Tax News

Identifying the Household Consumption Response to Tax Expectations using Municipal Bond Prices

by

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How predictable are personal income tax rates in the U.S.? And do households adjust their consumption in response to news about future tax changes, or do they mostly respond at the time when the tax rates actually change? These are important questions because they have broad implications for macroeconomics, public economics and finance.

The rational-expectations life-cycle theory of consumption is the work-horse model in modern macroeconomics. While there are various specifications of this theory, two predictions are common across them. First, consumption should not respond to predictable changes in after-tax income and second, consumption should respond to news about future after-tax lifetime income. There is a large literature that tests the first implication of the rational-expectations life-cycle theory and generally rejects this basic model by finding significant consumption responses to predictable income changes – that is, it finds that consumption is in fact excessively sensitive to predictable income changes relative to the basic model's prediction.

However, very few studies focus on the theory's second main prediction, that household consumption should respond to news about future after-tax income changes, even if current after-tax income has not changed yet.

This is the first study that directly estimates the consumption response to news about future after-tax income using micro-level household consumption data. We first identify news about future tax changes which we then use to estimate the sensitivity of household consumption to changes in the expected life-time after-tax income.

The use of tax policy changes offers two main advantages over other empirical frameworks commonly used by macroeconomists to test the consumption theory and to analyze the effect of news on macroeconomic aggregates. First, exploiting the fact that there is a lag between the decision to change taxes and the implementation of the tax reform allows us to separate the behavioral response to news from the response to the actual policy changes. Therefore, the response to tax news is not confounded by the response to the actual tax change. Second, actual tax changes are directly observable without measurement issues, which is different from other news shocks that have been recently studied using macroeconomic data, in particular news about future total factor productivity. Therefore, this measure of news about future taxes can be directly compared with the actual evolution of the tax rates.

Regarding public economics, this study addresses another question that is of interest to public policy makers. During the current Great Recession in which conventional monetary policy is not effective due to the zero lower bound on nominal interest rates, policy makers have shifted attention to fiscal interventions. In order to assess the effectiveness of fiscal policy we need to know the total effect of a tax reform on the economy, i.e. the tax multiplier. Unfortunately, almost all studies that provide estimates of tax multipliers focus on the response of the economy to actual tax changes. These estimates might miss a fraction of the total effect of a tax reform on aggregate consumption if tax changes are predictable and if households are forward-looking and are responding to the news rather than the actual tax changes. Ignoring anticipation effects can therefore bias the tax multiplier downward.

Finally, this study also has important implications for modern consumption-based asset pricing theory by directly analyzing the relationship between the arrival of new information, changes in asset prices, and the response of household consumption.

Identifying Tax News Shocks

The identification of news about future tax rates is key for estimating the response of household consumption to changes in expected after-tax life-cycle income. This paper exploits

the fact that there exist two classes of fixed-income securities in the U.S. that are very similar in all pricing dimensions except for the tax treatment of their income streams. Interest income from municipal bonds is tax-exempt, while interest on Treasury bonds is subject to federal income taxes. Relative price changes between municipal and Treasury bonds therefore reflect changes in expected future tax rates, holding fixed other risk factors.

In order to estimate the consumption response to tax news we not only need to identify when news arrives, but also how persistent such a tax reform is expected to be. For instance, if a tax change is expected to be only transitory, then the theory predicts that consumption does not respond much. On the other hand, if a tax reform is expected to have a large persistent component, then consumption should respond much stronger. The basic rational-expectations life-cycle model of consumption predicts that consumption responds one-for-one to changes in expected annuity value of after-tax lifetime income. The fact that different bonds have different maturities can be used to measure the expected persistence of a tax reform, since yield spreads of bonds with different maturities reflect information about future taxes over different horizons. For instance, the spread between a two-year Treasury and a two-year municipal bond is informative for the path of expected tax rates over the next two years, while the fifteen-year yield spread contains information about the path of expected tax rates over the next fifteen years.

Before we can extract the path of expected tax rates from the term-structure of municipal bond spreads we need to deal with factors other than tax news that could affect the municipal yield spread. There are three main factors that come to mind: default risk, state income taxes, and liquidity risk. To minimize the influence of these factors we carefully chose the types of bonds to make them as comparable as possible. We use and index of AAA rated general-obligation state bonds since such bonds are the most liquid and most secure among all municipal bonds. The last state to default on its obligation was Arkansas in 1933. Hence, the default risk of these type of state bonds relative to Treasury bonds is minimal. Moreover, the analysis of individual AAA general-obligation state bonds shows that both state income taxes as well as any remaining idiosyncratic risk such as credit risk has only minimal effects on the spread between the state bond yields. The remaining main factor other than tax news which cannot be fully eliminated by carefully choosing the two types of bonds is liquidity risk. In order to minimize

the influence of liquidity risk we use off-the-run Treasury bonds which are known to be less liquid than on-the-run Treasuries. However, even the least liquid market for Treasury bonds is still more liquid than the most liquid municipal bond market. To deal with the remaining liquidity difference between the two bonds we decompose the yield spread into a tax news component and a liquidity risk premium.

The identification of the marginal investor and hence the relevant marginal tax rate implied in the municipal yield spreads allows us to control for the liquidity risk premium. Data on municipal debt ownership from the Flow of Funds Accounts and the Survey of Consumer Finances (SCF) suggest that the marginal municipal bond investor is a household near the top of the income distribution. The marginal tax rate identified by the municipal yield spread should thus be the personal income tax rate of high-income households. Moreover, the SCF shows that the position of the marginal investor in the income distribution is stable over time. Changes in the yield spread therefore reflect news about future tax rates rather than changes in the marginal investor holding fixed future tax rates.

To formally test this conjecture about the marginal investor's tax rate, we use the presidential elections of 1992 and 2000 as two natural experiments and daily data from a political prediction market as source of additional variation. Changes in election probabilities reflect changes in expected future tax rates because each candidate had a very different tax reform proposal during both elections. The two natural experiments show that financial markets have strong fiscal foresight with respect to both the timing and the magnitude of the shocks, and that the marginal tax rate identified by the municipal yield spread is indeed the personal income tax rate of households near the top of the income distribution.

Consumption Response to Tax News

The basic rational-expectations life-cycle model of household consumption behavior predicts that household consumption decreases one-for-one with an unexpected increase in the annuity value of life-time tax liabilities. Combining the market-based tax expectations with data from the Consumer Expenditure Survey we calculate changes in the expected annuity value of

life-time tax liabilities for each household in the survey. Surprisingly, consumption of high-income households – for which the identified tax news shocks are most relevant – increases by close to 1% in response to news of a 1% increase in expected after-tax lifetime income, consistent with the basic rational-expectations life-cycle theory.

Using household-level data allows us to explore the heterogeneity of responses across households and the importance of non-linearities. Extending the sample to include all households that pay taxes at some point in their lifetime – and are therefore potentially affected by future tax reforms – we find that the consumption response in the full sample is only 0.5%. This estimate is sufficiently precise to reject responses of 0% and 1%. Moreover, we find that the response varies significantly, both with the absolute size of the shock and with household characteristics. If all households affected by income tax reforms are included in the sample, then consumption responds by 1.1% using the largest 50% of news shocks in absolute value, which is consistent with rational inattention or near rationality. Furthermore, consumption of more educated, less cash-constrained, or richer households responds one-for-one to both large and small news shocks.

Clearly, more research on the response of households to news shocks needs to be undertaken before such data can offer policy guidance that is empirically well-grounded. Two directions seem particularly promising for future research. First, it would be useful to extend the analysis of tax news shocks to other margins of adjustment, in particular to the labor supply response and to the response of taxable income. Second, identifying additional news shocks other than tax news which also directly affect household budget sets is clearly desirable in order to verify the results of this study. A particularly useful task is the identification of news shocks that affect lower-income households more directly than news about changes in marginal tax rates of high-income households. Such additional independent news shocks could be used to more thoroughly examine the reason for the different consumption responses of high-income and lower-income households to the news shocks.