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TAXES, JOBS, AND MARKET  
GROWTH RATES

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## TAXES, JOBS, AND MARKET GROWTH RATES

Since the Great Depression, business lobbyists have aggressively promoted the notion that states can stimulate their economies by cutting taxes. In the last decade this belief has achieved the status of conventional wisdom among many state legislators and policy makers. However, the dominant view expressed by those studying the impacts of taxes on job development remains that state and local taxes have no measurable influence on employment growth or on any other measure of state economic development. For manufacturing the most important factors affecting location and investment decisions have been found to be labor productivity, transportation costs to markets, access to inputs, and agglomeration effects. For retail trade, wholesale trade, and much of the services industry, market size is of greatest importance (Due; Borchert and Adams; Smith; Kieschnick; Noyelle).

A recent study by Wasylenko and McGuire (WM) claims to find that state and local taxes have a negative and statistically significant effect on job growth. Some students of economic development are accepting that claim uncritically--even going so far as to suggest that this study helps "revisionist" scholars gain ground in arguing that taxes do influence business investment (Papke and Papke; Blair and Premus; Courant and Rubinfeld; Johnson). Further, business lobbyists in several states have been using the study to press for changes in the individual income tax.

WM's findings deserve careful scrutiny. This note raises questions about both the statistical significance claimed for the relationship between taxes and job growth and the structure of the model from which those results were obtained.

#### Statistical Problems with the Wasylenko-McGuire Findings

If conventional criteria for significance (.05 and .01 for two-tailed t tests) are used, none of WM's 28 tax variables were significantly related to job growth, although two narrowly missed reaching the .05 level. One close-to-significant coefficient showed a negative relationship between the effective state personal income tax rate for individuals with \$50,000 income or more and the percentage change in employment in wholesale trade. The other showed a negative relationship between the percentage change in tax effort and the percentage change in services employment. WM found no statistically significant relationship between taxes and manufacturing employment growth or taxes and total employment growth.

Even those modest findings are questionable. Because 28 coefficients for tax variables were estimated, one would expect at least one coefficient to be significantly different from zero even if the true parameter values were zero.

The search techniques used to construct the statistical estimates further weaken the results reported. An earlier version of the study described the procedure: "If a variable is highly correlated with one or more variables in the subgroup, and it is always statistically insignificant in the initial

regressions and not found to be statistically significant in other studies of location it is dropped from the regression and a preferred model formulated" (Wasylenko, 1986).

Regressions estimated using this step-wise search process yield a larger number of significant coefficients due to Type I errors. Lovell (1983) and Kennedy (1985) offer a rule of thumb for deflating the claims of statistical significance in equations so constructed.<sup>1</sup> If this rule is followed, relying on the information in Wasylenko (1986), no tax variable coefficient in WM was close to conventional levels of significance.

#### Structural Problems with the Wasylenko-McGuire Approach

Inadequate research design casts further doubt on WM's findings. Successful studies of factors affecting state job growth rates must include all factors contributing to growth. If they do not, statistical results will be biased. WM omitted a key predictor of the percentage change in employment--the growth in local market size--and that omission raises substantial doubt about their findings.

A market growth variable could have been incorporated into their study in several ways. Ideally, a fully specified labor supply and labor demand function would have been developed allowing direct estimation of the effects of taxes and market growth on labor supply and demand schedules while permitting estimates of the indirect effect of tax changes on market growth.

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<sup>1</sup> If  $k$  variables have been selected out of  $c$  potential variables, a coefficient that appears to be significant at the  $a$  level is more likely significant only at the level  $b = (c/k)a$ .

Such models are difficult to specify and estimate, however, so simpler methods which ignore the effects of taxes on market growth are often used.

One way of including a market growth variable while retaining the effects of tax changes on market size would be to draw on economic base theory and include the percentage change in income not dependent on local market growth--income from forestry, fisheries, agriculture, mining, and manufacturing, for instance--as an independent variable in the regression equations for the trade and services industries. An even simpler solution, but one that ignores potential effects of taxes on market growth, would be to include the percentage change in personal income as an independent variable in the equations estimated.

WM chose neither of those methods. Instead, they used only one measure of market characteristics, state personal income in 1977. No measure of the change in local market size during the study period was included in their regressions. A footnote argues that the change in independent variables "is probably much less important than the variation in the levels of these variables among states" and "that adding the change in the independent variables to the equation would...confuse the results and with only 48 observations greatly reduce the degrees of freedom."

Those assertions are not sufficient to overcome a strong presumption of omitted variable bias in WM's estimates. By relying only on an absolute measure of market size they

implicitly argue either that only the absolute size of the local economy determines the rate of job growth (that is, other things equal, one would expect to see a larger percentage increase in employment in states with larger economies) or that market growth rates are proportional to the size of the state's economy.

Neither argument is appealing.

As is well known, omitted variables create serious problems for interpretation of regression coefficients when an omitted variable is correlated with an explanatory variable already in the regression. Of particular importance here is the correlation between the percentage growth rate in market size and the tax variables. A significant correlation between percentage change in market size and either tax variable would mean the estimated coefficient on the tax variable is both biased and inconsistent. Further, the usual tests of statistical significance for the tax variables no longer apply (Kmenta).

A simple test of omitted variable bias was conducted by computing the correlations between one crude measure of market change (the percentage change in per capita state personal income 1973-1980) and the tax variables that were close to significant in two of WM's equations. The results indicate a strong likelihood of omitted variable bias. Statistically significant correlations of  $-.35$  between the percentage change in personal income and the effective income tax rate, and of  $-.38$  between the percentage change in tax effort and the percentage change in personal income were found. The simple correlations between WM's

market variable, per capita personal income in 1977 and the percentage change in personal income was .04, evidence that WM's market variable did not capture the change in market size.

These findings support the presumption that market growth--not tax considerations--explains the growth in state employment in the wholesale trade and services sectors. That is, the tax variables were principally reflecting the effects of a market change variable.

#### Summary

WM's results do not support assertions that state tax levels--particularly income tax rates on high income taxpayers--affect rates of job growth. Statistical and structural difficulties with the estimated equations raise considerable doubt whether those findings are true representations of the underlying economic relationships. The problems with their study once again emphasize the difficulty of identifying the impact of state and local tax structures on economic growth.



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