

# Industrial pricing in Brazil in the 2010s: The pass-through effect

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## Abstract

The aim of this paper is to discuss the impact of costs on industrial inflation in Brazil. Assuming that inflation is mainly cost-push, this paper estimates the exchange rate pass-through on industrial prices. Based on Kalecki's price equation, the paper explores data from the producer price index from 2010 onward. One of the main findings is that more than 60% of the inflationary acceleration in the industrial prices can be explained by exchange rate devaluations. The econometric exercise also showed that when demand increases, even if labor unit costs do not change, firms increase their profit margin. Finally, the paper questions the effectiveness of the inflation targeting policy, when the diagnosis to the pressure on prices comes from the costs, and not from demand.

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*Keywords:* Exchange rate pass-through; Industrial pricing; Cost inflation

## Resumo

O objetivo deste artigo é discutir o impacto dos custos na inflação industrial no Brasil. Assumindo que a pressão de custos é mais importante para explicar o processo inflacionário, este artigo estima o efeito pass-through do câmbio para os preços industriais. Baseado na equação de preço de Kalecki, o artigo explora dados do índice de preços ao produtor a partir de 2010 e conclui que as desvalorizações do câmbio explicaram mais de 60% da variação do preço industrial no período. O exercício econométrico também mostrou que frente a um aumento da demanda, mesmo com queda no custo unitário do trabalho, as firmas aumentaram sua margem de lucro. Por fim, o artigo questiona a eficácia do regime de metas de inflação, quando o diagnóstico para a pressão sobre os preços advém dos custos, e não da demanda.

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*Palavras-chave:* pass-through do câmbio; preço industrial; inflação de custos

## 1. Introduction

The resilience of the inflation rates to decrease in 2015 has been shedding some doubts on the effectiveness of the inflation target regime in Brazil to deliver, mainly after the international financial crisis. Actually, looking in retrospect,

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one can argue that inflation targeting has been showing a poor result since its implementation in 1999 after the adoption of the flexible exchange rate regime. Indeed, in sixteen years the center of the target rate has been reached only in four (2000, 2006, 2007 and 2009), and Brazil still exhibits one of the highest interest rates in the world.<sup>1</sup>

In the conventional literature, inflation target and flexible exchange rate regime are seen as powerful mechanism in the administration of aggregate demand and price control. Inflation target regime, on one hand, should allow the reduction of inflation through the anticipation of any future inflationary pressures. Once inflation is stabilized, long-term growth rates should improve and expand potential output. Flexible exchange rate regime, on its turn, should overcome the well known ‘impossible trinity’ or ‘trilemma’ of economic policy, giving independence to the monetary policy. Under these assumptions, monetary policy is taken as the main instrument of macroeconomic policy, and fiscal policy loses its role as a powerful macroeconomic instrument. Actually, in this framework, fiscal policy should align with monetary policy (Arestis et al., 2009).<sup>2</sup> Recent evaluations on macroeconomic performance of developing economies that are financially integrated (see, for instance, Ocampo and Stiglitz, 2008), however, have shown that monetary policy independence is much constrained given the high volatility and pro-cyclical pattern of capital flows, and as a result, business cycles are much stronger in these economies, reducing their long-term growth rate.<sup>3</sup>

In this paper we will assume, following the Keynes–Kalecki literature on pricing,<sup>4</sup> that inflationary pressures in Brazil are mainly cost-push rather than demand-pull, as assumed in the inflation targeting literature.<sup>5</sup> In particular, we will be interested in investigating the impact of the nominal exchange rate on industrial inflation, that is to say, the pass-through effect on industrial prices.<sup>6</sup> Nominal exchange rate pressures can affect industrial prices in a direct and in an indirect way. In the first case, exchange rate variation has a direct impact on industrial prices via commodities. In the second case, the impact is via the price of traded goods and services, including the price of traded inputs used in nontraded goods. Therefore, the aim of this paper is to explain industrial inflation through the behavior of industrial costs. There is little literature on this topic, and this paper will exploit recently available statistics on producer industrial prices by the Brazilian Statistical Office.

In other to develop our arguments this paper is divided in three more sections. In the following section we briefly present the theoretical model based on Kalecki of price determination. In Section 3 we present our econometric model and results explaining the price behavior of manufacturing industry in the 2010–2015 period. A final section presents our conclusions.

## 2. A general approach to inflation

Inflation, in a generic definition, is a process of widespread and permanent increase in the general price level. Among its many causes, three sort of pressures can be identified: expectational inflation, demand inflation and cost inflation (Carvalho et al., 2007). Formally, the inflation rate can be expressed as:

$$\pi_t = \pi^e - \phi(\mu - \mu_n) + \varepsilon \quad (1)$$

Where  $\pi_t$  is inflation rate in time  $t$ ;  $\pi^e$  is the expectational component and  $\phi(\mu - \mu_n)$  represents the demand-push component, where  $\mu - \mu_n$  represents the full employment gap,  $\mu$  measures the unemployment rate and  $\mu_n$  the natural rate of unemployment and finally  $\varepsilon$  stands for the cost component.

<sup>1</sup> There is a large literature discussing the effectiveness of inflation targeting in Brazil. See, for instance, Arestis et al. (2009), Bresser-Pereira and Gomes (2010), Barbosa (2015), among many others.

<sup>2</sup> According to the authors when explaining inflation target regime (p. 4), “indeed, monetary policy is viewed as the most direct determinant of inflation, so much so that in the long run the inflation rate is the only macroeconomic variable that monetary policy can affect. Monetary policy cannot affect economic activity, for example output, employment etc., in the long run.”

<sup>3</sup> Weeks (2013, p. 66) argues that ‘With a fixed exchange rate, governments face the Trilemma; with a flexible exchange rate it can become a Dilemma’.

<sup>4</sup> Keynes (1936, chapter 21) argues that prices are function of costs. Kalecki (1956) presents a mark-up pricing model. See also Sylos-Labini (1969), Eichner (1976), Davidson (1978), among others.

<sup>5</sup> Kregel (2004, p. XXX) At the same time, high interest rates may have a direct impact on inflation, and in countries that use inflation targeting may create a second self-perpetuating cycle by which high interest rates that are used to create foreign investor confidence generate cost inflation, and then through low investment produce supply shortages, and thus demand imbalance.

<sup>6</sup> There are few studies about the pass through effect in Brazil. For an estimation of the exchange rate elasticity of the consumer in Brazil in the period 1980–2003, see for instance Mántey (2006).

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