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State-dependent exchange rate pass-through behavior



Luiggi Donayre^a, Irina Panovska^{b,*}

^a Department of Economics, University of Minnesota – Duluth, 1318 Kirby Dr., Duluth, MN 55812, USA

^b Department of Economics, Lehigh University, 621 Taylor Street, Rauch Business Center Room 457, Bethlehem, PA 18105, USA

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ABSTRACT

We estimate a Bayesian threshold vector autoregression (TVAR) to study the relationship between exchange rate pass-through and economic activity in Canada and Mexico. Both the model comparison and the analysis of impulse–response functions provide strong evidence of a nonlinear relationship and suggest that the exchange rate pass-through is dependent on the state of the economy. In particular, the pass-through coefficient is higher when the growth rate of output is large, and this difference is statistically significant across regimes for both countries. Furthermore, the results show that the degree of pass-through is complete in the case of import prices and that it falls along the distribution chain of goods.

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1. Introduction

The effects of exchange rate fluctuations on the price level, commonly known as the exchange rate pass-through (ERPT henceforth), are an important source of short-run inflationary pressures. This is especially true in small open economies, which take international interest rates and the state of the international business cycle as given. Recently, a decreasing level of the ERPT has been extensively documented (Ben Cheikh and Rault, 2015; Burstein et al., 2007; Campa and Goldberg, 2005; Goldfajn and Werlang, 2000; Ihrig et al., 2006; Marazzi and Sheets, 2007; Mihaljek and Klau, 2008; Takhtamanova,

* Corresponding author. Tel.: +16107581068.
E-mail address: irp213@lehigh.edu (I. Panovska).

2010). However, this nonlinearity has been primarily linked to changing inflationary environments (Devereux and Yetman, 2010; Taylor, 2000) with results evidencing a lower ERPT in periods of low inflation.¹

While there is evidence of nonlinear ERPT coefficients with small values in low-inflation environments like the prevailing one (Aleem and Lahiani, 2014; Shintani et al., 2013), work in the firm pricing behavior literature suggests that the ERPT may also vary according to the state of the economy (Campa and Goldberg, 1999, 2005). However, the effects of exchange rates on inflation over different levels of economic activity, especially during periods of low inflation, have received little attention in the empirical literature.

Nonlinearities that depend on the state of the economy may arise because the ERPT level is intrinsically related to the ability of importers and local producers to transfer their higher costs to final consumers. This, in turn, depends on the state of the economy. Intuitively, different output growth rates could alter the effects of exchange rate shocks on inflation because firms are more likely to increase their prices during periods of high economic activity, when they typically face increasing sales. By contrast, if the economy is sluggish, depreciation shocks may leave prices unchanged as firms will opt to reduce mark-ups in order not to lose market share (Campa and Goldberg, 1999; Engel, 2001; Goldfajn and Werlang, 2000; Rogoff, 1996).² Therefore, ERPT coefficients may be high and vary over time even in low-inflation environments.

Because inflation is currently low and stable in most countries, our focus is to address whether there remains any residual nonlinearity driven by economic activity. Understanding the effects of exchange rates on domestic prices and how they may depend on the level of economic activity is relevant for the design of monetary policy. First, an estimated low level and persistence of underlying inflationary pressures would allow for a higher degree of independence from exchange rate considerations in the design of monetary policy and inflation targets. Furthermore, ERPT levels may even influence the measure of inflation central banks should target (Adolfson, 2007; Flamini, 2007). Second, it contributes to a better understanding of the factors that affect the value of the ERPT and the aggregate process of price determination. Third, nonlinearities in the ERPT could affect inflation forecasts. If the effects of exchange rates on prices depend on the level of output and this is not taken into account, such forecasts could lead to wrong inferences and, consequently, inadequate policies. Fourth, a number of Central Banks in many small open economies remain concerned about the rise in the Federal Funds rate (FFR), the appreciation of the U.S. dollar over the value of their currencies and, consequently, their inflation objectives. If the ERPT is higher during periods of high output growth, monetary authorities in growing economies should be particularly careful about U.S. policy normalization. Lastly, the estimates of the ERPT coefficients from vector autoregressive (VAR) models are frequently used to calibrate structural parameters in theoretical DSGE models for small open economies (see, for example, Faruquee, 2006). If there is significant nonlinearity in the empirical relationship between exchange rates and inflation, models that assume a stable relationship may not describe the economy accurately.

In this paper, we estimate and test a threshold vector autoregression (TVAR) to make inferences about the behavior of the ERPT over different levels of economic activity in Canada and Mexico for the post-inflation targeting (IT) period between 2001–2013.³ Our empirical model contributes to the

¹ Taylor (2000) and Devereux and Yetman (2010) construct theoretical models in which agents keep their prices unchanged in a low-inflation environment, given that exchange rate shocks are perceived as transitory. However, they increase their prices in a high-inflation environment.

² This type of dependence on the state of the economy could be correlated with other factors that might explain a time-varying ERPT coefficient. Dvir (2010), for example, argues that large importers that arise due to the globalization process have contributed to the decline in ERPT because they have significant market power. Meanwhile, the nonlinear effects of exchange rate shocks on inflation can also be related to the literature on sticky prices and menu costs. For a given size of the menu cost, firms will choose a higher frequency of price adjustments (Alvarez and Lippi, 2014; Alvarez et al., 2014; Ball and Mankiw, 1994; Ball and Romer, 1990; Golosov and Lucas, 2007). Therefore, the higher the frequency of the price change, the higher the ERPT coefficient (Burststein et al., 2005, 2007; Devereux and Yetman, 2002, 2010).

³ Mexico introduced an IT regime in 2001 while Canada did it in 1991. By focusing on the post-IT period, we can study any remaining asymmetries in an environment of stable inflation, thus avoiding structural breaks in inflation dynamics that could drive changes in regimes. For a study that finds evidence of the instability of the ERPT coefficient associated with the decline in inflation rates, see Ben Cheikh and Louhichi (2015).

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