International Review of Economics and Finance 25 (2013) 202–218

Contents lists available at SciVerse ScienceDirect

International Review of Economics and Finance

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

Exchange rate misalignment and inflation rate persistence: Evidence from Latin American countries

Nikolaos Giannellis [a,*], Minoas Koukouritakis [b]

[a] Department of Economics, University of Ioannina, 45110 Ioannina, Greece
[b] Department of Economics, University of Crete, 74100 Rethymno, Greece

ARTICLE INFO

Article history:
Received 27 October 2011
Received in revised form 15 July 2012
Accepted 16 July 2012
Available online 23 July 2012

JEL classifications:
E42
F31
F41

Keywords:
CHEER
Misalignment rate
Structural shifts
Non linear two-regime unit root test
Inflation persistence

ABSTRACT

This paper tests the conjecture that inflation rate persistence in selected Latin American countries, namely Brazil, Mexico, Uruguay and Venezuela, is related with currency undervaluation. In this manner, we expect that the behaviour of inflation rates may be non linear reflecting the changing status of the exchange rate. By modelling an appropriate non linear model, we find no strong evidence in favour of the above commonly accepted view. However, our evidence shows that in periods of high depreciation of the home currency the domestic inflation rate was persistent, while in periods of slower depreciation, or relative stability, it was transitory.

1. Introduction

Since the exchange rate links the domestic economy with the rest of the world, it looks sensible that any country seeks the equilibrium level of the exchange rate or, at least, aims to lead the exchange rate to the desired level according to its policy objectives. Based on this, a well-known view in international macroeconomics states that a misaligned exchange rate provokes costs to the domestic economy: an overvalued currency may cause competitiveness loss in international trade, while an undervalued currency may cause inflationary pressures. The latter is stronger in high inflation countries, such as the Latin American countries, which face too high and persistent inflation.

A number of studies attempted to estimate the equilibrium exchange rate for Latin American countries. In brief, Buchs (2005) argues that the real effective exchange rate of the Brazilian "real" was slightly overvalued; while Paiva (2006) states that the "real" appreciation was an equilibrium phenomenon. Su, Tsangyao, and Chang (2011) show that PPP is valid only for four Latin American countries, thereby implying that the majority of the exchange rates, in Latin America, do not follow an equilibrium process. Similarly, Aflouk, Jeang, and Saadaoui (2010) studied the presence of exchange rate misalignments in the case of emerging countries and found that exchange rate misalignments are higher in Latin American countries. Specifically, they found that Argentina, Chile and Uruguay face an undervalued currency, while Mexico's exchange rate is close to equilibrium.

* Corresponding author at: Department of Economics, University Campus, 45110 Ioannina, Greece. Tel.: +30 2651005028; fax: +30 2651005092.
E-mail address: ngianel@cc.uoi.gr (N. Giannellis).

1059-0560/$ – see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.iref.2012.07.013

The main aim of this paper is to test the conjecture that inflation rate persistence in selected Latin American countries, namely Brazil, Mexico, Uruguay and Venezuela, is related with exchange rate misalignment.[1] According to this conjecture, if the source of inflation rate is mainly external, domestic inflation rates are expected to be persistent in periods of high undervaluation rates of the home currency, while they are expected to be transitory when exchange rates follow an equilibrium process. Next, there is theoretical and empirical evidence in the literature that inflation persistence is linked with exchange rate regimes (Dornbusch, 1982; Obstfeld, 1995). On the other hand, Burdekin and Siklos (1999) and Bleaney (2001) found no evidence supporting the view that the degree of persistence varies significantly across regimes. Furthermore, Bleaney and Francisco (2005), studying a large set of developing countries, including Brazil, Mexico, Uruguay and Venezuela, have found that inflation persistence is low in countries with hard pegs, but there is no significant difference between floating and soft pegs.

Thus, we expect that the behaviour of domestic inflation rates may be non linear reflecting the changing status of the home currency relative to the foreign one. There is evidence in the literature that inflation rates of Latin American countries are high and persistent (see among others, Ramos-Francia & Torres, 2008; De Mello & Moccero, 2011). However, the empirical studies have not taken into account that inflation rates may follow a non linear process instead of a linear one. In this study, we mainly focus on the non linear characteristics of national inflation rates and we attempt to explain this behaviour in correspondence with exchange rate developments.[2] We follow a two-step procedure. First, we estimate the equilibrium exchange rate of the selected countries against the US dollar in order to find if the home currency is considered as misaligned (undervalued or overvalued). Second, we test whether inflation rates are persistent or transitory and, most importantly, we test whether any status switching (i.e. from persistent to transitory inflation rates and vice-versa) coincides with specific exchange rate movements.

The theoretical model used in this analysis is the Capital Enhanced Equilibrium Exchange Rate (CHEER) model, which is a joint structure of the Purchasing Power Parity (PPP) and the Uncovered Interest Parity (UIP) conditions.[3] The key idea of the model is that the real exchange rate may be away from its equilibrium value due to non-zero interest rate differentials. In other words, while the PPP model may fail to explain long-run exchange rate movements, these may be explained by movements in interest rate differentials.[4] Regarding the econometric tools, the emergence of structural changes in these economies dictates the use of cointegration techniques that take into account the presence of structural breaks (Johansen, Mosconi, & Nielsen, 2000 and Lütkepohl and his associates in several papers noted below). Finally, the stationary nature of national inflation rates is tested by a two-regime threshold autoregressive (TAR) unit root test, originally developed by Caner and Hansen (2001), so that any non linear behaviour of these series is captured.

This paper contributes to the literature by a number of ways. First, although the CHEER model has been employed by an adequate number of recent studies, these studies have not presented any estimate of the equilibrium value for any exchange rate. They have focused only on the existence of two long run relationships among the variables of interest and the non rejection of the restrictions that confirm the validity of the model (see among others, Juselius & MacDonald, 2004; Kęblowski & Welfe, 2010; Koukouritakis, 2012). To the best of our knowledge, the present paper is the first to present an estimate of equilibrium exchange rate along the lines of the CHEER methodology. Secondly, we use state-of-the-art time series econometric techniques. Since the possibility of emergence of significant structural breaks is high, we employ more recent and powerful cointegration techniques which allow the presence of breaks. Next, we employ a recent non linear two-regime unit root test to investigate whether national inflation rates are persistent or transitory in the long run. The latter test allows us, in the presence of non linear behaviour, to discriminate between pure and partial persistence. Pure persistence exists when the series exhibits a random walk process across both regimes, while partial persistence exists when the series behaves like a unit root in one regime and like a stationary process in the other. Finally, this paper is shown to be the first in the literature, which aims to test whether inflation rate persists and to what extent this behaviour is regime-dependent. This is done by providing an estimate of the equilibrium exchange rate, on the one hand, and investigating, based on a two-regime unit root test, whether inflation rates are persistent, on the other. Combining the above, we are able to find out whether any exchange rate status switching coincides with the non linear behaviour of the inflation rate.

Briefly, our results show no strong evidence in favour of the idea that inflation rates in the selected countries are persistent only in periods of home currency undervaluation. The currency status (i.e. undervaluation or overvaluation) cannot alone explain

[1] We focus on Latin American countries because they have experienced large currency devaluations and hyperinflationary pressures. However, in the presence of extraordinary currency instability, our theoretical model may not be valid (see, Li, 2007). Hence, this selection has been even shortened to Brazil, Mexico, Uruguay and Venezuela because they have experienced relatively less unstable exchange rate regimes (see, Yang-Cheng & Tsangyao, 2011).

[2] The economic intuition behind this statement is that the inflation rate may behave non-monotonically in front of different exchange rate developments. Apart from the main conjecture, which states that the switching status of the home currency may alter inflation's behaviour, the exchange rate pass-through literature also implies that domestic inflation rates respond asymmetrically to currency appreciation or depreciation.

[3] In general, most of the studies that investigate empirically the CHEER approach have been focused on developed countries (see for example, Juselius & MacDonald, 2004). Recently, however, there is an increasing interest on the application of this methodology on emerging countries as well (see for example, Kęblowski & Welfe, 2010; Koukouritakis, 2012). This is related to the abolishment of trade and capital controls in developing countries, which leads to the establishment of the PPP and UIP conditions. This is also true for the Latin American countries under examination. Based on (a) the evidence in the literature in favour of the PPP hypothesis (see for example, Mollick, 1999; Wu, Cheng, & Hou, 2011) and (b) the establishment of the UIP condition after the financial liberalisation in Latin America (see for example, Flood & Rose, 2002; Carvalho, Sachsida, & Loureiro, 2004) we are able to consider the CHEER approach as valid for the estimation of the equilibrium value of the exchange rates under investigation.

[4] Note also that one should argue that PPP is more easily accepted in high inflation countries. However, the presence of a high inflation rate is not a guarantee that PPP will eventually hold. For example, Su et al. (2011) find that PPP is valid only for a limited number of Latin American countries. Therefore, there is room for applying the CHEER approach, whose main philosophy is that these conditions are more easily identified when considered jointly. Nonetheless, the present paper is the first to apply the CHEER model to Latin American countries.