Edukacja 2014, 5(130), 40–56
An interdisciplinary approach
ISSN 0239-6858

Family socio-economic profile and private spending on educational goods and services in Poland

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According to theory, educational goods and services have an important impact on a child's human capital. Although the majority of educational services in Poland are delivered within a public education system, various educational costs are borne by parents. This paper looks at the socio-economic determinants of private spending on education, including fees, private tutoring and courses, educational goods and materials, and the internet. The analysis was performed using the Polish Household Budget Survey for 2009 and 2010. Results from a logit regression suggest that disposable household income per capita and parental level of education, especially mother's level of education have the greatest impact on spending on educational goods and services. This was true for all analysed categories of expenditure. Regional disparities and community size were an important factor especially with regards to spending on private tutoring and additional courses.

Keywords: education economics, private educational expenditure, educational goods and services, financing of education, statistical analysis.

In order to clarify the differences in school achievement and their effect in the form of the obtained level and type of education, references are usually made to models of functioning of the educational system on the one hand, and the actions of families in the scope of educating their children on the other. It is expected that the prevalence of public education should separate the school achievements from the determining impact of characteristics and actions of the families in this regard, whereas the prevalence of private education increases that influence. There is a free, uniform, and compulsory system of primary and upper secondary education in Poland, with just a small number of private schools and institutions.

Nevertheless, there occur large educational differences, resulting, among other things, in a clear selection at the university level and selection on the labour market.

Article was developed within the seminar from the series research and educational policy entitled "Expenditures on education and its effects in the context of the labour market" organised by the Educational Research Institute in November 2012 within the systemic project "Quality and effectiveness of education – strengthening of institutional research capabilities" and financed from the European Social Fund (Human Capital Operational Programme 2007–2013, Priority III: High quality of the educational system, Submeasure 3.1.1 Creating the conditions and tools for monitoring, evaluation and research on the educational system). This article was published primarily in Polish language in *Edukacja*, *121*(1) 2013.

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What may be one of the factors that differentiate educational opportunities – and thus later economic and social inequalities – is the differentiation of private expenditures dedicated to the education of children and adolescents, beside their use of public educational services (Kevin, 2002; Cardak, 1999). Those expenditures are the topic of this article.

Theoretical context and research hypotheses

According to the economic theory (Becker, 1964; Becker and Tomes, 1986), beside the time devoted to a child, investments in goods and educational services have a direct impact on the development of the human capital of the child. Their size depends on many factors. In the model approach of Becker, it is limited chiefly by budget constraints of a given household, that is the income available to its members. Another factor which, according to the theory, influences educational expenditures is the expected rate of return to education analysed in intergenerational models. Expenditures on enhancing the human capital of children are a form of cost for their parents which, according to the classical assumption of rational behaviour, is comparable to the obtained benefits. And benefits from education are mainly operationalised on the labour market in the form of the level of return (pay) from levels and types of education.

Although the budget constraints seems well described and is a relatively uniform factor influencing the expenditures, estimation of the benefits for parents from education of their child is a much more complex area for analysis, not always easy to quantify. First of all, the assessment of the relative costs and benefits related to a child's education depends on the parents' knowledge on the educational system, their expectations and aspirations, which seem to be much more difficult to identify and quantify. What is a certain approximation of the educational expectations towards the child's educational level is the parents' educational attainment, although it is not an impeccable indicator. At the same time, the level of the parents' education may make it much easier for them to obtain information both on the system of public education, and its requirements, as well as on the paid educational offer (Domański, 2008).

Besides the above-mentioned demand factors, educational expenditures tend to increase due to – as in the case of every market – the supply side. Besides the above-mentioned demand factors, there is also the supply side, which should be considered, as in the case of every market.

Educational services and goods may be available in the form of public good, the availability of which is determined by the state, and in the form of goods and services offered on market principles against payment. On the one hand, supply of public educational services and goods should minimise private educational expenses – such a situation exists in the Nordic countries (James, 1993); on the other hand, availability of private educational services and goods makes it possible to satisfy the reported demand, in the case when the public system does not meet all needs of children in the opinion of themselves or their parents. Therefore, three forms of participation in education are possible:

- use of the public educational system only;
- participation in public school system in combination with partial, supplementary use of services on the private market of educational goods and services;
- participation in the private system only.

The use of public educational services – even if commercial services are not utilised as a supplement – may require partial financial participation on the part of the parents (when e.g. participation in school classes is not related to ensuring commuting to school, the school does not ensure full equipment of the students with school resources, etc.). Then, such expenses are incurred by households.

This study offers an analysis of a situation in which households that use the public education incur private educational expenditures, both for extracurricular classes and participation in public school education, as well as an attempt at determining their social and economic characteristics in comparison to households that use only what is offered and provided by public institutions.

This paper compares the socio-economic characteristics of households which, while using the public educational system, also incur private educational expenditures to those households which only use what is offered and provided by public institutions.

For it seems that additional private expenditures on education can differentiate the effects of teaching, assumed to be uniform in publicly available educational service. Private educational expenditures provide children with better educational conditions, ensure better studying resources or guarantee participation in a greater number of activities that supplement the standard school offer.

Educational expenditures are a very spacious category and their components are of unequal importance in the educational process. Therefore, we will analyse the determinants of four different categories of expenditures: (a) school fees, influencing what a child can obtain in a school (fees for school events, insurance, prices); (b) private tutoring and courses, that is the use of educational services outside of the public school; (c) educational goods (books, textbooks, other teaching resources etc.), which influence the conditions, which a child has for using the educational services, which support the learning process; as well as (d) fees for internet access, which we treat as a variable that demonstrates children's access to the world of information obtained through that medium.

In the study, we formulate hypotheses that explain educational expenditures of households for a school student, depending on the characteristics of households that shape both the possibilities, and motivations for incurring such expenditures.

Firstly, financing of education of children depends on the budget constraints of their households. They can be identified approximately by means of the affluence of households, expressed by:

- disposable income per capita;
- wealth (in the Polish conditions, owning a flat is a distinguishing feature, especially as opposed to renting a flat, which generates additional fixed costs and, limits the possibilities spending on other purposes).

We assume that affluence expressed in this way increases the likelihood of incurring private expenditures on education of children who attend public schools. However there are some confounding factors which lessen the overall impact. For example the number of dependent children under the age of 18 increases the general level of expenditures, which has a negative impact on educational expenditures on one child. The fact that a child lives in a single parent family, whose living costs per person are higher than in full families, act in the same direction (reducing expenditures). In addition, a single-parent family is characterised by a higher income risk, which may lead to the choice of more conservative expenditure options and limitation of investment expenditures – on education of children, in this case.

Secondly, we assume that the parental educational attainment, expressed as the highest level of education obtained by both the child's father and mother, has a positive impact on increasing expenditures on private tutoring and educational goods, directly leading to the growth of the child's human capital. Also expenditures on school fees, including those related to participation of the child in additional activities or school events, should tend to grow in proportion to the parental educational attainment. Economic causes that lie behind the positive connection between the education of parents and investing by them in the education of children, is a higher

motivation for recreating the professional and income level in the next generation, as well as better understanding of the connection between education and the future position, as well as the connection between expenditures on education and the results and educational advancement (Leibowitz, 1974; Haveman and Wolfe, 1995; Gang, 1997). People who are better educated are characterised by a lower information barrier. This leads to choices of more effective and better suited educational goods and services. However due to lack of appropriate data we will not focus on this aspect of research. A similar role – increasing the ability to identify the educational needs of children and understand the connection between expenditures on their learning and later benefits – can be played by the professional activity of the parents. Activity on the labour market contributes to better understanding of the role of education in later professional career, and on the other hand, constitutes the basis for income security. It also reduces the risk of losing income, so should have a significant impact on investing into children's education.

Thirdly, we assume that living in rural areas and in small towns may significantly reduce the use of additional, paid educational services. The supply of private educational services depends, among other things, on the size of locality, so the place of residence may significantly determine educational expenditures, especially on private tutoring and courses. At the same time, we expect that the impact of the size of locality will be of lesser importance in the case of expenditures on goods, such as books or teaching resources. As regards fees, it is difficult to identify the existence of an interdependency between the fact of incurring them and the size of locality inhabited by the family, as their scale may depend on the activity of the educational institutions, which is not related to the living environment.

Fourthly, stating that local differentiation of the public educational system may result in differing needs for the use of private educational goods and services, one should expect that the impact of variables that identify local governments (*gminas* (NUTS 5) or *poviats* (NUTS 4)) will be statistically significant (Domański and Pokropek, 2011). We do not have data on private expenditures allowing for identification of such low level of administrative units, so based on the neighbourhood principle (standardisation of behavioural patterns), we introduce a regional identifier on a: voivodeship (NUTS 2) level. The use of such a level of aggregation obliterates the within voivodeship differences and does not allow for direct assessment of educational policy coordinated at a lower level of local government, but it results from the limitations in the data coverage.

Data sources and their specification

The analysis is based on data from the years 2009 and 2010, coming from the Household Budget Survey (*Badanie budżetów gospodarstw domowych*, BBGD) carried out by the Central Statistical Office. The surveys are representative for Poland, based on a sample of households excluding households in collective housing institutions and immigrants' households, whose members cannot speak Polish. Every month, the survey covered around 3130 homes (totalling around 37 500 over the year)[1].

Although the BBDG is the best database on household expenditures in Poland, as regards the analyses of educational expenditures, it has some limitations. First of all, it does not include information on the purpose of expenditures, so e.g. we cannot distinguish

[1] A sampled household is obliged to keep a monthly specification of all incomes and expenditures, both monetary and in kind, along with a precise indication of the volume of purchased goods and paid services. Additionally, information on household material resources and the social and demographic situation of all members is collected. The definition of household adopted in the BBGD covers a group of people, relatives or not, living together and sharing their income (GUS, 2009; 2010).

expenses related to commuting of children to school amount from the transport expenses, while in clothes purchases – those that are a required school uniform. Thus, it was not possible to capture all expenditures related to participation of a child in education. Another limitation stems from aggregation of data at the household level, which excludes attribution of a specific expense to a child at a specific age, of specific sex or studying in a specific type of school. Therefore, we analyse the occurrence of an educational expense in a given household per an average child, rather than meeting educational needs of a specific child. In addition, deficiencies or insufficient scope of information on monthly income among farmers and self-employed people lead to exclusion of those groups from analysis.

For the study, we only used households with children at the age of 6–19, due to different rules concerning financing pre-school education and higher education, and the non-compulsory nature of education for omitted age groups. Households, in which the total monthly amount of expenditures on school fees per child aged 6–19 exceeded PLN 100 were excluded from the analysis. This constitutes 2% of our sample restricted to children aged 6–19. The data from the CSO's Local Database (*Bank Danych Lokalnych*, BDL) indicated that the share of students in the period under analysis who attended non-public primary schools was 3%, lower secondary schools 4%, and general upper secondary schools 5%. The amount of PLN 100 is, therefore, the lower threshold, which will enable exclusion from the analysis of those households that used only the services of non-public schools. We also tested other threshold amounts (PLN 150; 200), which slightly increased the sample of children in public schools, and reduced the sample of children in non-public schools (1% for PLN 150 and 0.6% for PLN 200, respectively). Such an insignificant increase in the volume of the sample did not influence significantly the results of our analyses. Thus, we decided that the monthly fees for school exceeding PLN 100 indicate the use of non-public schools instead of public ones, and we excluded that group from further analyses due to the goal of the research.

As we mentioned earlier, the analysis was carried out for three separate categories, which covered:

- school fees;
- fees for private tutoring and courses;
- expenses on resources and materials: purchase of books intended for educational purposes, purchase of newspapers and magazines intended for educational purposes, purchase of prints intended for educational purposes, purchase of stationery, drafting and painting materials intended for educational purposes;
- internet access fees (with full awareness of its use not only by students and not only intended for educational purposes).

Frequency of private expenditures on education of public school students

The categories of expenditures we mentioned above vary slightly in terms of the conditions, specificity and probably also a different rang of impact on children. School fees are a category that is under a much greater impact of external factors than household characteristics, including the rates of fees established by the school board, the valid insurance rates or costs of events organised by the school, failure to subsidise which excludes the child from participation in school life. At the same time, those are the fees that occur mostly at the beginning of a semester or school year, so they play a smaller role in monthly study of budgets – they appear in 13–11% of responses (in 2009 and 2010, respectively).

Another category is formed by private tutorials and courses. Those are additional educational services, available against payment and completely voluntary. Their main purpose is to supplement the student's deficiencies in

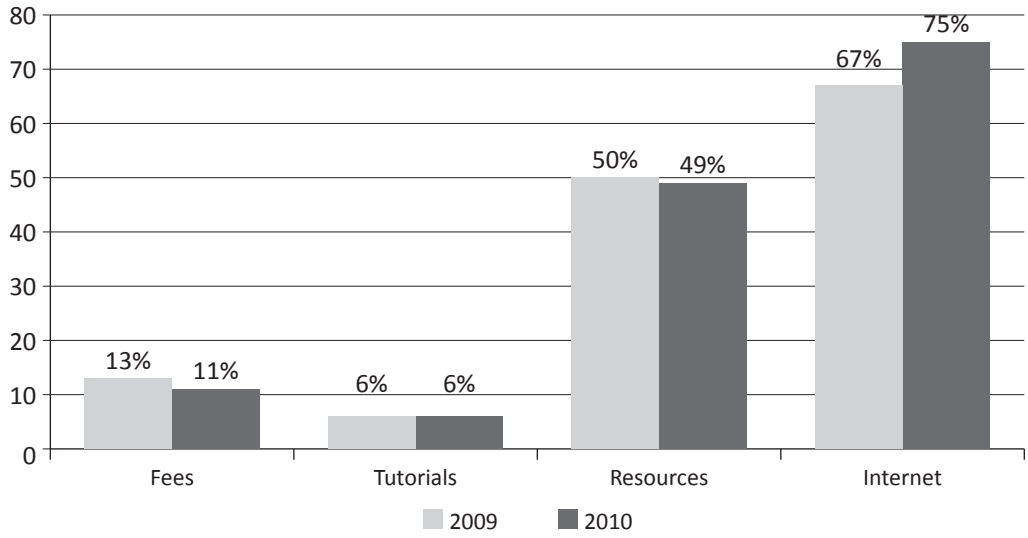

Figure 1. Share of households with children aged 6–19 that incur monthly educational expenditures, by the selected categories.

school knowledge or to extend the curriculum beyond that offered by the public school. Households have more freedom and influence on incurring that kind of expenses, as long as the access to such services is satisfactory. It is not, however, a common phenomenon – at the scale of the country, only about 6% of families with school children incur such an expense monthly on average (Figure 1).

During the month covered by the survey, educational materials (educational books, stationeries, resources) were purchased in half of the analysed households, and the most frequent expenses were internet access fees. Such a high position of internet access charges in the household budget may result from the specificity of the expenditure – it is incurred every month, unlike other, sporadic, educational expenses. Although it is difficult to consider the internet as such as an educational good, lack of access can seriously narrow down access to resources and information, not only in the scope of the curriculum, but also the general knowledge about the world.

Pursuant to the theory and hypotheses presented above, the per capita household income significantly influences educational expenditures. Indeed, the specification presented in Table 1 seems to reinforce that thesis. Households with the lowest income (less than PLN 546 per person) are much less likely to allocate a part of it to education, as compared to households from the higher income ranges, although the differences are not identical in specific categories of expenses. Although school fees are incurred by 10.6% of the poorest and 13.3% of the richest families, the differences in the case of private tutoring and courses are much greater: 1.4% compared to 13.1% of households with the lowest and the highest incomes, respectively. A similar stratification can be observed in terms of paying for internet access.

The results presented in the Table 1 indicate only some tendencies, rather than causal relations. The fact that income determines educational expenditures to such a high degree may also result from the fact that higher income is obtained e.g. by people with higher level of education, and it is not really the income, but the educational level that is the main determinant of the differences. Therefore, we will analyse the association between all factors identified in the

Table 1
Share of households with children aged 6–19 that incur monthly educational expenditures by disposable income (in %)

Income per person	Fees	Tutorials	Resources	Internet
Under 25th percentile	10.59	1.37	46.37	49.14
Between 25th and 50th percentile	12.04	2.79	48.96	65.45
Between 50th and 75th percentile	12.93	5.88	50.16	76.95
Above 75th percentile	13.33	13.14	52.30	84.49

Note: 25th percentile at the level of PLN 546, median at the level of PLN 790; 75th percentile at the level of PLN 1133.

theory, controlling the level of other features that might influence the result along the way.

Determinants of private educational expenditures

To separate out the force of impact of specific factors, we used the logistic regression model – we estimated the empirical model with the maximum likelihood estimation method: where the latent variable, and the observed result is:

$$W_i^* = \alpha + \beta X_i + \gamma Z_i + e_i$$

where is a latent variable, and the observed result is $W_i = \begin{cases} 1 \text{ if } W_i^* > 0 \\ 0 \text{ if } W_i^* \leq 0 \end{cases}$

and where:

- W_i the dependent variable, which in the first specification takes the value 1 if a household incurred any educational expenditure, and 0 otherwise; in the second specification, value 1 is adopted if a household has incurred expenditure on school fees, in the third one if it paid for private tutorials and courses, in the next specification value 1 is adopted if a household had expenses on educational materials and in the last specification dependent variable takes the value 1 if a household paid – internet access fees.
- X_i is the vector of individual and family characteristics of a household – including the logarithm of disposable income, the number of children up to 18, a set of binary variables that describes three levels of educational attainment (higher, secondary, below secondary) of the father and mother, a binary variable that describes the situation of the father and mother on the labour market (adopting the value of 1 for people in employment and 0 for unemployed people), the set of binary variables determining home ownership (ownership, rental on market conditions, rental on preference conditions, e.g. community flats etc.), type of family (binary variable, adopts value 1, when there are two parents, 0 otherwise). In addition, we added a set of control variables that identifies the month of survey.
- Z_i is the vector of variables that describe the location: place of residence (through five binary variables, identifying the size of the settlement) and the voivodeship (a set of fifteen binary variables).

Table 2 presents the logistic regression coefficients. Due to the non-linearity of the estimated function, the coefficients do not provide information about the marginal effects, as in the case of linear regression, but only the direction and statistical significance of the analysed factors.

As expected, the income per person turned out to be a statistically significant factor that shapes the incurring of educational expenditures, both in total and for each type of expenditures separately. Another important factor that influences whether household decides to incur additional educational expenditures

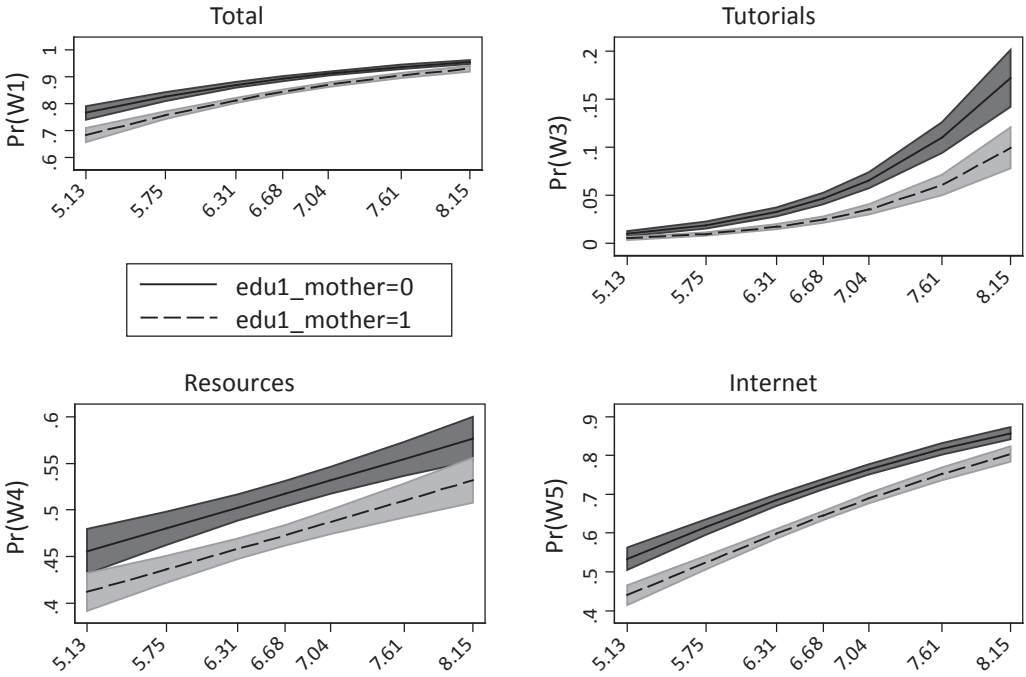

Figure 2. Predicted probability of incurring educational expenditure by families in which the mother has education below secondary (edu1_mother = 1) and above secondary (edu1_mother = 0) for various values of the natural logarithm of income.

is mother's level of education. In particular, when the mother has education below secondary, the likelihood of incurring educational expenditures in total, and for each of their types separately (school fees, private tutorials and courses, books and school resources, the Internet) is lower than in the case of mothers with secondary education.

Due to the fact that the two factors: income per person and mother's level of education have the greatest impact on incurring educational expenditures, it is important to study their mutual impact. For that purpose, we calculated the predictive probability of incurring an educational expenditure (PrW1 – total expenditures, PrW3 – expenditures on tutorials, PrW4 – expenditures on resources, PrW5 – expenditures on internet access), depending on whether the mother has lower than secondary education (edu1 = 1) or not (edu1 = 0) – for various income levels (Figure 2). Because we employed income logarithms for the analyses, such values were used in the analysis (where PLN 5.13 corresponds to the first income percentile, and PLN 8.15 to the 99th income percentile), the illustrated values delineate, respectively: 1st, 5th 25th 50th, 75th, 95th and 99th percentile of the logarithm of the disposal household income per person.

The first remark similar to that which can be drawn based on the results presented in Table 2 is that mothers with primary education will always be less likely to pay for public education of their children than mothers with at least secondary education. Secondly, the strength of the impact of the level of education of mothers depends both on the amount of disposable household income per capita and the type of educational expenditures analysed. Thus, as regards school resources (the third graph in Figure 2), the difference

Table 2
Incurring educational expenditures (coefficients from logistic regression, N = 19 256)

Variables	Total	Fees	Tutorials, courses	Resources	Internet
	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)
Log(income per capita)	0.624***	0.257***	1.019***	0.187***	0.574***
Number of children up to 18	0.143***	0.209***	0.043	0.367***	-0.104***
Level of education[a]					
Mother: below secondary	-0.443***	-0.131*	-0.668***	-0.208***	-0.396***
Mother: higher	0.320**	-0.046	0.428***	0.160**	0.234***
Father: below secondary	-0.243***	-0.027	-0.308***	-0.013	-0.312***
Father: higher	0.077	-0.202*	0.008	0.031	-0.164*
Situation on the labour market[b]					
Mother: employed	0.343***	0.026	-0.115	0.065	0.311***
Father: employed	0.159*	0.159*	-0.023	0.112*	0.063
Family with two parents[c]	0.486***	0.243	0.374	0.490***	0.185*
Home ownership[d]					
Rental on market prices	-0.475*	0.122	-1.027**	0.051	-0.695***
Rental on non-market prices	-0.290***	0.081	-0.258*	0.019	-0.363***
Size of locality[e]					
City above 500 000	0.403**	0.029	0.201	-0.206**	0.585***
City 200 000–499 000	0.474***	0.070	0.520***	-0.146*	0.649***
City 100 000–199 000	0.576***	0.164	0.655***	0.112	0.641***
City 20 000–99 000	0.631***	0.083	0.516***	0.089	0.720***
City under 20 000	0.386***	0.050	0.135	-0.032	0.499***
Voivodeship[f]					
Dolnośląskie	0.109	-0.431***	-0.534***	-0.243**	0.423***
Kujawsko-pomorskie	0.213	-0.124	-0.107	0.070	0.259**
Lubelskie	-0.138	-0.463***	-0.228	-0.019	0.009
Lubuskie	0.215	-0.382*	-0.827**	0.027	0.229*
Łódzkie	0.114	0.480***	0.219	0.050	0.021

Małopolskie	-0.043	-0.122	-0.350*	-0.130	0.115
Opolskie	0.416*	-0.085	0.178	-0.148	0.702***
Podkarpackie	0.106	-0.195	0.416**	-0.009	0.240**
Podlaskie	0.020	-0.190	-0.619**	-0.097	0.005
Pomorskie	-0.078	-0.125	-0.231	-0.280***	0.056
Śląskie	-0.085	-0.485***	-0.236	-0.421***	0.391***
Świętokrzyskie	-0.405***	0.055	-0.322	-0.139	-0.307**
Warmińsko-mazurskie	-0.224	-0.438**	-0.627**	-0.212*	0.207*
Wielkopolskie	0.180	0.125	0.029	-0.195**	0.411***
Zachodniopomorskie	-0.282*	-0.517***	-0.539**	-0.366***	0.157
Month of survey[g]					
January	-0.003	0.042***	0.014*	0.102***	-0.076***
February	0.006	0.011	0.014*	0.118***	-0.038*
March	0.002	0.014	0.016**	0.117***	-0.050**
April	-0.015	0.011	0.007	0.046*	-0.051**
May	-0.018	0.020*	0.004	0.013	-0.055**
June	-0.042***	0.041***	-0.010**	-0.141***	-0.037*
July	-0.041***	-0.097***	-0.035***	-0.062***	-0.032
August	0.067***	-0.092***	-0.031***	0.399***	-0.058**
September	0.073***	0.132***	-0.005	0.414***	-0.042*
October	0.018*	0.063***	0.010	0.133***	-0.041*
November	0.014	0.062***	0.015**	0.096***	-0.009
Year 2010[h]	0.270***	-0.160***	-0.150*	-0.009	0.388***
Pseudo R^2	0.11	0.10	0.17	0.11	0.11
Log likelihood	-6 702	-6 476	-3 658	-11 875	-10 442

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

[a] Secondary education is the reference category; [b] Unemployed is the reference category; [c] Single parent family is the reference category; [d] Living quarters with ownership title is the reference category; [e] Rural areas are the reference category; [f] The Mazowieckie Voivodeship is the reference category; [g] December is the reference category; [h] The year 2009 is the reference category.

Source: own calculations based on BBGD 2009–2010. Descriptive statistics of variables used in the model are presented in Appendix.

between the predicted probability of incurring expenditures by mothers with low education and mothers with at least secondary education is the same with each level of income – both with very low income (1st percentile equal to PLN 5.13, which gives PLN 170 per person), and very high (99th percentile equal to PLN 8.15). This result may suggest that the decision to incur expenditures on school resources is to a smaller degree limited by the financial possibilities of the family, especially those less wealthy, and more by the motivational conditions and parents' aspirations. Also due to the fact that the category of school resources analysed here is rather broad, and expenditures under that heading range from the purchase of small stationery to much more expensive books, it can be presumed that parents with lower incomes (at the level of the 1st percentile) would be more likely to incur this kind of expenditure, but e.g. buying cheaper items than parents with incomes much exceeding the average level of income. Thus, the purchase of more expensive goods may be substituted with the purchase of cheaper goods in the case of a family with less means, maintaining the proportion of incurring or not incurring various kinds of expenditures on educational resources.

The situation regarding private tutoring looked different. With very low income, the difference between aptness to pay for tutorials and courses by mothers with low education and mothers with at least secondary education is similar or close to zero; however, with improvement of the financial situation, the difference in expenditures on courses and tutoring, depending on education of mothers, grows. Such an effect may be explained in two ways. Firstly, the unit cost of tutoring and courses for people with low income turns out to be too high, and it is so despite the fact that they realise the educational needs of their children. In this situation, either mothers give up additional, private expenses on education, or they incur them in a different form (purchase of educational goods and services may be replaced with the help of acquaintances, family or the parents themselves). On the other hand, if the level of income in household is relatively high (above the median), the mother's education strongly influences the purchase of courses or tutoring. It seems that, in this case, what turns out to be important is the educational aspirations of parents, as well as their knowledge and possibility to evaluate the achievements and relative educational deficiencies of the child, which they can counteract by means of additional classes.

Our results are an extension of the view presented by Herczyński and Herbst (2002), according to whom, the less wealthy and less educated parents have lower expectations towards their children and are less able to help the financially to overcome school problems. At the same time, as the results of analyses based on the international survey of achievements in sciences and maths (Trends in International Mathematics and Science Study, TIMMS), most of the students participating in private, additional classes are people who manifest shortcomings or have problems with a given subject (Baker, Akiba, LeTendre and Wiseman, 2001). Thus, if we assume that tutoring and courses are directed especially to improving the achievements and bridging educational gaps of a child, then clearly the differences in factual competencies of children deepen between parents who finance such classes and those who do not.

A different trend takes place in the case of fees for internet access. In this case, the differences between the predicted probability of this expenditure by the level of education of the mother are greater when the income of the whole family is lower. In the case of well-off families, the difference between the impact of mother's education at a level below secondary (edu1_mother = 0) and above secondary (edu1 = 1) on incurring this type of expenditure is negligible.

Besides the two factors analysed in detail for educational expenditures, also the father's level of education is statistically significant. In a household, where the father has education lower than secondary, the predicted probability of the occurrence of expenses on educational purposes in total and expenses on tutoring and internet access fee are lower. Such an impact of father's education is not observed for the remaining groups of expenditures.

As expected, children of parents in employment and coming from two-parent families are characterised by higher probability of making use of private educational goods and services, whereas families that rent flats (not owning one) are less likely to contribute financially to classes, which their children receive in public schools.

Our study hypotheses are confirmed also with reference to the size of the locality were the family live. Although families in rural areas in general are less likely to spend on education than families who live in towns and cities, in the case of learning resources, books and materials, it turns out that the relation is slightly different. Families that live in cities with population over 200 000 are less likely to purchase learning resources than families that live in rural areas. At the same time, the results indicate lack of a statistically significant interdependence between the size of place of residence and an incurring expenditures on school fees. In accordance with our expectations, where access to private educational services is limited, that is in rural areas and in smaller towns, the probability that the parents will pay for additional classes or tutoring is lower, which is pointed to by statistically significant regression indicators. Some differences in infrastructure between the place of residence size classes are made evident also in terms of using the Internet. Residents of cities (of every size, both small towns and metropolises) are more likely to incur that kind of costs compared to inhabitants of rural areas.

Social research indicates that there are large disparities between regions in Poland, both in terms of development, and in terms of educational achievements of students – and the differences are too a high extent conditioned by the past and historical division of the territory of Poland in the 19th century and at the beginning of the 20th century, as well as less distant history of Poland (Bański, Kowalski and Śleszyński, 2002; Herbst, 2012). Although the lowest level of local aggregation which we managed to obtained on the basis of the BDGD data is the voivodeship, even here differences in the parents' approach to expenses on education of children can be seen. Compared to the Mazowieckie Voivodeship, parents from the Opolskie Voivodeship are more likely to pay for education, while parents in the Świętokrzyskie and the Zachodniopomorskie Voivodeships are less likely. Interestingly, in regressions carried out separately for various size classes of localities (the results are not presented herein), the relations are maintained only with reference to rural areas, which shows that parents in the cities of similar size, regardless of the region, share a similar approach to incurring expenses on education, and regional influences in cities have been obliterated to a certain degree, although they are still present in rural areas. On the other hand, only parents from the Podkarpackie Voivodeship are more likely to incur expenditures on tutoring and courses than those in the Mazowieckie Voivodeship. The expense is less frequently incurred by parents from the Zachodniopomorskie, Warmińsko-Mazurskie, Podlaskie, and Lubuskie Voivodeships, that is regions with smaller dynamics of development and greater social and economic problems, but also from the Małopolskie and Dolnośląskie Voivodeships, that is voivodeships with a completely different economic profile.

Conclusions

Our results indicate that, despite the access to free, public, rather uniform educational offer for children and adolescents of school age, households with children aged 6–19 participate – quite frequently – in financing education. Their expenses complement the public expenditures[2], and may, on the other hand, constitute a serious burden for the household budget, especially if the number of children is larger[3]. And so, in 2010, 49% of analysed households with children purchased at least once during each surveyed month books, educational resources and materials, 6% incurred expenditures on tutoring and courses for children, while 11% on fees required by the school[4].

At the same time, our analysis indicates that some features of households make them more likely to invest in child education. Disposable income per capita is one of the factors that increases the likelihood of incurring educational expense. Although the result is consistent with the theory and expectations (dependence of expenditures on budget constrains), it turns out that the impact of income on specific categories of expenditures is slightly different: it exerts the greatest influence on paying for tutoring and courses, its importance is the least in the case of expenses on materials and resources. It may be presumed that the purchase of materials and school resources is enforced to some extent, and thus constitutes a financial burden for relatively less wealthy families and at the same time cost that should not or even cannot be relinquished.

Another important factor that shapes the actual incurring of educational expenses is the education of parents, and especially the educational level of the mother. The association between educational expenditures and parents' education is not a Polish phenomenon, it is of general nature. Private tutoring and additional classes are most often financed by parents with the higher education in Canada (Davies, 2004), in Turkey (Tansel and Bircan, 2006) or Greece (Kanellopoulos and Psacharopoulos, 1997).

The analysis also revealed some disproportions in incurring educational expenses between the type and size of place of residence and between the voivodeships. In particular, parents of children from cities are prone to spend more often on education than parents in rural areas (an analogous cause of differences in expenses occurs, among others, in Greece: Kanellopoulos and Psacharopoulos, 1997). The differences may be significant, especially when living in a city in a voivodeship with a significantly higher level of expenditures, and between living in rural area in a voivodeship with a lower level of educational expenditures. What is a factor contributing to the occurrence of such differences may be uneven availability of commercial educational services (courses and tutoring) in urban and rural areas, despite unequivocal nature of the division between the city and the countryside in this respect (it pertains rather to urbanised areas and appropriately dense settlement network, where access to private educational offer is facilitated). But

[2] Based on other studies, we know that the participation is not small, as an expense of PLN 62–67 falls on a child attending a primary, lower secondary, or upper secondary school, on average per month, which gives amounts of PLN 750–800 per year, not counting the costs related to residence outside of family home in some cases (Rokicka and Sztanderska, 2012). It is quite a lot, especially when we consider that e.g. the average current expense per student attending a primary school on the part of the *gmina* is around PLN 8250, and for cities with the *poviat* status – almost PLN 5200 (per lower secondary school student PLN 7130 and 7150, respectively) (Kopańska and Sztanderska, 2012). Thus, households have a significant financial contribution into education of their children.

[3] The annual educational expenditure accounted for 8.8% of the level of expenditures calculated per person in households with children aged 3–18 (Rokicka and Sztanderska, 2012).

[4] The rotational method of gathering data in the BBGD does not enable determination of how educational expenditures accumulate in single households at the scale of the year.

those differences may also arise from differentiation between educational aspirations and the level of services offered by public educational institutions. It is precisely participation in courses and tutoring what varies relatively the most across voivodeships. Although the article does not examine the association between private expenses and children's educational achievements (as it is not possible on the basis of the BBGD database), even a simple juxtaposition of likelihoods of the occurrence of private expenditures on educational services with students' school achievements indicates that there may be a connection between them. It seems to be a promising field for further research. The hypothesis that private, strongly differentiating expenses on education of children condition their later school careers (not only exam results, but also participation in higher education, as in Turkey – Tansel and Bircan, 2006) is also tempting in the perspective of studies on the economic determinants of reproduction of structural income discrepancies.

To sum up, if private educational expenditures, determined by the income, the level of parents' education and place of residence were to affect children's achievement, it would lead to reproduction of the human capital structure and would weaken the role of public education in equalising the social and regional differences. Other studies show that private educational expenses occur usually where the greatest differences between effectiveness of schools exist (Dang and Rogers, 2008). As indicated by Roman Dolata (2010), in large Polish cities, one can observe a growing polarisation of schools, which can indicate that private educational expenditures will intensive there, still increasing the disproportions demonstrated in our study. On the other hand, one should remember that educational expenditures have a positive effect, as they contribute to increasing human capital and, all things considered, are probably one of better forms of investing in the future of children.

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Appendix

Table 1A
Descriptive statistics for dependent variables

Variables	%	Standard deviation
Total educational expenditure	0.87	0.34
Fees	0.12	0.33
Tutorials, courses	0.06	0.24
Resources	0.51	0.35
Internet	0.70	0.46

Table 2A
Descriptive statistics for independent variables

Continuous variable	Mean	Standard deviation
Income per capita	945	637
Log(income per capita)	6.67	0.62
Number of children up to 18	1.82	1.01
Binar variables	**%**	**Standard deviation**
Level of education		
Mother: below secondary	0.46	0.50
Mother: secondary	0.37	0.48
Mother: higher	0.16	0.37
Father: below secondary	0.61	0.49
Father: secondary	0.28	0.45
Father: higher	0.10	0.30
Situation on the labour market		
Mother: employed	0.72	0.45
Mother: unemployed	0.28	0.45
Father: employed	0.88	0.32
Father: unemployed	0.12	0.32
Family with two parents	0.96	0.20
Home ownership		
Rental on market prices	0.01	0.11
Rental on non-market prices	0.14	0.34
Ownership	0.85	0.36

Size of locality		
City above 500 000	0.06	0.24
City 200 000 – 499 000	0.06	0.25
City 100 000 – 199 000	0.06	0.23
City 20 000 – 99 000	0.15	0.36
City under 20 000	0.11	0.32
Country	0.56	0.50
Voivodeship		
Dolnośląskie	0.07	0.25
Kujawsko-pomorskie	0.06	0.23
Lubelskie	0.07	0.25
Lubuskie	0.03	0.16
Łódzkie	0.06	0.25
Małopolskie	0.10	0.30
Opolskie	0.03	0.16
Podkarpackie	0.07	0.25
Podlaskie	0.03	0.18
Pomorskie	0.05	0.23
Śląskie	0.11	0.32
Świętokrzyskie	0.04	0.19
Warmińsko-mazurskie	0.04	0.19
Wielkopolskie	0.09	0.29
Zachodniopomorskie	0.04	0.19
Mazowieckie	0.13	0.33
Month		
January	0.09	0.28
February	0.08	0.28
March	0.09	0.28
April	0.09	0.28
May	0.08	0.27
June	0.08	0.28
July	0.08	0.28
August	0.08	0.27
September	0.08	0.27
October	0.08	0.28
November	0.08	0.28
December	0.08	0.27
Year: 2010	0.51	0.50
Year: 2009	0.49	0.50