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New evidence on the monetary approach of exchange rate determination in Mexico 1994–2007: A cointegrated SVAR model

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We provide empirical evidence supporting the validity of both short and long run versions of the Monetary Approach of Exchange Rate determination for the Mexican peso–U.S. dollar exchange rate from 1994 to 2007 using a cointegrated SVAR model. We estimate not only the long-run relationship, between the variables of the monetary model for the exchange rate, but also the very short run effects which have been often ignored in previous empirical work. We show that there are robust short and long-run relationships between the Mexican monetary aggregates and the exchange rate, which ultimately responds to what Bilson's variant of MAER predicts.

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1. Introduction

Exchange rates have had a strong influence on economic growth and development during and after the post Bretton–Woods era. In the last three decades a number of dramatic episodes have confirmed the importance of exchange rate dynamics for the maintenance of economic stability in the context of worldwide trade and financial liberalization: the depreciation of Latin American currencies in the eighties, the exchange rate crises in England and Spain in the nineties, the 1994 economic crisis in

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Mexico, the collapse of the currency board in Argentina, and the alternate depreciation–appreciation of the U.S. dollar versus the euro, for the last two years.

Empirical research on exchange rate economics has been growing exponentially. This trend may be attributed to the huge concerns about the collapse of the Bretton–Woods system, and to the necessity for determining the impact of exchange rates on the economic performance of nations under the current economic circumstances. From an empirical point of view, the behavior of flexible exchange rates and their well-known intractability is a strong incentive for scholars to launch inquiries about the empirical determination of exchange rates now and in the future.

An important issue in this research field has been determining a reliable set of fundamental macroeconomic and microeconomic variables affecting the behavior of exchange rates (Taylor, 1995). There are a number of variables that determine exchange rates. A classical variant of the monetary approach of exchange rate (MAER), suggested by Bilson (1978), uses the log differences between foreign and domestic outputs, interest rates, and monetary aggregates as a reliable set of explanatory variables (fundamentals). According to such variant of MAER, any misalignment or widening of such spreads must be clearly reflected in the dynamics of the spot rate. This approach has been empirically tested for both developed and developing economies (Hallwood and MacDonald, 2000; Chin et al., 2007). However, such studies have used Johansen's cointegration method (1990) to show that a long-run relationship exists between the variables of the monetary model but very few articles raise the question whether MAER also holds in the short run. For our knowledge there are not many studies analyzing both the short and the long run validity of MAER simultaneously in an innovative way by combining short and long run properties of the data. Therefore, the objective of this article is to fill this gap by looking for new and reliable empirical evidence supporting the short and long run validity of MAER for the Mexican peso–USD spot exchange rate. Specifically, we make use of the SVAR methodology, in the presence of non-stationary variables to look for robust evidence about the validity of this approach during the explicit floating period (1994.04–2007.04).¹ A cointegrated SVAR model is an appropriate technique in this context, since it allows us to estimate the instantaneous correlations (very short run) between exchange rates and fundamentals while taking into account the existent long-run exchange rate equation in the estimation procedure.

Our empirical results show that in estimating the SVAR model we find short run consistent contemporaneous coefficient signs and impulse responses as in MAER and we are able to estimate a stable long run equation, which is consistent with the monetary model of exchange rate determination.

This article is organized as follows. In the second section we present the MAER fundamentals. The third section summarizes some recent empirical findings on the validity of the monetary approach for several countries. In the fourth section, we discuss econometric issues and briefly describe the SVAR methodology used to estimate the responses of Mexico's currency to shocks in the fundamentals. In the fifth section we analyze the evolution of the nominal exchange rate in Mexico according to different regimes. Afterwards, we report our main empirical findings and link them to the stylized facts of the Mexican economy. Finally, we briefly discuss our empirical results and some policy implications.

2. The monetary approach of exchange rate determination (MAER)

The MAER model (Hallwood and MacDonald, 2000; Taylor, 1995) can be seen as an extension of the PPP hypothesis since it attaches the monetarist theory of price determination to the former in order to explain nominal exchange rate fluctuations. Movements in money aggregates determine prices, and therefore, the nominal exchange rate.

¹ After deliberations we decided to end the analysis in 2007 due to the worldwide turmoil that started afterwards and could seriously affect the analysis. We split the time span estimation due to a recommendation of an anonymous referee. First, we obtain estimates for the exchange rate behavior from 1985.01 to 2007.04 where the nominal exchange rate depreciated by approximately 5400%. Second, we estimated the model for the flexible exchange rate period 1995.01 onwards. The results are robust to sample changes. Estimates are available upon request.

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