

LUDOSŁAW DRELICHOWSKI, CEZARY GRAUL
Wydział Zarządzania
Uniwersytet Technologiczno-Przyrodniczy w Bydgoszczy

BARBARA PTASZYŃSKA, WIOLETTA ZWARA
Urząd Statystyczny w Bydgoszczy

GRZEGORZ OSZUŚCIK
SOFTEAM Bydgoszcz

A model of dynamic analysis of the influence of the development of Poland's infrastructure on the level of changes arising from the financing costs of its construction and maintenance using business intelligence tools

1. Introduction

The occurrence of a tendency to trigger a variety of budget balance disturbances, observed in countries at different levels of economic development and at different stages of advancement in terms of international integration, is one of the sources of the global economic crisis. Considering a high level of budget deficit in such economically advanced countries as the USA or Japan, the already well-known difficulties of Greece, Portugal, Spain, Cyprus, as well as – occasionally – Ireland or Italy, and a number of other countries approaching the acceptable safety levels, it seems valid to ask about the sources of these problems in individual countries and their nature, evaluated from the perspective of local or international circumstances.

Economic stratifications among various groups of countries lead to moulding consumer expectations following the example of countries representing a higher level of economic development, which is natural in the era of global exchange of information. Opposition politicians, pursuing their goal of regaining access to power, spare no effort in offering promises, often empty, regarding 'justified' demands made by citizens to the present governing political parties. The tendency of party organisations in parliamentary democracies to focus largely on political rather than material activities makes any expectations of rational but inevitably restrictive measures unrealisable, which is due to the excessive trends of consumption growth.

The starting point mentioned above means that it is necessary to establish the degree to which the paradigm applied in the EU countries for decades – arguing that any level of external resources allotted for the development of economic infrastructure – is always substantially and economically justified as a starting point and idea to help the poorest EU countries. It should be noted that the development of infrastructure supported financially by the European Union requires co-financing with own resources at least at 25%, which often means taking out loans by local governments to cover their own contribution. There are also expenditures to finance access roads to motorways and expressways. The costs of lighting systems and maintenance also increase in direct proportion to the number of kilometres of infrastructure put in operation. What follows from these statements is that financial assets allotted to infrastructure to ensure civilisational advancement of a country may have a negative influence, posing a growing threat to the preservation of budget balance.

The purpose of this paper is to identify – as many as possible – statistical parameters containing information about the dynamics of changes in the level of expenses for the development and maintenance of infrastructure, particularly as regards obligatory payments. The data acquired from the Local Data Bank for the last 7 years is a sufficient source for identification of existing interdependencies and determination of the dynamics of changes.

A dynamic model will enable the registration of the extent of changes that have occurred in the recent years and their influence on the level of differentiation of incomes and expenditures in Poland. The research hypothesis is that the development of a model of dynamic budget balancing on the level of communes or municipalities (Polish: *gminy*), provinces (Polish: *województwa*) and the whole country will make it possible to determine more precisely the potential sources of threats and to identify which local governments may consider investments.

The idea to monitor the state of balance of communal and municipal budgets seemed to be essential, considering the aftermath of the 2008 crisis and economic difficulties in many countries. This problem was addressed in a paper by Drelichowski and Stawicka¹, including the idea to apply a data warehouse and OLAP tools to conduct a dynamic analysis of the budget balance on the level of communes and municipalities from all over the country, which was successfully implemented in 2013². The application of a data warehouse and Business Intelligence tools in public administration agencies was discussed in several papers³, whereas the possibilities of application of a balanced scorecard to support strategic functions were considered by Drelichowski et al. and Filinger and Misiak⁴.

2. Methodical assumptions for a dynamic model of analysis of the changes in the financing costs of construction and maintenance of infrastructure from a regional and national perspective

An analysis of the budget balance on various organisational levels of public administration units requires consideration of any available analytical sources of information which will enable inclusion of all components affecting the incomes and expenditures related to the applicable factors that influence the stability of the analysed entities. Balance models are strictly determined by regulations establishing the structure, data sources and balancing algorithms that

¹ L. Drelichowski, M. Stawicka, *Zastosowanie sieci migrujących i budowa hurtowni danych oraz baz wiedzy do oceny funkcjonowania przedsiębiorstw komunalnych przez władze samorządowe*, "Wiadomości Statystyczne" vol. 58, 2008, pp. 233–255.

² L. Drelichowski, E. Fronczak, C. Graul, G. Oszuścik, *Using data warehousing and the OLAP tools to analyze communal budgets in the kujawsko-pomorskie province in the light of absorbing funds from the European Union*, Studies and Proceedings of the PAKM, vol. 63, Bydgoszcz.

³ Ibidem; L. Drelichowski, M. Stawicka, op.cit.; R. Goodlad, P. Burton, J. Croft, *Effectiveness at what? The processes and impact of community involvement in area-based initiatives*, Scottish Centre for Research on Social Justice, Department of Urban Studies, University of Glasgow 2005, 23(6), pp. 923–938.

⁴ L. Drelichowski et al., *Methodological aspects and case studies of Business Intelligence applications tools in Knowledge Management*, Studies and Proceedings of the PAKM, vol. 59, Bydgoszcz 2010; W. Filinger, Z. Misiak, *Zarządzanie wiedzą w jednostkach administracji publicznej przy wykorzystaniu Strategicznej Karty Wyników*, Warsaw School of Economics, series: "Monografie i Opracowania", Warsaw 2010, pp. 87–100.

ensure the comparability of processed information. A detailed structure of the source information taken into account in the balance is laid down in Section 3 of this paper, along with the components to be considered for the purpose of identification of the sources and the scale of changes in the analysis. The use of available and successively updated information concerning a data warehouse with budgetary data for eight years (until 2012) collected from 2,476 communes and municipalities located across the country is a key element of the analytical process. The available data warehouse structure with OLAP tools was used to perform an analysis of the debt ratio of the communes and municipalities, the results of which were published in a paper by Drelichowski, Fronczak, Graul and Oszuścik⁵. This enabled the presentation of interesting and particularly important conclusions from the point of view of the new cycle of planned co-financing of Polish investments in the years 2014–2020 with EU funds. It is this opportunity and challenge for the Polish economy that require the introduction of very precise mechanisms of modelling and analysis of changes in the dynamics of financing investment expenditure with regard to the proportion of funds allotted to infrastructure, considering the consequences of such changes for the flow of investment expenditure and the increase of various operating costs. For this reason, it is predicted in the modelling process described in the research topic by parallel usage of advantages that come from opportunities of detailed analysis of data warehouse with Business Intelligence tools application.

In order to achieve this aim, information from the Local Data Bank⁶, Poland's largest collection of data concerning socioeconomic conditions of territorial governments, was used. The data included all communes and municipalities listed in the Nomenclature of Territorial Units for Statistical Purposes (NTS-5).

The Polish Nomenclature of Territorial Units for Statistical Purposes (NTS) was developed on the basis of the European Nomenclature of Units for Territorial Statistics (NUTS) applicable in the European Union countries. Thanks to this classification it is possible to compare any coded units from the entire EU⁷. This is an exceptionally valid argument to stimulate collaboration in this respect among the EU Member States, where budget deficit issues and the identification of reasons and extent of their occurrence require joint research work.

⁵ L. Drelichowski, E. Fronczak, C. Graul, G. Oszuścik, op.cit.

⁶ Statistical Office in Bydgoszcz, *Powiaty i gminy w województwie kujawsko-pomorskim w 2010 r. – sytuacja społeczno-gospodarcza w okresie programowania 2007–2013*, Statistical Office in Bydgoszcz, Bydgoszcz 2012.

⁷ Ibidem.

The performed analysis of the budgets covered the years 2008–2012 and the incomes and expenditures of individual units were listed according to relevant divisions of the Budget Classification. Communal budgets are basic financial plans that include all the components of financial economy over a year⁸. Converting the structure of budget information into a data warehouse form enables the use of BI tools to extract knowledge from databases containing economic information. The integration of database update procedures with the generation of new summaries of analytical information supports decision-making processes and the aspect of monitoring of the budget situation, emphasised in our previous work⁹. The increasing problems of self-financing of municipal and communal budgets are more and more reflected in the difficulties of central budgets of a number of the EU member states, not necessarily the less developed ones. A newspaper article from “Gazeta Wyborcza” of 16 September 2013, entitled ‘Germany is growing so fast its local governments are bursting at the seams’, describes the deterioration of a lot of communal and municipal governments, including an overview of the effects of the implementation of a restructuring plan by the government commissioner of the city of Nideggen in the North Rhine-Westphalia. The article lists a number of towns and communes having problems with balancing the budget on the respective levels of local government. Due to these disturbances a lot of these governments cannot afford to incur usual expenses, necessary to maintain expected standards of various elements of the German infrastructure.

Table 1 shows the budget deficit and the public debt expressed as a percentage of the GDP in the EU countries.

⁸ Ibidem.

⁹ L. Drelichowski, E. Fronczak, C. Graul, G. Oszuścik, op.cit.; L. Drelichowski, M. Stawicka, op.cit.; L. Drelichowski, M. Żółtowski, J. Mierzejewski, *Międzyorganizacyjne rozwiązania komunikacji i zarządzania wiedzą jako metoda kompensowania skutków dynamicznego rozwoju PESA Bydgoszcz S.A.*, Economic University of Katowice, Katowice 2011. See also: L. Albrechts, *Planning and power: towards an emancipatory planning approach*, in: “Environment and Planning C: Government and Policy”, 2003, 21(6), pp. 905–924; C. Asahi, Y. Hagiwara, *Marginal willingness to pay for public investment under urban environmental risk: The case of municipal water use*, Tokyo Metropolitan University Graduate School of Urban Science, Tokyo 2007.

Table 1. Budget deficit and public debt as a percentage of the GDP in the EU countries

Country	Budget deficit (% GDP)					Public debt (% GDP)					
	2008	2009	2010	2011*	2012*	2007	2008	2009	2010	2011*	2012*
Belgium	-1.3	-5.9	-4.1	-3.7	-4.2	84.2	89.6	96.2	96.8	97.0	97.5
Germany	0.1	-3.0	-3.3	-2.0	-1.2	64.9	66.3	73.5	83.2	82.4	81.1
Estonia	-2.8	-1.7	0.1	-0.6	-2.4	3.7	4.6	7.2	6.6	6.1	6.9
Ireland	-7.3	-14.3	-32.4	-10.5	-8.8	25.0	44.4	65.6	96.2	112.0	117.9
Greece	-9.8	-15.4	-10.5	-9.5	-9.3	105.4	110.7	127.1	142.8	157.7	166.1
Spain	-4.2	-11.1	-9.2	-6.3	-5.3	36.1	39.8	53.3	60.1	68.1	71.0
France	-3.3	-7.5	-7.0	-5.8	-5.3	63.9	67.7	78.3	81.7	84.7	86.8
Italy	-2.7	-5.4	-4.6	-4.0	-3.2	103.6	106.3	116.1	119.0	120.3	119.8
Luxembourg	3.0	-0.9	-1.7	-1.0	-1.1	6.7	13.6	14.6	18.4	17.2	19.0
Netherlands	0.6	-5.5	-5.4	-3.7	-2.3	45.3	58.2	60.8	62.7	63.9	64.0
Austria	-0.9	-4.1	-4.6	-3.7	-3.3	60.7	63.8	69.6	72.3	73.8	75.4
Portugal	-3.5	-10.1	-9.1	-5.1	-4.5	68.3	71.6	83.0	93.0	101.7	107.4
Slovenia	-1.8	-6.0	-5.6	-5.8	-5.0	23.1	21.9	35.2	38.0	42.8	46.0
Finland	4.2	-2.6	-2.5	-1.0	-0.7	35.2	34.1	43.8	48.4	50.6	52.2
Malta	-4.5	-3.7	-3.6	-3.0	-3.0	62.0	61.5	67.6	68.0	68.0	67.9
Cyprus	0.9	-6.0	-5.3	-5.1	-4.9	58.3	48.3	58.0	60.8	62.3	64.3
Slovakia	-2.1	-8.0	-7.9	-5.1	-4.6	29.6	27.8	35.4	41.0	44.8	46.8
Euro Zone (17 countries)	-2.0	-6.3	-6.0	-4.3	-3.5	66.3	70.0	79.4	85.5	87.9	88.7
Bulgaria	1.7	-4.7	-3.2	-2.7	-1.6	17.2	13.7	14.6	16.2	18.0	18.6
Czech	-2.7	-5.9	-4.7	-4.4	-4.1	29.0	30.0	35.3	38.5	41.3	42.9
Denmark	3.2	-2.7	-2.7	-4.1	-3.2	27.5	34.5	41.8	43.6	45.3	47.1
Latvia	-4.2	-9.7	-7.7	-4.5	-3.8	9.0	19.7	36.7	44.7	48.2	49.4
Lithuania	-3.3	-9.5	-7.1	-5.5	-4.8	16.9	15.6	29.5	38.2	40.7	43.6
Hungary	-3.7	-4.5	-4.2	1.6	-3.3	66.1	72.3	78.4	80.2	75.2	72.7
Poland	-3.7	-7.3	-7.9	-5.8	-3.6	45.0	47.1	50.9	55.0	55.4	55.1
Romania	-5.7	-8.5	-6.4	-4.7	-3.6	12.6	13.4	23.6	30.8	33.7	34.8
Sweden	2.2	-0.7	0.0	0.9	2.0	40.2	38.8	42.8	39.8	36.5	33.4
Great Britain	-5.0	-11.4	-10.4	-8.6	-7.0	44.5	54.4	69.6	80.0	84.2	87.9
European Union (27 countries)	-2.4	-6.8	-6.4	-4.7	-3.8	59.0	62.3	74.4	80.2	82.3	83.3

* European Commission's forecast; data according to the methodology used by the EC; PIIGS and countries where the public debt approached or exceeded 100% of the GDP are marked in bold.

Source: A. Zielińska-Głębocka, *Współczesna gospodarka światowa. Przemiany, innowacje, kryzysy, rozwiązania regionalne*, Wolters Kluwer Polska, Warsaw 2012, pp. 184–185 (on the basis of data provided by the European Commission).

The data presented in Table 1 confirms the fact that the problem of the level of budget deficit and public debt (measured as a percentage of annual GDP) in the EU countries is also a challenge for the richer countries, and requires a solution in which tools designed to extract knowledge from available structured databases will be applied.

Various issues and methods of their solving in the process of development of different structures of national administration in different countries can be found in the papers by Drelichowski et al. and by Goodlad, Burton and Croft¹⁰, and they can be useful when dealing with Polish conditions that determine the use of BI tools on various levels of public administration. The abovementioned papers describe, for instance, multifactorial conditions shaped by threats connected with the need to meet environment protection requirements in Belgium¹¹. Interesting solutions have been introduced in Italy, where a 'territorial treaty' is being developed to take into account social, political and institutional circumstances¹². Experiences gained from the solutions implemented as a priority to provide choices for regional policies in Italy are also noteworthy¹³. Asahi and Hagihara¹⁴ presented certain decisive aspects concerning the risk of procuring sources of financing for public investments in water supply infrastructure in Japan.

3. The structure of source information included in balances as components considered in the identification of sources and scale of changes in analytical parameters

In this section, an attempt is made to select different sources of statistical data that enable the identification of investment expenditure, as well as direct

¹⁰ L. Drelichowski et al., op.cit.; R. Goodlad, P. Burton, J. Croft, *Effectiveness at what? The processes and impact of community involvement in area-based initiatives*, Scottish Centre for Research on Social Justice, Department of Urban Studies, University of Glasgow 2005, 23(6), pp. 923–938.

¹¹ L. Albrechts, op.cit.

¹² F. Ramella, *The Italian experience of 'Territorial Pacts'*, in: "Environment and Planning C: Government and Policy", 2010, 28(3), pp. 512–527.

¹³ A. Zielińska-Głębocka, *Współczesna gospodarka światowa. Przemiany, innowacje, kryzysy, rozwiązania regionalne*, Wolters Kluwer Polska, Warsaw 2012, pp. 184–185 (based on the data of the European Commission).

¹⁴ C. Asahi, Y. Hagihara, op.cit.

and indirect data to determine actual or normative costs of maintenance of road infrastructure elements put in operation. We are aware of the complexity of determinants of the problem addressed in this section, the solution of which will enable identification of the scale of current and cumulative changes and thus will make it possible to propose reliable forecasts as regards the consequences of such changes when the structure of investment expenditure is maintained.

The primary source of infrastructure investment expenditure data is budgetary reporting done according to the regulation of the Minister of Finance of 27 June 2006 on budgetary statements (Journal of Laws No. 115, Item 781, as amended). Budgetary reporting includes a detailed classification of incomes, expenditures, revenues and expenses, and funds coming from foreign sources, which is divided into three levels: divisions, sections and paragraphs. Central and local level budgetary unit data summarised in Rb forms (quarterly/annual reports of the implementation of budgetary income and expenditure plans) is collected by the Ministry of Finance and then submitted to the Central Statistical Office (GUS). According to its objectives, the GUS drafts aggregate budget information of the state and territorial government units available in the largest electronic database of official statistical information, i.e. the Local Data Bank.

The legal basis for the generation of budget information within the scope of financial management provided by territorial government units is a budget resolution. It is a legal act performed by the decision-making body of a territorial government unit, in which incomes, expenditures, revenues and expenses of the unit are specified. A budget resolution is adopted for an accounting year defined as a calendar year. From the point of view of financial management four types of territorial government can be identified: a province, a county, a city with county rights and a commune or municipality.

These types of local government units operate under the act of 27 August 2009 on public finance (Journal of Laws No. 157, Item 1240, as amended), effective since 1 January 2010, which replaced the former act of 30 June 2005 on public finance (Journal of Laws No. 249, Item 2104, as amended). The amended law includes regulations concerning budget resolutions, which indicate that they consist of a territorial government budget and specifically defined annexes. The amendment also introduced the obligation to develop a long-term financial forecast for the given budget year and at least three subsequent years. These newly-introduced elements of long-term planning for the management of financial resources of a unit enable the Ministry of Finance to develop a four-year strategy

of public debt management. Additionally, on 1 January 2012, detailed accounting principles in a task-based system began to apply to territorial government units (Art. 40.3.2; Art. 41.4, and Art. 142.11). In 2012, territorial government units were obliged to manage their finances according to the regulations of the act of 27 August 2009 on public finance, i.e. the provisions implementing the public finance law. Under these regulations the total sum of payments – instalments on bank and other loans, redemption of securities and potential payments of amounts resulting from guarantees and sureties in a budget year – may not exceed 15% of planned income, whereas the debt of such a unit may not exceed 60% of its total annual income as at the end of the budget year. The principle of balancing of territorial government unit finances in the current part, applied for the first time in 2011, has affected budget resolutions since 2012.

New principles of debt limitation will apply in 2014, according to Art. 243 of the public finance act. A territorial government unit will not be able to approve a budget whose implementation will make the relationship between the total sum of planned expenditures to serve the debt and the total sum of planned income exceed the arithmetic mean of the ratio – calculated for the last three years – of current incomes, increased by the income from the sale of assets and decreased by current expenses, to the total budgetary income in the budget year and any subsequent year (GUS).

The act of 13 November 2003 on the incomes of territorial government units (Journal of Laws No. 203/2003, Item 1966, as amended) introduced regulations which allow territorial government units to include resources from the EU budget in their incomes. Pursuant to the act of 6 December 2006 on the principles of development policy (Journal of Laws No. 227, Item 1658, as amended), territorial government units may also obtain funds from the state budget to co-finance their own contribution, required for the implementation of projects financed with a participation of EU resources. Therefore, according to their specific development needs, territorial governments are wholeheartedly committed to implement EU subsidised projects within the 2007–2013 plan, which includes projects undertaken as part of 16 Regional Operational Programmes and national operational programmes: Infrastructure and Environment, Innovative Economy, Human Resources, Development of Eastern Poland, and Technical Assistance. The forthcoming new financial horizon of 2014–2020 and programmes and projects to be implemented in these years will require making balanced development decisions by territorial government units to ensure that their goals are attainable with the financial resources at hand.

When analysing the abovementioned specific legal conditions under which territorial governments have to operate, one wants to look at their activities from a long-term perspective. Given the long-standing dependence of the level of budgetary expenditures of territorial government units, including investments, on the amount of incomes, one should consider the operating surplus of their budgets. The surplus amount is affected by current incomes and expenditures which are connected with the implementation of current tasks by local governments, and these do not support development, unlike investment expenditures. It is a characteristic feature of investment expenditures of territorial government units that most of them are specifically infrastructural investments, such as the extension of infrastructure, primarily designed to provide public utility services (e.g. road infrastructure) and not intended to secure future incomes or, if they bring incomes, their level is close to the level of costs of operation and maintenance of the structures. An increase of investment expenditures for infrastructural projects often results in an increase of the running costs of their operation and maintenance, not infrequently exceeding related revenues.

In a general view, the development of infrastructure does not only improve the standard of living of citizens but also favours the development of business activities, which offers opportunities to increase future revenues of local governments, nevertheless it is an indirect effect, distant and not always fully achieved.

Table 2. Summary of operating surplus for the provinces

Territorial unit	Operating surplus						Dynamics			
	2008 thousand PLN	2009 thousand PLN	2010 thousand PLN	2011 thousand PLN	2012 thousand PLN	2009 %	2010 %	2011 %	2012 %	
Łódzkie province	213,953.15	736,780.25	283,913.76	266,948.98	281,961.18	244.4	-61.5	-6.0	5.6	
Counties of Łódzkie province	217,476.70	209,372.87	315,130.65	204,026.51	136,437.01	-3.7	50.5	-35.3	-33.1	
Communes & municipalities of Łódzkie province	1,493,961.33	1,405,748.09	1,292,513.99	1,098,453.14	1,304,214.68	-5.9	-8.1	-15.0	18.7	
Mazowieckie province	646,904.84	643,597.97	416,892.85	504,996.16	561,139.75	-0.5	-35.2	21.1	11.1	
Counties of Mazowieckie province	434,148.63	376,682.78	529,838.72	423,862.82	328,696.59	-13.2	40.7	-20.0	-22.5	
Communes & municipalities of Mazowieckie province	4,014 723.39	2,679,083.15	2,847,315.76	3,162,046.72	3,676,522.60	-33.3	6.3	11.1	16.3	
Małopolskie province	427,427.20	749,262.42	456,406.17	642,732.27	459,924.40	75.3	-39.1	40.8	-28.4	
Counties of Małopolskie province	242,729.23	311,770.35	411,281.90	360,231.67	275,449.51	28.4	31.9	-12.4	-23.5	
Communes & municipalities of Małopolskie province	1,598 801.60	1,555,211.90	1,847,316.03	2,089,835.43	1,871,987.51	-2.7	18.8	13.1	-10.4	
Śląskie province	403,861.75	613,275.78	597,931.70	490,571.99	469,541.21	51.9	-2.5	-18.0	-4.3	
Counties of Śląskie province	210,323.32	154,334.28	270,601.79	368,791.44	254,501.23	-26.6	75.3	36.3	-31.0	
Communes & municipalities of Śląskie province	3,053 778.58	2,365,939.87	2,830,054.16	2,947,685.51	2,830,497.95	-22.5	19.6	4.2	-4.0	
Lubelskie province	250,396.06	395,236.30	256,483.25	330,988.69	244,399.85	578	-35.1	29.0	-26.2	

Territorial unit	Operating surplus					Dynamics				
	2008	2009	2010	2011	2012	2009	2010	2011	2012	
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%	
Counties of Lubelskie province	154,765.03	126,474.65	277,508.67	286,371.57	263,697.85	-18.3	119.4	3.2	-7.9	
Communes & municipalities of Lubelskie province	905,107.47	770,884.32	883,208.11	1,207,622.79	1,340,064.99	-14.8	14.6	36.7	11.0	
Podkarpackie province	262,275.18	401,554.40	344,801.69	382,224.67	342,366.89	53.1	-14.1	10.9	-10.4	
Counties of Podkarpackie province	198,653.42	302,416.97	347,067.67	402,399.68	210,856.17	52.2	14.8	15.9	-47.6	
Communes & municipalities of Podkarpackie province	970,232.96	870,786.29	1,134,918.26	1,291,536.40	1,172,026.76	-10.2	30.3	13.8	-9.3	
Podlaskie province	161,248.41	400,050.72	185,110.88	204,808.49	176,933.81	148.1	-53.7	10.6	-13.6	
Counties of Podlaskie province	95,807.79	170,687.64	158,597.45	134,462.21	91,621.63	78.2	-7.1	-15.2	-31.9	
Communes & municipalities of Podlaskie province	620,557.81	741,808.89	805,420.71	799,027.97	801,475.47	19.5	8.6	-0.8	0.3	
Świętokrzyskie province	232,781.27	419,515.99	209,902.63	217,883.88	308,417.00	80.2	-50.0	3.8	41.6	
Counties of Świętokrzyskie province	150,245.33	195,400.17	190,909.58	178,756.13	122,500.77	30.1	-2.3	-6.4	-31.5	
Communes & municipalities of Świętokrzyskie province	560,338.69	592,886.29	733,210.62	821,973.22	675,450.99	5.8	23.7	12.1	-17.8	
Lubuskie province	121,640.93	459,711.61	191,068.66	180,631.74	132,358.62	277.9	-58.4	-5.5	-26.7	
Counties of Lubuskie province	43,257.72	119,530.75	71,199.12	105,100.57	47,382.24	176.3	-40.4	47.6	-54.9	

Territorial unit	Operating surplus					Dynamics				
	2008 thousand PLN	2009 thousand PLN	2010 thousand PLN	2011 thousand PLN	2012 thousand PLN	2009 %	2010 %	2011 %	2012 %	
Communes & municipalities of Lubuskie province	409,877.36	495,560.73	460,827.86	463,985.28	417,807.91	20.9	-7.0	0.7	-10.0	
Wielkopolskie province	264,684.24	1,228,050.85	441,269.12	525,331.11	373,010.56	364.0	-64.1	19.1	-29.0	
Counties of Wielkopolskie province	199,217.54	210,200.93	265,808.66	324,195.99	289,864.18	5.5	26.5	22.0	-10.6	
Communes & municipalities of Wielkopolskie province	2,169,141.32	1,617,881.39	1,551,787.55	1,790,269.39	2,015,278.99	-25.4	-4.1	15.4	12.6	
Zachodniopomorskie province	190,745.09	609,127.74	340,321.57	321,343.35	353,134.38	219.3	-44.1	-5.6	9.9	
Counties of Zachodniopomorskie province	159,574.53	125,968.88	179,903.61	173,559.84	136,531.79	-21.1	42.8	-3.5	-21.3	
Communes & municipalities of Zachodniopomorskie province	1,028,457.32	864,442.13	758,869.26	981,676.33	1,093,489.37	-15.9	-12.2	29.4	11.4	
Dolnośląskie province	390,372.24	694,831.09	187,975.19	353,520.48	788,484.51	78.0	-72.9	88.1	123.0	
Counties of Dolnośląskie province	169,322.62	120,134.32	167,363.06	284,896.59	212,624.00	-29.1	39.3	70.2	-25.4	
Communes & municipalities of Dolnośląskie province	1,646,823.79	1,295,379.00	1,839,860.80	2,080,381.58	2,257,031.34	-21.3	42.0	13.1	8.5	
Opolskie province	161,050.22	322,166.90	196,944.64	172,830.51	138,768.18	100.0	-38.9	-12.2	-19.7	
Counties of Opolskie province	59,993.88	76,901.17	83,772.31	104,358.74	59,317.39	28.2	8.9	24.6	-43.2	

Territorial unit	Operating surplus					Dynamics				
	2008 thousand PLN	2009 thousand PLN	2010 thousand PLN	2011 thousand PLN	2012 thousand PLN	2009 %	2010 %	2011 %	2012 %	
Communes & municipalities of Opolskie province	479,503.62	376,999.37	422,487.64	467,186.61	489,013.20	-21.4	12.1	10.6	4.7	
Kujawsko-pomorskie province	193,190.77	422,502.94	291,912.20	207,196.92	218,077.07	118.7	-30.9	-29.0	5.3	
Counties of Kujawsko-pomorskie province	89,691.89	154,414.96	179,823.51	188,345.17	139,302.32	72.2	16.5	4.7	-26.0	
Communes & municipalities of Kujawsko-pomorskie province	1,118,373.00	938,942.20	944,848.61	1,112,615.51	1,316,057.10	-16.0	0.6	17.8	18.3	
Pomorskie province	327,249.35	619,392.55	235,380.45	350,763.18	338,486.97	89.3	-62.0	49.0	-3.5	
Counties of Pomorskie province	116,074.05	168,466.49	191,738.79	245,023.01	127,582.04	45.1	13.8	27.8	-47.9	
Communes & municipalities of Pomorskie province	1,480,730.55	985,512.67	1,531,471.20	1,576,410.37	2,225,488.01	-33.4	55.4	2.9	41.2	
Warmińsko-mazurskie province	184,134.43	323,552.39	165,295.73	187,955.27	241,018.84	75.7	-48.9	13.7	28.2	
Counties of Warmińsko-mazurskie province	112,638.92	181,612.59	230,361.55	210,431.39	151,261.02	61.2	26.8	-8.7	-28.1	
Communes & municipalities of Warmińsko-mazurskie province	672,498.24	540,298.13	723,048.29	922,329.04	808,643.20	-19.7	33.8	27.6	-12.3	
TOTAL	29,308,742.76	30,140,344.12	29,279,676.38	32,148,576.31	32,570,699.03	2.8	-2.9	9.8	1.3	

Source: own elaboration based on the Local Data Bank

Table 3. Summary of assets and capital expenditures for the provinces

Territorial unit	Capital expenditure						Dynamics			
	2008	2009	2010	2011	2012	2009	2010	2011	2012	
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%	
Łódźkie province	229,478.00	826 151.58	360,283.45	408,575.01	354,219.41	260.0	-56.4	13.4	-13.3	
Counties of Łódźkie province	184,745.97	259,672.71	382,340.26	228,239.38	132,286.75	40.6	47.2	-40.3	-42.0	
Communes & municipalities of Łódźkie province	1,562,808.71	1,875,884.46	1,822,363.19	1,551,375.72	1,471,875.94	20.0	-2.9	-14.9	-5.1	
Mazowieckie province	1,032,715.33	805,347.89	412,523.76	618,728.66	534,330.28	-22.0	-48.8	50.0	-13.6	
Counties of Mazowieckie province	443,084.52	535,686.31	663,067.40	475,959.96	351,635.21	20.9	23.8	-28.2	-26.1	
Communes & municipalities of Mazowieckie province	4,553,806.74	4,728,348.16	5,332,851.65	4,465,886.61	4,208,632.67	3.8	12.8	-16.3	-5.8	
Małopolskie province	419,130.86	817,123.75	575,408.97	731,085.95	460,604.48	95.0	-29.6	27.1	-37.0	
Counties of Małopolskie province	265,721.71	403,959.71	527,420.33	420,530.56	248,073.66	52.0	30.6	-20.3	-41.0	
Communes & municipalities of Małopolskie province	1,864,650.69	2,276,634.43	2,431,268.51	2,512,883.58	2,017,609.28	22.1	6.8	3.4	-19.7	
Śląskie province	522,913.73	769,313.91	643,974.73	600,011.56	537,976.19	47.1	-16.3	-6.8	-10.3	
Counties of Śląskie province	186,505.94	264,497.60	362,976.99	353,533.49	233,969.88	41.8	37.2	-2.6	-33.8	
Communes & municipalities of Śląskie province	2,859,802.12	3,485,920.49	3,437,478.62	3,183,603.06	2,885,431.38	21.9	-1.4	-7.4	-9.4	
Lubelskie province	290,332.74	339,063.16	250,238.46	354,522.44	292,483.17	16.8	-26.2	41.7	-17.5	

Territorial unit	Capital expenditure					Dynamics				
	2008	2009	2010	2011	2012	2009	2010	2011	2012	
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%	
Counties of Lubelskie province	145,395.27	159,726.11	358,238.77	362,791.77	217,529.11	9.9	124.3	1.3	-40.0	
Communes & municipalities of Lubelskie province	939,150.94	1,178,496.10	1,611,257.59	1,652,726.95	1,333,748.08	25.5	36.7	2.6	-19.3	
Podkarpackie province	204,703.35	488,118.10	427,482.16	392,925.98	353,703.34	138.5	-12.4	-8.1	-10.0	
Counties of Podkarpackie province	937,104.09	1,238,008.06	1,723,058.46	1,683,639.22	1,222,311.17	32.1	39.2	-2.3	-27.4	
Communes & municipalities of Podkarpackie province	177,984.47	371,711.86	399,358.29	437,725.42	255,998.58	108.8	7.4	9.6	-41.5	
Podlaskie province	103,897.44	339,026.57	154,441.15	237,107.05	200,797.90	226.3	-54.4	53.5	-15.3	
Counties of Podlaskie province	80,912.38	179,008.76	173,625.13	135,258.39	88,780.19	121.2	-3.0	-22.1	-34.4	
Communes & municipalities of Podlaskie province	572,758.64	948,313.35	1,295,677.55	1,120,646.73	828,550.75	65.6	36.6	-13.5	-26.1	
Świętokrzyskie province	128,396.32	390,133.02	235,247.11	231,482.68	403,365.21	203.9	-39.7	-1.6	74.3	
Counties of Świętokrzyskie province	139,192.53	223,536.11	263,862.39	211,686.57	150,368.50	60.6	18.0	-19.8	-29.0	
Communes & municipalities of Świętokrzyskie province	516,006.80	891,440.55	1,234,839.14	1,112,154.88	813,665.86	72.8	38.5	-9.9	-26.8	
Lubuskie province	111,051.75	480,824.63	228,593.99	183,833.81	139,632.82	333.0	-52.5	-19.6	-24.0	
Counties of Lubuskie province	47,482.59	162,854.31	136,660.81	118,690.87	36,847.94	243.0	-16.1	-13.1	-69.0	

Territorial unit	Capital expenditure						Dynamics				
	2008	2009	2010	2011	2012	2009	2010	2011	2012		
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%		
Communes & municipalities of Lubuskie province	440,599.52	775,046.67	945,279.06	591,636.15	371,469.77	75.9	22.0	-37.4	-37.2		
Wielkopolskie province	288,845.97	1,190,629.43	487,247.30	616,411.48	402,249.96	312.2	-59.1	26.5	-34.7		
Counties of Wielkopolskie province	181,290.06	255,926.38	466,815.06	402,669.68	262,160.38	41.2	82.4	-13.7	-34.9		
Communes & municipalities of Wielkopolskie province	2,121,484.84	2,424,452.62	2,786,958.24	2,779,417.97	2,069,984.89	14.3	15.0	-0.3	-25.5		
Zachodniopomorskie province	177,451.30	623,639.84	390,653.39	428,627.97	385,826.46	251.4	-37.4	9.7	-10.0		
Counties of Zachodniopomorskie province	169,431.45	168,444.30	280,759.19	245,579.73	137,284.50	-0.6	66.7	-12.5	-44.1		
Communes & municipalities of Zachodniopomorskie province	992,028.80	1,094,296.10	1,326,769.59	1,457,367.54	1,311,551.09	10.3	21.2	9.8	-10.0		
Dolnośląskie province	276,002.43	746,848.75	433,657.74	573,386.98	611,513.17	170.6	-41.9	32.2	6.6		
Counties of Dolnośląskie province	195,225.77	271,432.13	268,368.30	309,849.79	184,270.72	39.0%	-1.1%	15.5	-40.5		
Communes & municipalities of Dolnośląskie province	2,285,988.34	2,611,650.70	2,599,464.02	2,404,275.04	2,155,190.49	14.2%	-0.5%	-7.5	-10.4		
Opolskie province	132,418.57	374,564.14	258,706.38	199,559.54	136,093.56	182.9%	-30.9%	-22.9	-31.8		
Counties of Opolskie province	60,574.99	122,077.53	105,040.29	108,340.86	56,922.74	101.5%	-14.0%	3.1	-47.5		

Territorial unit	Capital expenditure					Dynamics				
	2008	2009	2010	2011	2012	2009	2010	2011	2012	
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%	
Communes & municipalities of Opolskie province	453,195.72	540,714.63	717,204.47	584,159.66	429,152.85	19.3%	32.6%	-18.6	-26.5	
Kujawsko-pomorskie province	208,235.01	442,390.34	304,513.24	237,564.62	207,464.47	112.4%	-31.2%	-22.0	-12.7	
Counties of Kujawsko-pomorskie province	86,320.99	221,207.78	249,406.49	198,778.84	111,413.93	156.3%	12.7%	-20.3	-44.0	
Communes & municipalities of Kujawsko-pomorskie province	1,249,850.97	1,277,344.45	1,552,052.66	1,687,729.32	1,622,712.37	2.2%	21.5%	8.7	-3.9	
Pomorskie province	274,584.95	706,055.68	362,875.95	410,197.60	340,915.86	157.1%	-48.6%	13.0	-16.9	
Counties of Pomorskie province	124,694.77	227,629.63	265,528.46	253,682.92	154,947.02	82.5%	16.6%	-4.5	-38.9	
Communes & municipalities of Pomorskie province	1,690,251.74	1,648,246.37	2,219,497.42	2,350,885.87	2,359,761.08	-2.5%	34.7%	5.9	0.4	
Warmińsko-mazurskie province	125,622.05	348,834.95	186,324.89	207,947.27	303,872.46	177.7%	-46.6%	11.6	46.1	
Counties of Warmińsko-mazurskie province	117,414.51	227,075.98	277,739.82	205,566.94	152,671.86	93.4%	22.3%	-26.0	-25.7	
Communes & municipalities of Warmińsko-mazurskie province	648,587.04	863,393.21	1,352,281.14	1,148,916.11	859,221.52	33.1%	56.6%	-15.0	-25.2	
TOTAL	30,819,833.42	41,600,703.30	43,281,681.96	41,188,158.18	34,401,078.90	35.0%	4.0%	-4.8	-16.5	

Source: own elaboration based on the Local Data Bank

Table 4. Summary of operating surplus for individual units of Kujawsko-Pomorskie

Territorial unit	Operating surplus					Dynamics				
	2008 thousand PLN	2009 thousand PLN	2010 thousand PLN	2011 thousand PLN	2012 thousand PLN	2009 %	2010 %	2011 %	2012 %	
Bydgoszcz county	6,025.09	8,052.95	12,858.29	14,099.09	8,939.11	33.7	59.7	9.6	-36.6	
Communes & municipalities of Bydgoszcz county	65,055.58	57,437.82	54,908.45	61,655.32	64,601.82	-11.7	-4.4	12.3	4.8	
Town of Bydgoszcz	195,047.47	92,897.58	90,002.82	179,981.41	149,026.23	-52.4	-3.1	100.0	-17.2	
Toruń county	6,584.08	11,462.11	9,294.53	12,234.87	16,343.49	74.1	-18.9	31.6	33.6	
Communes & municipalities of Toruń county	37,915.93	43,032.38	46,346.49	62,096.04	59,233.49	13.5	7.7	34.0	-4.6	
Town of Toruń	195,818.54	187,524.01	137,993.34	182,956.20	294,435.11	-4.2	-26.4	32.6	60.9	
Brodnica county	7,747.73	7,610.00	7,545.54	16,316.19	8,923.86	-1.8	-0.8	116.2	-45.3	
Communes & municipalities of Brodnica county	28,762.48	49,091.66	43,225.61	34,650.25	33,524.72	70.7	-11.9	-19.8	-3.2	
Chełmno county	7,087.07	9,948.37	9,351.27	14,042.42	6,478.44	40.4	-6.0	50.2	-53.9	
Communes & municipalities of Chełmno county	15,371.80	26,500.93	20,167.95	25,527.54	27,542.81	72.4	-23.9	26.6	7.9	
Golub-Dobrzyń county	4,966.73	7,348.43	7,431.62	2,667.13	1,999.52	48.0	1.1	-64.1	-25.0	
Communes & municipalities of Golub-Dobrzyń county	20,923.08	21,800.23	18,679.91	19,655.93	32,120.85	4.2	-14.3	5.2	63.4	
Grudziądz county	698.82	4,390.87	5,733.10	4,699.35	4,583.35	528.3	30.6	-18.0	-2.5	
Communes & municipalities of Grudziądz county	14,563.92	16,992.80	16,689.56	21,247.14	22,018.49	16.7	-1.8	27.3	3.6	

Town of Grudziądz	134,073.33	62,555.17	41,010.45	51,250.25	47,868.34	-53.3	-34.4	25.0	-6.6
Sępólno county	2,498.17	2,514.11	2,010.67	12,389.49	3,960.67	0.6	-20.0	516.2	-68.0
Communes & municipalities of Sępólno county	13,006.95	14,281.67	19,002.29	16,877.16	21,027.40	9.8	33.1	-11.2	24.6
Świecko county	7,557.92	7,844.78	17,571.29	15,163.56	12,265.33	3.8	124.0	-13.7	-19.1
Communes & municipalities of Świecko county	48,964.72	36,970.26	47,471.23	54,758.88	59,859.75	-24.5	28.4	15.4	9.3
Tuchola county	4,527.50	6,021.84	9,150.56	14,469.82	12,532.57	33.0	52.0	58.1	-13.4
Communes & municipalities of Tuchola county	22,039.93	26,292.33	32,036.13	31,743.12	27,571.60	19.3	21.8	-0.9	-13.1
Wąbrzeźno county	1,198.49	4,394.41	1,181.06	3,068.11	2,831.17	266.7	-73.1	159.8	-7.7
Communes & municipalities of Wąbrzeźno county	12,547.70	16,146.23	17,064.60	16,064.99	21,053.94	28.7	5.7	-5.9	31.1
Aleksandrów county	2,958.27	3,238.96	8,468.67	2,164.53	2,496.25	9.5	161.5	-74.4	15.3
Communes & municipalities of Aleksandrów county	26,172.69	25,116.99	32,031.69	25,077.70	40,801.66	-4.0	27.5	-21.7	62.7
Inowrocław county	18,434.28	24,942.35	30,329.38	20,164.58	18,246.69	35.3	21.6	-33.5	-9.5
Communes & municipalities of Inowrocław county	52,227.55	44,821.24	76,492.72	84,120.49	69,554.58	-14.2	70.7	10.0	-17.3
Lipno county	3,102.09	6,190.16	-54.62	3,013.46	3,244.29	99.5	-100.9	-5617.1	7.7
Communes & municipalities of Lipno county	20,903.90	21,845.64	30,001.89	24,393.32	20,536.22	4.5	37.3	-18.7	-15.8
Mogilno county	6,221.47	6,589.81	8,201.91	7,607.66	4,153.85	5.9	24.5	-7.2	-45.4

Communes & municipalities of Mogilno county	14,169.82	17,526.67	13,532.14	20,866.27	25,571.85	23.7	-22.8	54.2	22.6
Nakło county	467.85	11,878.24	9,505.57	13,933.43	9,233.67	2438.9	-20.0	46.6	-33.7
Communes & municipalities of Nakło county	25,966.47	27,283.79	20,337.62	29,693.31	38,816.58	5.1	-25.5	46.0	30.7
Radziejów county	1,323.80	4,122.98	4,691.92	8,273.94	400.22	211.5	13.8	76.3	-95.2
Communes & municipalities of Radziejów county	15,994.27	16,195.60	13,559.07	18,169.71	25,809.46	1.3	-16.3	34.0	42.0
Rypin county	2,839.09	5,842.18	5,226.62	4,480.38	4,296.30	105.8	-10.5	-14.3	-4.1
Communes & municipalities of Rypin county	17,456.74	19,573.14	25,467.66	30,945.06	21,337.24	12.1	30.1	21.5	-31.0
Włocławek county	1,895.49	16,105.46	20,060.25	13,634.72	9,136.91	749.7	24.6	-32.0	-33.0
Communes & municipalities of Włocławek county	44,655.37	48,003.14	58,342.69	57,193.30	61,385.14	7.5	21.5	-2.0	7.3
Town of Włocławek	68,463.05	44,215.59	66,676.19	43,815.50	126,627.76	-35.4	50.8	-34.3	189.0
Żnin county	3,557.98	5,916.96	11,265.87	5,922.42	9,236.64	66.3	90.4	-47.4	56.0
Communes & municipalities of Żnin county	28,271.72	22,837.32	23,808.11	19,876.63	25,732.08	-19.2	4.3	-16.5	29.5
TOTAL	1,208,064.93	1,093,357.16	1,124,672.11	1,300,960.67	1,455,359.45	-9.5	2.9	15.7	11.9

Source: own elaboration based on the Local Data Bank

Table 5. Summary of assets and capital expenditures for individual units of Kujawsko-Pomorskie

Territorial unit	Capital expenditure						Dynamics			
	2008	2009	2010	2011	2012	2009	2010	2011	2012	
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%	
Bydgoszcz county	4,987.01	9,985.77	14,880.48	15,156.42	3,736.11	100.2	49.0	1.9	-75.3	
Communes & municipalities of Bydgoszcz county	75,371.49	79,674.08	80,185.80	81,398.00	90,041.34	5.7	0.6	1.5	10.6	
Town of Bydgoszcz	300,684.05	152,878.95	169,666.79	250,135.25	257,919.60	-49.2	11.0	47.4	3.1	
Toruń county	3,737.31	12,562.73	10,926.02	9,024.20	12,631.37	236.1	-13.0	-17.4	40.0	
Communes & municipalities of Toruń county	38,500.94	56,069.57	78,433.35	84,033.55	59,940.89	45.6	39.9	7.1	-28.7	
Town of Toruń	242,157.36	245,756.84	221,293.95	352,918.77	416,101.94	1.5	-10.0	59.5	17.9	
Brodnica county	5,510.96	9,161.85	7,003.49	18,829.43	9,183.93	66.2	-23.6	168.9	-51.2	
Communes & municipalities of Brodnica county	28,084.74	68,076.42	66,279.75	40,749.11	30,151.59	142.4	-2.6	-38.5	-26.0	
Chełmno county	8,070.24	12,517.61	8,702.32	19,786.29	6,941.21	55.1	-30.5	127.4	-64.9	
Communes & municipalities of Chełmno county	20,262.12	27,851.33	28,044.89	32,776.57	23,740.68	37.5	0.7	16.9	-27.6	
Golub-Dobrzyń county	4,075.36	10,864.31	12,286.63	3,337.91	336.90	166.6	13.1	-72.8	-89.9	
Communes & municipalities of Golub-Dobrzyń county	21,724.99	31,120.69	30,585.37	25,438.43	33,956.47	43.2	-1.7	-16.8	33.5	
Grudziądz county	515.86	4,291.31	5,647.74	6,191.96	3,402.36	731.9	31.6	9.6	-45.1	
Communes & municipalities of Grudziądz county	11,450.37	19,971.45	31,551.56	28,532.62	21,749.68	74.4	58.0	-9.6	-23.8	
Town of Grudziądz	122,825.42	75,260.86	69,335.48	87,666.78	106,998.48	-38.7	-7.9	26.4	22.1	
Sępólno county	4,201.70	3,422.03	2,194.73	7,808.84	6,374.96	-18.6	-35.9	255.8	-18.4	
Communes & municipalities of Sępólno county	13,933.81	23,761.07	32,039.85	17,631.55	20,302.10	70.5	34.8	-45.0	15.1	

Territorial unit	Capital expenditure						Dynamics					
	2008	2009	2010	2011	2012	2009	2010	2011	2012	2010	2011	2012
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	thousand PLN	%	%	%
Świecko county	6,450.79	6,579.93	18,503.62	17,564.37	11,483.80	2.0	181.2	-5.1	11,483.80	2.0	181.2	-34.6
Communes & municipalities of Świecko county	34,034.78	44,073.77	75,683.22	64,018.06	55,609.78	29.5	71.7	-15.4	55,609.78	29.5	71.7	-13.1
Tuchola county	9,512.55	13,678.84	17,448.43	17,075.54	8,997.90	43.8	27.6	-2.1	8,997.90	43.8	27.6	-47.3
Communes & municipalities of Tuchola county	22,896.03	34,877.13	53,361.63	40,469.87	19,724.59	52.3	53.0	-24.2	19,724.59	52.3	53.0	-51.3
Wąbrzeźno county	1,735.48	7,688.08	909.34	2,459.28	2,754.82	343.0	-88.2	170.4	2,754.82	343.0	-88.2	12.0
Communes & municipalities of Wąbrzeźno county	12,825.83	17,686.93	22,846.66	23,142.78	19,334.52	37.9	29.2	1.3	19,334.52	37.9	29.2	-16.5
Aleksandrów county	1,910.09	4,001.65	11,444.98	5,802.15	1,138.42	109.5	186.0	-49.3	1,138.42	109.5	186.0	-80.4
Communes & municipalities of Aleksandrów county	20,600.35	27,266.99	47,039.34	33,124.14	48,423.42	32.4	72.5	-29.6	48,423.42	32.4	72.5	46.2
Inowrocław county	15,781.18	54,385.32	53,853.16	13,108.30	9,333.86	244.6	-1.0	-75.7	9,333.86	244.6	-1.0	-28.8
Communes & municipalities of Inowrocław county	70,447.37	72,943.33	147,970.79	90,980.80	61,197.00	3.5	102.9	-38.5	61,197.00	3.5	102.9	-32.7
Lipno county	3,491.00	9,583.83	7,974.95	1,386.47	2,942.81	174.5	-16.8	-82.6	2,942.81	174.5	-16.8	112.3
Communes & municipalities of Lipno county	21,861.84	38,364.02	35,012.25	30,636.78	16,732.65	75.5	-8.7	-12.5	16,732.65	75.5	-8.7	-45.4
Mogilno county	5,307.04	6,498.54	8,701.74	7,245.09	3,384.75	22.5	33.9	-16.7	3,384.75	22.5	33.9	-53.3
Communes & municipalities of Mogilno county	11,948.97	23,488.37	20,357.69	25,328.36	31,333.21	96.6	-13.3	24.4	31,333.21	96.6	-13.3	23.7
Nakło county	4,303.49	16,288.89	20,595.44	13,270.05	11,681.67	278.5	26.4	-35.6	11,681.67	278.5	26.4	-12.0
Communes & municipalities of Nakło county	25,503.47	41,988.07	39,535.26	48,019.42	30,626.50	64.6	-5.8	21.5	30,626.50	64.6	-5.8	-36.2
Radziejów county	304.63	5,713.91	6,008.43	8,112.78	354.58	1775.7	5.2	35.0	354.58	1775.7	5.2	-95.6

Territorial unit	Capital expenditure						Dynamics			
	2008	2009	2010	2011	2012	2009	2010	2011	2012	
	thousand PLN	thousand PLN	thousand PLN	thousand PLN	thousand PLN	%	%	%	%	
Communes & municipalities of Radziejów county	11,704.53	19,425.27	25,046.37	26,991.27	17,897.61	66.0	28.9	7.8	-33.7	
Rypin county	1,483.75	7,215.92	9,314.93	5,002.09	3,126.06	386.3	29.1	-46.3	-37.5	
Communes & municipalities of Rypin county	14,157.70	22,081.85	34,263.48	40,071.96	20,236.32	56.0	55.2	17.0	-49.5	
Włocławek county	691.37	19,505.02	21,657.06	14,398.76	4,972.73	2721.2	11.0	-33.5	-65.5	
Communes & municipalities of Włocławek county	46,387.89	59,546.35	74,511.70	81,502.55	63,177.84	28.4	25.1	9.4	-22.5	
Town of Włocławek	55,940.30	55,963.68	120,943.65	151,256.82	153,519.85	0.0	116.1	25.1	1.5	
Żnin county	4,251.16	7,262.26	11,353.02	13,218.91	8,635.68	70.8	56.3	16.4	-34.7	
Communes & municipalities of Żnin county	26,546.59	39,217.43	48,063.83	30,905.89	23,996.30	47.7	22.6	-35.7	-22.4	
TOTAL	1,336,171.91	1,498,552.25	1,801,459.17	1,886,508.17	1,734,126.28	12.2	20.2	4.7	-8.1	

Source: Own elaboration based on Local Data Bank.

4. Summary

The methodological determinants and proposed organisational and legal solutions trigger feedbacks that force an adaptation of budgeting mechanisms to ensure maintaining balance in Polish communes and municipalities for the budget year and the years to follow in the aspect of dynamic analysis. As a result, the tables presented in Section 3 show only a fragmentary picture of the expenditures for infrastructure in relevant territorial units. The included few analytical summaries of selected data concerning the expenditures in the communes and municipalities reveal striking differences among them. A selective spatial and dynamic analysis of the data sets from the communes and municipalities, comprehensively investigated in homogeneous groups, should enable the identification of extremely diverse levels of investment expenditures on infrastructural projects and changes in the costs of their operation and maintenance, viewed in the aspect of budget balance.

In our opinion, the applied method of decomposition of analysed factors will make it possible to determine a substantial number of constituents of budget balance threats. An analysis of subsequent groups of expenses with a significant influence of the state of budget balance will support the evaluation of the influences these particular groups have on the budget and then will enable their overall impact on the occurrence of budget deficits in communes, municipalities, regions or countries. Future papers will focus on the abovementioned methodological assumptions.

References

1. Albrechts L., *Planning and power: towards an emancipatory planning approach*, in: "Environment and Planning C: Government and Policy" 2003, vol. 21(6), pp. 905–924.
2. Asahi C., Hagihara Y., *Marginal willingness to pay for public investment under urban environmental risk: The case of municipal water use*, Tokyo Metropolitan University Graduate School of Urban Science, Tokyo 2007.
3. Central Statistical Office, *Gospodarka finansowa jednostek samorządu terytorialnego 2012*, Central Statistical Office of Poland, Warsaw 2013.
4. Central Statistical Office, *Statystyka sektora instytucji rządowych i samorządowych*, Central Statistical Office of Poland, Warsaw 2010.

5. Drelichowski L., *Czynniki determinujące zastosowanie narzędzi business intelligence w sektorze MSP oraz zarządzaniu regionalnym*, Working papers of the Szczecin University, "Studia Informatica" no. 24, Szczecin 2009, pp. 111–122.
6. Drelichowski L., *Innowacyjność i konkurencyjność organizacji gospodarczych stymulatorem rozwoju regionalnego*, "Studia i Materiały" no. 43, Polskie Stowarzyszenie Zarządzania Wiedzą, Bydgoszcz 2011, pp. 27–39.
7. Drelichowski L., Fronczak E., Graul C., Oszuścik G., *Using data warehousing and the OLAP tools to analyze communal budgets in the kujawsko-pomorskie province in the light of absorbing funds from the European Union*, Studies and Proceedings of the PAKM, vol. 63, Bydgoszcz.
8. Drelichowski L., Stawicka M., *Zastosowanie sieci migrujących i budowa hurtowni danych oraz baz wiedzy do oceny funkcjonowania przedsiębiorstw komunalnych przez władze samorządowe*, "Wiadomości Statystyczne" vol. 58, 2008, pp. 233–255.
9. Drelichowski L., Stawicka M., Cilski B., *Budowa międzyregionalnych Hurtowni Danych i rozwiązań automatycznych analiz cenników i kosztów działalności firm usług komunalnych dla potrzeb władz samorządowych*, "Studia i Materiały", no 26, Polskie Stowarzyszenie Zarządzania Wiedzą, Bydgoszcz 2010, pp. 47–56.
10. Drelichowski L., Żółtowski M., Mierzejewski J., *Międzyorganizacyjne rozwiązania komunikacji i zarządzania wiedzą jako metoda kompensowania skutków dynamicznego rozwoju PESA Bydgoszcz S.A.*, Economic University of Katowice, Katowice 2011.
11. Drelichowski L. et al., *Methodological aspects and case studies of Business Intelligence applications tools in Knowledge Management*, Studies and Proceedings of the PAKM, vol. 59, Bydgoszcz 2010.
12. Dyczkowski M., *Economic crisis and information – strategies of enterprises. Results of comparative surveys from years 2009–2010*, Wrocław University of Economics, Wrocław 2010, pp. 101–118.
13. Filinger W., Misiak Z., *Zarządzanie wiedzą w jednostkach administracji publicznej przy wykorzystaniu Strategicznej Karty Wyników*, Warsaw School of Economics, series: "Monografie i Opracowania", Warsaw 2010, pp. 87–100.
14. Goodlad R., Burton P., Croft J., *Effectiveness at what? The processes and impact of community involvement in area-based initiatives*, Scottish Centre for Research on Social Justice, Department of Urban Studies, University of Glasgow 2005, 23(6), pp. 923–938.
15. Hauke K., Owoc M., Smok B., *Business Intelligence w zarządzaniu*, Wrocław University of Economics, Wrocław 2010.
16. Kaplan R.S., Norton D.P., *Strategiczna Karta Wyników. Jak przełożyć strategię na działanie*, PWN, Warsaw 2001.
17. Kosek-Wojnar M., Surówka K., *Podstawy finansów samorządu terytorialnego*, PWN, Warsaw 2007.

18. Miler A., *Rozwiązania business intelligence w administracji publicznej*, "Studia i Materiały", no. 26, Polskie Stowarzyszenie Zarządzania Wiedzą, Bydgoszcz 2010, pp. 94–108.
19. Misterek W., *Zewnętrzne źródła finansowania działalności inwestycyjnej jednostek samorządu terytorialnego*, Difin, Warsaw 2008.
20. Porter M.E., *Przewaga konkurencyjna – osiągnięcie i utrzymanie lepszych wyników*, as translated by M. Witkowska, Helion, Gliwice 2006.
21. Ramella F., *The Italian experience of 'Territorial Pacts'*, in: "Environment and Planning C: Government and Policy", 2010, 28(3), pp. 512–527.
22. Regional Chambers of Audit, *Działalność inwestycyjna jednostek samorządu terytorialnego w latach 1999–2004*, Regional Chambers of Audit, Warsaw 2005.
23. Statistical Office in Bydgoszcz, *Powiaty i gminy w województwie kujawsko-pomorskim w 2010 r. – sytuacja społeczno-gospodarcza w okresie programowania 2007–2013*, Statistical Office in Bydgoszcz, Bydgoszcz 2012.
24. Statistical Office in Bydgoszcz, *Raport o sytuacji społeczno-gospodarczej województwa kujawsko-pomorskiego w 2011 r.*, Statistical Office in Bydgoszcz, Bydgoszcz 2012.
25. Sternad S., Bobek S., *End user's knowledge issues in ERP solutions use*, Studies and Proceedings of the PAKM, vol. 58, 2012, pp 129–143.
26. Wyszowska D., *Zdolność jednostek samorządu terytorialnego do absorpcji funduszy europejskich*, Central Statistical Office of Poland, PTS, Warsaw 2013.
27. Zielińska-Głębocka A., *Współczesna gospodarka światowa. Przemiany, innowacje, kryzysy, rozwiązania regionalne*, Wolters Kluwer Polska, Warsaw 2012, pp. 184–185 (based on the data of the European Commission).

* * *

Model dynamicznej analizy wpływu rozbudowy infrastruktury Polski na poziom zmian wynikających z kosztów finansowania budowy tej infrastruktury i jej eksploatacji z zastosowaniem narzędzi *Business Intelligence*

Streszczenie

W pracy zaprezentowano możliwości zastosowania hurtowni danych zbudowanych na podstawie ośmioletnich baz budżetów gmin z banku danych lokalnych poddanych analizie dotyczącej skutków dofinansowania i kosztów eksploatacji oddawanych do użytku elementów infrastruktury, co ma odzwierciedlić dynamiczny zakres zachodzących w niej zmian. Podstawę bazy danych stanowiły zweryfikowane informacje ujmujące pełny zakres danych wymaganych do planowania, zatwierdzania i rozliczania budżetów gmin. W pracy przedstawiono zestawienia dotyczące nadwyżki operacyjnej

dla województw w kraju i powiatów z województwa kujawsko-pomorskiego oraz wydatków majątkowo-inwestycyjnych w identycznym układzie – od 2008 r. do 2012 r. Zaprezentowane w tabelach wstępne zestawienia pozwalają zilustrować diagnostyczną wartość wyselekcjonowanych i przetworzonych w ramach hurtowni danych oraz narzędzi OLAP informacji, a także uwzględniają dynamikę i skutki budżetowe zachodzących w tym czasie zmian.

Słowa kluczowe: infrastruktura drogowa, równowaga budżetowa, finansowanie inwestycji, modelowanie procesów gospodarczych