

A factor-augmented vector autoregressive (FAVAR) approach for monetary policy: Replication of the empirical results in “measuring the effects of monetary policy”

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1 | INTRODUCTION

In recent paper, Bernanke, Boivin, and Elias's (2005) study presented a model of how the monetary policy rate affects the large subset of variables that the researcher and policymaker care about. Several criticisms of the vector autoregression (VAR) approach, which was developed by the considerable literature of Bernanke and Blinder (1992) and Sims (1992), to monetary policy identification center around the relatively small amount of information used by low-dimensional VARs. In that case, factor-augmented vector autoregression (FAVAR) methodology leads to broadly plausible estimates for the responses of a wide variety of macroeconomic variables to monetary policy shocks. Bernanke et al. also provided empirical support for this model based on an analysis of the federal fund rate and other macroeconomic indicators of the US economy between the early 1950s and late 2001. This paper replicates the main empirical findings of Bernanke et al.

2 | EMPIRICAL RESULTS

Bernanke et al. (2005) estimated the effects of the federal fund rate on a large subset of variables using two different methodologies. The first was a two-step principal components approach, which provided a nonparametric way of uncovering the common space spanned by the factors. The second was a single-step Bayesian likelihood approach (Gibbs sampling), which differed in various dimensions. In their paper, all series were directly taken from DRI/McGraw Hill Basic Economics Data and results were estimated using MATLAB software.

We replicate the results of Bernanke et al. (2005) using the same specification (number of factors) and the same methodological approaches, but we estimate and compare the results delivered by a different data source and software package. To verify the results of Bernanke et al., first we use the Federal Reserve Economic Data (FRED) database to take all series.¹ Second, the coauthor of this replication paper, Davaajargal Luvsannyam, created a FAVAR add-in² and BFAVAR add-in of EViews software and used those two add-ins to estimate the main findings. Figure 1 shows, for the core results of Bernanke et al. (2005), impulse responses that are estimated with three factors and Federal Fund rate (FFR) by a two-step principal component approach. The replicated results are very similar to those presented in the original article by Bernanke et al., covering the period from January 1959 to August 2001. Sample size for the data is 512, with a monthly frequency. Therefore, results from the combination of FRED database and EViews Add-ins confirm the published results from the combination of DRI database and MATLAB of Bernanke et al.

¹See the Supporting Information Appendix for a data description.

²The add-in package is the EViews program, which provides seamless access to user-defined programs using the standard EViews command, menu, and object interface.

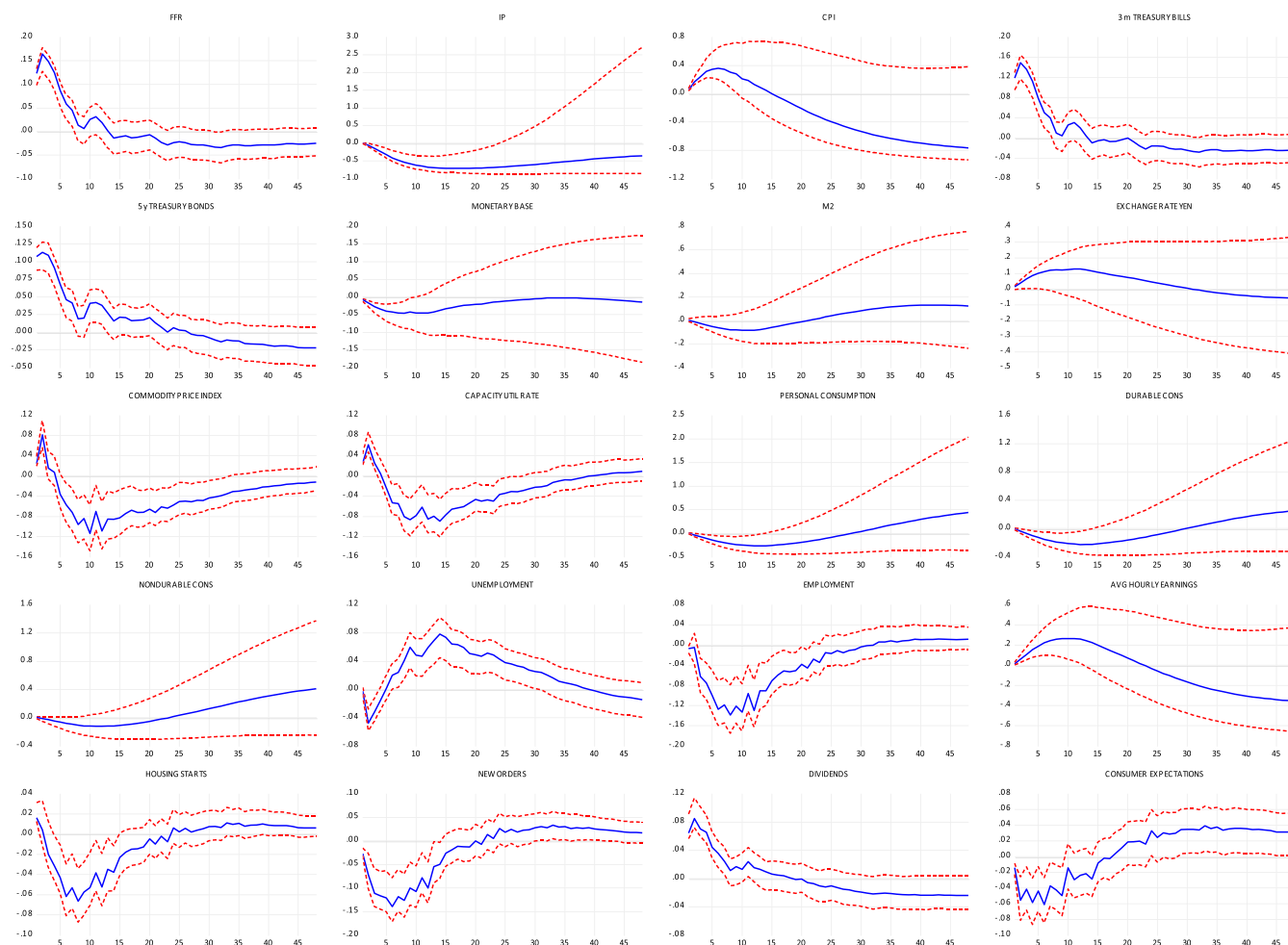


FIGURE 1 Impulse responses generated from FAVAR with three factors and FFR estimated by principal components with two-step bootstrap [Colour figure can be viewed at wileyonlinelibrary.com]

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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