

Analysis of Household Expenditure on Education in Cyprus †

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Abstract

This paper investigates household expenditure on education in Cyprus and analyses factors affecting the level of education using data from the Family Expenditure Surveys 1996/7, 2002/3 and 2008/9. The results obtained show that the level of education expenditure increases with income across years. In addition, the proportion of households spending on private tutorials range between 60-90% at primary and secondary education levels, while the variation of this proportion over income groups is almost nonexistent. In empirical analysis the most profound factors affecting the level of household expenditure on education are income, number of children in household, region of residence and head's age and education. However, education and age of head appears to diminish over time. The findings can have implications for a wide range of issues regarding educational policies in Cyprus.

Keywords: Education expenditure, household analysis, Cyprus.

1. Introduction

Since the introduction of the human capital theory by Becker (1964) the economics of education has been central in public policy debate. Schooling exerts a major effect upon earnings or occupational status and is seen almost as a universal cure to economic problems such as unemployment and poverty. According to the theory of human capital, education increases productivity and income through the acquisition of knowledge (Walker, 2003; Chevalier et al, 2004). The historical works of Becker (1964), Mincer (1974) and Lucas (1988) shaped economic thinking on how the acquisition of education enhances individuals' income and affects the long-term performance of the economy. Also interesting (and more debatable) is the effect of education on the distribution of income. Empirical findings demonstrate that education may act as a tool for redistributing income and

† This paper is part of the research project entitled "Economic Valuation of the State Education in Cyprus", which is funded by the Research Promotion Foundation of Cyprus in the framework of DESMI 2009-2010", (project number ANΘΡΩΠΙΣΤΙΚΕΣ/ΟΙΚΟΝ/0609(BE)/13).

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alleviating poverty (Stiglitz 1974; Behrman et.al. 1980). So, education can be a source of both economic growth and income equality.

The impact of education on earnings reveals a wide range of estimates, and an equally wide range of empirical approaches have been adopted to estimate the returns to education. Some of the most important studies include Harmon and Walker, (1995); Harmon, Oosterbeek and Walker, (2000); Blundell, Dearden and Sianesi, (2001) and Trostel, Walker and Woolley, (2002). Also, in the last three decades there has been an extensive body of literature examining the relation between parental investment in children and children's outcomes (Haveman and Wolfe, 1995; Becker, 1991; Becker and Tomes, 1979, 1986; Dearden et.al, 1997); and empirical analysis of the effect of family background/structure and children's educational attainment (e.g Behrman et al, 1980, 1986; Hanushek, 1992; Wells, 1995). Generally, the education attainment of children appears to depend mainly on the choices made by: (i) society and determine the opportunities available to both children and their parents; (ii) parents and relate to the family background and resources; and (iii) children, given the investments and opportunities available to them.

The choice between state and private schooling is also a widely researched issue in literature, where authors are primarily concerned with factors determining the outcome of this choice (e.g. Buttin, 1998). Questions like 'why households choose private schools' or 'who chooses or can choose a private school' are examined in the empirical literature. Family characteristics, like income/wealth tastes for education, socioeconomic background and other factors (race, ethnic background) are found to be important factors in the private/state school choice (Buttin, 1998; Lankford, Lee and Wyckoff, 1995; Lankford and Wyckoff, 1992; Long and Toma, 1988). Private schools may have a number of advantages over public schools (Hamilton and Macauley, 1991; Buttin, 1998; Lankford, Lee and Wyckoff, 1995). For example, they can offer more religious-based in a disciplined learning environment than state schools; and possibly more opportunities for meaningful participation in extracurricular activities for the students who desire to do so. They can also have a more homogeneous peer group, with students more likely to have college ambitions and come from high-socioeconomic status families than students in state schools. There is a widely held belief that private schools respond to competition (Hoxby, 1994) in ways state schools do not, and consequently are superior to state schools in providing educational services.

The aim of this paper is to present some stylized facts about aggregate and household education expenditure in Cyprus and to analyse the factors affecting the level of household education expenditure. Both the descriptive and empirical analyses of household expenditure on education

are based on data drawn from the Cyprus Family Expenditure Surveys (CyFES) for the years 1996/7, 2002/3 and 2008/9. The CyFES includes information about expenditure on different levels of education and, also, a large number of demographic and other personal characteristics of households such as family size, number of children, age of head, the education level of the head etc. Therefore, to our knowledge, the CyFES is the only publicly available database that can be used to examine factors affecting household expenditure on education in Cyprus. Findings can be used for reaching results that can have policy implications for a wide range of issues regarding educational policies in Cyprus, including efficiency and equity.

The paper is organized as follows. Section 2 discusses the evolution of aggregate education expenditure in Cyprus and provides some comparisons with other countries. Section 3 analyzes household education expenditure in Cyprus using data from the Family Expenditure Surveys and further investigates the factors affecting household education expenditure. Finally, Section 4 discusses findings and provides some useful conclusion drawn from the results.

2. Education expenditure in Cyprus and the EU

During the past decades there has been a strong debate in the European Union (EU) and other countries on which is the most appropriate method of mass educational provision (Trostel, 2002). Central to this debate has been the ability of the state to provide «quality» education at any given time and place. Governments intervene in education by regulating its content (prepare curriculum and testing), its demand (through laws concerning compulsory attendance) and through the determination of funding¹ and provision. A principal aim of state intervention is often the expansion of education systems through increasing public expenditure and encouraging expansion of the private sector. Other important aims of educational policies include the provision of equal opportunities to all and the increase of educational attainment. In OECD countries, on average, the proportion of people with at least an upper secondary education is about 80% in 2008, and the proportion of those with tertiary qualifications has risen from 20% in 1995 to 38% in 2008 (OECD report,2010).

¹ For example in US, funding can be either direct through free state-schooling or indirect through the use of education vouchers (see for example Ladd, 1992 and Epple and Romaro 1998). At the heart of the debate about state provision of education is the efficiency-equity trade-off (see for example Blomquist and Christiansen, 1995, 1999).

Cyprus is of particular interest because it appears to have the second highest educational expenditure in terms of GDP percentage in the EU. In Cyprus, education is provided free of charge by the state at all levels through pre-school and pre-primary schools, primary schools, secondary general and secondary technical /vocational schools, special schools and tertiary university and non-university educational institutions (public and private). Also non-formal education is provided through non-formal institutions and centres. Public schools are mainly financed from public funds, while private schools raise funding primarily from tuition fees. At the secondary level of education private schools receive a small state subsidy; and in a few cases foreign aid through various religious organizations.

As seen in Figure 1 the public expenditure on education as a percentage of GDP over the period 2000-2009 is higher in Cyprus than the EU average. It also shows great variation over time¹, ranging between 5.5% and 8.0%; while the EU average EU countries is steady around 5.0-5.5%. Among EU countries, Denmark and Iceland appear to have the highest ratios (7.8% and 7.1% respectively), followed by Sweden, Belgium and France (6.3%, 6.1% and 6%). According to an OECD, the average education expenditure (at all levels of education) as a percentage of GDP was 5.7% in 2007 for the OECD countries.

Figure 2 shows the percentage of public expenditure allocated to different levels of education in Cyprus during 2000-2009. Over this period secondary education absorbed the highest share in all years, followed by primary and higher education. This largely reflects the relatively high teacher and administrative personnel salaries in the primary and secondary education². Pre-primary and other³ education levels engaged smaller shares across all years. As regards changes over time, the share of higher education appears to slightly increase; while the share of secondary education decreases.

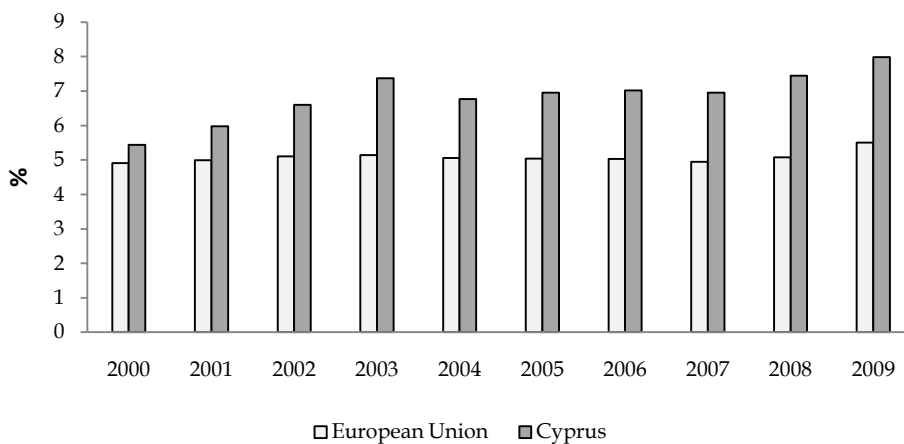
¹ The amount of public expenditure on education in 2001 was around 600 thousands euros, while during the decade the amount has more than doubled (source: Statistics of Education, Statistical Service of Cyprus, 2000-2009).

² In addition, according to the Statistical Service of Cyprus,2009, the expenses for students loans, grants and allowances was higher for higher university education level compared to higher non-university, primary and secondary education level.

³ Other includes the non-formal education and the educational programmes.

FIGURE 1

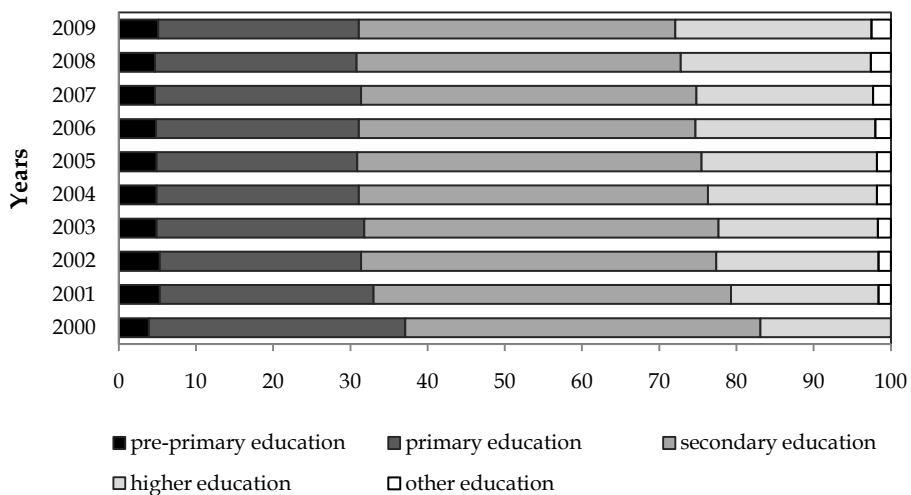
Public expenditure on education as % of GDP: Cyprus and the EU average



Source: Eurostat.

FIGURE 2

Allocation of public expenditure on education to different levels (Cyprus, 2000 – 2009)



Source: Statistics of education, Statistical service of Cyprus (2000-2009).

According to Eurostat, in 2009 Cyprus appears to have the highest expenditure per pupil at the secondary level, followed by Norway, United States, Spain, Belgium and Switzerland, while it lying in the fifth place after Norway, United States, Denmark and Switzerland regarding primary education level. However, compared to the average EU member states, Cyprus has about 48% and 78% higher annual expenditure per pupil in primary and secondary education. Romania, Bulgaria and Lithuania have the smallest annual expenditure per pupil in EU.

Table 1 presents the level of expenditure (euro) per pupil in Cyprus for the years 2000 and 2009. Higher education exhibits the highest expenditure per pupil in both years, followed by secondary education. Pre-primary and primary education had the smallest expenditure per pupil ranging between 2,000-6,000 euro. Notably, the expenditure per pupil in Cyprus increased substantially from 2000 to 2009 across all levels of education.

TABLE 1
Expenditure per pupil in Cyprus (euro)

	Pre-primary	Primary	Secondary	Higher
2000	1,966	2,689	3,947	8,994
2009	5,949	6,017	9,274	13,568

Source: Statistics of education, Statistical service of Cyprus (2000 and 2009).

It follows from the data presented in Diagrams 1 and 2 and Table 1 above that, in spite of its small geographic size, the Cypriot education system can be interesting for several reasons including, among others: (a) demand for all levels of education is exceptionally high¹; and (b) a growing number of families supplement the free of charge state education with out-of-pocket paid tuition mainly at secondary but, also, at primary education level. In the remainder of this paper we examine the factors affecting the level of education expenditure in Cyprus; and consider whether this level is high due to low satisfaction with state education, resulting in duplication of free state-schooling with out-of-pocket paid private tuition.

¹ This may be a consequence of the high social status of formal education, which is strongly embedded in the perceptions of Cypriot households. This is demonstrated by Eliophotou (1997), who estimated the perceived rates of return to higher education in Cyprus and studied the effect of economic considerations on the decision of secondary school pupils to pursue higher education. Similar claims are found in Demetriades & Psacharopoulos (1987), who studied educational expansion and the returns to education and Eliophotou (1998, 2008), who analyzed the factors influencing the demand for higher education.

3. Household Education Expenditure

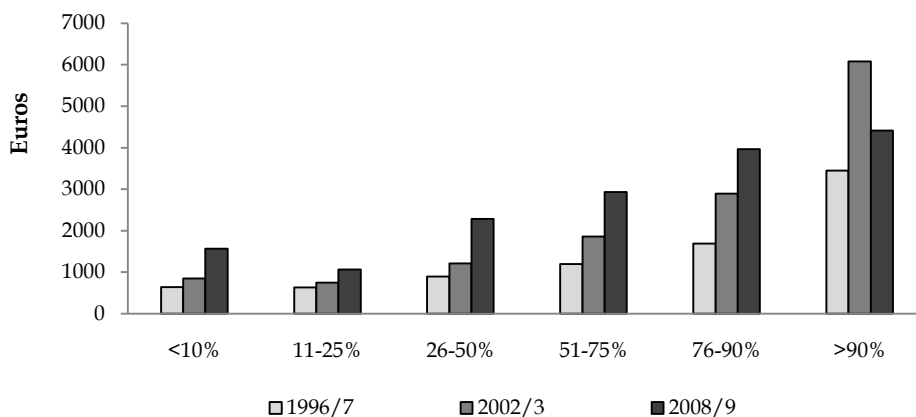
In this section we analyze education expenditure in Cyprus using individual household data drawn from the Family Expenditure Survey (CyFES) of 1996/7, 2002/3 and 2008/9¹. In particular, we investigate: (i) factors affecting the level of education expenditure incurred by households; and (ii) the household choice regarding public vs private schooling.

3.1 Descriptive analysis

Figure 3 presents the average education expenditure by income decile, calculated from the FES 1996/7, 2002/3 and 2008/9². The level of education expenditure increases with income within and between years³. In 2002/3 it appears to be much higher (around 6,000 euro) for the top income decile compared to 2008/9 (around 4,500 euro).

FIGURE 3

Total average education expenditure by income decile (1996/97, 2002/3 and 2008/9)



Source: Family expenditure survey and author's own calculations.

¹ It should be noted that most of the results presented below are based on the last two CyFES, where the information on education expenditure is comparable.

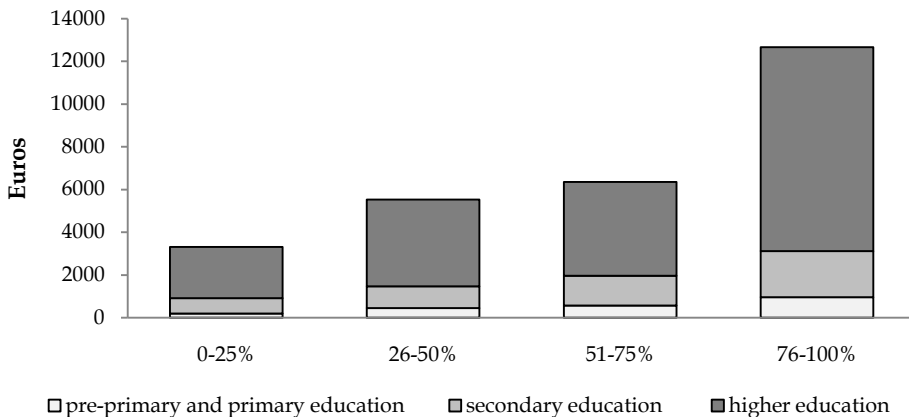
² The sample consists of households with children up to 30 years old.

³ The level of education expenditure in 2008/9 was a bit lower for the second income group (11-25%) in relation to the first income group (<10%).

Figure 4a shows the average education expenditure by income quartile and different education levels for 2002/3. Wealthier households (top income quartile) appear to have a much higher education expenditure compared to other income groups, with the largest component of this expenditure going to higher education. This is also the case for the other three income quartiles. Secondary education follows as the second biggest part of household education expenditure and pre-primary and primary the third part of expenditure in all income groups.

FIGURE 4a

Average education expenditure by income quartile and education (2002/3)

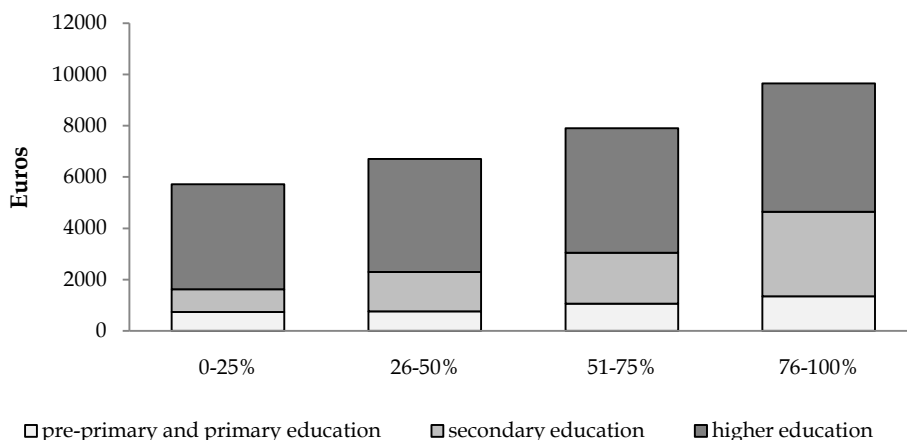


Source: Family expenditure survey and author's own calculations.

Figure 4b reports the level and composition of average household education expenditure by income quartile in 2008/9. Overall, the expenditure on different levels of education increases with income, while the largest increase occurs in the case of secondary education. Expenditure on secondary education is less than 1000 euro for the lowest income quartile, between 1,500 and 2,000 euro for the two middle income quartiles and around 3,300 for the highest income quartile. Yet, the expenditure on higher education exhibits small variation over income, while the overall education expenditure exhibits smaller variation over income compared to 2002/3.

FIGURE 4b

Average education expenditure by income quartile and education (2008/9)



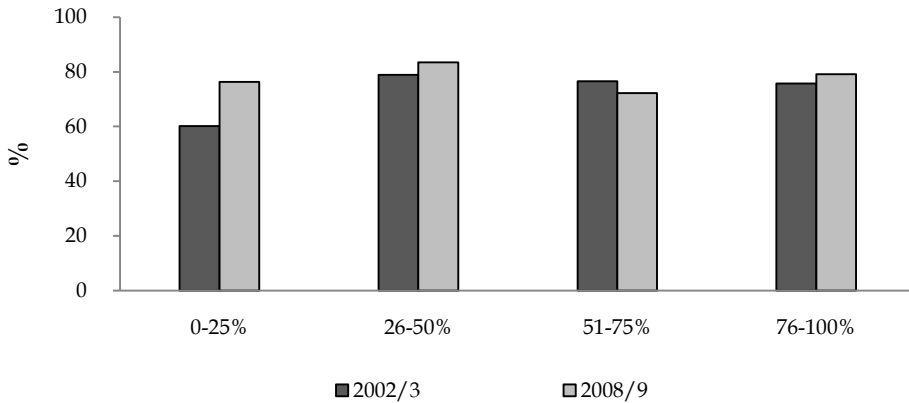
Source: Family expenditure survey and author's own calculations.

As far as supplementary education is concerned, Figure 5 shows the proportion of households with spending on private tutorials by income quartile for the years 2002/3 and 2008/9. Overall, a large proportion of households in Cyprus spend on private tutorials in all income groups, with the higher proportion in both years appearing in the second income quartile (26-50%). The proportions exhibit small variation over years and income groups.

Figure 6 reports the proportion of households spending on private tutorials by income quartile and level of education for the year 2008/9. As we can see, the proportions in the first three quartiles are higher for secondary education, while being almost the same as that of primary education in the top income quartile. The proportion of households spending on private tutorials at primary education level exhibits small variation over income, being above 60% in all income quartiles; and in some cases (for secondary education) rising as high as 90%.

FIGURE 5

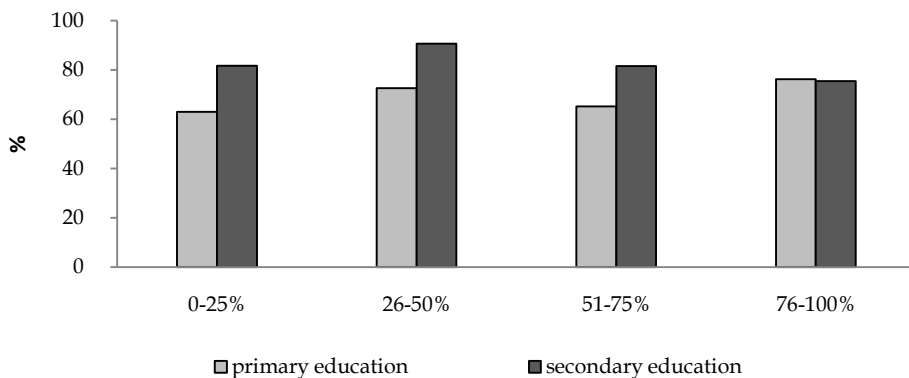
Proportion of households spending on private tutorials by income quartile



Source: Family expenditure survey and author's own calculations.

FIGURE 6

Proportion of households spending on private tutorials by income quartile and education level (2008/9)



Source: Family expenditure survey and author's own calculations.

Generally, supplementary education paid out-of-pocket is an important feature of the educational system in Cyprus. For those who secure a place in university and subsequently appointed in the public sector, investing in additional education has considerable financial and other benefits. But for the rest the same investment has minimal performance, since the knowledge and skills that additional education offers is primarily useful only for the exams for admission to universities. Until very recently, this was the case particularly in the field of science of education. Such

supplementary tutoring is widely known as ‘shadow education’. The metaphor is used because much tutoring mimics the mainstream school system.

Southern Europe has particularly high rates of shadow education, led by Cyprus and Greece and followed by Italy, Spain and Malta. Western Europe had long traditions of private tutoring on a small scale and Northern Europe to date seems to be the least affected by the rise of private tutoring. Finally, Scandinavian countries seem to maintain stronger traditions of schools adequately meeting their students’ needs. *“Certainly students in Scandinavia receive extra lessons, both to help slow learners keep up with their peers and to stretch the learning of high achievers; but much of this work is provided within the framework of public schooling rather than through a parallel system”* (The Challenge of Shadow Education, 2011).

It is important to mention that Cypriot households purchase supplementary education from both private and public sector. Usually, public sector offers tutoring lessons at a low cost compared to the private sector. Table A1 in the appendix presents the proportion of household purchasing supplementary education across sectors, educational level and income group. The highest proportions correspond to private sector for both education level and income group. Still, the proportion of public sector reduces with household income mainly for primary education. For secondary education the share exhibits a small reduction with income.

Figure 7 shows the different types of private education expenditure across income quartiles for 2008/9. The four types of private expenditure are:

1. tuition fees for primary and secondary education;
2. fees for private tutorials or supplementary education (named *frontistiria*);
3. fees for higher education; and
4. other expenditure, such as expenses for books and stationery.

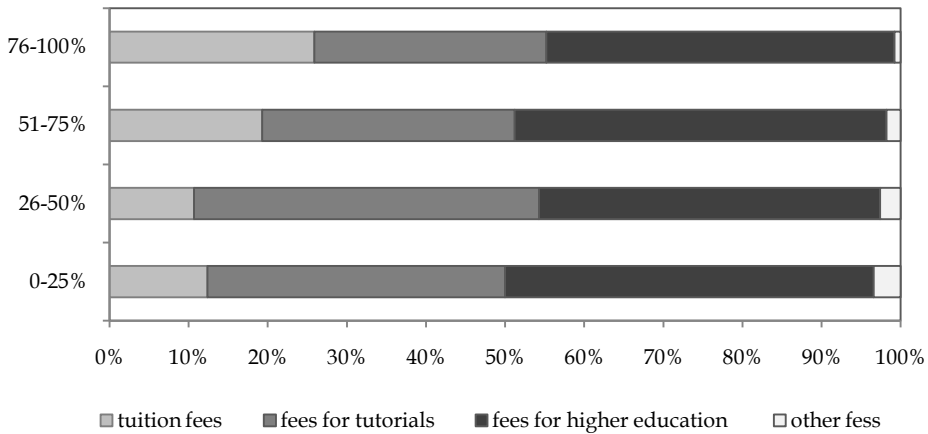
It is obvious that the largest share (around 45%) of expenditure on private education is for the attendance at institutions of higher education. This applies almost to all income groups¹. Fees for private tutorials hold the second large share of private education expenditure, exhibiting small variation over income (30-43%). Households in the second income quartile appear to have the highest education expenditure share for tutorials

¹ Higher education and tutorials have the same proportions in the second group (25-50%).

among all income groups. Finally, wealthier households appear to have the largest education expenditure share (26%) for tuition fees.

FIGURE 7

Private education expenditure by type and income quartile (2008/9)



Source: Family expenditure survey and author's own calculations.

Note: The fees for private tutorials concerns children attending primary and secondary education, while the tuitions fees for primary and secondary education are mainly for private schools.

On average, private education expenditure for 2008/9 in Cyprus is distributed as follows:

- 19% for attendance at private schools
- 34% for supplementary education
- 45% for higher education

3.2 Econometric analysis

In general, the descriptive analysis of the previous section reveals some important features relating the level of expenditure on education to household characteristics. The econometric analysis in this section goes a step further and attempts to estimate the separate (marginal) contribution of each household characteristic on this expenditure.

The sample consists of households with children at all education levels (pre-primary, primary, secondary and higher education level) for the years 1996/7, 2002/3 and 2008/9. Our analysis does not distinguish between private education expenditure because no information on the type of

schooling/institution and/or education expenditure in the years 1996/7 and 2002/3 is available. However, we believe there is no concern about any sample selection problem¹, because most of the households with children in the CyFES have positive expenditure on education (either fees for private schooling/institutions or fees for private tutorials). What may be the case is that the structure of education expenditure may differ according to households who choose to send their children in private or state institutions. In the first case they pay education fees directly, thus substituting the publicly provided education, while in the second case they spend on private tutorials, thus complementing the publicly provided education. Hence, the results reported in Table 2 represent the average effect of the two above cases.

As shown in Table 2 income and number of children are estimated to be key determinants of education expenditure in all years. The age and education of the household head appear to be important only for the years 1996/7 and 2002/3, while most of the regions are significant in all years. Specifically, the number of children in older age groups increases education expenditure compared to children up to pre-primary education (reference group).

The educational background of parents is usually expected to have a positive effect on whether households decide to invest in education. It may also have a bearing on whether they decide to invest in their child's education. If at least one of the parents had been to university then they may be more prepared to see their child also attending university. Our results show households whose heads completed tertiary education to have higher education expenditure than those with lower education in both 1996/7 and 2002/3. However, the magnitudes in 2002/3 appear to be lower and less significant for all levels of education compared to 1996/7, and not at all significant in 2008/9.

¹ A standard Heckman (1979) model has been applied to the 2008/9 dataset (households with children up to secondary education level), where information about the type of schooling (public or private) is available. The LR test for the independence of the two equations ($p=0$) gives a p-value equal to 0.19(chi-squared statistic= 1.69). So, we accept that the two equations are independent, thus it is not necessary to apply a Heckman estimation approach in order to estimate the contribution of each household characteristics on education expenditure.

TABLE 2
Factors affecting expenditure for education

Characteristic	1996/7		2002/3		2008/9	
	Coef.	s.e	Coef.	s.e	Coef	s.e
Income	0.297**	(0.149)	0.936***	(0.127)	0.532***	(0.135)
<u>Number of children (ref: 0-5)</u>						
6-12	0.031	(0.059)	-0.025	(0.055)	0.006	(0.065)
13-19	0.571***	(0.061)	0.387***	(0.053)	0.326***	(0.053)
20-30	0.609***	(0.096)	0.413***	(0.075)	0.273***	(0.069)
<u>Region (ref: Nicosia)</u>						
Famagusta	-0.209	(0.209)	-0.578***	(0.188)	-0.577***	(0.211)
Larnaka	-0.316**	(0.128)	-0.427***	(0.112)	-0.249*	(0.129)
Limassol	-0.351***	(0.114)	-0.067	(0.100)	-0.314***	(0.110)
Paphos	-0.266	(0.167)	-0.230	(0.152)	0.123	(0.156)
Urban area	0.341***	(0.117)	0.156	(0.103)	0.224**	(0.111)
<u>Head characteristics</u>						
Male	0.337	(0.249)	0.180	(0.178)	0.151	(0.159)
Manager	0.044	(0.209)	0.009	(0.181)	0.409	(0.353)
Professional	-0.135	(0.138)	-0.166	(0.122)	0.036	(0.121)
Work in private sctr	-0.179	(0.114)	0.140	(0.097)	0.118	(0.099)
Employer	0.750*	(0.389)	0.002	(0.310)	0.126	(0.344)
Self-employed	0.398	(0.312)	-0.124	(0.250)	-0.216	(0.270)
Employee	0.356	(0.285)	-0.116	(0.223)	-0.143	(0.235)
<u>Employer sector (ref: other)</u>						
Agriculture sector	-0.466**	(0.234)	-0.033	(0.244)	-0.717**	(0.305)
Constraction sector	0.163	(0.122)	-0.061	(0.107)	0.133	(0.234)
<u>Head age group (ref: <30)</u>						
30-40	0.513**	(0.200)	0.484**	(0.194)	-0.391	(0.322)
40-50	0.850***	(0.214)	0.635***	(0.202)	-0.009	(0.324)
>50	1.225***	(0.238)	0.839***	(0.219)	-0.135	(0.329)
<u>Head education (ref: primary)</u>						
Gymnasium	0.384**	(0.157)	-0.158	(0.163)	0.229	(0.159)
Lyceum	0.496***	(0.124)	0.298**	(0.116)	0.096	(0.112)
College	0.772***	(0.211)	0.296*	(0.161)	-0.105	(0.169)
University	0.705***	(0.198)	0.450***	(0.162)	-0.073	(0.151)
<u>Other characteristics</u>						
Sqrmt of the house	0.002	(0.001)	0.001	(0.001)	0.003***	(0.001)
Seconf house	0.286*	(0.166)	0.063	(0.145)	0.025	(0.150)
Rent a house	-0.108	(0.208)	-0.023	(0.153)	-0.019	(0.195)
Number of rooms	-0.062	(0.048)	0.081*	(0.046)	-0.048	(0.040)
<u>House type (ref: other)</u>						
Detached	-0.021	(0.164)	0.008	(0.148)	-0.298*	(0.162)
Semi-detached	-0.082	(0.181)	-0.029	(0.154)	-0.194	(0.171)
Flat	0.041	(0.201)	0.337*	(0.172)	-0.491**	(0.196)
Observations	1251		1247		1012	
R-squared	0.275		0.317		0.199	

The occupation of the parents could also affect the willingness of a household to invest in children's education. Children growing in families whose head is employed on a 'lower social class' occupation often tend not to be high performers in state education, partly because they do not get much help from their family environment. In terms of expenditure on private education this can work in opposite directions. It can have a positive effect insofar as parents on lower class occupations try to make up for the education disadvantage of their children by purchasing more education from the private sector. However, it can also have a negative effect because education tends to be of a relative low value in the preferences of these households, compared to upper-class households. These opposing effects may be the reason why the occupation of household head does not, in general, have a significant effect on private education expenditure in any of the years under examination. The notable exception is households with head employed in the agricultural sector, whose spending on private education is significantly less than households with heads in other occupations.

In addition, households with older heads spend more on education. Nevertheless, it appears that the age of the household head is not important in the 2008/9 data. As far as the region of residence of a household is concerned, the estimated results show households living in Nicosia to be associated with higher education expenditure compared to those in the other four districts of Cyprus¹. Furthermore, households living in urban areas are generally those spending more on education (significantly so both in 1996/7 and 2008/9), probably because of higher education related opportunities. Lastly, it seems that the gender of head and housing characteristics (type of the house, number of rooms, second house) appear to have mainly insignificant effect on education expenditure.

So, there is a variety of factors influencing parents' willingness to purchase private education for their children. While some factors are common in all countries, others may be country-specific. In the case of Cyprus our econometric analysis suggests that income, number of children, education of head and location are among the factors having a significant effect on private education expenditure; whereas other factors (such as the occupation and gender of head) do not appear to be significant.

Finally, as far as the public vs private school choice is concerned, it is well accepted that parents choosing private schools tend to be those who are

¹ Living in Paphos appears to be insignificant in all years, while the negative effect of the other regions varies both in significance and over years.

very supportive of education and want to send their children to high quality schools. Usually, private sector schools vary in quality and thus they provide an opportunity for households to obtain the desired level of quality by paying different educational fees. However, the cost of attending a private school is often beyond the budget of most households and probably the single most important factor forcing parents to send their children to state schools. A sample consists of two adult (non-retired) households with children up to secondary education attending private or state schools from the 2008/9 CyFES data were used to examine the factors affecting this choice^{1,2}. Household income and number of children appear to be the most significant determinants of the choice of household regarding the type of schooling. As expected, wealthier households have a higher probability to send their children to private schools, while this probability decreases with the number of children in the family. Heads that have a university degree and work in the private sector also have a higher probability to choose in private schooling for their children. In addition, a household with Cypriot head appears to have a lower probability to have children in a private school compared to a household with head of another EU nationality³. The age of head and region of residency have no effect on the choice of schooling.

4. Discussion and conclusions

This paper provides evidence about household expenditure on education in Cyprus. First, it presented a descriptive analysis and then investigates the factors affecting expenditure on education. The analysis of household education expenditure appears to be of great interest because Cyprus has one of the highest public expenditure on education as a percentage of GDP in the EU. Actually, it holds the second position after Denmark according to the last available data of Eurostat.

The data show that the level of education expenditure increases with income almost in all years, while the same is happening across years

¹ Around 16,5% are households with children in only private schools while the rest 83,5% are households with children in only state schools. It is important to mention that this sample selection was motivated by the need to limit heterogeneity among households to demographic characteristics of interest, i.e. the number of children of schooling age. Extending the sample to include other household categories, for example households with more than two adults, households with head over 65 or households with children in higher education, would introduce further heterogeneity

² Details on the parameter estimates are given in a full version of an Appendix to interested readers on request.

³ Head nationality was available only in the last CyEFS survey (2008/9).

within each income group. Another general observation is that while the expenditure on education increases with income, the largest component of this expenditure concerns higher education level. Still, the largest increase across income groups occurs in the case of secondary education expenditure. Finally, as far as supplementary education is concerned, the data show that the proportion of households with spending on private tutorials range between 60-90% for primary and secondary education levels, while the variation over income groups is almost nonexistent.

In terms of empirical analysis, this study used simple econometric models for the analysis of the factors affecting both household education expenditure and choice regarding the type of schooling. As expected, among the most important factors affecting the level of household expenditure on education are income, the number of children and the region of household residency; and some characteristics of the household head such as age and education, albeit their effect is fading over time.

A key factor influencing the educational expenditure of a household appears to be supplementary education. The growing number of families that supplement the compulsory education is a very pronounced phenomenon in the Cypriot society. Probably, the provision of mainstream schooling appears to be inadequate to meet all households' expectations regarding the achievement of their children in relation to that of other young people. Private supplementary tutoring of various kinds is used to bridge this gap, and especially to improve and maintain their children's competitive advantage. The rapid expansion of private tutoring brings major challenges for policy makers due to its social and economic implications. The proponents of supplementary education claim that it can help low achievers to keep up with their peers, can further extend the learning of high achievers, and can increase society's stock of human capital, thereby contributing to wider economic and social objectives. On the other hand, its critics claim that it adds considerably to existing social and economic inequalities, being a mechanism for the already privileged to extend their advantage at the expense of low-income households. In addition, it may have a negative effect on mainstream schooling through the different pedagogic approaches of teachers. Supplementary tutoring can also exert undesirable pressure on children by making the schooling day very long. Finally, when teachers receive extra income from the private tutoring of their own students, concerns arise about perverse incentives leading to corruption.

The high total expenditure on education in Cyprus as a percentage of GDP does not necessarily translate to better quality outcomes. The low efficiency of the education in Cyprus can be associated with various phenomena. First, the system of admission to the universities of Cyprus

and Greece, push households to spend a large part of their income to supplement state schooling with tuition purchased from the private sector, especially at secondary education level. Another important reason for the low efficiency of education in Cyprus is the distortion that public service causes in the labour market: the Ministry of Education and Culture is the sole buyer while the unions of teachers are the only sellers of educational services in the public sector. As always in such cases, there is a constant conflict between the two sides to entice the 'surplus' caused by the distortion of the market to the detriment of the consumer. The third possible reason is connected with the fact that the evaluation and funding is not based on criteria reflecting measurable performance indicators of the teachers and the school.

The inadequacies of the Cypriot educational system need urgent attention. The government needs to recognise and evaluate the nature, scale and implications of supplementary education systems on mainstream schooling. They should also consider ways to regulate and guide supplementary education in order to secure child safety regarding the quality of education; and going further, Cyprus government may also wish to find ways to tax the earnings of tutors. Additionally, the creation of a new system of teachers' appointments through examinations (and further removing catalogues and lists) is very crucial. This will promote teacher quality over seniority. What seems promising is that governors have already started to discuss and work on this change in the educational system. Additional training of the teaching staff, revision of salaries based on teacher's performance; and the decentralization of the education system to reduce the monopoly control and increase competition for teachers and educational institutions are policy recommendations the government needs to consider seriously and implement without further delay.

Overall, it is well accepted that an important reason for the provision of free education by governments is the guarantee of minimum consumption by economically deprived social groups. The social welfare is maximized through the pursuit of economic efficiency and equity. The crucial question is how far a government must intervene in the provision of education and whether it is possible to devise an efficient and equitable package whereby the state can regulate education and subsidize it wholly or in part. The challenge for policymakers is to find ways to design an efficient educational system in order to promote alternative goals depending on current public universal needs, especially nowadays amidst the economic crisis and the new global market reality.

Appendix

A1. The Education System in Cyprus

The state educational system in Cyprus is highly centralized with head-masters and teachers appointed, transferred and promoted by the Educational Service Commission, an independent five-member body, appointed for a six year period by the President of the Republic. Private schools are owned and administered by private individuals or bodies but are liable to supervision by the Ministry of Education which is responsible for the operation and the regulation of the education system in Cyprus. State schools are mainly financed from public funds, while the private schools raise their funds primarily from tuition fees.

Pre-Primary Education is compulsory for all children between 4 8/12 – 5 8/12 years old. Children are also accepted over the age of 3. Primary education is compulsory for all children over the age of 5 8/12 and has a duration of 6 years. Age is the only criterion for the admission of children to primary education. Secondary General Education offers two three-year cycles of education – Gymnasio (lower secondary education) and Lykeio (upper secondary education) – to pupils between the ages of 12 and 18. Children are admitted to lower secondary education on the criterion of age and if they possess a primary school leaving certificate. Instead of the Lykeio, pupils may choose to attend Secondary Technical and Vocational Education which provides them with knowledge and skills which will prepare them to enter the workforce or pursue further studies in their area of interest. At all levels, school year is divided into three terms of three months, with attendance on five days of the week. Several private foreign language schools operate in parallel with the state schools.

Higher Education is provided in two levels: universal level, from the state and private institutions of tertiary university education; and the non-university level, from the state educational institutions of tertiary education and the private colleges¹. In particular, there are three state university institutions: the University of Cyprus, the Open University and the Cyprus University of Technology, and three private universities, the University of Nicosia, the European University of Cyprus and the Frederick University. All private universities started their operations in September 2007, while state universities admitted their first students in September 1992, September 2006 and September 2007 respectively.

In addition, the Cyprus educational system provides education of primary and secondary school level and vocational training to children and persons with special needs at all ages. It includes Schools for the Blind, the Deaf as well as special schools for children with mental or other disabilities. Finally, further to the formal education there is a non-formal/part time education which it consists of

¹ Currently, 25 Private Institutions of Higher Education are registered with the Ministry of Education and Culture some of which have branches in other cities in Cyprus, besides Nicosia. Private Institutions of Higher Education do not have university status but they offer both academic and vocational programmes of study at the undergraduate and postgraduate levels.

various public and private part-time institutions. State non-formal education is provided through: the Apprenticeship Training Scheme and the Afternoon and Evening classes of Technical Schools of the Ministries of Labour and Education respectively; the Human Resource Development Authority organizes accelerated vocational training and retraining courses, which are usually subcontracted out to suitable institutions; the Productivity Center provides courses for upgrading and/or training of managerial and supervisory personnel and skilled workers; the Cyprus Academy of Public Administration of the Ministry of Finance; the State Institutes of Further Education; the Adult Education Center

A2. Tables

TABLE A1

Proportions of supplementary education across sectors and income groups (2008/9)

Primary education	Low income households	Average income households	High income households
Private sector	0.86	0.90	0.94
Public sector	0.14	0.10	0.06
Secondary education			
Private sector	0.92	0.93	0.94
Public sector	0.08	0.07	0.06

Acknowledgements

The author would like to thank Prof. Panos Pashardes for his useful comments and suggestions.

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