Available online at www.sciencedirect.com
ScienceDirect
Journal of Monetary Economics 53 (2006) 1135–1160
Journal of MONETARY ECONOMICS
www.elsevier.com/locate/jme

Data revisions and the identification of monetary policy shocks ☆

Dean Croushore[a,*], Charles L. Evans[b]

[a]*Robins School of Business, University of Richmond, Economics, 1 Gateway Road, Richmond, VA 23173, USA*
[b]*Federal Reserve Bank of Chicago, Chicago, IL, USA*

Received 13 December 2002; received in revised form 13 April 2005; accepted 10 May 2005
Available online 15 May 2006

Abstract

Monetary policy research using time-series methods has been criticized for using more information than the Federal Reserve had available. To quantify the role of this criticism, we estimate VARs with real-time data while accounting for the latent nature of many economic variables, such as output. Our estimated monetary policy shocks are closely correlated with typically estimated measures. The impulse response functions are broadly similar across estimation methods. Our evidence suggests that the use of revised data in VAR analyses of monetary policy shocks may not be a serious limitation for recursively identified systems, but presents more challenges for simultaneous systems.

JEL classification: E52

Keywords: Real-time data; Monetary policy shocks; VARs; Data revisions; Identification

☆We thank Ryan Hayward, James Sherma, and Judy Yoo for valuable research assistance. We thank Chris Sims for helpful comments on this research, as well as other seminar participants at Princeton University, Michigan State University, the University of Richmond, the Division of Monetary Affairs at the Board of Governors, the Federal Reserve Banks of Chicago and Philadelphia, the Southern Economic Association meetings, the American Economic Association meetings, the 2000 Econometric Society World Congress, and the Federal Reserve System Committee on Macroeconomics. This paper represents the views of the authors and should not be interpreted as reflecting the views of the Federal Reserve Bank of Chicago or the Federal Reserve System.

*Corresponding author. Tel.: +1 804 287 1961; fax: +1 804 289 8878.
E-mail address: dcrousho@richmond.edu (D. Croushore).

0304-3932/$ - see front matter
doi:10.1016/j.jmoneco.2006.02.001

1. Introduction

Empirical research with vector autoregressions (VARs) typically ignores issues associated with data revisions and economic agents' access to only real-time data releases. An example of this is the literature on monetary policy shocks in VARs (for example, Bernanke and Blinder, 1992; Sims, 1992; Christiano et al., 1996, 1999; Sims and Zha, 1996; Bernanke and Mihov, 1998). Each of these studies is based upon some data series that were not known to anyone during the period of the empirical analysis. Specifically, the data used in these studies, as well as virtually all other macroeconomic time-series research, have been revised relative to the data known at that time. Since government agencies and private sources do not provide these data conveniently, these shortcuts are rarely questioned.[1] The real-time data collected by Croushore and Stark (2001), however, allow researchers to explore the empirical robustness of many existing macroeconomic results to this issue. Armed with the original data releases that were known at that time to business analysts, market participants, policymakers, and the rest of the interested universe, the econometrician can answer the question, how much of a difference does this make to empirical analyses of monetary policy shocks?

Addressing this question is complicated by the fact that some data are always revised, and hence the true underlying economic concept is never observed fully. For example, aggregate economic activity in the United States is not directly observable, but data on real *GDP* are reported and revised by the Bureau of Economic Analysis. The monetary policy shock literature has focused on how real *GDP*, for example, is affected by an exogenous shock to monetary policy. This is an interesting question when real *GDP* is taken to be an accurate measure of aggregate economic activity, but the focus should instead be on the impact of monetary policy shocks on economic activity. Consequently, when data revisions are accounted for in empirical VAR analyses, the unobserved true variable must be modeled.[2] In standard *OLS* estimates of autoregressions, this will induce errors-in-variables biases.

Errors-in-variables issues raise another econometric problem for identified VAR analyses, not simply the literature on monetary policy. Structural shocks are identified based upon the covariance structure of the VAR innovations. The standard method of estimating VAR innovations from the residuals, however, will include data revisions (or measurement noises). In general, the revision components will be correlated across the equations in the system. Identifying the economic shocks from the measurement noises requires more structure on the measurement process. In our empirical example, conditional on having the complete data set, the identification and estimation of the monetary policy equation is simpler than for other equations because the policy instrument is set based on observable data.

This paper considers two approaches to addressing the fact that econometricians' macroeconomic data sets are changing over time because of data revisions. The first approach is to assess the sensitivity of VAR estimates across different data vintages. For

[1] Diebold and Rudebusch (1991) investigate this issue for the index of leading indicators. Rudebusch (1998) criticizes VAR-based estimates of monetary policy reaction functions for ignoring this issue. Orphanides (2001) empirically assesses the importance of this issue for Taylor rule estimates.

[2] Sargent and Sims (1977) provide an early example of this environment. Sargent (1989) and Stock and Watson (1989) discuss how Kalman filter methods can be used tractably to estimate these models.