Estimating the Effects of Tax changes

- Blanchard and Perotti (2002):

$$\eta_{\tau t} = b_{\tau g}\eta_{gt} + b_{\tau y}\eta_{yt} + \varepsilon_{\tau t}$$
$$\eta_{gt} = b_{g\tau}\eta_{\tau t} + b_{gy}\eta_{yt} + \varepsilon_{gt}$$
$$\eta_{yt} = b_{y\tau}\eta_{\tau t} + b_{yg}\eta_{gt} + \varepsilon_{yt}$$

Recall that they also set $b_{g\tau} = b_{gy} = 0$

They set (1) $b_{g\tau} = b_{gy} = 0$ to identify the government spending shock; and (2) they use outside information to set $b_{\tau y}$=2.08.to identify the tax shock.

- Romer-Romer (2010) narrative method:

Identify legislated tax changes motivated by reducing inherited deficits or by promoting long-run growth as exogenous to current state of the economy.

The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks

By Christina D. Romer and David H. Romer*

This paper investigates the impact of tax changes on economic activity. We use the narrative record, such as presidential speeches and Congressional reports, to identify the size, timing, and principal motivation for all major postwar tax policy actions. This analysis allows us to separate legislated changes into those taken for reasons related to prospective economic conditions and those taken for more exogenous reasons. The behavior of output following these more exogenous changes indicates that tax increases are highly contractionary. The effects are strongly significant, highly robust, and much larger than those obtained using broader measures of tax changes. (JEL E32, E62, H20, N12)

C. *Identifying Motivation*

Our framework implies that we need to separate legislated tax changes into two broad categories: those taken in response to other factors likely to affect output growth in the near future, which we will call endogenous, and those taken for any other reason, which we will call exogenous.[3]

Endogenous Tax Changes.—Since output is typically growing over time, endogenous tax actions are ones taken to offset developments that would cause output growth to differ from normal. The quintessential endogenous action is a tax cut made because policymakers are forecasting a recession. In this case, some other factor is thought to be reducing output growth, and policymakers are changing taxes to try to return growth to normal. Such a tax change is clearly one of our $b_t^i \varepsilon_t^i$'s.
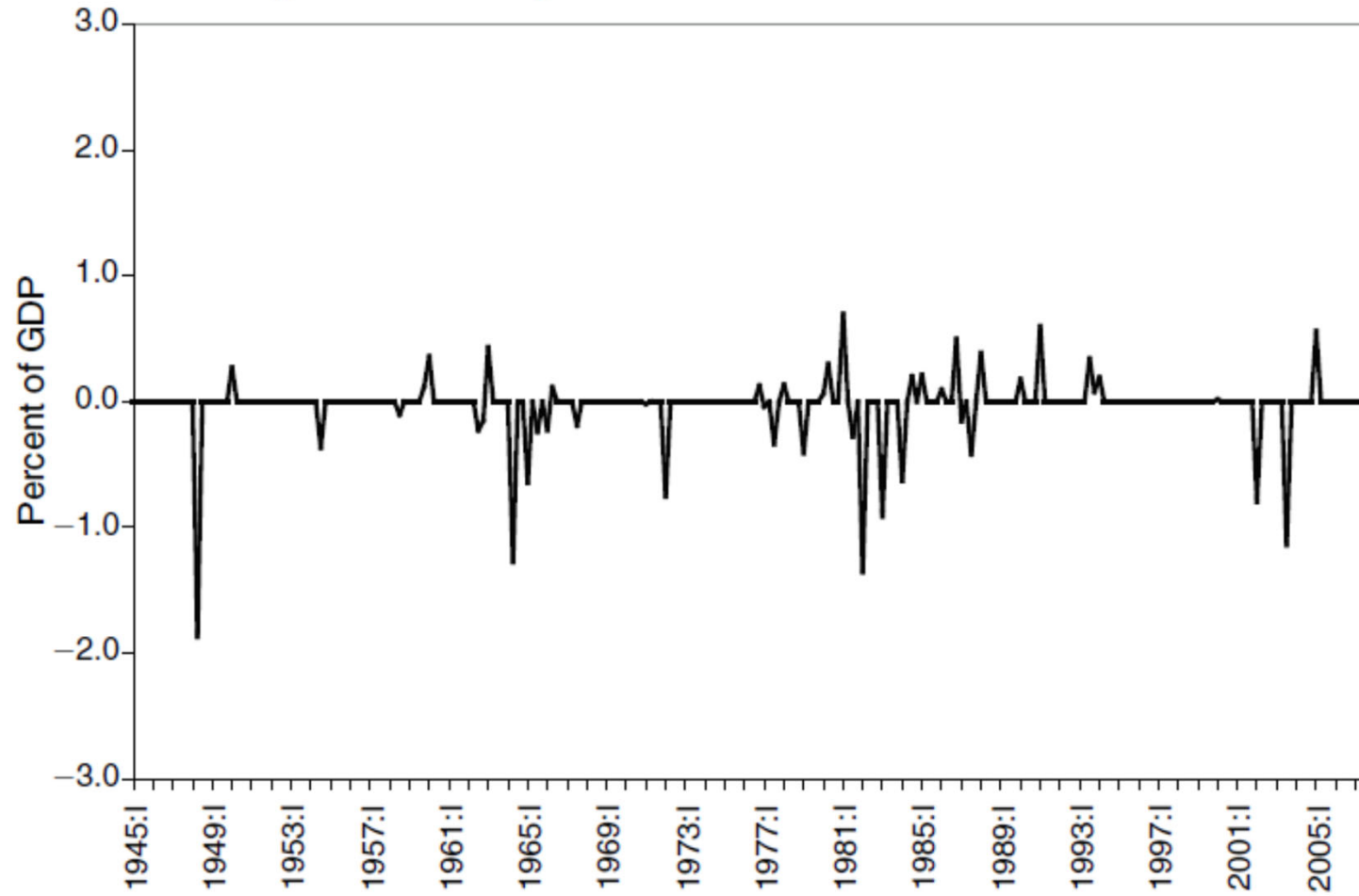
Exogenous Tax Changes.—Exogenous tax changes are those not taken to offset factors pushing growth away from normal. The quintessential exogenous change might be a tax cut motivated by a belief that lower marginal tax rates will raise output in the long run. Such an action is fundamentally different from the countercyclical actions discussed above because the goal is to raise normal growth, not to offset shocks acting to reduce growth relative to normal.

We identify exogenous tax changes from the narrative record in two ways. The first, and most straightforward, is by the absence of any discussion of counteracting shocks or of a desire to return growth to normal. Second, we look at the actual reasons given for the action and verify that they do not appear related to other factors affecting output in the near future.

For a tax action to be exogenous, it is not crucial that the economy be growing normally. If policymakers are not motivated by the state of the economy, the resulting actions should not be systematically correlated with prospective economic conditions. As a result, they are legitimate actions to use to estimate the output effects of tax changes. However, because accidental correlation is always a possibility in small samples, our statistical analysis includes a number of checks. For example, we show that our exogenous tax changes are not Granger caused by output growth.

One particular motivation that is common and that falls into the exogenous category are tax increases to deal with an inherited budget deficit. An inherited deficit reflects past economic conditions and budgetary decisions, not current conditions or spending changes. If policymakers raise taxes to reduce such a deficit, this is not a change motivated by a desire to return growth to normal or to prevent abnormal growth. So it is exogenous. An example of such a deficit-

Panel A. All exogenous tax changes

A. *Specifications*

Our series on exogenous tax changes reflects policies adopted for reasons essentially unrelated to other factors likely to influence real output in the near term. Thus, there is no reason to expect systematic correlation between these tax changes and other determinants of output growth. Our most basic specification is therefore extremely simple: we regress real output growth on a constant and the contemporaneous value and numerous lags of our measure of exogenous tax changes. That is, we estimate:

$$(6) \qquad \Delta Y_t = a + \sum_{i=0}^{M} b_i \Delta T_{t-i} + e_t,$$

where Y is the logarithm of real output and ΔT is our measure of exogenous tax changes. The analysis in Section I implies that OLS estimation of (6) should, in principle, yield unbiased estimates of the reduced-form impact of changes in the level of taxes on output.

In Section V, we examine the effects of adding various control variables to (6). One control variable, however, is sufficiently important that we consider it from the outset: lagged output growth itself. That is, in addition to (6), we estimate:

$$(7) \qquad \Delta Y_t = a + \sum_{i=0}^{M} b_i \Delta T_{t-i} + \sum_{j=1}^{N} c_j \Delta Y_{t-j} + e_t.$$
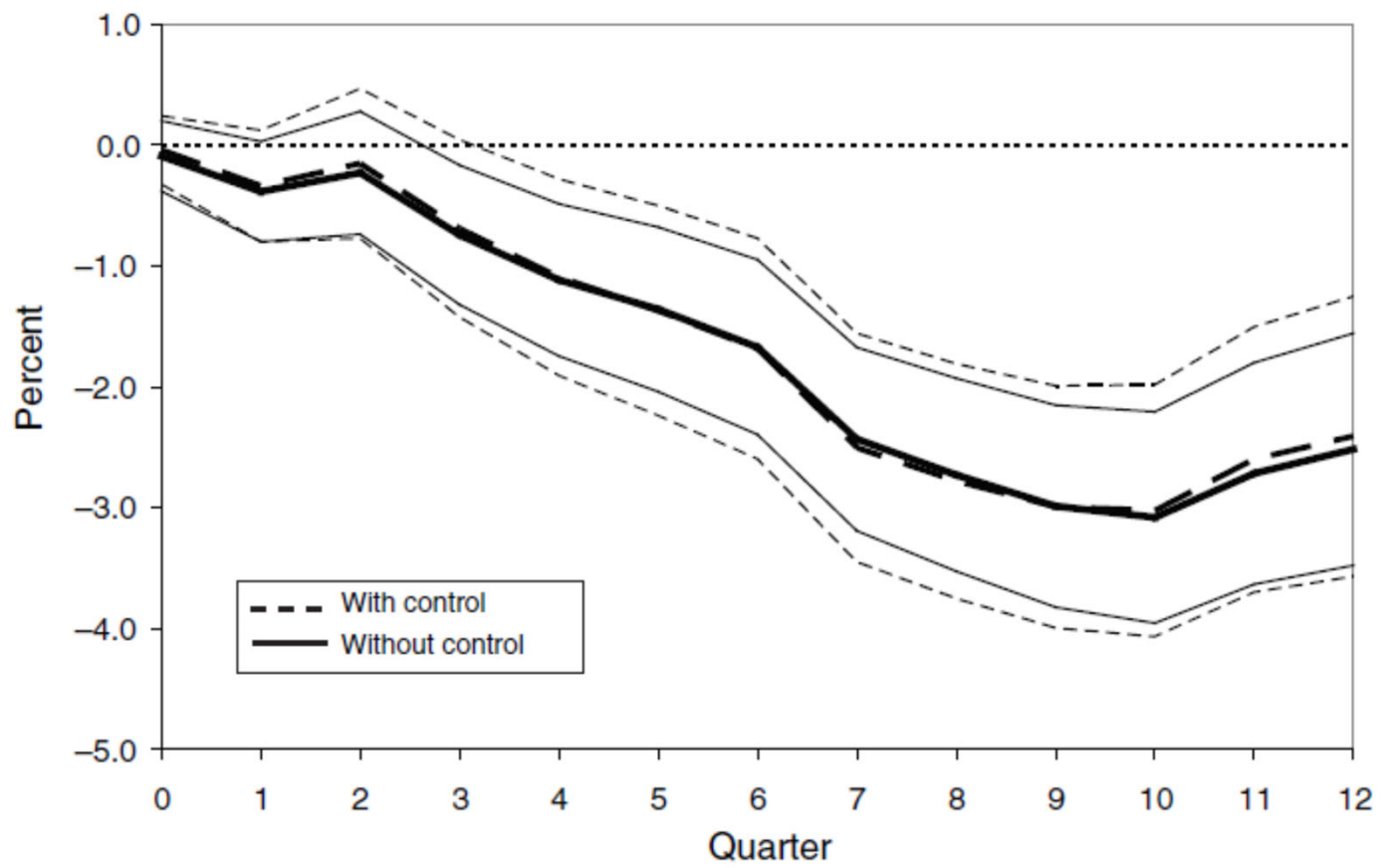
FIGURE 5. ESTIMATED IMPACT OF AN EXOGENOUS TAX INCREASE OF 1 PERCENT OF GDP ON GDP
(*Single equation, controlling for lagged GDP growth*)

Mertens-Ravn's Contributions

- Split the Romer shocks into anticipated vs. unanticipated
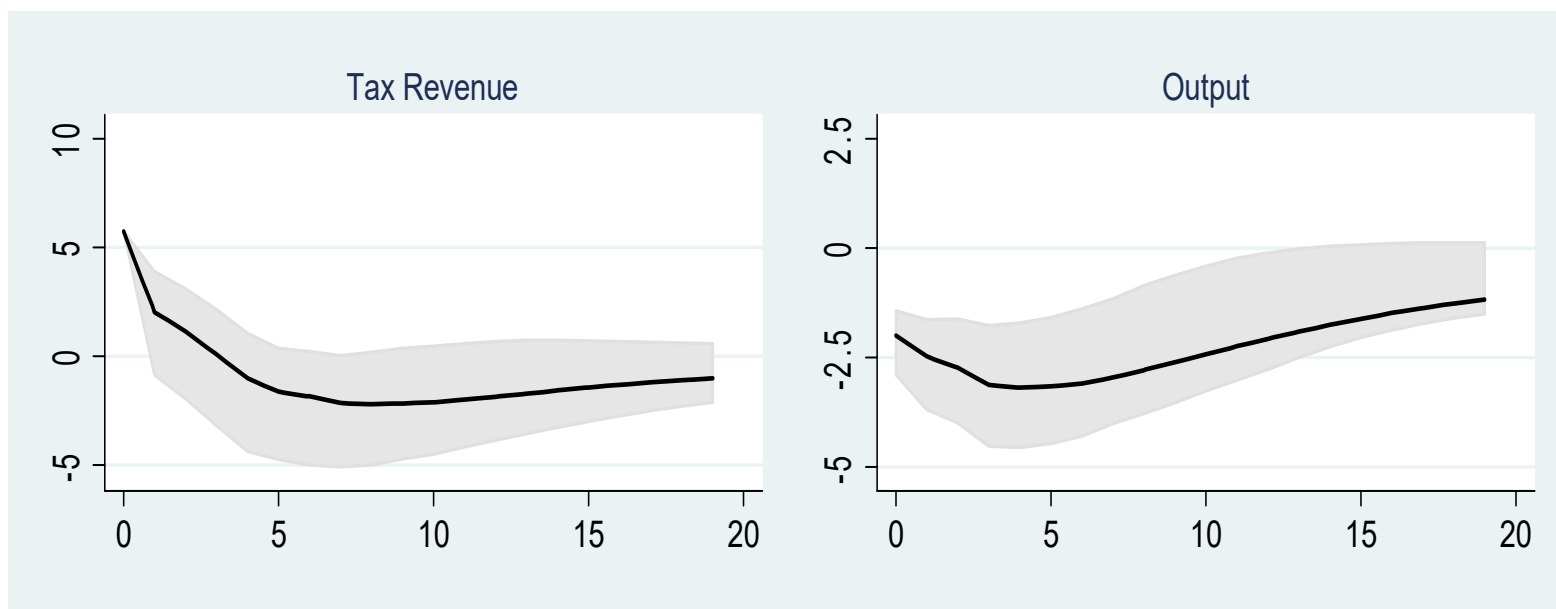
  Deals directly with issue of fiscal foresight.

- Reconciles Blanchard-Perotti and Romer Methods

  Develop proxy SVARs to do so.

- Distinguish between changes in personal income taxes and corporate income taxes

Effect of Unanticipated Romer Tax Shock, Trivariate VAR, 1950q1 – 2006q4

Mertens-Ravn Proxy SVAR
(90% confidence intervals)

They confirm Romer-Romer's large negative multipliers: around -2.5 to -3.0.

BP had preset the elasticity of tax to GDP at 2.08. MR estimate it to 3.13.
This makes a big difference for the estimation multiplier.

Econometric problems caused by fiscal foresight.

FISCAL FORESIGHT AND INFORMATION FLOWS

BY ERIC M. LEEPER, TODD B. WALKER, AND SHU-CHUN SUSAN YANG[1]

News—or foresight—about future economic fundamentals can create rational expectations equilibria with non-fundamental representations that pose substantial challenges to econometric efforts to recover the structural shocks to which economic agents react. Using tax policies as a leading example of foresight, simple theory makes transparent the economic behavior and information structures that generate non-fundamental equilibria. Econometric analyses that fail to model foresight will obtain biased estimates of output multipliers for taxes; biases are quantitatively important when two canonical theoretical models are taken as data generating processes. Both the nature of equilibria and the inferences about the effects of anticipated tax changes hinge critically on hypothesized information flows. Different methods for extracting or hypothesizing the information flows are discussed and shown to be alternative techniques for resolving a non-uniqueness problem endemic to moving average representations.

KEYWORDS: News, anticipated taxes, non-fundamental representation, identified VARs.

Tax news

- Do agents really have foresight?

http://lorenzkueng.droppages.com/

Tax news

- One of the best ways to deal with foresight is to try to measure the news and incorporate it.

- Three main methods:

  - Romer-Romer tax shocks with more than 90 days between legislation and implementation (Mertens-Ravn)

  - Spreads between federal and municipal bonds

    Leeper, Richter, Walker (2011), Kueng (2016)

 - DSGE models (Schmidt-Grohe and Uribe (2012), Miyamoto-Nguyen (2015) do this for other types of news)

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Mertens-Ravn AEJ: Econ Policy.
(Left is unanticipated tax decrease, right is anticipated tax decrease
implemented at quarter 0.)
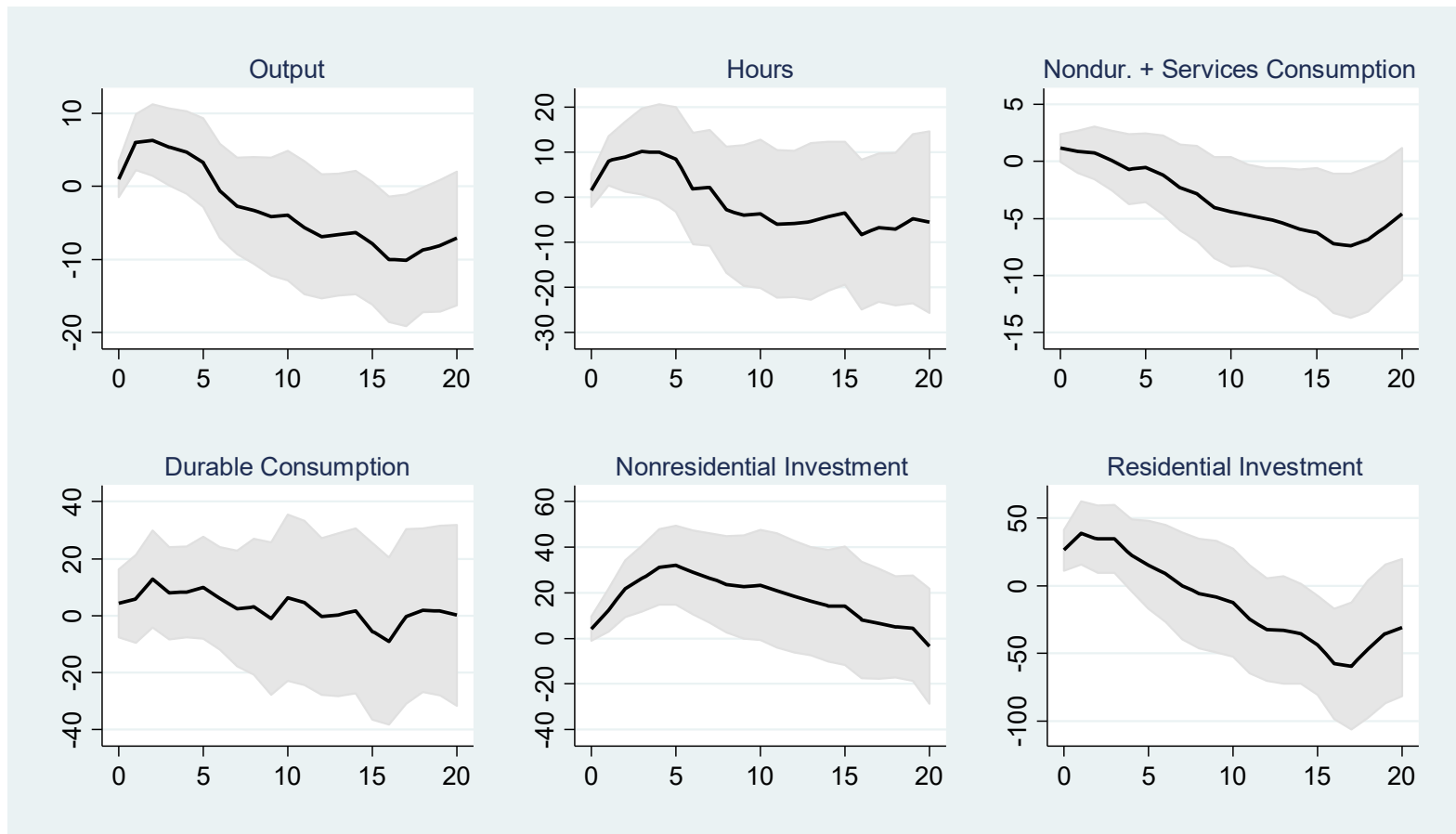
Investment / Investment / Hours / Hours
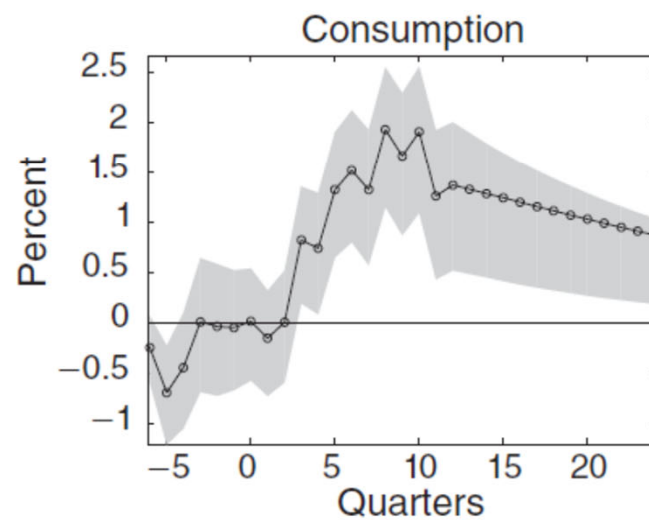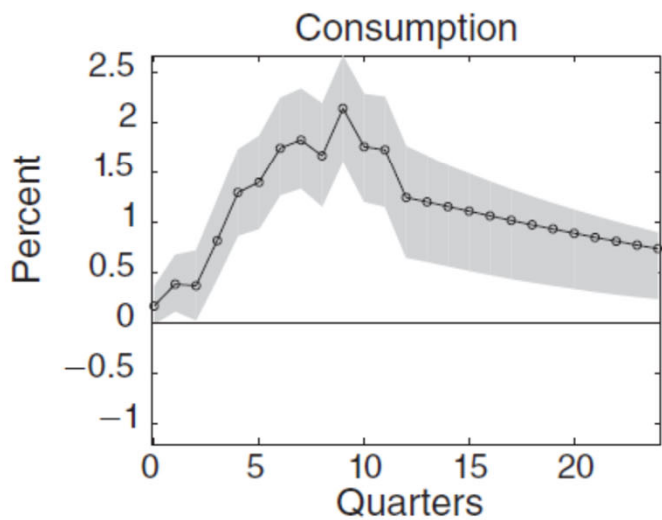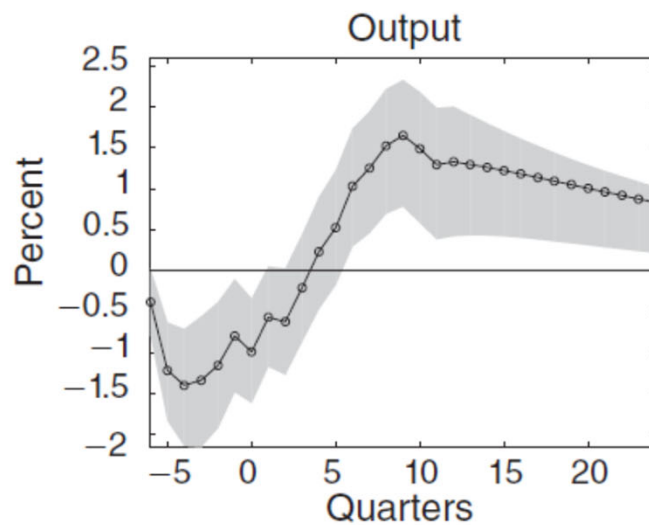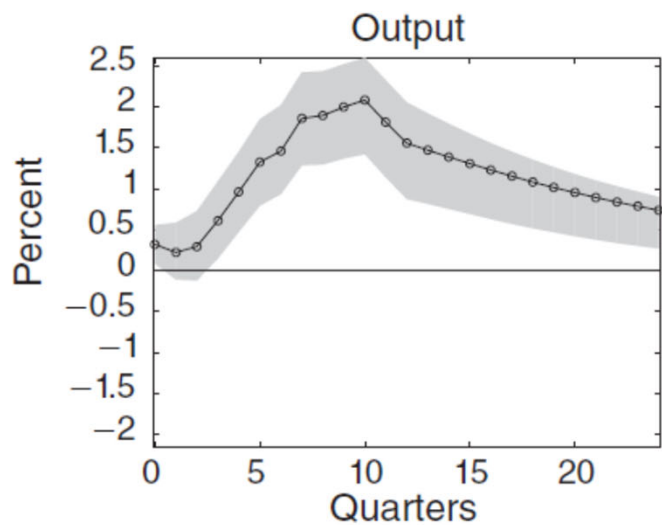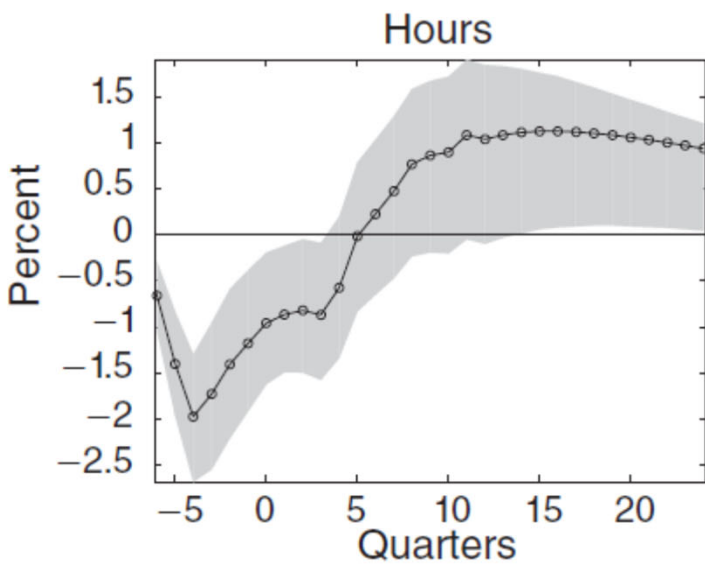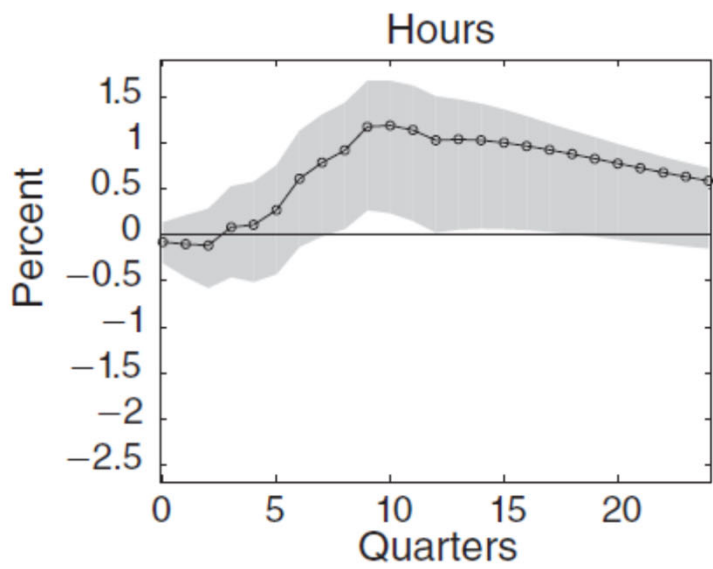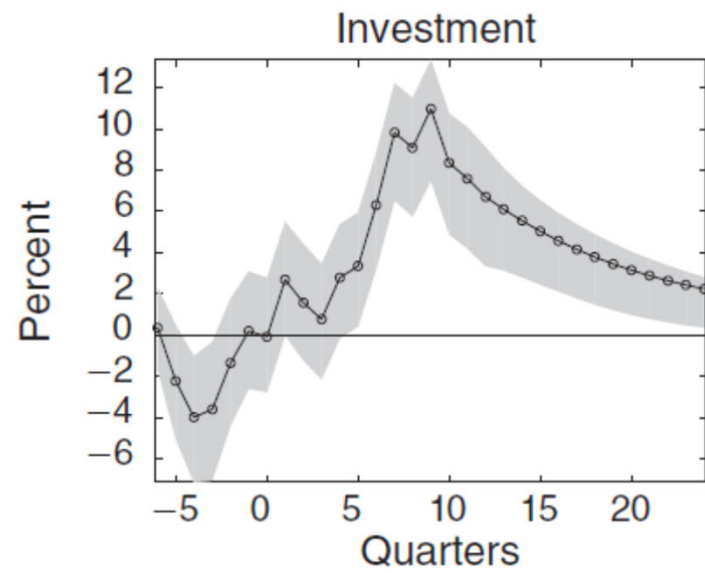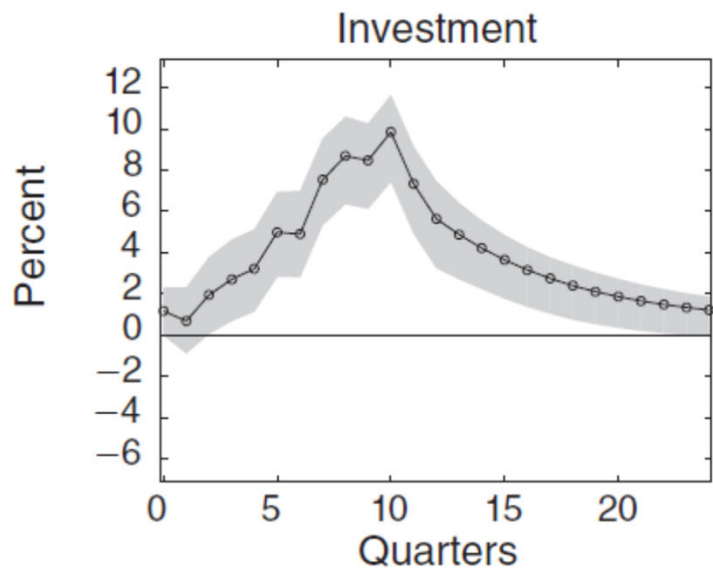
Effect of Anticipated Romer Tax Increase, Mertens-Ravn (2011) Estimates
1950q1 – 2006q4   (90% confidence intervals)
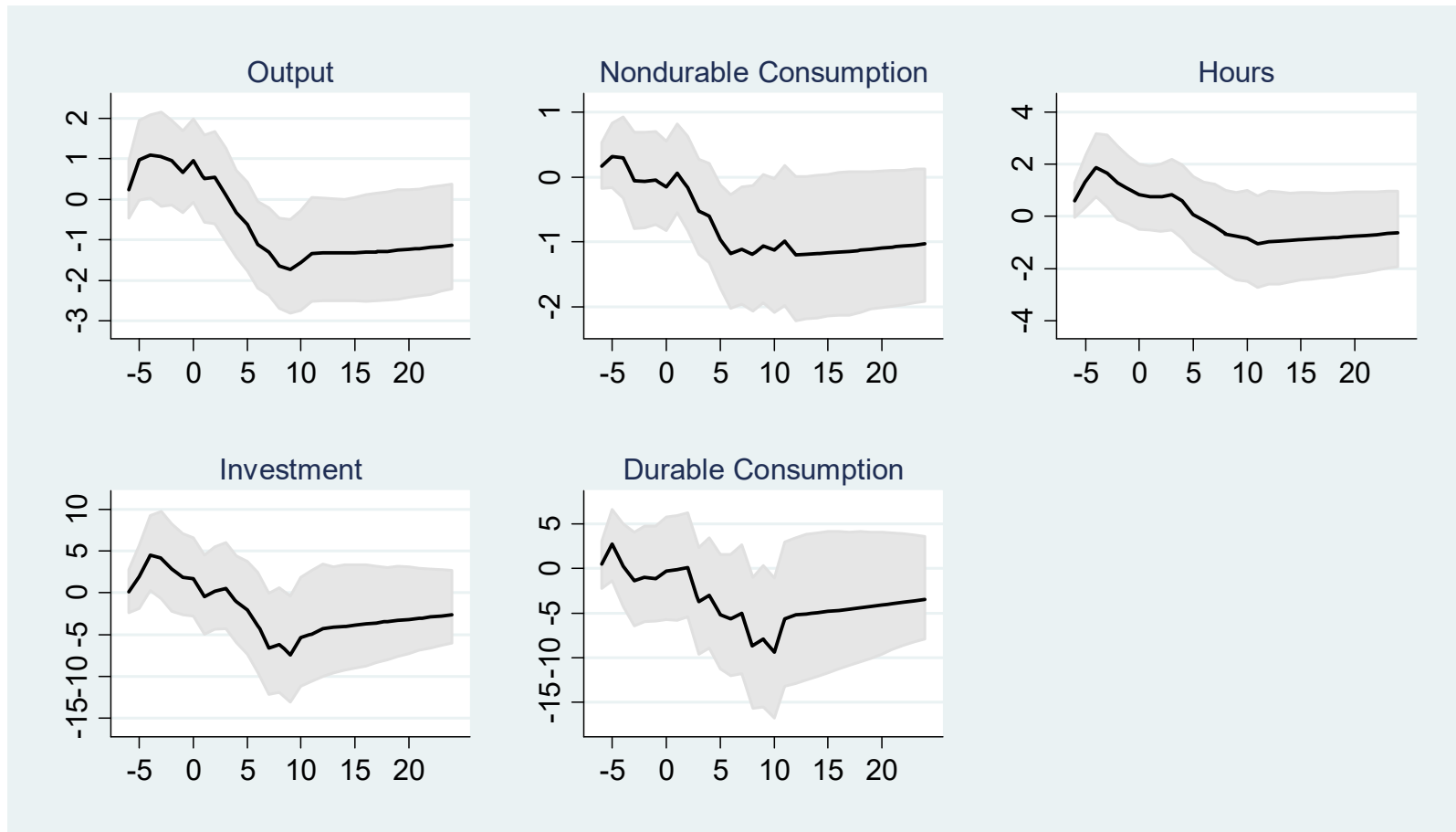
Effect of News of Future Tax Increase, Leeper, Richter, Walker (2011) Measure

Jorda local projection

Summary of Tax Results

- Results using Romer-Romer tax shocks are fairly robust.

    There are potential issues with instrument relevance, though.

- Fiscal foresight for taxes is theoretically and empirically important.

- Strong, robust effects of anticipated tax changes.