



Monetary policy and the transmission of oil shocks

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Abstract

This paper provides evidence on the role played by monetary policy in the transmission of oil shocks to the US economy. We show that for the period since 1986, oil shocks have had a negative effect on stock returns, regardless of whether the oil shock is defined as the percentage change in the price of oil or a nonlinear transformation of that series. We then demonstrate that there is no relationship between the reaction of individual stock prices to oil shocks and to monetary policy shocks. This implies that oil shocks do have effects on the economy beyond their effect on monetary policy. We conclude that systematic monetary policy is not as effective as suggested in some previous studies.

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1. Introduction

Monetary policy can affect the economy in two ways. The first, which has been the focus of most of the literature in the past two decades, is through shocks to the Federal Reserve's policy instrument, typically the federal funds rate. The primary challenge when measuring the effect of monetary policy shocks is providing a plausible set of assumptions sufficient to identify exogenous movements in the policy instrument. Alternatively, the Federal Reserve can affect the economy through its choice of policy rule (see e.g., Sims

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and Zha, 2006; Bernanke et al., 1997; Cochrane, 1998; Sims, 1999; Hoover and Jorda, 2001; Hamilton and Herrera, 2004; Bernanke et al., 2004 and the references contained therein). Woodford (2003, p. 7) takes the view that it is *only* the effect of systematic monetary policy that is of interest, as “under almost any view it is desirable to eliminate such shocks...to the greatest extent possible.”

Measuring the effects of systematic monetary policy is difficult. BGW tested the hypothesis that it is the response of monetary policy to oil shocks, rather than the direct effects of oil shocks on production, that causes recessions. In an attempt to control inflation, the Federal Reserve pursues a contractionary monetary policy after an oil shock, and it is this tightening of monetary policy that causes output growth to slow.¹ If the Federal Reserve had instead pursued a policy of not responding to oil shocks, according to this argument, the post-World War II recessions either would not have occurred or would have been less severe. The difficulty in evaluating this hypothesis empirically is that it requires an estimate of the path output would have followed under a policy regime different from the one that was actually in place.

BGW estimated a structural VAR model for seven variables, including output and monetary policy. Impulse response functions for GDP after an oil shock were computed in the usual fashion. They then changed the equation describing the Federal Reserve's reaction function to “shut off” the response of monetary policy to oil shocks, and computed new impulse response functions for output, assuming the coefficients of the other equations would not have been affected.² The difference in impulse response functions is interpreted as an estimate of the effect of systematic monetary policy on the economy. They concluded that oil shocks may not have had any effect on output under the alternative policy rule, implying that systematic monetary policy is important, as it can even push an economy experiencing normal growth into a recession.

Several authors have discussed in detail the shortcomings of the approach taken by BGW (see e.g. Sims, 1997; Hamilton and Herrera, 2004; Bernanke et al., 2004). Sims (1997) argues that the alternative policy rule imposed by BGW implies “unsustainably explosive behavior of prices”. Hamilton and Herrera (2004) are skeptical about BGW's conclusions about the importance of systematic monetary policy for two reasons.³ First, they show that the monetary policy actions required to implement BGW's alternative policy rule are implausibly large, as much as a 900 basis point reduction in the federal funds rate. Second, they question the specification of the estimated VAR model, demonstrating that monetary policy is far less powerful when more lags of the variables are included. Bernanke et al. (2004) suggest that it may be necessary to move toward a more structural approach in order to make further progress.

This paper provides evidence on the role that monetary policy plays in the transmission of oil shocks to the economy, but using a methodology that is not subject to the criticisms of BGW.⁴ If oil shocks affect the economy only indirectly through monetary policy, then

¹ This explanation for the oil price–output relationship was first suggested by Bohi (1990).

² Actually, BGW do allow long term interest rates to react to the change in policy.

³ Specifically, they write, “the potential of monetary policy to avert the contractionary consequences of an oil price shock is not as great as suggested by the analysis of Bernanke, Gertler, and Watson”.

⁴ We view this paper as complementary to the innovative and important work done by BGW. One of the eye-opening results in BGW is that it is possible for the entire effect of oil shocks on output to be explained by the reaction of monetary policy to oil shocks, and our goal is to evaluate that hypothesis from a different perspective.

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