Three options is better than one: the art of being a wise parent

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## Abstract

The governments of nearly all countries are major providers of primary and secondary education to their citizens. However, down the ages people are interested in private schooling. Moreover, recently there is a rapid growth in the number of homeschoolers all over the world. In this study, I ask two questions. First, why is homeschooling prohibited in some countries. The problem is that unlike in conventional markets where with the increase of competition the society benefits, the education market suffers from the adverse selection problem. Second, I ask why different people make different choices regarding the study process of their children. I develop a theory which integrates the possibility of teaching a child at home, at public and in private school as well as check it in practice. Overall the highest probability corresponds to public schooling irrespective of income and education.

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# 1 Introduction

A classic economic dispute is considered with the dilemma between public versus private education. However, the recent econometric study vividly shows that no school type robustly dominates another type when controlling for the school environment and taking equity into account (Cherchye et al., 2010).

Looking backwards, the researchers tried to estimate the difference in return between public and private investment in human capital. Glomm and Rabikumar (1992) found that income inequality declines quickly under public education. On the other hand, private education yields greater per capita incomes unless the initial income inequality is sufficiently high. The estimation of the efficiency between private and public education in different political regimes was conducted by De la Croix and Doepke (2009) who concluded that in a given political environment, high income inequality leads to more private education, as rich people opt out of the public system. More private education, in turn, results in an improved quality of public education, because public spending can be concentrated on fewer students. They also found that when political power is evenly distributed, a unique political equilibrium exists. Parents decide to send their children to a private school if they would like to endow their children with an education of a much higher quality than what is provided by the public system. In a society with little inequality, the preferred education level varies little in the population, so that all parents use public schooling. For increasing levels of inequality, an increasing share of richer people chooses private education for their children.

As it has been showed there is a wide-ranging debate about both private and public education, however a new trend is coming up: it's homeschooling. By the measurement of the National Center for Education Statistics (the USA) approximately 3 percent of the school-age population was homeschooled in the 2011–12 school year. To better understand the magnitude of the recent events it's necessary to mention that in 1999 the US had only 850,000 children while in 2007 it reached 1.5 million children. [2]. As for the reasons parents gave a number of those for homeschooling their children, they are as follows. In the 2011–12 school year, 91 percent of homeschooled students had parents who said that a concern about the environment of other schools was an important reason for homeschooling their child, which was a higher percentage than other reasons listed. To the best of my knowledge there are still no studies which try to compare the pros and cons of the homeschooling in comparison with the private education. I do hope that this paper will contribute to the understanding of this not easy choice.

The paper challenges to answer two questions. First is why homeschooling is prohibited in some countries? For some countries for which tolerance is of particular importance abandoning homeschooling makes sense. German authorities state: «In our increasingly multicultural society school is the place for a peaceful dialogue between different opinions, values, religions and ideologies. School is a training ground for social tolerance. Therefore homeschooling is not an option for

[2]https://nces.ed.gov/pubs2009/2009030.pdf

Germany.» However, not all countries care about it that much, why is homeschooling still illegal in them? The previous literature presents insight about the influence of private school competition on public schools. The results are controversial. That is Hoxby (1994) finds evidence that for the United States the private school competition increases the attainment of public school students. While Thapa (2013) finds no significant relationship using both continuous and binary measures of competition. I develop a theory which is based on the fact that education market is a place for the emergence of adverse selection problem. The argument is that a school with many high-earning families will support their school with their financial resources and with their time. They will monitor the school to make sure both that the teaching is good and that resources continue to flow to the school. In contrast, a school with families with low-earning single parents will be unable to prevent the school's decline. The end result is that highly-educated and upper-class people are those that have the means, ability, and knowledge to abandon public schools. Contrary to the arguments of conservative economists, allowing homeschooling to compete with public schools will not improve the public schools. Instead, because of adverse selection, the competition will inevitably cause the public schools to decline (Shepard, 2016).

Second, I try to find the intuition behind the choice of the type of education (public school, private school or homeschooling) across families with different income and educational levels. To the best of my knowledge this question was studied only in the paper of Isenberg (2006). He found that families are inclined to avoid low quality public schools. For families leaving the public school system, they are relatively more likely to exit to home schooling rather than private schools if the mother has abundant time but scarce income, and if the state public school finance system is centralized, making Tiebout sorting less efficient and private schooling more costly. These effects are especially strong among well-educated parents and younger children. In this paper I found that irrespective of income and education of the parents there is the highest probability that they will send their children to public school. However, the increase of the probability to send the child to private school rises up with the increase of income and education level (and decrease for the public school). For homeschooling the effect for education holds however with income the result is much trickier: up to a certain moment the probability increases (the effect of decreased marginal utility of income takes place) while after this peak it decreases (parents have a chance to put their money into more valuable option- private schooling).

The paper is organized as follows. Section 2 presents the theoretical model which explains one of the reasons why homeschooling is illegal in some counties. Section 3 presents the theoretical model which tries to explain the intricacies of the choice among public, private and homescholing and presents some empirical evidence behind the results. Section 4 concludes.

## 2 Part 1. Why homeschooling is prohibited in some countries?

### 2.1 Story

It is naturally to assume that it is impossible for a single parent (without a spouse or partner) to homeschool her children. Since the parent has to work, she can not simultaneously homeschool the children. Those who are wealthy in money or time are also likely to be those who will be most aware of alternatives other than the public schools. It happens because exactly the same factors that allow someone to earn high wages, such as a good education, also make the person to be more aware of other educational opportunities for their children except the public schools. The final result is that highly-educated and upper-class people are those that have enough ability and knowledge to abandon public schools. With these groups neglecting public schools, the remaining public-school families are disproportionately single-parent, minority households, with parents with lower education levels, lower earnings, and lower wealth (Shepherd, 2016). Hence, the irresistible forces of adverse selection cause the resilient to abandon the public schools, leaving only the vulnerable.

The families who abandon the public schools are the families with the greatest resources for improving the schools. They are the families with the most wealth to contribute to improve their public school, the ones with the existence of one parent not having a market-based job so that the latter one has the time to devote to improving the public school. They are the families with the greatest political connections for influencing the political process to direct additional resources to their school are the greatest enthusiasm for forcing school administration to improve the school.

A vicious cycle is created. A wave of resilient, wealthy, educated families abandons the local public school. Due to their absence, the school becomes worse. This makes more and more families to leave, causing the school to become worse. The process continues until the only remaining families are the vulnerable ones who lack the wealth and enough education to leave. The standard economic theory predicts that competition should improve the quality of public schools. However, it does not happen in the reality. What is the reason for it? Contrary to the arguments of conservative economists, allowing homeschooling to compete with public schools will not improve the public schools. Instead, because of adverse selection, the competition will inevitably cause the public schools to suffer. Competition is harmful in a market that exhibits strong adverse selection. As we can see, the presence of choice in such types of markets make the low income groups to suffer (the effect is larger the larger is the share of low-income families in the society) and prevent middle and high income families to benefit from diversity- that is the exact reason to abandon homeschooling in some countries.

### 2.2 Model

Consider the following setup. The model is based on the one from Estevan (2009).

Assume that the economy consists of the individuals identical with respect to their preferences. These preferences are defined over the private consumption, $c_i$, and human capital, h. Thus, the preferences are represented by the utility function $U(c_i, h)$, which is assumed to be continuous, strictly increasing, concave and twice differentiable. Individuals are heterogeneous with respect to their income $y_i$ and mother's education $a_j$ which is incorporated into the function of human capital and will be defined further. There are three income groups: poor, middle and rich denoted by $i = P, M, R$ where $y_p < y_m < y_r$. Their proportions in the population are $\lambda_p$, $\lambda_m$ and $\lambda_r$ respectively where $\lambda_p + \lambda_m + \lambda_r = 1$.

All individuals' incomes are taxed at the constant rate t. The government uses tax revenues to finance the public education system. The technology in the economy transforms e units of private consumption to one unit of education quality, e (the price of public education is normalized to one). Hence, the government provides education at quality e per student. The constraint of the government's budget is as follows:

$$t\bar{y} = e\theta,$$

where $\bar{y} = \lambda_p y_p + \lambda_m y_m + \lambda_r y_r$ is average income and $\theta$ is the proportion of students enrolled at public schools.

Although public education is freely available to everyone at quality e, not all children go to school. This happens because of three reasons. First, they may obtain education of high quality $h > e$ during homeschooling. Second, private education may exist at quality $s > e$ (the tuition price is set to one).Third, there are opportunity costs of attending school denoted by w.

Human capital, h, is a function of mother's education $(a_j)$, the quality of the school and student body composition. The model includes mother's (not also father's) education because the existing evidence indicates that mothers are responsible for the bulk of hometeaching (Stevens, 2009). In the model all students are assumed to have the same innate ability, however the parent pay attention to the average income in the school since it may reflect peer effects that may improve learning during educational process or network formation which may influence child's income in the future. The human capital function is given by

$$h = h(q, a_j, \mu_q),$$

where $q = e(\theta), k, s$ for public, home and private education respectively ; $\mu_q$ is the average income in school q and $a_j$, where j=h,l (high; low) which corresponds to mother's education.

Further assuming that private school does exist in this economy, the utility functions of a household at private school, public school, homeschooling or being out of school are as follows:

$$U(c_i, h(s, a_j, \mu_s)), \text{ where } c_i = (1-t)y_i - w - s$$
$$U(c_i, h(e(\theta), a_j, \mu_e)), \text{ where } c_i = (1-t)y_i - w$$

$$U(c_i, h(k, a_j, \mu_k)), \text{ where } c_i = (1-t)y_i - w - k$$
$$U(c_i, 0) \text{ where } c_i = (1-t)y_i$$

In order to further analyze the situation, we need to make some simplifying assumptions.

If the human capital is low the families with middle income ($y_M$) always choose public schooling, that is:

$$U((1-t)y_M - w, h(e(\theta), a_l, \mu_e)) > U((1-t)y_M - w - s, h(s, a_l, \mu_s))$$

$$U((1-t)y_M - w, h(e(\theta), a_l, \mu_e)) > U((1-t)y_M - w - k, h(k, a_l, \mu_k))$$

$$U((1-t)y_M - w, h(e(\theta), a_l, \mu_e)) > U((1-t)y_M, 0)$$

If human capital is low, rich households may choose private or public education. They will choose private if (taking into the account that inequalities above hold):

$$U((1-t)y_R - w - s, h(s, a_l, \mu_s)) > U((1-t)y_R - w, h(e(\theta), a_l, \mu_e))$$

Poor households irrespective of the level of human capital choose public school or no schooling (private is ineligible while they have to work in order to make ends meet, hence homeschooling is also not an option).

Thus, they will be out of school if $U((1-t)y_P, 0) > U((1-t)y_P - w, h(e(\theta), a_j, \mu_e))$

If the human capital is high rich people will choose homeschooling, private schooling or public schooling while middle income families will choose homeschooling or public schooling.

Following the logic above consider the following case. Middle income households will prefer public schooling to homeschooling if:

$$U((1-t)y_M - w, h(e(\theta), a_h, \mu_e)) > U((1-t)y_M - w - s, h(s, a_h, \mu_s))$$

$$U((1-t)y_M - w, h(e(\theta), a_h, \mu_e)) > U((1-t)y_M - w - k, h(k, a_h, \mu_k))$$

$$U((1-t)y_M - w, h(e(\theta), a_h, \mu_e)) > U((1-t)y_M, 0)$$

The rich households will prefer home schooling to public schooling if

$$U((1-t)y_R - w - k, h(k, a_h, \mu_k)) > U((1-t)y_M - w, h(e(\theta), a_h, \mu_e))$$

Next, consider the following difference:

$$\Gamma = U((1-t)y_R - w - k, h(k, a_h, \mu_k)) - U((1-t)y_M - w, h(e(\theta), a_h, \mu_e))$$

Note that for a household which has chosen homeschooling, $\Gamma > 0$. Obviously, the effect of an increase in e for a given t will mainly depend on the human capital technology. In the case when e and $a_h$ or e and $\mu_e$ are complements, the share of homeschoolers does not react to an increase in quality ($\Gamma$ is decreasing in e as you may notice ). The first channel and second channel give us the story provided above. When $a_h$ and $e$ are perfect complements (that is increase in quality is obtained by the contribution of parents with high human capital) it's inefficient for the rich households to shift to public schooling. On the other hand, when e and $\mu_e$ are perfect complements by the story above the quality increases with the increase of the money invested to the school. In that case it is also inefficient to shift to public schooling, so the problem of adverse selection happens.

# 3 Part 2. What types of education (private/public/homeschooling) do different families (differentiated by income and education) choose?

## 3.1 Model

The model is based on the one presented in Isenberg (2006). Here I find necessary not to explain the direct choice of the houshehold depending on the income and education of the parents but the possible channels of influence on the choice. Consider the following setup.

The model for homeschooling. As it has been presented in Part 1 families which choose homeschooling are the ones mother is responsible for children's education. The mother i who is residing in local area j solves the following problem:

$$\max_{t_{il}, t_{iw}, t_{ih}} u_{ij} = u(z_{il}, t_{il}, s_i)$$

s.t. budget constraint:

$$z_{il} + z_{is} = w_i t_{iw} + y_i;$$

s.t. time constraint:

$$\bar{t} = t_{il} + t_{iw} + t_{ih};$$

s.t. school production function:

$$s = \begin{cases} s_h(t_h), t_h > 0 \\ s_j(z_s), t_h = 0 \end{cases}$$

Notation:

$t_{il}$- mother's leisure time;

$t_{iw}$-mother's time spent working;

$t_{ih}$- mother's time spent teaching a child;

$s_i$ -school quality;

$z_{il}$- composite consumption;

$z_{is}$- price for buing a school quality (private or public);

$w_i$-wage;

$y_i$- non-labor income.

In this model it is assumed that school quality may be purchased either by paying tuition costs for private schooling or paying implicitly for public schools through local taxes.

**Income's effect**:

For homeschooling: on the one hand, more income, by decreasing the marginal utility of income, will decrease the mother's labor supply, expand her disposable time, thus increasing the probability of homeschooling. On the other hand, since homeschooling and conventional schooling are substitutes, an increase in income directly rises up the quality of private schools the family can afford, making homeschooling option less attractive. Summing it all up, the effect of income on homeschooling is ambiguous.

For private schooling: since the first effect is ineligible here, only the second matters- assuming that private schooling is of the best quality with the increase of income the probability of private schooling will increase. By analogy the probability of public schooling will decrease.

**Education's effect**: For homeschooling: the influence of mother's education on homeschooling is also ambiguous because on the one hand $\frac{\partial w_i}{\partial educ_i} > 0$ (that is the higher is the level of mother's education the higher is the opportunity costs), but on the other hand $\frac{\partial s_{ih}}{\partial educ_i} > 0$ (that is the higher is the level of mother's education the higher is her contribution to children's education while homeschooling). It is the well-known trade-off (see Datcher-Loury, 1988).

For private schooling: since as discussed in the first part more educated people are better acknowledged with the existing opportunities and realize that private or homeschooling is the better opportunity in comparison with the public schooling the probability of choosing private schools will increase with the increase of the level of the education.

### 3.2 Empirical evidence

Data is retrieved from the surveys of the National Center for Education Statistics[3] of the US. The sample covers the following years: 2001, 2003, 2005, 2007, 2012 and is obtained as a representative of the US citizens over all 50 states. For the analysis it is necessary to use the multinomial logit model, which allows to estimate the probabilities of choosing public education,

[3] https://nces.ed.gov/nhes/dataproducts.asp#2012dp

private education or homeschooling with the respect to the levels of income and education. In table 1 are presented the results of the regression.

| Income | Education | Public | Private | Homeschooling |
|---|---|---|---|---|
| 1 | 1 | .927 | .047 | .026 |
| 2 | 1 | .894 | .078 | .028 |
| 3 | 1 | .872 | .113 | .015 |
| 1 | 2 | .867 | .094 | .039 |
| 2 | 2 | .81 | .15 | .04 |
| 3 | 2 | .768 | .211 | .021 |

Table 1: Multinomial logit model

The sample was divided into three income groups (by distribution): low income, middle income and high income, which correspond to 1, 2 and 3 in the column *Income*. Moreover, the sample was divided by low-educated people (less than college) and high-educated (more than college). The highest education in the family was taken into consideration. Other specifications were tried (more income/education groups, inclusion of the location characteristics and other control variables) but no qualitative changes were noticed.

What is the main take-away message from this table? There is a higher probability of choosing public education irrespective of the income and education group. Two other tendencies should be mentioned. First, the probability of attending private school increases with the increase of income by the education groups. Second,there is an increase in the probability of choosing homeschooling from low to middle-income groups, but there is a significant drop for high income groups- they choose homeschooling.

As it has been stated in the model provided above here we obtain that until the income reaches «high-income» group the effect of decreasing marginal utility of the income outweighs, while after that when private schooling becomes more attractive the family shifts to it. While on the other hand fixing the income group with the increase of education the probability of homeschooling increases which proves that only the effect of the increased contribution to the development of human capital matters.

The results for private as well as public schooling coincide as well with the theoretical model.

## 4 Conclusion

In the 21 century in the most countries there is a wide choice of possible ways of education: public schooling, home schooling and private schooling. However, as it has been shown in the model above the education market is the one which suffers from the adverse selection: increased competition from private schooling and homeschooling does not lead to the increased quality of instructions, it leads to the opposite effect. Moreover, the world full of possibilities does not make the parents on average choose the unconventional option of private or homeschooling: they still

prefer public schooling. However, there are interesting tendencies: with the increase of both income and education levels the probability of choosing private schooling increases. The same result holds for education for homeschooling (which actually means that the effect of the increased influence of mother's human capital dominates). However, in case of homeschooling the influence of income is much trickier: up to a high income, the probability of home schooling increases and right after that decreases. This result is connected with the increase of attractiveness of private school option.

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