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State tax revenues over the business cycle: Patterns and policy responses

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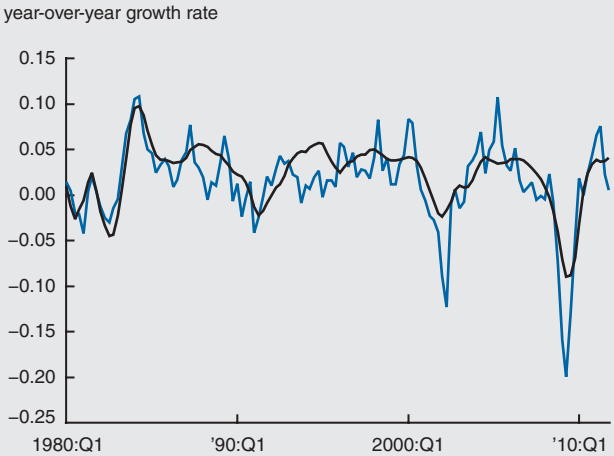
State tax revenues have become far more sensitive to changing economic conditions since the turn of the century. The authors document this increasing volatility and offer suggestions for what state governments might do to better manage their tax revenues to avoid or minimize dramatic fiscal downturns.

State tax revenues have historically been procyclical (i.e., rising when economic times are good and falling when they are bad). However, the magnitude of this response since 2000 has been much larger than in the 1980s and 1990s. The behavior of the state individual income tax is a key underlying factor behind this increased responsiveness to national business cycle fluctuations. Changes in both income tax rates and personal income dynamics have contributed to increased volatility in individual income tax revenues. On average, income tax rate policy across states has transitioned since 2000 from being countercyclical (i.e., raising tax rates when economic times are bad and lowering rates when times are good) to being largely independent of the business cycle. Since 2000, individual income growth—especially from investment income (i.e., income from capital gains, interest, and dividends)—has become more sensitive to changing economic conditions.

1. State tax revenues and economic conditions



NOTES: State tax revenues are in real per capita terms. The coincident index is a measure of national economic conditions.

SOURCES: Authors' calculations based on data from the Federal Reserve Bank of Philadelphia, State Coincident Indexes, from Haver Analytics; and U.S. Census Bureau, *Quarterly Summary of State and Local Government Tax Revenue*.

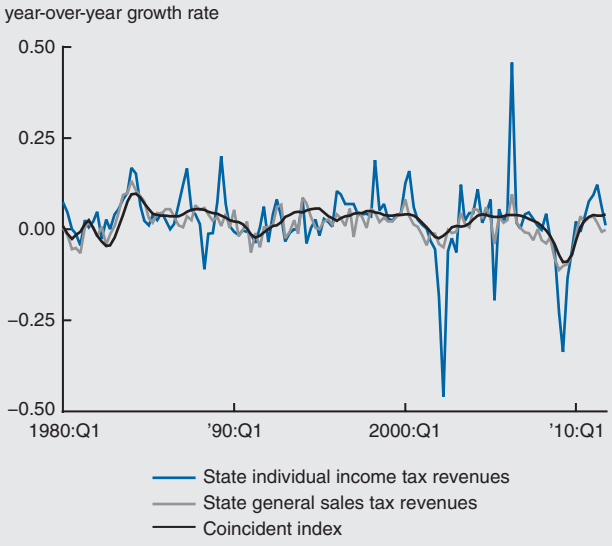
In this *Chicago Fed Letter*, we document the changing cyclical behavior of state tax revenues and discuss some of its causes. We then offer some suggestions for what state governments might do to avoid the negative consequences of the boom–bust cycles in state tax revenues observed over the past decade.

Evidence for increased volatility

To examine tax revenue performance over the business cycle, we compare a measure of state tax revenues (summed across the 50 states) with a measure of national business cycles (figure 1). For our measure of state tax revenues, we use the year-over-year growth rate of quarterly aggregate real state tax revenues per capita (e.g., 2011:Q1 relative to 2010:Q1), as reported by the U.S. Census Bureau.[1] For our measure of business cycle conditions, we use the growth rate of the Federal Reserve Bank of Philadelphia's coincident index for the United States. This coincident index combines four indicators at the national level to generate a single measure of economic conditions.[2] (The Philadelphia Fed also creates a measure for each of the 50 states in a similar manner.)

In the first two decades depicted in figure 1, state tax revenue growth and

2. State tax revenues, by source, and economic conditions



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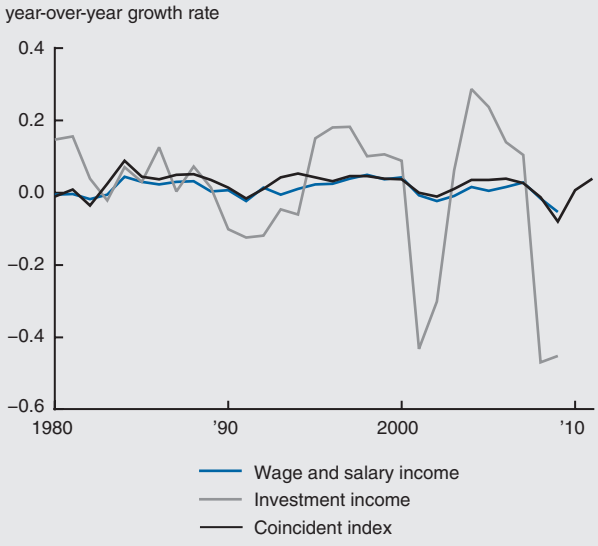
SOURCES: Authors' calculations based on data from the Federal Reserve Bank of Philadelphia, State Coincident Indexes, from Haver Analytics; and U.S. Census Bureau, *Quarterly Summary of State and Local Government Tax Revenue*.

3. Income and economic conditions



NOTES: Investment income is the income from capital gains, interest, and dividends. The coincident index is a measure of national economic conditions.

SOURCES: Authors' calculations based on data from the Federal Reserve Bank of Philadelphia, State Coincident Indexes, from Haver Analytics; and Internal Revenue Service, Statistics of Income Division.

economic growth track each other closely. Starting around 2000, however, the swings in state tax revenues become more dramatic relative to the swings in economic conditions. While this new pattern is most pronounced during the downturns in 2001 and 2008–09, we also note relatively large positive swings in revenues in the middle years of the 2000s. In our recent research,[3] we date this change in the state tax revenue–business cycle pattern to 2000 and note that it occurred in many of the 50 states.

In figure 2, we separately depict changes in the two most important sources of state tax revenues—the individual income tax and general sales tax. Combined, these two types of taxes represented about two-thirds of state tax revenues across all 50 states in 2010.[4] As shown in the figure, the increased volatility of state tax revenues over the business cycle is primarily due to the dramatic swings in the individual income tax.

Individual income tax

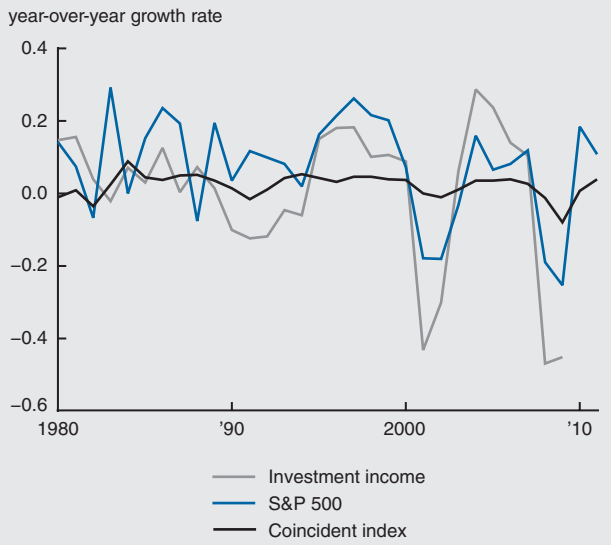
Changes in individual income tax revenues can arise from two sources: changes in the amount or type of income that is taxed and changes in the tax rates that apply to the various forms of income. Thus, a higher volatility of individual income tax revenues could emerge if incomes rose and fell more dramatically with changing economic times or if the income tax rate policy became less countercyclical than it had been historically. (Countercyclical tax policy would typically offset some of the business cycle impact.)

We first investigate changes in the dynamics of income. Figure 3 shows the behavior of wage and salary income and investment income plotted against the business cycle. Data on wage and salary income and investment income are available from the Internal Revenue Service (IRS), Statistics of Income Division, at an annual frequency and only through 2009. We observe that wage and salary income has tracked the coincident index quite closely, partly because wage and salary disbursements make up one of the indicators used in the construction of the index. In addition, wage and salary disbursements are fairly stable over time. By contrast, there are large swings in investment income. While investment income experienced modest swings during the 1990s, it experienced dramatic swings throughout the 2000s.

There are a couple of potential explanations for why investment income has risen and fallen more dramatically with the economy from 2000 onward. First, since 2000, there have been two major drops in the stock market. In figure 4, we compare annual stock market returns with investment income growth. We observe that the major drops in investment income occurred along with major drops in stock market returns. Second, changes in capital gains tax policy as part of the Jobs and Growth Tax Relief Reconciliation Act of 2003 may have influenced investors' decisions concerning when to take gains and in which amount.

Broader changes in income tax policy may also have influenced the pattern of state income tax revenues over the business cycle since 2000. In figure 5, we compare changes in the coincident index to changes in the dollar-weighted average state marginal tax rate on wages. The average marginal tax rate on wages measures the average amount of tax that would be due to state governments on an extra dollar of wage income. This rate is calculated by the National Bureau of Economic Research (NBER).[5] We find that in the recessions of the early 1980s and early 1990s, states increased

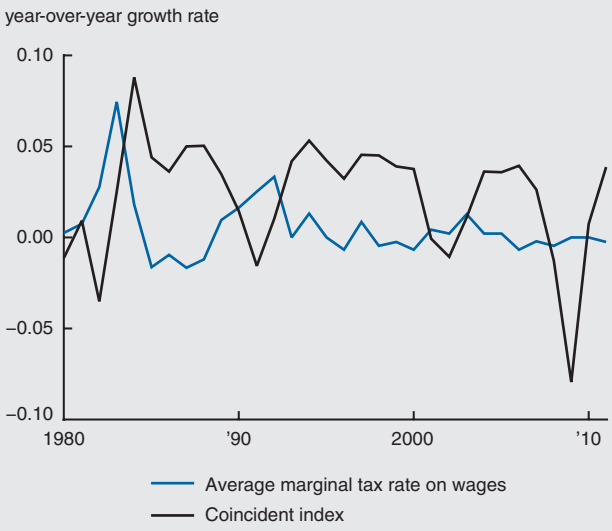
4. Market returns, investment income, and economic conditions



NOTES: Investment income is the income from capital gains, interest, and dividends. The S&P 500 (Standard and Poor's 500 Index) is a gauge of the large-cap U.S. equities market—measured as its average value over the year. The coincident index is a measure of national economic conditions.

SOURCES: Authors' calculations based on data from the Federal Reserve Bank of Philadelphia, State Coincident Indexes, from Haver Analytics; Standard and Poor's, S&P 500, from Haver Analytics; and Internal Revenue Service, Statistics of Income Division.

5. State tax rates and economic conditions



NOTES: The average marginal tax rate on wages measures the average amount of tax that would be due to state governments on an extra dollar of wage income. The calculation of this rate allows tax policy to vary, but keeps the distribution of income fixed at its 1995 level. The coincident index is a measure of national economic conditions.

SOURCES: Authors' calculations based on data from the Federal Reserve Bank of Philadelphia, State Coincident Indexes, from Haver Analytics; and National Bureau of Economic Research, TAXSIM model.

tax rates when the economy soured—presumably to stabilize revenues. When economic conditions were good in the late 1980s, tax rates fell—presumably because states flush with revenues no longer needed the funds. By contrast, since the mid-1990s, tax rates have been essentially unchanged in the face of economic fluctuations. Because of political constraints or other forces, policymakers began to make a different set of decisions concerning tax rate policy.

Possible state policy strategies

What might state governments do about the increased cyclical sensitivity of state tax revenues to changing economic conditions? There are four principal ways that state policymakers can adjust to this increased cyclical sensitivity, should it persist: They can adjust policies concerning tax and other own-source revenues; they can rely on the federal government for aid; they can adjust expenditures; and they can manage states assets to provide greater resources during recessions.

State policymakers responded to the recent revenue dearth by enacting substantial revenue policy changes in 2010 and 2011. So, policymakers are indeed adjusting tax-revenue-setting policy, and state governments are returning to countercyclical tax rate setting. Going back to the historical practice of increasing tax rates during bad economic times and decreasing them during good economic times would be one way that states could reduce state tax revenue volatility. Alternatively, states could restructure state taxes to mitigate their tax revenue volatility. For steadier tax revenues, states could rely more on targets that are less volatile over the business cycle—e.g., through an increased emphasis on wage and salary income and a reduced emphasis on investment income. States could also reduce volatility in taxes other than the income tax; for instance, to do this for the sales tax, states could broaden the sales tax base to include a greater number of foods and services. Spending on foods and services is more stable over the business cycle, but foods and many services are not subject to sales taxes in many states. Higher sales taxes on foods and services would reduce states' reliance on tax revenues generated from less frequently purchased big-ticket goods, like furniture and cars.

Instead of relying on own-source revenues, states could turn to the federal government for aid during bad times. The American Recovery and Reinvestment Act of 2009 is the most recent in a series

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of countercyclical federal aid packages.[6] One challenge to federal policymakers is to construct policies that do not reward or promote irresponsible policymaking at the state level.

States could also work to adjust their expenditures over the business cycle to ease budgetary stresses during downturns. If we assume that the volatility in state tax revenues will continue, states' adjustment of spending over the business cycle may be one way to close budgets gaps. The problem with this strategy is that many of the demands on state government programs—such as education, Medicaid, and unemployment insurance—increase or stay constant when the economy worsens.

States could also adapt to the heightened cyclical sensitivity of their tax revenues to changing economic conditions by managing their assets so that they have greater access to funds during downturns. In particular, states could increase their reliance on "rainy day funds." Given the role of investment income in generating dramatic fluctuations in state tax revenues, states could have dedicated rainy day funds explicitly connected to tax revenues generated by capital gains. Massachusetts implemented a program in fiscal year 2011 that would require all tax revenues collected from capital gains in excess of $1 billion to be added to the state's rainy day fund.[7] The advantage of this type of program over a traditional rainy day fund is that this type provides a direct link between one major source of state tax revenue volatility and the response to it.

Conclusion

State governments are facing a period of fiscal turbulence. To get through these stressful times, states must understand the dynamics influencing their tax revenue collections. In this article, we have suggested that since 2000, state tax revenues have become somewhat more procyclical, largely because of the changing dynamics of the state individual income taxes. If this trend persists, states should consider ways of adapting their budgeting practices to ensure that necessary services can be maintained in the face of this new revenue pattern.

[1] For more details, see https://www.census.gov/govs/qtax/.

[2] For more details, see www.philadelphiafed.org/research-and-data/regional-economy/indexes/coincident/.

[3] Richard H. Mattoon and Leslie McGranahan, 2012, "Revenue bubbles and structural deficits: What's a state to do?," Federal Reserve Bank of Chicago, working paper, No. WP 2008-15, revised April 2012, available at www.chicagofed.org/webpages/publications/working_papers/2008/wp_15.cfm.

[4] There is substantial variation across states in their reliance on these two sources. Five states do not levy a general sales tax, and nine lack a broad-based individual income tax.

[5] This rate isolates the effect of policy changes because it is calculated with the distribution of income fixed at its 1995 level. This rate is calculated by the NBER using its TAXSIM model.

[6] Richard H. Mattoon, Vanessa Haleco-Meyer, and Taft Foster, 2010, "Improving the impact of federal aid to the states," *Economic Perspectives*, Federal Reserve Bank of Chicago, Vol. 34, Third Quarter, pp. 66–82.

[7] See www.mass.gov/bb/h1/fy11h1/exec_11/hbudbrief15.htm.