THE IMPACT OF MUNICIPAL DEBT ON HOUSE VALUES: FOCUSING ON THE ROLE OF REFERENDUM*

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THERE HAVE BEEN LONG-STANDING ARGUments about the consequences of using public debt. This is due to disagreement over the empirical results obtained as well as over crucial assumptions underlying the Ricardian theorem. Ricardo posited that in perfectly functioning markets, the taxation and public debt are equivalent in their effects on the economy. On the other hand, fiscal illusion literature purports that individuals underestimate the present value of debt and therefore view debt as less expensive than tax finance (Buchanan, 1964; Oates, 1988).

Given that the capitalization of local fiscal differentials into home values has been confirmed in prior studies, the capitalization approach can be used to empirically test the debt illusion hypothesis. If taxpayers are rational and perceive the future tax liabilities that debt issue implies, local debt issues are capitalized into property values. The existence and degree of capitalization will depend on to what degree individuals are aware of the level of local public debt and on whether the level of local debt matters when choosing a place to live.

While information about the current taxes and benefits are quite good, individuals' projections of future benefits and future taxes may not be very accurate (Floyd and Hynes, 1978). Debt illusion is less likely when bond issues are subject to voter approval and/or the bond issue is linked to a specific purpose. However, it is also possible that residents are not well informed about the level of debt in their community.

This study investigates whether and to what extent municipal debt is capitalized into property values by utilizing a sample of New Jersey's municipalities for the years 1980, 1990, and 2000. Additionally, institutional details of New Jersey's school districts allow us to empirically test whether the types of bond issues and referendum requirements affect the existence and degree of debt capitalization. Bond issues for New Jersey's counties and municipalities are not subject to voter referenda, while bond issues for the majority of New Jersey's school districts require the approval of the district's voters.

LOCAL GOVERNMENT DEBT AND CAPITALIZATION

State and local governments issue long-term bonds almost exclusively to finance capital programs.[1] Long-term municipal new debt issues in 2002 were equal to approximately $356 billion, of which $125.6 billion was General Obligation (GO) debt. On the other hand, total capital outlays by state and local governments in 2002 were approximately $257.2 billion, which indicates that only one-half of total capital expenditures were funded by issuing new long-term debt.[2]

The question is whether or not the method of financing has real effects. As discussed earlier, the Ricardian equivalence theorem suggests that these two forms of finance should make no difference since rational taxpayers will fully capitalize future tax liabilities. Bennett and Dilorenzo (1983) provided anecdotal evidence that taxpayers do not fully capitalize tax liabilities embodied in public debt; namely, the existence of constitutional and statutory debt limitations.[3] They argue that if politicians and citiziens were indifferent to tax and debt finance, there would be no need for such limits.[4]

Wagner (1970) suggests that in a system of local governments, individuals who expect to migrate from the locality will vote for a higher level of debt issuance instead of a socially optimal level. These individuals prefer debt finance of public goods to avoid the future tax liabilities associated with debt service. Wagner also points out that the process of capitalization eliminates the voters' incentive to issue excessive debt. In other words, debt capitalization indicates that voters cannot avoid taxes through migration.

Daly (1969) and Oates (1973) also argue that future tax liabilities associated with local debt should be capitalized into local property values. The basic idea of their analysis is that local public debt policies leave the net wealth of local property owners unchanged. Wellisch and Richter (1995) and Schultz and Sjostrom (2001) argue that the

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Daly-Oates neutrality thesis generally holds only if local taxes are source-based taxes on immobile factors such as land.

Oates (1969, 1973) and others found that local governments' fiscal differentials are capitalized.[5] However, they were concerned with the capitalization of public expenditure financed by current taxation, not with the differentials that may exist between the two alternative means of financing: taxation and debt financing. There are several studies with respect to debt capitalization. Unlike the studies on property tax and public service capitalization, these studies found inconsistent results regarding whether the future tax liabilities associated with unfunded pension liabilities or debt issues are capitalized into property values (Epple and Schipper, 1981; Leeds, 1985; Dollery and Worthington, 1995; Landers and Byrnes, 2001).

The determination of whether debt is capitalized has significant implications for intergenerational distributive effects of burden, and for local government spending and debt policy. If capitalization does occur, the burden of the capital project remains with the current generation since the project is essentially financed through a reduction in their property values. The degree of debt capitalization also indicates how much residents are aware of their future tax obligations, implying an allocative efficiency of local public good provision.[6] At any rate, the change in house values, arising from debt capitalization incurs a substantial wealth effect. This wealth effect, subsequently, alters the revenue base of local taxation in the future. Policy makers in the local municipalities must then account for fiscal capitalization in their design of inter-temporal taxation.

STUDY DESIGN AND SAMPLE

A hedonic price model is employed to explain variations in residential property values. In equation form, house value can be represented as follows:

$$\textbf{(1)} \quad HV = \frac{HC + G - T}{r},$$

where,

HV = house price,
HC/r = the present value of housing characteristics, which include physical dimensions; neighborhood amenities; and accessibility,
G/r = the present value of government services,
T/r = the present value of the tax liability incurred from living in a location,
r = the discount rate.

We assume that the effective tax rate T is a proportion of property value evaluated as discounted current taxes, plus some weighting of future tax liability per unit of housing due to debt in a community. That is:

$$\textbf{(2)} \quad T/r = t/r + \delta d/r.$$

Thus, equation (1) can be rewritten as follows:

$$\textbf{(3)} \quad HV = \frac{HC + G - (t + \delta d)}{r},$$

where t is the current annual tax rate, r is the discount rate, and d/r is the discounted cost of debt per unit of taxable property value. Parameter δ lies between 0 and 1, and reflects the extent to which residents recognize the property tax and tax burden implicit in the debt carried by a community. If $\delta = 1$, then residents fully perceive the tax burden of future obligations incurred by debt; if $\delta = 0$, they do not recognize these liabilities.[7]

As discussed earlier, individuals' projections of their future tax liabilities and benefits may be erroneous. Therefore, it is expected that the capitalization effect of debt liabilities is smaller than the capitalization effect of property taxes. It is also expected that residents will recognize the existence (or the size) of debt in their community when a referendum is required to issue debt.

This study models house value differences among communities to assess the response of house values to tax liabilities and other variables. One of the concerns in the study design is simultaneity between house values and fiscal variables. Property values are not only affected by the availability of local services and tax liabilities; they also, in turn, affect the property tax rates and the size of debt.[8] Another relationship to be considered in the structural model is that the burden of debt will affect property tax rates because it is likely that the previous and current debt issues increase present tax burdens.

The 3-equation system is designed to capture the market behavior with local fiscal outcomes and local fiscal policy process. Because of endogeneity of the levels of municipal debt and property tax

rates in the house value equation, we need to derive new debt and property tax variables. To generate these new variables (i.e., instrumental variables) for the burden of debt and property tax rates, additional predetermined variables are employed.[9]

The dependent variable in this study is the mean house value of owner-occupied houses in each municipality from the U.S. Census. The burden of debt is measured as the gross GO debt per housing unit (DEBT) and three different measures are entered into each model: total, school-purpose and other municipal debt.[10] The effective tax rate (PTAX) is constructed by adding local tax and school tax rates.

The sample for this study consists of 502 municipalities (i.e., cities, boroughs, and townships) in New Jersey, and data are collected for three years: 1980, 1990, and 2000.[11] This study uses data from various sources.[12] The definition and descriptive statistics for the variables used in this study are presented in Table 1.

EMPIRICAL RESULTS

The model in this study is estimated by employing two-stage least square (2SLS) with fixed effects. The 2SLS estimation method corrects simultaneity between house values and fiscal variables. The cross-section and time dummy variables are also added since a Hausman test result indicates that the fixed-effects model is more appropriate for the data used in the study.[13] The house value equation is specified in log form while the equations for debt and property tax rates are specified in linear form.[14] The estimated results of the model including the effect of total gross debt on house values are presented in Table 2. In addition, the estimates of school-purpose and other GO gross debt are reported in Table 3.

As we can see in Table 2, the coefficient of DEBT is positive but statistically insignificant. One notable finding is that the debt burden variable has an indirect effect on house values in that the level of outstanding debt increases the current property tax

Table 1
Definition of Variables and Descriptive Statistics

Variables	*Definition*	*Mean*	*Std. Dev.*
	House Value Equation Variables		
HV	Mean house value of owner-occupied housing	220,751	119,598
DEBT (total)	Gross debt per housing unit	3,527	2,975
DEBT (school)	Gross school debt per housing unit	1,311	1,685
DEBT (other)	Gross other debt per housing unit	2,216	2,296
PTAX	Effective property tax rates	2.29	.64
HAGE	Mean age of owner-occupied housing	33.16	10.04
ROOM	Mean # of rooms per owner-occupied house	6.68	.70
CRIME	Crime rates per 1,000	38.09	32.66
HHINC	Mean household income	64,006	25,568
OWNER	Percent of owner-occupied housing units	68.48	17.92
COLL	Percent of adults with college education	24.37	14.34
UNEMP	Percent of unemployed persons in 18 & over	5.15	2.99
NWHITE	Percent of nonwhite	11.12	13.87
VACANT	Percent of vacant house	7.56	11.81
TWORK	Mean travel time to work	28.43	5.13
1990	Time dummy		
2000	Time dummy		
	Other Variables		
SAID	State aid per capita	70.68	101.63
HSTOCK	Average age of the housing stock	32.60	9.26
PCTPOP	Percentage change in population over 10 yrs.	10.48	28.86
POP	Population in a municipality	13,997	22,476
OLD	Percent of population greater than 64 yrs. old	13.32	5.80
CHILD	Percent of school age children	18.28	3.90
RATING	Moody's rating for municipalities (dummies)		
NONRES	Percent of nonresidential property tax base	21.70	13.48
PPH	# of persons per owner-occupied house	2.90	.30

Table 2

Two-Stage Squares Estimates (with Fixed Effects) of Housing Values, Debt, and Property Taxes (Total Gross Debt)

HV Equation		*DEBT Equation*		*PTAX Equation*	
Variable	*Coefficient*	*Variable*	*Coefficient*	*Variable*	*Coefficient*
CONSTANT	8.620 (.457)	CONSTANT	-6.422 (6.135)	CONSTANT	5.136*** (.774)
DEBT	.022 (.018)	HV	1.480* (.807)	HV	-.467*** (.067)
PTAX	-.510*** (.068)	HHINC	-.424 (.478)	DEBT	.050*** (.015)
HAGE	-.080** (.043)	SAID	-.00047 (.00033)	SAID	.00019*** (.00005)
ROOM	1.150*** (.129)	HSTOCK	-.040*** (.010)	NONRES	-.001* (.0008)
CRIME	-.007 (.012)	PCPOP	-.000 (.001)	PPH	.244*** (.033)
HHINC	.047 (.045)	POP	-.000 (.000)	VACNT	-.032*** (.010)
OWNER	.044** (.027)	OLD	-.012 (.015)	POP	.000 (.000)
COLL	.106** (.019)	OWNER	.209 (.187)	(POP)2	.000 (.000)
UNEMP	-.005 (.010)	COLL	-.110 (.019)	1990	.146*** (.039)
NWHITE	-.004 (.007)	CHILD	.058*** (.018)	2000	.386*** (.049)
VACNT	.023** (.010)	RATINGB	.479*** (.099)		
TWORK	.146*** (.045)	RATINGA	.312*** (.076)		
1990	.386*** (.018)	RATINGA2	.086 (.121)		
2000	.568*** (.041)	RATINGA3	.399*** (.144)		
		1990	-.283 (.362)		
		2000	.339 (.144)		
R^2 (Adj. R^2)	.98 (.97)	R^2 (Adj. R^2)	.61 (.40)	R^2 (Adj. R^2)	.88 (.82)
N	1506	N	1506	N	1506

*p<.1, **p<.5, ***<.01.

Standard errors in parentheses.

Table 3
Two-Stage Squares Estimates (with Fixed Effects) of Housing Values, Debt, and Property Taxes (Gross School and Other Debt)

HV Equation		*DEBT Equation*		*PTAX Equation*	
Variable	*Coefficient*	*Variable*	*Coefficient*	*Variable*	*Coefficient*
		School Debt Gross			
DEBT	.043***	HV	-.274	HV	-.420***
	(.017)		(1.476)		(.071)
PTAX	-.653***	HHINC	-1.278	DEBT	.042***
	(.093)		(.940)		(.013)
		Other Debt Gross			
DEBT	-.019	HV	1.265	HV	-.485***
	(.019)		(.817)		(.065)
PTAX	-.406***			DEBT	.056***
	(.094)				(.016)

*p<.1, **p<.5, ***<.01.
Standard errors in parentheses.

rates, which, in turn, negatively affect house values. Specifically, the property tax rate increases by .050 percent as the level of gross debt goes up 1 percent. The magnitude of the coefficient of debt variable on house values is 0.025 (.050*.510), indicating that an additional percentage increase in debt depreciates house values by 0.025 percent.

The property tax rate is negatively related to house values as expected. The coefficient of property tax rate is –.510, indicating that a 1 percent rise in property tax rate is estimated to reduce house values by about $42,162.[15] When the model is estimated without the debt variable, the coefficient of the PTAX variable is .463, indicating that property tax rates are still slightly overcapitalized. The smaller magnitude of the PTAX in the model without the DEBT variable implies that the property tax variable may pick up the future tax liabilities from debt issuance.

When the school-purpose debt is entered into the house value equation, the coefficient of gross school debt is positive and statistically significant.[16] The school-purpose debt burden variable also indirectly affects house values through increased property tax rates. The combined effect shows that an additional percentage increase in school-purpose debt appreciates house values by 0.016 percent.

The positive relationship between gross school debt and house values in this study is somewhat surprising. A possible explanation for this unexpected positive relationship can be provided: it is possible that residents and potential residents perceive the amount of debt as a level of capital services given that funds from issuing bonds are spent exclusively for capital projects. Local residents may perceive a direct link between debt burden and capital improvement and thus, the DEBT variable may pick up the effects of infrastructure differences between jurisdictions. The impact of increased benefits of capital programs on house value is partially offset by the price-depressing effect of anticipated tax increases.

As for the other municipal debt, the estimated coefficient of the other gross debt variable in the house value equation is negative but insignificant. However, the other gross debt variable is positively related to property tax rates, which indicates that the other municipal debt negatively affects house values. The capitalization rate of property taxes in the other municipal debt model is smaller than the capitalization rate in the total or school debt model. Other municipal debt's insignificance in the house value equation indicate that voters may not perceive the existence (or size) of other municipal debt because no referendum is required to issue such debt.

The estimated property tax rates in this study are more than fully capitalized. This result may imply that households do not expect the current property tax rates to persist in the future. Instead,

they anticipate the future tax increases resulting from debt issuances and capitalize these increases into their house values.

CONCLUSION

This study examines both whether municipal debt is capitalized into property values and whether the degree of capitalization differs by the type of debt or by the existence of debt limits. The study results show that debt is indirectly capitalized into house values in that the previous bond issues affect the current tax burden, thereby influencing house values in the current period. It is also found that the capitalization effect of debt is smaller than the capitalization effect of property taxes.

Another interesting finding is that the burden of school purpose debt has a direct positive effect on house values. It seems that referendum requirements help make residents aware of the existence and/or the size of debt, although they perceive the amount of debt as benefits resulting from capital service, not as future tax liabilities. The positive effect of debt burden on house values should be interpreted with caution. If residents are aware of the benefits of debt financing and capitalize them into property values, this positive effect of school-purpose debt on house values could be interpreted as refutation of the debt illusion hypothesis.

The estimation results support that property taxes are fully (or over-) capitalized. This indicates that local residents fully comprehend the current tax levels of their community and furthermore, they are also partially aware of the future tax burden resulting from debt issuances. Taken together, property taxes and municipal debt are not equivalent and the method of financing has real effects on the local housing market.

The problems in this study suggest a need for future research. This study faces some possible econometric problems. Since there are no variables measuring the quality of infrastructure, this study may commit omitted variable bias if municipality dummies in the model cannot capture the effect of infrastructure differences. As mentioned earlier, the debt variable in this study may be more of proxy for infrastructure or other capital assets. Therefore, some kinds of natural experiments in which a large bond issue was decided on with very short notice could be explored. Additionally, obtaining data for future research that allows different times and situations can help to generalize the results of this study.

Notes

[1] This study includes only General Obligation (GO) bonds, which are backed by the full faith and pledge of the issuer. Revenue bonds and other non-guaranteed bonds are excluded, as they are not payable from general tax revenue. Some guaranteed debt are "self-liquidating," which means they are funded out of a specified, non-tax source of revenue, but the indenture specifies that general tax revenue will be forthcoming if needed to prevent default (Kiewiet and Szakaly, 1996).

[2] Historically, the breakdown between intergovernmental grants, tax-exempt bonds, and current tax receipts has been about 20 percent, 40 percent, and 40 percent, respectively. Outstanding debt and other fiscal data are obtained from the Statistical Abstract, U.S. Census Bureau, various years.

[3] Such restrictions are state laws that limit issuing of new bonds or place limits on the amount of GO indebtedness as a percentage of tax bases, or required referenda for bond issuance. Most states utilize more than one instrument.

[4] Some research has examined whether constitutional and/or statutory debt limitations are an effective instrument for constraining long-term indebtedness. The empirical findings from most studies in this area indicate that these limits had little impact on state and local borrowing (Bahl and Duncombe, 1993; Clingermeyer and Wood, 1995; Pogue, 1970), while Kiewiet and Szakaly (1996) argue that some types of limitations are more effective than others.

[5] Although the magnitude of capitalization varies widely in the literature, most studies conclude that both services and taxes are significant property determinants. More contemporary studies examine the effect of school quality or property tax reform (i.e., Proposition 13 or Proposition 2 ½) on property values (Bogart and Cromwell, 1997; Lang and Jian, 2004).

[6] Imperfect capitalization would indicate that inefficiency exists in the provision of local public services. Therefore, state limitations on the use and the issuance of debt by local governments become important and appropriate (Landers and Byrnes, 2001).

[7] See Epple and Schipper (1981).

[8] The effective property tax rate changes as the market value of a house changes. The market value of a house may represent the capacity of a community to raise revenues, which could also affect the ability to issue and service local debt.

[9] The variables that affect the level of debt in a community are drawn from the existing literature (Bahl and Duncombe, 1993; Clingermayer and Wood,

1995; Ellis and Schansberg, 1999). The variables for the property tax rates model are borrowed from Leeds (1985).

[10] It should be noted that the measure of debt burden for this study is based on gross debt, which includes all bonds and notes authorized or guaranteed by a local unit or a school district, whether or not issued. Data on the outstanding debt, which is generally referred to as the remaining principal that has not been paid off, are not available for the full study period.

[11] The primary advantage of the New Jersey sample is that school districts in the state are coterminous with municipalities. This guarantees that residents share the same services, including education, within the municipality boundary. In New Jersey, the issuance of bonds and notes in order to finance certain government municipal expenditures is governed by the Local Bond Law. The Local Bond Law does not require a referendum of voters for counties and municipalities. There are two types of school districts commonly referred to as "Type 1" and "Type 2" districts. A bond issue in a "Type 2" district is subject to the approval by the district's voters at a regular school election or a special election held for bond purpose. The majority of school districts fall into a "Type 2," and "Type 1" school districts and municipalities with missing values are excluded from this study. As a result, the study sample includes 502 municipalities and the total observations are 1506 (502*3).

[12] The data on housing values, housing characteristics, and neighborhood characteristics are obtained from the Census of Population and Housing. The data for local fiscal variables are obtained form the Division of Local Government Services in New Jersey.

[13] Hausman (1978) devised a test for independency of the random effects and the regressors. Under the null hypothesis of no correlation, both the OLS estimator in the fixed-effects model and GLS estimator are consistent, but the OLS estimator is inefficient. Under the alternative hypothesis of correlation between the error and the regressors, the OLS estimator in the fixed-effects model is consistent, but the GLS estimator is inconsistent. The P-value in the random effects model for each equation is less than .01, indicating that the regressors are correlated to the random effects.

[14] There is no consensus in the literature that the choice of the functional form can be determined a priori. Rosen's (1974) hedonic model admits nonlinear price function and the log form allows a multiplicative impact of the independent variables on house values. The house value, debt, and other monetary measures are stated in real dollars, adjusted to year 2000 constant dollars.

[15] The mean house value in the study sample is $220,751. The implicit prices of the attributes of the average house from the regression coefficients are computed as $dHV_i = \beta_i * HV/X_i * dX_i$, where dHV is the dollar change in the price of the mean house; β is the vector of coefficients of the various attributes; X is the vector of mean attributes, and the dX is the vector of unit change in attributes. A 3 percent discount rate with an infinite time horizon is used to compute the capitalization rate.

[16] This DEBT coefficient equaling 0.043 indicates that an additional dollar increase in gross school debt per housing unit increases house value by about $7.24.

References

Bahl, Roy, and William Duncombe. State and Local Debt Burden in the 1980s: A study in Contrast, *Public Administration Review* 53 (January/Feburary 1993): 31-40.

Bennett, James T. and Thomas J. DiLorenzo. The Ricardian Equivalence Theorem: Evidence from the Off-budget Public Sector, *Public Finance* 38 (1983): 309-316.

Bogart, William T. and Brian A. Cromwell. How Much More Is a School District Worth? *National Tax Journal* 50 (June 1997): 215-232.

Buchanan, James. M. Taxpayers' Anticipations and Fiscal Illusion. In James M. Ferguson, ed. *Public Debt and Future Generations*. Chapel Hill: The University of North Carolina Presss, 1964.

Clingermayer, James C. and B. Dan Wood. Disentangling Patterns of State Debt Financing. *American Political Review* 89 (March 1995): 108-120.

Daly, George G. The Burden of the Debt and Future Generations in Local Finance. *Southern Economic Journal* 36 (July 1969): 44-51.

Dollery, Brian E. and Andrew C. Worthington. The Impact of Fiscal Illusion on Housing Values: An Australian Test of the Debt Illusion Hypothesis. *Public Budgeting & Finance* 15 (Fall 1995): 63-73.

Ellis, Michael A. and D. Eric Schansberg. The Determinants of State Government Debt Financing. *Public Finance Review* 27 (November 1999): 571-587.

Epple, Dennis and Katherine Schipper. Municipal Pension Funding: A Theory and Some Evidence. *Public Choice* 37 (April 1981): 141-178.

Floyd, John E. and J. Allan Hynes. Debt Illusion and Imperfect Information. *European Economic Review* 11 (December 1978): 379-286.

Hausman, Jerry A. Specification Test in Econometrics. *Econometrica* 46 (November 1978): 1251-1271.

Kiewiet, D. Roderick and Kristin Szakaly. Constitutional Limitations on Borrowing: An Analysis of State Bonded Indebtedness. *Journal of Law, Economics and Organization* 12 (1996): 62-97.

Landers, James R. and Patricia E. Byrnes. An Empirical Investigation of the Presence of Debt Illusion. In *Proceedings of the 93rd Annual Conference on Taxation,* Santa Fe, 2000. Washington, D.C.: National Tax Association, 2001.

Lang, Kevin and Tianlun Jian. Property Taxes and Property Values: Evidence from Proposition 2 1/2. *Journal of Urban Economics* 55 (May 2004): 439-457.

Leeds, Michael A. Property Values and Pension Underfunding in the Local Public Sector. *Journal of Urban Economics* 18 (July 1985): 34-46.

New Jersey Department of Community. Division of Local Government Services. Trenton, NJ, 1980, 1990, and 2000.

Oates, Wallace E. The Effect of Property Taxes and Local Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis. *Journal of Political Economy* 77 (November/December 1969): 957-971.

Oates, Wallace E. The Effect of Property Taxes and Local Public Spending on Property Values: A Reply and Yet Further Results, *Journal of Political Economy* 81 (July/August 1973): 1004-1008.

Oates, Wallace. E., 1988, On the Nature and Measurement of Fiscal Illusion: A Survey. In Geoffrey Brennan, ed. *Taxation and Fiscal Federalism; Essays in Honour of Russell Matthews*. Sydney: Australian National University Press, 1988, pp. 65-82.

Pogue, Thomas F. The Effect of Debt Limits: Some New Evidence, *National Tax Journal* 23 (March 1970): 36-49.

Rosen, Sherwin. Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition. *Journal of Political Economy* 82 (1974): 34-55.

Shultz, Christian and Tomas Sjostrom. Local Public Goods, Debt and Migration. *Journal of Public Economics* 80 (May 2001): 313-337.

U.S. Census Bureau.

Census of Population and Housing, Washington, D.C. 1980, 1990, and 2000.

Statistical Abstract. Washington, D.C., various years, 1980-2005.

Wagner, Richard E. Optimality in Local Debt Limitation. *National Tax Journal* 23 (September 1970): 297-305.

Wellisch, Dietmar and Wolfram F. Richter. Internalizing Intergenerational Externalities by Regionalization, *Regional Science and Urban Economics* 25 (December 1995): 685-704.