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Real asset returns, inflation and activity in a small, open, Cash-in-Advance economy

Arman Mansoorian [a,*], Mohammed Mohsin [b]

[a] Department of Economics, York University, 4700 Keele Street North York, Ontario, M3J 1P3 Canada
[b] Department of Economics, University of Tennessee, Knoxville, TN 37996, USA

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A B S T R A C T

The effects of inflation are worked out for a small open economy with Cash-in-Advance (CIA) constraints on bond purchases. If all transactions are subject to CIA constraints, an increase in the inflation rate will reduce savings, bringing about a current account deficit, while the capital stock will be unaffected. If investment is not subject to CIA constraints, an increase in the inflation rate will encourage investment and reduce savings, bringing about a current account deficit. Numerical evaluation of the model gives rise to falls in real interest rates that are in line with recent empirical findings.

1. Introduction

There is considerable empirical evidence that the nominal rates of return on assets do not generally keep up with inflation. This negative correlation between inflation and real asset returns was originally thoroughly investigated by Fama (1981); and it has been investigated by several authors since then.[1] Barnes et al. (1999), in fact, conclude that this phenomenon extends to other assets; for most countries that they consider, inflation has a negative impact on the real rate of return on a variety of assets including bonds. When regressing the level or the changes in the safe nominal interest rates on the level or the changes in the inflation rate they find that for most countries the coefficient on the inflation

* Corresponding author.
E-mail address: arman@yorku.ca (A. Mansoorian).

[1] See, for example, Fama and Gibbons (1984), Geske and Roll (1983), Wahlroos and Berglund (1986), Serletis (1993), Thornton (1993), Rapach (2003) and Rapach and Wohar (2005).

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rate is positive, but significantly smaller than unity, indicating a significant fall in the real rates of return resulting from an increase in the inflation rate.[2]

Fama explained this negative relationship between asset returns and inflation by arguing that inflation reduces expected economic activity, which in turn reduces the return on equities. One important shortcoming of this explanation is that it implies that inflation will reduce real activity, which is not consistent with the empirical literature that has been the focus of the New Keynesian literature.[3]

The open economy implications of the negative relationship between inflation and real asset returns have also not been studied in the literature. Indeed, Barnes et al. (p. 740) note that "many monetary models imply that inflation cannot affect the steady state real rate of return on assets."

In this paper we propose a simple workable model which is tractable enough that we could use it to study some basic open economy implication of the negative relationship between inflation and real asset returns.

We assume that real bond returns fall when inflation increases because bonds are purchased with money. The assumption that bonds are purchased with money was central to development of the traditional IS-LM-BP model. In the textbook treatment of the IS-LM-BP model when domestic interest rates are above (below) foreign rates, there is a huge capital inflow (outflow), and balance of payments surplus (deficit). This implied an excess demand for (supply of) the domestic currency on the foreign exchange market, which rose (lowered) the value of the domestic currency.

Moreover, empirically, for small open economies changes in domestic interest rates do lead to substantial movements in the price of the country's currency on the foreign exchange markets, which are mainly induced by the movements of short term capital. From this, one could infer that international transactions involving assets are financed with money.

We consider a small open economy model in which bond purchases are subject to Cash-in-Advance (CIA) constraints.[4,5] We show that in this setting, following an increase in inflation, the adjustments of consumption, investment and net foreign assets exhibit Keynesian features, even though prices are fully flexible. The New Keynesian literature (in the spirit of Woodford (2003)) has made considerable efforts to obtain such dynamics using price setting behaviour in imperfectly competitive environments.[6]

With CIA constraints on bond purchases, the real rate of return on bonds is not constant. In that setting, inflation, brought about by the rate of devaluation of the domestic currency, acts as a tax on bond purchases. Hence, the real rate of return on bonds depends on the rate of devaluation. Hence, in order to have a well defined steady state equilibrium, in which the real rate of return on bonds is equal to the rate of time preference, we make the rate of time preference endogenous. As in Uzawa (1968),

[2] See their Table 3, where they report the results of the regressions of changes in the money market rate on changes in inflation for different countries. The estimated coefficients on the changes in the inflation rate are between −0.0383, for India, and 0.1182, for New Zealand. But for most countries this coefficient is positive and very small: 0.0127 for Australia, 0.0532 for Canada, 0.0186 for France, 0.0055 for Germany, 0.1095 for Italy, 0.0434 for Japan, 0.0235 for the U.K., and 0.0515 for the U.S.

[3] Authors such as Marshall (1992), Bakshi and Chen (1996) and Stulz (1986) have tried to explain this phenomenon in terms of Lucas (1978) type asset pricing models. In these models a permanent increase in the inflation rate does not affect steady state real interest rates.

[4] We speculate that the literature has not given enough attention to this channel through which monetary policy impinges upon the open economy because it is believed that "One difficulty with this (i.e., the CIA) approach is that the introduction of the various constraints, embodying the role played by money in transactions, can very quickly become intractable" (Turnovsky, 1997, p. 20). See also Turnovsky (2000, p. 264). Similarly, Blanchard and Fischer (1989, p. 155) state that "Models based explicitly on (CIA) constraints…can quickly become analytically cumbersome…" The analysis in the present paper is very tractable because we adopt a continuous time setting. The reader is referred to Calvo (1987), Calvo and Vegh (1994, 1995) and Edwards and Vegh (1997) for other discussions of open economy issues with CIA constraints on consumption.

[5] The small open economy literature has considered several channels though which monetary policy can affect the economy. Obstfeld (1981a,b) combines the money-in-utility model of Sidrauski (1967) with Uzawa (1968) preferences, where the rate of time preference is an increasing function of instantaneous utility. Mansoorian (1996) considers the importance of habits, combining the habit formation model of Ryder and Heal (1973) with money-in-utility. There, the rate of time preference is fixed, but instantaneous utility depends on habits, which are modelled as a weighted sum of past levels of instantaneous utilities. Shi and Epstein (1993) combine endogenous time preference with habit formation, making the rate of time preference an increasing function of habits. Mansoorian and Mohsin (2006) consider a model with a fixed rate of time preference and no habits, but with endogenous labour and a Cash-in-Advance (CIA) constraint on consumption expenditures.

[6] See, for example, Roberts (1995) and Rudd and Whelan (2007).