Ensayos sobre Política Económica 32 (74) (2014) 18-35

Ensayos
sobre POLÍTICA ECONÓMICA
www.elsevier.es/espe

Analyzing the Exchange Rate Pass-through in Mexico: Evidence Post Inflation Targeting Implementation

Sylvia Beatriz Guillermo Peón[a,*] and Martín Alberto Rodríguez Brindis[b]

[a]*Profesor and Researcher, Facultad de Economía, Benemérita Universidad Autónoma de Puebla, Puebla, Mexico*
[b]*Profesor and Researcher, Escuela de Economía y Negocios, Universidad Anáhuac, Oaxaca, Mexico*

ARTICLE INFO

History of the article:
Received October 24, 2013
Accepted May 19, 2014

JEL Classification:
E31
F31
F41
C32

Keywords:
Exchange rate pass-through in Mexico
Structural VAR-X models
Impulse-response functions

ABSTRACT

This paper presents an analysis of the exchange rate pass-through mechanism for the Mexican economy after the formal adoption of inflation targeting policy. In particular, this research work analyzes how a change in the nominal exchange rate depreciation is transmitted to domestic prices along the distribution chain of pricing. The analysis is carried out using a recursive Structural Vector Autorregression with exogenous variables (recursive SVAR-X) model, which aims at the estimation of structural impulse-response-functions as a tool to analyze the degree and speed of the effect of exchange rate depreciation changes on domestic prices. Additionally, variance decompositions are computed to capture the relative importance of exchange rate depreciation shocks in explaining inflation fluctuations. Our results show that, for the period of analysis (after the formal adoption of inflation targeting in Mexico), the exchange rate pass-through to consumer prices is quite small and fast and exchange rate surprises are not relevant to explain consumer price inflation variation.

Analizando el traspaso del tipo de cambio en México: evidencia tras la implementación de la política de inflación objetivo

Clasificación JEL:
E31
F31
F41
C32

Palabras clave:
Traspaso del tipo de cambio en México
Modelos VAR-X estructurales
Funciones impulso-respuesta

RESUMEN

Este trabajo de investigación presenta un análisis del mecanismo de traspaso de movimientos del tipo de cambio para la economía mexicana después de la implementación formal de la política de objetivos de inflación. En particular, este trabajo de investigación analiza cómo un cambio en la tasa de depreciación del tipo de cambio nominal se transmite a los precios locales a lo largo de la cadena de precios. El análisis se lleva a cabo utilizando un modelo VAR estructural recursivo con una variable exógena (SVAR-X), cuyo objetivo es la estimación de las funciones impulso-respuesta estructurales como una herramienta para analizar el grado y la rapidez de los efectos en los precios por los cambios en la depreciación del tipo de cambio. Además, la descomposición de varianzas se lleva a cabo para captar la importancia que los choques en la depreciación del tipo de cambio tienen en las fluctuaciones de la tasa de inflación. Nuestros resultados muestran que, para el periodo de análisis (después de la adopción de la política de objetivos de inflación en México), el traspaso del tipo de cambio a los precios del consumidor es muy pequeño y rápido y que las sorpresas en el tipo de cambio no son relevantes para explicar la variación de la inflación en precios al consumidor.

1. Introduction

Domestic price stability is a key element to consider in the design of monetary policy, and the fact that exchange rate changes affect inflation dynamics makes the understanding of the exchange rate pass-through (ERPT) mechanism a subject of particular interest for monetary policy makers, especially in small open economies like Mexico. Additionally, the understanding of how nominal exchange rate changes are reflected in domestic prices of goods and services provides elements to analyze the transmission mechanism of monetary policy on real exchange rate behavior, and hence on the real sector of the economy.

The exchange rate pass-through can be understood as the degree to which exchange rate changes are passed on into domestic prices along the distribution chain. Exchange rate shocks may affect

*Corresponding author.
E-mail addresses: silvia.guillermo@correo.buap.mx; sguiller@ucla.edu (S.B. Guillermo Peón).

prices at different stages both directly as well as indirectly. The conventional transmission mechanism of the exchange rate works in two stages. In the first stage the exchange rate changes have a direct effect on import prices and in the second stage, the mechanism works through its impact on producer prices and consumer prices.

This paper presents an analysis of the ERPT mechanism for the Mexican economy after the formal adoption of inflation targeting. In particular, using a data set from January 2001 to March 2013, this research work analyzes how a change in the exchange rate depreciation is transmitted to domestic prices along different stages of the distribution chain of pricing.

The analysis is carried out using a recursive Structural Vector Autorregression with exogenous variables (recursive SVAR-X) model which, unlike the traditional VAR model with exogenous variables, allows us to impose overidentified restrictions on the contemporaneous matrix of coefficients in order to improve estimation results. The SVAR-X framework aims at the estimation of structural impulse-response-functions as a tool to analyze the degree and timing of the effect of exchange rate depreciation changes on domestic prices along the distribution chain. Additionally, variance decompositions are computed to capture the relative importance of exchange rate depreciation shocks in explaining inflation fluctuations.

Given that Mexico is an oil exporter country and given the relevance that this commodity price has in the country's supply of foreign currency, our model includes the oil price index as exogenous variable in the system of equations. The recognition of the impact of oil prices on Mexico's exchange rate and on the other variables in the model represents an important contribution to the literature on ERPT for Mexico. And because this study aims at finding evidence on how the exchange rate changes are passed on into prices along the distribution pricing chain, three basic price indexes are taken into account and are the center of the empirical analysis: Import Prices, Producer Prices and Consumer Prices. Additionally, a measure of domestic economic activity is included as well as the interest rate which is the monetary policy instrument. The data sample consists of monthly observations starting from January 2001 as we are interested in analyzing the size and speed of the ERPT once the inflation targeting policy is implemented in Mexico.

Based on the estimated cumulative structural impulse responses and following Capistrán et al. (2012), we estimated the cumulative ERPT elasticities. Our results show that the ERPT to import prices is nearly complete, as its corresponding cumulative pass-through elasticity is 0.97 on impact and it decays to 0.91. This result is in line with other studies for Mexico. In regard producer prices, our results show a smaller cumulative pass-through elasticity close to 0.12 on impact and increasing to 0.17 six months after the shock. And finally, the corresponding elasticity on consumer prices is zero on impact and it increases to its highest value of 0.026 after four months and then stabilizes around 0.021 because consumer price responses are not significant afterwards. This implies that, at most 2.6 percent of a change in the exchange rate is passed onto consumer prices four months after the shock which is a very small and short effect of the exchange rate depreciation on consumer prices. The estimated variance decompositions show that exchange rate depreciation shocks are a very important determinant of the variance of import price inflation, while they moderately explain producer price inflation variation, and do not explain (statistically) the consumer price inflation variance. This result provides evidence that, for the period of analysis (after the formal adoption of inflation targeting in Mexico), exchange rate surprises are not relevant to explain consumer price inflation variation. Thus, according to our findings, not only the size of the ERPT declines along the distribution chain of pricing, but also does the share of variance explained by exchange rate shocks.

The paper is organized as follows: section 2 presents a brief theoretical background and literature review; section 3 presents a detailed explanation of the methodology based on a SVAR-X approach used to assess the size and speed of the ERPT along the distribution pricing chain; in this section we also present estimation results of the structural impulse response functions and variance decompositions which are used as analytical tool to assess the size and speed of the pass-through of exchange rate shocks to prices; and because we believe that theory as well as empirical research findings must help to improve policy design, in section 4 we present some comments regarding the ERPT implications on the real exchange rate behavior; in particular, we develop some arguments to explain why a very small exchange rate pass-through on consumer prices does not imply that policymakers can implement a RER targeting policy in an effort to gain competitiveness and to benefit export-oriented industries. Finally, conclusions are presented in section 5.

2. Background

By the end of 1994, Mexico was forced to abandon the exchange rate peg regime adopting a new floating rate regime instead. Under this situation, Banco de México faced the challenge of providing the economy with a nominal anchor to achieve financial and price stability (Ramos-Francia and Torres, 2005). Monetary authorities' efforts were concentrated on reducing inflation and in 2001 Banco de México announced the formal adoption of an inflation targeting framework[1] which has substantially helped to anchor inflation expectations (Capistrán and Ramos-Francia, 2010). Several empirical studies have presented evidence showing that, once inflation targeting was implemented in Mexico, the transmission mechanism of monetary policy has changed (Gaytán, 2006; Sidaui and Ramos-Francia, 2008) in the sense that monetary policy instruments are more effective in reducing the impact of shocks. In particular, Capistrán et al. (2012) "find that the exchange rate pass-through seems to have decreased substantially from 2001 onwards, which coincides with the adoption of an inflation targeting regime by Banco de México."

The monetary transmission mechanism can be defined as the way in which policy induced changes in short-term interest rates or the money stock affect economic activity and inflation through several channels[2]. One of the most important transmission channels is the exchange rate where changes in this variable could have inflationary and trade implications. This is the reason why the understanding of how exchange rate shocks affect domestic prices becomes a very important issue when designing monetary policies.

The ERPT can be understood as the degree to which exchange rate changes are passed on into domestic prices along the distribution chain. A high degree of pass-through can generate a depreciation-inflation spiral (as it was experienced in Mexico during the 80s and early 90s) thus affecting the inflation target. In such a case, the design of monetary policy must be coordinated with the foreign exchange policy to counteract the inflationary as well as trade implications of exchange rate shocks. On the other hand, a low degree of exchange rate pass-through allows the monetary policy actions to control inflation, to be more independent of exchange rate fluctuations (Capistrán et al., 2012).

Exchange rate shocks may affect prices at different stages both directly as well as indirectly. The conventional transmission mechanism of the exchange rate works in two stages. In the first stage the exchange rate changes have a direct effect on import

1. The conduct of monetary policy towards an inflation targeting framework started as a gradual process two years before its formal adoption (Sidaui and Ramos-Francia, 2008).

2. Interest rate channel, credit channel and the asset price channel. The exchange rate channel can be classified into the asset price channel (Sidaui and Ramos-Francia, 2008).