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The "price puzzle" reconsidered ☆

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Abstract

A large literature has employed structural vector autoregressive (SVAR) models to investigate the empirical effects of U.S. monetary policy. Many of these models regularly produce a "price puzzle"—a rise in the aggregate price level in response to a contractionary innovation to monetary policy—unless commodity prices are included. Conventional wisdom maintains that commodity prices resolve the price puzzle because they contain information that helps the Federal Reserve forecast inflation. I examine a number of plausible alternative indicator variables and find little correlation between an ability to forecast inflation and an ability to resolve the price puzzle. Additionally, a sub-sample investigation reveals that evidence of a price puzzle is associated primarily with the 1959–1979 sample period, and that most indicators—including commodity prices—cannot resolve the puzzle over this period.
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1. Introduction

Over the past decade, a large number of researchers have estimated structural vector autoregressive (SVAR) models to establish "stylized facts" about U.S. monetary policy.[1] Contrary to intuition and most commonly accepted macroeconomic theories, many studies find a protracted rise in the price level following an exogenous contractionary innovation to monetary policy. Sims (1992) first commented on this empirical anomaly, dubbed the "price puzzle" by Eichenbaum (1992).

Despite subsequent advances in SVAR modeling, the price puzzle has generally remained a problem for empirical researchers. Some authors have argued that the presence of a price puzzle should serve as an informal specification test of a VAR model: if such an anomalous result is observed, then what one has labeled as "monetary policy" probably has not been correctly identified. Proponents of this view include Zha (1997), Sims (1998), and Christiano et al. (1999). Viewed this way, understanding the price puzzle is a prerequisite for measuring the effects of monetary policy.

Sims (1992) first demonstrated that the price puzzle largely disappeared if commodity prices were included in his VAR. He proposed that commodity prices served as an "information variable", i.e. as an indicator of nascent inflation, in the Federal Reserve's policy reaction function. Failure to include a variable that signaled future inflation thus would constitute a misspecification of the VAR model.

Most subsequent research has adopted commodity prices as a necessary variable in monetary VAR models.[2] As this tactic has since evolved into a "conventional wisdom", many authors now make only a passing reference to the problem commodity prices are intended to resolve. Nor is an a priori rationale regularly provided for including commodity prices in an otherwise parsimonious VAR model. And while a VAR system often is meant to correspond with a theoretical business cycle model, most theories do not accord an explicit macroeconomic role for commodity prices.

This essay examines the empirical consistency of this "solution" to the price puzzle. While offering some intuitive appeal, how does this approach hold up under more extensive econometric investigation? In an earlier study, Balke and Emery (1994) reported some support for both the above "information variable" view and for commodity prices serving as proxies for "supply shocks".[3] My results cast some doubt on both of these proposed explanations, suggesting the need for additional research into the role of commodity prices (and other inflation indicators) in these models. Given the sensitivity of the effects of policy to this modeling

[1] Some authors refer to these models as "identified VARs". Whichever nomenclature is used, the concept is the same: restrictions placed upon the model allow the researcher to imbue the estimated disturbances (or some subset thereof) with a particular economic interpretation.

[2] For similar reasons, commodity prices also have found their way into empirical monetary models that use other estimation techniques. See, e.g., Sims (1999) and Clarida et al. (2000).

[3] Christiano et al. (1996b) also suggest that commodity prices may belong in the VARs to account for oil price "supply shocks".

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