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Does the exchange rate pass-through into prices change when inflation targeting is adopted? The Peruvian case study between 1994 and 2007

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ABSTRACT

This paper analyzes whether the exchange rate pass-through into prices changed when the inflation targeting scheme was adopted in Peru. First, a simple dynamic stochastic general equilibrium model is simulated, which shows that adopting this scheme induces an increase in exchange rate volatility. Furthermore, applying the theory of the currency denomination of international trade, it is demonstrated that increased exchange rate volatility reduces the share of firms that set their prices in foreign currency. Given that the pass-through has a direct relationship with this share, it is shown that adopting inflation targeting generates a pass-through contraction. Second, we empirically test whether the Peruvian Central Bank's decision to adopt inflation targeting in January 2002 actually had an effect on the pass-through estimating a time-varying vector autoregressive model which allows for an asymmetrical estimation of the pass-through. It provides parameters for both the pre and post inflation targeting regimes based on the assumption that the transition from one regime to the other is smooth. An analysis of the generalized impulse response functions reveals that the decision to adopt inflation targeting significantly decreased the exchange rate pass-throughs into import, producer, and consumer prices. The results are consistent with economic theory and are robust to the specification of parameters of the model.

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1. Introduction

Since New Zealand first adopted inflation targeting (IT) in 1990, a set of countries, both industrialized and developing, has adhered to the same regime. In recent years, several empirical papers have demonstrated that the adoption of IT is linked to better macroeconomic performance (Petursson, 2004; IMF, 2005; Vega and Winkelried, 2005; Mishkin, 2007a), while there are only a few that propose that the effects have been null (Ball and Sheridan, 2005). In order to determine whether the adoption of IT improved macroeconomic performance, most papers analyze the level and persistence of inflation, the effects on economic growth, and exchange rate volatility. However, determining whether the exchange rate pass-through into prices¹ changes when IT is adopted is also crucial to defining this regime's performance. This is particularly relevant in small

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¹ Throughout this paper the concept of exchange rate pass-through into prices (import, producer, or consumer prices) makes reference to the exchange rate variations' effect over the variations of the respective price index, provided that the former is due to an exchange rate shock. When the price index is not specified, it must be understood that the paper is referring to the exchange rate pass-through into the consumer prices.

open economies – such as Peru’s – given that changes in the pass-through can affect both inflation forecasts and the effectiveness of monetary policy.

Throughout this paper, the pass-through is regarded as a nonlinear phenomenon that depends, in particular, on the monetary policy scheme. Although, to the authors’ knowledge, a comprehensive theory explaining how the monetary policy scheme conditions the magnitude of the pass-through does not exist, several papers are reviewed to shed light on this relationship. For this purpose, a dynamic stochastic general equilibrium model (DSGEM) – calibrated for a small open economy – is simulated. It is shown that when the central bank adopts IT, it becomes less responsive to exchange rate fluctuations, thus allowing for increased exchange rate volatility. This result is particularly relevant given that the theory of the currency denomination of international trade predicts that an increase in the exchange rate variance induces a decrease of the share of firms that set their prices in foreign currency. Finally, by using a formal definition for the pass-through, it is shown that the latter is directly dependent on this share. Consequently, it is concluded that adopting IT reduces the pass-through.

In the empirical literature, [Gagnon and Ihrig \(2004\)](#) are amongst the first to suggest that decreased pass-throughs, observed in several countries, can be attributed to a greater commitment and credibility of central banks in maintaining low levels of inflation. Although they do not make an explicit connection between the greater commitment and credibility of central banks and IT, it is clear that these characteristics are fundamental to the implementation of this scheme. In their paper, they estimate the pass-through for 20 countries (7 of which adopted IT) for two subsamples: one with high inflation and another with low inflation. It is worth mentioning that the cut date that separates both sub-samples does not coincide with the adoption date of IT (in the case of the countries that adopted this regime). The results of [Gagnon and Ihrig \(2004\)](#), which are drawn from a uni-equational linear model, show that the pass-through decreased in most countries. Furthermore, although IT countries had, on average, a greater pass-through in the high inflation subsample, the result is reversed in the low inflation scenario. Finally, by means of instrumental variables, they estimate Taylor rules for all the countries considered and show that pass-through decreases are associated with a more energetic response by central banks to inflationary pressures.

[Mishkin and Schmidt-Hebbel \(2007\)](#) analyze if the adoption of IT allowed for inflation to be less responsive to foreign shocks (i.e. oil price or exchange rate shocks). This study uses a sample of 21 countries that adopted IT and 13 others that followed a different monetary policy scheme. An important characteristic of their analysis is that they use two possible dates for the adoption of IT: the first one refers to the beginning of the disinflation process in which inflation targets are periodically adjusted downwards (DD hereafter) while the second refers to the implementation of full-fledged IT (FD hereafter). The authors compare the differences in the pass-through before and after IT, as well as the differences between the countries that adopted IT and those that did not. For this purpose, they analyze the impulse response functions obtained from a VAR panel model for the two sub-samples. Their results show that there is no significant difference in the pass-through before and after IT is adopted when DD is considered. This result, however, changes if FD is taken into consideration. Nonetheless, when comparing the countries that adopted IT (using either DD or FD) with those that did not, it is shown that the pass-through is always smaller in the latter group.

Recent research on the pass-through in Peru includes [Miller \(2003\)](#) and [Winkelried \(2003\)](#). The former makes use of a linear VAR model to estimate the pass-through for the period from 1994 to 2002 while the latter analyses the pass-through’s nonlinearities in a set of variables applying a VSTAR model to the same sample.

In this paper a time varying vector autoregressive model (TV-VAR, which belongs to the VSTAR family), is utilized. This model sets itself apart from standard VAR models in that it allows for parameters to be state-dependent. In particular, it allows for the pass-through in the pre-IT period to be different from that in the post-IT period. In addition, the model assumes that the transition from one state (regime) to the other is smooth.

Unlike [Gagnon and Ihrig \(2004\)](#) but similar to the papers that utilize the VAR framework ([Miller, 2003](#); [Mishkin and Schmidt-Hebbel, 2007](#); [Winkelried, 2003](#)), the proposed methodology has the advantage of being able to predict and evaluate the pass-through’s path after an exchange rate shock. Like [Winkelried \(2003\)](#), this paper has chosen a nonlinear VAR model over a linear specification, on the grounds that the pass-through is recognized as a state-dependent phenomenon. Nonetheless, this paper expands on [Winkelried’s work \(2003\)](#) by modeling the dependency of the pass-through in an additional variable, which in this case is the monetary policy scheme. Finally, unlike studies that split the sample, the suggested methodology allows for the pass-through to be estimated in countries for which few post-IT observations are available.

The analysis of the generalized impulse response functions calculated shows that the Peruvian Central Bank’s decision to adopt IT (PCB) in January 2002 led to a decrease in the exchange rate pass-throughs into import, producer, and consumer prices. In particular, there was a significant reduction of 86% in the long-run (36 months after the initial shock) exchange rate pass-through into consumer prices. The results are consistent with economic theory and are robust to the specification of the model’s parameters. Furthermore, the evidence provided is relevant from a policymaker’s perspective, in that it shows that IT not only contributes to price stability by pegging inflationary expectations to the target but also by reducing the effects of exchange rate shocks on inflation.

The remainder of the paper is organized as follows: Section 2 explores the relationship between IT, exchange rate volatility, and the pass-through, demonstrating the latter’s dependency on the monetary policy scheme; Section 3 presents the methodology utilized, an analysis of the series, and the result obtained; finally, Section 4 provides conclusions.

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