 675 047	55 305 729
Coefficients	Municipalities in Dolnośląskie	Municipalities in Podlaskie
α_0	-664 379 329	
α_1	0,302	0,2449
α_2	12 278 809	9 405 395
R ²	0,9295	0,891
Standard error	127 958 205	57 810 826

Source: Own calculations.

The data used to construct the models were the data on revenue and expenditure of local administrative units obtained from the Local Data Bank, whereas the forecasts for total revenue were derived from the long-term financial forecasts for all local administrative units made available by the Regional Clearing Chambers. In the case where the LTFF for a county / city / municipality ended earlier than the year 2025, the value of total revenue for the missing years was accepted at the level of the last year from the LTFF. The LTFF included the current financial forecast (2007-2013) which, in accordance with the n+2 rule, also relates to the period 2013-2015. Not to duplicate EU funding in these years (it was already included in the estimates of the investment potential of the regional government), revenue from EU funds was deducted from total revenue of local administrative units (derived from the LTFF). Since

the value of revenue from EU funds was not shown separately in the LTFFs for all local administrative units, the share of revenue from EU funds in total revenue was estimated on the basis of the available data. This was done separately for each model. Due to the lack of information on all local administrative units, there can be some error in the values calculated.

Table 6. The investment potential (expenditure) of local administrative units (in PLN billion).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2013 - 2025
Dolnośląskie														
Counties	0.31	0.30	0.31	0.31	0.31	0.32	0.32	0.33	0.33	0.33	0.33	0.33	0.33	4.15
City counties	1.15	1.28	1.35	1.43	1.47	1.51	1.56	1.61	1.65	1.70	1.75	1.79	1.84	20.10
Municipalities	1.89	1.92	1.95	2.01	2.01	2.06	2.08	2.10	2.11	2.12	2.13	2.13	2.14	26.65
TOTAL	3.35	3.50	3.61	3.75	3.79	3.89	3.96	4.03	4.09	4.15	4.20	4.26	4.31	50.90
Podlaskie														
Counties	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	2.21
City counties	0.69	0.73	0.76	0.77	0.79	0.81	0.83	0.85	0.87	0.88	0.90	0.91	0.92	10.69
Municipalities	0.93	0.91	0.90	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94	0.94	0.94	12.01
TOTAL	1.77	1.81	1.82	1.84	1.87	1.90	1.93	1.95	1.97	1.99	2.01	2.02	2.04	24.91

Source: Calculations based on the data from the Local Data Bank, the long-term financial forecasts for local administrative units, and the authors' calculations.

2.1.4. Funds transferred by central government

In order to determine capital expenditure from the state budget allocated to the regions, total government expenditure was first estimated for the period 2016-2025 (using a linear regression based on the 2000-2015 data - for the period 2000-2011 they were obtained from the reports on state budget execution, while for the period 2012-2015 from the Long-term State Financial Plan 2012-2015). On the basis of the budget execution data, it was calculated that in the period 2000-2011 the average annual share of government capital expenditure in total expenditure was 4.64%. The value of government capital expenditure was derived by multiplying this share by estimated total expenditure. The shares of government capital expenditure allocated to the individual regions were calculated (3.2% - Lower Silesia, 3.5% - Podlasie)¹¹. In this way, estimated government capital expenditure allocated to Dolnośląskie and Podlaskie was obtained.

¹¹ Based on a report prepared by the Gdańsk Institute for Market Economics (IBnGR): "Public revenue and expenditure in 2006-2007. Regional analysis",

Table 7. Government capital expenditure allocated to the two regions (in PLN million).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2013-2025
Dolnośląskie	0.50	0.51	0.52	0.56	0.58	0.60	0.62	0.64	0.66	0.68	0.71	0.73	0.75	8.06
Podlaskie	0.55	0.55	0.57	0.61	0.63	0.66	0.68	0.70	0.73	0.75	0.77	0.79	0.82	8.81

Source: Calculations based on the data from the Ministry of Finance and the GIME's report.

EU funds allocated to the national Sectoral Operational Programmes (their value was estimated in 2.1.1.), which have an impact on the development of the regions in question, should be added to these amounts, namely 61% and 69%, respectively, of EU funds estimated for the period 2014-2025 as well as funding allocated to Dolnośląskie and Podlaskie Voivodeships under the Common Agricultural Policy.

Table 8. EU funds transferred by the central government (in PLN million).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2013-2025
Dolnośląskie														
Structural funds	0.00	0.00	0.06	0.59	0.90	1.91	2.33	2.86	2.65	2.23	0.85	0.85	0.85	16.06
Common Agricultural Policy	0.00	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.32	0.32	0.32	6.77
EU funds transferred by central government	0.00	0.64	0.71	1.23	1.55	2.55	2.98	3.50	3.29	2.87	1.17	1.17	1.17	20.17
Podlaskie														
Structural funds	0.00	0.00	0.03	0.37	0.74	1.18	1.44	1.77	1.64	1.38	1.07	1.07	1.07	11.77
Common Agricultural Policy	0.00	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	10.56
EU funds transferred by central government	0.00	0.88	0.91	1.25	1.62	2.06	2.32	2.65	2.52	2.26	1.95	1.95	1.95	22.33

Source: Authors' calculations based on the information from the Ministry of Regional Development, the data on NSRF 2007-2013 funding, and CSO data.

2.1.5. Special purpose agencies and funds

Among the special purpose agencies and funds operating at the regional level in Poland, the most significant ones in terms of financing development activities are the Regional Funds for Environmental Protection and Water Management (WFOŚiGW). Taking it into account, this part of the paper was focused on the WFOŚiGWs in Wrocław and Białystok – the capital cities of Dolnośląskie and Podlaskie respectively.

The Regional Funds for Environmental Protection and Water Management

As part of their statutory activities, these Funds give interest-bearing loans and grants, including investment grants and subsidies to interest on bank loans, and they also grant forgiveness of loans and make reimbursements for property tax relief. WFOŚiGWs in

Wrocław and Białystok are mainly loan providers for regional and local authorities. In the below table the data on loans in the period 2010-2012 were included. The value of grants, loan cancellations, subsidies, and reimbursements is estimated in this report; the capital that allows loans to be given is not included in this place, since the earlier estimated expenditure of local administrative units assumes the maximum debt threshold, thus it also covers funds obtained from loans from the Regional Funds for Environmental Protection and Water Management (WFOŚiGW). It is worth noting that these loans are a major part in the structure of financial support provided by these Funds to beneficiaries.

Table 9. Grants and loans from WFOŚiGW (in PLN million).

	2010	2011	2012	Average
Dolnośląskie				
Loans	67.16	351.39	194.97	204.51
Investment grants	33.86	26.83	32.71	31.14
Forgiveness of loans	0.00	0.08	0.79	0.44
Investment grants and subsidies to interest on bank loans	0.15	0.17	0.14	0.15
Reimbursements for property tax relief	0.01	0.01	0.01	0.01
Total	34.02	27.09	33.66	31.59
Podlaskie				
Loans	52.19	34.85	25.61	37.55
Investment grants	5.53	4.52	3.70	4.58
Forgiveness of loans	1.15	1.97	0.88	1.33
Investment grants and subsidies to interest on bank loans	0.08	0.16	0.27	0.17
Reimbursements for property tax relief	0.06	0.06	0.06	0.06
Total	6.82	6.71	4.90	6.14

Source: Calculations based on the data derived from the reports and financial plans of WFOŚiGW in Wrocław and Białystok.

Historical data show that WFOŚiGW activities have been mainly focused on providing loans. The analysis of the grants provided by WFOŚiGW both in Wrocław and Białystok does not indicate that there have been any upward or downward trends. Thus, when estimating future grants from WFOŚiGW the average historical values were taken. Hence, the values of grants provided by WFOŚiGWs were estimated at PLN 31.59 mln and PLN 6.14 mln in Wrocław and Białystok respectively.

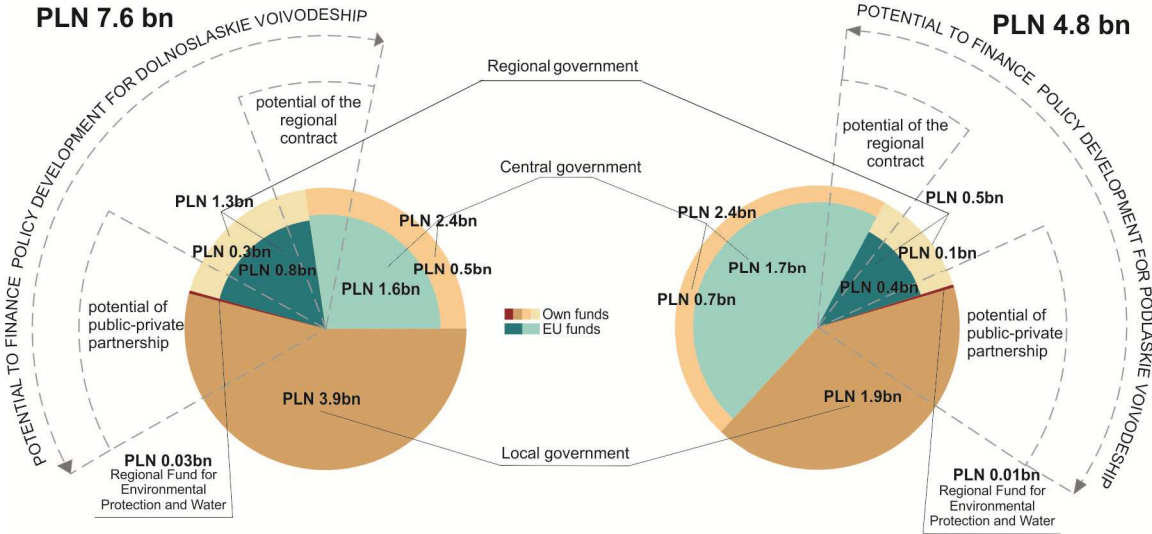
2.1.6. Total public funds

Table 10. The financial potential of public funds to implement the Lower Silesian and Podlaskie Voivodeships (in PLN billion).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2013-2025	On average per year
Dolnośląskie															
Regional government	1.21	0.63	0.51	0.78	0.99	1.63	1.9	2.24	2.1	1.83	0.95	0.95	0.95	16.67	1.28
Counties	0.31	0.3	0.31	0.31	0.31	0.32	0.32	0.33	0.33	0.33	0.33	0.33	0.33	4.16	0.32
City counties	1.15	1.28	1.35	1.43	1.47	1.51	1.56	1.61	1.65	1.7	1.75	1.79	1.84	20.09	1.55
Municipalities	1.89	1.92	1.95	2.01	2.01	2.06	2.08	2.1	2.11	2.12	2.13	2.13	2.14	26.65	2.05
EU funds transferred by the central government	0.00	0.64	0.71	1.23	1.55	2.55	2.98	3.5	3.29	2.87	1.17	1.17	1.17	22.83	1.76
Government capital expenditure	0.50	0.51	0.52	0.56	0.58	0.6	0.62	0.64	0.66	0.68	0.71	0.73	0.75	8.06	0.62
Grants from WFOŚiGW	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.41	0.03
TOTAL	5.09	5.31	5.38	6.35	6.94	8.70	9.49	10.45	10.17	9.56	7.07	7.13	7.21	98.87	7.61
Podlaskie															
Regional government	0.1	0.1	0.11	0.27	0.44	0.64	0.76	0.91	0.85	0.74	0.6	0.6	0.6	6.72	0.52
Counties	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.18	0.18	2.22	0.17
City counties	0.69	0.73	0.76	0.77	0.79	0.81	0.83	0.85	0.87	0.88	0.9	0.91	0.92	10.71	0.82
Municipalities	0.93	0.91	0.9	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94	0.94	0.94	12.02	0.92
EU funds transferred by the central government	0.00	0.88	0.91	1.25	1.62	2.06	2.32	2.65	2.52	2.26	1.95	1.95	1.95	22.32	1.72
Government capital expenditure	0.55	0.55	0.57	0.61	0.63	0.66	0.68	0.7	0.73	0.75	0.77	0.79	0.82	8.81	0.68
Grants from WFOŚiGW	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08	0.01
TOTAL	2.44	3.35	3.43	3.99	4.57	5.27	5.69	6.22	6.08	5.75	5.34	5.38	5.42	62.88	4.84

Source: Summary of results obtained.

The potential to finance the region’s development with public funds – average annual estimates for 2013-2025.



Source: Authors’ estimates.

For the period 2013-2025, the total development potential of Dolnośląskie is PLN 98.9 billion, which gives an average annual amount of PLN 7.6 billion. In terms of the distribution of funds over time, three periods of similar financial potential can be distinguished: 2013-2017 – an average annual amount of PLN 5.8 billion; 2018-2022 – an average annual amount of PLN 9.7 billion; and 2023-2025 – an average annual amount of PLN 7.1 billion. The highest capacity to finance the Lower Silesian development was estimated for the year 2020 (PLN 10.45 billion), while the lowest capacity for the year 2013 (PLN 5.09 billion). In the case of Podlaskie, the total development potential for the period 2013-2025 is PLN 62.9 billion, which gives an average annual amount of nearly PLN 4.8 billion. In terms of the distribution of funds over time, three periods of similar financial potential can be distinguished: 2013-2017 – an average annual amount of PLN 3.6 billion; 2018-2022 – an average annual amount of PLN 5.8 billion; and 2023-2025 – an average annual amount of PLN 5.4 billion. The highest capacity to finance the Podlaskie development was estimated for the year 2020 (PLN 6.2 billion), while the lowest capacity for the year 2013 (PLN 2.4 billion).

2.2. Private funds

To estimate the financing potential of private investments, forecasts of total gross fixed capital formation derived from the HERMIN models¹² for the economy of Lower Silesia and Podlaskie were used in the analysis. Table 11 shows the values of gross fixed capital

¹² A detailed description of the HERMIN modeling framework can be found in (Bradley, Untiedt 2010).

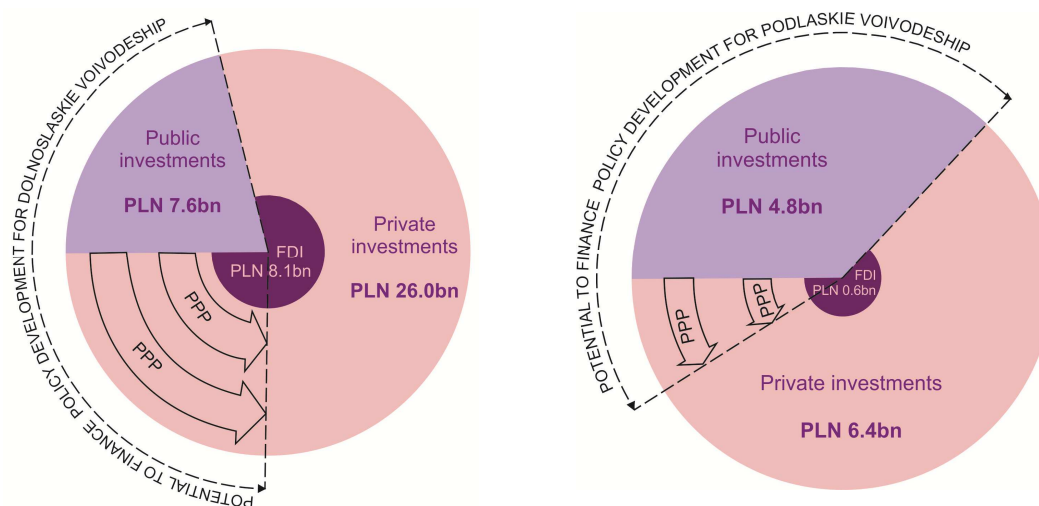
formation (GFCF) in the private sector. It was calculated on the basis of the total gross fixed capital formation of the two regions (derived from the HERMIN models) and the average annual shares of private sector in total investment expenditure which amounts to 63.50% in the case of Dolnośląskie and 61.35% in the case of Podlaskie. The table also shows separately estimated foreign direct investment (FDI) which was calculated as 31.0% of private capital expenditure in Lower Silesia and as 9.3% in Podlaskie. These shares were calculated based on a report of the Bureau for Investments and Economic Cycles⁹ as the average share for the period 2007-2009.

Table 11. Private gross fixed capital formation and FDI (in PLN billion).

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2013-2025
Dolnośląskie														
Private GFCF	17.6	18.6	19.6	21.2	22.6	24.9	26.6	28.5	29.6	30.4	31.7	33.0	34.3	338.6
FDI	5.5	5.8	6.1	6.6	7.0	7.7	8.3	8.8	9.2	9.4	9.8	10.2	10.7	105.1
Podlaskie														
Private GFCF	5.0	5.2	5.5	5.7	6.0	6.3	6.7	7.0	7.0	7.0	7.0	7.0	7.0	82.7
FDI	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	7.7

Source: Authors' calculations based on the forecasts of the regional HERMIN model for Lower Silesia and the data from the report of BIEC¹³.

The potential to finance the region's development with private funds – average annual estimates for 2013-2025.



Source: Authors' calculations.

¹³ Bieć A., Kwartalna informacja o sytuacji społeczno-gospodarczej kraju i województw z elementami prognozy [Quarterly information on the socio-economic situation of the country and regions with elements of forecasting], Warszawa, February 2010.

3. Dolnośląskie and Podlaskie versus selected EU countries – comparative analysis of historical data

In order to place Dolnośląskie and Podlaskie in the European context, in this part financial frameworks of the two regions in question were compared with the frameworks in selected EU countries that are non-federal as Poland – France, Italy and Sweden.

To analyse the sources of private and public funds earmarked for development, the analysis was based on the data on gross fixed capital formation (GFCF). Due to the lack of data at the regional level for France, Italy and Sweden, the analysis was not disaggregated into their regions. The historical distribution of investment into public and private investment for the above-mentioned states is shown in table 12; the source of these data is the AMECO database.

Table 12. The percentage share of the private and public sector in gross fixed capital formation in France, Italy, Poland, Sweden and Dolnośląskie and Podlaskie¹⁴ [in %].

Country	Sector	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
France	public	15.9	15.9	16.5	16.5	16.9	16.0	15.6	15.2	17.5	16.0
	private	84.1	84.1	83.5	83.5	83.1	84.0	84.4	84.8	82.5	84.0
Sweden	public	16.2	17.8	17.5	17.3	16.7	16.3	15.7	16.4	19.6	19.3
	private	83.8	82.2	82.5	82.7	83.3	83.7	84.3	83.6	80.4	80.7
Italy	public	11.6	8.3	12.0	11.7	11.3	11.0	10.8	10.7	13.0	10.8
	private	88.4	91.7	88.0	88.3	88.7	89.0	89.2	89.3	87.0	89.2
Poland	public	29.4	29.5	29.3	29.2	29.8	29.3	28.6	29.9	35.3	37.1
	private	70.6	70.5	70.7	70.8	70.2	70.7	71.4	70.1	64.7	62.9
Dolnośląskie	public	32.9	36.2	39.9	33.6	33.0	30.4	31.4	36.5	42.6	47.1
	private	67.1	63.8	60.1	66.4	67.0	69.6	68.6	63.5	57.4	52.9
Podlaskie	public	43.5	32.2	37.5	43.5	43.4	36.6	28.2	28.0	40.2	47.2
	private	56.5	67.8	62.5	56.5	56.6	63.4	71.8	72.0	59.8	52.8

Source: AMECO (for France, Sweden, Italy), Polish Central Statistical Office.

In analysing the breakdown of gross fixed capital formation into the public and private sector (Table 12), it can be seen that investment financed from private sources make up a major part in each of the four states in question and in Dolnośląskie and Podlaskie. The highest share is in Italy where its average annual value in the period 2001-2010 was 88.9%, whereas this share was the lowest in Poland, with its average annual value of 69.3% (in Dolnośląskie and Podlaskie it was even lower). In the period concerned, a significant increase in the share of public funds can be noticed in Poland and its regions, which is associated with the implementation of the programmes co-financed from European Union funds, of which Poland was the largest beneficiary in the period 2007-2013.

¹⁴ In the case of Dolnośląskie and Podlaskie the data on investment outlays were used.

To compare the structure of public investment, the data on public gross fixed capital formation were used with a breakdown into central and local government (for France, Italy and Sweden data available only at the national level - these data come from the Eurostat database). The category of central government is understood as national government investment, while local government includes investment of all regional and local administrative units from the levels NUTS2-NUTS5.

Table 13. The structure of public investment by source in France, Italy, Poland, Sweden and Dolnośląskie and Podlaskie [in %].

Country	Government	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
France	central	23.1	23.1	23.5	21.3	21.6	18.9	18.3	17.8	21.3	20.8
	local	76.9	76.9	76.5	78.7	78.4	81.1	81.7	82.2	78.7	79.2
Sweden	central	43.7	45.2	46.8	50.5	48.0	47.0	44.9	45.4	46.0	45.7
	local	56.3	54.8	53.2	49.5	52.0	53.0	55.1	54.6	54.0	54.3
Italy	central	24.0	22.2	23.5	16.8	21.1	20.5	23.7	22.7	24.6	25.5
	local	76.0	77.8	76.5	83.2	78.9	79.5	76.3	77.3	75.4	74.5
Poland	central	29.5	29.8	33.3	44.5	38.1	33.8	39.9	42.3	38.9	40.2
	local	70.5	70.2	66.7	55.5	61.9	66.2	60.1	57.7	61.1	59.8
Dolnośląskie	central	15.7	19.6	21.9	35.9	40.6	40.2	45.0	30.8	38.8	50.7
	local	84.3	80.4	78.1	64.1	59.4	59.8	55.0	69.2	61.2	49.3
Podlaskie	central	35.5	41.4	40.7	40.6	51.4	54.4	61.2	54.2	46.4	51.8
	local	64.5	58.6	59.3	59.4	48.6	45.6	38.8	45.8	53.6	48.2

Source: Eurostat and own calculation.

The data presented in the above table show that in all the countries concerned own funds of local governments have a higher share in investment. In Poland this share is lower than in France and Italy, which demonstrates a still relatively low level of decentralisation of development policy. The lowest share is recorded in Sweden, which is a result of the high level of redistribution at the central level in this country. The average annual share of funds from local sources ranges from 53.7% in Sweden to 66.1% in Poland, 77.4% in Italy, and 78.9% in France. It is worth noting that in the case of Podlaskie after 2004 (with the exception of 2009) central sources are more important in financing development. In the case of Dolnośląskie investment undertaken by central government exceeded expenditure by local one in 2010. Those facts imply that in the two regions in question the structure of public investment is not in line with the one in the developed EU countries where decentralization in financing development went further.

4. Conclusions

The development gaps of the Polish voivodeships in relation to the wealthier regions of the European Union induce the need to undertake intensive investments that would allow the pace of socio-economic development to be made more dynamic and thus to eliminate these gaps. The implementation of the above-mentioned investments entails the need to obtain funds to finance them. Apart from the amount of investment funds, the financing structure by sources of funding is a very important issue. This paper includes the analysis of historical data and presents the method of forecasting the financial potential for regional development during the period 2013-2025 in two Polish NUTS-2 regions: a relatively affluent and economically strong region of Lower Silesia (Dolnośląskie Voivodeship) and one of the poorest regions in the EU, Podlaskie Voivodeship. The forecasting method presented in this paper allows us to construct financial frameworks for Polish regional strategies. It enables to estimate more precisely financial resources that a particular region is capable of allocating for development. The presented estimates ought to be treated as optimal ones. The real investment expenditure is likely to be lower – e.g. local authorities might not be willing to run into maximum debts or a part of expenditure could be finally allocated for consumption purposes.

The following conclusions can be made on the basis of the analysis:

- Private sector funds are a major part of potential resources to finance development investments in these two regions (79.4% and 61.3% of the total investment potential in Dolnośląskie and Podlaskie, respectively). It is the activity of the private sector that is the major long-term determinant of the dynamics and trajectory of development processes. Given that, it is extremely important that public funds allocated under the EU's new financial perspective 2014-2020, which is probably the last financial perspective with such generous support provided to the Polish regions, are used effectively for the improvement of the regional endogenous development capacity. The identification and strengthening of the regions' own potential will enable a smooth and relatively problem-free transition to the future reality without EU grants;
- The analysis of the structure of potential financing of development from public funds in these two Polish regions allows us to conclude that NUTS-5 administrative units and city counties (NUTS-5) have the highest shares in expenditure. It should however be noted that in the case of Dolnośląskie Voivodeship it is 51.3% on average per year, whereas in the case of Podlaskie Voivodeship 39.6%. This difference results from the fact that

- Podlaskie, as a relatively less wealthy and economically weaker region, is to receive relatively higher funds from the state budget and under EU cohesion policy. The average annual share of funds from these two sources is estimated at 14.6% and 35.4%, respectively. In the case of Dolnośląskie, these values are 6.6% and 21.1%, respectively;
- Due to cohesion policy support, the real weight of public investments (understood as the ratio of average annual public funds earmarked for development investments to regional GDP) in stimulating the development processes is to be higher in the case of the economically weaker region of Podlaskie (14.2%) than in the case of Dolnośląskie (6.2%), which is aimed at making the convergence processes more dynamic, both in the external dimension (in relation to the EU average) and in the internal dimension (in relation to the average for Poland);
 - The financial potential of the authorities of the NUTS-2 regions in question (17.1% of the average annual value of public investment expenditure in Dolnośląskie and 10.4% in Podlaskie) to impact the socio-economic development is not high. Nevertheless, it is worth noting that the regional authorities can try to increase their impact on the development processes through, among others, regional contracts under which government funding can be obtained as well as by initiating public-private partnerships (which enable private financing to be provided in the public services sector) and public-public partnership (among others, by providing co-funding for partnership agreements between lower-level administrative units – e.g. NUTS-5 units);
 - The Polish voivodeships – Dolnośląskie and Podlaskie are characterized by the greater share of central financial resources (allocated by the central government) in the total regional public investment in comparison to the both France and Italy. Furthermore, in the two regions in question the structure of public investment is not in line with the one in the developed EU countries where investment from local sources exceed this undertaken by central government. It implies a relatively low decentralization of development policy in Poland.
 - In the EU's future financial perspective 2014-2020, the importance of repayable financial instruments is supposed to increase at the expense of non-repayable financial instruments. At the moment, the proportions of these instruments have not been yet determined. In the future, an important research issue will be to analyse the impact of the public sector on private sector expenditure through initiatives similar to, for example, JEREMIE.

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