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Preface

This book presents the results of Polish-Ukrainian scientific cooperation. It contains the papers prepared for the 10th international conference “Quantitative Methods in Accounting and Finance”. Accounting and finance face nowadays many challenges. They require both an international and local approach, they need to be considered from the theoretical and practical point of view, and they also encourage general and specific analysis.

Support from quantitative methods is needed in order to discover, implement and verify new finance and accounting trends, methods and instruments. The research papers which are part of this book present different aspects of accounting and finance combined with a quantitative, in particular Econometric, approach.

Some of the papers focus on methodology of measurement, estimation and forecasting of financial phenomena, especially those related to investment processes. Others address specific problems of accounting such as accounting solutions for different branches, legal issues of accounting, responsibility and reporting. An alternative approach was also undertaken and the roles of a narrative and culture in accounting were presented.

The variety of papers selected for this issue ensures the complexity of the book. It provides theoretical as well as empirical material which can be used in further research and in business practice, particularly in accounting and finance. We hope that the content of the book provides a starting point for scientific discussion and practical changes.

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**THE USE OF PERFORMANCE-BASED BUDGET
TO MEASURE THE EFFICIENCY OF PUBLIC
TRANSPORT IN METROPOLISES IN POLAND**

**WYKORZYSTANIE BUDŻETU ZADANIOWEGO
DO POMIARU EFEKTYWNOŚCI TRANSPORTU
PUBLICZNEGO W POLSKICH METROPOLIACH**

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Summary: The issue of public transport is in the interest of many researchers, scientists, economists and politicians. Among other things they write about the role of performance-based budget in increasing the efficiency of the public financial resources management, the efficiency of transport in the metropolitan structure, sustainable transport indicators, the need to develop a line-based performance measurement in order to favour an optimisation in the situation of the public funding restrictions. Therefore, the aim of the article is to show the possibilities of using a performance-based budget to measure the efficiency of public transport in Polish metropolises. The following research questions were asked in the article: 1. Are there metropolises in Poland (according to the article definition of metropolis)?, 2. Do the metropolises use a performance-based budget to measure efficiency?, 3. Is a performance-based budget, which is optional in the metropolis, available for the average citizen or is it an internal document prepared for the city needs?, 4. Do the measures used in a performance-based budget provide reliable information on the efficiency of expenditure?, and 5. Is the comparison of the tasks and measures between metropolises justified?. The following research methods were used in this article: the literature research, the analysis of the general regulations (the Public Finance Act), the analysis of the specific rules (the resolutions implementing the city budget made by the councils of the cities), the analysis of the budget reports in the cities where the performance-based budget is used and the comparative analysis.

Keywords: public transport measures, performance-based budget, efficiency, Poland.

Streszczenie: Problematyka transportu publicznego jest poruszana przez wielu badaczy. Piszą oni o roli budżetowania zadaniowego w zwiększeniu efektywności gospodarowania publicznymi zasobami finansowymi, o efektywności transportu w strukturze metropolii, o miernikach zrównoważonego transportu, o potrzebie opracowania mierników efektywności opartych na efektywności poszczególnych linii komunikacyjnych, aby sprzyjać optymalizacji, zwłaszcza w sytuacji ograniczenia finansowania publicznego. Celem artykułu jest wskazanie możliwości wykorzystania budżetu zadaniowego do pomiaru efektywności transportu

publicznego w polskich metropoliach. W artykule postawiono następujące pytania badawcze:

1. Czy w Polsce występują metropolie (zgodnie z przyjętą w artykule definicją metropolii)?
2. Czy w metropoliach jest stosowany budżet zadaniowy do pomiaru efektywności? 3. Czy budżet zadaniowy, który jest fakultatywny w metropoliach, jest dostępny dla przeciętnego mieszkańców, czy jest on dokumentem wewnętrznym na potrzeby miasta? 4. Czy mierniki stosowane w budżecie zadaniowym dostarczają rzetelnej informacji o efektywności wydatków?
5. Czy porównywanie zadań i ich mierników między metropoliami jest zasadne? W artykule zastosowano następujące metody badawcze: badania literatury, analizę regulacji prawnych ogólnych (ustawa o finansach publicznych) oraz szczegółowych (uchwały rady miast wprowadzające w życie budżet miasta), analizę sprawozdań z wykonania budżetu stosujących budżet zadaniowy oraz analizę porównawczą.

Słowa kluczowe: mierniki transportu publicznego, budżet zadaniowy, efektywność, Polska.

1. Introduction

The issue of public transport is in the interest of many researchers, scientists, economists and politicians. For example, the journals "Transport Policy" and "Research in Transportation Economics" are dedicated to this subject. Published articles cover the entire transport sector including public and private. Transport policy issues are broad and cover among others safety, efficiency and sustainable economic development.

In the journal "Transport Policy" there is published an article in which sustainable transport indicators are the interest of researchers Nicolas, Pochet and Poimboeuf [2003, pp. 197-208]. The authors describe how data from a survey of local travel and other available information is used to assess the sustainability of the transport system in the conurbation of Lyon in France. The region has a population of 1.2 million people living in relatively centralized and well-developed urban environment. The indicators have been organized to reflect the economic, social and environmental influences. Economic indicators characterize the profitability of transport, i.e. cost per unit of travel, including the costs incurred by residents, businesses and government. Social indicators illustrate the relative mobility, and the financial burden of the population in connection with the use of transport for various classes of income. Environmental indicators show different emissions caused by transport and off-road requirements.

Issues related to sustainable transport are part of the EU Sustainable Development Strategy. The document identified seven key areas: climate change and clean energy, sustainable transport, sustainable consumption and production, conservation and management of natural resources, public health, social integration, demography and migration, global poverty and sustainable development challenges. Sustainable Development Indicators (SDI) defined by Eurostat are to monitor the implementation of the objectives of the EU Sustainable Development Strategy. This report is published every two years and the last one was published in 2015 [Sustainable... 2015].

The journal “Research in Transportation Economics” published an article “Measuring the performance of urban public transport in relation to public policy objectives” [d’Arcier 2014, pp. 67-76]. The author suggests the need to develop a line-based performance measurement in order to favour an optimisation in the situation of the public funding restrictions.

For example, Kozaczko writes about the efficiency of transport in the metropolitan structure [2009, pp. 137-142]. The author focuses on the cohesive force of the city fabric and the ability to capture this phenomenon in a controllable measurable frame. This would allow to achieve huge energy and space savings, thanks to the planning tool aimed for optimizing built or transformed urban areas. Filipiak conducted a study about the role of performance-based budgeting in increasing the efficiency of public financial resources management [2011 p. 55-102]. Nieplowicz conducted a study about measuring efficiency in cities with county rights in Poland [2014].

One could point to a lot of examples, but the aim of the article is to show the possibilities of using a performance-based budget to measure the efficiency of public transport in Polish metropolises. The following research questions were asked in the article: 1. Are there metropolises in Poland (according to the article definition of metropolis)?, 2. Do the metropolises use a performance-based budget to measure efficiency?, 3. Is the performance-based budget, which is optional in the metropolis, available for the average citizen or is it an internal document prepared for the city needs?, 4. Do the measures used in the performance-based budget provide reliable information on the efficiency of expenditure?, and 5. Is the comparison of the tasks and measures between metropolises justified?

The following research methods were used in this article: the literature research, the analysis of the general regulations (the Public Finance Act), the analysis of the specific rules (the resolutions implementing the city budget made by the councils of the cities), the analysis of the budget reports in the cities where the performance-based budget is used and the comparative analysis.

2. The importance of metropolis and selection of the research entities

In order to answer the first question “Are there metropolises in Poland (according to the article definition of metropolis)?” the literature study has been conducted.

The problem of the metropolis has been the interest of scientists, economists and politicians for a long time. In the current period of urban development and globalization in the world, one should observe metropolitan areas and their surroundings. It is expected that in 2030 the share of the urban population will constitute up to 60.2% of the total population of the globe. Although the urban area occupies 2% of the socio-economic area of the world, however, this area produces about 80% of the total GDP of the world economy [Obaid 2007, p. 1; Pięta-Kanurska 2013, p. 18].

The research on metropolis are commonly conducted for the impact that they have on surrounding areas. The description of the metropolis is often based on the description of the city center, surroundings of the center and the border area of metropolis and the relationship between these areas. Observations and research clearly show that there are no two same metropolitan areas.

A metropolis should be seen as a geographical, social and economic phenomenon. Jałowiecki states that: "a metropolis is defined as a city of at least half a million people with diverse functions. Although the criterion of population is important and easy to measure, it is not the only and sufficient one to define the metropolis. Therefore, one needs to add three others: 1. the excellence of services, institutions and equipment. 2. the potential for innovation in technical, economic, social, political and cultural fields. 3. the uniqueness and specifics of the place" [Jałowiecki 2007, p. 87].

In addition, the transnational aspect of the transport hub is indicated in the definition of the Association "Union of Polish Metropolises", according to which "a metropolis is a residential complex of the city of the knowledge, in which there are over 500 thousand. residents, and over 50 thousand. students, which is a European (transnational) transport hub. The metropolis network is an international environment of capital, business and knowledge. Modern metropolises are urban and rural regions, and not only a huge municipality." [Adamowicz 2012, p. 22]

However, for the purpose of the article the definition of Markowski and Marszał was accepted because it concerns the most important aspects of metropolis in Polish conditions. The authors defined the criteria that a city must meet in order to be listed among metropolis in Polish conditions [Markowski, Marszał 2006, p. 12]: 1. be relatively large (min. 0.5-1.0 million inhabitants); 2. have considerable economic potential and a highly developed service sector of higher order; 3. have a high potential for innovation (scientific and R&D units); 4. perform the functions of metropolitan nature, i.e. central functions of high-order hierarchical range of at least national level; 5. act as a hub in the system (network) of communication, organizational and information services links and be characterized by high availability at different spatial scales, also on an international scale; 6. stimulate the development of network economy and management model.

Moreover, the following features of a morphological character should appear in a metropolis [Markowski, Marszał 2006, p. 13]: 1. educated metropolitan spatial layouts with extensive suburban urbanized area with strong centripetal connections of integration; 2. the uniqueness and specifics of space (especially urban center) due to historical, cultural or architectural and urban values.

It can therefore be concluded that the metropolis is not just a big city, although population potential is crucial, but also a city operating in international networking and possessing the services at the appropriate level to support these relationships. According to Jałowiecki [2007, p. 87], in Polish conditions only Warsaw meets the requirements of the definition. In the first group of potential metropolis there are Poznań, Wrocław and Kraków. In the second group there are: the Katowice conurbation, Tricity (Gdansk, Gdynia, Sopot) and Łódź.

In this context, the research subject will be Warsaw and both groups of potential metropolises, namely Poznan, Wroclaw, Krakow, the Katowice conurbation, Tricity (Gdansk, Gdynia and Sopot) and Lodz.

3. The need for measuring efficiency

In order to answer the second question “Does a metropolis use a performance-based budget to measure efficiency?” it was necessary to search for new forms of budget which will both control and promote the more efficient allocation of public resources. In addition, the cities using a performance-based budget in Poland have been identified.

Measuring efficiency is very important in the context of the limited resources for public activities in Polish cities. In addition, Kulesza [2005, pp. 10-11], the architect of the local government reform in 1999, admits sadly that “there are few municipal offices in Poland, in which city officials actually care for the effective achievement of the objectives set by the political authorities – the government or the local authorities (...) next to the “political” president we need a professional city manager (director of the city)”.

Therefore it is necessary to search for new forms of budget which will not only control but also promote the more efficient allocation of public resources. Many of these new concepts have their roots in the solutions used in the private sector, which is consistent with the idea of New Public Management. A good solution to these problems could be a performance-based budget, which is a new budgeting model geared to the results achieved in relation to the public expenditure incurred. It is used in different forms and ranges in many countries in the world, including the majority of the OECD countries [Andrews 2005; Rivenbark, Kelly 2006].

The first attempt to change the form of budgeting was made by Polish local governments in the 1990s. The support of the Local Government Partnership Program (LGPP) sponsored by the U.S. Agency for International Development (USAID) played a significant role in this process. Krakow as the first city implemented a performance-based budget in 1994. Through training and direct assistance from this program in 1999-2000, 38 other local governments prepared their budgets in the form of performance-based budgets (both big cities and smaller municipalities).

Currently, a performance-based budget is used by 12 out of 66 cities with county rights, namely: Bytom (2008), Gdansk (2011), Gliwice (2004), Krakow (1994), Krosno (2005), Piotrkow Trybunalski (2008), Płock (2003), Poznań (2000), Szczecin (2005), Warszawa (2008), Wroclaw (2008) and Zabrze (2004). Three units were in the process of implementing a performance-based budget (Katowice, Kielce, Ruda Śląska), and three of the cities declared their willingness to implement this type of budget in the near future (Bydgoszcz, Lublin, Lodz) (the year of the implementation of a performance-based budget is given in parentheses) [Korolewska, Marchewka-Bartkowiak 2013, p. 2].

The earlier analysis shows that Warsaw is the only Polish city that can be called an educated metropolis (though of a relatively low order on an international scale [Smętkowski, Jałowiecki, Gorzelak 2008, p. 3]). Apart from Warszawa, cities of more than 500-thousand inhabitants have fairly well developed metropolitan functions – Poznań, Wrocław, Kraków, Tricity (Gdańsk, Gdynia and Sopot), the conurbation of Katowice and Łódź. Other Polish cities with a much smaller population did not develop metropolitan functions.

In this context the cities that can be considered as metropolises or cities with well-developed metropolitan functions and using the performance-based budget are: Warszawa, Wrocław, Poznań, Kraków and Gdańsk. Łódź does not use a performance-based budget. Katowice is in the process of implementing a performance-based budget.

Among others this is due to the fact that in Poland a performance-based budget is mandatory from the legal point of view in the government sector and it is optional for local government units. Even though it is optional it must be consistent with the assumptions resulting from the long-term plans (strategies, and long-term financial forecast), as well as the annual budget. The implementation of performance-based budgeting in local government units results only from their own initiative, and the most common reason why such initiatives are taken is the desire to increase the efficiency of financial management.

Therefore to ensure a reliable system to measure the efficiency, properly chosen and constructed measures should be used. Table 1 presents many rules, attributes, tips on design and features that the measures should meet.

Duda et al. [2004, p. 21], pointed out that the measures should motivate executives and city officials to make an effort in order to achieve the desired result. This is made possible by translating the vision, mission and strategy of the city on a set of measures that allow the evaluation of the results achieved and the on-going evaluation of the progress of the city actions aimed to achieve the goals. Measures constructed in accordance with the criteria proposed by Biniecki and Szczupak [2004, p. 67] will better assess the actions of the municipal authorities. They will check the degree of implementation of the city strategy, but in this context they should be included in the set of indicators to measure the efficiency of the city. Nita [2009, pp. 269-270] presented the conditions to be met in the design of the measures which were compiled into eight major groups associated with the attributes of the measure. Filipiak [2010, p. 126] presented the principles which should guide the design of the measures.

In summary, the traditional budget, also called a classic budget, drawn up according to budgetary classification divisions (sections, chapters and paragraphs) is unclear and does not show the expediency of the incurred expenditures and their effectiveness in a sufficient way. In contrast, a performance-based budget is an alternative to the traditional system. This allows for the better allocation of financial and material resources, and as a result also better satisfying of the social needs. It corresponds to the statutory demands in terms of the expediency of public expenditures as a specific expenditure associated with the task.

Table 1. Requirements for measures

Author	Requirements for measures
Duda et al.	<ul style="list-style-type: none"> • suitable for objectives that an entity wants to achieve • clearly defined, with clear, unambiguous definitions, allowing for consistent data capture • up-to-date, generating data regularly enough to monitor progress and quickly enough to make the resulting data useful • reliable, that is sufficiently accurate and responsive to change • comparable with past periods or with other similar measures • verifiable, supported by clear documentation, so that we can confirm the validity of the processes generating the measures • incentives, to encourage the exercise of appropriate action, and not those unwanted or wasteful
Biniecki, Szczupak	<ul style="list-style-type: none"> • criterion of rightness – to ensure coherence between the strategic objectives at the local level to the priorities established at the European, national or regional level • criterion of effectiveness – to indicate whether and to what extent undertaken strategic initiatives and directions of development contribute to achieving the strategic objectives of a global nature • criterion of utility – to assess whether the undertaken directions of development and strategic initiatives affect the satisfaction of basic needs or the target participants of the cities • criterion of persistence – to assess the degree of irreversibility and the positive effects associated with the implementation of the direction of development and adequate to its set of strategic initiatives
Nita	<ul style="list-style-type: none"> • purpose of measure usage • link with the strategy • formal character of a measure • data source • feedback orientation and continuous improvement • the possibility of cascading • specified frequency of measurement • persons involved in the efficiency measurement
Filipiak	<ul style="list-style-type: none"> • principle of significance – the principle indicates the extent to which the objectives of the tasks are important in relation to the growing needs and priorities of socio-economic development of the local government units • principle of efficiency – the principle shows how to utilize the resources to produce services or to achieve concrete results • principle of effectiveness – the principle indicates how far the task will serve the achievement of specific and main objectives of the strategy • principle of utility – the principle describes whether the task will have an impact on the target group in terms of satisfying its needs • principle of persistence – the principle that determines whether and to what extent one should expect changes resulting from the completion of the task.

Source: own study based on [Duda et. al. 2004, p. 21; Biniecki, Szczupak 2004, p. 67; Nita 2009, pp. 269-270; Filipiak 2010, p. 126].

In Poland, according to the Public Finance Act (art. 44), public expenditure should be made in an expedient and economical way, with the principles of the best results of the data inputs, and the optimal selection of the methods and the means of achieving these goals, and also in the amount and under the terms of previously contracted commitments. Thus, through the use of the task system, the budget becomes clear and transparent.

4. The comparative analysis of the tasks “Public Transport” in metropolises

In order to answer to the third question, “is a performance-based budget, which is optional in the metropolis, available for the average citizen or it is an internal document prepared for the city needs?” its availability in the “Public Information Bulletin” was verified and the source documents relating to the performance-based budget were analyzed.

In the case of Warszawa and Gdansk, documents for a performance-based budget were published and widely available. Krakow presented only some elements of a performance-based budget, which eliminated its participation in further studies. In the case of Wroclaw and Poznan the information about the use of a performance-based budget was found, but the documents on the performance-based budget in the “Public Information Bulletin” or on the home pages of these cities were not found. The managers of Financial Departments responsible for drawing up the performance-based budget confirmed that they are internal documents and it is not possible to access them. Therefore the research will be conducted in Warszawa and Gdansk.

The performance-based budget of Warszawa includes 11 areas, 35 programs, 190 tasks and 140 subtasks. The performance-based budget of Gdansk includes 15 functions, 40 tasks, 135 subtasks and actions.

The terminology used in the two performance-based budgets is slightly different, but of similar meaning. Generally, based on the example of Gdansk it can be concluded that the functions form the main unit of task classification and group expenditure of one area of action. Tasks form the second level of the task classification and group expenditure by objectives. Subtasks form the third level of task classification and group actions, the implementation of which affects the achievement of the objectives set out at the tasks – subtasks are of an operational nature. While the actions are the lowest level of task classification, they include all the key elements of the process of achieving the objectives of subtasks and specific objectives of the task. Table 2 presents the areas and functions of the performance-based budget of Warsaw and Gdansk.

The area “Transport and communication” (Warsaw) and the function “The public transport system” (Gdansk) were analyzed. In Warszawa, within this area, the Program 1. “Public transport” and Program 2. “Roads and bridges” were indicated. In Gdansk within this function Task 1. “Ensuring public transport system” and Task 2. “Managing the urban road system” were indicated. The subsequent analysis focuses on one

task only, namely Program 1. "Public transport" in Warszawa (Table 3) and Task 1. "Ensuring public transport system" in Gdansk (Table 4.).

Table 2. Areas/functions of the performance-based budget of Warsaw and Gdansk

Areas of the performance-based budget of Warsaw	Functions of the performance-based budget of Gdansk
1. Transport and communication	
2. Governance spatial and property management	1. The management of the city and its structures
3. Public utilities and environmental protection	2. Ensuring security and public order in the city
4. Security and public order	3. Education and educational care and material assistance
5. Education	4. City finance
6. Health care and social assistance	5. Governance and spatial policy
7. Culture and protection of cultural heritage	6. Real estate and housing management
8. Recreation, sport and tourism	7. Municipal economy
9. Promotion and economic development support	8. Sports, recreation, leisure and tourism in the city
10. Management of government structures	9. Formation and development of culture and art in the city
11. Finance and various settlement	10. The environment and urban greenery protection
	11. Social assistance and the implementation of social policy instruments
	12. Public transport system
	13. Health of the citizens and social pathologies prevention
	14. Citizen affairs and administrative services
	15. Socio-economic development of the city

Source: own study based on: [Budget City of Warsaw in 2014; City of Gdansk Adopted budget for 2014; Budget implementation reports of the City of Warsaw for 2014; Budget implementation reports of the City of Gdansk for 2014].

Table 3. Goals, tasks and measures of "Public transport" program within "Transport and communication" area in Warsaw

WARSAW			
AREA 1: Transport and communication			
Program 1. Public transport			
Tasks			
1. Purchasing of public transport services	2. Managing public transport	3. Maintaining the stops infrastructure	4. Organization of communication, marketing, surveillance and traffic control
Subtasks			
1.1. Warsaw Metro 1.2. Municipal Bus 1.3. The other bus companies 1.4. Fast Urban Rail 1.5. Warsaw Trams 1.6. The other rail carriers	2.1. Maintaining the Board of the Public Transport, including support for investment 2.2. Maintaining and servicing the ticketing system	-	-

Table 3, cont.

Goals of subtasks/tasks			
Ensuring the optimal level of transport services (the same objective and measures for all subtasks)	2.1. Ensuring the proper organization and functioning of public transport 2.2. Ensuring functional operation ticket system and vindication of charges for driving without a valid ticket	3.1. Maintaining and improving the existing infrastructure of the bus stop	4.1. Optimization of the connections and ensuring the continuity of the functioning of public transport
Measures of subtasks			
1. The total annual number of VKT (vehicle-kilometer travelled) per 1 inhabitant of Warsaw 2. The supply of passenger seats in the morning rush hour traffic 3. The average cost of the purchase of public transport services per capita in Warsaw 4. The average rate for 1 VKT 5. The number of VKT payable 6. The participation of modern vehicles (low-floor, air-conditioned, equipped with cameras etc.) in the public transport	2.1.1. The share of spending on maintenance the Board of the Public Transport (BPT) in the total expenditure of the BPT 2.1.2. The average annual number of full-time employee in the BPT 2.1.3. The cost of the task per full-time employee 2.2.1. The number of ticket offices (stationary and mobile) 2.2.2. The number of swipe cards sold per annum 2.2.3. The number of magnetic strip tickets sold per annum 2.2.4. The number of payment confirmations for traveling without a valid ticket or without a valid document entitling to reduced ticket price 2.2.5. The number of additional charges issued for travelling without a valid ticket or without a valid document entitling to reduced price 2.2.6. The average monthly cost of printing, storage and distribution of tickets 2.2.7. Participation of closed cases relating to the additional charges imposed for traveling without a valid ticket or without a document entitling to reduced price, relative to the total amount of additional charges imposed	3.1.1. The number of bus terminals 3.1.2. Total number of bus stops 3.1.3. The number of bus bars on a network of the BPT 3.1.4. The average annual cost of maintaining the bus terminal 3.1.5. The average annual cost of maintaining the bus stop 3.1.6. The share of covered bus stops in the total number of bus stops	4.1.1. Communication network density per km ² service area (km/km ²) 4.1.2. The number of marketing campaigns (promotional) 4.1.3. The number of passengers security patrols a day 4.1.4. The average cost of 1 passenger security patrol per day 4.1.5. The average cost of marketing campaign
Administrator of budget: Board of the Public Transport (BPT)			

Source: own study based on: [Budget City of Warsaw in 2014, Budget implementation reports of the City of Warsaw for 2014].

This analysis will be carried out to give the answer to the fourth question, “Do the measures used in the performance-based budget provide reliable information on the efficiency of expenditure ?” and the fifth question, “Is the comparison of the tasks

and measures between metropolises is justified ?". The study used the data from the city budgets for 2014 and the reports on the implementation of these budgets.

Table 4. Goals tasks and measures of “Ensuring public transport system” task within “Public transport system” function in Gdansk

GDANSK	
Function 12: The public transport system	
Goal: Gdansk communication friendly	
Measure: The position of Gdansk among the cities with the most developed system of the public transport	
Task 1: Ensuring public transport system	
Goal: Public transport system to cover urban area of the city according to the standard by 2030	
Measure: The city's area covered by the public transport system in relation to the total urban area according to the standard	
Subtask 1.1: The organisation and financing of the public transport Goal: 1. The annual provision of efficient and punctual transport in the city 2. The reduction of the subsidies to public transport to a level no greater than 40% of the current expenditure by 2030 Measures: 1. The number of justified complaints about the efficiency and punctuality of the public transport in the base year 2. The level of subsidies to the public transport in a given year Actions: 1. Financing of the Board of the Public Transport (BPT) in Gdansk and supervision of public transport 2. Financing of the active mobility actions 3. Maintenance of ferry passage – Wisłoujście 4. Ensuring public transport in the city of Gdansk 5. Sustainability of transport in the cities of Central Europe through improved and integrated cycling promotion and cooperation in the international networks (Central Meetbik) 6. Improving accessibility by integrating the bicycle into the system of multimodal transport and mobility culture (abc. multimodal) 7. Participation in the project "European Cities for Cycling Municipal Integration of Sustainable Mobility Management Programmes" (Cycle Cities) Statistical value: 1. The number of VKT (vehicle-kilometer travelled) (purchased by the City of Gdansk) 2. The cost of 1 VKT in public bus transport 3. The cost of 1 VKT in public tram transport 4. The average remuneration in the Board of Public Transport 5. The average number of employees in the Board of Public Transport in 2014 6. The number of ferry crossings	Subtask 1.2. Maintenance of the tram infrastructure Goal: Improvement of the technical condition of the tram tracks and the electricity traction by 2020 Measures: 1. The ratio of tram tracks that are in poor condition to the total length of the tracks 2. Financial expenditures on the maintenance of the tram infrastructure (tracks, power traction, punctuation, shelters) (PLN/km) Actions: The maintenance of tram tracks, electricity traction, stop signage and shelters Statistical values: 1. The average cost of maintaining 1 km of a single track 2. The annual cost of maintaining the vertical tram and bus stops signage 3. The annual cost of maintaining one bus shelter owned by the city 4. The annual cost of maintaining 1 km of a fencing

Table 4, cont.

<p>Subtask 1.3. The recapitalization of the transport companies with the participation of the city Goal: The annual provision of the railway transport and passengers services at the airport for, in aggregate, not less than 40 million passengers Measure: Number of passengers carried by railway and handled at the airport, which provided communication thanks to the funding of the city Actions: 1. Taking up shares in companies Statistical values: 1. Number of shares in a given year in the company “Airport Gdansk”</p>	<p>Subtask 1.4. Preparation and realization of investments Goal: The annual performance of undertakings in the form of investment tasks provided for in the long-term financial forecast Measures: 1. The number of implemented investment tasks 2. The level of realization of planned investments in the year</p>
Administrator of Budget: Department of Public Utilities, Roads and Greenery	

Source: own study based on: [*City of Gdańsk Adopted budget for 2014; Budget implementation reports of the City of Gdańsk for 2014*].

The program/task concerning transport is a typical task, whose implementation is similar in the analyzed entities, and for this reason it was selected for this study. The formulation of the first program/task also sounds similar in both cases, namely: “ensuring a public transport system” (Gdansk) and “public transport” (Warszawa), which can be broadly defined as a public transport system. The program/task implemented in these cities according to the traditional classification of budget expenditures are contained in the same chapter number 60004.

In contrast, the subtasks/actions are formulated differently and relate to the individual needs of the metropolis. The measures of subtasks/actions shown in Tables 3 and 4 are similar and are mainly the output indicators. The values of these indicators are relatively easy to determine, but they give only limited information to the local community about the real effects of financial expenditure. Nevertheless, the outcome measures, which are defined as the ratio of the effect of a specific group of products and the impact measures, defined as the long-term consequences of the tasks that go beyond the immediate effects, are seldom used. The reason for this is the difficulty in measuring the results of specific actions that are not of a commercial nature. Additionally, some results can be achieved only within a few years’ time.

Only Gdansk defined the goal and measure at the level of function (i.e. the highest level of the task classification). The accepted measure “the position of Gdansk among the cities with the most developed system of public transport” and its target value will uniquely define the degree of implementation of the function “the public transport system”.

Warszawa has not defined the measure at the main level of the task classification. This may be due to the fact that Warszawa as the Polish capital has the most diversified transport system in Poland. Therefore it is difficult to define a universal measure that takes into account the specificity of all kinds of transports operating in Warszawa. Gdansk, also in the case of intermediate levels of the task classification has defined

goals and measures, while Warszawa determines measures for subtasks only at the fourth level, which is the lowest level of the task classification.

In the case of public transport organization, Warszawa has identified two tasks (“purchasing of public transport services” and “managing public transport”), while Gdansk defined only one subtask, which is complex (“the organization and financing of the public transport”).

Warszawa provides public transport by purchasing transportation services from external entities (limited liability companies), while Gdansk provides public transport with its own departments, which are funded by the city. Therefore, the measures are differently defined. In the case of Warszawa there are more specific measures, taking into account both the relationship of individual expenditure per capita and the level of technological efficiency of rolling stock used.

In the case of Gdansk, measures for tasks and subtasks were specified, while for actions statistical values were assigned, without a relational nature, in the form of simple indicators of structure (vertical analysis).

A possible reason for defining a second task “managing public transport” in Warszawa is to measure the efficiency of administrative actions related to the consumption charges for the use of public transport. However, in Gdansk the efficiency of charges collection is not measured.

The last comparable area is the maintenance of technical infrastructure. In both cases, simple measures were used based on the average maintaining cost of the selected position of the cost (cost of maintaining a bus stop, the cost of signage, etc.).

A comparison of the performance-based budgets between metropolises is justified because it indicates areas that require more attention and areas that are measured in a consistent manner, and the obtained results are comparable. A comparison of measures may be a part of an early warning system, especially when the selected targets significantly differ from the national average. For example, if the level of the measure “operational cost per capita” is several times higher than the result in other metropolises, such a situation should result in immediate corrective action aimed at reducing operating costs.

In conclusion, the choice of measures in a performance-based budget is always a difficult problem. The fundamental mistake is the assumption that if a phenomenon or task, in the performance-based budget jargon, is difficult to measure quantitatively, it should be ignored, not measured or measured in a limited way [Woźniak 2010, p. 10). In a situation where we cannot quantify the phenomenon or establish a quantitative measure of the degree of the task, we ought to use the measures of quality (e.g. the degree of satisfaction of the metropolis inhabitants).

5. Conclusion

The analyzed metropolises implemented a performance-based budget in different years – Warszawa in 2008 and Gdansk in 2011 which is relatively new, since the first performance-based budget was applied in a Polish city in 1994. It may be noted that

the cities which recently introduced a performance-based budget, using the experience of the other cities, elaborated the goals, actions and measures, which allowed them to gain detailed and transparent information. Thus they eliminated the possibility of the manipulation of the results, since so much detail ensures that the funds will be spent in accordance with the intended plan. Therefore it is not possible that they will be changed according to the current needs (legitimate or not) within a given subtask.

Analysis of measures in Tables 3 and 4 provides the impression that some of them are chosen in a way that does not show the actual effectiveness and efficiency of metropolises (or the lack of it). However, one should take up the challenge and adopt such measures so as to obtain the information on how actually the metropolises operate. Such information should allow decisionmaking on increasing the budgetary resources for the task in the next budget years in order to obtain better results. If the metropolises operate in an effective and efficient manner, a performance-based budget is not always indispensable, yet its implementation would facilitate measuring the results, which could consequently lead to their improvement.

The most important needs and challenges necessary for the effective implementation of the performance-based budgets in metropolis in Poland include:

- development of a comprehensive methodology for performance-based budgets for metropolis on the basis of best practices and experience from national units and, where possible, foreign entities,
- preparation of draft amendments to the legislation, enabling the usage of a performance-based budget with the developed methodology,
- issuing recommendations on the implementation of a performance-based budget in the metropolis in accordance with the developed methodology,
- creation of the terms of reference for the system supporting the development and implementation of a performance-based budget and to appoint, by tender, the contractor of the system,
- conducting a pilot implementation of a performance-based budget with a computer system in a few selected metropolises.

In appreciating the voluntary effort of metropolises implementing a performance-based budget, one may note the lack of uniform regulations which leads to a lack of consistency between the different tasks and measures and makes comparisons between similar cities quite difficult. The information presented in the system of tasks by each city should have a significantly greater similarity, so that one can make comparative analyses, e.g. in terms of efficiency of expenditure for the same tasks by individual metropolises.

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