Journal of International Money and Finance 43 (2014) 155–166

Contents lists available at ScienceDirect

Journal of International Money and Finance

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

Gauging exchange rate targeting☆

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Jel classification:
F4

Keywords:
Exchange rates
Exchange rate management
Monetary policy rule
Inflation targeting
Exchange rate regimes
Exchange rate classification
Factor instrumental variables
Data-rich estimation

A B S T R A C T

In this paper, we examine whether a monetary authority targets the exchange rate, *per se*, or instead simply appears to do so as it responds to the exchange rate and other variables in service to inflation and output targets. We combine data-rich estimation with a system of forward-looking equations in order to disentangle the possibilities. The combined approach reveals the potentially misleading nature of standard estimates of the extent of exchange rate and inflation targeting. We illustrate the approach by applying it to two *de jure* inflation targetters, Canada and Korea. In contrast to standard methods and much past work, we find that neither country targets its exchange rate; and, both are *bona fide* inflation targetters.

1. Introduction

In an open economy, a monetary authority may respond to exchange rate changes and other related variables in order to insulate their effects on inflation and on economic growth. In this type of monetary policy, a response to the exchange rate is incidental to standard price and output targets. Such a policy differs fundamentally from a policy of exchange rate targeting (sometimes pejoratively referred to as exchange rate manipulation), where the monetary authority responds independently to changes

☆ The authors thank Yin-Wong Cheung, Menzie Chinn, David Cook, Bob McCauley, Marcus Miller, and Anella Munro for their insights; Richard Tsay and Kenneth Chow for careful data collection; and the Hong Kong Institute for Monetary Research, the Financial Markets Research Center, and the Leavey School of Business for research support. We also appreciate the comments of three anonymous referees and of seminar participants at the Bank of England, the Federal Reserve Bank of San Francisco, the Hong Kong Institute for Monetary Research, the South African Reserve Bank, Stellenbosch University, the University of Cape Town, and the Hong Kong University of Science and Technology.

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http://dx.doi.org/10.1016/j.jimonfin.2014.01.002

in the exchange rate itself.[1] This paper provides an approach to help distinguish between the two types of policies. Specifically, the paper combines data-rich estimation with a system of forward-looking equations characterizing a small open economy. The combination addresses the simultaneity and informational shortcomings that plague many policy assessments. To our knowledge, this paper is the first to extend the data-rich approach to the analysis of monetary policy in an open economy framework. The paper demonstrates the usefulness of the data-rich approach and clarifies the role of the exchange rate in the monetary policy rule. In doing so, it allows for a more accurate assessment of the extent of exchange rate targeting.

The paper builds on the work of Calvo and Reinhart (2002), Reinhart and Rogoff (2004), Levy-Yeyati and Sturzenegger (2005), Ilzetzki et al. (2008), and others who provide measures of countries' *de facto* exchange rate arrangements. These papers classify exchange rate arrangements using indicators such as exchange rate variability and monetary aggregates. Like these papers, ours is concerned with discerning a country's *de facto* arrangement.[2] What we do differently from these papers is that we assess the role of the exchange rate in the conduct of monetary policy itself. Once an economy opens its capital markets, exchange rate policy and monetary policy merge.[3] To discern the exchange rate arrangement, one must examine the behavior of monetary policy.[4] Thus, our focus is on the monetary authority's policy rule.

Our emphasis on monetary policy follows Shambaugh (2004), Ball and Reyes (2004, 2008), and Lubik and Schorfheide (2007). These papers all explicitly consider the conduct of monetary policy in their assessments of exchange rate arrangements. However, Shambaugh's classification ultimately depends on the behavior of the exchange rate exclusively; and Ball and Reyes focus on the monetary rule exclusively. Our work is closest to that of Lubik and Schorfheide, who examine the importance of the exchange rate in monetary policy in the context of a small, forward-looking open economy model; and our work builds on theirs by using data-rich estimation.

Bernanke and Boivin (2003) use the term 'data-rich' to describe an environment where relevant information may be contained in thousands of macroeconomic time-series. Econometrically, the challenge is how best to incorporate the information in such large data sets into empirical macroeconomic models consisting of only a few equations. In an important contribution, Stock and Watson (2002) show rigorously that one can reduce the dimensionality of a very large number of time series (large vis-à-vis the number of observations in time) to improve forecasts. They apply principal component analysis to extract just a few factors that summarize the common co-movements from a large macroeconomic dataset. Their factor-model framework makes it possible for an empirical macroeconomic model to incorporate a great deal of information while retaining a blend of variable parsimony and dynamic generality. Moreover, their approach does not require that one be able to precisely specify the correct macroeconomic model. Instead, it only requires that many of the observed series be linked to a smaller number of underlying variables, which themselves needn't even be observable.[5] More recently, Bai and Ng (2010) carefully demonstrate the superiority of the data-rich

[1] Engel (2009) provides a recent theoretical argument for managing the exchange rate in the presence of observed law of one price deviations. Other rationales sometimes given for a *de facto* policy of exchange rate management include concerns about the relative condition of the economy's traded sector, related concerns about export-led growth, and concerns about financial stability.

[2] Frankel et al. (2001) and Popper et al. (2013) also look at *de facto* arrangements. However, rather than providing measures of exchange rate arrangements, the work of Frankel, Fajnzylber, Schmukler, and Servén is intended to use exchange rate behavior to examine the verifiability of the *de jure* arrangements; while Popper, Mandilaras, and Bird characterize exchange rate arrangements in terms of archetypes within the international macroeconomic trilemma.

[3] Exchange rate controversies often go hand in hand with foreign reserve concerns. Here, we focus on settings with open capital markets where the scope for successful foreign exchange intervention is diminished.

[4] While our approach has the advantage of a more general treatment of a country's exchange rate arrangement, it offers a complement, not a substitute for these earlier approaches that rely on a narrow range of indicators. Classifications that are tied to just a handful of indicators can be used to gauge policy changes as those indicators change. In contrast, our approach relies on estimation, so it requires that policy remain in place long enough to be estimated. The data-rich technique can make the task easier by allowing for estimation using data series of different lengths, but estimation nevertheless requires time.

[5] The requirement that the observed series be linked to a smaller number of underlying potentially unobservable variables is arguably met by all standard macroeconomic models.