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A conscious investment or an unpleasant necessity? Parental expenditures on children's education in Poland**

Summary

This study explores parents' expenditures on the education of children aged 7–15 in Poland, focusing on the perception of school-related and additional expenditures. The study used a mixed-method approach. A qualitative analysis reveals differences in parental attitudes towards educational spending and a quantitative analysis, employing the Tobit regression model due to censored variables, indicates that a difficult financial situation correlates with slightly lower school-related expenditures, while it significantly affects additional expenditures. Parents' education is a significant factor for additional expenditures but not for school-related ones. School-related expenditures show minimal variation based on family characteristics, suggesting their obligatory nature. Conversely, additional educational expenditures exhibit high diversity, with a notable percentage of families not incurring them. These outlays contribute to perpetuating educational inequalities. The study emphasises the importance of ongoing research on parental expenditures. This knowledge is essential for ensuring access to key public services such as education.

Keywords: human capital, educational expenditures, additional activities, Tobit regression, mixed method

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Introduction

In 2015, the European Parliament urged the European Commission and the Member States of the European Union to implement a Child Guarantee. This initiative aims to provide every child living in poverty with access to free healthcare, education, childcare, suitable housing, and sufficient nutrition. It is envisioned as a crucial component of a comprehensive European plan to address child poverty. The next step was the establishment of the European Child Guarantee in 2021, with the primary goal of combating social exclusion and ensuring children's access to these key services. Consequently, the issue of actual access to essential public services is emerging in research (Frazer et al., 2020). Besides factors like quality and the availability of public services, affordability is also an important aspect to consider.

In many countries, primary and secondary education is free. However, participation in education still incurs costs for parents, which vary depending on the extent of state funding for education. As analysis across ten EU countries reveals (Nieuwenhuis et al., 2021), many goods and services are provided within the school environment. Nevertheless, parents continue to bear mandatory or unavoidable costs. At the same time, the authors point out the lack of comparative and national-level research that would demonstrate the actual costs associated with children's participation in public education, in other words – the affordability of compulsory education for families. Expanding this knowledge is essential because it can help establish a set of necessary goods for full educational participation, which can be compared between countries. Knowing this set and its costs can also guide education and social policies aimed at assisting children in challenging situations in achieving at least the minimum required for full educational participation.

Educational expenditures constitute one type of investment in a child's human capital (Becker, 1962). They, along with various other efforts by parents, schools, and students themselves, influence educational achievements. The literature suggests that the level of expenditures depends on the socioeconomic status of the student's family (parental education and wealth). Analyses of school-related expenditures, however, are somewhat limited, with significantly more research focused on additional parental investments. There is a wide body of literature on additional investments such as additional activities or tutoring (for Poland e.g. Hawrot, 2018; Kłobuszewska, 2022; Safarzyńska, 2013). Also, there is a shortage of research on educational expenditures for Poland. One of the few is, for example, the work of Rokicka and Sztanderska (2013) or the unpublished dissertation of Kłobuszewska (2019).

In this article, we aim to examine the costs incurred by Polish parents in educating their children. We analyse various types of costs identified through qualitative research, which include expenses directly related to participation in public education. These costs are significant concerning the issue of accessibility to essential public services for children. We also look into expenditures that are paid by the parents entirely voluntarily, for example on the additional activities or tutoring. This article investigates the following research questions:

1. How do Polish parents perceive expenditures on children's education?
2. Are school-related costs affordable?
3. To what extent do school-related and additional expenditures depend on the parents' education and financial situation of the family? Do these factors have different effects on these two categories of expenditures?

In order to answer our research questions and verify hypotheses we apply the mixed method approach. Qualitative research allows us to understand the roles that parents attribute to various types of expenditures, while quantitative research verifies the characteristics of families and students that influence the levels of expenditures. In the quantitative analysis of the determinants of school-related and additional expenditures we use the Tobit regression model. The qualitative and quantitative analysis is based on data from the 'BECKER' study conducted by the Educational Research Institute (Instytut Badań Edukacyjnych, IBE) in 2013–2014.

The collection from the 'BECKER' study is quite old, but Poland lacks research on education expenditures that would cover so many different categories of expenditures. The slightly more recent study – the Determinants of Educational Decisions (UDE), which was carried out by the Educational Research Institute in 2014, contains information on expenditure categories at a very general level of aggregation. Data from representative Household Budget Survey conducted by Central Statistical Office (GUS) are fragmentary. It is also not possible to attribute educational expenditures of a household to individual persons.

Therefore, we believe that despite the use of a dataset from 10 years ago, this work can still provide interesting threads for discussion about Polish parents' expenditures on their children's education. And, as suggested by Nieuwenhuis et al. (2021), it may also be an indication that it is high time to update our knowledge about the costs of free education in Poland. We hope than this study can serve as a valuable foundation for further research in this area, which is crucial from the perspective of the goals of European Child Guarantee.

Literature review

Importance of the parental investments

Education is one of the main elements of human capital, which is important from the point of view of the economy and society, but also brings individual benefits in the form of e.g. higher earnings. This is the main message of the human capital theory proposed by Gary S. Becker (1962). According to the human capital theory, parents invest their time and money in their children's education, because it is important for their own utility (this is how economists name satisfaction or pleasure). Parents decide how much of the budget to allocate for their own consumption and how much to invest in their child's education. Preferences regarding the amount of individual expenses are related to various family characteristics.

The literature on children's human capital indicates the great importance of various parental investments in children's education. In their review, Haveman and Wolfe (1995) present parents' decisions, which have an impact on child's development, educational outcomes and future success on the labour market. There are decisions about the size and structure of the family, the level of consumption and savings, as well as the allocation of income and time within the family. Other important factors influencing the level of the child's human capital indicated in the literature are: the choice of school (also the choice between public and private education) (Glomm, Ravikumar, & Schiopu, 2011) and the choice of place of residence (Owens, 2016), which is related to both the quality of education and the impact of the neighbourhood. The Coleman Report (Coleman et al., 1966) shows that the differences in students' achievements are mostly influenced by their family background. Many recent studies show that social background and wealth of the family still have a substantial impact on educational success (e.g. Bloome, Dyer, & Zhou, 2018; Hällsten & Pfeffer, 2017; Hanushek, Peterson, Talpey, & Woessmann, 2019; Smulczyk, Dolata, & Pokropek, 2019) and in many countries socioeconomic achievement gap increased (Chmielewski, 2019). This is most likely due to the different levels of various parental investments for which family socioeconomic status is crucial (e.g. Coley, Kruzik, & Votruba-Drzal, 2020; Kaushal, Magnuson, & Waldfogel, 2011).

Parental expenditures on children's education

Parental expenditures on education are one of the forms of investment in children's human capital. In the economic literature, however, more attention is devoted to public expenditures on education (e.g. Blankenau & Simpson, 2004; Hanushek & Woessmann, 2017; Woessmann, 2007) than to parental expenditures.

Some of the educational expenses are necessary for participation in lessons, and some are completely voluntary and not directly related to the formal education. According to Nieuwenhuis et al. (2021), there is a lack of research on parents' expenditures on education, especially those related to participation in formal education. Few European countries systematically collect such information. The extent of parental educational expenditures which are necessary for participation in formal education varies between countries depending on the level of state involvement. Nowadays school textbooks are free-of-charge in primary schools, but other school supplies or notebooks, exercise books and additional printed materials are unavoidable or 'hard to avoid' costs in many countries, with the exception of Sweden or Finland (Nieuwenhuis et al., 2021). Some of the additional expenses, almost forced upon Polish parents, are discussed by Grzebielucha (2022), for example. There isn't really a standard that describes the necessary equipment for students. A lot depends on the autonomous decisions of the school or the teachers themselves. However, more detailed knowledge about this issue is important because the necessity to incur expenses related to participation in education can be a significant burden for families. According to data from Eurostat (Eurostat, 2016), in Poland about 18% of households with dependent children indicate great or moderate difficulties in affording formal education. A more challenging situation is faced by single-parent households and households at risk of poverty, where the percentages declaring these difficulties are 31% and 37%, respectively. Recently, there have been introduced support programs for Polish schoolchildren, such as free textbooks and the "good start" ("dobry start" or "300+") program. However, there is a lack of scientific research evaluating their effectiveness, especially an analysis of whether they provide sufficient assistance to the poorest families and whether they protect children from exclusion. The analysis of obligatory expenditures incurred by parents on children's education was undertaken in two Polish studies by Kłobuszewska (2014; 2019). This article expands on one of the threads addressed in her work. However, it still relies on data from previous years and does not allow for assessing the impact of educational policies on the burden of families with expenses on children's education.

When it comes to additional parental expenses on education, there is much more research available, but public expenditure is still a more popular topic. Existing literature indicates that such expenditures on children's education could have a positive influence on children's educational performance. (e.g. Geesa, Izci, Song, & Chen, 2019; Juan & Visser, 2017). For Poland, we identified a few studies regarding parents' expenditures on children's education, e.g. Janoś-Kresło (2012), Kłobuszewska (2019), Kłobuszewska and Rokicka (2015); Kołaczek (2011), Piekut (2016) and Rokicka and Sztanderska (2013).

Determinants of parental investments in children's education

The literature on the determinants of investments in children's human capital is very extensive and encompasses various types of such investments, primarily time devoted by parents to their children. Many factors related to different types of investments will have a similar impact on the level of parents' educational expenditures. Above all, factors related to socioeconomic status (SES), such as parents' education and income, but also aspirations.

Parents' education

Much attention is paid to the relationship between parents' education and the amount of time devoted to the child. Many studies confirm that better educated parents spend more time with their children (Sayer, Bianchi & Robinson, 2004; Sayer, Gauthier & Furstenberg, 2004). A study by Craig (2006) shows that although parents with higher education spend more time at work and the opportunity cost of their time is greater, they devote more time to their child than less educated parents. The same conclusions can be drawn from the study by Guryan, Hurst and Kearney (2008). In their study, Berniell and Estrada (2020) proved that college-educated parents increase their time investments to support children who enter school at younger age, while less-educated parents do not show such behaviour.

Hao and Yeung (2015) show that the education of parents is the most important factor influencing the amount of expenditures on education. A positive relationship between parents' education and their financial investment in children's education was also shown in the studies by Guryan et al. (2008), Mauldin et al. (2001), Mimura (2014), Rokicka and Sztanderska (2013).

Income

Family income may translate into the amount of educational expenses as it affects the budget of the household. A smaller budget, with other necessary expenses, means that less resources can be devoted to investments in education. A significant relationship between income and investment in education has been shown in many studies (e.g. Blanden & Gregg, 2004; Kaushal, Magnuson, & Waldfogel, 2011; Rokicka & Sztanderska, 2013).

However, it should be remembered that income itself does not have to translate into higher expenses. As Blau (1999) points out, income preferences are also important. Boneva and Rauh (2015) show that parents with different income have different beliefs about the returns to education. And their real investments follow these beliefs. Similar conclusions can be drawn from the works of Domański (2010) and

Lareau (2003). Higher social classes, which also have a higher income, take a different approach to the education of their children than the lower classes. Caucutt, Lochner and Park (2016) show various mechanisms of the influence of income on the amount of expenditure. First, investment in education is treated by parents as a consumption expenditure, so as the family income increases, so does investment. Second, they assume that poorer families have greater uncertainty about the investment returns and less access to information about possible returns, which makes their investments suboptimal. Parents with lower incomes may also not know what type of investment is most beneficial (Cunha, Elo, & Culhane, 2013; Dizon-Ross, 2014).

Aspirations

The relationship between parental aspirations and investments in education is multidimensional. From the perspective of economic theory, resources are distributed among family members based on anticipated returns in the labour market (e.g. Becker & Tomes, 1994). The decision about investing in child's education reflects parents' expectations regarding their child's future labour market outcomes. These expectations, in turn, influence the aspirations of parents such as the level of education they want for their child.

The psychological literature indicates that there is a connection between parental educational aspirations and children's educational achievements (e.g. Areepattamannil & Lee, 2014). Aspirations and expectations are factors influencing parental involvement in a child's education and development, which, in turn, correlates with their achievements (Jeynes, 2022). In research, educational involvement is most commonly understood as communication with the child and cooperation with the school, as suggested by Yang and Chen (2023) in their meta-analysis. We assume that forms of such involvement can also include expenditures on additional activities or goods supporting the child's development and interests.

Educational aspirations are strongly linked to parents' socio-economic status. Higher social classes have high aspirations for their children's education, aiming for their children to achieve a similar status, while lower classes have lower ambitions both in terms of education and professional position (e.g. Domański, 2004). Parents' aspirations are followed by various actions, such as choosing a better school for their child, organising extra activities, etc.

Other determinants

Other determinants mentioned in the literature that have a significant impact on the amount of parental investments in a child's human capital, are the number

of children, the child's gender and age. A greater number of children in a family reduces the expenses or other investments per each child, mainly due to family budget constraints, but also due to economies of scale. This negative correlation between the number of children and parents' investments was shown in many empirical studies (e.g. Dang & Rogers, 2013; Kłobuszewska, 2014; Lee, 2007; Rokicka & Sztanderska, 2013).

Child gender significantly affects parental educational investments in developing countries (Alderman & King, 1998; Deng et al., 2014; Filmer, 2005). In developed nations, no notable expenditure differences between boys and girls have been observed. However, studies, such as Baker and Milligan (2013), indicate gender-based variations in the amount of parental time allocated to specific activities. Disparities also exist in gender participation in extracurricular activities and tutoring, representing forms of educational investment. Research reveals that boys are more likely to engage in sports activities (Heath et al., 2022; Molinuevo et al., 2010), while girls tend to participate more in academically oriented activities (Fletcher et al., 2003). Girls also exhibit a higher prevalence in private tutoring participation (e.g., Šťastný, 2016). In the context of Poland, Safarzyńska (2013) demonstrates that girls are more likely to partake in math tutoring than boys, and Kłobuszewska (2022) observes that girls are more frequently involved in foreign language activities.

Child's age can also be a factor in determining the amount of expenditure. With the child's age, the number of subjects related to school increases over time, leading to more expenses on notebooks, exercise books, teaching aids, etc. Older children, especially those preparing for external exams, also tend to participate more in extracurricular activities and tutoring (e.g. Hille et al., 2016).

Polish Education System

In Poland, education is mandatory for children aged 7 to 18. The current Polish education system comprises an 8-year primary school (culminating in an external exam) and secondary schools, including general schools, vocational secondary schools, and sectoral vocational schools (stage I and II). In the school year 2012/2013, which is the period analysed in this study, the system consisted of a 6-year primary school, a 3-year lower secondary school (*gimnazjum*), and 3-4-year upper secondary schools (general school, secondary vocational school, and basic vocational school). Primary school education concluded with a sixth-grade test. Subsequently, students progressed to *gimnazjum* without undergoing selection. *Gimnazjum* concluded with an external exam, and based on the results of this exam, school marks, and other achievements, students gained admission to upper secondary schools. This constituted the initial selection threshold in the education system.

Research questions and hypotheses

The presented review yields several conclusions worth exploring and verifying. The issue of expenditures related to participation in formal education is crucial from the perspective of children's access to basic public services. It is interesting to understand how parents perceive such expenditures and whether they are a burden to a family budget. Therefore, we formulated three research questions for which we would like to find answers in the hitherto analysis:

1. How do Polish parents perceive expenditures on children's education?
2. Are school-related costs affordable?
3. To what extent do school-related and additional expenditures depend on the parents' education and financial situation of the family? Do these factors have different effects on these two categories of expenditures?

Building on the conclusions drawn from the presented research, we also formulated the following hypotheses, which will be tested in further sections of the article.

H1. Parents perceive school-related and additional educational expenditures differently, attributing distinct roles to both types of expenditures.

H2. Socio-economic status differentiates attitudes towards expenditures on education.

H3. School-related expenditures are, in a sense, obligatory. Therefore their amount is not strongly correlated with the characteristics of the student and their household.

H4. Additional expenditures on education depend on the socio-economic characteristics of the student's family. Higher parental education, a better financial situation of the household, and high educational aspirations are associated with higher additional expenditures.

Method

Data collection

To verify hypotheses and address research questions, we conducted two complementary analyses: qualitative and quantitative, thereby employing a mixed-methods approach. We used qualitative and quantitative data from the Study on the Economic Determinants for Objectives and Guidelines on Allocation of Private and Public Education Spending in Poland 'BECKER', conducted by the Educational

Research Institute (IBE) in 2013–2014.[1] The collected data concern the school year 2012/2013. The data is derived from nine selected counties, each representing various levels of wealth and educational achievement among students. The wealth of the local government was estimated using the average incomes per capita of municipalities within a given county's territory (averaged for the years 2006–2010). Educational achievements of students were approximated by the average results of lower secondary examinations in Polish and mathematics for the years 2008–2010.

Local governments were categorised into three groups based on wealth (affluent, average, and poor) and three groups based on the educational results of students (high, average, and low). For the study, local governments displaying extreme characteristics, such as low educational results and high wealth, were specifically chosen. The selected counties are: Giżycko County (Warmian-Masurian voivodeship), Głogów County (Lower Silesian voivodeship), Pruszków County (Mazovian voivodeship), Sępólno County (Kuyavian-Pomeranian voivodeship), Sokółka County (Podlaskie voivodeship) with municipalities in their area, and Tarnobrzeg, Poznań, Siemianowice Śląskie and Świnoujście counties.

Empirical framework for qualitative analysis

The qualitative analysis involved 35 semi-structured family interviews conducted with parents and their school-aged children from nine selected counties from 'BECKER' study, residing in both urban and rural areas. The selection for the study was determined by specific characteristics such as the educational background of the head of the household and the average monthly income per person in the household. The sample for the study was selected to ensure that interviews were conducted with families of both higher and lower socio-economic status in each county. The interview script covered topics such as the family's daily life, the assessment of the school's role, educational aspirations, extracurricular activities, decision-making regarding education, expenditures on education and child development and time devoted to learning.[2] The research scenario encompassed a wide range of topics. Although parental expenditures was one of them, unfortunately it was not always a subject explored in depth by the interviewing researcher. The transcription analysis involved identifying threads related to parents' expenditures on education and participation in additional

[1] The research tools and datasets from this study are available at the Educational Research Institute (IBE).

[2] The interview script was prepared as part of the 'BECKER' project, and the interviews were conducted by researchers from the SMG KRC, also responsible for transcribing the interviews.

activities. These were then analysed in cross-sections based on the head of the household's level of education. The type of residence area, whether rural or urban, was also taken into account.

Empirical framework for quantitative analysis

In the 'BECKER' study, numerous surveys were conducted with various types of respondents. One of them involved households with children of preschool and school age. In each of the nine counties, random representative (for each county) sample of children and youth aged 3–19 was selected from the PESEL administrative registry. The total number of observation was 5,398. In the presented analyses the sample was limited to children in primary and lower-secondary school (aged 7–15), with 3,062 observations. Due to the missing data for some variables, the final number of observations analysed in this study is 2,700.

The 'BECKER' Household Survey employed the CAPI method. The survey targeted the head of the household, with questions focusing on one child within the household. The questionnaire covered inquiries about education expenditures per child selected for the study, along with details about the household, including its socio-demographic, economic, and cultural status.

The expenditure categorisation proposed by Nieuwenhuis et al. (2021) is: free, compulsory, hardly avoidable and optional, but it only applied to expenditures related to participation in formal education. However, our qualitative study does not allow for such nuanced distinctions in the degree of obligatory nature of expenditures. We are able only to identify 'obligatory' school-related expenditures and additional expenditures (on additional activities/tutoring). Therefore, in the quantitative analysis, these two expenditure categories serve as dependent variables.

Dependent variables

The household survey primarily focused on educational expenditures, collecting detailed information from parents across various categories. However, it is crucial to note that these details were based on parents' self-reporting rather than recorded through diaries or receipts, potentially introducing some error. The questionnaire included inquiries about various expenditures associated with a child's education at school, as well as other goods or services supporting the child's development. Respondents provided details on all expenditures during the 2012/2013 school year, including amounts and frequency. Based on this data, individual expenditures were aggregated, accounting for varying frequencies, to derive annual expenditure information for specific categories.

Table 1. Definition of dependent variables

School-related expenditure	Additional expenditure
• school fees (e.g. for Parent Committee), insurance fees, • dormitory fees, • photocopied materials, • textbooks and exercise books, • school supplies, • instruments for music lessons and art materials, • school shoes, outfit, • backpack, outfit for PE classes	Expenditure on extra-curricular activities (e.g. foreign languages, sports activities, art classes, music classes, etc.) and tutoring

School-related and additional expenditures varies across different regions. Table 2 provides descriptive statistics for both educational expenditure categories in each county. School-related expenditures show less variation compared to additional activity expenditures. Notably, Pruszków county, situated near Warsaw (the capital of Poland), stands out. The municipalities in this county are relatively affluent compared to others in Poland, with a wealthier population, which is reflected in the average level of educational investments in the county.

Table 2. Annual school-related and additional expenditures on education in zlotys (PLN) by county (means calculated for the whole sample) in the school year 2012/2013

County	*N*	School-related expenditures		Additional expenditures	
		M	*SD*	*M*	*SD*
Głogów	267	1199	1162	590	1148
Sępólno	260	775	618	297	1078
Pruszków	313	1295	2339	1626	3634
Tarnobrzeg	293	1015	586	563	1119
Sokółka	386	957	657	296	803
Siemianowice Śląskie	263	987	558	548	1122
Giżycko	306	1024	737	637	1779
Poznań	319	1015	615	717	1548
Świnoujście	293	1047	785	943	2702

Source: Own calculations.

Independent variables

The independent variables were selected on the basis of the conclusions of the literature review on the determinants of expenditure on education. Economic theoretical and empirical literature pointed to the parents' education as a factor differentiating investment in children's human capital. This is a key determinant in this study. The highest level of education achieved by any of the parents was divided into 3 categories: below-secondary (at most elementary, lower secondary or basic vocational education), secondary (general secondary, technical and post-secondary) and tertiary (completed undergraduate or graduate studies and academic degree). On their basis, binary variables were constructed, which take the value of 1 when the highest level of parents' education corresponds to a given category and 0 – otherwise.

The second important variable in this study is a self-assessment of the financial situation of the household. Three binary variables were created on the basis of the question:

"Please say which of the following terms best describes the current financial situation of your household:

1. There is not enough money even for the most urgent needs.
2. We must deny ourselves many things so that we have enough money to live.
3. On a daily basis there is enough money, but we cannot afford larger expenses.
4. There is enough money, and some we can save.
5. We are wealthy, we do not have to save even for larger expenses."

Variable 'Difficult financial situation' takes the value 1 when the respondent in the above question chose option 1 or 2. Variable 'Good financial situation' takes the value 1 when the respondent chose the answer 4 or 5. Variable 'Average financial situation' is the base category.

The level of education and wealth is related to social status, so often analysed by sociologists in the context of educational opportunities. There is also cultural capital associated with social status, which, according to Bourdieu (Bourdieu & Passeron, 1990), influences educational success. Owning cultural goods, such as books, turns out to be significantly correlated with higher educational achievement. We assume that it is also related to higher educational investments of parents, therefore the number of books (not textbooks) owned by a household was among the analysed variables influencing the level of expenditure. The variable takes the following levels: (1) Lack of the books at home, (2) 1–10, (3) 11–25, (4) 26–50, (5) 51–100, (6) 101–200, (7) 201–500, (8) More than 500. This variable is treated as a continuous variable in the analysis.

The aspirations towards the child's education should translate into actual parental actions and an appropriate level of investments. Therefore we also take into account parental aspirations. A binary variable was constructed on the basis of the question: "What level of education would you want for your child?" The variable takes the value 1 if the respondent chose the answer 'master's degree' or 'doctoral degree', and 0 otherwise.

The other controlled variables in the study are: child's gender, number of children in the household, educational level of school[3], place of residence and dummies for the county. The descriptive statistics calculated on the regression sample are presented below (Table 3).

As mentioned earlier, due to missing data on some variables, a data in the model was reduced from 3,062 to 2,700 observations. In the question regarding the assessment of the financial situation, only 73 individuals did not provide an answer (about 2%). Slightly more missing data were related to questions about

Table 3. Descriptive statistics

Variable	*M*	*SD*
Annual obligatory expenditure (PLN)	1035.95	1059.38
Annual additional expenditure (PLN)	691.48	1922.94
Child's gender (girl)	0.49	0.50
Number of children in the household	2.05	0.94
Parental education: below secondary	0.29	0.45
Parental education: tertiary	0.29	0.45
Difficult financial situation	0.21	0.41
Good financial situation	0.16	0.36
Number of books (levels 1–8)	4.69	1.68
Parents' educational aspirations	0.68	0.46
Lower secondary school	0.37	0.48
Place of residence: village	0.27	0.45

Number of observations: 2700. Base category: for child's gender – boy, for parental education – secondary education, for financial situation – average financial situation, for parents' educational aspirations – at most a bachelor's degree, for education level – primary school, for village – city.

Source: Own calculations.

[3] Since this variable is also associated with the child's age, age was not additionally controlled for in the model.

the number of books at home (75 observations), and the most were for questions about parental educational aspirations (242 observations, around 8%)[4].

Not all households from the sample incurred expenses related to the child's education. The school-related expenditure have the zero value for 9 observations. The expenditure on additional activities have the value of zero for 1,735 observations (almost 65%). In such a case the OLS estimator is biased. Removing zero-value observations from the analysis leads to a problem with non-random sampling. Estimating a linear model with zero-value observations does not guarantee that all fitted values will be positive. Therefore, to indicate the significant determinants of the school-related and additional educational expenditure we use the Tobit regression model (Tobin, 1958). Our estimated models take the following functional form:

$$Y_i^* = X_i\beta + \varepsilon_i, \qquad \varepsilon_i \sim N(0,\sigma^2),$$

$$Y_i = \begin{cases} 0 \; for \; Y_i^* \leq 0 \\ Y_i^* \; for \; Y_i^* \leq 0 \end{cases}$$

where Y_i^* is the latent variable and Y_i is an observed amount of parental expenditure on education incurred for the child i. X_i is the vector of independent variables, β_i is the vector of parameters, and ε_i is the random error.

Due to the skewness of the expenditure and the possible problem of heteroscedasticity, we use the natural logarithm of school-related and additional expenditures. As a result of the 'BECKER' study sample design, the observations are nested in counties. To control counties' fixed effects we use a vector of 8 dummies in the estimation.

The models were estimated using *tobit* command in the statistical software Stata 15. After estimating the models, marginal effects conditional on non-zero expenditures were calculated. So, only for households that incurred any expenditures. These results are the ones subject to interpretation.

Qualitative findings

Obligatory and additional expenditures

The research scenario included questions about various expenditures related to children's education. In the interviews, the theme of expenditures associated with school-related learning emerged more prominently. In the school year 2017/2018, free textbooks were introduced in primary and lower secondary schools. However,

[4] The additional estimation of models without this variable yielded very similar results.

in the school year when the 'BECKER' study was conducted (2012/2013), the cost of the textbooks was covered by the parents. Parents were, and still are, obliged to buy exercise books, notebooks, atlases, art materials, instruments for music lessons and outfits for physical education (PE). Although the school does not formally require a computer, it is nevertheless a much needed educational tool (and as it turned out during the COVID-19 pandemic, it became essential for participating in lessons.). In their statements, parents emphasised the financial burden of school expenditures, particularly those incurred at the beginning of the school year, on the household budget. Parents described this situation using words such as 'horrible', 'macabre' etc. However, they did not assign these expenses any role in the development of their children. When asked about the purpose of these expenses, parents focused solely on school requirements.

"R (Researcher): Why are you paying these costs?

P1 (Person 1): Because we have to.

P2: Someone came up with it. The state offers free education, but you have to buy everything.

[…]

R: What effects do you expect from these expenses? What are the benefits of this?

P2: You have to buy this for kids. It's hard to send kids to school without it.

P1: Yes. The teacher demands and that's it. Nothing can be done about it."

(family interview, Siemianowice Śląskie county, education of the head of the household – secondary)

Parents also bear the costs of equipping schools with office and hygiene supplies, despite it being against regulations, due to the difficult financial situation of the schools themselves. Other expenses incurred by parents related to school include clothing for physical education classes (PE), spare shoes, as well as costs associated with commuting to school or supporting a child studying away from home. School-related expenditures depend primarily on the school's requirements, such as the choice of textbooks, accessory requirements, clothing, and the amount of contributions to the Parent Committee. Since most of these expenses are related to the curriculum, they should not vary significantly. However, parents can seek savings, for example, by purchasing used textbooks if possible or opting for more affordable equipment.

The topic of additional expenditures on education appeared less frequently in the parents' statements. Nevertheless, parents acknowledged the purpose of these expenses, which was to contribute to their children's development and enhance their chances of educational success.

"R: And what are you doing to support the children in other spheres, regarding their plans, goals and dreams?

P1: Well, what can we do about their professional future... It's with these foreign languages… I will watch over it, for sure.

P4: Mom buys books.

P1: Yes, I buy books. If I see a need, I go to the bookstore. First, I will search the Internet (…) For example I searched the biological forum for what to learn to do it right."

(family interview, Głogów county, education of the head of the household – tertiary)

The economic literature on parents' investments in the human capital of their children most often mentions participation in additional activities and tutoring, intended to complement public education (Bray & Kwok, 2003; Dang & Rogers, 2013). From the interviews with families, it can be concluded that additional activities serve a dual purpose. They not only help children better understand the school material but also extend their interests, knowledge, and skills beyond what the school can offer. These additional activities are organised at school in the form of subject circles or compensatory classes, typically free of charge. Parents also opt for paid classes for their children, available through public institutions like community centres and private establishments such as language schools, and, finally, private tutoring services. Both forms of classes, whether paid or unpaid, should be considered as additional investments in human capital, as each requires additional commitment of the child's and parents' time, contributing to their educational development.

Role of parents' education

The analysis of family interviews did not reveal significant differences in the amount of school-related expenditures based on parents' education levels. All parents expressed the view that these expenditures are necessary. Regarding additional investments in the form of extra classes, there were also no notable differences between parents with higher and secondary education. However, the qualitative data does not allow for a comparison of the number of additional activities, frequency of use, and their actual impact on children's achievements. Nevertheless, it appears that in families where parents have at least a secondary education, participation depends to a greater extent on the availability of public and private offerings, as well as the child's interests. Among families with parents who have lower levels of education, a passive attitude towards additional classes was more common. These families were not even interested in unpaid extracurricular activities.

"R: Is there any community centre in the neighbourhood that has any offer for young people? Is there such a thing?

P3: There is.

P1: There is definitely a community centre, but there is simply no time for it.

R: Do you know what they offer, what is possible here?

P1: No.

R: Is this community centre far away?

P1: No."

(family interview, Poznań, education of the head of the household – below secondary)

"R: Are the boys enjoying any extracurricular activities at school? Is there anything available for you?

P3: They are available, but I don't use them. I don't need something like this. And I don't need to spend more time at school."

(family interview, Sępólno county, education of the head of the household – below secondary)

Lower educated parents also showed less interest in their children's school education. For example, they were unable to evaluate the work of teachers and school, and they had no opinion on the quality of teaching. One of the parents said: "You know what, if I could be more in this school, maybe I would say something about it. I do not see that anything needs to be changed there. I say, I was there when we delivered the application." Parents with basic vocational education more frequently expressed concerns that higher education did not guarantee a good professional situation. This could be attributed, on one hand, to a potential lack of knowledge about the returns on higher education. On the other hand, it might represent an attempt to rationalise their own past choices regarding the educational path. These parents often emphasised the importance of their child acquiring practical skills and a profession after graduating from secondary school. For them, the goal of education is to acquire a profession, rather than to acquire abstract skills and broaden the horizons. Parents with higher education, as well as the majority of parents with secondary education, exhibited higher aspirations and displayed more interest in their child's education compared to parents with lower levels of education. This interest may be manifested in concrete actions and investments.

Quantitative results

According to the findings of the qualitative research presented in the previous section, some expenses are treated by parents as an obligation. Apart from school-related expenditures, there are also additional expenses which parents decide to make in order to increase their children's educational opportunities.

Table 4 presents results of the Tobit regression models along with marginal effects conditional on non-zero school-related expenditures (M1) and non-zero

expenditures on additional activities (M2). For Model 1, Tobit regression results and marginal effects are almost identical, due to a small number of censored observations. Because dependent variables are in natural logarithm, the estimates are semi-elasticities. Below we present the interpretation of conditional marginal effects of independent variables.

Results of estimation (M1) show that parents' education is not a significant predictor of school-related expenditures. Additionally, the household's good financial situation does not differentiate these expenditures compared to households with an average financial situation. No significant results were obtained for gender, place of residence, and parental educational aspirations as well. However, significant determinants turned out to be the number of children in the family, difficult financial situation, the number of books in the household, and the type of school. The presence of another child in the family is associated with a modest, 3% decrease in the amount of school-related expenditures. Households in a more challenging financial situation spend, on average, 6.4% less on school-related expenditures than households in an average financial situation. A greater number of books in the household is associated with school-related expenditures approximately 4% higher. Expenditures related to the education of lower secondary school students were nearly 9% higher than expenditures on primary school students.

In the case of additional expenditures on education (M2), a greater number of predictors proved to be significantly influential in determining their amount. Parents' education is a significant predictor of additional expenditures on child's education. Parents with tertiary education spend 117% more on additional activities than parents with secondary education. And parents with educational level below secondary spend 99% less than parents with secondary education. In households with a difficult financial situation expenditures on child's extra-curricular activities are 48% lower than in households with an average financial situation. Wealthier parents spend 42% more on additional activities than parents with an average financial situation.

The number of books in a household is a significant predictor of the amount of additional expenditure. A higher number of books in the household translates into 32% higher additional expenditures per child. Parental aspirations towards their child's education are also important for the additional expenses. Parents with higher aspirations spend 39% more on additional activities than parents with lower aspirations.

The number of children does not affect the amount spent on extra-curricular activities. There were also no differences in the amount of expenditure on additional activities between children living rural and urban areas or between boys and girls.

Table 4. Determinants of the school-related expenditure (Model 1) and additional expenditure (Model 2). Tobit regression results and conditional marginal effects

	Model 1		Model 2	
	Ln of school-related expenditure	Conditional marginal effects ($Y > 0$)	Ln of additional expenditure	Conditional marginal effects ($Y > 0$)
Sex	0.018	0.018	0.143	0.057
	(0.025)	(0.025)	(0.332)	(0.131)
Number of children in the household	–0.031*	–0.031*	–0.327	–0.129
	(0.012)	(0.012)	(0.190)	(0.077)
Parental education: below secondary	–0.038	–0.038	–2.500***	–0.986***
	(0.029)	(0.029)	(0.454)	(0.179)
Parental education: tertiary	0.028	0.028	2.971***	1.172***
	(0.031)	(0.031)	(0.399)	(0.157)
Difficult financial situation	–0.064*	–0.064*	–1.224**	–0.483**
	(0.030)	(0.030)	(0.456)	(0.180)
Good financial situation	0.037	0.037	1.057*	0.417*
	(0.034)	(0.034)	(0.445)	(0.175)
Number of books (levels 1-8)	0.044***	0.044***	0.806***	0.318***
	(0.008)	(0.008)	(0.112)	(0.044)
Parents' educational aspirations	0.023	0.023	0.979*	0.386*
	(0.028)	(0.028)	(0.400)	(0.158)
Lower secondary school	0.088***	0.088***	–0.248	–0.098
	(0.024)	(0.024)	(0.345)	(0.136)
Village	0.057	0.057	–0.479	–0.189
	(0.033)	(0.033)	(0.465)	(0.183)
Constant	6.723***		–5.218***	
	(0.063)		(0.890)	

	Model 1		Model 2	
	Ln of school-related expenditure	Conditional marginal effects ($Y > 0$)	Ln of additional expenditure	Conditional marginal effects ($Y > 0$)
LR	–2654.45		4136.23	
Pseudo R^2	0.04		0.06	
Observations	2,700		2,700	
Uncensored observations ($Y > 0$)	2,691		965	

Standard errors in parentheses, $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p > 0.05$. Base category: for sex – boy, for parental education – secondary education, for financial situation – average financial situation, for parents' educational aspirations – at most a bachelor's degree, for education level – primary school, for village – city. In the analysis binary variables for counties were controlled.

Source: Own calculations.

Summary and conclusions

The European Child Guarantee initiative aims to provide children in the most challenging situations with access to essential public services, including free education. It is crucial for us to monitor the situation of children in terms of access to public education. One aspect of accessibility is the amount of costs necessary for full participation. This study addresses the topic of expenses incurred by parents in Poland for the education of their children. Our study reveals a distinction between school-related expenditures on children's education and additional expenditures, both in parental perspectives and in their variation concerning parental and household characteristics.

Qualitative research indicates that most parents view school-related expenditures as an obligation that burdens the household budget, without recognising their significance in building their children's human capital. On the other hand, parents consider expenditures on additional activities, voluntarily undertaken, as crucial for children's development and enhancing their educational opportunities. These results lead us to accept Hypothesis 1.

In qualitative research, diverse parental attitudes toward educational expenditures were observed. While school-related expenditures appear to be less influenced by parents' characteristics, the role of parents' education becomes evident in the case of additional expenditures. Parents with higher and secondary education demonstrated more significant interest in their children's school situation and held greater aspirations regarding their children's future education compared

to lower-educated parents. Their children often participated in various additional activities. In contrast, lower-educated parents did not consider their children's participation, even in unpaid activities. This, in turn, is in line with Hypothesis 2.

The results of the quantitative study indicate that school-related expenditures are much less dependent on family-related characteristics than additional expenditures. Not only did a smaller number of factors prove to be statistically significant for their amount, but also the significant factors did not differentiate expenditures to the same extent as is the case for additional expenditures. Those results confirm Hypothesis 3. However, we observe lower school-related expenditures among families in more challenging financial situations. Perhaps poorer families are looking for cheaper school equipment and used textbooks to save the money or they choose not to incur some expenditures. Families with more children spend less on school-related expenditures for one child than families with fewer children. Younger siblings often inherit some school equipment from their older siblings, which allows for lower costs. A larger number of children also limits the overall family budget, which may also prompt the search for savings or the abandonment of certain expenditures.

The results of quantitative analyses also show, that parents' education and the economic situation significantly differentiate the amount of expenditure on child's additional activities. Parents' higher education and a better financial situation of the household are associated with a higher level of additional educational investments. These results are in line with previous studies. Our study also tested other characteristics associated with socio-economic status such as cultural capital of the household and parents' aspirations towards child's education. It turns out that they also play a significant role in the amount of additional expenditure on education. Thus, it allows us to confirm Hypothesis 4.

There are other quite interesting results. The number of books in the household is a significant factor for both categories of expenditures. Although school-related expenditures are less responsive to the changes of this variable than additional expenditures, these results suggest that families with higher cultural capital incur higher school-related expenditures, perhaps giving even more consideration to their obligatory nature. Surprisingly, there were no differences in the amount of expenditures on additional activities between children living in the villages and cities. Certainly, there is a big difference in the supply of such activities between rural and urban areas and it should affect spending on them. However, this effect could be hidden in the controls for counties.

There were also no differences in the amount of school-related and additional expenditures between boys and girls. In case of school-related expenditures this result is not surprising, however, in case of additional activities literature suggests that girls more often participate in them, thus expenditures on them should follow.

Thanks to the analysis, we managed to answer two out of three research questions. From the qualitative and quantitative analysis, it emerges that Polish parents perceive expenditures related to participation in formal education as an obligation. They do not attribute any other significance to them. On the other hand, parents consider other educational expenditures, unrelated to school, as important for the development of their children. While almost everyone incurs any expenditures related to school (missings did not exceed 1% of the analysed sample), many parents did not incur additional educational expenditures for their child (almost two-thirds). This means that expenditures related to school are indeed unavoidable or hardly avoidable, whereas additional expenditures (on additional activities) are obviously optional. Expenditures related to school were found to be minimally dependent on family characteristics. Parental education did not significantly impact their amount. Financial difficulties were associated with lower expenditures, but the influence was modest. This may indicate that school-related expenditures are linked to a certain standard of school equipment, possibly aligned with the curriculum. On the other hand, additional education expenditures vary widely based on parental education and the financial situation of the household. Parents with higher education and those from financially stable households allocate a significantly higher percentage of funds to additional expenditures. If these expenditures indeed translate into educational achievements for children, this represents one of the mechanisms perpetuating socio-economic inequalities.

It is hard to say whether expenditures related to school are affordable for Polish families. Therefore, the second research question remains unanswered. The questionnaire lacked a question assessing the budget burden of such expenditures. Slightly lower (by 6%) expenditures incurred by families declaring a difficult financial situation compared to the expenditures of families with an average situation suggest that these families are either giving up some expenditures or seeking cheaper solutions. Also noteworthy are some expressions from qualitative interviews describing expenditures related to school as 'horrible' or as 'a macabre'. This suggests that, at least for some families, educational expenditures were indeed a significant burden. Public free education, in reality, generated high costs for them. The introduction of free textbooks from the 2017/2018 school year undoubtedly relieved family budgets. However, learning in school entails many other additional costs. Our study, conducted on old data, does not provide an answer as to whether additional social programs are sufficient.

To conclude, it is important to highlight the limitations of the presented analyses. One drawback of the analysis is the non-random sample of counties. Therefore, we cannot generalise the results for the entire country. However, we can still discuss the patterns.

Another issue concerns the accuracy of the education expenditure data. The data rely on parents' declarations rather than receipts or diaries, introducing the possibility of estimation errors. There is a potential concern that some parents might intentionally declare higher expenditures on education due to the positive perception of investments in children's human capital. This is likely to be more pronounced among parents with a high socio-economic status. However, the lack of relevance of socio-economic status for school-related expenditure suggests that any potential overestimation of education expenditure may not be significant.

In the economic literature, income is recognised as a key factor influencing investment in education. In this study, self-assessment of financial situation was employed instead of family income, primarily due to a substantial number of missing data. Future extensions of this research should consider addressing this issue through the application of imputation methods.

Certain reservations also apply to the qualitative study. It covered a wide range of topics, so the issue of parental expenditures was not extensively explored by the interviewers (although the script included many questions on this topic). The collected material allowed for the identification of certain patterns. However, it seems that, for assessing the affordability of school-related expenditures, a separate, dedicated study would be necessary[5].

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