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Daily monetary policy shocks and new home sales ☆

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ABSTRACT

The conventional notion of a monetary policy shock as a surprise change in the fed funds rate is misspecified. The primary news for market participants is not what the Fed just did, but is instead new information about the Fed's future intentions. Revisions in these anticipations show up instantaneously in long-term mortgage rates. Home sales do not respond until much later. This paper attributes this delay—and hence much of the hump-shaped response of economic activity to monetary policy—to cross-sectional heterogeneity in search times. This framework allows one in principle to measure policy impacts at the daily frequency.

1. Introduction

How can the effects of monetary policy on the economy be measured? One popular approach (e.g., Christiano et al., 1999) is based on a structural VAR. Let $\mathbf{y}_m$ denote a vector of variables observed for month m of which the average fed funds rate over the month, r_m, is one element. Consider a linear forecast of $\mathbf{y}_{m+s}$ based on lagged values of $\mathbf{y}$ (denoted Ω_{m-1}) and some subset of the current values of $\mathbf{y}$ (denoted Λ_m). How would news about the value of r_m, denoted u_m, cause the forecast to change? The standard impulse-response function is simply a graph of the answer to this question[1]:

$$\frac{\partial \hat{\mathrm{E}}(\mathbf{y}_{m+s}|u_m, \Lambda_m, \Omega_{m-1})}{\partial u_m}. \tag{1}$$

Much of the discussion in the literature concerns which elements of $\mathbf{y}_m$ to include in the contemporaneous information set Λ_m. However, this choice often proves of limited consequence. Fig. 1 displays impulse-response functions for a fairly standard VAR including industrial production, the CPI, commodity prices, the fed funds rate, and M2.[2] One sees the same broad hump-shaped response, with an increase in the fed funds rate being followed after a substantial delay by a slowdown in industrial production, regardless of the specification of Λ_m.

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[1] Here $\Omega_{m-1} = \{\mathbf{y}_{m-1}, \mathbf{y}_{m-2}, \ldots\}$ and $u_m = r_m - \hat{\mathrm{E}}(r_m|\Lambda_m, \Omega_{m-1})$. See for example Hamilton (1994, eqs. [11.4.19] and [11.6.16]).

[2] The commodity price index is the Reuters/CRB index from http://www.crbtrader.com/crbindex/. All other series were obtained from the St. Louis FRED database. The first four series were converted to 100 times the year-over-year logarithmic change. The sample period is 1961:01–2008:03, and 12 lags were used.

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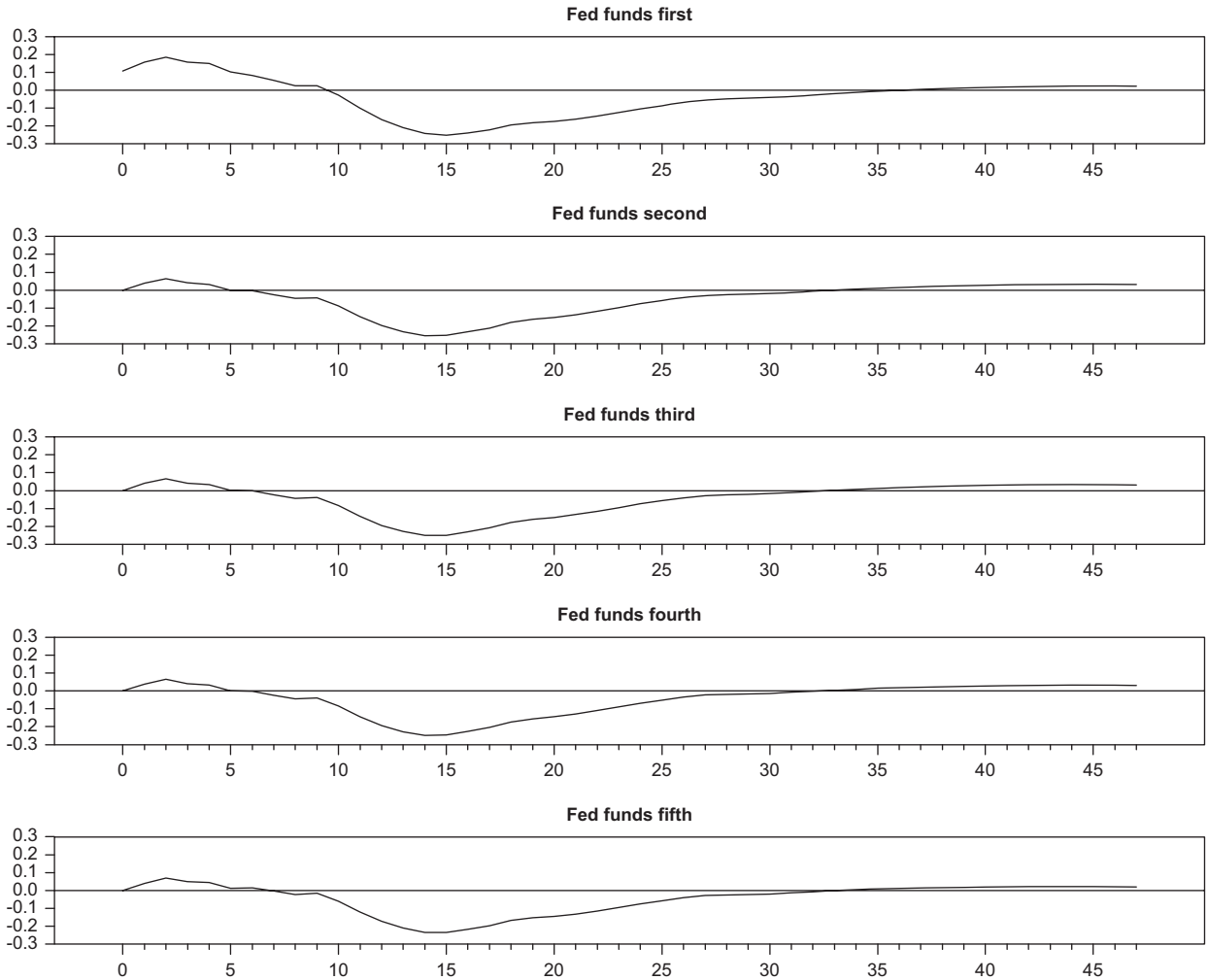

Fig. 1. Response of industrial production (in percentage annual growth rate) to 25-basis-point increase in fed funds rate for different Cholesky orderings.

Although the choice of Λ_m makes little difference for the answer to this forecasting question, the specification of the lagged information set Ω_{m-1} is quite significant, as stressed by Rudebusch (1998) and Brissimis and Magginas (2006). The top panel of Fig. 2 plots the errors u_m associated with a monthly VAR (in which the fed funds rate is ordered last) between 2003:01 and 2006:06. The second panel plots the difference between r_m and the forecast implied by the 1-month fed funds futures contract on the last day of month $m-1$. Over this period, changes in the fed funds rate that would be characterized by the VAR as monetary policy shocks were in fact almost perfectly anticipated by market participants.

This is not to say that there were no surprises in monetary policy over this period. However, any surprises were not about what the Fed just did, but instead reflected new information about what the Fed was going to do in the future. The bottom panel plots revisions during each month in the anticipation of what the fed funds rate was going to be 2 months after the indicated month. For example, what the VAR classifies as a surprisingly high fed funds rate in July 2004 actually showed up as news to markets in a much more modest adjustment in the July fed funds contract price between April 30 and May 31. This paper presents evidence that, for purposes of determining long-term mortgage rates or new home sales, only unanticipated monetary policy changes matter, that is, it is the bottom panels rather than the top panel inFig. 2 that will affect the economy.

Before proposing an alternative to the forecasting question posed by (1), let me clarify what it is that I believe we are trying to estimate. The primary input the Fed needs from empirical researchers is an answer to questions like the following:

> We're trying to decide between a funds rate of 5 or 5.25. How would the predicted path for $\mathbf{y}_{m+s}$ be different under the two choices?

This question is potentially related to the impulse-response function in (1), in that both represent questions about a conditional forecast. However, interpreting an object like (1) as telling us the answer to the policy question of interest faces