

Influence of EU grants on local government spending behaviours. Case study for Polish rural municipalities.

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Grants are important part of municipal budgets. Due to horizontal and vertical imbalance, there are no possibility to resign from this source of financing local governments. According to theoretical model, which is discussed in this paper the impact of grants on municipal spending depend on income and price effect. Previous empirical research presented, that due to political rent-seeking behaviours' we could suspect also other effects, such as leakage of funds from granted project and increase of other expenditure not related to the project. In this paper we presented panel data analysis for Polish rural municipalities. We tried to find if and how investment grants from European Union influence other-operational spending of municipalities. The results are not obvious, but analysed model presented that potential impact of EU investment grants on operational spending policy is very limited.

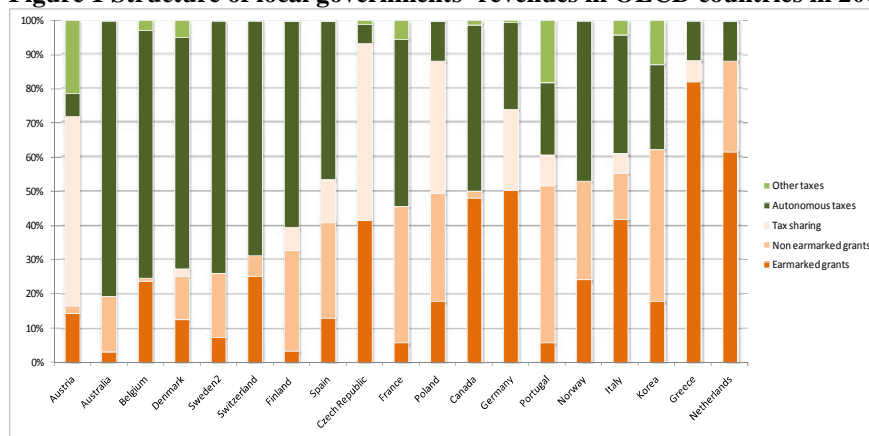
1. Introduction

Poland is great payee of EU grants policy. Important part of this help goes to local governments for their investment expenditure. Specific grants are assigned particularly for environmental and transport projects. The EU grants, as all others, influence not only the granted area, but also whole local government budget. According to economic theory, we could expect three sources of abovementioned influence – income and substitution effects, but also effects related with local officials policy, described by public choice literature. The aim of this paper is to analyze if and how EU investment grants affect local government budget policy in Poland. The first part contains an overview of literature analyzing the problem with conditional grants as a source of financing local government units. The second part presents the information about value and type of EU investment grants consumed in previous years by Polish municipalities and also shortly describes local government revenues and expenditures. The third part presents a model for budget policy based on panel data for rural municipalities in Poland. The last part features a summary and conclusions.

2. Economic effects of conditional grants – theory and evidence

The classic economic theory of decentralization suggests that the basic source of revenues for local governments need to be their own taxes and charges. It is necessary to achieve allocative efficiency (Oates 1972, p. 35). The grants need to be used only as an additional revenue, needed to cover horizontal and vertical imbalance. The conditional³ grants due to this theory should not be used widely, to not disturb local expenditure decision. For example in European Charter of Local Government is written: “As far as possible, grants to local authorities shall not be earmarked for the financing of specific projects. The provision of grants shall not remove the basic freedom of local authorities to exercise policy discretion within their own jurisdiction” (Art. 9.7). Nevertheless in practice both conditional and unconditional grants are very important part of local finance (cf. fig. 1).

Figure 1 Structure of local governments' revenues in OECD countries in 2002.



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³ The other names of this type of grants, which need to be used for specific, defined by grantor activity are: specific, earmarked and categorical grants

Source: OECD, Fiscal Federalism Network

The horizontal fiscal imbalance refers to the differences in the ability of individual local units to create own revenues. It is related with differences in local and regional economic development, which caused the divergence in tax bases. The proper source to cover this kind of imbalance are unconditional transfers for less developed units. The vertical fiscal imbalance is related with a gap between revenue sources and spending responsibilities among levels of government – the state and local units. There are public services (and goods) “production” of which have local characteristic, but their benefits influence bigger area (country or even continent). The best cases of such services are education, health care or social services but also services related with environment – water production and sewage utilization, transport etc. That external effects need to be compensated, and the proper way of compensation are conditional grants. (see for example Gamkhar S. 2002, p. 7). That logic is visible in practice. The general public services, health, education and economic affairs⁴ are sectors the most granted by conditional grants.

Table 1 Structure of earmarked grants by government function in OECD countries (2004)

	General public services 01	Defence 02	Public order and safety 03	Economic affairs 04	Environment protection 05	Housing and community amenities 06	Health 07	Recreation, culture, religion 08	Education 09	Social protection 10	Others	Total
Australia	-	-	0.2	9.0	-	4.9	39.6	0.1	37.5	8.4	0.3	100.0
Austria	-	-	24.3	21.4	-	-	0.1	-	25.3	28.9	-	100.0
Belgium	-	-	24.3	21.4	-	-	0.1	-	25.3	28.9	-	100.0
Canada	-	-	24.3	21.4	-	-	0.1	-	25.3	28.9	-	100.0
Czech Republic	9.3	0.0	0.5	6.0	0.3	7.5	2.2	0.7	54.3	17.7	1.4	100.0
Denmark	5.5	-	0.6	17.2	1.8	0.4	12.0	16.9	27.0	18.7	-	100.0
Finland	16.9	1.7	8.0	13.0	2.3	22.4	-	30.8	5.0	-	-	100.0
France	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Germany	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Greece	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Hungary	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Iceland	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Italy ¹	16.9	-	-	40.6	3.8	-	31.7	-	7.0	-	-	100.0
Korea	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Mexico	56.6	-	-	18.9	5.6	5.6	-	7.2	-	6.1	-	100.0
Netherlands	0.0	-	0.6	1.4	1.1	8.6	5.3	0.5	22.4	60.2	9.9	100
Norway	79.3	0.2	0.1	-	0.0	0.1	14.0	-	4.7	1.7	-	100.0
Poland	3.1	3.5	16.2	4.4	8.9	5.5	10.8	5.2	17.9	24.6	-	100.0
Portugal	3.2	3.2	26.0	-	-	-	-	61.3	-	-	9.5	100.0
Spain	42.4	-	0.2	35.4	0.6	3.2	4.7	0.9	2.5	10.0	-	100.0
Sweden	3.5	1.1	0.0	6.2	3.8	-	56.3	-	29.1	-	-	100.0
Switzerland	43.2	-	-	14.2	19.1	22.2	-	0.9	-	0.5	-	100.0
Turkey	43.2	-	-	14.2	19.1	22.2	-	0.9	-	0.5	-	100.0
Unweighted average	20.0	0.5	3.6	15.3	3.4	5.7	17.0	4.5	16.6	11.9	1.5	100.0

1. 2002

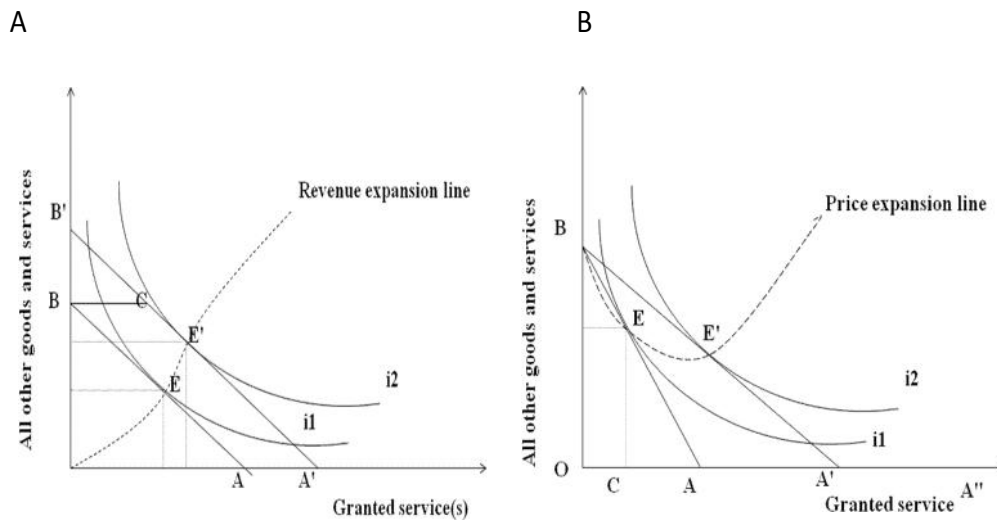
Source: National sources.

Source: : OECD, Fiscal Federalism Network

The economic rationale for using earmarked grants to cover external benefits is related with the effect of this grants for local government decision. It is worthwhile to distinguish in that category of grants – lump-sum and matching grants. The first type could be visible just as an extra money in local budget, because there are no own local spending required for granted service (or good). In classical analysis of local government expenditure decision, which used median-voter model, it means that there is only income effect, because lump-sum grants do not change the relative price of aided service (see figure 2, part A). The grantor could expect, that grant increased not only aided service but also other public (or even private) consumption. If the basic reason of granting is to improve consumption of particular service – then matching grant is better. This kind of grant co-finances granted service with own local government revenues. It means that for the local government (median voter) this service is cheaper than without aid. In this case we have income and substitution effect (see figure 2, part B), and grantor could expect more important increase of consumption of granted service than for the same amount of grant assigned as a lump-sum (Bailey S. 1999; p. 190). But still the consumption of other than granted services is influenced by the grant. Proper understanding of these changes should be important part of analysis of effects of grant policy.

⁴ According to United Nation Statistical classification General public services are composed of expenditures for-executive and legislative organs, financial and fiscal affairs, external affairs; foreign economic aid; general services; basic research; R&D, general public services; public debt transactions; and transfers of a general character between different levels of government. The economic affairs are composed of expenditures for-general economic, commercial and labour affairs, agriculture, forestry, fishing and hunting fuel and energy, mining, manufacturing and construction, transport, communication, other industries, R&D economic affairs, economic affairs n.e.c. <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=4&Lg=1>

Figure 2 Lump-sum and matching grants and its effect on median voter spending decision



i1, i2 – median voter’s indifference curves – on every line is represented the same level of utility related with consumption of granted service and other goods and services, utility at i1 is smaller than at i2

AB; A'B' – budget lines-represents the combination of goods (granted and others) for which median voter has enough revenues (public and private), their slope is related with relative prices of granted service and other goods,

E, E' – equilibrium – the combination of goods, which represents the maximum possible with given budget level of utility of median voter

Source: Bailey S. 1999; p. 186-189

Presented above charts, based on median voter model, suggest that grants to local government have the same effect for public and private spending like increase of private-voter revenues (Oates E.; 1972; p. 113). However the empirical research do not support this conclusion. Well known are the analyses of lump-sum unconditional grants (which are in theoretical models very similar to presented above lump-sum conditional grants, Fisher R. 1996; p. 215). It was found that the public expenditures response for public grants is more significant than for increase of private revenues. This effect is called “fly-paper effect”, because “money stick where it hits” (Inman R. 2008). The explanation of the fly-paper effect could be the same as one of the arguments against median-voter model – politics. The decisions made by local government are influenced mostly by politicians and bureaucrats (Inman R. 2008; Bailey S. 1999, p. 231). The median voter, due to lack of proper information – fiscal illusion, does not have the possibility to control the budget, and the decision about public spending is made by and for self-interested governors. That is why the analysis of local government fiscal decisions should be focused on governors and bureaucrats perspectives and try to understand their preferences (Oulasvirta L. 1997). The basic assumption is that bureaucrats aim is to maximize their income and finally public budget as well, also politicians who try to maximize reelection odds tend to oversize public budget (Niskanen W. A. 1975).

The results of researches on matching conditional grants, especially related with investments, are in line with the above assumption. We should distinguish two types of matching conditional grants. First, there are grants which are redistributed due to strictly defined, uncompetitive rules, given by law (the good example are grants allocated due to formula). The potential political effect of such grants is not very strong, because such grants are stable and expectable element of local budget. But in case of grants allocated for projects such rigorous definition is very difficult and very often stipulations are more or less general. The other problem is that in most cases the donor had limited sources. That is why the grants are distributed due to competitive rules. The potential beneficiary need to prove, that he really needs the grant – so is in line with definition of recipients given by grantor, and need to spend money in accordance with grantor rules. There are observed strategic behaviors of local governors, who try to increase the amount of grant. Such activity is possible due to information asymmetry, where local governors give the data about themselves to grantor, while the detailed control of accuracy of these information is too costly (if possible) (Guilbert G; Rocaboy Y; 2004). According to Tullock the competition for conditional grants provokes wasteful grant-seeking among potential recipients (Tullock G. 1980). The grant seeking, related with the politicians goal to be reelected, could be especially strong in case of investment grants. Investment projects are visible for voters, so could be used as “[election gimmick](#)”. There are also suggestion, that voters rate the governors according to their effectiveness of wining the grants (Boarnet M. G., Glazer A. 2002).

In view of the above, we could suspect that matching conditional grants affect local government spending. On one hand conditional grants could crowd-out public spending other than granted, due to substitution effect. But results from previous researches describe opposite effect. Oates presented that public spending’s price elasticity

is low (Oates; 1996). In practice grants increase public spending, other than granted as well – which is explained by politicians rent-seeking behaviours (Knight B. 2002, Otim S. 1996; Dahlberg M. at al. 2008). Among others it could mean, that local government’s own revenues, which could be in other situation used to finance particular project, due to external aid leak from it to another one (Bailey S.; 1997). The question of this influence should be basic for grantors and also public officials, because it is related with the efficiency and also equity of public programs. These questions seem to be especially important in countries like Poland, where foreign (EU) aid is important part of local budgets.

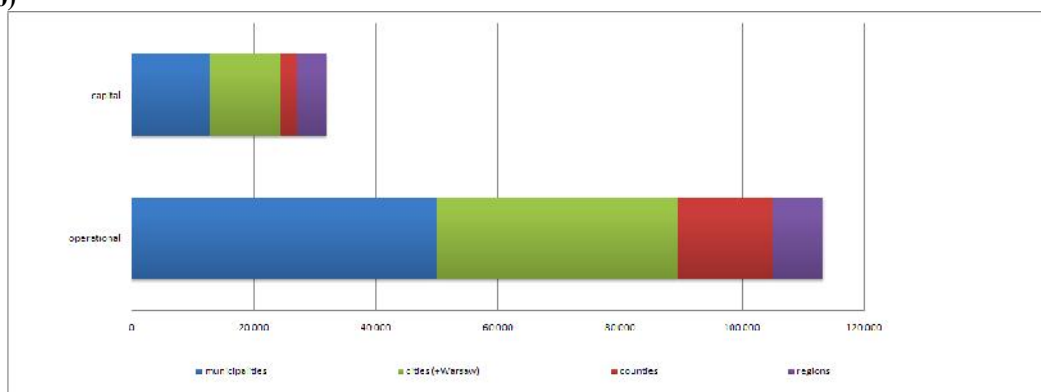
3. EU grants as a source of financing local investment in Poland, in years 2004-2009

Poland as big (the area of Poland is 312,7 thousand km²; 5th among 27 EU countries, and the population 28 millions – 6th in EU) and one of the less developed EU country (Polish GDP per capita at purchasing power parity in 2009 was 61% of EU average, 23rd in EU) is important consumer of EU aid from the structural funds and Cohesion Fund. For the years 2004-2006, in order to help new member States⁵ to integrate into the EU and to reduce disparities in development levels, UE prepared EUR 23 billion. Poland received EUR 12.8 billion (56%) from this amount. For the next period – years 2007-2013 it was planned that Poland would receive about EUR 67.3 billion (19% of the whole EU regional policy budget for these years). Poland has defined 21 operational programs (OPs). The 25 sectoral OPs represent 75% of the EU funds, “Infrastructure and Environment” (the biggest OP – approximately EUR 25 billion), “Human Capital”, “Innovative Economy” and “Development of Eastern Poland” (for the 5 least developed regions). The 16 regional OPs (25% of funds) are dedicated to all 16 Polish regions which have defined regional strategies in line with community priorities. Great part of this aid goes to sub-government budgets (NSRO; 2007).

Sub-sovereign government in Poland consists of three levels. At the lowest – local level, there are 2478 municipalities (gmina). There are 307 urban municipalities (gminy miejskie), 582 mixed municipalities (gminy miejsko-wiejskie) and 1589 rural municipalities (gminy wiejskie). The intermediate tier is made up of 314 counties (powiat). The largest 66 cities work as powiat and gmina in one. At the upper level there are 16 regions (województwo).

The responsibilities of municipalities have been broadly defined as „all matters that are not reserved to other entities under existing laws”, while the Gmina Local Government Act enumerates the most important tasks⁶. All municipalities work under the same law, but as will be presented later, the structure and amount of their revenues and expenditures vary widely. Powiat is responsible for public tasks of supra-gmina nature. Primary responsibilities of województwo are aimed toward region’s development by defining measures and development goals in so-called “województzka development strategy”. Furthermore, regions are responsible for public tasks of regional nature that gminas or powiaty are unable to fulfill.

Figure 3 Capital and operational expenditures by the levels of sub-sovereign government in 2009 (in PLN ‘000 000)



Source: Own calculation based on Ministry of Finance and GUS (Statistical Office) data

Nowadays (2009 data) sub-sovereign governments are responsible for about 30% of total general government expenditures (after consolidation) and are about 12% of GDP. Almost 44% of sub-sovereign budgets are spent on a municipal level, 35% by cities with powiat rights and Warsaw, 13% by a county level and 12% by a regional self-government. (see Fig. 3) More than quarter of sub-sovereign expenditures is related with

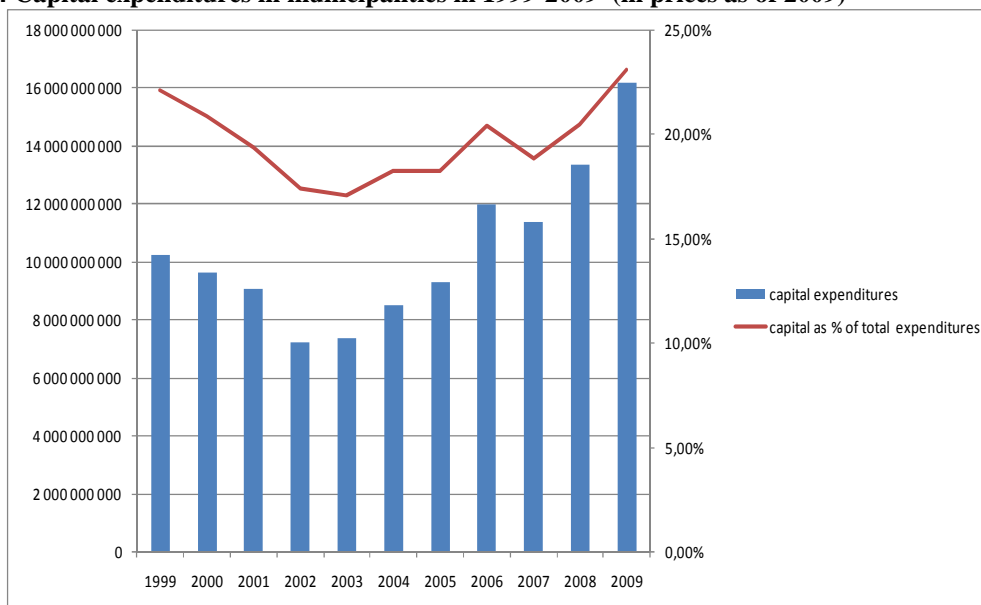
⁵ Poland joined the European Community on May 1, 2004

⁶ such as spatial planning, health care, social care, primary education; municipal housing, culture, physical culture, construction and maintenance of local roads, streets, bridges, the local public transport, planning for and financing of lighting in public areas, restoring good environmental conditions, the creation and protection of parks and forests, protection against flood, solid waste management, maintenance of public areas, the construction and maintenance of sanitary facilities, landfills, wastewater treatment plants, the construction and operation of water supply and sewerage systems, the provision of power and heat supply;

investments. The capital spending is very important on regional level (where investments make more than half of expenditures). But 28% of whole sub-sovereign capital expenditures was done in 2009 by municipalities. In the next parts of this paper we will focus on that sub-sovereign level.

Such a huge capital investment effort of municipalities is associated with serious underdevelopment of the communal infrastructure inherited from the past. Due to the magnitude of existing needs, the amount allocated to capital projects is relatively stable, however there are visible changes in that expenditures. In years 2000-2003 capital expenditures decreased (in 2003 they were 28% lower – in real terms – than in 1999). This decrease can be explained by a worse financial situation of local governments in that period (cf. Figure 4).

Figure 4 Capital expenditures in municipalities in 1999-2009 (in prices as of 2009)



Source: Own calculation based on Ministry of Finance and GUS (Statistical Office) data

In 2004 Poland accessed to European Union (EU), what caused very important obligations for communal infrastructure. The abovementioned special EU grants were established to help Poland to fulfill these obligations, but still local governments needed their own money to co-finance these grants. This forced important changes in Polish local governments revenues. The financial situation of sub-national government was radically modified in 2003 with the introduction of a new financing system (Act on Local Government Revenues) put into force in the 2004.

The local revenues are divided into 2 obligatory groups, and one- not obligatory:

1) Own revenues

- (1) Revenues from own sources – such as local taxes, fees for services, revenues from local governments' property (selling, leasing).
- (2) Local government shares in revenues from central taxes (Personal Income Tax and Corporate Income Tax) which are allocated due to revenues collected from particular territory.

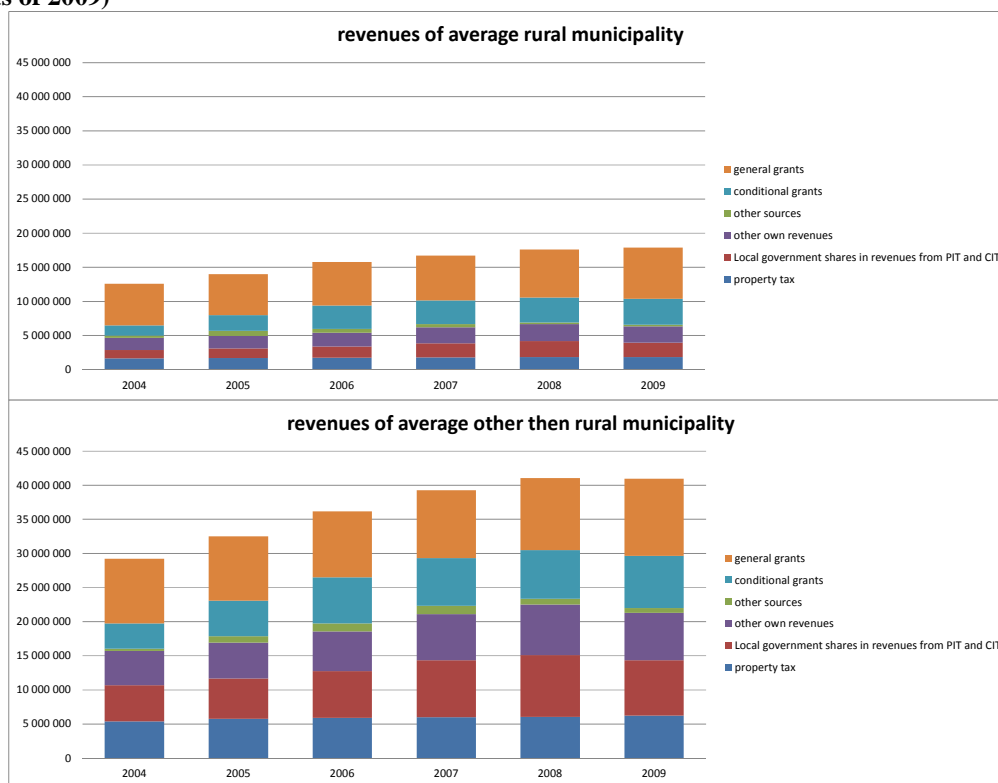
2) Transfers

- (1) General purpose grants (subventions).
- (2) Specific grants coming from the state budget,

3) The third group of revenues is not obligatory, in that group different kinds of grants from international organization (also from EU) were added.

New Act on Local Government Revenues did not create any new sources of local revenues. In Poland the only tier collecting own taxes is municipality (including large cities). Local property tax is the most important local tax (covering in 2009 about 28% of municipal own revenues, and 10% of all revenues in rural municipalities, and 13% in others). It is calculated based on area and category of the property. Important change in local revenues established by law in 2003 was increase of shares in central taxes (from 27.6% of PIT to 39,34% and from 5% to 6,71% of CIT). This affected mostly revenues of the biggest cities. In smaller municipalities, especially rural, where citizens-farmers do not pay PIT, this change was not very important. The shares in central taxes covered in 2009 12% of revenues in rural municipalities and 16% in others (see Fig 5). Generally, rural municipalities have lower tax base, and have less possibilities to collect own revenues, which create only 37% of local budgets, while in other types of municipalities it was 54 % (in 2009).

Figure 5 Amount and structure of local (rural and other municipalities) revenues in 2004-2009 (average in prices as of 2009)



Source: Own calculation based on Ministry of Finance and GUS (Statistical Office) data

The general grant for municipalities (also modified in 2004) consists of 3 parts:

1. The education part intends to cover educational expenses. It is the most significant grant received by sub-national governments.
2. The equalization part is calculated for every municipality according to its tax revenues. Municipalities have access to the grant when their tax revenue is lower than 90% of the average, while those with revenue that is higher than 150% must contribute to the financing of the grant. An additional share is paid to municipalities with low population density.
3. The balancing part intends to cover the social expenditure of municipalities and counties.

As visible at figure 5, general grants are very important share of municipal revenues, especially in rural areas where they stand for about 40% of budget (in other type of municipalities it was only 27% in 2009). This is related mostly with the equalization part – as mentioned revenues from taxes (PIT and CIT) in rural areas are lower than in others, besides in rural municipalities there is low population density. The educational part, which is designed according to “calculated student” also promotes rural areas.

The last part of local budget – conditional grants are divided into four types: grants earmarked to carry out State delegated responsibilities; grants earmarked to exercise their own specific responsibilities, grants from special purpose funds (like Local Fund for Environmental Protection and Water Management), grants earmarked to carry out responsibilities in conjunction with State organizations. These grants are especially important for rural gminas, were decided about 21% of revenues, while in others it was 18% (in 2009)

In aggregated statistics⁷, most of grants from EU⁸ were added to category “other sources” which in years 2008-2009 was part of own local revenues. In that category were also aggregated other international grants and other (country) sources which co-financed granted projects. Those “other sources” are not very significant part of local budgets – less than 2% in 2009, but EU aid is important for local investments (see below table).

⁷ Presented by Statistical Office, Regional Chambers Office and Ministry of Finance

⁸ The other part of EU grants were budgeted as conditional grants

Table 2 EU and other international grants in municipal revenues and capital expenditures in years 2005-2009

	2005	2006	2007	2008	2009
EU and other international grants as % of municipal revenues	2,7%	3,1%	2,8%	2,0%	3,2%
Investment grants as % of all EU and international grants for municipalities	94,4%	93,3%	88,8%	71,4%	69,1%
Investments financed by EU and international grants as % of municipals' capital expenditures	13,5%	16,1%	11,1%	5,8%	11,0%

Source: Own calculation based on RIO (Regional Chamber Office) data

In most cases the EU grants appear in municipal budget after realization of projects. This caused important problems with pre-financing. Special development grants were established to cover part of this spending, but another important source of pre-financing are loans and credits. What is important since 2004 loans made in order to co-finance (or pre-finance) projects obtaining EU fund grants are exempted from local-public debt limitations.

The EU grants are great chance for Poland as a country and also for every municipality which efficiently uses them. The public discussion about EU grants and the necessity to consume them all is very strong. In newspapers and also in official documents, the most important question about EU grants is “did we use all what was available?” or “which local unit is more effective in consumption of EU grants (consumed more)”. There are also published classifications, of “the best” local units, these which received (won) more EU grants. This could provoke competition for conditional grants among potential recipients, based on political rent-seeking behaviors, and finally influence other then granted expenditures of local governments. In next part of this paper, it will be analyzed how EU investment grants influenced municipal operational spending (so other then granted). The research will be based on rural municipalities. As presented the budget of “average” rural municipality is relatively small and even single project co-financed by EU grants usually is very important part of local spending (and revenues). On the other hand the rural municipalities have less sources of own revenues than cities. We believe, that both these elements strengthen potential effect of grants.

4. EU grants in rural municipalities budgets- panel analysis

4.1. Data – source and limitations

Data used in this analysis come from Polish Statistical Office (GUS) and include all rural municipalities of Poland (more than 1500) in years 2006-2009. Earlier period was under interest as well, but before 2006 the EU grants were not differentiated as a category in public statistics of municipal budgets, and generally the structure of older statistics is quite difficult to make it comparable with recent information. However, in dynamic models some data of 2005 were used to construe an aggregate of operational expenditures as lagged variable.

All estimated models attempt to explain the operational expenditures with various sources of revenue of the municipalities. The categories taken into account are own income, unconditional and conditional grants, distinguishing in the former educational subvention, and in the latter EU and non-EU grants as well as whether the grant was earmarked for an investment. All the income/expenditure variables were represented in 2009 PLN per capita. Additional variables include population, indicators for years 2007-2009 (we were especially concerned for the influence of global financial crisis in 2009), and indicators for lack of grant of a given type.

Being interested not only in nominal effects of changes in regressors, but also in elasticities, we have considered both linear and loglinear models. Unfortunately each year about 60% of rural municipalities did not received any EU grant earmarked for an investment, and the problem together with gaps in other grants resulted in drastically diminished sample in logarithms.

4.2. Methodology applied

The panel data approach allowed us to include into consideration dynamic aspects of the relationship, following two main paths of the methodology. First one started from classical model with individual effects constant in time:

$$y_{it} = \alpha + x_{it} + \mu_i + \epsilon_{it}$$

where μ_i may be either component of disturbance (random effects, e.g. Balestra, Nerlove 1966, Maddala 1971) or a series of constants specific for the municipalities, which are reduced from equation through so called “within transformation” rather than estimated because of their cumbersome number (fixed effects, e.g. Mundlak 1963). As in all estimations performed there was an autocorrelation in the time-variable disturbance, the equation was extended with autoregressive process of first order:

$$u_{it} = \rho u_{i,t-1} + \epsilon_{it}$$

where ϵ_{it} is i.i.d. (Lillard, Willis 1978; Lillard, Weiss 1979; Bhargava et al. 1982).

Second path explains the autocorrelation observed in basic model with omitted lags of dependent variable that should be present among regressors. As only four periods of data are available, the considered equation included just one such lag:

$$y_{it} = \alpha + \beta y_{i,t-1} + \gamma x_{it} + \mu_i + \epsilon_{it}$$

Estimation of such a model has to deal with the collinearity of lagged dependent variable and individual effect μ_i – traditionally just removed through differencing the equation (Anderson, Hsiao 1981, 1982) – and then with endogeneity of resulting differences (the same lag of y appears on both sides). The latter problem is solvable by application of further lags of differences or levels of dependent variable as instruments, but the information loss caused by further decreasing already small number of periods makes it difficult to achieve efficient estimators. Subsequent milestones on the road were established by Manuel Arellano and his peers. Initially GMM estimator was proposed that applies different sets of instruments for successive periods, thus utilizing all lags available for each of them (Arellano, Bond 1991). Later it was augmented with original equation in levels supplied with appropriate instruments (Arellano, Bover 1995; Blundell, Bond 1998). Yet another improvement available in the more advanced (“GMM system”) models is the “forward orthogonal deviations” transformation instead of differencing data, allowing to save some observations if there are gaps in the time series. Both caring for the number of observations utilized and for the quality of instruments applied are crucial for the models.

4.3 Estimation results

Table 3 Results of linear models estimation

Equation	Autoregressive disturbance				Lagged dependent variable			
	RE AR(1)		FE AR(1)		Arellano-Bond estimator		Blundell-Bond estimator	
Operational expenditures								
Own income	0,3493	***	0,0294	***	0,0302	**	0,2250	***
General grants (without educational part)	-0,1042	***	0,0453		-0,0278		-0,6963	**
Educational subvention	0,8449	***	0,4702	***	0,4648	***	0,5300	***
Specific grants - operational	1,1366	***	1,0776	***	1,0630	***	1,6712	***
EU grant - operational	0,3282	***	0,4741	***	0,4509	**	0,3594	
Specific grants - investmental	-0,0278		-0,0413	*	-0,0386		-0,0161	
EU grant - investmental	0,1643	***	0,0131		0,0067		0,1155	***
Population	-0,0141	***	0,0649	***	0,0186		-0,0082	*
Year 2007	5,97				65,93	**	-51,18	**
Year 2008	31,23	***	63,63	***	148,73	***	-2,81	
Year 2009	141,41	***	154,66	***	252,70	***	122,25	*
Lagged operational expenditures					-0,0694		0,3428	***
Constant	712,69	***	688,58	***			293,85	***
Number of observations	6343		4754		4753		6342	
Number of municipalities	1589		1587		1587		1589	
Average number of periods	3,99		3,00		2,99		3,99	
AR(1) coefficient	0,2329		0,2152					
Sargan statistic					254,13		105,09	
Hansen statistic					27,86		12,16	

Source: Own calculation based on GUS (Statistical Office) data.

Stars denote significance levels: * p < 5%, ** p < 1%, *** p < 0,1%.

Estimators for the indicators of lack of a given kind of grant were omitted due to their insignificance as regressors; however, they were useful as instruments in models with lagged dependent variable.

Presented results may have various interpretations, especially as for the linear models with autoregressive disturbance. The Hausman test normally used to choose among random and fixed effects indicates there is systematic difference in their coefficients. As the RE should be consistent with FE if the former's assumptions are met (particularly lack of correlation between individual effects and regressors) and FE assessment of the correlation coefficient is about -0,7, we could conclude the random effects model estimators are inconsistent and should be ignored. However, the loss of one period (or a quarter of all observations) in within transformation may degrade the quality of FE estimators and thus also may disturb the Hausman test results.

The dilemma is easier to solve for the linear models with lagged dependent variable – Arellano-Bond estimators do not pass both tests of overidentifying restrictions (Sargan and Hansen test; the second one is robust to heteroscedasticity, but can also be weakened by instruments proliferation) and are significantly less efficient than the GMM system. As the Blundell-Bond estimators are quite close to random effects ones, it may be yet another argument for not rejecting RE so easily.

Table 4 Results of loglinear models estimation

Equation	Autoregressive disturbance				Lagged dependent variable			
	RE AR(1)		FE AR(1)		Arellano-Bond estimator		Blundell-Bond estimator	
Operational expenditures								
Own income	0,0438	***	0,0100		0,0040		0,0376	***
General grants (without educational part)	-0,0349	***	0,0011		-0,0061		-0,0249	*
Educational subvention	0,2438	***	0,3041	**	0,0753		0,0845	***
Specific grants - operational	0,2473	***	0,2812	***	0,2467	***	0,2177	*
EU grant - operational	0,0067	***	0,0034		0,0048	**	0,0063	***
Specific grants - investmental	-0,0068		-0,0058	*	-0,0024		0,0003	
EU grant - investmental	0,0013		0,0021		0,0016	*	0,0013	
Population	-0,0526	***	0,0202		0,2044		-0,0153	*
Year 2007	0,0145	**	2,0414	**	-0,0066		-0,043	***
Year 2008	0,0371	***	2,9618	**	0,0309		-0,0319	*
Year 2009	0,0920	***	3,3972	**	0,0724	**	-0,0051	
Lagged operational expenditures					0,2013		0,5243	***
Constant	4,8123	***	-0,0043				1,7894	***
Number of observations	1242		425		425		1242	
Number of municipalities	817		329		329		817	
Average number of periods	1,52		1,29		1,29		1,52	
AR(1) coefficient	0,4371		0,4371					
Sargan statistic					13,17		85,39	
Hansen statistic					11,68		17,49	

Source: Own calculation based on GUS (Statistical Office) data.

Stars denote significance levels: * $p < 5\%$, ** $p < 1\%$, *** $p < 0,1\%$.

Indicators of lack of a given kind of grant were dropped altogether because zero values became missings in logarithmic transformation.

Loglinear models have greatly suffered because of gaps in data caused by lack of some types of grants for municipalities. As both approaches to dynamic analysis require some time sequences to be present in data, at best (RE and Blundell-Bond models) almost half of the municipalities have been dropped with only one in five observations usable. Worse – more sensitive to the presence of precedent observations – are cases of FE and Arellano-Bond models, where we are left with just about one in ten observations of one in five municipalities.

The standard tests used to qualify the estimators are less decisive – Hausman test have reported its assumption broken (it may be interpreted as the result of different samples), and for Arellano-Bond model the tests of overidentifying restrictions are quite satisfactory. Nevertheless we are tempted to favor random effects and Blundell-Bond estimators.

5. Conclusion

The theory and international evidence present that grants both conditional and unconditional influence local governors spending policy. In this paper we analyzed if and how earmarked investment grants from EU influence municipal spending in general. Taking into account political and social pressure we suspected that these grants “leak” from granted area and impose operational (or other than granted) expenditures.

However the results of computations are not unambiguous. EU investment grants in analyzed panel data models in most estimations (especially log-linear ones) are not statistically significant variable. The sign of coefficient is always positive, but the value is usually very small (close to zero). The only significant result that is not questionable on the grounds of model diagnostics is the Blundell-Bond estimator for linear model – each 100 zloties of EU investmental grant entails 11,55 zloties of operational expenditures. It may be noted that even less significant (on the negative side) are non-EU investmental grants. It means that generally investment grants do not influence importantly operational spending of local units. The small growth of operational spending due to EU project may be normal effect, related with extra organization needs, but the suspected leakage of grant into the spending is not observed

The results of our analysis could also be influenced by problem of data quality. There are at least two problems, which should be taken into account in next studies. First- part of grants as presented by Statistical Office are added to category “own revenues” of local units. The extraction of these donations were not possible- so we need to find more precise data. The other problem is related with moment when grants occur in local budget. As it was mentioned in some of projects, grants only cover already done costs- so the potential changes in spending could be earlier then grant. In order to analyze effect of grants on local spending policy, we would find it more effective, to study spending side rather than revenue side of local budgets and focus on spending related with EU projects than on grants.

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Appendix: Descriptive statistics

Table 5 Descriptive statistics of the raw variables

Sample	Larger (RE, BB)		Smaller (FE, AB)	
	Mean / Proportion	Standard Deviation	Mean / Proportion	Standard Deviation
Operational expenditures	2061,88	499,41	2104,80	497,95
Own income	830,46	1083,53	879,87	1084,78
General grants (without educational part)	364,90	183,42	380,76	189,35
Educational subvention	681,35	120,54	693,11	122,49
Specific grants - operational	496,96	137,96	498,44	141,25
EU grant - operational	11,84	32,53	14,49	36,08
Specific grants - investmental	47,78	83,55	51,14	86,18
EU grant - investmental	46,44	140,05	42,34	134,53
Population	6796	3531	6805	3554
Lack of general grants	3,17%		3,35%	
Lack of EU operational grants	45,99%		34,90%	
Lack of specific investmental grants	17,99%		17,00%	
Lack of EU investmental grants	61,14%		61,31%	
Number of observations	6343		4753	

Source: Own calculation based on GUS (Statistical Office) data.

Table 6 Descriptive statistics of the logarithmed variables

Sample	Larger (RE, BB)		Smaller (FE, AB)	
	Mean	Standard Deviation	Mean	Standard Deviation
Operational expenditures	7,6233	0,1362	7,6233	0,1319
Own income	6,5536	0,4972	6,6191	0,4269
General grants (without educational part)	5,7243	0,8799	5,6908	0,9531
Educational subvention	6,5334	0,1811	6,5323	0,1717
Specific grants - operational	6,1769	0,2818	6,1615	0,2693
EU grant - operational	2,5608	1,1473	2,6963	1,1798
Specific grants - investmental	3,4548	1,3984	3,4334	1,4294
EU grant - investmental	3,3631	1,9766	3,5956	1,9833
Population	8,8248	0,4698	8,8801	0,4679
Number of observations	1242		425	

Source: Own calculation based on GUS (Statistical Office) data.