Journal of International Economics xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Journal of International Economics

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

Input-trade liberalization, export prices and quality upgrading ☆

Maria Bas [a,b,1], Vanessa Strauss-Kahn [c,*]

[a] Sciences Po, 28, rue des Saints-Pères, 75007 Paris, France
[b] CEPII, 28, rue des Saints-Pères, 75007 Paris, France
[c] ESCP-Europe, 79, avenue de la République, 75011 Paris, France

ARTICLE INFO

Article history:
Received 8 April 2014
Received in revised form 17 November 2014
Accepted 13 December 2014
Available online xxxx

JEL classification:
F10
F12
F13

Keywords:
Imported inputs
Trade liberalization
Export prices
Quality upgrade
Mark-up
Firm-level data

ABSTRACT

This paper explores the impact of input trade liberalization on imported input and exported product prices. Using Chinese transaction data for 2000–2006, we capture causal effects between exogenous input tariff reductions and within firm changes in HS6-traded product prices. For identification, we make use of a natural control group of firms that are exempted from paying tariffs. Both imported input and export prices rise. The effect on export prices is specific to firms sourcing inputs from developed economies and exporting output to high-income countries. Results are consistent with a scenario within which firms exploit the input tariff cuts to access high-quality inputs in order to quality-upgrade their exports.

1. Introduction

Firms exporting high-quality (price) products have high revenue, access a large number of destination markets and pay high wages (e.g., Verhoogen, 2008; Crozet et al., 2012; Manova and Zhang, 2012). Recent theoretical works show that producing these high-quality products require high-quality inputs (i.e., Kugler and Verhoogen, 2012; Hallak and Sivadasan, 2013). Although upgrading export quality may help firms in developing countries enter profitable markets, it would prove difficult if accessing high-quality inputs is too costly. We argue that firms may take advantage of input trade liberalization to upgrade the quality of their imported inputs in order to upgrade the quality of their exported products.

This paper provides empirical evidence on the link between input trade liberalization and the quality of traded products. We capture a causal effect between exogenous input tariff reductions and changes in imported inputs and exported product prices by exploring the evolution of prices within firms at the HS6 (harmonized system) product level in a period of trade liberalization. We first show that following the input trade liberalization, firms import more varieties of inputs – if the input originates from the most advanced economies. As input tariffs fall, firms also pay a higher price for their imported inputs at the HS6 level. This effect is two times higher for firms sourcing their inputs from high-income countries. It is also stronger than a full pass-through effect of decreased tariffs on import prices. We interpret these findings as the firms upgrade of their imported inputs quality in a period of trade liberalization. This result could also be explained by a lack of competition among suppliers of foreign inputs taking advantage of the tariff cuts to increase their prices or by an exogenous increase in the price of commodities. We show that our findings are not driven by these alternative explanations.

☆ We have benefited from discussions with Andrew Bernard, Lorenzo Caliendo, Céline Carrère, Arnaud Costinot, Matthieu Crozet, Swati Dhingra, Anne-Célia Disdier, Do Quoc-Anh, Pushan Dutt, Beata Javorcik, Juan Carlos Hallak, James Harrigan, Sébastien Jean, Philippe Martin, Julien Martin, Thierry Mayer, Florian Mayneris, John Morrow, Florian Le Bris, Marcelo Olarreaga, Gianmarco Ottaviano, Nina Pavcnik, Sandra Poncet, Antoinette Schoar, Gabriel Smagghue, Johannes van Biesebroeck, Eric Verhoogen, Frederic Warzynski and two anonymous referees. We also thank the seminar participants at ETSG 2012, CEPII 2012, Louvain-la-Neuve 2012, CEPR-Causal Analysis in International Trade (Villars) 2013, N.Y.U. 2013 International Conference, Canadian Economic Association Meeting 2013, PSE-CEPII workshop 2013: "The Strategies of Exporting Firms", the University of Cergy 2013, the Asian Econometric Society Meeting 2013 and Sciences Po seminar for their useful comments. We are responsible for any remaining errors.

* Corresponding author. Tel.: +33 1 49 23 20 90.
E-mail addresses: maria.bas@sciencespo.fr (M. Bas), vstrauss-kahn@escpeurope.eu (V. Strauss-Kahn).
[1] Tel.: +33 1 53 68 55 77.

http://dx.doi.org/10.1016/j.jinteco.2014.12.005
0022-1996/

The input trade liberalization also results in an increase of firms HS6 exported product prices. Such impact of input tariffs' reduction on export prices is specific to inputs imported from the most advanced economies and to products that are exported to the highest income countries. Our results suggest that the increase in firms exported product prices reflects an improvement in product quality. The alternative explanation of higher markups is difficult to reconcile with the increase in imported input prices and the facts that only imports from advanced countries and exports towards high-income countries are relevant to explain the increase in export prices. Our findings are robust to the use of an alternative measure of quality: results hold when Khandelwal et al. (2013)'s quality estimates are used instead of unit values. This is consistent with a scenario according to which trade liberalization allows firms to upgrade their inputs at low cost in order to quality upgrade their exported products.

We rely on an original methodology which allows us to identify causal links between cuts in input tariffs and trade prices. We take advantage of a detailed and unique database of Chinese firms' trade data for the 2000–2006 period that includes two essential features for our analysis. First, it covers the Chinese accession to the World Trade Organization (WTO) in 2001 which led to an important decrease in tariffs. Second, it characterizes trade transaction according to a dual trade regime where some firms are exempt from paying tariffs: firms importing under the "ordinary" regime pay tariffs, whereas firms importing under the "processing" regime have been exempted from paying tariffs for over 30 years. In order to obtain the processing status, imported inputs must be used in the production of goods for the export markets only. This dual trade regime is crucial to our approach as it allows us to use a natural control group made of firms not subject to tariffs and thereby to alleviate concerns related to potential endogeneity issues.[2]

Our identification strategy exploits both the variation in input tariffs and the existence of a control group composed of processing firms with similar export characteristics as ordinary firms – we require that for each ordinary firm there is at least one processing firm exporting the same product to the same destination in the same year. Moreover, our analysis focuses on domestic Chinese ordinary and processing firms by excluding foreign-owned companies. With imported input prices as variable of interest, we rely on the variation of input tariffs across HS6 products and time. In order to capture the impact of input trade liberalization on exported product prices, we construct firm level input tariffs. Firm specific input tariffs are calculated as a weighted average of the tariffs paid by the firm on the inputs it actually uses, with constant initial weights. These tariff measures reflect the firm's input mix and capture the HS6 input tariff variations. Moreover, they are free of composition and reverse causality problems related to the change of weights over time. We include in the estimation several fixed effects which control for sectoral, destination (origin) and location time-varying shocks which may affect firms' prices. Some unobservable shocks however remain (e.g., specific policies at the sectoral–regional level). We make use of the control group of processing firms in order to account for these unobserved variables that affect prices of ordinary and processing firms similarly.

An important concern is the potential endogeneity between tariff changes and the imports or exports of firms. We show that the input tariffs reduction is exogenous to the firms' expected imports/exports patterns and political lobbying. We are also concerned with the quality of our control group. Importantly, we show that the firms' processing status is exogenous to the level of input tariffs. We also ensure that our control group is similar to our treated group in terms of ownership and export patterns by (i) excluding foreign-owned companies, and (ii) requiring that, for each ordinary firm, there is at least one processing firm exporting the same HS6 product to the same destination in the same year. Our identification strategy also controls for initial firm size trends, sector-year, country-year and province-year fixed effects and, therefore, compares ordinary and processing firms of similar initial size that have experienced similar firm size-related trends and the same sectoral, destination (origin) and location time varying shocks. Firm-product fixed effects help control for differences between ordinary and processing firms. These fixed effects do not, however, capture time-varying features other than input tariffs, that may affect ordinary and processing firms differently in term of objectives or responses to shocks. We address this concern by including in the estimation a time trend by trade status in order to capture status specific paths or shocks over the sampled period (i.e., we interact firms' type – ordinary or processing – with a time dummy). Our results are robust to this alternative specification, which makes us confident in the relevance of our control group.

We also ensure that changes in export prices are not associated with country-product specific demand shocks or increased marginal costs and set out several arguments that endorse our prior hypothesis of a product quality upgrading (for example, we show that the effect of input trade liberalization on prices is specific to differentiated products and do not affect homogeneous goods). Finally, we carried out several robustness tests that show that our estimates are not driven either by the measure of input tariff or our sample. All our findings are robust to alternative explanations and sensitivity tests.

In addition to the literature on the determinants of export price variation in cross-section, i.e., within-product across firms or within product-firm across markets (see, Bastos and Silva (2010); Gorg et al. (2010); Kugler and Verhoogen (2012); Martin (2012); Manova and Zhang (2012) and Harrigan et al. (2012)), this paper also contributes to the literature on trade liberalization and firm-performance. Most of the literature focuses on productivity and investigates the effect of a decrease in tariffs on firms' total factor productivity (TFP) (e.g., Pavcnik, 2002; Schor, 2004; Fernandes, 2007; Amiti and Konings, 2007; Topalova and Khandelwal, 2011; Brandt et al., 2012). These papers find that there is a positive impact from cuts in output tariffs on productivity (the pro-competitive effect) and an even stronger impact from a decrease in input tariffs (the imported inputs channel). Other studies relate imported inputs and firms' TFP but do not consider trade liberalization (e.g., Kasahara and Rodrigue, 2008; Halpern et al., 2009). Bas (2012), Goldberg et al. (2010), and Bas and Strauss-Kahn (2014) explore the impact of trade liberalization on the other attributes of the firms. They show that trade liberalization entails a large increase in firms product and export scopes. None of these papers however examine the role of trade liberalization on firms' imported inputs and export prices or investigate quality upgrading in a period of trade liberalization. Few papers empirically study the relationship between trade, prices and markups. Those that do focus on the pro-competitive effect (i.e., Fernandes and Paunov, 2011; Amiti and Khandelwal, 2013) or examine output prices and markups (i.e., De Loecker et al., 2012). We differ from these works by focusing on the role of input tariff reduction on export prices (i.e., the imported input channel) and by identifying a causal link between input trade liberalization and traded product prices.

The paper is organized as follows: Section 2 discusses the literature and provides a theoretical motivation for our work; Section 3 presents the Chinese trade liberalization and dual trade regime, explores the data and discusses the empirical strategy; Section 4 reports our main results regarding the impact of input trade liberalization on firms' imported inputs and exported product prices; Section 5 proposes alternative explanations to the quality upgrading pattern, discusses our findings and presents several robustness checks. Section 6 concludes.

2. Theoretical motivation

Our analysis of export price variations relies on the idea that consumers value quality. Firms compete on quality as well as on price on export markets. Furthermore, since quality is expensive to produce, a rise in export price may be associated with an increase in demand:

[2] The literature so far has shown a positive correlation across firms between input and output prices (Kugler and Verhoogen, 2012; Manova and Zhang, 2012; Hallak and Sivadasan, 2013), these cross-section analyses do not however assess causality.

Please cite this article as: Bas, M., Strauss-Kahn, V., Input-trade liberalization, export prices and quality upgrading, J. Int. Econ. (2014), http://dx.doi.org/10.1016/j.jinteco.2014.12.005