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Small homes, public schools, and property tax capitalization ☆

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ABSTRACT

Efforts to estimate the degree to which local property taxes are capitalized into house values are complicated by any spurious correlation between property taxes and unobserved public services. One public service of particular interest is the provision of local public schools. Not only do public schools bulk large in the local property tax bill, but the inherent difficulty in measuring school quality has potentially undermined earlier attempts at achieving unbiased estimates of property tax capitalization. This particular problem has been of special concern since Oates' (1969) seminal paper.

We sidestep the problem of omitted or misspecified measures of school quality by focusing on a segment of the housing market that likely places little-to-no value on school quality: small homes. Because few households residing in small homes have public school children, we anticipate that variations in their value do not account for differentials in public school quality. Using restricted-access microdata provided by the U.S. Census, and a quasi-experimental identification strategy, we estimate that local property taxes are nearly fully capitalized into the prices of small homes.

1. Introduction

Empirical efforts to measure the capitalization of local property taxes are greatly complicated by the challenges of controlling for public benefit levels. The early approach to this problem was to include tax rates and various measures of service levels in a hedonic analysis of housing prices.[1] But achieving adequate controls for public services in such hedonic equations has proven to be extremely difficult. The extent, quality, and location of all potentially relevant public services are not easily measured. Chief among these hard to quantify characteristics are the dimensions of public school quality. Recent attempts to estimate willingness to pay for public school characteristics (Black, 1999; Bayer et al., 2007; Gibbons et al., 2009) have generated a wide range of results that relied on a various proxies for school quality. For those concerned with measuring school quality these difficulties must be addressed directly. But for those attempting to measure the capitalization of property taxes, the best strategy is to identify quasi-experiments that hold local public service levels (and quality) constant, while allowing tax rates to vary.

Palmon and Smith (1998a,b) construct an interesting quasi-experiment of this type by limiting observed variation in home values and taxes to those that occur across a select number of municipal utility districts (MUDs) operating within the unincorporated sections of Harris County, TX (northwest of Houston). With the exception of schooling, many public services are evenly supplied to all households in their sample by either the county or by the MUDs themselves.[2] However, due to historical accidents, the effective rate of property taxation is not equal across MUDs. Thus, while holding most public services constant, there are observed variations in property taxes. Taking advantage of this unique circumstance, Palmon & Smith estimate rates of property tax capitalization near 100%, suggesting that effective property tax differentials may be a major determinant of home price differentials.

The use of MUDs to measure inter-jurisdictional tax differentials represents a major improvement over earlier identification

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[1] See Oates (1969, 1973), Pollakowski (1973), Rosen and Fullerton (1977), and King (1977) for early examples.

[2] Palmon & Smith note that the MUDs are responsible for distributing sewer and water services and that these services are likely identical across MUDs. They also note that three separate school districts serve their sample of homes. They do not control for differences in school district tax rates but, instead, suggest that the rates are quite similar across the three districts. They also argue that there are only small differences in school quality, noting that test scores, demographics, and relative expenditures are similar across these districts.

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strategies that were unable to explicitly hold many public services constant across jurisdictions.[3] However, in light of recent methodological developments, it is worthwhile to reexamine property tax capitalization within the context of an identification strategy that provides even further controls for potentially endogenous fiscal variables. For example, beginning with Cushing (1984) and Black (1999), it is now a standard practice within the home price capitalization literature to control for the "neighborhood" within which homes on either side of a jurisdiction fall. This is because homes in close proximity to one another are more likely to benefit from the same level of unobservable and spatially localized public services (e.g., public parks). Failure to control for public services of this kind will bias any estimates of tax capitalization if the services in question are correlated with tax rates. For example, a MUD's tax rate is a direct function of its subdivisions' levels of completion. This is because less-complete subdivisions (i.e., fewer homes than initially intended) will need relatively high residential property tax rates to finance debt payments. However, because less-complete subdivisions are also more likely to have fewer developed parks, failure to control for neighborhood fixed effects may bias property tax capitalization estimates.

Palmon & Smith's estimates are also potentially complicated by their failure to control for public school characteristics which, although perhaps similar in some respects, as they note, may vary along many difficult-to-measure dimensions (e.g., value added, accountability, pupil-to-teacher ratios, etc.) that are thought to be valued by the housing market. To the extent that these factors are correlated with inter-jurisdictional tax differentials, estimates of property tax capitalization will be biased. This issue has plagued much of the housing price capitalization literature for years, primarily due to the difficulty and debate surrounding appropriate measures of perceived school quality.[4]

We make no attempt at improving upon these measures of perceived school quality. Rather, in recognition of the many difficulties inherent in measuring school quality, we look to sidestep this complication altogether by focusing on a segment of the housing market that pays public school property taxes but presumably places little-to-no value on the level of public school services provided: small homes. For example, the 2000 Census reports that, within suburbs of metropolitan Chicago, only 13% of U.S. owner-occupied households residing in small homes (defined as homes with two bedrooms or less) had children enrolled in public schools. This is to be compared to 34% for households residing in homes with three or more bedrooms (hereafter referred to as "large homes").[5] This disparity suggests that much, if not all, of the problem associated with controlling for public school quality stems from the market for larger homes. Buyers of large homes, because they are more likely to have children, drive up the prices of homes in good school districts, thus complicating any estimates of property tax capitalization that cannot fully control for school quality. Conversely, smaller homes will not likely reflect school quality differentials, thus neutralizing the problem of school quality capitalization.

For small homes, observing inter-jurisdictional variation in school district property taxes, while controlling for other taxes and public services, will offer unique insights into the nature and degree of property tax capitalization. For this stratum of the housing market, educational property taxes are essentially direct transfers to households with children in the public schools. These transfers represent a tax without a corresponding direct benefit.[6] The fact that households buying these small homes are statutorily required to "contribute" to this redistribution program provides the motivation for our identification strategy. A hedonic equation for these small homes should be free of complications generated by the problems inherent in measuring education quality. The vast majority of small-home buyers do not directly benefit from the local schools because they do not have children enrolled in those schools.

As indicated above, the inter-jurisdictional distribution of non-education public services will impact small home values. To the extent that these services are unobserved and correlated with school district taxes, estimates of property tax capitalization will be biased. To minimize this potential problem, the present study incorporates a border discontinuity design similar to that used by Black (1999) and Bayer et al., (2007, hereafter BFM). Here, household observations are limited to those falling within a quarter-mile of a public school district border that itself intersects a single municipality. Spatially localized unobservable characteristics are then controlled for by identifying a given home's localized neighborhood that, while falling completely within a municipality, straddles a public school district border (quarter mile on either side of the border and a half mile in length). Thus, the key comparisons made in the empirical equations presented below are between small houses subject to differing education property tax rates, but similar neighborhoods, non-education services, and non-education municipal taxes. Our empirical findings suggest that, for small homes, education property taxes are capitalized almost fully into home values, thus supporting the earlier findings of Palmon & Smith and others.

In the discussion that follows, Section 2 outlines our empirical design and describes the data used while Section 3 discusses our results. Section 4 concludes and provides directions for future research.

2. Empirical design and data

2.1. Identification strategy

This paper estimates a hedonic housing price equation in order to assess the degree to which property taxes are capitalized into home values. Under ideal circumstances, estimation would involve taking advantage of complete information on relevant structural characteristics of an individual home as well as fiscal, amenity, and socio-demographic characteristics of the home's immediate neighborhood. Following convention, this data could then be used to return unbiased parameter estimates for the following hedonic equation:

$$\ln\left(V_{imsj}\right) = \alpha + \mathbf{X'_i}\boldsymbol{\beta_i} + \mathbf{Z'_{mj}}\boldsymbol{\beta_{mj}} + \gamma_\tau(\tau_m + \tau_s) + \gamma_Q Q_s + \varepsilon_{imsj} \quad (1)$$

where $\ln(V_{imsj})$ is the natural log of home i's value (in municipality m, school district s, and neighborhood j), $\mathbf{X_i}$ is a vector of i's structural characteristics, $\mathbf{Z_{mj}}$ is a vector of characteristics of neighborhood j within municipality m (including public services), τ_m is the non-education property tax rate (consisting of municipal taxes) and τ_s and Q_s measure effective school district tax rates and quality, respectively, for district s. For the purposes of this study, the parameter of particular interest is γ_τ, which, in equilibrium, measures the level of

[3] Earlier studies attempted to explicitly control for the distribution of public services. However, as is made clear by the debate between Oates (1973) and Pollakowski (1973), as well as papers by King (1977) and Rosen and Fullerton (1977), measuring public service levels (especially with respect to public schooling) is difficult and likely subject to much error.

[4] There exists an extensive literature surrounding the capitalization of school quality as well as which dimensions of school quality are actually capitalized into housing value. See Taylor (2005), Brasington and Haurin (2006), Gibbons et al. (2009), and Hilber (2011) for comprehensive reviews of this literature. See Stiefel et al. (2005) for a broader discussion concerning the various problems associated with measuring school performance and accountability. Rosen and Fullerton (1977) is one of the earliest housing price capitalization studies to address this problem.

[5] This statistic is 28% for homes with three bedrooms, 42% for homes with four bedrooms, and 48% for homes with five or more bedrooms. This data was downloaded from www.ipums.org (see Ruggles et al., 2010).

[6] Kurban, Gallagher & Persky (2012) provide estimates of education tax redistribution in suburban Chicago from households without children in public schools to those with children in those schools. They estimate that such transfers account for about two-thirds of all owner-occupied, education property taxes in the area.