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Exchange rate pass-through and product heterogeneity: Does quality matter on the import side?

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ABSTRACT

This paper investigates theoretically and empirically the heterogeneous response of exporters to real exchange rate fluctuations due to the quality of imported inputs and exported output. We develop a model where the production of high-quality products requires high-quality inputs sold in monopolistically competitive foreign markets. The model predicts that exporters using imported inputs have low exchange rate pass-through, but this effect is weaker for firms shipping high-quality goods. This is due to the heterogeneous price adjustments of foreign suppliers selling inputs of different quality. We test the predictions of the model using Italian firm-level trade data for the period 2000–2006. The empirical analysis shows that the imports of intermediates have a significantly weaker effect in reducing the exchange rate pass-through into the export price of high-quality varieties. By showing that the import price of high-quality inputs is less sensitive to exchange rate variations, we provide evidence supporting the theoretical hypothesis that the pricing power of input suppliers weakens the import channel.

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1. Introduction

A major puzzle in international macroeconomics is why the prices of imported goods do not fully reflect exchange rate movements. Indeed, abundant empirical evidence shows that the exchange rate elasticity of import prices is rather low. One of the possible explanations for the incomplete exchange rate pass-through (ERPT) is that exporters adopt pricing-to-market strategies, namely they adjust export prices to limit the transmission of exchange rate variations into consumer import prices (Knetter, 1993; Atkeson and Burstein, 2008). While investigation on this topic has originally been conducted on aggregate data, the recent availability of disaggregated information has revealed heterogeneous pricing to market strategies across exporters depending on their productivity, market share, use of imported inputs and output quality.²

Our paper contributes to the existing literature on the heterogeneous pricing to market strategies of exporters by investigating, both theoretically and empirically, previously unexplored channels through which firms' characteristics might influence the transmission of exchange rate movements into consumer prices. Our research provides evidence that the imports of intermediate inputs contribute to insulate the import price of an exported final good from exchange rate

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variations depending on the final good quality and on the quality of the imported intermediates.³ With respect to previous studies we propose a unified framework that jointly considers how firms' import intensities and quality levels determine ERPT heterogeneity across exporters. This new channel is key to understanding the variation in pass-through across firms.

We propose a theoretical model where the exporters of high-quality products are also importers of high-quality intermediate inputs sold in monopolistically competitive markets. The novel prediction of this model is that while the imports of intermediate inputs generally reduce an exporter's ERPT, this effect is weaker if the imported inputs have higher quality. Our framework follows the recent work of [Amiti et al. \(2014\)](#) which shows that the adoption of imported intermediate inputs favors an exporter's ability to insulate the consumer import price of its exported varieties from exchange rate (ER) variations. This 'intermediate imports channel' arises because changes in the ER affect with opposite sign the import prices of the imported intermediate goods and the import prices of the exported final goods. An appreciation of the currency reduces the import prices of the imported intermediate inputs, it lowers the marginal cost of production of an exporter. As a consequence, an exporter can reduce the export prices of its products to offset the effect of the appreciation on the consumer import prices. In the model of [Amiti et al. \(2014\)](#) inputs are obtained from perfectly competitive markets and foreign suppliers cannot adjust prices in response to ER variations. In our model, instead, we investigate the 'intermediate imports channel' within a more general theoretical setting where foreign suppliers of intermediate inputs have pricing power, and they can mirror the behavior of final good exporters by adjusting their export prices in response to exchange rate variations. The quality of intermediate and final goods respectively determine the ability of input suppliers and final good exporters to adjust their export prices in response to ER variations.⁴ The model is able to generate a channel previously unexplored according to which the 'intermediate imports channel' has a weaker effect on the export price of high-quality final goods, as these goods require high-quality intermediate inputs provided by foreign suppliers with a greater ability to adjust their export prices.

We test the predictions of the model on a rich dataset of Italian firms reporting export and import transactions for the period 2000–2006. Our analysis confirms the relevance of the 'intermediate imports channel', but consistently with the model it suggests that this channel is weaker in reducing the ERPT into the consumer import price when the quality of the final goods is higher. Differences across varieties with heterogeneous quality are statistically and economically significant. According to our estimates, an exporter can reduce by 6% the ERPT into the export price of a good with 'average' quality by increasing by 50% its share of imported intermediate inputs over variable costs. However, a similar increase in the share of imported intermediates reduces the ERPT only by 2% for firms whose quality is one standard deviation above the average. This result is robust to the inclusion of different firm level characteristics which are related to firms' ability to absorb exchange rate variations in their markups. In particular, our result holds when controlling for the fact that firms with high export market shares set high markups and actively adjust them in response to ER movements. The role of suppliers' pricing strategies in determining this result is supported by further analyses on the ER sensitivity of the import prices paid by exporters for imported intermediates of different quality. Indeed, we find that the ERPT on the import prices of imported intermediates is lower for high-quality inputs.

Our empirical work overcomes one of the main limitations of previous studies on ERPT and export quality. Because the quality of exported goods is generally unobserved in trade datasets, the existing analyses focus on specific sector for which quality information is available. [Chen and Juvenal \(2014\)](#) restrict their investigation to the exports of Argentinian wine using rating of wine guides as a proxy of quality. [Basile et al. \(2012\)](#) resort to survey data to identify Italian exporters competing in foreign market through quality. Our analysis extends to a much larger set of products than the one covered by previous studies, hence producing more robust evidence supporting the hypothesis that export quality is an important determinant of ERPT heterogeneity across firms and products. We obtain a firm-product-destination level measure of revealed export quality from the estimation of a discrete choice model of consumer demand ([Berry, 1994](#); [Khandelwal, 2010](#)). This estimator allows us to avoid comparability issues and measurement errors arising from the use of survey data.

Our paper relates to three strands of the international trade literature. First, our paper is mostly related to a very recent literature on exporters' heterogeneity and pricing-to-market behavior. The seminal article by [Berman et al. \(2012\)](#) shows that more productive exporters are more capable to reduce the ERPT into the consumer import prices. This is because larger and higher performance firms are more capable to absorb ER variations in their markups. [Amiti et al. \(2014\)](#), which is the paper closely related to our work, observe that import-intensive exporters have significantly lower exchange rate pass-through because of the marginal costs channels but also because they have high export market shares and hence set high markups. [Chatterjee et al. \(2013\)](#) study the effect of exchange rate shocks on the export behavior of multi-product firms, while [Caselli et al. \(2014\)](#) investigate markups adjustments across products in response to real exchange fluctuations.

The quality of exported varieties has been investigated as an additional determinant of ERPT heterogeneity. [Auer and Chaney \(2009\)](#) explain lower exchange rate sensitivity of higher quality goods with a model featuring assortative matching

³ Throughout the paper we distinguish between the import price of an imported intermediate good (or exporter import price) and the import price of an exported final good (or consumer import price). The former is the price paid by an exporter for an imported intermediate input, the latter is the price paid by a consumer for the final good. These prices are expressed and paid in the currency of the importer. Similarly, for exports we distinguish between the export price of the final good producer and the export price of the intermediate input supplier. These prices are expressed and set in the currency of the exporter.

⁴ This feature of the model is consistent with previous studies showing that high-quality goods are characterized by lower ERPT ([Basile et al., 2012](#); [Chen and Juvenal, 2014](#)).

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