



On the political economy of educational vouchers[☆]

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ABSTRACT

Two significant challenges hamper the analyses of the collective choice of educational vouchers. One is the multi-dimensional choice set arising from the interdependence of the voucher, public education spending, and taxation. Second, even absent a voucher, preferences over public spending are not single-peaked; a middling level of public school spending may be less attractive to a household than either high public school spending or private education coupled with low public spending. We show that Besley and Coate's (1997) representative democracy model provides a viable approach to overcome these hurdles. We provide a complete characterization of equilibria with an endogenous voucher. A voucher is adopted in political equilibrium provided the coefficient of variation of income is sufficiently small. We undertake a parallel quantitative analysis and we find that no voucher arises in equilibrium for the U.S. income distribution, which exhibits too much heterogeneity. For a tighter income distribution, including those in Douglas County, Colorado where a voucher was recently adopted, our model predicts a positive voucher. Public support for a not-too-large voucher arises because the cross subsidy to public school expenditure from those switching to private schools outweighs the subsidy to those who attend private school in the absence of a voucher.

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1. Introduction

Vouchers that can be used to finance education at private schools are frequently advocated and regularly proposed as a policy to improve education in the U.S. With a few exceptions, these proposals fail politically. Critics of vouchers decry the loss of funding for public school students that would arise by public educational monies being diverted to finance vouchers. Without the support of households that would remain in public schools, voucher proposals are unlikely to be politically feasible. As investigation by other researchers has shown, however, vouchers below per student public expenditure might increase that expenditure as students take up vouchers and exit the public sector in spite of the subsidy to students initially in private schools. We investigate the public choice equilibrium that permits vouchers in light of this possibility.

Our analysis builds on the literature focused on the fiscal effects of vouchers.¹ Ireland (1990) provides the first formal model of public-private provision of a good with a voucher as a centerpiece. Ireland

showed theoretically that some policy vectors Pareto-dominate others, in particular that expenditure per public school student might rise with a voucher for a fixed tax system. In addition to being the first to make this observation (to our knowledge), his framework has been the point of departure for further research. Rangazas (1995) identifies three effects of a voucher on the majority choice of public expenditure. First, a voter with a child in public school faces a lower tax price of increasing public expenditure because the voucher induces some students to switch from public to private schools. Thus, when the voucher is less than per student public expenditure, those that switch schools cross-subsidize students in public schools. Second, tax revenues must also finance the voucher including students that would attend private school with no voucher. In addition to the latter two effects, the median voter's wealth would decline with a positive voucher as relatively wealthy households take up the voucher and exit public schools. Assuming that voters ignore the effect of vouchers on school sector choice when voting for public expenditure, Rangazas employs parameter estimates to conclude that the net effect of a voucher would be to increase support for public expenditure. Like Ireland, Rangazas does not examine equilibrium determination of a voucher. The most closely related paper to ours is Hoyt and Lee (1998). They also investigate political support for vouchers in a model with the same technological elements as we do, but differ with respect to their analysis of equilibrium. Most of their analysis holds public expenditure constant. They show that vouchers can lower tax rates given public expenditure, which would imply a

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¹ Other research on vouchers is discussed below.

Pareto improvement and thus political support for a voucher. Their analysis of an endogenous voucher assumes two stages, with the voucher determined first followed by the median preferred choice of public expenditure (with a tax that balances the budget). They provide conditions such that a positive voucher would be majority preferred to no voucher.

Our contribution is to provide a complete equilibrium analysis, including a demonstration of existence computationally, and to examine equilibrium outcomes in a realistically calibrated model. While the analysis abstracts from some factors that might affect public choice of a voucher (e.g., effects on school productivities), it clarifies the pure fiscal incentives in the context of the “standard model.”²

Finding a public-choice equilibrium with vouchers is nontrivial because the relevant policy vector is a triplet: the tax rate, per student public expenditure, and the amount of the voucher. Using the government budget constraint, the policy vector can be reduced to two variables, but the standard multidimensional voting problem (Plott, 1967) precludes the existence of a majority choice equilibrium over all feasible policy vectors. We resolve this problem by using the representative democracy model of Besley and Coate (1997).³ Voters elect a member of the population anticipating that the office holder will implement his/her preferred policy vector, which is known. The implied restriction on equilibrium policies implies existence of a Condorcet winner in our model and a population member with such preferences is elected. Our analysis illustrates the power of the Besley–Coate model in finding a public-choice equilibrium, which we view as another contribution of the paper.

The theoretical analysis identifies conditions under which the model predicts a positive voucher. For parameters such that the elected office holder sends his/her child to public school, a simple condition that tracks the earlier literature must be satisfied. The tax saving from students that switch from public to private schools with the introduction of a voucher must exceed the tax cost of subsidizing those students that would choose private education with no voucher. The tax saving is relatively large if public expenditure is high and a voucher would induce significant switching to private schools, while the tax cost is relatively high if private school patronage is substantial with no voucher. We provide a theoretical argument that the coefficient of variation of household incomes in an economy is the relevant statistic determining whether a voucher is politically supported.

We then turn to a computational analysis calibrated to the data to investigate further when a voucher might arise. The computational analysis serves several purposes. First, it provides nontrivial examples where the equilibrium we study exists. Second, it illustrates the features of such equilibria. Third, it shows that the model predicts a positive voucher with a low coefficient of variation of income. With the income distribution calibrated to the U.S. population or to several state income distributions, no voucher arises in equilibrium. With the income distribution calibrated to that in Douglas County, a district in the Denver, Colorado MSA, where a voucher was recently unanimously approved by the locally elected district school board, a voucher does arise in equilibrium. The equilibrium with a voucher is Pareto-improving relative to equilibrium with no voucher allowed. A lower tax rate and higher per student expenditure arise with a voucher. While Douglas County is wealthy relative to the U.S., it is a combination of lower variance and higher mean income in Douglas County that is relevant to finding a positive voucher in equilibrium. While the Douglas County example is not contrived, we do not claim that our model explains the empirical adoption and rejection of vouchers. The amount of the voucher predicted by our model is substantially below the empirical amount. Non-fiscal factors from which we abstract are surely relevant to public choice of a voucher. We do, however, believe

that our analysis clarifies impacts on the fiscal tradeoff relevant to voucher adoption.

For realistic parameters, equilibrium has the “ends against the middle” property that arises in Epple and Romano (1996a, 1996b). Whether or not a voucher is chosen, a coalition of the poorest voters whose children attend public school and rich voters that send their children to private school prefer lower taxes and public expenditure, balanced by an equal-sized coalition of middle-income households with children in public school that advocate the opposite.⁴ In the computational analysis, we show how voting coalitions would vary in elections pitting the winning candidate for office against candidates with differing incomes and thus preferred policies.

Other research on vouchers bears mention but is a bit more distant. Chen and West (2000) and Barse et al. (2009) consider majority approval of voucher regimes that provide every student with a voucher, i.e., with no distinct public alternative available. Voucher programs that do not permit a public alternative have diminished political support because the cross subsidy (discussed above) to public school students from those that switch to private schools disappears. These papers both then consider political support for “targeted vouchers” that vary with income. Epple and Romano (2008) examine voucher design that would eliminate cream skimming of classmates by private schools when students differ by ability and educational peer effects are present. There we provide a fiscally neutral targeted voucher design that would eliminate incentives of private schools to cream skim high-ability students and would lead to (near) Paretian gains if competition for students improves outcomes.⁵ The present paper focuses on voucher programs that are non-targeted and permit expenditure per pupil in public schools to differ from the amount of the voucher, as are frequently proposed.⁶

Section 2 presents the model and some preliminary results. Section 3 develops the main theoretical results. Section 4 provides the computational analysis of equilibrium. Section 5 discusses issues relevant to vouchers from which our analysis abstracts. Section 6 summarizes. An appendix contains much of the technical analysis.

2. The model and preliminary results

We refer to the decision makers in the economy as “households” or “voters.” A household has an endowed income y , a child in school, and utility function $U(x, q)$, where x is numeraire consumption and q is the quality of education. Educational quality is measured by per student expenditure in the student’s school. U is increasing, twice differentiable, and quasi-concave in (x, q) , and satisfies the standard Inada property. Ordinary demand for educational quality is normal. The population of households is characterized by a continuous distribution on income $F(y)$, with density $f(y)$, positive on $[y_{\min}, y_{\max}]$. Denote mean income Y .

Households will choose to send their child to a public or private school. Let g denote expenditure per student in the public sector, which is the same for every student attending a public school. Public finance is by a proportional income tax denoted t . Utility of household y if their child attends a public school is then: $U^p = U(y(1-t), g)$.⁷

⁴ The ends-against-the-middle property of voting coalitions also arises in Rangazas’s and Hoyt and Lee’s analyses.

⁵ Nechyba (1999, 2000) examines the effects on educational quality of inter-district household mobility of various voucher designs. See Epple and Romano (2012) for discussion of more models of vouchers and other references.

⁶ As one example, the 2000 California state-wide voucher proposal (Proposition 38) that was defeated by referendum, supported by only 30% of the population, would have provided a \$4000 voucher, one-half the per student public expenditure there. The Douglas County School District voucher equals 75% of state funding, which is about 55% of per student public funding.

⁷ By “household y ,” we mean household with income y . As well, we sometimes refer to “voter y .”

² Other factors that might affect public choice of a voucher are discussed in Section 5.2.

³ See also Osborne and Slivinski (1996).

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