



# Monetary policy channels in Brazil through the lens of a semi-structural model<sup>☆</sup>

André Minella<sup>\*</sup>, Nelson F. Souza-Sobrinho

Research Department, Central Bank of Brazil, SBS, Quadra 3, Bloco B, Edifício-Sede, Banco Central, 70074-900, Brasília, DF, Brazil

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## ABSTRACT

We develop and estimate a medium-sized, semi-structural model for the Brazilian economy during the inflation targeting period. The model describes fairly well key features of the economy and allows us to decompose the transmission mechanism of monetary policy. In the baseline decomposition, the transmission mechanism is broken down into *household interest rate*, *firm interest rate*, and *exchange rate channels*. In addition, we carry out an alternative decomposition that allows us to evaluate the *expectations channel* as well. In both procedures, the household interest rate channel is the most important for explaining the response of output to a monetary policy shock. In the baseline decomposition of inflation, both the household interest rate and the exchange rate channels are the main transmission channels. However, in the alternative decomposition, the expectations channel accounts for the bulk of the inflation response.

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## 1. Introduction

We still lack a good understanding of the monetary policy transmission mechanism in emerging market economies, especially if we compare it with what we know about developed countries.<sup>1</sup> This paper attempts to fill in this gap by identifying and measuring the relevant monetary policy transmission channels in Brazil during the inflation targeting regime.

Throughout the 1980s and early 1990s, Brazil experienced high inflation and macroeconomic instability. During those years, the transmission channels worked very poorly, and as a result monetary policy was unable to ensure its effectiveness. The end of high inflation in 1994 (Lopes, 1998) and the shift to a floating exchange rate regime and inflation targeting in 1999 were major changes that helped to

restore the transmission channels. Yet, until recently any attempt to better identify these channels was restricted by the small sample size.

However, as the data span grew larger and better identification tools were developed, it became possible to conduct a thorough analysis of the monetary transmission mechanism in countries like Brazil.<sup>2</sup> In this paper, we use nine years of data (1999–2008), which is a fairly large amount of information relative to what we had a few years ago. Furthermore, we rely on the methodology of Altissimo et al. (2002), henceforth ALS, for identifying and measuring the transmission channels. Based on the work of Mauskopf and Siviero (1994), ALS proposed a fairly general approach for decomposing the overall response of an economic model to a shock into the contributions associated with its distinct channels. In the case of linear models, the channel decomposition is exact because the sum of the individual effects that transit through each channel exactly equals the overall effect. Since the mid-1990s many researchers and central banks – including BIS (1995), van Els et al. (2001), and McAdam and Morgan (2001) – have used this approach to quantify the transmission channels of monetary policy.

We proceed in two steps to decompose the monetary policy channels. First, we develop and estimate a medium-sized, semi-structural model that describes fairly well key features of the Brazilian economy, in particular of the transmission mechanism in place. Although not derived from first principles, in many aspects the model resembles reduced-form versions of the current generation of dynamic stochastic general equilibrium (DSGE) models with new Keynesian features. In particular, the model allows agents' expectations and financial variables

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<sup>\*</sup> Corresponding author. Tel.: +55 61 3414 3653; fax: +55 61 3414 3913.  
E-mail addresses: [andre.minella@bcb.gov.br](mailto:andre.minella@bcb.gov.br) (A. Minella), [nelson.souza@bcb.gov.br](mailto:nelson.souza@bcb.gov.br), [nelson.sobrinho@ibmecd.f.br](mailto:nelson.sobrinho@ibmecd.f.br) (N.F. Souza-Sobrinho).

<sup>1</sup> A classical review of the transmission mechanism in mature economies is provided by Mishkin (1995). The main transmission channels include not only the traditional interest rate channel, highlighted by Taylor (1995), but also the credit channel (Bernanke and Gertler, 1995), the exchange rate channel in the case of open economies (Obstfeld and Rogoff, 1995), and asset price channels in the case of financially developed economies (Meltzer, 1995).

<sup>2</sup> For other developing countries, see BIS (1998) and BIS (2008). However, these studies are either qualitative or incapable of providing precise measures of the various monetary policy channels, as we do in this paper.

to play an important role in the economy's dynamics. In the second step, we apply ALS' methodology to decompose the overall transmission mechanism into three distinct operating channels.

The first one is the *household interest rate channel*, which propagates monetary policy shocks to the household lending rate and from this to household consumption. The second is the *firm interest rate channel*, which captures the effects on firms' external financing costs, and hence on investment. Together, these two channels comprise the traditional *interest rate channel*. The third is the *exchange rate channel*, which

captures – via an uncovered interest parity (UIP) condition – the effects of monetary policy shocks on the real exchange rate and then the resulting effects on the marginal cost of production and on net exports. Since expectations play an important role in the model, we also evaluate what we call the *expectations channel*, which measures the effects of monetary policy shocks via changes in inflation expectations.

When we do not explicitly identify the expectations channel, the main results of the decomposition are as follows. The household interest rate channel accounts for 62% of the fall in output one year after a monetary

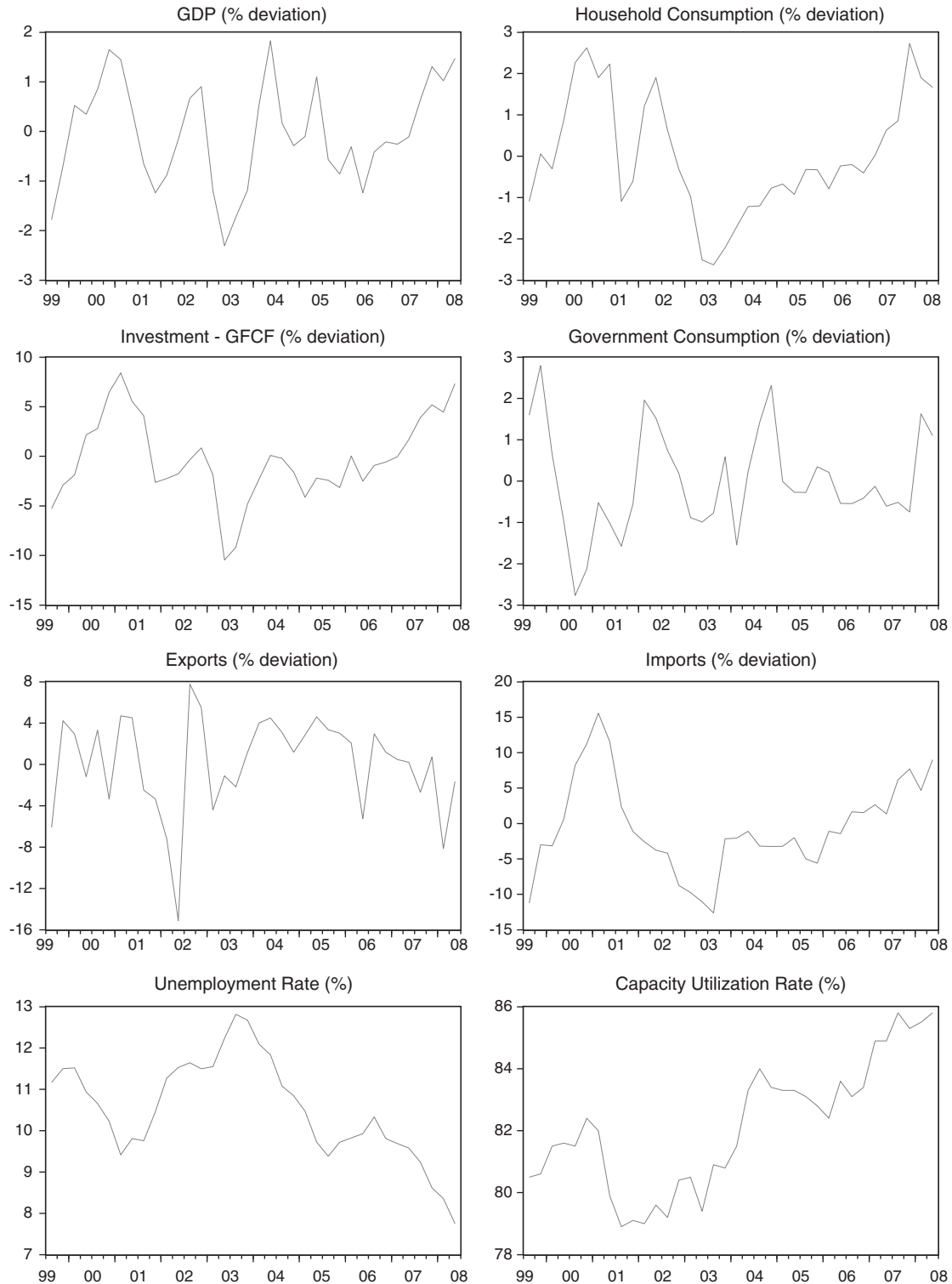


Fig. 1. Data series.

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