ECON 442

Fiscal Stimulus – Some Evidence

Winter 2015

Introduction

One can distinguish different approaches to estimate fiscal multipliers:

- ▶ counterfactuals in model economies
- ▶ aggregate data – time series
- ▶ "controlled" experiments
- ▶ micro-econometric studies

Can we correctly identify the effectiveness of fiscal stimulus?

Does it matter in what state (recession/expansion) the economy is?

Is the type of stimulus important for its effectiveness?

What is a multiplier?

We define a multiplier by

$$\frac{\Delta Y}{\Delta Z}$$

How much does output change over time (ΔY) in response to a change in a policy variable (ΔZ)?

Variables are usually direct government spending or tax rebates/cuts.

The financing of such measures might matter too.

Example: Federal gov't makes a transfer to a state, but reduces its own spending to finance it.

A first try ...

Consider the following regression specification:

$$
\begin{aligned}
y_t &= \delta_y + \beta g_t + \gamma x_t + \epsilon_{yt} \\
g_t &= \delta_g + \alpha y_t + \epsilon_{gt}
\end{aligned}
$$

where

- ▶ y_t is output growth

- ▶ g_t is gov't expenditure

- ▶ x_t are some controls

Note that α measures the reaction of gov't expenditures on revenues, while β measures the effectiveness of fiscal stimulus.

Question: Can we estimate β and interpret it correctly?

We make no assumptions on the disturbances ϵ_{it}.

Solving the model, we obtain

$$
\begin{aligned}
y_t &= \tilde{\delta}_y + \frac{\gamma}{1 - \beta\alpha} x_t + \tilde{\epsilon}_{1t} \\
g_t &= \tilde{\delta}_g + \alpha \frac{\gamma}{1 - \beta\alpha} x_t + \tilde{\epsilon}_{2t}
\end{aligned}
$$

This allows us to estimate α by comparing the two slopes of the regressions.

But we cannot measure/estimate β at all!

Why? Any correlation between y and g could just come from correlations of the exogenous shocks.

More problematic is that a positive relationship is consistent with (i) $\beta = 0$ and $\alpha > 0$ or (ii) $\beta > 0$, $\alpha < 0$ and a large enough stimulus shock ϵ_{gt}.

... is a failure.

Economist A uses model A given by $y = \beta g + \epsilon$ where $\beta = 1.5$.

Economist B uses model B given by $y = \epsilon$.

One observes $y = -1$ and stimulus $g = 2$.

Economist A says: "Woooh. The shock has been really big! Without stimulus output would have been much smaller."

Economist B says: "Rubbish. The shock was not that bad.

Question: What can be done to **identify** the size of a multiplier?

Macro Data

Use an exogenous shock to gov't expenditure.

Prime example – military expenditures.

- ▶ not correlated with economic shocks
- ▶ but few observations
- ▶ only covers direct gov't expenditures

Size of the multiplier can be reasonably expected to be in the range of $0.5 - 2.0$ (see for example the survey by Ramey (JEL, 2011)).

Problem: cannot easily take into account other considerations like the current state of the economy.

Problem: tends to estimate a "marginal" multiplier and not the average one.

"Controlled" Experiment

A good example is the *American Recovery and Reinvestment Act* (ARRA) program in 2009.

US federal gov't spending increase was small, but transfers from the US federal government to state and local authorities were large.

Estimates show that most the transfers are used to reduce debt rather than increase spending. Hence, the multipliers are small.

Alternatively, one can look at differences in transfers across different states:

▶ Suppose state A receives \$1 more than other states. How does its output change?

A key issue is whether these effects are (partially) undone in the aggregate.

Micro-econometric evidence

The idea is to look at changes in consumption by individuals that receive tax rebates.

The US rebates of 2001 and 2009 are great, because the timing for individuals to receive rebates was random.

This helps to establish a causal effect on how spending changed when people received their rebates.

Johnson, Parker and Souleles (2011) show that about 25% - 35% of the rebates are spent on consumer durables.

There are variations across different households, where low income and low net worth households tend to spend a larger fraction.

One can take into account here that households spending behaves different across different states of the economy (recession vs. expansion).