Int. Fin. Markets, Inst. and Money 22 (2012) 359–380

Contents lists available at SciVerse ScienceDirect

Journal of International Financial Markets, Institutions & Money

journal homepage: www.elsevier.com/locate/intfin

Monetary policy and inferential expectations of exchange rates☆

Gordon D. Menzies[a,b,*], Daniel John Zizzo[b,c,1]

[a] University of Technology Sydney, Australia
[b] Centre for Applied Macroeconomic Analysis, Australian National University, Australia
[c] University of East Anglia, United Kingdom

ARTICLE INFO

Article history:
Received 18 April 2011
Accepted 6 November 2011
Available online 22 November 2011

JEL classification:
C91
D84
E50
F31

Keywords:
Exchange rates
Market experiments
Belief conservatism
Inferential expectations
Uncovered interest parity

ABSTRACT

We present a macroeconomic market experiment to isolate the impact of monetary shocks on the exchange rate, as an alternative to SVAR identification. In a non-stochastic treatment, covered interest rate parity holds and predicted exchange rates are tracked well. In a stochastic treatment, we model expectations using a Neyman–Pearson hypothesis test (inferential expectations) and find evidence of belief conservatism and uncovered interest rate parity failure. The market environment *magnifies* belief conservatism, which is opposite to the standard claim that markets tend to eliminate individual choice anomalies.

1. Introduction

The debate about monetary policy's impact on exchange rates has spanned the whole floating rate era (Kim and Roubini, 2000; Chinn, 2006). In his seminal overshooting model Dornbusch (1976) elegantly melded the central bank's influence over interest rates and the future nominal exchange rate

☆ http://www.uea.ac.uk/~ec601/MZ/MZ_XRatesEAppendix contains experimental instructions and other appendices.

* Corresponding author at: University of Technology, Sydney, Australia. Tel.: +61 2 95147728; fax: +61 2 95147711.
E-mail addresses: gordon.menzies@uts.edu.au (G.D. Menzies), d.zizzo@uea.ac.uk (D.J. Zizzo).
[1] Tel.: +44 1603 593668; fax: +44 1603 456259.

1042-4431/$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.intfin.2011.11.001

into a theory of foreign exchange. His setup has been a building-block ever since, and is imbedded in the New Open Economy Macroeconomic paradigm (Lane, 2001).

Yet it is no secret that OLS regression tests have weighed heavily against the key Dornbusch exchange rate equation – uncovered interest parity (UIP). Under the joint hypotheses of rational expectations, risk neutrality and zero transactions costs, the current interest differential ought to be an unbiased predictor of the future change in the nominal spot rate. That is, the regression slope in Eq. (1) should be unity[1]

$$\Delta s_{t+1} = \beta(i_t - i_t^*) + u_{t+1} \tag{1}$$

Instead, the estimated coefficient in Eq. (1) is less than unity, and sometimes negative (Frankel and Rose, 1995; Froot and Thaler, 1990).[2] However, Eq. (1) is not a strict test for the appropriateness of the Dornbusch (1976). This model inhabits a world where the only shocks are nominal, so there is no reason to suppose (1) will hold in general. Fortunately, structural vector autoregressions (SVARs) enable researchers to sift pure monetary shocks from all others and (1) can be tested for this subset. One such study (Bjornland, 2009, p. 1403) supports UIP, claiming that "Dornbusch was right after all".

However, SVARs can only test joint hypotheses: the hypotheses explicitly in view, plus any identifying restrictions. Unfortunately, SVAR results about UIP are beholden to different identifying restrictions (Faust and Rogers, 2003; Fry and Pagan, 2007). The contribution of this paper is to detail a market experiment where agents must trade foreign exchange in the light of information about a stylized economy. Our experimental conditioning is an *alternative* to the econometric SVAR conditioning, because the only shocks affecting the economy are monetary. Furthermore, unlike a SVAR, our experiment allows the complete set of agents' buying and selling intentions to be observed.

As we shall see, agents exhibit belief conservatism. That is, they change their beliefs (about future nominal exchange rates) only when the evidence passes a threshold. We operationalize this by treating belief formation as a statistical hypothesis test. Under inferential expectations (IE), agents with a high evidence threshold act as though they conduct a hypothesis test with a low test size α our measure of belief conservatism (Menzies and Zizzo, 2009).[3]

One surprising result we find is that belief conservatism for individuals is less pronounced than it is in a market. This contrasts with the folk wisdom that markets should drive out individual-choice anomalies.

A caveat for this result is that our metric for individual belief conservatism is based on the bid and offer that the experiment elicits from them. As a robustness check, we confirm the existence of individual choice belief conservatism more precisely in a non-market supplementary experiment.

The paper is structured as follows. Section 2 outlines the notion of inferential expectations, which can be used to quantify belief conservatism while retaining rational expectations as a special case. In Section 3 we build a two-period theoretical economy which becomes the environment for the experiment, discussed in Section 4. The results are outlined in Section 5, with the last sub-section providing the results from a supplementary experiment. Section 6 concludes.

[1] The variables s, i, and i^* are the log nominal exchange rate, the domestic interest rate and the world interest rate. The latter two are measured as proportions (so 5% is 0.05).

[2] A vast literature in the 1980s and 1990s routinely rejected UIP. Boudoukh et al. (2005, p. 1) claim to have counted 'well over a hundred papers' that document its failure, and say that this result 'is one of the more robust puzzles in financial economics.' Krugman (1993, p. 9) puts it this way "the most favourable thing that one could possibly say is that the data give no positive support to the idea of speculative efficiency [in foreign exchange market]." Although Chinn (2006) has shown that the failure is not as pronounced for long-term securities, he also shows that the extent of the downward bias for short- to medium-run securities is not disappearing with the passage of time. Burnside et al. (2006) note that the literature has explored time-varying risk premia (perhaps as a result of endogenous market segmentation), the interaction of risk premia and monetary policy, statistical considerations such as peso problems and non-cointegration of forward and spot rates, learning, biases in expectations, and, the cost of actively managing foreign exchange portfolios. Some of these approaches assume RE, and blame the failure of UIP on auxiliary assumptions.

[3] If the test size is zero in a hypothesis test, no amount of evidence will make an agent change their belief – they are conservative *in extremis*. If it is unity, they are required to change their belief – for the way to minimize the probability of making a type II error is just to reject the null, if one is completely unconcerned about making a type I error ($\alpha = 1$).