Changes in Federal Reserve preferences

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A B S T R A C T

Using a model of optimizing central bank behavior, I estimate the dynamic behavior of preferences, which are captured by the relative weight put on stabilizing inflation versus minimizing the output gap. Unlike previous work, I let this parameter vary continuously over time. There is a drastic but steady rise in the weight on inflation around the appointment of Paul Volcker; however, I find variation in preferences throughout the sample period. The results suggest that preference changes have been more complex than typically assumed in the literature. The estimated preference series is used to perform counterfactual experiments and to construct a new measure of monetary shocks.

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1. Introduction

The Federal Reserve has a dual mandate of full employment and price stability, and quite often there is a short-run tradeoff between these two objectives. For example, although the Federal Reserve tried to combat the high unemployment rate following the financial crisis of 2007–2008 by using both traditional and unconventional measures, it was cautious in implementing more aggressive policy actions. This was in part due to the fear of causing a future rise in inflation. Thus at each point in time, the Fed is forced to choose which it dislikes more: high unemployment or high inflation. The weight that it places on inflation relative to unemployment can be thought of as a measure of Federal Reserve preferences and is a crucial input into monetary policy decisions. The primary goal of this paper is to estimate how these preferences have evolved over time in order to gain a deeper understanding of the motivations behind Federal Reserve actions.

Most of the existing work in the literature has used some version of a Taylor rule to model monetary policy, where the interest rate responds to output and inflation. Consequently, attempts to investigate changes in the behavior of the Federal Reserve have typically involved looking for instability in the Taylor rule.[1] While there is evidence of changes in these parameters, these changes cannot be used as direct evidence that preferences have changed. This is because Taylor rules are only reduced form representations of monetary policy behavior. The estimated coefficients of the Taylor rule capture the

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[1] Typically, the parameters are allowed to be different across split samples (Clarida et al., 2000; Lubik and Schorfheide, 2004; Boivin and Giannoni, 2006), allowed to switch between regimes (Fernandez-Villaverde et al., 2010) or vary continuously over time (Boivin, 2006; Kim and Nelson, 2006; Cogley and Sargent, 2005).

combined effect of underlying structural parameters of the economy and preferences of the central bank. In this paper I use the restrictions from a simple model of optimizing central bank behavior to identify and estimate a time-varying series of Federal Reserve preferences. The central bank's goal is simultaneously to stabilize inflation around an inflation target and minimize the output gap. I use the relative importance that the central bank puts on inflation stabilization versus output gap minimization as a measure of central bank preferences. Using the central bank's optimization problem, I derive an optimal policy rule where the coefficients are functions of both the preference parameter and the underlying structure of the economy.

Not only is it important to structurally model the preference parameter, but there is reason to believe that this parameter is not constant over time. There are two main broad reasons why the preference parameter can change over time. First, the composition of the Federal Open Market Committee (FOMC)[2] changes over time. This includes changes in the chairman, with the most famous example being the appointment of Paul Volcker in 1979; Meltzer (2006) states that the biggest difference with the appointment of Paul Volcker was the changing of the weight the Fed put on inflation relative to unemployment. While the Fed chairman has changed only a handful of times in the last few decades, the composition of the FOMC changes more often with rotating voting rights for Presidents of four of the regional Federal Reserve Banks and staggered changes in members of the Board of Governors. Additionally even if the composition of the FOMC committee is the same over two periods, there can be changes in the preferences of the committee members.[3] Second, Fed preferences can change due to political pressure on the Fed. There are accounts of Presidents Johnson and Nixon putting pressure on Fed chairmen Martin and Burns to refrain from monetary tightening (Meltzer, 2011). More recently with the financial crisis, Di Maggio (2010) provides evidence of monetary policy being influenced by Congress. In some instances the Fed has been more influenced by this pressure (see Burns, 1987) while in others the Fed has stood its ground (see Greenspan, 2008).

But most papers in the literature that estimate Fed preferences have assumed constant preferences. When efforts have been made to introduce time variation into Fed Preferences, they have been done in restrictive ways. The common approach is estimating two values for the preference parameter by splitting the sample at the appointment of Paul Volcker (see Dennis, 2006; Favero and Rovelli, 2003; Ozlale, 2003; Salemi, 2006; Ilbas, 2012; Givens, 2012; Best, forthcoming). Given the potential for gradual changes in the preference parameter due to continual changes in FOMC composition or political pressure, it is important to allow for a more flexible form of estimation that can capture this. In this paper I use a time-varying parameter approach to estimate a preference parameter that can change continuously over time. The combination of an optimal policy setup with the time variation in the preferences introduces non-linearities that cannot be addressed using the linear estimation techniques that are standard in this literature. I deal with these non-linearities by using the Extended Kalman Filter which is conveniently embedded in a Bayesian Markov Chain Monte Carlo algorithm. The only other paper in my knowledge to allow a more general form of time variation is Owyang and Ramey (2004), where Fed preferences are modeled as a Markov-switching process. They find multiple switches between hawk and dove regimes providing further evidence against the split sample approach and supporting the framework adopted in this paper.[4] While the regime-switching framework has been a popular technique to model parameter instability in the literature, it is not the natural choice here as we want to allow for potential gradual changes.[5]

I find that the Fed generally put lower weight on inflation relative to the output gap in the 1970s, though even within Arthur Burns' tenure there is some variation in preferences. The weight starts rising gradually around the appointment of Paul Volcker but the rise is temporary as the weight falls in the early 1980s before rising again in the mid-1980s. Under Greenspan there is a steady decline in this weight until the end of his tenure when the weight begins to increase again. There is a growing literature that focuses on estimating dynamic macroeconomic models with a framework of optimal monetary policy. These results suggest that researchers should be careful to account for the dynamics of preferences. To further illustrate the importance of the dynamics of the estimated preferences I perform the following exercise. I first take the average of the preferences under Volcker's and Greenspan's regimes and using impulse responses show that they imply pretty similar reactions of the Federal Reserve to inflation shocks. However these average differences in preferences mask the considerable variation within each chairman's tenure. If instead I use the preference parameter from specific points during each chairman's time at the Fed, I find that their reactions to inflation shocks differ significantly.

I then use changes in the estimated preference parameter to construct a novel measure of monetary policy shocks. In their seminal survey on monetary policy shocks Christiano et al. (1999) point to exactly these changes in preferences as an interpretation of monetary policy shocks estimated in Vector Autoregressions (VARs). I use two alternative identification strategies to embed my measure of monetary policy shocks in a structural VAR and evaluate its effects on the economy. The results suggest that the preference shocks have a smaller contemporaneous but more persistent effect on output, relative to using a more traditional shock measure in a VAR.

Since the results show that the Fed became more hawkish with the election of Paul Volcker, it is important to understand the role of preferences in the high inflation episode of the 1970s. To shed light on this issue I consider a counterfactual

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[2] The FOMC is the Fed's main monetary policy making arm.

[3] For example the Minneapolis Fed President Naryana Kocherlakota famously switched from being an "inflation hawk" to a "dove" in 2012, see for example http://blogs.wsj.com/economics/2012/09/28/another-reason-kocherlakota-changed-his-mind/

[4] Although they take a more reduced form approach where the preferences capture, among other things, changes in the weight parameter used here and changes in the inflation target. Additionally they use a stylized model that implies restricted dynamics for the economy.

[5] Furthermore, a regime-switching estimation would be highly intractable for the model in this paper as discussed in Section 3.