China Economic Review 46 (2017) 87–96

Contents lists available at ScienceDirect

China Economic Review

journal homepage: www.elsevier.com/locate/chieco

Tariff and exchange rate pass-through for Chinese exports: A firm-level analysis across customs regimes

Florence Bouvet[a], Alyson C. Ma[b,*], Ari Van Assche[c]

[a] Department of Economics, Sonoma State University, 1801 E. Cotati Avenue, Rohnert Park, CA 94928, USA
[b] School of Business Administration, University of San Diego, 5998 Alcala Park, San Diego, CA 92110, USA
[c] Department of International Business, HEC Montréal, 3000 chemin de la Côte-Sainte-Catherine, Montréal, QC H3T2A7, Canada

ARTICLE INFO

JEL classification:
F31
F41
F14

Keywords:
Exchange-rate pass-through
Tariff pass-through
China
Firm type
Custom regime

ABSTRACT

We examine whether a firm's import content share differentially affects the degree of tariff and exchange rate pass-through into its export prices. Our pricing-to-market model suggests that a firm's import content share negatively affects the degree of exchange rate pass-through but does not affect the degree of tariff pass-through. Using firm-level data for Chinese exporting firms during the period 2000–2006, we find evidence of an almost complete exchange rate pass-through. As expected, when we distinguish firms by their trade regime, processing-trade firms, especially pure-assembly firms which tend to have higher import-content share, have a lower exchange rate pass-through than ordinary trade firms. We find no evidence that the tariff pass-through differs across the various trade regimes.

1. Introduction

A central concern among policymakers is how large fluctuations in tariffs and exchange rates affect the prices of internationally traded goods. This has generated a vast literature in the field of international economics, yet few studies have taken into account one of the most notable features of international trade in recent years, that is that firms increasingly rely on imported inputs to produce their exports. Johnson (2014) estimates that the import content embedded in gross world exports rose by about 10 percentage points between 1970 and 2008. This growth accelerated over time, with the import content of exports increasing roughly three times faster after 1990 than in the 1970s and 1980s. In this paper, we seek to analyze both theoretically and empirically how the import content share of exports affects both the tariff and exchange rate pass-through.

In a first step, we set up a simple pricing-to-market model that allows us to investigate how the import content share of exports alters the effectiveness of tariffs and exchange rate. Similar to Feenstra (1989), our model shows that the tariff and exchange rate pass-through is symmetric as long as the entire value chain of export products is concentrated in the home country. This symmetry breaks down, however, when GVCs emerge. Once a portion of the exporter's intermediate inputs are imported, and these costs are not denominated in the exporter's domestic currency, then an exporter's marginal cost of production will only be partly exposed to exchange rate fluctuations, while remaining fully exposed to tariff changes. As a result, a firm's import content share negatively affects the degree of exchange rate pass-through (Amiti, Itskhoki, & Konings, 2014; Goldberg & Knetter, 1997), but does not affect the degree of tariff pass-through. Our model therefore predicts that the exchange rate pass-through is smaller in customs regimes with a higher import content share of exports. At the same time, the tariff pass-through should not be statistically different across customs regimes with varying import contents.

* Corresponding author.
E-mail addresses: bouvet@sonoma.edu (F. Bouvet), maa@sandiego.edu (A.C. Ma), ari.van-assche@hec.ca (A. Van Assche).

http://dx.doi.org/10.1016/j.chieco.2017.08.013
Received 16 November 2016; Received in revised form 28 April 2017; Accepted 28 August 2017
Available online 01 September 2017
1043-951X/

Guided by the theory, we in a second step empirically evaluate the prediction that the exchange rate pass-through is smaller in customs regimes with a higher import content share, whereas the tariff pass-through is identical. We do so by using a highly detailed dataset on the universe of trade transactions by Chinese firms during the period 2000–2006. The dataset categorizes trade transactions into two broad customs regimes which have been documented to have significant differences in the import content share of their exports: ordinary trade (OT) regime and processing trade (PT). Specifically, firms under PT enjoy duty-free imports of intermediate inputs, and as a result the import content share of exports are on average 50 percentage points higher than in OT (Kee & Tang, 2016; Koopman, Wang, & Wei, 2012). Our estimation results show that, in line with our theoretical predictions, the exchange rate pass-through is significantly lower for firms in PT than in OT, but there is no significant difference in tariff pass-through (measure by anti-dumping) for firms in the two regimes. Digging deeper, we further evaluate if our results hold when we separate PT into the two sub-regimes pure assembly (PA) and import and assembly (IA). In a recent paper, Manova and Yu (2016) estimate that the import content in PA is significantly higher than in IA. In line with our theoretical predictions, we find that the exchange rate pass-through is lower in PA than in IA. At the same time, there is no difference in tariff pass-through for the three regimes.

Our paper relates to a number of literatures. First, it contributes to a vast field of study that has analyzed the incomplete pass-through of exchange rate and trade policy shocks into export prices (Blonigen & Haynes, 2002; Olivei, 2002; Campa & Goldberg, 2005; Marazzi et al., 2005). In the past decade, substantial progress has been made in the study of both phenomena, albeit separately. Theoretically, the literature has focused on the various channels that lead to incomplete pass-through (Devereux & Engel, 2002): short-run nominal rigidities with prices sticky in the local currency (Gopinath & Rigobon, 2008); pricing-to-market (Atkeson & Burstein, 2008; Goldberg & Knetter, 1997; Krugman, 1987; Vigfusson, Sheets, & Gagnon, 2009; Yoshida, 2010); and import content of exports (Aksoy & Riyanto, 2000; Amiti et al., 2014; Goldberg & Campa, 2010). We add to this literature by identifying under which circumstances the symmetry between exchange rate pass-through and tariff pass-through breaks down. Empirically, a growing number of studies have started using firm-level data to circumvent methodological issues (notably endogeneity and estimation bias) related to estimating exchange rate pass-through with aggregate price data (Amiti et al., 2014; Berman, Martin, & Mayer, 2012). We follow this literature by using firm level data which allows us to treat exchange rate fluctuations as exogenous (Feinberg, 1996).

Our paper is also related to recent studies that have investigated whether GVC trade behaves differently from regular trade. Yi (2003) proposes that GVC trade should be more sensitive to a world-wide decline in trade costs than regular trade since the same component crosses borders multiple times. Ma and Van Assche (2014) argue that GVCs allow firms to more easily shirk tariffs and use Chinese data to provide evidence of this. Cheung, Chinn, and Fujii (2010) and Thorbecke and Smith (2010) estimate that Chinese aggregate processing exports are more sensitive to foreign income changes than ordinary trade, but Gangnes, Ma, and Van Assche (2014) demonstrate that this is mostly due to a composition effect. We add to this literature by demonstrating that exchange rate pass-through is different between GVC trade and regular trade, but not tariff pass-through.

Lastly, our study adds to the debate on trade policies' stance against China (Hu, Li, Yang, & Chao, 2016). The growing trade deficit of the United States versus China has fueled the widespread concern among U.S. policymakers that the increased exposure to Chinese imports is reducing U.S. welfare by leading to higher unemployment, lower labor force participation, and reduced wages (Autor, Dorn, & Hanson, 2016). Numerous U.S. policymakers and commentators have swiftly reacted by putting forward a myriad of trade policies aimed to limit the growth of Chinese exports, ranging from pressuring the country to appreciate their currency to treating China's alleged currency manipulation as a source of dumping that would permit the imposition of antidumping on Chinese imports (Staiger and Sykes, 2010). Our paper provides new insights to policymakers by illustrating that policies targeting China's exchange rate may not be as effective due to China's heavy reliance on imported inputs.

The remainder of the paper is organized as follows. We present in Section 2 a pricing-to-market model to understand how changes in exchange rate and ad valorem tariffs affect a firm's pricing decisions. In Section 3, we describe the dataset on Chinese exporting firms, as well as the macroeconomic data used in this paper and some summary statistics. Section 4 reports our model specification. Section 4 provides estimations of exchange rate pass-through and antidumping pass-through for Chinese export prices. Section 5 concludes and discusses directions for future research.

2. Model

Our model is a variant of Burstein and Gopinath (2014). Exporting firm i in industry k sets an optimal price, p_{iknt}, as the markup over its marginal costs when selling to destination country n in period t:

$$p_{iknt} = \mu_{iknt} + mc_{iknt} + \tau_{knt}, \tag{1}$$

where lower case characters denote variables expressed in natural logarithm. The destination-country-specific mark-up μ_{iknt} depends on the price charged by the exporting firm i relative to the aggregate industry price level in the destination country n. That is, $\mu_{iknt} = \mu_{iknt}[p_{iknt} - p_{knt}]$. We assume that μ_{iknt} is a decreasing function of the firm's price relative to the aggregate industry level price in the destination country. In other words, there is decreasing returns to scale so that $\Gamma_{iknt} = -\frac{\partial \mu_{iknt}[.]}{\partial (p_{iknt} - p_{knt})} > 0$.

A firm faces ad valorem trade cost τ_{knt} that is both industry and destination-country specific. The dollar marginal cost is given by $mc_{iknt}[q_{iknt}, w_{ikt}, m_{iknt}(e_{nt})]$, where q_{iknt} is the quantity sold by firm i in destination country n in period t, w_{ikt} summarizes those variables that impact the local production costs incurred by the firm such as wages and total factor productivity, and $m_{iknt}(e_{nt})$ captures the cost of imported inputs which are denominated in foreign currency, where we assume $\frac{\partial m_{iknt}[.]}{\partial e_{nt}} = 1$. We specify marginal cost in log so that:

$$mc_{iknt} = A_{iknt} + \kappa_{knt} q_{iknt} + \alpha_{iknt} m_{iknt}(e_{nt}) + (1 - \alpha_{iknt}) w_{ikt} \tag{2}$$