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How suburbanisation affects the functioning and governing of education at the local level – the evidence from the Poznań metropolitan region (Poland)

Jak suburbanizace ovlivňuje vzdělávací systém na lokální úrovni – případová studie Poznaně

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Abstract

Over recent years one of the most frequently discussed issues in educational geography has been the spatial organization of the primary and secondary educational systems. Researchers have usually concentrated on the problems of functioning of school catchment areas and showed the relations between the motives behind the choice of a given school, pupils' social background, their educational achievements as well as the policy of authorities at different levels of government. The majority of works concerned urban schools and – if one may say so – "the urban educational system." Nevertheless, it seems that these days the greatest problems related with the management of education occur in areas located in the vicinity of big cities. Intensive suburbanization and a resultant increase in connections between the city functioning as a center and adjoining communes lead to: (a) significant changes in the number of pupils in school districts, (b) an intensification of pupils' movement between the city and surrounding communes and (c) necessity of reorganization of the school network. This article attempts to answer a question as to how the process of suburbanization of a big city (Poznań) impacts on the functioning of local education and on the educational policy of the communes in Poznań metropolitan region.

Keywords: education, schools, suburbanisation, Poznań, educational expenditures.
Klíčová slova: vzdělávání, školy, suburbanizace, Poznaň, výdaje na vzdělávání

1. Introduction

This article aims at answering the question on how suburbanisation processes which take place in the metropolitan regions impact education management. This issue has been analysed on the basis of the functioning of the primary education system in the Poznań metropolitan region, Poland. The primary education was chosen for the reason that pursuant to the Polish Act on the Education System (Journal of Laws 1991, No. 95, item 425, as amended) it constitutes one of the two levels of education (apart from the lower secondary school education) whose organisation local authorities are responsible for. For that purpose, pursuant to the Act on the Income of Local Government Units (Journal of Laws 2003 No. 203, item 1966, as amended), districts receive funds from the state budget (the so-called educational subsidy).

Considering the aforementioned legal regulations, it may seem that the issue connected with education management is settled therefore by districts themselves. In practice, however, it often goes beyond the area of individual districts – a significant number of children attend primary schools and lower secondary schools located outside the district where they live. Therefore, it may be stated that in practice local primary and lower secondary school systems in Poland are partially systems without set boundaries in terms of the area they encompass. The area which the problem mostly refers to includes the metropolitan regions where intensive suburbanisation processes entail a number of consequences germane to education management (see, among others, Lisowski and Grochowski 2008). The article, drawing on the study of the Poznań metropolitan region (PMR) presents the most important ones:
1) changes in the distribution of pupils and schools;
2) increased movement of pupils among districts;
3) problems of forecasting the number of pupils; and
4) costs of extending school infrastructure in sub-metropolitan districts.

2. Distribution of schools and pupils

In 2002-2008 the number of primary school pupils of PMR decreased from 61,500 to 51,100 (by 17 per cent). The fall, likewise in the other Polish metropolitan regions, resulted primarily from the fact that the primary education was started by less populous years of children of parents born in the period of population decline which took place in the second half of the 60s and the first half of the 70s of the 20th century. As much as 62 per cent of the fall referred to Poznań, where the number of pupils went down from 33,100 to 26,600 (by 20 per cent). In Poznań an additional reason of the fall in the number of pupils lay in intensive migrations of families with their children to neighbouring districts (in 2002-2008 more than 15,000 people moved from Poznań to districts situated in its vicinity). The two aforementioned

processes led to the less effective use of the Poznań educational infrastructure.

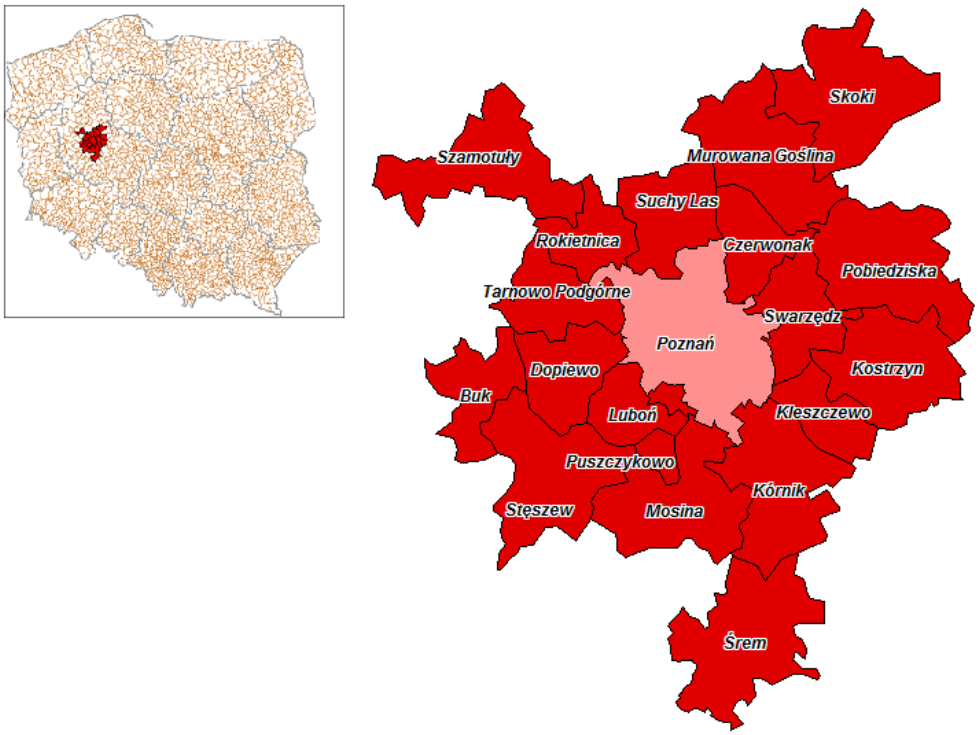

Fig. 1. Geographical position and internal structure of Poznań metropolitan region
Source: own construction

Table 1. Primary education in the Poznań metropolitan region in 2002 and 2008

District	Number of schools		Number of classes			Number of pupils		
	2 002	2 008	2 002	2 008	Dynamics 2002-2008 (2002 = 1)	2 002	2 008	Dynamics 2002-2008 (2002 = 1)
Buk	5	5	51	45	0,88	1081	899	0,83
Czerwonak	5	5	70	68	0,97	1582	1 389	0,88
Dopiewo	8	7	55	56	1,02	929	982	1,06
Kleszczewo	3	3	30	26	0,87	532	483	0,91
Komorniki	6	5	39	47	1,21	728	832	1,14
Kostrzyn	6	6	62	59	0,95	1329	1 092	0,82
Kórnik	4	4	55	56	1,02	1254	1 138	0,91
Luboń	4	4	79	79	1,00	1895	1 814	0,96
Mosina	10	9	94	85	0,90	1880	1 668	0,89
Murowana Goślina	5	5	68	55	0,81	1492	1 091	0,73
Pobiedziska	8	7	71	65	0,92	1460	1 202	0,82
Poznań	92	89	1 553	1 290	0,83	33149	26 585	0,80
Puszczykowo	2	2	28	25	0,89	737	593	0,80
Rokietnica	3	2	24	24	1,00	487	518	1,06
Skoki	6	6	40	42	1,05	778	621	0,80
Stęszew	6	5	56	44	0,79	1189	976	0,82
Suchy Las	6	4	51	52	1,02	903	985	1,09
Swarzędz	7	6	135	122	0,90	3014	2 478	0,82

Szamotuły	9	9	114	100	0,88	2290	1 837	0,80
Śrem	10	10	149	125	0,84	3374	2 596	0,77
Tarnowo Podgórne	5	5	70	64	0,91	1446	1 321	0,91
PMR	**210**	**198**	**2 894**	**2 529**	**0,87**	**61 529**	**51 100**	**0,83**

Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

Data displayed in Table 1 shows, however, that the decline in the number of pupils did not refer to all metropolitan districts – this number rose in 4 out of 21 districts. The rise varied from 6 per cent (Dopiewo and Rokietnica) to 14 per cent (Komorniki). All the four districts are direct neighbours of Poznań and constitute the area characterised by the biggest growth of single-family housing and the most significant developer investment in the vicinity of Poznań (cf. Łodyga 2008; Marcinowicz 2008).

A temporary reaction to the fall in the number of pupils observed in most metropolitan districts was reducing the number of school classes. However, the reduction as far as the whole metropolitan region is concerned was smaller than the fall in the number of pupils (the latter fell by 17 per cent, while the number of classes was reduced by 13 per cent, cf. Table 1). That led to the decrease in the number of pupils in an average school class. The smaller number of pupils and school classes did not have any significant impact on the network of schools. In 2002-2008, the number of primary schools went down by a merely 6 per cent (by 12). The above facts and data lead to a conclusion that the school network was fairly resistant to demographic changes. It seems that there were two key factors of that resistance: 1) the spatial structure of the settlement network in rural areas, which frequently makes it impossible to close some of schools (see, among others, Herbst et al 2009); 2) the intention of school closing itself usually leads to numerous protests of local communities (mainly parents).

3. Movement of pupils between districts

Although it is the district's responsibility to organize the primary and lower secondary school education and control whether the school duty is fulfilled on its area, the problem of the primary education in the PMR goes beyond the area if individual districts. That is due to the growing number of pupils attending schools located in other districts. This number was estimated by referring the number of primary schools pupils to the number of children aged 7-12 (corresponding to the primary school age band).

The calculations made showed that the estimated number of pupils attending schools located in other districts increased in the PMR from 1,800 to 3,800 in 2002-2008 (by 102 per cent).

The main trend influencing district connections in terms of the primary and lower secondary school education is that more and more children who live in districts in the Poznań neighbourhood attend schools in Poznań. In 2002 the estimated increase of primary school pupils in reference to children aged 7-12 came in Poznań to 620, which corresponded to the value of the gross schooling rate of 1.02 (Table 2). Until 2008 the surplus of Poznań primary school pupils over children aged 7-12 went up to 1,700. As a consequence, the gross schooling rate grew to 1.07. The increase in the number of children living outside Poznań who attended primary schools in the city led to the fall in the number of those children attending local schools.

Table 2. Relationship between the number of primary school pupils and the number of children aged 7-12 in Poznań metropolitan region (PMR) in 2002 and 2008

District	2002 r.					2008 r.				
	Number of pupils	Number of children aged 7-12		Number of pupils / number of	Number of pupils - number of	Number of pupils	Number of children aged 7-12		Number of pupils / number of	Number of pupils - number of
		A	B				A	B		
Buk	1081	1060	1061	1,02	20	899	895	884	1,02	15
Czerwonak	1582	1747	1749	0,90	-167	1389	1603	1584	0,88	-195
Dopiewo	929	988	989	0,94	-60	982	1223	1209	0,81	-227
Kleszczewo	532	469	469	1,13	63	483	488	482	1,00	1
Komorniki	728	1003	1004	0,73	-276	832	1178	1164	0,71	-332
Kostrzyn	1329	1310	1311	1,01	18	1092	1126	1113	0,98	-21
Kórnik	1254	1336	1337	0,94	-83	1138	1390	1374	0,83	-236
Luboń	1895	1871	1873	1,01	22	1814	1919	1896	0,96	-82
Mosina	1880	1892	1894	0,99	-14	1668	1764	1743	0,96	-75

Murowana	1492	1487	1489	1,00	3	1091	1108	1095	1,00	-4
Pobiedziska	1460	1450	1451	1,01	9	1202	1174	1160	1,04	42
Poznań	33149	32496	32529	1,02	620	26585	25217	24920	1,07	1665
Puszczykowo	737	664	665	1,11	72	593	564	557	1,06	36
Rokietnica	487	641	642	0,76	-155	518	827	817	0,63	-299
Skoki	778	797	798	0,98	-20	621	627	620	1,00	1
Stęszew	1189	1217	1218	0,98	-29	976	1021	1009	0,97	-33
Suchy Las	903	865	866	1,04	37	985	1026	1014	0,97	-29
Swarzędz	3014	3138	3141	0,96	-127	2478	2782	2749	0,90	-271
Szamotuły	2290	2273	2275	1,01	15	1837	1775	1754	1,05	83
Śrem	3374	3365	3368	1,00	6	2596	2589	2559	1,01	37
Tarnowo	1446	1397	1398	1,03	48	1321	1413	1396	0,95	-75
PMR	**61529**	**61466**	**61529**	**1,00**	**0**	**51100**	**51709**	**51100**	**1,00**	**0**

Explanations: A – the real number of persons in a given age band; B – the corrected number of persons in a given age band
Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

Such a phenomenon led to the situation where the share of children and young people living in districts around Poznań who learn in local schools is falling. The problem refers particularly to districts directly bordering Poznań (Figure 2). While in 2002 the surplus concerned 4 districts bordering Poznań, in 2008 the figure came to merely 2. What strikes even more attention is the range of educating children outside a district. In 2008 there were over 300 primary school pupils from Komorniki who learned outside the district, and over 200 pupils from the other districts including Dopiewo, Kórnik, Rokietnica, Swarzędz, and over 100 pupils from Czerwonak. Referring the rise in the number of children at the school age to the number of pupils, it turns out that in 2008 37 per cent of children at the age of primary school who lived in Rokietnica learned outside the district; the same phenomenon concerns 29 per cent of children from Komorniki and 19 per cent from Dopiewo. The figures directly lead to the conclusion that districts located in the vicinity of Poznań are losing their self-sufficiency in terms of the primary and lower secondary school education and are becoming more and more unofficially dependent on education in Poznań and its educational infrastructure.

Figure 2 shows that districts with the biggest 'shortage' of pupils border Poznań directly. These districts are characterized by one of the highest rate of migrant population increase in the 90s of the 20th century and the first decade of the 21st century as a result of the intensive development of housing construction in connection with the suburbanisation process of Poznań [cf. Łodyga 2008, Marcinowicz 2008, Beim 2009]. After moving to districts around Poznań, Poznań dwellers often resign from a local school and decide to drive their children to a school located in the city. Another common situation is that after moving to a neighbouring district, parents decide to continue their children's education in the school in Poznań which they previously attended.

Despite the lack of relevant research on real reasons why children and young people from districts around Poznań attend city schools, there are primarily two of them that may be pointed out. Firstly, dwellers of districts in the vicinity of Poznań believe that the level of education in Poznań schools is higher than in their local schools [Mikuła 2009]. Secondly, there are problems connected with school infrastructure in those districts (shortage of places in schools). Such problems concern: (1) schools located in the areas characterised by the intensive development of housing construction within the last years and (2) schools conveniently situated in terms of transport, i.e. near access roads to Poznań (between the place of living and parents' work). Since infrastructural investment is costly and characterized by a long implementation period, in the time of a dynamic increase in the number of children, it is likely that submetropolitan districts will not be able to keep up with extending school infrastructure.

4. Forecasting the number of pupils

The increasing number of pupils from districts bordering Poznań who attend schools situated in Poznań leads to the growing problem of forecasting the number of pupils in the following years. Districts cannot rely on information about the number of individual years as much as they used to anymore. The problem is well demonstrated in data from districts directly bordering Poznań: Kleszczewo, Kórnik, Luboń, and Tarnowo Podgórne (Table 3). In 2002-2008 despite of the increase in the number of children at the primary school age, they reported the fall in the number of pupils in local schools. It seems, therefore, that one of the basic tools for managing education in submetropolitan districts should involve not only tracking numbers of individual years but also educational flows of children and young people to main cities and its conditions.

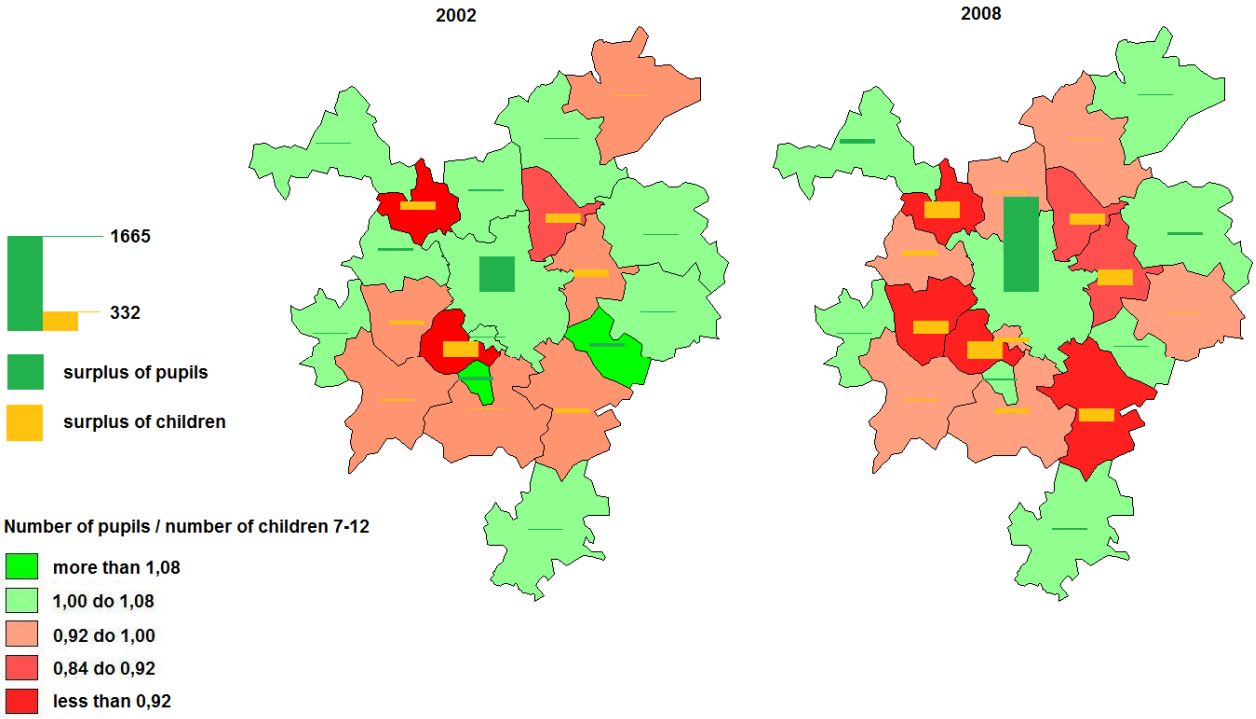

Fig. 2. Spatial diversification of the relationship between the number of primary school pupils and the number of children aged 7-12 in Poznań metropolitan region in 2002 and 2008
Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

Table 3. Districts in Poznań metropolitan region which in 2002-2008 saw the fall in the number of primary school pupils with the growth of children and young people in a relevant age band

District	Number of pupils			Number of children aged 7-12			Number of pupils / number of children aged 7-12		
	2002	2008	Dynamics 2002 -2008 (2002 = 1)	2002	2008	Dynamics 2002 -2008 (2002 = 1)	2002	2008	Dynamics 2002 - 2008 (2002 = 1)
Kleszczewo	532	483	0,91	469	488	1,04	1,13	0,99	0,87
Kórnik	1254	1138	0,91	1336	1390	1,04	0,94	0,82	0,87
Luboń	1895	1814	0,96	1871	1919	1,03	1,01	0,95	0,93
Tarnowo Podgórne	1446	1313	0,91	1397	1413	1,01	1,04	0,93	0,90

Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

5. Costs of extending school infrastructure in sub-metropolitan districts

A dynamic rise in the number of school-aged children in sub-metropolitan districts not only leads to larger current expenditure on education (the state subsidy for education is usually sufficient to cover around 70-80 per cent of current expenditure on education in districts – see Herbst et al 2009) but also to the need for extending the school infrastructure (renovations and expansion of schools, building the new ones).

The analysis of average annual expenditure in the education sector per one pupil in 2002-2008 (Figure 3 and 4) shows that the highest property expenditure per unit in the education sector was observed in districts bordering Poznań, which saw the dynamic growth of population in recent years leading to the necessity for extending educational infrastructure (cf. Table 1). The expenditure in 3 districts exceeded PLN 1,600 per pupil (over CZK 10,000) annually. The lowest average property expenditure in the education sector was characteristic of those districts which in 2002-2008 saw usually a considerable fall in the number of school-aged children (cf. Table 1). As a result, instead of developing educational infrastructure, those districts had to take steps to reduce expenditure on education, e.g. opening fewer classes.

The amount of property expenditure in the education sector per one pupil corresponds to its share in the total of districts' educational expenditure (Figure 5). This share in districts with the highest property expenditure per a pupil exceeded sometimes as much as 25 per cent of the total expenditure on education (Dopiewo).

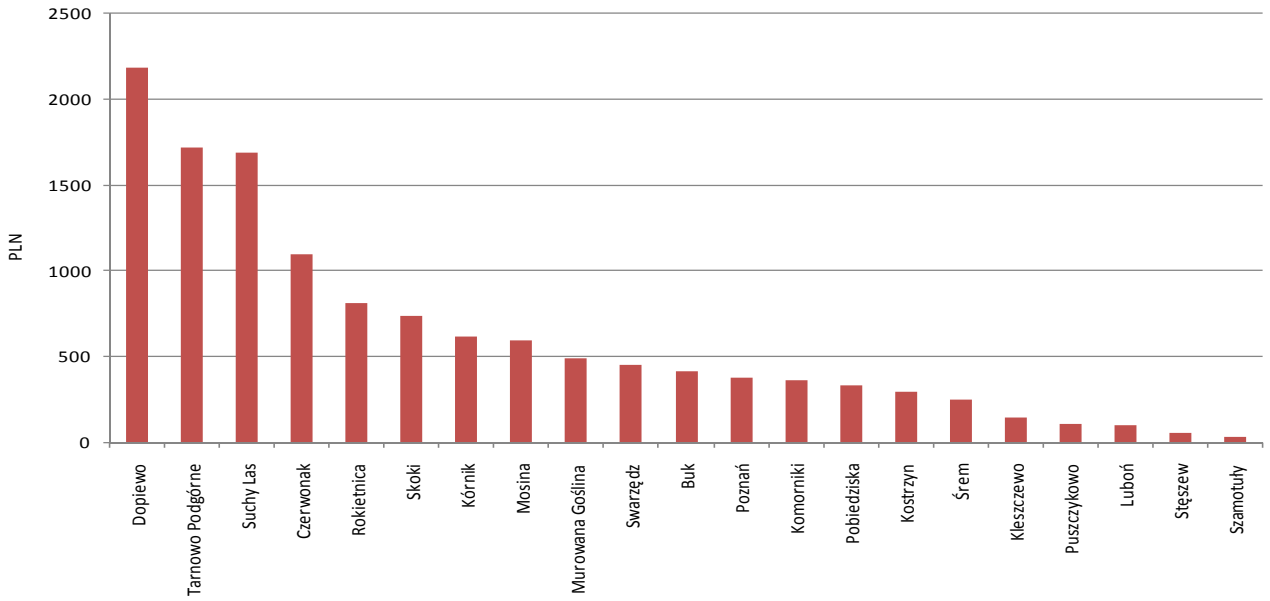

Figure 3. Average districts' property expenditure in the education sector in Poznań metropolitan region in 2002-2008 (per pupil annually, in PLN)
Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

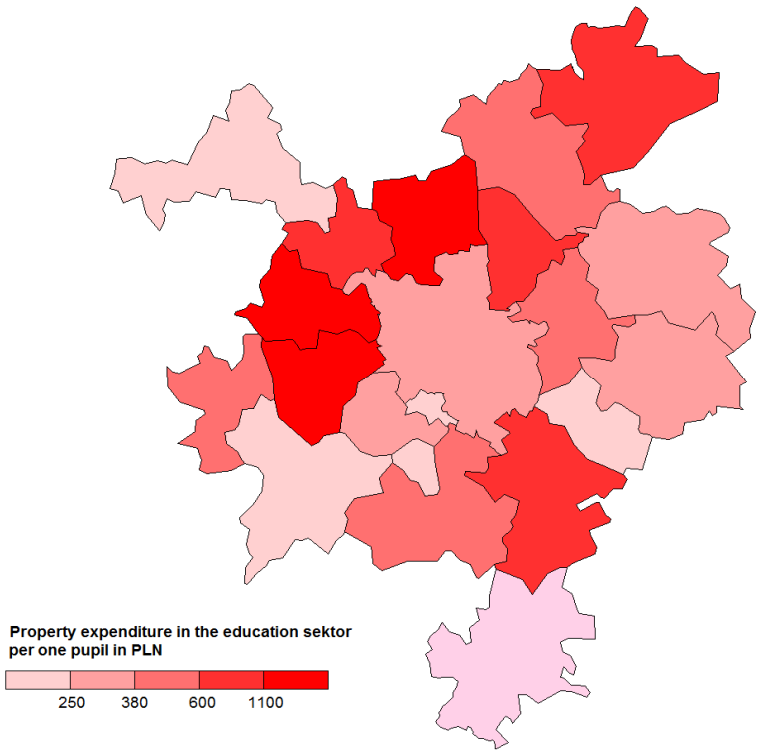

Figure 4. Spatial diversification of average districts' property expenditure in the education in Poznań metropolitan region in 2002-2008 (per pupil annually; in PLN)
Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

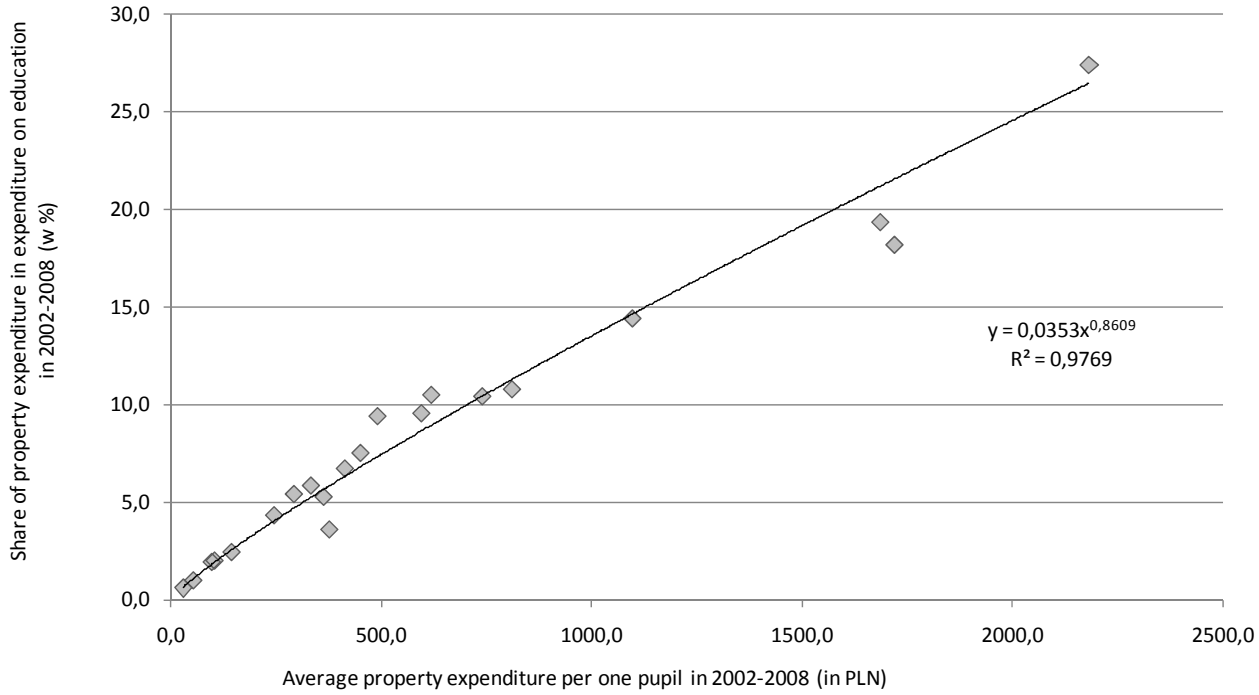

Figure 5. The relationship between average districts' property expenditure per pupil annually and the share of districts' property expenditure in expenditure on education in Poznań metropolitan region in 2002-2008
Source: prepared on the basis of the Regional Data Bank of the Polish Central Statistical Office

6. Conclusions

The article attempted to demonstrate the most important consequences of suburbanisation for education management in Polish metropolitan regions, basing on the case of the Poznań metropolitan region. Drawing on the analysis presented in the body of the article, it may be concluded that suburbanisation processes lead to the following phenomena: 1) the necessity for the reorganisation of the school network; 2) higher frequency of pupils' journeys from sub-metropolitan districts to schools located in the main city of a region, which at the same time makes it more difficult to estimate the number of future pupils; and 3) significant increase of educational expenditure of sub-metropolitan districts on extending school infrastructure. Furthermore, other processes not analysed in the article should be also added to the aforementioned list of consequences of suburbanisation. They include polarization of school infrastructure in sub-metropolitan districts, the necessity of modifying school catchment areas, and, what sparks controversy among districts mayors and parents, the issue of costs referring to educating pupils outside a district (Poznań primary schools educate over 1,600 pupils living outside the city, which costs them additionally around PLN 1,800 – CZK 11,000 per pupil annually).

Only on the basis of the aforementioned conclusions it may be observed that suburbanisation processes hinder education management both in main cities and submetropolitan districts. In both cases the processes also lead to increased costs of education, which are consequences of decreasing adequacy of the distribution of children and schools. Until accurate economic analyses are conducted, it will not be possible to provide a clear answer to the question of who pays more for educational repercussions of suburbanisation (submetropolitan districts or main cities).

On the one hand, sub-metropolitan districts have to extend school infrastructure and incur additional costs of a still growing number of children, but on the other hand, with the inflow of population there is increase in submetropolitan districs' tax base, i.e. the number of registered tax payers who pay Personal Income Tax to the district's budget (in Poland this tax is paid according to a place of residence; nearly 40 per cent of this tax goes to the district's budget).

When it comes to the main city of a region (including Poznań), on the one hand suburbanisation and its consequences incur the rising expenditure on extra costs of education of pupils living outside the city with a diminished tax base at the same time, but on the other hand, pupils from sub-metropolitan districts enable a better use of the existing school infrastructure, which

makes it possible to reduce unit educational costs and sometimes avoid the necessity of closing some schools.

In the years to come there should be a mechanism put in place for financial flows among districts connected with the flow of pupils among districts. Such a system could not only compensate main cities (including Poznań) for costs of educating children from outside but also, with promoting education in them, it could lower unit costs and reduce the need for extending school infrastructure in sub-metropolitan districts.

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