THE IMPACT OF STATE AND LOCAL TAXES ON ECONOMIC GROWTH

*David S. Dahl and Samuel H. Gane**

Introduction

Proposition 13 and similar proposals in other states have raised an economic question: Do state and local taxes influence personal income growth? Some proponents of Proposition 13 claimed that lower taxes, in addition to causing the obvious increase in disposable income, would lead to higher total personal income in California. To quote one article on the subject:

> Arthur Laffer of the University of Southern California estimates that the property tax cut will trigger enough additional private investment and spending over the next decade to lift personal income in the state by $110 billion more than it would have risen without the initiative. [11, p. 82]

Aside from those effects which lower property taxes may have on California's economy, this study addresses the broader question of whether state and local taxes in general influence personal income growth. The results of our study imply that state and local taxes are a significant deterrent to growth in personal income per capita across states.

While these results have policy implications for state and local policymakers, the study itself addresses only the impact of state and local taxes on income growth. Ours is a positive approach and says nothing about the appropriate objectives for either tax structures or income growth.

Theory

Although the basic principles of economics indicate that a reduction in state and local taxes might influence growth in personal income, the direction of change is not clear.

The immediate impact of lowering taxes is to shift resources from the public sector to the private sector. In the private sector, lowering taxes raises the disposable income of households and increases household spending for goods and services. It also increases savings, resulting in an increased supply of investment funds. An additional effect of lowering taxes in the private sector is to lower the costs of production faced by firms. This raises profits and shifts supply curves to the right.

On the other hand, state and local governments generally cannot run deficits to cover operating costs, so lower taxes would reduce public sector spending for goods and services. This could lower personal income. Therefore, a tax cut could have opposing effects on income so that its net effect is uncertain.

Similarly, the longer-run effects of a tax reduction on personal income through firm location decisions are also ambiguous. From the perspective of costs alone, lowering taxes would seem to encourage firms to expand and attract new firms to the area, increasing income. On the other hand, tax cuts

*Regional Economic Affairs Specialist and Economic Analyst, respectively, Research Department, Federal Reserve Bank of Minneapolis.

could lead to cuts in services provided to business by state and local governments. If business firms deem these services important and economically irreplaceable, tax cuts may discourage firm expansion and location.[1]

The theoretical implications of tax cuts are inconclusive, since there are effects working in opposite directions and no clear understanding of their relative magnitudes exists. Therefore, a tax cut's net effect on personal income growth could be positive, negative, or neutral.

Methodology

An empirical answer to the question of how state and local taxes influence personal income growth is provided in this study by cross-sectional analysis. The ideal conceptual experiment to address this question would be the comparison of two states that were identical in all respects. We would alter the tax structure of one state and observe whether its personal income growth then differed from that of the other.

This study attempts to approximate that experiment by multiple regression analysis across states. The dependent variable, per capita personal income growth, is regressed on state and local taxes per capita and a number of other variables. The other independent variables are used to control for factors besides taxes which may cause growth differences among states.

The regressions are performed for two time periods: 1960-1969 and 1970-1977, using the 48 contiguous states as observations. The variables are generally measured as either growth rates or average levels over these periods. Our primary focus is on the latter period, while the earlier period is intended to serve as a check on the results.

The cross-sectional approach to this issue has more than one precedent in the literature. In a study similar to ours, Raymond J. Struyk regresses measures of growth on state and local taxes cross-sectionally [13]. His findings included a significant negative relationship between growth and taxes.

Our study differs from the Struyk study in three respects. First, our observations are by state rather than city, states being more politically autonomous and fitting the question posed by Proposition 13 better. In addition, ours covers two periods, 1960-1969 and 1970-1977, while Struyk's study covers one time period, 1950-1960. Finally, the most important difference is that our study controls for other factors which may affect personal income growth. Struyk, by not doing this, may have seriously biased his results.

In a regression of growth on taxes, the omission of other relevant explanatory variables will bias the results if any of the omitted variables are correlated with taxes. The direction of this bias is indeterminant as long as the signs of the coefficients of the omitted variables and the directions of their correlation with taxes are unknown [6, pp. 392-395].

One recent study does make a limited attempt at correcting for the omitted variables problem. In a cross-sectional analysis by state, Robert J. Kleine finds that population density is correlated with both personal income growth and state and local taxes [5]. He uses population density as a proxy for economic

[1]Some evidence exists to support the hypothesis that the cost effects dominate. A review of previous studies in this area concludes that tax considerations may be marginally important in firm location decisions, although overwhelmed by other criteria. See John F. Due, "Studies of State-Local Tax Influences on Location of Industry," *National Tax Journal*, 14 (June 1961), pp. 163-173.

maturity. His results for a regression of income growth on taxes and population density covering the period 1970-1975 include a significant negative coefficient for the state and local tax variable. But by his own admission, Kleine's study does not go very far toward accounting for the omitted variables and he characterizes his results as inconclusive because of the possible existence of other omitted variables which are correlated with taxes.

Our methodology employs a reduced-form model of regional growth across states which is then adjusted after determining what variables need to be included to address our question.

Reduced-form Model:

$$(1) \quad Y_i = a + b_1 X_i^1 + \sum_{j=2}^{n} b_j X_i^j + \sum_{j=n+1}^{m} b_j X_i^j + \epsilon_i$$

where

Y_i is growth in per capita personal income in state i over the relevant period.

X_i^1 is the average level of state and local taxes per capita in state i over the relevant period.

X_i^j, $j = 2, \ldots, n$, are variables affecting Y_i which are correlated with X_i^1.

X_i^j, $j = n + 1, \ldots, m$, are variables affecting Y_i which are uncorrelated with X_i^1.

Since the estimate of b_1 is unaffected by X_i^j, $j = n + 1, \ldots, m$, they can be omitted from the analysis without any damage to the results in order to preserve degrees of freedom. Therefore, the adjusted model becomes:

$$(2) \quad Y_i = a + b_1 X_i^1 + \sum_{j=2}^{n} b_j X_i^j + \epsilon_i.$$

With no a priori indications from theory as to the sign of b_1, our null and alternative hypotheses become:

$$H_O: \ b_1 = 0$$

$$H_A: \ b_1 \neq 0..$$

The use of the variables measuring per capita income growth and taxes is central to the issue this study addresses, while the other variables come primarily from previous studies of regional growth.

Growth in per capita personal income (Y_i) should be thought of as a general measure of welfare for our purposes. It measures the welfare of individuals

directly through changes in their income stream. The welfare of firms is measured only indirectly through the effects of their behavior on employment, wages and salaries, etc.

State and local taxes per capita (X_i^1) is our tax variable. While tax revenues are generally accurate in measuring the direct impact of taxes on households and firms, they do omit other forms of revenue such as licenses and special fees. Tax revenues are less accurate conceptually, however, with respect to measuring the effects of spending by state and local governments, since they can separate taxes from capital spending over time by debt financing. In addition, the use of tax revenues excludes the effects of differing relative amounts of federal aid which add to state and local government spending.

As to the other explanatory variables, we compiled a relatively long list of measurable variables which might be correlated with income growth on the basis of previous studies of regional growth and intuition

$$(X_i^2, \ldots, X_i^n, X_i^{n+1}, \ldots, X_i^m).$$

These variables generally represent endowments, economic structure, and demographic characteristics of states (see Table I). From this list we included in the regressions only those variables which were found to be correlated with

$$X_i^1, \text{ representing the set } X_i^2, \ldots, X_i^n.$$

Using a table of correlation coefficients [9, p. 305], we kept only those variables for which we could reject the hypothesis that their partial correlation with

$$X_i^1$$

was zero at a 95 percent level of significance. While the sets of variables selected for the two periods by this technique were not identical, the fact that they were very nearly the same helps to justify the use of the technique.

Findings and Conclusions

The results of the study indicate that state and local taxes may be an important determinant of personal income growth (see Table 2 for a summary of regression results). In the regression for the period 1970-1977, b_1, the coefficient of X_i^1 (state and local taxes per capita) was negative and significantly different from zero at the 95 percent level.

The test of our hypothesis rests on the assumption that growth is a function of taxes as well as other independent variables. Strictly speaking, this significant finding for the period 1970-1977 implies only correlation, not dependence or causality. While it is conceivable that causality could run from growth to taxes or in both directions between the two, our view of the world is that taxes are essentially exogenous with respect to growth. We make this assertion on the basis of the observation that taxes can be controlled by state and local policymakers while income cannot. On this basis we conclude that, for the period 1970-1977, state and local taxes appear to have had an adverse impact on personal income growth.

TABLE 1. List of Variables.

Symbol	Included in Regression 1960-69	Included in Regression 1970-77	Variable	Source
Y	✓	✓	Growth rate of personal income per capita	Bureau of Economic Analysis
X 1	✓	✓	State and local taxes per capita	Department of Commerce
X 2		✓	Employment rate	Bureau of Labor Statistics
X 3	✓	✓	Percentage of population 18 and over	Bureau of Census
X 4		✓	Agriculture income as a percentage of total	Bureau of Economic Analysis
X 5			Capital expenditures in manufacturing per capita	Survey of Manufactures
X 6			Growth rate of nonagricultural employment	Bureau of Labor Statistics
X 7	✓	✓	Average hourly earnings in manufacturing	Bureau of Labor Statistics
X 8			Manufacturing income as a percentage of total	Bureau of Economic Analysis
X 9			Ratio of value added to wages in manufacturing	Survey of Manufactures
X 10	✓		Migration rate	Bureau of Census
X 11	✓	✓	Total population	Bureau of Census
X 12			Index of cyclical swing of nonfarm personal income	Survey of Current Business
X 13			Total value of farmland	Census of Agriculture
X 14	✓		Normal annual heating degree days	U.S. Statistical Abstract
X 15			Total federal aid per capita	U.S. Treasury Department
X 16	✓	✓	Percentage of population 25 and over completing high school	Bureau of Census
X 17	✓	✓	Union members as percentage of total employment	*Economic Report of the Governor — 1977*, California
X 18			Value of mineral production as percentage of U.S. total	*Minerals Yearbook*
X 19	✓	✓	Ratio of federal spending to federal taxes	*National Journal*, June 26, 1976
X 20	✓	✓	Percentage of nonwhite workers in labor force	Bureau of Census
X 21	✓	✓	Number of scientists per 1,000,000 population	U.S. Statistical Abstract
X 22			Percentage of manufacturing shipments for export	U.S. Department of Commerce

TABLE 2. Regression Results

Period	Equation
1970-77	$Y = -1.293 - .269\ X\ 1 + 1.243\ X\ 2 + .028\ X\ 3$ $(-1.13)\quad (-2.05)^*\quad (1.35)\quad (.04)$ $+ .047\ X\ 4 + .120\ X\ 7 + 1.395\ X\ 11 + .006\ X\ 16$ $(0.18)\quad (3.77)^*\quad (.49)\quad (1.25)$ $- .005\ X\ 17 + .198\ X\ 19 - .082\ X\ 20 - .001\ X\ 21$ $(-1.91)\quad (3.45)^*\quad (-.41)\quad (-.70)$ $\bar{R}^2 = .581\qquad F(11,36) = 6.925$
1960-69	$Y = -.152 + .237\ X\ 1 - .122\ X\ 3 - .049\ X\ 7$ $(-.19)\quad (.65)\quad (-.19)\quad (-.73)$ $+ 1.118\ X\ 10 + .306\ X\ 11 + .018\ X\ 14 + .012\ X\ 16$ $(3.49)^*\quad (.09)\quad (1.94)\quad (2.15)^*$ $-.004\ X\ 17 + .046\ X\ 19 + .444\ X\ 20 - .004\ X\ 21$ $=(-1.70)\quad (.70)\quad (2.07)^*\quad (-2.87)^*$ $\bar{R}^2 = .699\qquad F(11,36) = 10.942$

t-statistics appear in parentheses under the coefficients.
*Significant at the 95 percent level.
See Table 1 for identification of variables

The results for the period 1960-1969 do not support the same conclusion. In this period, the coefficient of the tax variable was not significantly different from zero. However, we feel that this discrepancy does not necessarily detract from our conclusion. There are at least three reasons why the results for the two periods might differ in this way.

First, the impact of state and local taxes on households and firms may be less important in an expanding economy than in a contracting one. And the sixties were definitely a more expansionary period than the seventies which contained two national recessions. Average annual rates of growth in real GNP were 4.1 percent for the period 1960-1969 and 2.7 percent for the period 1970-1977.

Second, the impact of state and local governments on income growth may depend on the relative size of government, i.e., there may be a nonlinear relationship between growth and state and local taxes. This would be consistent with a hypothesis that some things, which are inherently public goods, are more efficiently provided by government, so that the economic effect of the public sector is positive or neutral at lower levels of size but becomes negative when government grows to the extent of supplanting the private sector. By the seventies, the relative size of state and local government was larger than in the sixties. State and local government purchases of goods and services as a percent of U.S. GNP was 11.8 percent in the period 1960-1969 and 13.1 percent for 1970-1977, an increase of more than 10 percent in the relative size of state and local government between these two periods.

Third, in a concept somewhat related to the second point, the impact of state and local governments on growth may depend on the composition of their spending. Spending by state and local governments in the sixties may have had a more productive impact on growth than in the seventies because of how the revenue was spent. While this is a somewhat difficult concept to measure, a relatively larger portion of state and local outlays for capital expenditures might be indicative of more productive spending. The percentage of state and local government direct expenditures on capital outlays was 23.4 percent for 1960-1969 and 17.5 percent for 1970-1977.

The inconsistency of the findings of our study between these two time periods suggests an area for further research. We have only speculated as to some of the possible explanations of why state and local taxes appear to be a deterrent to growth in the latter period but not in the earlier one. But the hypothesis that there is a nonlinear relationship between growth and the size of state and local government or that some government functions are more economically productive (or less counterproductive) than others could possibly be placed in a testable framework. The findings of such a study should have important implications for state and local policymakers.

This study's contribution is the inclusion of other relevant, but previously omitted, variables which help to make the findings and conclusions more credible. While our findings and conclusions do not justify any specific programs for changing state and local taxes, they do establish that states with higher state and local taxes tend to have lower growth in per capita personal income. And since the issues surrounding taxes and the appropriate size of state and local governments aren't likely to fade away soon, our findings provide useful input for policymakers contemplating these issues.

REFERENCES

1. Bretzfelder, Robert B. "Sensitivity of State and Regional Income to National Business Cycles." *Survey of Current Business*, (April 1973), 22-27.

2. Browne, Lynn E. "Regional Unemployment Rates — Why are They So Different?" *New England Economic Review*, (July/August 1978), 5-26.

3. Due, John F. "Studies of State-Local Tax Influences on Location of Industry." *National Tax Journal*, 14 (June 1961), 163-173.

4. *Economic Report of the Governor — 1977*. Governor's Office, Sacramento, California, March 14, 1977.

5. Kleine, Robert J. "State and Local Tax Levels and Economic Growth — A Regional Comparison." National Tax Association — Tax Institute of America, *Proceedings*, 70th Annual Conference, Columbus, Ohio, (1978), 162-172.

6. Kmenta, Jan. *Elements of Econometrics*. New York: The Macmillan Company, 1971.

7. Lande, Paul S., and Peter Gordon. "Regional Growth in the United States: A Reexamination of the Neoclassical Model." *Journal of Regional Science*, 17 (1977), 61-69.

8. McLure, Charles E., Jr. "Taxation, Substitution, and Industrial Location." *Journal of Political Economy*, 78 (1970), 112-132.

9. Mills, Frederick C. *Statistical Methods*, 3rd ed., New York: Henry Holt and Company, 1955.

10. Nourse, Hugh O. *Regional Economics*. New York: McGraw-Hill, 1968.

11. Quirt, John. "California Taxquake." *Fortune*, (September 1978), 75-84.

12. Richardson, Harry W. *Regional Economics*. New York: Praeger Publishers, 1969.

13. Struyk, Raymond J. "An Analysis of Tax Structure, Public Service Levels, and Regional Economic Growth." *Journal of Regional Science*, 7 (1967), 175-183.