



Quality uncertainty and intermediation in international trade[☆]

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ABSTRACT

Uncertainty about product quality is endemic in international trade. We develop a dynamic, two-country model, where home producers differ in terms of the quality of their products. Quality is not fully observed by foreign consumers initially but known once the product is consumed. We show that this lack of information generates an information cost of exporting, over and above the usual fixed costs used in standard heterogeneous firm models. We use the model to examine the role played by intermediaries in alleviating quality uncertainty. In the process, we uncover a positive externality of using intermediaries. The model generates a novel prediction about price dynamics that finds support in the data.

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1. Introduction

Intermediaries – firms that facilitate the exchange of goods between producers and final consumers – play a crucial role in trade. [Spulber \(1996\)](#) documents that in 1995, (i) intermediaries accounted for about a quarter of the U.S. gross domestic product and (ii) close to two million firms operated in the U.S. intermediation industry. [Spulber \(1996\)](#) suggests that among other things, intermediaries arise when there is uncertainty about demand and supply, or un-observability of the buyers' and sellers' characteristics. Given that such problems of incomplete information are more acute when goods cross national borders, it is all the more surprising that intermediaries have been relegated to the background in the study of international trade. But that state of affairs is changing.

Recently, a number of papers have shed light on the prevalence of intermediaries in international trade.¹ This literature makes two important observations: First, a significant fraction of international trade is routed through intermediaries. Second, there are systematic variations in the mode of export (i.e., using intermediaries or exporting directly) not only across firms within an industry, but also across industries. But although these papers have highlighted the importance of intermediaries in international trade, they differ in their view of the exact role being performed by the intermediary firms. The lack of a consensus is partly because intermediaries perform a wide variety of roles.

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¹ See [Blum et al. \(2017\)](#) for a comprehensive survey.

One such role that trade intermediaries perform is providing quality assurance. Uncertainty about product quality is endemic in international trade. This uncertainty creates familiar problems of adverse selection and, when firms choose the quality of their products, moral hazard. Intermediaries alleviate this problem by screening the quality of products and then revealing it to consumers (something that would be prohibitively expensive for individual consumers to perform). Examples abound. Li & Fung, a multinational trading and sourcing firm based in China, claims that they are committed to meeting the demands of international business through “impeccable quality; reliable, on-time delivery; and the highest standards of service”.² Similarly, Home Depot, the world’s largest home improvement retailer, has a Quality Assurance (QA) program in place, which “evaluates supplier performance in the areas of factory, product, and packaging quality”.³ Feenstra and Hanson (2004) argue that one of the factors behind Hong Kong’s success in intermediating trade between China and the rest of the world is information. Hong Kong’s traders have an informational advantage in identifying Chinese producers who can meet foreign quality standards.⁴

In this paper, we develop a model to understand the role of intermediaries in facilitating trade in the presence of incomplete information about product quality. We begin in Section 2 by developing a benchmark model of quality uncertainty. Our model has two countries, home and foreign, and we focus on the home producers’ decision to export to the foreign country. Producers live for two periods and produce varieties of a good that is differentiated both horizontally as well as vertically. The quality of these varieties, however, are stochastically revealed to foreign consumers in the first period. If producers export a positive amount in the first period, their quality is fully revealed at the beginning of the second period.

In this setting, we solve for a pooling equilibrium, where every exporter whose quality (i.e., whose product’s quality) has not been revealed charges a common price \bar{p} in period one and exports the same quantity. In this equilibrium, every producer above a threshold level of quality exports in both periods, while the remaining producers never export. Due to incomplete observability of quality, producers have to forego a part of their full information profits, with this part being producer-specific. Thus, quality uncertainty generates an “information cost” of exporting, lowering the profits of most of the exporters relative to a full information world.

In Section 3, we introduce intermediaries into the benchmark model. Intermediaries are foreign firms that reveal the quality of a product to foreign consumers in lieu of a fee from the producers. Hence, intermediaries solve the problem of quality uncertainty in the first period. We show that in the presence of intermediaries, there exists a semi-separating equilibrium with some producers exporting through intermediaries, others exporting directly and the remaining producers not exporting.

In the model, intermediaries allow some exporters to signal the true quality of their goods to foreign consumers. These exporters do not have to incur the information cost of exporting. Selling through intermediaries, however, also raises the final price of the goods, resulting in lower sales. We show that the benefit of using intermediaries relative to costs is highest for firms with intermediate levels of quality. As a result, the firms with the highest levels of quality export directly, while those with intermediate levels of quality export through intermediaries. The presence of exogenous fixed costs ensures that the firms with the lowest levels of quality do not export. If high quality firms are also larger, our model predicts that larger firms are more likely to export directly rather than use intermediaries relative to smaller firms, a prediction that finds support in the data.

In the model, every exporter above a threshold level of quality exports directly – the high quality exporters signal their quality by *not using* intermediaries. These exporters continue to charge the price \bar{p} in the event their quality is not revealed, but the quantity sold by these exporters is higher than in Section 2. This is because the entry of intermediaries creates a positive externality for direct exporters: in the presence of intermediaries, the direct exporters with the lowest quality switch to exporting through intermediaries, thereby raising the average quality of the ones who continue to export directly. Because foreign consumers have rational expectations, they correctly anticipate this increase in average quality, resulting in higher demand for the goods sold by direct exporters.

We use the model to study how the equilibrium cutoffs and, in particular, the share of producers exporting through intermediaries depends on the degree of product differentiation as well as the level of information. First, we show that when goods are more horizontally differentiated, a greater share of producers export through intermediaries. A higher degree of horizontal differentiation implies that consumers care less about quality. Because producers signal higher quality by exporting directly, there is less need to incur this costly signal when quality matters less. Second, with less information, the share of producers exporting through intermediaries goes up. If distance is a measure of information cost, our results imply that intermediaries should be more important for exporting to destinations that are further away. Both of these predictions find support in the data.

Finally, we test a novel prediction about price dynamics. The quality of varieties sold by the indirect exporters in our model is revealed in the first period. The implication is that the FOB (free-on-board) price of these exporters do not change over time. The direct exporters, on the other hand, have to signal their quality through prices. In particular, they charge a

² www.lifung.com/eng/business/efficiency.php

³ <https://suppliercenter.homedepot.com/wps/portal>

⁴ This is closely related to the existence of certain institutions that evaluate the quality of a product or service. Examples include Moody’s bond ratings or the *U.S. News & World Report’s* ranking of colleges. See Dranove and Jin (2010) for a survey on the state of the theoretical and empirical literature on quality assurance.

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