



## Policy futures markets with multiple goals

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### ABSTRACT

Previous work in monetary policy futures markets under a single policy goal have shown this approach to be effective at eliminating the circularity problem inherent with private-sector targeting strategies. We extend this monetary policy setting framework to a typical multiple goal policy objective: inflation and output stabilization. We also demonstrate how the prices in policy futures markets can help resolve debates over important policy questions.

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## 1. Introduction

Because monetary policy affects the economy with a lag, observers such as [Svensson \(1997\)](#) have proposed that central banks target private-sector forecasts of future inflation. [Bernanke and Woodford \(1997\)](#) point out this approach to targeting forecasts of inflation can be problematic: as stabilization of the goal variable is achieved, no useful information about the state of the economy is gained from private agents, and hence transmitted to the policymaking authority. Thus, perfect stabilization of the goal variable(s) becomes impossible.

[Jackson and Sumner \(2006\)](#) discuss a way around this ‘circularity problem’ by proposing a futures market in which the value of a policy futures instrument is linked to the ratio of the policy goal variable (e.g., an inflation target) and the policy instrument (e.g., the fed funds rate). The model of [Jackson and Sumner \(2006\)](#) is part of a larger literature on economic uses of prediction markets, as described by [Wolfers and Zitzewitz \(2004\)](#), [Hanson \(forthcoming\)](#), and [Hahn and Tetlock \(2005\)](#), among others. An important distinction between the proposal of Jackson and Sumner, and (prediction) markets that currently exist, is that a policy futures market generally involves setting policy directly in response to outcomes of the market, whereas existing (prediction) markets have no explicit bearing on the operational aspects of policy. For instance, liquid fed funds futures contracts are traded at the Chicago Board of Trade, however, the outcomes of this market are a reflection of what the market thinks the fed will do, but the fed is under no obligation to set policy according to the market consensus.

Some earlier proposals to integrate private-sector markets into the setting of monetary policy include [Hall \(1983\)](#), [Hetzel \(1990\)](#), [Sumner \(1989\)](#), and [Dowd \(1994\)](#). Several of these papers are susceptible to the same circularity problem described

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above. These four proposals all focused on singular nominal targets, usually some measure of either the price level, inflation rate, or nominal GNP. As demonstrated in this paper, in addition to addressing the circularity problem, we consider multiple targets, including stabilization of real variables.

Recent innovative proposals for the use of futures markets to guide policy include Sumner (2006), who investigates the feasibility of extending the Federal Open Market Committee to the public, and Jackson and Sumner's (2009) proposal of using policy futures markets as a guide to global warming policy. Perhaps the most well-known attempt to use futures markets to guide policy is the US Defense Department's proposal in 2003 of a Policy Analysis Market (PAM), which was designed to elicit information about geopolitical risk among Middle Eastern countries. It was highly controversial due to the widely held view that traders would be 'profiting from terrorism', and as a result was abandoned for political reasons.

Setting monetary policy according to the outcomes of a policy futures market has the advantages of transparency, as in a forecast targeting regime, efficiency in terms of aggregating and disseminating useful information, as well as simplicity: a credible central bank or policy setting authority simply sets policy based on realizations of futures market trading to achieve its stated goal. Policy futures traders using rational expectations provide an explicit forecast of the futures price, and an implicit forecast of the instrument.

For monetary policy regimes that have the singular goal of strict inflation targeting with little or no regard to cyclical variation in real activity, such as the Reserve Bank of New Zealand, an approach utilizing a policy futures market may be an innovative opportunity to gain further transparency and credibility for maintaining a nominal anchor. However, many central banks, even those with explicit inflation targets, attempt to stabilize competing goal variables to varying degrees, most commonly the dual goals of inflation and output stabilization. The policy futures market proposed by Jackson and Sumner analyzes only singular nominal targets and therefore ignores the practical concerns that most central banks would have under such a monetary regime. Indeed, in the context of a central bank's loss function, that paper analyzes only the special case where the implied weight on output stabilization in the central bank's loss function is zero.

As Cecchetti and Ehrmann (1999) find, there is considerable variation in the weight on inflation stabilization relative to output stabilization among central banks around the world, and most central banks (even among apparently 'strict' inflation targeters) choose to pay at least modest attention to output variability. Thus, in order for a monetary policy futures market to be considered practical as a policy framework, it needs to be demonstrated that such a regime can meet multiple policy objectives. Note that this is distinctly different from the debate over *which* policy goal or goals are best suited to enhance an economy's welfare (i.e., an inflation target, or a dual mandate as in the US). This paper takes no formal stand over this debate, however, it is demonstrated that such a monetary policy futures market could be useful in framing such a debate. Rather, the main concern in this paper is how central banks can most effectively use its resources to achieve those goals.

We address this concern by formalizing such a policymaking regime. In the next section we discuss the literature on private-sector forecast targeting, and the related literature on using prediction markets for policy purposes. In Section 3 we extend the framework of Jackson and Sumner (2006) to include a central bank pursuing multiple policy objectives, and in Section 4 show how such a market could be useful in resolving important academic policy debates. Concluding remarks then follow.

## 2. Forecast targeting and prediction markets

### 2.1. Forecast targeting for policy purposes

In the last decade or so, as information technology has proliferated in parallel with increasingly sophisticated financial innovations, many economists have raised the possibility of using private-sector forecasts of target variables to aid in dealing with lags in monetary policy effectiveness. This approach is advantageous to the central bank since it receives feedback in the current period about the effectiveness of policies which have an effect in the future. For instance, if private-sector forecasters believe inflation will rise at some horizon in the future, current policy can be tightened until expected inflation is in line with the target inflation rate over that horizon.

However, as Bernanke and Woodford (1997) show, as the policymaking authority becomes more successful at stabilizing expectations of the future value of the target variable, the signal-to-noise ratio declines. With perfect stabilization (but for unpredictable shocks), private-sector agents are unable to provide useful information about the target variable, thus the central bank can no longer make use of private-sector forecasts in conducting policy. Bernanke and Woodford did suggest that the circularity problem described above could be alleviated if "policymakers draw information from a variety of sources." However, because of their concerns about indeterminacy, Bernanke and Woodford did not put much emphasis on overcoming the circularity problem and concluded that there is no substitute for a central bank relying on a structural model to implement policy.

Jackson and Sumner (2006) address Bernanke and Woodford's criticism by proposing policymakers base policy on a single indicator variable which is the ratio of the target variable and the instrument variable. Their paper demonstrates that a policy futures market can be constructed such that the central bank is utilizing only private-sector information, and is free of the circularity problem. The implication is that the central bank does not require a structural model when implementing policy, as the central bank can fully stabilize the economy by setting its instrument exclusively according to private-sector information.

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