A quantitative analysis of Turkish Private Education Reform

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ABSTRACT

A recent education policy Turkish government is wishing to undertake is to shut down all private supplementary education centers (SECs) unless SECs manage to convert into a private school. With this policy, the government is willing to increase equality of opportunity among students. We show quantitatively that the policy, in fact, leads to a decrease in equality of opportunity since SECs are given the option to convert into private schools. We use a political economy model of education at which households, heterogeneous with respect to exogenously set income, choose among a continuum of private schools differentiated by tuition and a public school. Households choosing the public school can privately supplement their child's education spending in any amount. Public school is free of charge, and its spending is financed by income tax revenue collected from all households. Income tax rate is determined by majority voting. Achievement of a child depends only on educational spending. We calibrate the model's parameters by matching certain targets from 2013 Turkish data. We then exogenously restrict the supplemental education spending to zero in a counterfactual experiment. We find that variance of achievement (or inequality of opportunity) increases by 23.51% and mean achievement decreases by 1.74%.

1. Introduction

A recent education policy Turkish government is wishing to undertake is to shut down all supplementary education centers (SECs) unless SECs manage to convert into a private school.[1] SECs supply private tutoring services and they mainly prepare students for university entrance examination. They are more common among 12th-grade students. According to Tansel and Bircan (2005) and İKSARA (2012), around 50% of 12th-grade students enroll in SECs. Moreover, Tansel and Bircan (2005) and Özoğ̆lu (2011) finds that 86% of SEC students belong to middle and low-income families in 2002. This paper aims to quantitatively analyze the effect of this governmental policy on student achievement distribution after high school using an equilibrium political economy model of education. We find that mean achievement declines by 1.74% and variance of achievement increases by 23.51%.

Government's rationale for shutting down SECs is to increase equality of opportunity among students taking the college entrance exam. Unfortunately, shutting down SECs may not produce the desired outcome since the government also allows SECs to convert into private schools. As of July 2015, 2280 SECs out of 3107 applied to Ministry of Education for conversion. The application of 2260 SECs is approved by Ministry and 907 SECs already converted into private schools. The conversion process of the remaining SECs is planned to be completed within near future. Therefore after the reform, private school enrollment is expected to increase causing a

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[1] To become a private school, a SEC is supposed to meet certain criteria such as having i) science laboratory, ii) 60m² sports hall which can be hired from nearby schools, and iii) at least four classrooms.

decrease in equality of opportunity. Consistently with this expectation, our model predicts that private school enrollment increases from 3.96% to 28.44% and equality of opportunity, proxied by the inverse of the variance of achievement, decreases by 23.51%.

Our model, borrowing from Bearse et al. (2005), consists of a continuum of heterogeneous households, a continuum of heterogeneous private schools, a public school and a continuum of heterogeneous SECs. Each household consists of one parent and one child, and they differ by exogenously specified income. Each household pays the same fraction of its income in the form of tax. They derive utility from numeraire consumption and achievement level of their children. Achievement of a child depends only on the educational spending. Therefore, achievement is measured by educational spending per pupil. Private schools differ by tuition they charge which equals their per pupil spending. Public school spending per pupil is determined by equally dividing total income tax revenue among public school students. Only public school students are eligible to enroll in the SECs which are differentiated by tuition.[2] One unit of spending in public or private schools contributes the same amount to achievement whereas one unit of SEC spending contributes comparably less to achievement.[3] Households make a discrete choice between public and private schools taking as given income tax rate and per pupil public spending. Those choosing the public school also choose the amount of supplemental education they wish to purchase from SECs. Achievement of a public school student depends on public expenditure per pupil and private supplemental spending. On the other hand, achievement of a private school student simply equals tuition. Income tax rate is determined via majority voting in an election at which all households participate. Households are non-myopic voters in the sense that they consider the effect of their vote on aggregate public school enrollment and public spending per pupil.

We calibrate the parameters of our quantitative model so as to match certain education statistics from 2013 Turkish data. We also compare model's performance with respect to non-targeted statistics such as i) coefficient of variation of university entrance examination score distribution, ii) ratio of total SEC spending to GDP, and iii) joint distribution of income and SEC enrollment. We then exogenously eliminate the option of supplementing public education as is happening in Turkey. As a result, the achievement of those children attending SECs will be adversely affected. Some of the parents of these children would therefore opt out of public school causing a rise in private school enrollment. This is expected to impact per pupil public spending level in two ways. First, per pupil public spending rises because of the decline in public school enrollment. Second, fraction of households voting for zero income tax rate would increase because of higher private school enrollment. As a result, the prevailing income tax rate is expected to decrease causing a decline in income tax revenue and per pupil public spending. The net effect of these two forces is ambiguous and requires a quantitative analysis. We find that in equilibrium private school enrollment increases from 3.96% to 28.44%, income tax rate decreases by 29.59% and per pupil public spending decreases by 5.27%. The increase in private school enrollment together with the decrease in per pupil public spending causes variance of achievement to increase. Moreover, mean achievement after high school decreases which is mainly caused by the decline in per pupil public spending.

Stiglitz (1974) is one of the first theoretical papers that analyzed political determination of public education funding level when there are private schools. He finds that because of non-single peaked preferences, standard theorem of Black (1948) does not apply and therefore decisive voter and majority voting equilibrium may not exist. Solutions for this issue are provided in Epple and Romano (1996a) and Glomm and Ravikumar (1998). An "ends against the middle" type of equilibrium emerges as shown in Epple and Romano (1996a) at which poor and rich households prefer lower public funding levels compared to middle income households. Moreover, decisive voter's income is less than median income. In Stiglitz's model, privately supplementing public education is not available. Private supplementation when there is only a public alternative is introduced in Epple and Romano (1996b); Gradstein and Justman (1996) and Gouveia (1997). The marriage of these papers with Stiglitz (1974) at which there are both private supplementation and a separate private school sector is studied in Bearse et al. (2005). Our main contribution to this literature is calibrating the model of Bearse et al. (2005) and then apply it to understand the effects of the recent Turkish SEC reform. Previously, variants of Stiglitz's model are successfully applied to analyze childcare and education voucher policies as in Borck and Wrohlich (2011) and Bearse et al. (2013).

Our paper also contributes to a different strand of literature that analyzes SECs from an applied perspective. Tansel and Bircan (2005) study the determinants of SEC enrollment in Turkey and find that students participating in SECs are more successful in university entrance examination. Berberoğlu and Tansel (2015) emphasizes the vast inequality of opportunity created by SECs by pointing out that a minimum wage earning worker cannot afford SECs. Tansel et al. (2013b) points out the inequality created among SEC students with respect to their track in high school since SECs are more effective in terms of mathematics and Turkish language tracks as opposed science tracks. Moreover, Tansel and Bircan (2006) find that spending on supplemental education is higher in urban areas and rises mainly with income and education level of the parent. Using Korean data and a dynamic discrete choice model, Choi (2012) analyzes governmental policies regarding SECs. He finds that shutting down SECs in Korea contracts the achievement gap between rich and poor students by 57% but at the cost of lower mean achievement. In the case of Turkey, there is lack of data regarding the effects of the SEC reform since it did not take place yet.[4] Moreover, we believe that the adjustment in public funding level after reform needs to be captured. Therefore, we are relying on an equilibrium political economy model of education different from previous applied studies.

Our paper is organized as follows. Section 2 explains the model. Section 3 studies theoretical properties of the model. We calibrate the parameters of the model in Section 4 so as to match certain statistics from 2013 Turkish data. Section 5 analyzes the effects of the Turkish SEC reform through a counterfactual experiment. Section 6 concludes.

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[2] In reality, private school students also attend SECs in Turkey. However, their fraction can be neglected given that private school students are 4% of all K-12 (i.e., kindergarten through 12th-grade) students. Moreover, around 7%–8% of high school students attend private schools according to ERG (2014).

[3] SECs are relatively less efficient than private schools in our model to make sure there is nonzero enrollment in private schools in equilibrium.

[4] SECs exist in Turkey since 1960 and they are never shut down since then as argued in Özoğlu (2011).