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Title

Intensive and extensive margins in wine trade.
The case of Verona wines

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Conference Presentation

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Keywords

Heterogeneous firms; international trade; wine quality; reputation; quality; collective reputation; gravity equations.

Research Question

Which firms decide to export wine? Is quality an important determinant in explaining this choice? Is collective reputation important for wine exports?

Methods

In this paper we explore firm level data of wine exporting firms and estimate gravity equations taking into account wine quality.

Results

Preliminary results show that quality is important for both intensive and extensive margin.

Abstract

The main objective of this project is the estimation of gravity equations for wine trade generating from the province of Verona, a major production area in Italy. The main innovation of the project is the use of trade data at the firm level and the explicit consideration of wine quality and of collective reputation. In the literature (that we briefly review in the following), it is quite well known (see, e.g., Melitz, 2003) that more efficient and/or bigger firms export more, i.e., 'big is better'. However, when product quality is important, whether and to what extent firm size matters is open to investigation. Indeed, products of high quality may enable even relatively smaller firms to export into many foreign markets; moreover, collective reputation, as that coming from Denomination of Origins, may help many more firms in international markets.

The literature on international trade has been enjoying a renewed interest in the last couple of decades. More

traditional monopolistic competition (MC) models have as core elements imperfect competition, increasing returns and homogeneous firms. They are usually based on Dixit and Stiglitz (1977), that is, CES preferences and 'love for variety', implying that consumers buy some quantities of all goods, i.e., no 'export zeros'. Many studies have tried to go beyond these 'standard' models taking into account - within the monopolistic competition setting - both firms' heterogeneity and the quality of goods.

Starting with Melitz (2003), recent contributions have considered firms' heterogeneity (we can refer to these as the heterogeneous firms trade - or HFT - models. The Melitz model has all the features of MC models, plus two additional ones: a common fixed cost to enter into foreign markets and heterogeneous firm-level marginal costs, these latter generated via a stochastic technology process. When a firm is established and gets to know its marginal cost, it learns whether it is profitable to enter into some foreign markets as well. Probably one of the major contributions of the studies based on HFT models is that they can explain the diversity in firms' behavior regarding international choices. Indeed, while the contribution of MC models has been the explanation of intra-industry trade, these more recent models can explain why only a subset of domestic firms decide to export (or to off-shore or to out-source abroad), as is regularly observed for firms in many countries over the world. In effect, only those firms that are more efficient can afford to pay the fixed cost needed to enter into foreign markets. These models thus explain the 'sorting of firms' based on their efficiency: the more efficient (bigger) firms serve both domestic and foreign markets, while less efficient firms either serve only the domestic market or exit the market altogether after discovering their low efficiency level.

Apart from heterogeneity, another important extension of previous models to better understand trade flows in recent literature is the consideration of (product and input) quality. Indeed, many papers have considered the role of quality in explaining trade-flows. This can be ascertained by looking at either product- or firm-level data. Many empirical papers investigate the attributes of countries that export and import higher quality goods, as inferred from unit values (UVs). Other (still fewer) papers use product-level trade data to test the implications of models with firm-heterogeneity in quality based on Melitz. There are also papers that use firm-level trade data plus firm-heterogeneity in quality models. Last, very few papers use firm-level trade data and firm-heterogeneity models with endogenous quality. We briefly and selectively review some of these contributions.

Schott (2004) studies the U.S. manufacturing imports for the period 1972-1994, finding that unit values (UVs) vary widely even within finely detailed product categories. Across all the U.S. imports, the mean high-to-low unit value (UV) ratio was 24 in 1994, when the price of a Big Mac in 1999 varied by a factor of 3 across countries. By using product-level data, he could test whether these patterns are consistent with either 'old' or 'new' trade theories. Using product-level data for U.S. imports in 1972-1994, Schott finds that there is no evidence of endowment-driven specialization across products, but data is consistent with specialization within products, and there is a positive relationship between UVs, exporter endowments, and exporter production techniques, supporting the view that "capital- and skill-abundant countries use their endowment advantage to produce vertically superior varieties, i.e., varieties that are relatively capital and skill intensive and possess added features or higher quality". Last, data is not consistent with the predictions of the new trade model, who would call for more productive countries, e.g., developed ones, to export lower-priced varieties. It thus seems that high- and low-wage countries specialize in distinct goods, and therefore the wage link between developed and developing countries may be weakened. As Japanese consumers shifts away from the less sophisticated goods produced by the Philippines, the wages of Japanese workers "may be less susceptible to price movements of the world's most labor-intensive goods. And the extent of insulation is a fiction of the substitutability of high- and low-wage country varieties.

Hallak (2006) finds evidence that richer countries have relatively greater demand for high-unit-value source countries. Hummels and Skiba (2004) find that average free on board (FOB) export prices rise with freight costs to a destination market. They interpret this as a confirmation of the Alchian-Allen (1964) effect. The Alchian-Allen effect, also known as "shipping the good apples out", arises when freight costs depend on weight, rather than being proportional to value as per the iceberg assumption. An increase in freight costs therefore lowers relative delivered prices and thereby raises the relative attractiveness of high-quality goods for distant consumers. Khandelwal (2010) critiques the use of UVs as proxies for quality and instead infers exporter product quality by comparing market shares conditional on price. He also finds that higher income countries export higher quality goods.

Within the 'family' of the HTF models, Baldwin and Harrigan (2011) were among the first to consider (exogenous) quality. Indeed, they argue that many recent models have difficulties in explaining the presence of "export zeros" and that export unit values are positively related to distance and negatively related to market size. In many Ricardian models, like in Eaton and Kortum (2002), each country competes in every market according to the price gross of the transportation costs, and its competitiveness depends on its technology, its wages, and trade costs. Highly competitive countries export a wider range of goods than less competitive nations, but the average import price of their goods does not change with either competitiveness, size, or distance to the final destination market. On the other hand, the main prediction of Melitz (2003) and the 'new' new trade theory is that a firm's product competitiveness depends upon its price: the cheapest goods are the most competitive.

To have a model where predictions match with the empirical evidence, they suggest an extension of the heterogeneous firms trade (HFT) model of Melitz to consider explicitly that firms compete on price and quality, i.e., they suggest a quality-heterogeneous firms trade (QHFT) model. In the quality-modified HFT model, competitiveness depends upon the quality-adjusted price: when consumers care about quality, the highest priced goods are the most competitive. The QHFT model is thus based on Melitz's but with two major modifications. First, consumers care about quality and regard some varieties as superior to others, with their preferences modeled with an extended version of the CES preferences of Dixit and Stiglitz (1977). Second, firms are heterogeneous but also produce varieties of different qualities. In addition, higher quality comes with higher marginal costs, and as such high costs are not necessarily bad news as in the HFT models. To conclude, Baldwin and Harrigan (2011) show that by amending the HFT model they can add quality in the competitiveness dimension of firms; firms are heterogeneous in terms of productivity and quality, consistently with empirical evidence; and, finally, that the QHFT model is more consistent with the US data than the other models.

Crozet et al. (2012) is another important contribution proposing a quality-sorting version of Melitz (2003) and testing it with firm level data. First, they argue that revenue-based productivity measures - such as value-added per worker or sales in the home market - could be driven by "primitives other than physical output per unit of input". Indeed, it is not clear whether productivity is high because a worker produces a lot or because she produces a product with high price. Second, they recall that Melitz (2003) points out that "productivity" can be thought of as either a cost shifter, or a demand-shifting quality variable. They thus propose (probably) the first empirical attempt to test the quality interpretation of Melitz (2003), combining firm-level data that directly measures quality (from Juhlin, a Champagne Wines guidebook), and trade (from export data).

This brief review of the literature shows the importance of using data at the firm level and of taking into account wine quality. In this project we start the empirical analysis by looking at the evolution of intensive and extensive margins of trade. The 'intensive margin' refers to the flow of exports for each firm. The 'extensive margin', on the other hand, refers to the number of firms that export (and/or the number of foreign markets that they serve). Mayer and Ottaviano (2008), for instance, notice that the pattern of aggregate exports for EU firms is driven both by the intensive and the extensive margins. Since they consider the extensive margin much more important, they suggest that economic policies should increase the number of exporters and nurture the superstars of the future, without "wasting time helping the incumbent superstars". However, they do not take into consideration product quality, which is instead critical for many manufacturing sectors (see, e.g., Fontagné et al, 2008). We thus consider the role of quality, by constructing a set of quality indicators based on the major wine guides associated to firms. Then we will replicate the econometric analysis of Crozet et al., 2012, which is based on cross-sectional data, extending it to a panel setting. We thus check whether quality can explain the intensive and extensive margin of trade for the firms under consideration. We use data on wine firms located in the Verona province. We believe that Verona is an interesting setting per se, since it has both red and white wines. In addition, for red wines in particular, it has experienced a significant increase in worldwide reputation (especially for Amarone wines) and demand.

The initial econometric analysis is quite standard, but we take special care to perform robustness checks across quality reviews and for different wines. Notice also that while the Juhlin main wine-guide used by Crozet et al. (2012) reviews firms, most of other guides review the wines. Apart from testing the theory of trade and quality, with this investigation we can (indirectly) test whether "terroir" - that is specific production zones defined by their climatic and soil conditions - is significant and has a role in explaining product (wine) quality and trade. We also look at the impact that quality reviews and collective reputation have on both intensive and extensive margins.

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Intensive and extensive margins in wine trade.

The case of Verona wines

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Abstract

The main objective of this project is the estimation of gravity equations for wine trade generating from the province of Verona, a major production area in Italy. The main innovation of the project is the use of trade data at the firm level and the explicit consideration of wine quality and of collective reputation. In the literature (that we briefly review in the following), it is quite well known (see, e.g., Melitz, 2003) that more efficient and/or bigger firms export more, i.e., 'big is better'. However, when product quality is important, whether and to what extent firm size matters is open to investigation. Indeed, products of high quality may enable even relatively smaller firms to export into many foreign markets; moreover, collective reputation, as that coming from Denomination of Origins, may help many more firms in international markets.

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