Short communication

A note on the effects of monetary policy surprises on the Brazilian term structure of interest rates

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Abstract

This paper examines the information content of COPOM decisions by estimating the responses of the term structure to changes in target short-term interest rates on COPOM meeting days. Within an event-study approach empirical evidence suggests that the introduction of the floating exchange rate and the inflation targeting (IT) regime have had a dampening effect on interest rate surprises along the term structure.

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1. Introduction

In this note the influence of monetary policy on the term structure of interest rates is examined by estimating the effect of changes in the target short-term interest rate in Brazilian Monetary Policy Committee’s (COPOM) meeting days.

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1 The opinions expressed in this note do not reflect necessarily those of the Central Bank of Brazil or its staff.

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There is a voluminous empirical literature examining this issue for the Fed funds rate such as Cook and Hahn (1989), Reinhart and Simin (1997), and Roley and Sellon (1995, 1998a, 1998b). Furthermore, Haldane and Read (2000) and Hardy (1996) analyze the market reaction to changes in official interest rates for different countries such as the UK and Germany.

We are not aware of previous studies that have focused on the effects of changes in the target interest rate in COPOM meeting days on the term structure of interest rates for the Brazilian market. Yet, the study of the response of market interest rates to changes in target official rates may give additional insights in the transmission channels of monetary policy as shocks to target interest rates, which should be able to change the entire spectrum of short and long-term market interest rates.

Cook and Hahn (1989) were pioneers in this literature. They found evidence of strong response of short-term market interest rates and small response of long-term interest rates to changes in the Fed funds rate in the 1970s. Following this seminal paper, most of the literature has focused on the US market.

The note is structured as follows. In Section 2 we present the data and methodology that will be used. Section 3 shows the empirical responses of the Brazilian term structure of interest rates to changes in the COPOM’s short-term interest rate. Section 4 concludes the note.

2. Data and methodology

The main data used consist of spot interest rates for maturities 1, 2, 3, 6, and 12 months and the official target interest rate.

The Expectation Hypothesis (EH) can motivate the influence of changes in the short-term interest rates (target interest rate) on long-term market interest rates. From the EH it is known that monetary policy affects indirectly long-term interest rates as it influences current and expected short-term rates. Additionally, the response of long-term rates in changes in short-term interest rate should depend on the expected persistence of changes in the target.

In this note we follow along the line of Cook and Hahn (1989), which examined the 1 day response of bond rates to changes in the target Fed funds rates using the following regression

\[ \Delta R_t = \alpha + \beta \Delta \text{Target}_t + \epsilon_t \]  

(1)

where \( \Delta R_t \) stands for changes in market interest rates and \( \Delta \text{Target}_t \) for changes in the Fed funds target rate. The parameter \( \beta \) measures the mean interest rate surprise for any given maturity. If official target rate changes were fully anticipated then this coefficient should be equal to zero.

Monetary policy has had a significant change in 1999 in Brazil, with the introduction of both a floating exchange (after many years with a crawling-peg exchange rate regime) and an inflation targeting (IT) regime a few months later. For that reason we add a dummy variable for the change in the exchange rate regime that gives
Table 1
One-day response of market interest rates to changes in target interest rates

<table>
<thead>
<tr>
<th>Maturity (months)</th>
<th>Intercept</th>
<th>Response IT response</th>
<th>$R^2$ (%)</th>
<th>SE</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1033 (0.1166)</td>
<td>0.3462* (0.1193)</td>
<td>-0.3467* (0.1196)</td>
<td>55.44</td>
<td>0.9550</td>
</tr>
<tr>
<td>2</td>
<td>-0.0350 (0.1035)</td>
<td>0.2210* (0.0441)</td>
<td>-0.2684* (0.0458)</td>
<td>40.37</td>
<td>0.8391</td>
</tr>
<tr>
<td>3</td>
<td>-0.0776 (0.1150)</td>
<td>0.1906* (0.0309)</td>
<td>-0.2621* (0.0334)</td>
<td>31.20</td>
<td>0.9211</td>
</tr>
<tr>
<td>6</td>
<td>-0.0766 (0.1162)</td>
<td>0.1490* (0.0236)</td>
<td>-0.2562* (0.0287)</td>
<td>29.13</td>
<td>0.8919</td>
</tr>
<tr>
<td>12</td>
<td>-0.0763 (0.1091)</td>
<td>0.1020* (0.0236)</td>
<td>-0.2192* (0.0307)</td>
<td>22.03</td>
<td>0.9185</td>
</tr>
</tbody>
</table>

Newey–West (1987) standard errors are given in parentheses. The sample contains 54 months with changes and no changes in short-term interest rate (target) from 26th June 1996 to 14th February 2001.

* Significant at the 1% level.

In this case $\beta_2$ measures the effect of the introduction of the floating exchange regime and the IT regime.

3. Empirical results

In Table 1 we present results for regressions given in Eq. (1).

The results shown in Table 1 are in line with the findings of Haldane and Read (2000). The introduction of the floating exchange rate and IT regime has had a dampening effect on interest rate surprises in Brazil, as the coefficient for the dummy variable is negative for all maturities.

We also performed Wald tests for the joint restriction on both coefficients $\beta_1$ and $\beta_2 = 0$, if there is a significant effect from the IT framework then the sum of these coefficients should be statistically distinguishable from zero. As we can see from Table 2 this seems to be the case for all maturities except for the 1-month interest rate.

2 These results must be looked with caution. The central bank has changed both its instruments and its goals with the introduction of the floating exchange rate and IT regime. Before the recent float the main goal was to protect the currency from speculative attacks and therefore, in the awakening of the Asian crisis and Russian crisis interest rates were doubled to stop capital outflows and ease pressures on the domestic currency. Furthermore, in the beginning of 1999 the central bank changed the target instrument for monetary policy purposes. The Basic interest rate (Taxa Básica de Juros; TBC) was extinct and the Selic was elected as the new instrument. Therefore, we should expect to have a significant change in the effect on these targets on long-term interest rates. However, if the IT and the floating exchange rate regime are credible then there should be a dampening effect. This can be tested by estimating the coefficient on the dummy in Eq. (2) and analyzing it’s sign.

3 As we have mentioned before, these results are indicative rather than conclusive.
Table 2
Wald tests (H0: \( \beta_1 + \beta_2 = 0 \))

<table>
<thead>
<tr>
<th>Maturity (month)</th>
<th>( \chi^2 )-Statistic</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0039</td>
<td>0.9499</td>
</tr>
<tr>
<td>2</td>
<td>24.18</td>
<td>0.0000</td>
</tr>
<tr>
<td>3</td>
<td>47.07</td>
<td>0.0000</td>
</tr>
<tr>
<td>6</td>
<td>54.09</td>
<td>0.0000</td>
</tr>
<tr>
<td>12</td>
<td>41.57</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

This dampening effect that was found in this note could be due to the greater transparency that is associated to the IT framework. Another reason is that under a fixed exchange rate regime all decisions from COPOM’s meeting should be reflected in interest rates as the impact on the exchange rate was blocked, while with a floating exchange rate regime the exchange rate can absorb part of surprises and thus the impact on interest rates could be reduced.

4. Final considerations

Empirical evidence indicates that the adoption of the IT framework with a floating exchange rate has had a dampening effect on interest rate surprises along the term structure, which could be explained by a greater transparency of the conduct of monetary policy after the adoption of the IT. This transparency effect can be seen as one of the main benefits of the IT framework. The introduction of the IT framework has improved substantially expectations in a period where agents in the economy were much concerned with the prospects of future inflation, after a 5-year period with low inflation4. Another explanation that fits the encountered findings, at least partially, in this note is that with the introduction of a flexible exchange rate regime, part of the external shocks in short-term interest rates could be absorbed by the exchange rate.

Some extensions are suggested for further research. The first would be to perform these tests with a higher frequency and check whether the term structure responds differently in different positions in the Business Cycle. Another extension would be to use interest rates future contracts to extract market expectations on target rate changes and perform the regressions using anticipated and non-anticipated monetary policy actions. Furthermore, the sample could be extended as more data becomes available to test the robustness of the results.

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4 If compared to other countries that suffered exchange rate crisis in a recent period, Brazil has recovered quite fast. This is attributed mainly to the success of the implementation of the IT framework and the flexibilization of the exchange rate.
References


