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Interest-rate smoothing in a two-sector small open economy ☆

Timothy Kam *

School of Economics, Australian National University, ACT 0200, Australia

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Abstract

In this paper, interest-rate smoothing under Taylor-type rules is considered for an empirically plausible two-sector small open economy. A simple Taylor-type rule that has sufficient response to output gap, coupled with interest-rate smoothing, can improve welfare relative to our benchmark historical rule. This result is robust to alternative values of the degree of habit persistence and non-traded-goods price stickiness in the model. Alternatively, the interest-rate smoothing result may not hold when an strictly inflation-forecast-based (IFB) rule is used. However, incorporating sufficient response to contemporaneous output gap and inflation in the IFB rule, interest-rate smoothing can also deliver superior welfare outcomes.

JEL classification: E32; E52; F41

Keywords: Interest-rate smoothing; Operational monetary policy; Small open economy; Sticky prices; Habit formation

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* Tel.: +61 2 6125 1072; fax: +61 2 6125 5124.
E-mail address: timothy.kam@anu.edu.au

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1. Introduction

It is often observed that central banks tend to change interest rates in small steps over time; and typically in the same direction for some duration of time. This has come to be known as interest-rate smoothing in the monetary-policy literature.[1] An interesting question is how such a behavior of the central bank affects business-cycle fluctuations and therefore welfare in a small open economy, since this behavior has sometimes been considered to be central-bank caution at best, or timidity, at worst. Rotemberg and Woodford (1999) show that, in the context of simple policy rules in a closed economy, policies where there is a smoothing of the rate of interest-rate change can be optimal under certain classes of policy rules and parameterization.

The contribution in this paper is the study of welfare effects, in the context of a richer, microfounded and empirically plausible small open economy, arising from simple monetary-policy rules with interest-rate smoothing. This is an important question for the design of simple monetary-policy rules in a small open economy. Popular models used in the small-open-economy monetary policy literature are often small in scale, featuring fully-traded goods and hence retain full purchasing power parity (see e.g. Galí and Monacelli, 2005; Clarida et al., 2001). These models also neglect capital and investment dynamics. Our model possesses costly capital accumulation, habit formation in the style of Campbell and Cochrane (1999), and sticky nontraded-goods prices.

Fuhrer (2000) shows how habit persistence can improve the empirical plausibility of models with monetary policy. McCallum and Nelson (1999) also introduce a simple habit-formation process in their small open economy to improve the model's dynamics. Choi and Jung (2003) show that, within a simple small-open-economy setup of Galí and Monacelli (2005), a policy rule with an interest-rate smoothing term can arise as a result of optimal monetary policy in the presence of habit formation. Unlike the simple model of Choi and Jung (2003), we allow for explicit interest-rate smoothing under an operational rule, and in a more realistic model. We allow for nontraded goods, creating deviations from purchasing power parity. The intuition from Hau (2000) is that with a larger share of nontradables in the CPI money-market equilibrium requires large exchange rate adjustments to support a smaller fraction of tradables. Jung (2000) also makes use of the nontradable goods assumption in conjunction with sticky prices. However, Jung (2000) considered a model where monetary policy is conducted as a money growth rule. Here we focus on monetary policy using an interest-rate rule.

Our experimental strategy is as follows. First, we construct and calibrate a theoretical model which is empirically plausible, nesting a simple monetary-policy rule representing the operational rule which would have been used had it actually been employed by our central bank of interest. Second, using the preceding environment as the welfare benchmark, we consider alternative rules and their implied welfare and business-cycle volatility

[1] Some authors suggest that interest-rate smoothing is the result of the central bank's dislike of interest-rate volatility (e.g. Debelle and Stevens, 1995; Söderlind, 2001), or a desire to prevent large movements in financial-market prices (e.g. Cukierman, 1996), or the existence of measurement errors in key macroeconomic variables (e.g. Sack, 2000). Sack and Wieland (2000) show that in a VAR framework, policy gradualism can be the result of an optimal interest-rate policy when the central bank is uncertain about the parameters in the economy's law of motion. Similarly, Clarida et al. (1999) show in the context of their model that parameter uncertainty may give rise to interest-rate smoothing behavior by the central bank.