

“Estimating the Effects of Fiscal Policy in OECD  
Countries”

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## Introduction

This is a thoughtful, carefully implemented study of the effects of fiscal shocks, as estimated from structural VARs. The paper extends the method used by Blanchard and Perotti in their QJE paper by adding variables and applying it to several countries. The paper gives an encyclopedic account of the effects of estimated spending and net tax shocks. With five countries, three time periods, and two types of shocks, we are presented with 30 sets of results for each outcome variable.

The key to the paper is the identification. Perotti decomposes fiscal error terms into three possible sources: *automatic*, *systematic discretionary*, and *random discretionary changes*. *Automatic changes* are those that arise from the structure of the tax and transfer system or automatic government spending. These are clearly endogenous. Perotti purges the error terms of these types of effects by using fiscal spending and taxation elasticities derived from other sources. *Systematic discretionary changes* are changes in fiscal spending that require additional authorization, such as extending the weeks of unemployment insurance. These types of shocks are also endogenous. Perotti purges the residuals of these types of shocks by assuming that discretionary fiscal policy can only be undertaken with a one-quarter lag. What is left is presumably *random discretionary changes*.

Perotti goes to great effort to make sure his shocks are immune to various possible critiques. For example, he delves deeply into how spending shows up in the national income accounts, how shocks can happen within budgetary cycles, etc. He shows some evidence that his shocks are not predictable by certain OECD forecasts.

Nevertheless, I am concerned that the structural VARs are incapable of getting the timing correct. In particular, I think that most shocks identified by structural VARs are actually anticipated. Moreover, this timing lag can explain why the results from this method can differ from those of other methods. To demonstrate this, I will compare the methodology and results from my previous work (Ramey-Shapiro (Carnegie-Rochester (1998))) to those of a structural VAR. I will then present a simple theoretical model that explains how differences in timing can lead to the different effects.

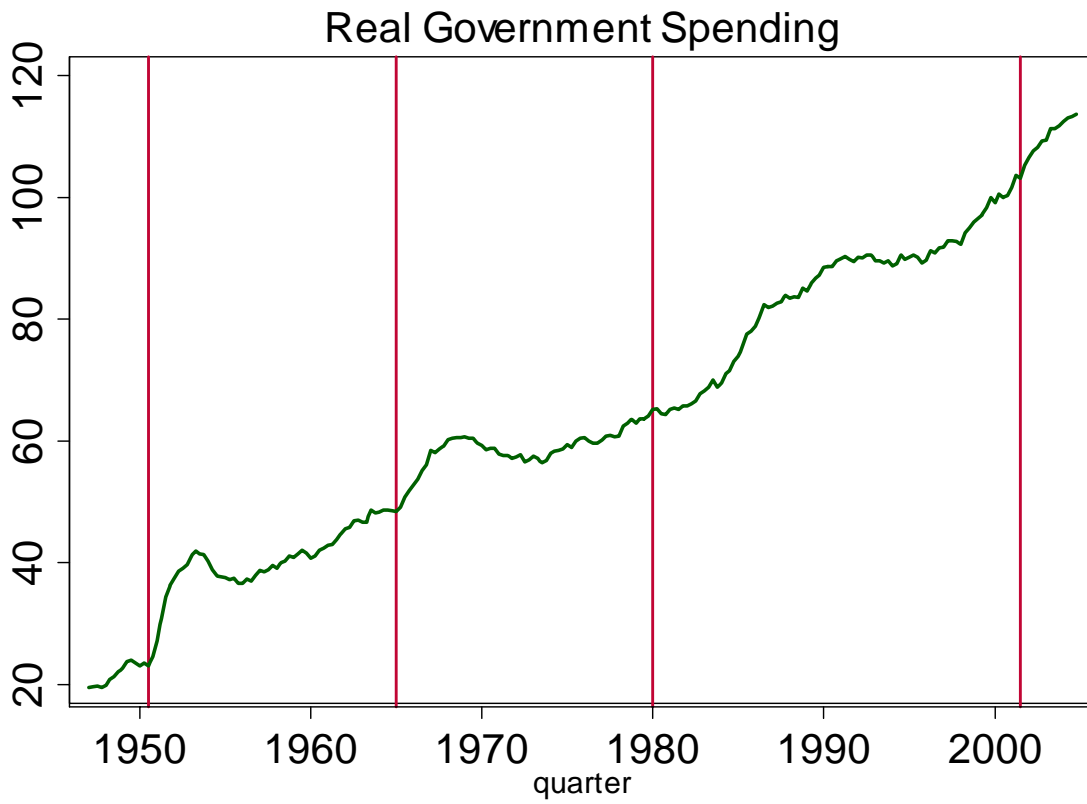
## VAR Methods vs. Ramey-Shapiro Narrative Approach

### Effect of Increase in Government Spending USA

	<b>Perotti</b>	<b>Ramey-Shapiro</b>
Response of Gov't Spending	Initial burst, followed by slow decline	Hump-shaped increase
Government spending multiplier – 1 year	0.36 – 1.29	0.61 (Eichenbaum-Fisher)
Response of Consumption	Increase	Decrease
Response of Investment	Decrease	Increase



The red lines are the Ramey-Shapiro military dates. These dates were chosen by reading *Business Week*. To be classified as a date, a major political event had to change *Business Week's* forecast of defense spending from a declining or stable path to a dramatic increase. The four events shown are the North Korean invasion of South Korea (end of June 1950), the attack on the military barracks in Vietnam (February 1965), the Soviet Invasion of Afghanistan (end of December 1979), and 9/11. 9/11 was not one of the original Ramey-Shapiro dates.



Total government spending also increased after the military dates.

1. **Korean War.** On June 25, 1950 the North Korean army launched a surprise invasion of South Korea, and on June 30, 1950 the U.S. Joint Chiefs of Staff unilaterally directed General MacArthur to commit ground, air, and naval forces. The question then arises as to expectations about the impact of this event on future military expenditures. Readings of *Business Week* give an indication of forecasts of the buildup from the standpoint of businesses. All of the articles clearly implied that the hostilities would lead to a large increase in military spending. Furthermore, *Business Week* noted several times (e.g., July 1, 1950, page 9) that the U.S. was "no longer in peacetime," even if the Communists backed down in Korea. It was generally believed that the U.S. had to build up its military to be ready for any other Communist incursions around the world.

In the first half of 1950, defense spending was only 6.5 percent of GDP. After hostilities broke out, spending increased steadily and hit peaks of 15 percent of GDP in 1952 and 1953. After the signing of the armistice agreement in July 1953, military spending decreased somewhat but was still 14 percent of GDP in the first quarter of 1954 and 11 percent two years later in 1956. Thus, defense spending stayed much higher than it had been before the Korean War.

2. **The Vietnam War.** It is more difficult to isolate a date for the hostilities leading to the Vietnam War buildup. A military coup overthrew Diem on Nov. 1, 1963, but the United States was still talking about defense cuts for the next year (*Business Week*, Nov. 2, 1963, p. 38;

July 11, 1964, p. 86). The Gulf of Tonkin incident occurred on August 2, 1964, but there was little indication that it would lead to an increase in defense spending. After the February 7, 1965 attack on the U.S. Army barracks, though, *Business Week* began forecasting the anticipated increases in defense spending (March 6, 1965, p. 41, and April 3, 1965, p. 29). Thus, we take the February attack on the army barracks as the key hostility.

Immediately before the shock, defense spending accounted for 8.9 percent of GDP. This fraction fell slightly for several quarters after the shock and then rose until it hit 10 percent in the third quarter of 1967. It was still 10 percent in the third quarter of 1968, but then fell to 9 percent by the first quarter of 1970.

3. **The Carter-Reagan buildup.** The Soviet invasion of Afghanistan on December 24, 1979 seems to have led to a very sudden change in the U.S. policy. The United States was particularly worried about this event because of possible future actions against Persian Gulf oil states. The January 21, 1980 *Business Week* (p. 78) article entitled "A New Cold War Economy" discussed the dramatic suddenness of the change in the outlook for the United States and the expected step-up in defense spending. The article indicated the expectation of a prolonged increase in defense spending.

When the Soviets invaded Afghanistan, defense spending was under 6 percent of GDP. It rose until it hit a peak (relative to GDP) of 7.7 percent in the third quarter of 1986. By the first quarter of 1997, defense spending was down to 4.3 percent of GDP.

## Granger Causality Tests

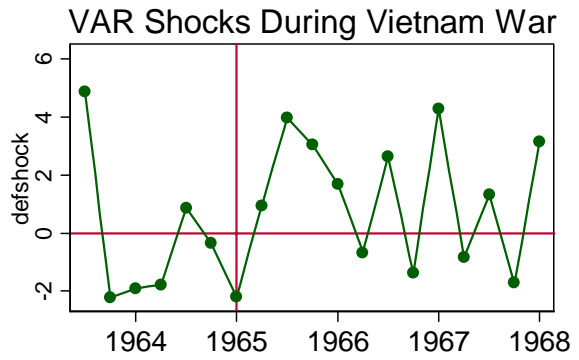
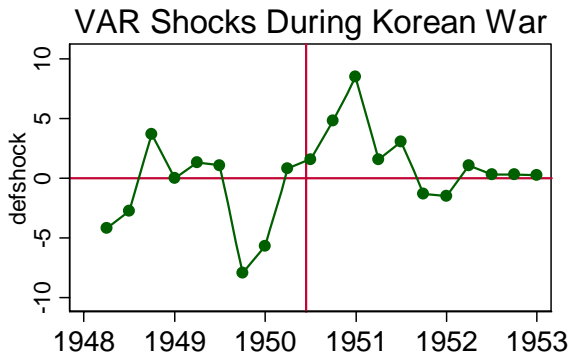
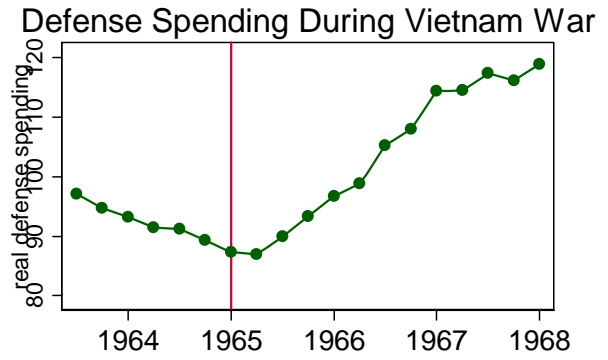
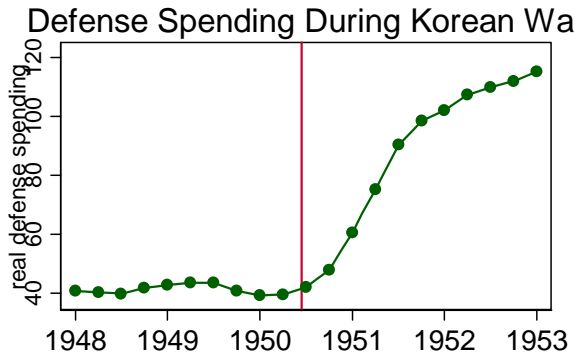
2 measures of shocks

1. Residuals from regression of log real defense spending on 4 lags of:
  - Log real government spending
  - Log real GDP
  - 10 year treasury bond interest rate
  - Inflation rate
2. Ramey-Shapiro military dates with 9/11 added.

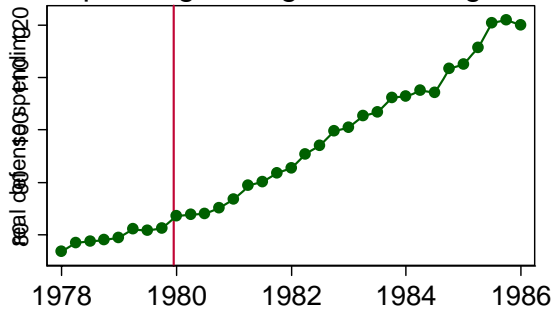
### P-Values for Tests

Do Ramey-Shapiro dates Granger-cause VAR shocks?	0.026
Do VAR shocks Granger-cause Ramey-Shapiro dates?	0.174

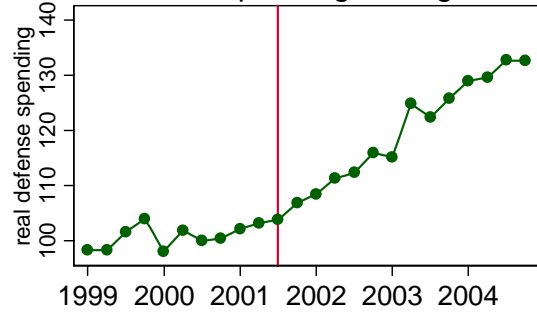
Note how the VAR shocks occur several periods after the Ramey-Shapiro dates.



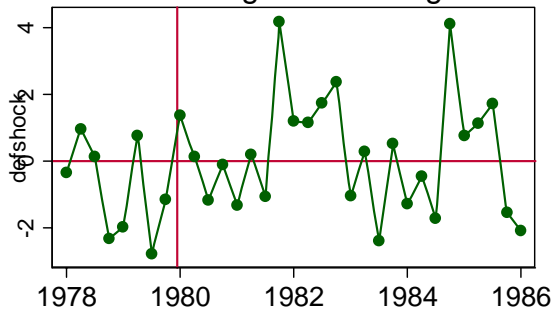
Defense Spending During Carter-Reagan Bu



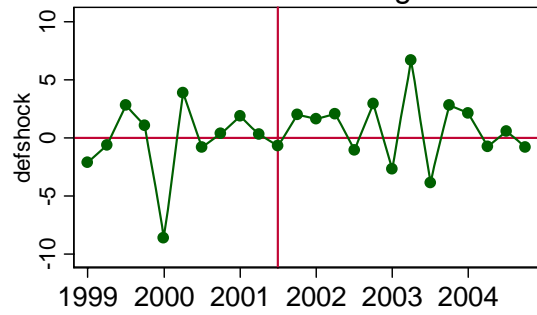
Defense Spending During 9/11



VAR Shocks During Carter-Reagan Build



VAR Shocks During 9/11



A simple model shows how getting the dates wrong can lead to faulty inferences. I will use a very simple model with government spending and lump-sum taxation. I will then simulate the path of spending similar to the Korean War. The key is that the new spending path is announced one quarter before it happens, similar to what we saw in the data.

## Model

$$Y_t = N_t^{0.67} K_t^{0.33}$$

$$U = \log(C_t) + \log(500 - N_t)$$

$$Y_t = C_t + I_t + G_t$$

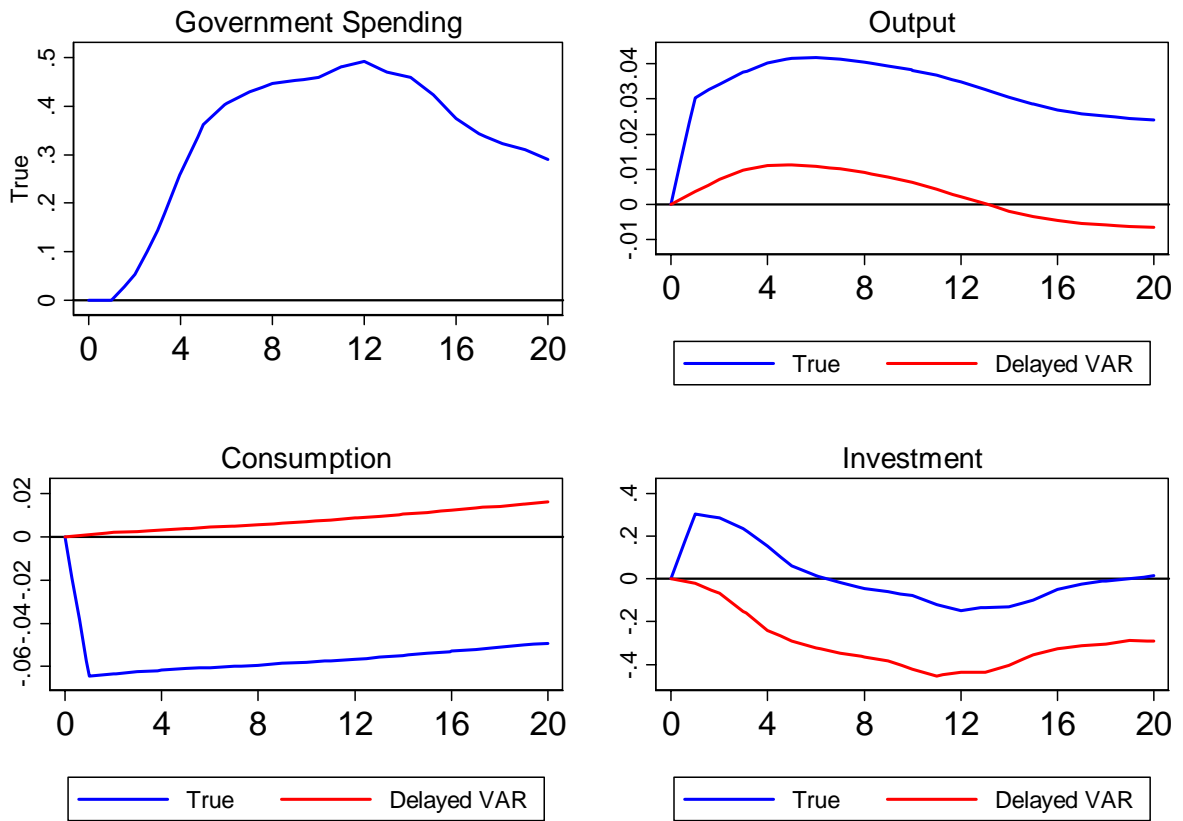
$$K_{t+1} = I_t + (1 - 0.025)K_t$$

$$\beta = 0.984$$

Simulate effect of a Korean War size build-up

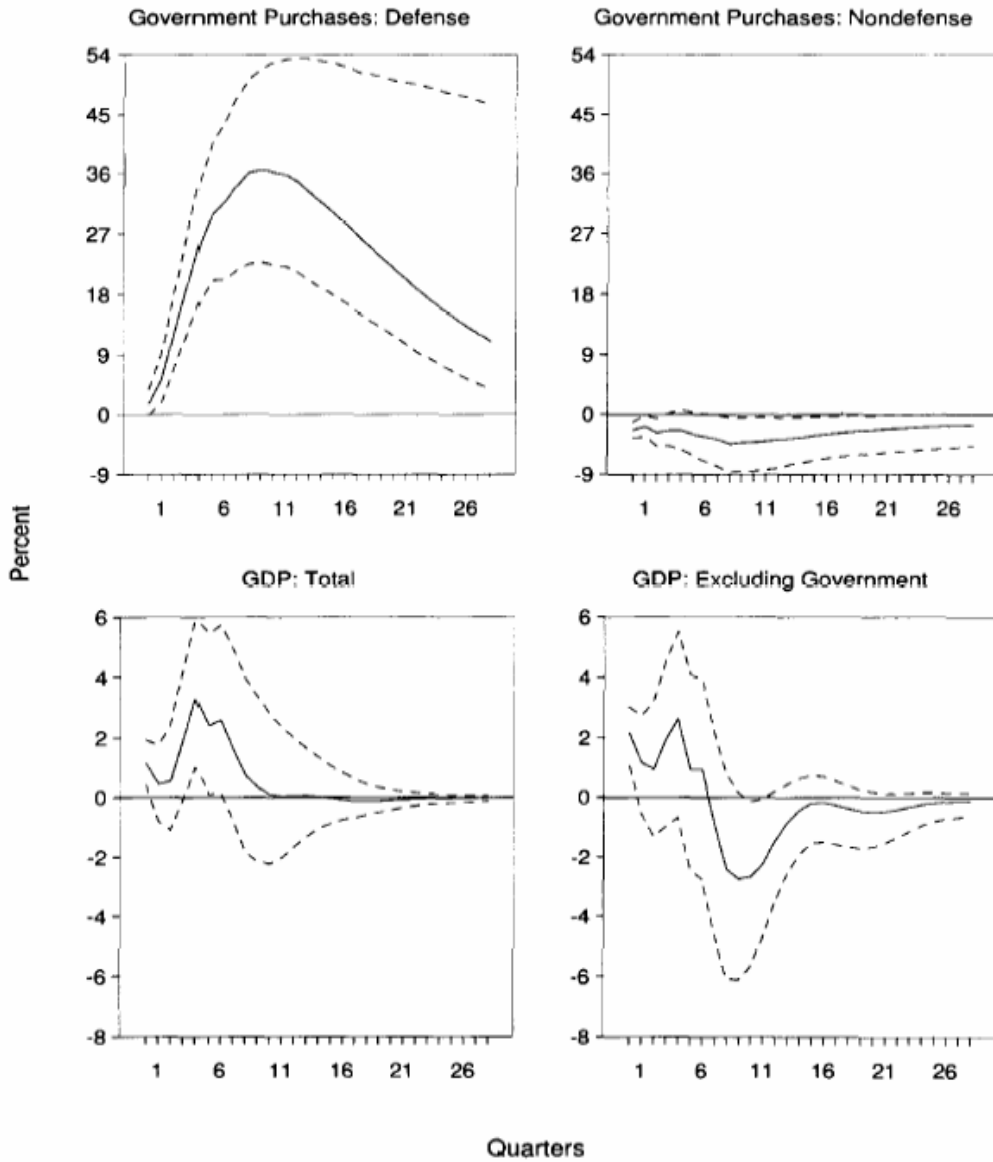
The increase in government spending is announced in quarter 1, but does not start until quarter 2. The red line shows the effect of dating the shock as occurring in quarter 2 rather than quarter 1.

## Model Simulation



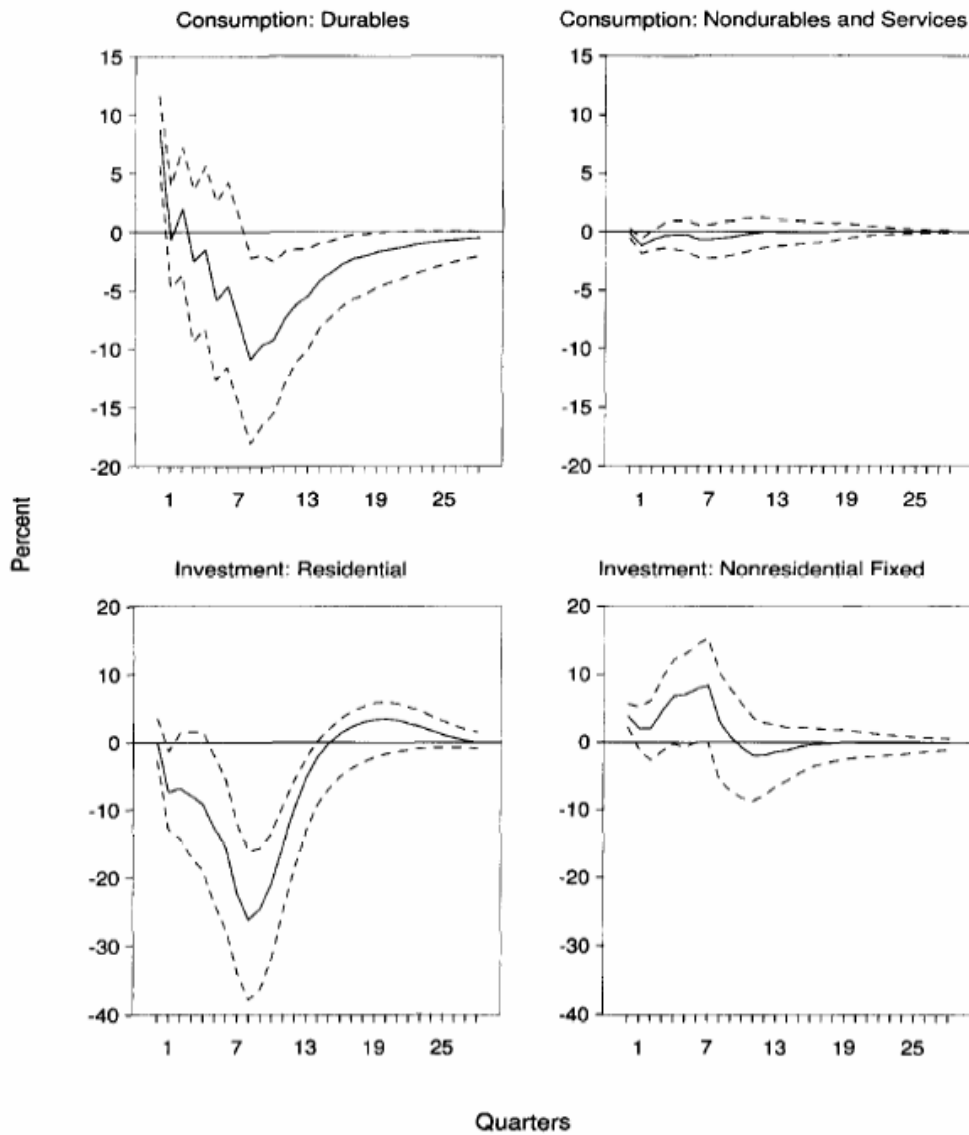
The following are some of the estimated impulse response functions from the Ramey-Shapiro paper, using the military dates. Note that although output increases, consumption variables fall while nonresidential investment rises. Note also that real wages fall after a military date.

Figure 6A. Estimated Response to a Military Buildup



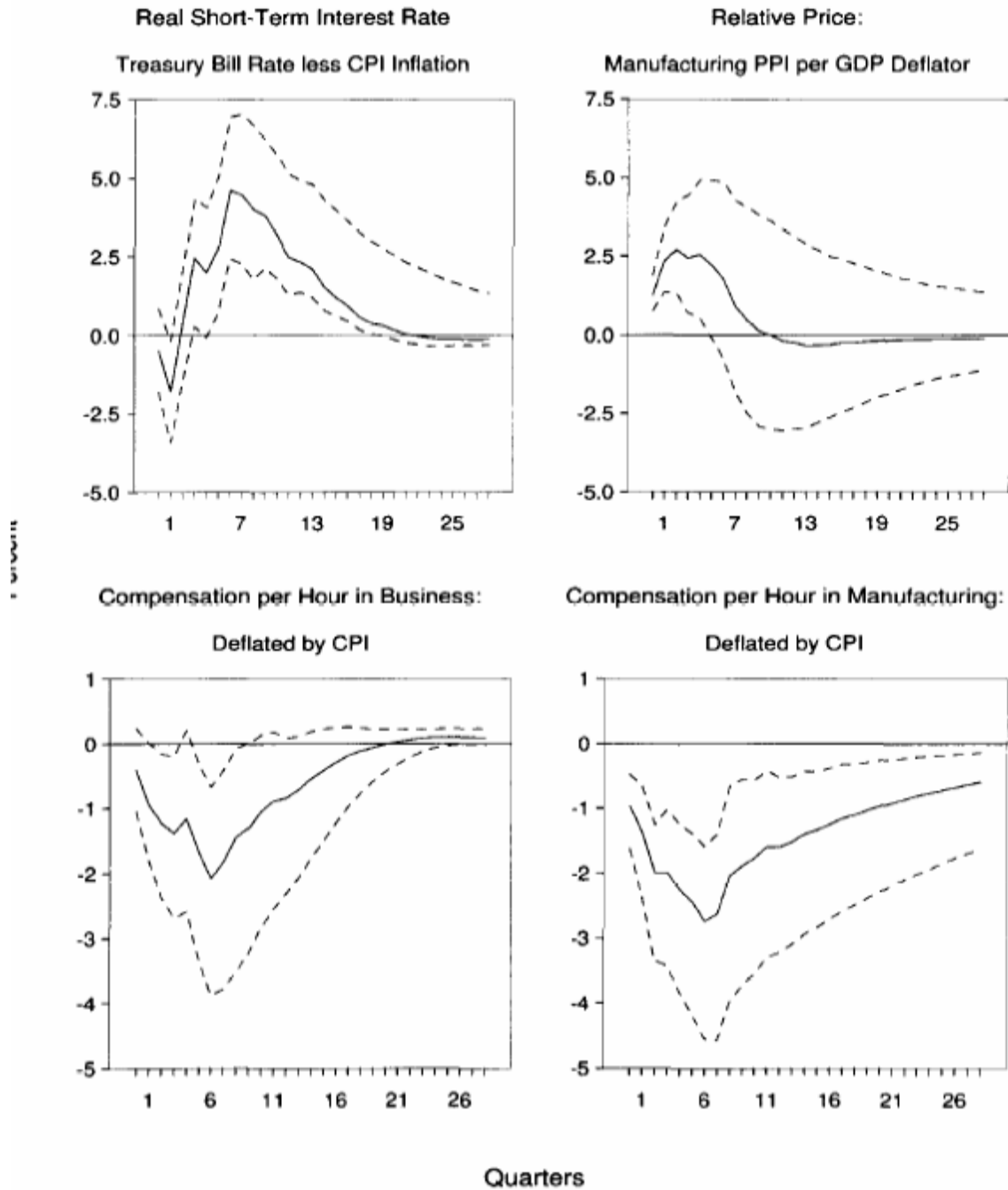
Note: Solid lines are the estimated impulse response to a dummy variable that is equal to one with the onset of a military buildup. Dashed lines are the 10 and 90 percent bootstrap-within-bootstrap confidence bands. See text for details of the estimation procedure.

Figure 6B. Estimated Response to a Military Buildup



Note: Solid lines are the estimated impulse response to a dummy variable that is equal to one with the onset of a military buildup. Dashed lines are the 10 and 90 percent bootstrap-within-bootstrap confidence bands. See text for details of the estimation procedure.

Figure 6D. Estimated Response to a Military Buildup



Note: Solid lines are the estimated impulse response to a dummy variable that is equal to one with the onset of a military buildup. Dashed lines are the 10 and 90 percent bootstrap-within-bootstrap confidence bands. See text for details of the estimation procedure.

## **Other Important Anticipated Government Spending Build-Ups**

### **- Highway program**

1955 – Congress rejects Administration's 10 year road building plan.

Early 1956 – “Fight over highway building will be drawn out.”

Business Week, May 5, 1956: Highway construction bill now seems a sure bet since the House passed its version. Passed in June 1956.

Multi-billion dollar, 13 year construction period.

### **- Schools for the Baby Boom**

Demand for new schools is known 6 years in advance.

Primary & secondary school expenditures as a % of nondefense government spending:

21% in 1950

29% in 1965

## Conclusion

No matter how careful and meticulous one is (as Perotti is), it is difficult for VARs to get the timing right for fiscal policy because so many programs are announced far in advance of the actual spending and taxation.