



Free float and stochastic volatility: the experience of a small open economy

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Abstract

Following a dramatic collapse of a fixed exchange rate based inflation stabilization program, Turkey moved into a free floating exchange rate system in February 2001. In this paper, an asymmetric stochastic volatility model of the foreign exchange rate in Turkey is estimated for the floating period. It is shown that there is a positive relation between the exchange return and its volatility. Particularly, an increase in the return at time t results in an increase in volatility at time $t + 1$. However, the effect is asymmetric: a decrease in the exchange rate return at time t causes a relatively less decrease in volatility at time $t + 1$. The results imply that a central bank with a volatility smoothing policy would be biased in viewing the shocks to the exchange rate in favor of appreciation. The bias would increase if the bank is also following an inflation targeting policy.

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1. Introduction

Following a dramatic collapse of an IMF backed, fixed exchange rate based inflation stabilization program, Turkey moved into a free floating exchange rate system in February 2001. Since then, the Central Bank of Turkey has insisted that the monetary authority would stick with the floating exchange rate regime and pursue an implicit inflation targeting policy by controlling the monetary aggregates along with an indicative interest rate. The Central Bank has asserted several times that the level or the direction

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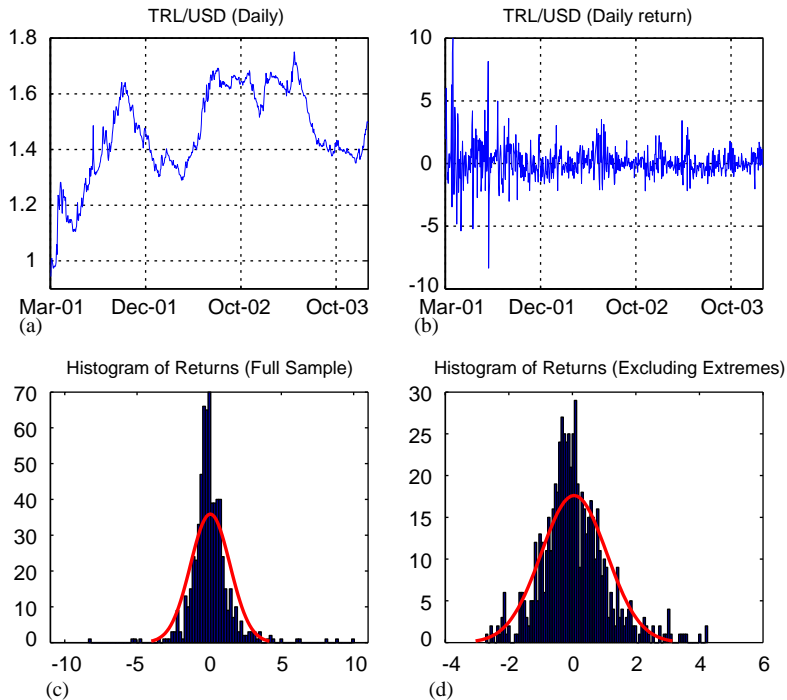


Fig. 1. TRL/USD daily exchange rate during the floating exchange rate regime in Turkey. (a) The level (in million TRL). (b) Continuously compounded daily return of TRL/USD (percent) (c) Histogram of daily returns. (d) Histogram of daily returns excluding 1% of extremes from both tails. Sample period: March 12, 2001–October 30, 2003, covering 667 business days. Data source: the Central Bank of Turkey.

of nominal exchange rates has not been a target but the volatility of the exchange rate is a real concern (CBT [1]).

At the beginning of the float period, the daily change in exchange rate fluctuated wildly. The Central Bank's policies on the one hand and the developments in the supply side of the exchange rate market along with favorable external factors on the other hand resulted in a decrease in volatility and the exchange rate is relatively stabilized (see Fig. 1).¹ The initial sharp real depreciation of the Turkish Lira (TRL) against major currencies was reversed later and the real appreciation reached to record levels, especially during the first three quarters of 2003. According to the real effective exchange rate index of the Central Bank, the overall real appreciation between February 2001 and September 2003 is 44%.

Substantial appreciation of TRL can be explained to a certain extent by a sharp increase in labor productivity and a fall in real wages during the same period. The labor productivity in the private manufacturing industry went up 12% between the last

¹ See, Selçuk [2] and references therein for a detailed account of the developments in the Turkish economy during the floating exchange rate period of February 2001–August 2003.

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