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Educational policy and intergenerational mobility

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ABSTRACT

In the United States, there is considerable variation in intergenerational mobility across states. We argue that the distribution of public school spending across school districts under public school finance systems affects intergenerational mobility within the United States. We build a dynamic model in which school districts vote over public school spending per pupil taking the finance system as given. We embed this model with median voting at the district level within a fairly standard model of human capital accumulation. Our model can replicate the relationship between the distribution of public school spending and intergenerational mobility observed in data. Furthermore, three counterfactual simulations suggest that i) the correlation between parental human capital and a child's learning ability plays a significant role in explaining the cross-state variation in intergenerational mobility, ii) a more equal distribution of public school spending under a foundation program by relaxing a borrowing constraint improves intergenerational mobility, especially when a child's learning ability is not highly dependent on parental human capital, and iii) switching to a full state funding program improves intergenerational mobility, but not enormously. This is because full state funding limits public school spending, which hinders intergenerational mobility.

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1. Introduction

Intergenerational mobility is an important issue in the United States. Evidence suggests that the United States is one of the least mobile countries in the world.² There is also considerable variation in intergenerational mobility at the state level. According to our calculations based on data from Chetty et al. (2014), the most and least mobile states are Hawaii and Mississippi, respectively. In Hawaii, rank–rank slope, a measure of relative mobility, is 0.236, whereas the corresponding value in Mississippi is 0.414. These slopes mean that if the difference in income ranks of two parents is 100, the difference in their child's income rank will fall to 24 in Hawaii and 41 in Mississippi. Therefore, where a family resides affects a child's future outcomes significantly.

A natural question is: what factors generate this variation across states? Chetty et al. (2014) argue that segregation, income inequality, school quality, social capital and family structure are highly correlated with the variation in intergen-

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² For example, Corak (2013) shows that the intergenerational income elasticity (introduced in the next section) in the United States is close to 0.5. This number is the highest among the OECD countries.

erational mobility. However, since all of these variables are endogenous, more work is needed to better understand the underlying causal factors.

We take the stand that public school spending is an important determinant of intergenerational mobility. Recent evidence suggests that early childhood investments are critical in improving child's status and consequently, intergenerational mobility (Cunha and Heckman, 2007, and Caucutt and Lochner, 2012). Therefore, spending on public schools potentially plays an important role.

The focus of our paper is on the distribution of public school spending across school districts within a state, which, in practice, is measured as the estimated coefficient of school district income on public schooling spending per pupil (henceforth, the 'slope coefficient').³ We find a substantial variation in the distribution of public school spending across states. For example, rich school districts in Illinois tend to spend more on public schools than poor school districts, whereas public school spending is more equally distributed in California. More importantly, we find a positive correlation between the distribution of public school spending and rank–rank slope across states. That is, a more equal distribution of public school spending is associated with lower rank–rank slope. This suggests that the cross-state variation in the distribution of public school spending is a potential contributor to the variation in intergenerational mobility.

We explore the relation between public school spending and intergenerational mobility by taking into account the public school finance systems. In the U.S., there are four public school finance systems: a flat grant program, a full state funding program, a foundation program, and an equalization program. We model a foundation program, the most popular one, and a full state funding program, the ideal one if the goal is to reduce inequality in public school spending. A full state funding program is ideal in terms of equal spending because public school spending is financed only by statewide taxes and local governments cannot impose taxes for additional spending. In contrast, in a foundation program, a minimum amount of public school spending is guaranteed in all school districts by the state government, but local governments can raise spending through a local tax. A foundation program was employed in 39 states in the early 1990s, the period we consider in this paper. Revisiting the relation between public school spending and rank–rank slope by school finance system, we find two salient patterns in data: (1) Among states using a foundation program, there is considerable variation in both the distribution of public school spending and rank–rank slope, and a positive correlation between them still holds; (2) Relative to states with a foundation program, states with a full state funding program have a more equal distribution of public school spending and lower rank–rank slope.

We model the connection between public school spending and intergenerational mobility by extending the framework in Fernandez and Rogerson (2003). In particular, we extend their static model to a dynamic setting with three periods where a child can accumulate human capital both in school and at work. More importantly, human capital accumulation in school depends not only on public resources from the state and local government, but also on private resources from parents and a child's own learning ability. Public school spending from the state government is determined through majority voting under either a foundation program or a full state funding program. Furthermore, parents can make a non-negative transfer to their children when the children become independent after schooling.

We estimate the model state by state using various data sets. In the estimation, we assume that a child's own learning ability is correlated with parental human capital. Our estimated model fits some aspects of the data reasonably well. In particular, our model generates a positive correlation between the distribution of public school spending and intergenerational mobility across states. However, the set of targeted states is limited in our estimation highlighting a failure of our model. We drop the states in which the slope coefficient is negative. In our model, in order to generate a negative slope coefficient, the correlation between parental human capital and a child's learning ability needs to be negative. This leads to a negative rank–rank slope which is inconsistent with data.⁴ With the estimated model, we conduct three counterfactual simulations to understand the determinants of intergenerational mobility. The first simulation shows that the correlation between parental human capital and a child's learning ability plays an important role in explaining intergenerational mobility. The second simulation shows that allowing parents to borrow against their children's future income and using it to invest in their children leads to a more equal distribution of public school spending. The effect on rank–rank slope, however, depends negatively on the correlation between parental human capital and a child's learning ability. With a smaller correlation, allowing parents to borrow against their children's future income improves intergenerational mobility significantly. In the third simulation, we find that switching to a full state funding program also improves intergenerational mobility. However, when we compare results on rank–rank slope across simulations, we find that the degree to which intergenerational mobility improves in a full state funding program is not dramatic. This result arises from two competing forces prevalent in a full state funding program. On the one hand, a full state funding program leads to a uniform distribution of public school spending across school districts. On the other hand, it restricts the level of public spending. Therefore, poor and middle-income school districts gain little benefit by full state funding. In our exercise, the restriction on public school spending impedes intergenerational mobility in a full state funding program.

³ As explained later, we use median household income as a measure of school district income. Parent income and school district income are used interchangeably in this paper.

⁴ A sceptic might view negative empirical relationship between district funding and income with suspicion and this may well be a failure of the way in which we look at this relationship empirically (i.e. just the raw correlation). We tried several controls including urban/rural dummy and racial dummies but the negative coefficient persists. Interestingly, Biasi (2015), also finds a negative coefficient. She regresses median per-capita household income in district on per-pupil expenditure in district for each community zone. Her result shows that the slope coefficient is negative on average.

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