



Special Report / Viewpoint

Do Taxes Matter? Yes, No, Maybe So

by *Therese J. McGuire*

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My goal in this report is to articulate a personal assessment and interpretation for policymakers of the scholarly empirical literature on the effect of taxes on economic development. It has been almost exactly 20 years since I was first asked by Robert Ebel, then executive director of the Minnesota Tax Study Commission, to think about the question of the effect of state taxes on business location decisions. I begin with my assessment and interpretation of the literature that asks whether taxes matter for states and regions, and I close with a look at two recent studies of the effect of taxes on local development within a metropolitan area.

News Flash: Taxes Do Matter (or Do They?)

In 1991, Timothy Bartik published a very influential book. In setting out to answer the question posed in the title of the book, *Who Benefits From State and Local Economic Development Policies?*, Bartik needed to take an important, initial step and ask whether local economic development policies are effective. To answer this question, Bartik provided the first comprehensive survey of the extensive empirical literature on the effect of taxes on economic development. In many respects, the chapter devoted to this literature is a sidebar to Bartik's thesis that properly targeted local economic development benefits the nation, but it is largely because of this chapter that the book is so widely cited. Bartik staked out a position: "This recent research suggests a consensus on the likely magnitude of tax effects on business location decisions." (Page 43) Notice that it is not the "likely effect" of taxes that is in doubt. With Bartik's survey, we seem to have moved on to developing a consensus on the "likely magnitude" of the *agreed-upon* effect. And what is this consensus? Bartik puts the consensus elasticity in a range of -0.1 to -0.6, implying that "A ten percent reduction in state and local business taxes in a state or metropolitan area, holding public services constant, would increase that state or metropolitan area's employment or output by between one percent and six percent." (Bartik, 1995, page 102)

In my 1992 review of Bartik's book, published in the *National Tax Journal*, I question whether the enormous amount of evidence that Bartik amasses supports his conclusion. In Table

2.3 in his book, he gives the percentage of studies with at least one statistically significant negative tax effect. Among three types of interarea studies (totaling 99 studies), he finds that 70 percent, 92 percent, and 80 percent of the studies find at least one statistically significant negative tax effect. One of those studies is a 1985 study by Michael Wasylenko and me. I use this one study to illustrate the sense in which I look at the same evidence and see the glass as half empty, whereas Bartik sees the glass as half full. Among the 28 possible tax coefficients that Wasylenko and I estimated, eight were statistically significant, so certainly more than one. At the time of the study, we stressed the eight rather than the 20 insignificant coefficients for a variety of reasons, not all unscrupulous.¹ This was one of the first studies in many years to find any significant effects, the significant coefficients seemed to "make sense" to us, and we focused our discussion on the applicability (and interpretation) of the results to relatively high-tax states such as Minnesota, where arguably the high taxes were a deterrent to business expansions and locations. Today, because I am perhaps wiser and more experienced (certainly older and grumpier), I interpret the 20 insignificant coefficients out of 28 possible as providing a preponderance of evidence against taxes having an effect. But, in fact, my change of heart came about much sooner than the writing of this review and is attributable to the results of studies that followed on the heels of Wasylenko's and my study and that shook our confidence in our earlier results. I describe these other studies, each of which involved Wasylenko in some capacity, below.

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Only a few new interregional studies have been published since Bartik's survey. James Hines published a study in the *American Economic Review* in 1996 in which he found that foreign direct investment was significantly affected by state corporate tax rate differences. Probably the single most influential study is a paper by Leslie Papke published in the *Journal of Public Economics* in the same year as Bartik's book. Let me describe it in some detail to give a flavor for why this study is

¹The borderline unscrupulous reason for emphasizing the eight significant coefficients is recognition of the general bias in the refereed journals towards publishing statistically significant results.

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considered one of the best. Papke analyzes the location of new firm births in five manufacturing industries with annual data from 22 states over the period 1975 to 1982. Because she has both cross-state and time-series data, she is able to control for unobserved characteristics of the states that may be correlated with the observed policy variables of interest, something that few previous studies were able to do.² Papke summarizes her findings as follows.

High ETRs [effective tax rates] are predicted to deter births of firms in half of the industries examined (the coefficient is statistically significant in Outerwear and Communication Equipment, marginally significant in Furniture). The implied elasticities at the means are 15.7, 5.62, and 1.59, respectively. (Page 65)

To continue with my metaphor, Bartik and many others read this paper and see the glass more than half full. I read this paper, which I agree is one of the best studies, and see the inconsistencies across industries and unbelievably strong effects, and wonder: what is really going on here?

Contemporaneous with and subsequent to the publication of Bartik's book, several authors have tried to replicate and test the robustness of many of the studies that Bartik counted on the "taxes matter" side of the ledger. Using more recent data, Wasylenko and I in 1987 and Wasylenko and Robert Carroll in 1991 tried without success to replicate the results of Wasylenko's and my 1985 study. In particular, using data from the 1980s rather than the 1970s, the newer studies did not find taxes to be a significant determinant of state employment growth. In his Ph.D. dissertation research, Carroll tried unsuccessfully to replicate Jay Helms' widely cited 1985 study in which Helms found that an increase in state taxes coupled with an increase in welfare expenditures depressed state personal income. This series of defeats led Carroll and Wasylenko to publish in the *National Tax Journal* in 1994 an article entitled "Do State Business Climates Still Matter? Evidence of a Structural Change," in which they found the early estimates not to be robust to changes in time periods analyzed. Finally, in his 1996 study, Robert Tannenwald applied the approach of Papke (1987) to more recent data and was unable to replicate Papke's finding of a statistically significant negative effect of taxes on capital investment.

Since Bartik published his book, there have been several gatherings of the major contributors to this literature at one conference or another. One such gathering occurred essentially at the same time as Bartik was writing his book and resulted in a 1991 volume edited by Henry Herzog and Alan Schlottmann. One of the chapters in the volume is by William Fox and Matthew Murray. They conclude: "Perhaps the most important result is that the influence of any single local-government policy on the start-up or location of firms is, in general, very small in any given year." (Page 117) In a session organized by Wasylenko at the 1994 National Tax Association's annual fall conference, Bartik, Wasylenko, Tannenwald, and Papke rehash, without resolving, many of the issues and conflicting findings raised in the literature.³ A 1997 special issue of the

²Mofidi and Stone (1990) also control for state fixed effects in their study of the effect of state and local taxes on manufacturing investment and employment. Like Papke (1991), they find that taxes exert a statistically significant and strong negative effect on economic growth.

³See Wasylenko (1995).

New England Economic Review titled "The Effects of Local Public Policies on Economic Development" proceedings of a symposium organized by Tan Wasylenko and Ronald Fisher each provide surveys of the empirical literature with slightly different focuses. Wasylenko concludes that "the literature suggests that taxes have a small, statistically significant effect on interregional location behavior." (Page 49) Fisher, who describes himself as primarily a consumer rather than a producer of this research, carefully discusses and emphasizes the differences across the various studies. He concludes that "[there is a need] to be sensitive to how our work is interpreted and subsequently used by policymakers . . . there is ample opportunity for these econometric estimates to be misunderstood and misused, and researchers should not encourage that tendency." (Page 65)



For employment growth, we find that two of the four tax variables are statistically significant determinants and both have economically large negative effects on employment growth.

This may seem like one of those "academics pissing in the wind" episodes. Why can't we reconcile the conflicting results and messages and come up with a consensus view? In fact, I do sometimes feel like a lone voice in the wilderness. In a 1998 volume on tax and land use policies written primarily by Helen Ladd, she reviews several surveys of the literature and concludes that the research of the 1980s "renders obsolete the old conventional wisdom among economists that taxes have negligible impacts on interstate location decisions. Indeed, taxes appear to have quite large impacts." (Page 95) Even more recently, in a volume on tax increment financing, Joyce Man asserts that "research in the 1980s and 1990s has found that state and local taxes and expenditures exert statistically significant influences on the level of economic activity." (Johnson and Man, 2001, page 102) But then I read Carroll and Wasylenko's work, which provides a careful, honest assessment of the fragility of the estimates, and I do not feel so alone in my doubts. And, I read Ron Fisher's measured review of much of the same literature reviewed by Bartik and others, and take solace in his unwillingness to conclude any more than "that some public services clearly have a positive effect on some measures of economic development in some cases." (Page 54, emphasis in the original.) Finally, I venture back into the fray.

Taxes and the Central City (County)

In recent years, I was coauthor of two studies of the effect of taxes on economic development. These studies differ in one important respect from the studies I have described thus far: Both studies examine the effect of taxes on economic development *within* a given metropolitan area. In other words, the studies seek to determine whether differences in taxes (and other factors) across local jurisdictions in a metropolitan area contribute to differential economic growth rates for those local jurisdictions. This is a fundamentally different question than the effect of taxes on state or regional economic development in at least two respects. First, many of the other factors that are



likely to attract or repel businesses, such as quality of the labor force and energy prices, are likely to be uniform within a metropolitan area. Any differences in taxes across the metropolitan area are thus less likely to be swamped by differences in these other factors as businesses make location and expansion decisions. Second, by virtue of their legal status, the tax policy levers available to local policymakers differ from and in many respects are more limited and constrained than those available to state policymakers.

Stephen Mark, Leslie Papke, and I teamed up in 1997 to undertake a study of the effect of taxes on economic development for the District of Columbia's Tax Revision Commission. The commission was interested in whether the district's relatively high taxes were to blame for the district's dismal economic performance. The district presented an interesting case study. Like many metropolitan areas, the D.C. metropolitan area was (and probably still is) characterized by a declining central city surrounded by thriving suburbs. Unlike most metropolitan areas, the local jurisdictions that constitute the area are located in more than one state (three states to be precise, counting the District of Columbia), making for an unusual variety of tax and spending policies.

Our study, which was published in the *National Tax Journal* in 2000, was an attempt to determine which local policy variables and environmental factors help explain the poor economic performance of the district compared with its suburbs. We examined two measures of economic growth: growth in population and growth in employment. Our sense was that population and employment represent two different aspects of the health of a local area. Population is of interest from a fiscal perspective in the D.C. context because the district is prohibited by Congress from imposing an income tax on commuters. We used regression analysis to relate each of these measures of economic health (annual growth rate of population and annual growth rate of employment) to a set of possible explanatory variables. Table 1 lists the variables examined for each mea-

sure. Our choice of variables was based on moral (for population) and business (for employment) decisions. The variables are meant to capture factors across local jurisdictions in a metropolitan area that influence utility maximization and profit maximization.

Nine local general-purpose governments constitute the D.C. metropolitan area: the district, three counties in Maryland, and four counties and one city in Virginia. Because we had annual observations from 1969 through 1994, we were able to control for fixed jurisdiction effects (time-invariant, jurisdiction-specific influences on economic growth, such as the central-city status of the district) as well as annual time effects (yearly influences on economic growth that are common to all jurisdictions, such as a recession). The advantage of being able to control for time-invariant characteristics of the jurisdictions through fixed jurisdiction effects is that we can be relatively confident that any effect we estimate for one of our variables, say property taxes, is truly attributable to that variable and not to some other aspect of the jurisdictions that happens to be related to property taxes. For example, suppose that across the nine jurisdictions there is a strong positive correlation between the level of property taxes and an unmeasurable variable, say the level of local pollution. If we run a regression of population growth on property taxes and find a negative correlation, we cannot be sure whether high property taxes deter population growth or high pollution levels, which are associated with the measured variable, deter population growth. If we can, in effect, control for the unobservable, time-invariant pollution level by estimating the relationship between population growth and property taxes using the variation in these two variables over time within each city, then we will have an unbiased estimate. This example raises the disadvantage of fixed-effects estimation as well: The estimated coefficients are identified using time-series variation in the variables within each city, rather than the variation across the cities, which may be of greater economic interest.

Our findings for annual population growth are summarized in Table 2.

Annual Population Growth	Annual Employment Growth
income per capita	income per capita
total crime index	total crime index
non-AFDC expenditures per capita	non-AFDC expenditures per capita
AFDC expenditures per capita	—
personal income tax rate at \$25,000 income	corporate income tax rate
sales tax rate	sales tax rate
residential property tax rate	commercial property tax rate
—	personal property tax rate
—	unemployment insurance cost

Annual Population Growth (1969-94)	Coefficient (standard error) *significant at the 10 percent level
income per capita	0.064* (0.032)
total crime index	-0.0020 (0.011)
non-AFDC expenditures per capita	-0.00067 (0.0032)
AFDC expenditures per capita	-0.014* (0.007)
personal income tax rate at \$25,000 income	-0.810 (0.580)
sales tax rate	0.826 (0.542)
residential property tax rate	-1.231 (0.877)

^aFixed jurisdiction and time effects are not displayed.



We find that only two factors affect population growth: income per capita and AFDC expenditures per capita. Given that these two variables are included in logarithmic form, the coefficients can be interpreted as elasticities; so, for example, a 10 percent increase in income per capita is estimated to result in a 0.64 percentage point increase in the growth rate of population. We interpret both of these variables as characterizing the local environment/local amenities. Because AFDC expenditures are largely driven by caseloads, this variable may be a proxy for concentrations of poverty. If so, our estimates indicate that concentrations of poverty negatively affect population growth. Higher income per capita appears to attract residents. Interestingly, none of the three tax variables are statistically significant determinants of population growth.

Our findings for annual employment growth are summarized in Table 3.

Table 3: OLS Regression Results^a	
Annual Employment Growth	Coefficient (standard error) *significant at the 10 percent level
income per capita	0.141* (0.073)
total crime index	0.0080 (0.025)
non-AFDC expenditures per capita	0.029* (0.0073)
corporate income tax rate	2.757 (2.951)
sales tax rate	-2.078* (1.172)
commercial property tax rate	1.584 (1.662)
personal property tax rate	-2.441* (0.672)
unemployment insurance cost	-0.021 (0.013)
^a Fixed jurisdiction and time effects are not displayed.	

For employment growth, we find that two of the four tax variables are statistically significant determinants and both have economically large negative effects on employment growth. Our estimates indicate that a 1 percentage point higher tax rate on personal property (increase in the sales tax rate) reduces annual employment growth by 2.44 (2.08) percentage points. Evaluated at the means, these results imply an elasticity of employment growth with respect to either tax of about minus 2.

One surprising tax result that differs from much of the previous literature is our finding that property taxes are not a significant factor explaining economic growth (measured either by population or by employment).⁴ One possible explanation for this finding is that we were unable to control for

⁴Except for Luce (1994), previous studies of the effect of property taxes on intraregional economic development have measured economic development by new firm locations or expansions as opposed to employment or population. Because of this difference and the fact that no previous intraregional studies have relied on panel data, it is difficult to compare our results with the results found in the previous literature.

school quality or school expenditures. If high property taxes are correlated with high spending on education, which is probably the case, high property taxes would have a positive effect on both population and employment, the property tax coefficient may be picking up this effect as well as any independent (and opposite) effect of the property tax. Still, it is perplexing that population and employment growth across jurisdictions in a metropolitan area do not seem to be sensitive to differences in real property taxes. This is all the more perplexing in light of the findings of the other study I was recently involved with, to which I now turn.

The Chicago metropolitan area is composed of six counties⁵ with Cook County, containing the city of Chicago, as its geographic, economic, and demographic center. Like the District of Columbia, the Chicago metropolitan area has been characterized in recent decades by slow growth, even stagnation, of its central city and older suburbs and rapid growth of its outer suburbs. Many observers attribute at least part of this difference in economic fortunes to an unusual aspect of the property tax system in Illinois. Cook County, alone among the 102 counties in Illinois, assesses different types of property at different rates, resulting in significantly higher effective tax rates for commercial and industrial property relative to residential property in any given taxing jurisdiction in the county. If property taxes are a significant negative determinant of business location decisions and economic development in general, then this relative disadvantage in the tax treatment of commercial and industrial property might help explain the differences in economic fortunes observed between the jurisdictions in Cook County and those in the outlying five counties (known locally as the collar counties). Certainly many policymakers, politicians, and taxpayers are convinced that classification of property has driven business out of Cook County.

I find it difficult to be convinced that taxes are an important factor in explaining differences in business location decisions and economic activity between states or regions.

Richard Dye, David Merriman, and I attempted to test this assertion in a study published in the *Journal of Regional Science* in 2001. We asked two related questions: (1) are property taxes a significant determinant of economic activity in the Chicago metropolitan area? and (2) does classification exert a distinct and separate effect on economic activity in the Chicago metropolitan area? We examined three measures of economic activity: growth in the market value of commercial property, growth in the market value of industrial property, and growth in employment; and we measured the growth rates for each municipality in our sample over a six- or seven-year period in the early 1990s. As in the study of the District of Columbia, we used regression analysis to relate each of these measures to a set of possible explanatory variables, one of

⁵The official Primary Metropolitan Statistical Area is composed of nine counties, but the locals invariably mean the five "collar counties" plus Cook County when they refer to the Chicago metropolitan area.



which was the local effective property tax rate. Unlike in the D.C. study, we relied solely on cross-sectional variation, with the sample size ranging from 63 jurisdictions to 256 jurisdictions depending on the measure under study and the specification of the estimating equation.

The tricky part of this study was to try to separate the effects of classification (differences in countywide average tax rates) from the effects of differences in local property tax rates. Our approach involved estimating the equation on two samples, one composed of all municipalities in the six-county area (for which data were available) and the other composed of municipalities in Cook County only. The estimated coefficient on the property tax variable in the metropolitan-wide sample would reflect the effects of both countywide and municipal (within-county) differences in property taxes, while the coefficient in the Cook-only sample would, by design, reflect only within-county (within Cook to be specific) differences in property taxes. We were not successful in isolating the two possible effects on each of our measures of economic activity, but we did find evidence in each instance that property taxes are a deterrent to economic activity. In Table 4 we present the estimated coefficient on the property tax variable for six different specifications.⁶

The coefficients derived using the six-county sample reflect

taxes, while the coefficients derived using the six-county sample reflect only variation across municipal county.⁷ For each of the measures of economic activity, the coefficient displayed indicates that, other things equal, a 1 percentage point increase in a municipality's tax rate — say from the average level of 4 percent to 5 percent — would lower the growth rate in the value of commercial property by 1.1 percentage points per year. The results for commercial property are interesting. The significant coefficient derived from the six-county sample combined with the insignificant coefficient obtained when using the Cook sample indicates that only countywide average tax rates matter. One interpretation of this is that classification exerts a separate negative effect on the growth of commercial property.

Final Remarks

Where does all this lead? Here is where I confess to being somewhat (perhaps very) irrational in my interpretation of this literature. With respect to the interstate and interregional studies, despite the number of studies with significant coefficients, I find it difficult to be convinced that taxes are an important factor in explaining differences in business location decisions and economic activity between states or regions. In part, I believe the discrepancy between my conclusion and that of many other scholars of the topic is due to our different perspectives. I came to this topic through the tax-study, blue-ribbon-commission route. I have seen firsthand state policymakers grasping for straws. I simply do not think that the evidence allows us to comfortably advise lawmakers that reducing the corporate income tax rate or the personal income tax rate will revive a flagging state economy.

In contrast, the findings of the intraregional studies lead me to be fairly confident, if not certain, that high local property taxes deter economic growth.

In contrast, the findings of the intraregional studies lead me to be fairly confident, if not certain, that high local property taxes deter economic growth. This confidence remains despite the fact that the two recent studies I have participated in reach debatable, perhaps even conflicting, conclusions. When I interpret empirical findings for policymakers, they have to pass both the statistical test and the “gut test.” The finding that classification, which results in average tax rates twice as high in Cook County as in the other counties in the Chicago metropolitan area, negatively affects Cook's economic activity passes the gut test (for me, not necessarily for my coauthors, which is why I admit to having irrational thoughts). But the preponderance of (non-robust) evidence on the side of state taxes having a negative effect on business location decisions does not.

Dependent variable	Six-county sample {number of municipalities}	Cook County sample {number of municipalities}
annual growth in market value of commercial property 1990-1996	- 1.1313** {256}	0.0933 {117}
annual growth in market value of industrial property 1990-1996	- 1.3099** {253}	-1.6556** {116}
annual growth in employment 1991-1996	-0.3102 {109}	-1.7793** {63}
** indicates significant at the 5 percent level.		

the effects of both classification and local variation in property

⁶We included several other variables in the regressions, such as per capita income, population density, share of the population with post-high-school education, miles to O'Hare Airport, miles to the central business district, and commercial and industrial share of property market value.

⁷The equation estimated on the six-county sample does not include dummy variables for the six counties, and thus there is the possibility of omitted variable bias.

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