



# Asset prices, nominal rigidities, and monetary policy

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## Abstract

Should monetary policy respond to asset prices? This paper analyzes this question from the vantage point of equilibrium determinacy. A central bank responding to asset prices is indirectly responding to firm profits. In a model with sticky prices, increases in inflation tend to lower firm profits so that a central bank responding to share prices implicitly weakens its overall response to inflation. This is the novel source of equilibrium indeterminacy highlighted in the paper.

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## 1. Introduction

Should monetary policy respond to asset prices? This is a classic question in monetary policy. This paper addresses this issue in the context of a general equilibrium model with nominal rigidities. Our focus is on equilibrium determinacy.

Bernanke and Gertler (1999, 2001) address the efficacy of a central bank response to asset prices based on the model outlined in Bernanke et al. (2000). In their sticky price model a shock to asset prices increases aggregate demand and thus drives up the price level. Bernanke and Gertler conclude that there is no need for a direct central bank response to asset prices because a central bank that is responding to general price inflation is already responding to asset price

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movements. They state: “Policy should not respond to asset prices, except insofar as they signal changes in expected inflation.”

Cecchetti et al. (2000), however, argue that central banks, at least in inflation targeting countries, should respond to asset prices: “[a] central bank concerned with hitting an inflation target at a given time horizon, and achieving as smooth a path as possible for inflation, is likely to achieve superior performance by adjusting its policy instruments not only to inflation (or to its inflation forecast) and the output gap, but to asset prices as well” (p. 2).

Whether or not the central bank can potentially make the economy better off by responding to asset prices in a judicious way seems to be jumping ahead of the game. Elsewhere we have argued (Carlstrom and Fuerst, 2001a) that the focus on monetary policy should not be in finding the optimal rule, but to first ensure that any proposed rule does no harm. The problem is that by following a rule in which the central bank responds to endogenous variables, the central bank may introduce real indeterminacy and sunspot equilibria into an otherwise determinate economy.<sup>1</sup> These sunspot fluctuations are welfare-reducing and can potentially be quite large.

Asset prices reflect market forecasts of current and future profitability. For a central bank responding to asset prices this presents a potential problem from the perspective of equilibrium determinacy. A familiar result in the literature is the celebrated “Taylor Principle”: a necessary condition for equilibrium determinacy is that a permanent increase in inflation leads to a more than proportionate increase in the nominal interest rate (see, for example, Woodford, 2003). In our model the central bank is responding positively to both movements in inflation and movements in share prices. Suppose that a (sunspot) shock to inflation tends to lower firm profits and thus share prices. The falling share price adds a negative force to the central bank’s overall response to inflation. If this share price response is large enough, the policy rule violates the Taylor Principle and we have equilibrium indeterminacy. This is the novel result of this paper.

Our result is related to, but quite distinct from, Bernanke and Woodford (1997) who demonstrate that indeterminacy can arise from a policy based on inflation forecasts, even when these forecasts are inferred from asset prices. The profit mechanism that is key to our result is entirely absent from their analysis. Several authors have explored equilibrium indeterminacy in the context of exchange rate targeting, e.g., Linnemann and Schabert (2002) or Uribe (2003). Again, the profit mechanism is not the source of indeterminacy in these models.

The paper proceeds as follows. In the next two sections we lay out the benchmark sticky price model and demonstrate the possibility of equilibrium indeterminacy. The key mechanism in our results is the negative effect of inflation on profits and share prices. A natural robustness analysis is to consider models with sticky nominal wages. We demonstrate that equilibrium indeterminacy may still arise for plausible parameter values when both nominal prices and wages are sticky. In particular, indeterminacy may well occur under calibrations that are consistent with empirical VAR evidence suggesting that profits rise in response to a loosening of monetary policy (although profits would decline in response to a sunspot shock to inflation, as this is a necessary condition for indeterminacy in the model). Finally, we consider the alternative “cash-in-advance” (CIA) money demand timing suggested by Carlstrom and Fuerst (2001a). We demonstrate that the conditions for indeterminacy in the cash-in-advance model are at least as tight as they are in the more traditional “cash-when-I’m-done” (CWID) or end-of-period money demand timing. Under

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<sup>1</sup> The term “sunspot” is in one sense misleading since these shocks are accommodated by the money supply movements needed to support the interest rate policy. But we use the term since the central bank introduces real indeterminacy by responding to public expectations which can be driven by sunspots.

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