Estimating the Federal Reserve's implicit inflation target: A state space approach

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Abstract

Existing estimates of the Federal Reserve's implicit inflation target typically rely on the assumption that it is constant for the duration of the period of analysis. This paper relaxes this assumption and estimates the implicit inflation target using a time-varying parameter model and the Kalman filter. In applying this method to the Volcker–Greenspan period, it finds significant time variation in the implicit target that is consistent with hypotheses about 'opportunistic disinflation' and the recent 'deflation scare'.
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1. Introduction

Over the Volcker–Greenspan period, inflation in the United States declined from double digits in the late 1970s to close to 1% by the early 2000s. An important question is: how did the Federal Reserve conduct monetary policy during this broadly successful period?

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A large literature on monetary policy rules has addressed this question by measuring how US interest rates have reacted to deviations of inflation and real activity from their target levels. The accepted wisdom is that, since 1979, the Federal Open Market Committee (FOMC) has consistently responded to increases in inflation above the desired level by raising the real federal funds rate above its natural, or 'neutral', level, in accordance with the Taylor principle. There is also a consensus that the Federal Reserve has responded to deviations of output from potential.[1]

Analyzing US monetary policy is, however, complicated by the fact that the Federal Reserve does not announce quantitative inflation objectives. This practice differs from that of a number of other central banks. For example, while the Bank of England has an explicit quantitative target of 2% for CPI inflation in two years' time, the Federal Reserve's inflation objective is defined in qualitative terms as 'stable prices' (Federal Reserve Act, Section 2A).[2]

While empirical estimates of the Federal Reserve's unobserved *implicit* inflation target exist, they typically rely on the assumption that the target remains constant for the duration of the period of analysis. For example, Clarida et al. (1998) estimate the Federal Reserve's policy reaction function over 1979–1994 using a model with a constant inflation target, and estimate it at 4%.

However, there are a number of reasons to believe that the Federal Reserve's implicit inflation target has, in fact, varied over time. The Federal Reserve's 'Blue Books', confidential strategy documents prepared for every FOMC meeting, provide some evidence of changing inflation objectives.[3] For example, the Blue Book prepared for the February 1997 FOMC meeting presents a 'price stability' policy scenario consistent with achieving a rate of inflation of the price index for personal consumption expenditures excluding food and energy (core PCE inflation) of about 2–2.5% over the next 4–8 quarters – a typical horizon for monetary policy purposes – and 1% after seven years. In contrast, the Blue Book prepared for the February 1999 FOMC meeting presents a 'price stability' policy scenario consistent with achieving a rate of core PCE inflation of about 1–1.5% over the next 4–8 quarters, and 0.75% after seven years. This Blue Book indicative evidence, and the fact that the inflation targets of central banks with explicit, quantitative objectives have changed over time, suggest that the assumption of a constant implicit target is overly restrictive.[4]

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[1] Orphanides (2002, 2004) finds that Federal Reserve policy before 1979 was also consistent with the Taylor principle, and that the Great Inflation of the 1970s arose because policymakers had overestimated the degree of slack in the economy. However, this paper focuses on the Volcker–Greenspan period during which inflation declined, i.e., since 1979.

[2] The lack of a quantitative inflation target means that applying the empirical approach of authors such as Kuzin (2006), who uses the inflation objectives reported in Bundesbank monthly reports to estimate how the Bundesbank responded to deviations of inflation from these targets during 1975–1998, cannot be directly applied to the Federal Reserve.

[3] The Blue Book of each FOMC meeting is confidential for five years following the meeting, after which it can be obtained from the Federal Reserve by request.

[4] For example, the Bundesbank's inflation objective declined from more than 4% in 1975 to near 2% in 1998, as reported by Kuzin (2006).