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Credibility and monetary transmission channels under inflation targeting: An econometric analysis from a developing country

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After more than two decades of inflation targeting in the world, it is important to evaluate if the adoption of this regime in a relevant developing country contributed to the creation of a better environment for the process of entrepreneurs' expectations formation. Brazil is part of an important group of developing countries (BRIC — Brazil, Russia, India and China) and represents a potential laboratory experiment in which the effects of an adoption of inflation targeting after more than a decade can be evaluated. Not enough is known about the consequences of inflation targeting credibility on both monetary policy and monetary policy transmission channels in developing countries that adopted inflation targeting. Hence, the paper analyzes the effects of credibility on the conduct of monetary policy, and the transmission channels through which monetary policy affect the economy. The study found that inflation targeting has represented an important strategy for the achievement of a more stable macroeconomic environment, which has been of great importance to investments and employment creation. Besides, the study found the following novelties: inflation targeting credibility positively affects entrepreneurs' expectations, expectations of entrepreneurs affect investment decisions and employment creation and the expectations of entrepreneurs are affected by the traditional transmission channels.

1. Introduction

At the start of 2011, 27 central banks were considered fully fledged inflation targeters, and several others were in the process of establishing a full inflation-targeting (Hammond, 2011). The explicit purpose of inflation targeting is to ensure an environment of low and stable inflation and to serve as a nominal anchor for the process of expectations formation. In this regime, the way to conduct monetary policy (more aggressively or more smoothly) is closely related to the credibility of the regime, i.e., to the power of the nominal anchor. The belief in the capacity of the regime to anchor inflation expectations is important because a higher credibility requires smaller changes in interest rates to control inflation, thereby giving rise to minor variations also on employment and output. Thus, it is expected that a high credibility is associated with a lower volatility of the interest rate for the achievement of the inflation target, and as a consequence, with a lower volatility of both output and employment.

Monetary policy does not directly affect the performance of macroeconomic variables such as employment, output and inflation. Until the macroeconomic performance is affected, monetary policy acts first on the decisions of economic agents and through different transmission channels. There is a vast literature studying the monetary transmission mechanism for different countries. Based on many studies assessing monetary transmission of developed countries (e.g., Christiano et al., 1999; Peersman and Smets, 2003) some consensus of how the monetary transmission mechanism works has been reached regarding these developed countries.

However, not enough is known about the consequences of inflation targeting credibility on both monetary policy and the transmission of monetary policy to the economy in developing countries that adopted inflation targeting. In this sense, some important questions are raised. Does this consensus view on the monetary transmission mechanism hold for a developing country (even under inflation targeting)? Is credibility important for creating a more stable macroeconomic environment, able to enhance monetary policy effectiveness and stimulate investments in the economy? Do the expectations of entrepreneurs play an important role as a transmission channel and are these expectations affected by the other transmission mechanisms?

Therefore, after more than two decades of inflation targeting in the world, it is important to evaluate if the adoption of this regime by a representative developing country contributed to the improvement of credibility and the creation of a better environment for the process of entrepreneurs' expectations formation, investment expenditures and employment creation. Different from other approaches, in this paper it is also analyzed: (i) the influence of credibility on monetary policy, (ii) the influence of the four traditional transmission channels (interest rate, credit, exchange rate and asset prices) on entrepreneurs' expectations, and on

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investments, and (iii) the importance of investments for employment creation.

Regarding developing countries, Brazil is part of an important group – BRIC (Brazil, Russia, India and China) – and represents a potential laboratory experiment in which the effects of an adoption of inflation targeting after more than a decade can be evaluated. Hence, considering the Brazilian experience, this paper estimates the effects of inflation targeting credibility on the conduct of monetary policy through changes in the basic short-term interest rate (Selic), and the transmission channels through which monetary policy can affect investment expenditures and employment.

Hence, the main contribution of this study is the presentation of empirical evidence for the influence of credibility on monetary policy and, as a consequence, for the transmission of monetary policy to the economy through the traditional channels (the interest rate channel, the credit channel, the exchange rate channel, the asset prices channel and the expectations channel), with emphasis on the expectations channel, after the adoption of inflation targeting in Brazil.

For this purpose, the paper is organized as follows. Section 2 presents the relation between credibility and monetary policy conduction and explains how monetary policy affects investment decisions and, as a consequence, the amount of employment on the economy through the monetary policy transmission mechanisms. Section 3 provides empirical evidence about the monetary policy transmission mechanisms for the Brazilian economy, based on impulse response functions through vector autoregression (VAR) and estimates the relations through ordinary least square (OLS) and generalized method of moments (GMM). Section 4 concludes the paper.

2. Credibility and the transmission channels of monetary policy that affect investment and employment

Since the seminal work of Kydland and Prescott (1977), credibility plays a key role in the conduct of monetary policy. According to them, for a monetary policy being considered credible it must follow a rule or a strategy in which the agents will believe that the monetary authority is not going to renege. Hence, a policy is credible when the public believes on the rule/strategy and, through expectations, on the results the monetary authority is attempting to reach.

As expectations are considered an important monetary transmission channel, the lack of credibility may hinder the reach of a certain goal due to expectations being formed in a context of distrust. Under inflation targeting, for example, expectations and credibility are fundamental to the success of monetary policy.

When the inflation target is credible and the monetary authority presents an increased capacity of affecting the public expectation, less effort is necessary to achieve the inflation target. The work of de Mendonça and de Guimarães e Souza (2009) used OLS estimations to test the impact of different credibility indices on the volatility of interest rates. They argued that a credible monetary policy implies less effort by the Central Bank of Brazil for the achievement of the inflation target due to the increased capacity of affecting the public expectation. In this sense, they suggest that a high credibility, ceteris paribus, is associated with a lower volatility of the interest rate for the achievement of the inflation target. Their estimates found, for the Brazilian economy, empirical evidence that confirms the hypothesis that higher credibility implies lower variations in the interest rate for controlling inflation.

According to Calderón et al. (2004), the cyclical properties of macroeconomic policies depend critically on policy credibility. The evidence they found for emerging countries supports that countries with higher credibility are able to conduct countercyclical fiscal and monetary policies.

The gain in credibility is a powerful instrument for reducing inflation without increasing social costs. This is because expectations are more strongly anchored to the inflation target and thus less effort is required by the central bank in terms of changes in interest rate. The work of de Mendonça (2009) found evidence that credibility represented an important element responsible for the disinflationary process in Brazil, after the adoption of inflation targeting.

With minor fluctuations in interest rate, due to greater credibility, investment decisions are taken with greater confidence, leading to a process of employment creation more robust.

The work of de Mendonça and Lima (2011) presents an empirical analysis through Generalized Method of Moments in order to find the macroeconomic determinants of investment under inflation targeting in Brazil. The period covered in the analysis is from January 2000 to September 2009. The work tests the influence of GDP, real interest rate, credit, inflation, exchange rate, public debt and credibility on private investment. According to them, the main idea of the link between credibility and investment is that when credibility is high, the capacity of anchoring inflation expectations improves, as a consequence, the need to increase interest rates to promote inflation stabilization then decreases. In brief, it is expected that there exists a positive relation between credibility and investment. The results suggest that the variables capable of promoting private investment include output, credit, and credibility. In particular, the effect on private investment of an increase in inflation target credibility is positive and has statistical significance. An increase in credibility enhances planning capacity due to lower uncertainty in the economy and concomitant increases in investment. In brief, the success of inflation targeting in the Brazilian economy is an important mechanism to promote private investment, i.e., the work found that successful inflation targeting creates a stable macroeconomic environment that promotes private investment.

Under inflation targeting, the effectiveness of monetary policy depends on the transmission channels of monetary policy. According to Mukherjee and Bhattacharya (2011), the literature to date emphasizes four key transmission channels: the traditional interest rate channel, the credit or loan supply channel, the exchange rate channel, and the asset price channel. However, most of the private economic decisions are taken under uncertainty and, as a consequence, are guided by expectations. Investment decisions, for example, which entrepreneurs have to take, are often based on several expectations concerning different aspects, such as the influence of economic policies and the state of the economy on their business.

Regarding the effect of monetary policy on the economy (Fig. 1), five transmission channels can be recognized: 1) interest rate channel, 2) exchange rate channel, 3) credit channel, 4) asset prices channel, and 5) expectation channel.

Under inflation targeting, changes in the short-term interest rate depends on the credibility of the regime and affect investment decisions (and, as a consequence, employment) through a large set of variables, including the real cost of capital, availability of bank credit, the exchange rate, wealth and expectations.

The traditional interest rate channel derives from standard Keynesian theory. The basic assumption is that prices are sticky and adjust to a monetary shock with a delay. Thus adjustments to the short-term nominal policy interest rate lead to changes in the short-term real interest rate. Movements in real interest rates in turn influence the decisions of economic agents. More specifically, changes in the cost of capital affect the investment decision of firms. Thus, it is expected that when the real interest rate increases the cost of capital is raised, which decreases investments. Besides, when the real interest rate increases and turns more volatile, expectations of entrepreneurs deteriorate, postponing investment decisions.

The study of Minella and Souza-Sobrinho (2009) developed, estimated and used a semi-structural model for the inflation targeting period to decompose the effects into four important individual channels (the *household interest rate channel*, the *firm interest rate channel*, the *expectation channel* and the *exchange rate channel*). They estimated the model equation by equation with two stage least squares or