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Interest rate pass-through, monetary policy rules and macroeconomic stability☆

Claudia Kwapil [a,*], Johann Scharler [b,1]

[a] Oesterreichische Nationalbank, Economic Analysis Division, Otto-Wagner-Platz 3, POB 61, A-1011 Vienna, Austria
[b] Department of Economics, University of Linz, Altenbergerstraße 69, A-4040 Linz, Austria

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A B S T R A C T

In this paper we analyze equilibrium determinacy in a sticky price model in which the pass-through from policy rates to retail interest rates is sluggish and potentially incomplete. In addition, we empirically characterize and compare the interest rate pass-through process in the euro area and the U.S. We find that if the pass-through is incomplete in the long run, the standard Taylor principle is insufficient to guarantee equilibrium determinacy. Our empirical analysis indicates that this result might be particularly relevant for bank-based financial systems as for instance that in the euro area.

1. Introduction

The stability properties associated with monetary policy rules have attracted a substantial amount of attention. In principle, monetary policy rules give rise to a determinate equilibrium if the implied response to inflation is sufficiently strong. To avoid indeterminacy, nominal interest rates have to respond sufficiently to an increase in inflation to raise the real interest rate. Hence, the nominal rate has to respond at least one-for-one to changes in the (expected) inflation rate to guarantee a unique and stable equilibrium. This result is referred to as the *Taylor principle* (Woodford, 2003). Otherwise, the

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* Corresponding author. Tel.: +431 404 20 7415; fax +431 404 20 7499.
E-mail addresses: claudia.kwapil@oenb.at (C. Kwapil), johann.scharler@jku.at (J. Scharler).
[1] Tel.: +43732 2468 8360; fax: +43732 2468 9679.

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equilibrium is indeterminate and fluctuations resulting from self-fulfilling revisions in expectations become possible. Intuitively, if nominal rates do not adjust sufficiently, a rise in expected inflation leads to a decrease in the real interest rate, which stimulates aggregate demand. Higher aggregate demand results in an increase in inflation, and consequently the initial expectation is confirmed. Several studies argue that the comparatively successful conduct of monetary policy since the early 1980s is primarily due to the implementation of an appropriate policy rule, that is, a rule that satisfies the Taylor principle (see e.g. Judd and Rudebush, 1998; Taylor, 1999; Clarida et al., 1998; Clarida et al., 2000).[2]

Empirically it appears that retail interest rates respond less than one-for-one to policy rates (e.g. Cottarelli and Kourelis, 1994; Borio and Fritz, 1995; Moazzami, 1999; Hofmann and Mizen, 2004; Sander and Kleimeier, 2004; De Bondt, 2005; Kok Sorensen and Werner, 2006). Moreover, retail interest rates are likely to influence aggregate demand. Thus, it seems conceivable that although monetary policy is tightened sufficiently, obeying the Taylor principle, retail interest rates do not respond sufficiently to ensure that real rates are stabilizing. This appears to be particularly relevant for the euro area, which is generally thought to be an example of a bank-based financial system (Allen and Gale, 2000).

In the present paper we analyze the stability properties of a simple sticky price model in which retail interest rates adjust sluggishly to changes in policy rates and the pass-through is potentially incomplete. In particular, we introduce costly financial intermediation, which gives rise to sticky retail interest rates. Although we model the limited interest rate pass-through in a highly simplified way without providing explicit micro foundations, we still believe that this feature of the model represents an important aspect of the monetary transmission mechanism that is missing in most other models.

Several studies find that the conditions for a determinate equilibrium have to be modified under certain circumstances. Edge and Rudd (2002) and Roisland (2003) claim that the presence of taxes on capital income requires a strengthening of the Taylor principle. Galí et al. (2004) introduce rule-of-thumb consumers in a sticky price model and show that the Taylor principle is no longer sufficient for determinacy. De Fiore and Liu (2005) find that for a small open economy the degree of openness to trade is critical for stability.

Equilibrium determinacy is usually analyzed in models without capital accumulation. In models with capital investment, the Taylor principle may no longer be sufficient to guarantee uniqueness (see Benhabib et al., 2005, and the references therein). However, to our knowledge the idea that the financial system and in particular the interest rate pass-through may impact upon the determinacy of the equilibrium has not been explored. Thus, the present paper contributes to the literature in this respect.

Our main result is that if the pass-through to retail interest rates is incomplete in the long run, the standard Taylor principle no longer guarantees a determinate equilibrium. Put differently, the coefficient on inflation in the Taylor rule may have to be well above unity to be consistent with a unique and stable equilibrium.

In addition, we explore whether limited interest rate pass-through is likely to be important in a quantitative sense. We provide empirical evidence on the pass-through process for the euro area and the U.S. as examples of bank-based and market-based financial systems, respectively. Our estimates suggest that the pass-through is limited in both systems, but smaller in the euro area than in the U.S. Comparing our empirical results with monetary policy reaction functions estimated in the literature, we conclude that limited pass-through does not appear to be a source of instability; neither in the euro area nor in the U.S. However, because the banking sector is more important and the pass-through is smaller in the euro area, it appears to be closer to the indeterminate region than the U.S.

The paper is structured as follows: Section 2 describes a simple model, which will be the basis of our analysis. The link between limited pass-through and determinacy is analyzed in Section 3. Section 4 reports the results of our empirical analysis and Section 5 discusses the implications of the empirical results in terms of determinacy. Section 6 concludes the paper.

[2] Nevertheless, this view is not without controversy. In a series of papers, Orphanides (2004, 2003, 2002) argues that the instability observed in the 1970s was the consequence of too ambitious goals for output stabilization and too pessimistic real-time estimates of the output gap.