# Development Uncorked: Reputation Acquisition in the New Market for Chilean Wines in the UK.

Rocco Macchiavello*
Warwick, Harvard University, BREAD and CEPR.

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**Abstract**

Consumers in rich countries are willing to pay a price premium for the consistent delivery of high-quality goods. Since contracting on quality and consistency is particularly difficult in export markets, suppliers from developing countries need a good reputation to succeed. To explore the empirical relevance of reputation, this paper develops a theoretical framework of learning about firms and matching in new markets and tests its predictions using an originally constructed panel of relationships between Chilean wineries and distributors in the UK. The model delivers four sets of predictions linking the age and order of these relationships to free on board (FOB) prices, likelihood of relationship breakdown, effects of marketing costs and distributor characteristics. All the predictions find support in the data. Due to learning effects, FOB unit prices increase by at least 3 percent with every additional year. These effects, which are identified within buyer-seller relationships, are not confined to the initial few years, are robust across a variety of samples and identification strategies and are not driven by confounding factors such as shifts in supply, improvements in product quality, distributors or product effects. Policy implications are discussed.

Keywords: Reputation, Matching, Intermediation, Industrial Development.

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# 1 Introduction

In recent decades, falling trade barriers and costs have given the opportunity to producers in developing countries to take advantage of low wages and export their products to richer countries at competitive prices. Examples abound: e.g., apparel from Sri Lanka, flowers from Kenya, wines from Chile, to name just a few. Relative to the average consumer in a developing country, however, the average consumer in a rich country has a sufficiently high income to be willing to pay a price premium for the consistent delivery of high-quality goods. Contracting on quality and consistency of delivery, however, is difficult in general and especially so in the context of export transactions, since distance amplifies uncertainty and makes contracts harder to enforce. A good reputation, therefore, can become a critical asset to successfully penetrate markets in developed countries and obtain some of the price premium consumers are willing to pay.

Is reputation an important determinant of a firm's performance in a new market? Answering this question is important for our understanding of the determinants of industrial development, international trade and, by implication, policy. But while the importance of reputation in contexts in which contracts are hard to write and enforce is theoretically well appreciated, empirically it has been hard to provide convincing evidence. This is because a firm's reputation, being embedded in the beliefs held by market participants about the firm, is inherently unobservable. The paucity of data on contracts and transactions between firms has further hindered the development of empirical work on reputation formation between firms.

Banerjee and Duflo's (2000) study of the Indian Software industry and McMillan and Woodruff's (1999) study of intrafirm credit in Vietnam are two notable exceptions. These studies rely on cross-sectional survey data and infer the importance of reputation from age effects on contract choice (Banerjee and Duflo (2000)) or trade credit (McMillan and Woodruff (1999)). Cross-sectional evidence, however, is not very satisfactory in the context of rapidly changing environments because it does not allow us to separately identify age and cohort effects. For example, do older firms receive better contractual terms because they have a better reputation, because better firms entered the industry first, or because better firms survive in the market? In fact, it is well known (see, e.g., Deaton (1997)) that even with panel data is not possible to separately identify age, cohort, and time effects.

This paper attempts to make progress by developing and testing the predictions of a simple theoretical framework of learning about firms and matching in new markets.

To enter a new market, a firm needs to be matched with a distributor. There are good and bad distributors in the market. The firm's reliability, which is initially unknown, affects the returns to the distributor's marketing effort and is revealed over time. The model delivers four sets of predictions linking the age and order of the relationships between the firm and the distributors to *i*) free on board (FOB) prices, *ii*) likelihood of relationship breakdown, *iii*) effects of marketing costs, and *iv*) distributor characteristics.

The four sets of predictions are tested using an originally constructed panel of the entire history of relationships between Chilean wineries exporting to the UK and distributors matched with export data.[1] The paper finds empirical support for all of the qualitative predictions. In particular, wineries enter the market without an established reputation for reliability. They are initially matched with distributors with relatively high costs of marketing, since those distributors have a relative comparative advantage in discovering new wineries that have not yet established a good name. As the winery acquires a good name, FOB prices increase and become less sensitive to shocks to marketing costs. Eventually, wineries move on to better distributors that pay higher FOB prices and have longer lasting relationships.

The evidence is qualitatively consistent with reputation acquisition by the wineries.The effects are also quantitatively relevant. On average, FOB unit prices increase by at least 3 percent with every additional year in the market. The increase in price is not confined to the first few years. Importantly, age effects are identified within buyer-seller relationships, which makes it possible to control for winery (which includes cohort), time and distributor effects in a flexible way. The estimate of the age effect is robust across a variety of samples and identification strategies and is not driven by confounding factors such as shifts in supply, improvements in product quality, distributors or product effects.

The evidence shows that reputation acquisition is a quantitatively important determinant of FOB prices in this market. Building a reputation, however, takes time. This point has several implications. First, the initial investments required to build a reputation might represent an important component of the sunk costs associated with exporting. Exporters might require access to credit in order to develop a good name

[1] As further detailed in Section 2, the relationships between wineries and distributors are the key junction where developing a reputation for reliability matters. Wine is a branded good and, therefore, its quality is observable by consumers (and, importantly, by the econometrician). Chilean wines in the UK are an appropriate setting to study how new industries penetrate markets where quality is important, since Chile only started exporting wines in the 1980s while UK traders have historically played a central role in the international trade of wines.

in export markets. Before a firm has acquired a good reputation, initial prior beliefs matter. This paper does not identify the nature of prior beliefs among buyers, but it can be conjectured that they are affected by previous experiences with early entrants in the industry or with suppliers from other industries in the same country, resulting in externalities across firms in the same industry, across industries in the same country, and over time. Relative to the social optimum, firms might underinvest in customer relations, and trade patterns might fail to reflect underlying comparative advantage for long periods of time.

There is, of course, a large theoretical literature on seller reputation (see, e.g., Bar-Isaac and Tadelis (2008) for an overview). The paucity of data on contracts and transactions between firms, however, has hindered the development of empirical work on reputation between firms, with the notable exceptions of McMillan and Woodruff (1999) and Banerjee and Duflo (2000) already mentioned above. Banerjee and Munshi (2004), Woodruff (1998), Andrabi et al. (2006), and Munshi (2010) provide interesting studies of contractual relationships in a development context, but with rather different focuses. Banerjee and Munshi (2004) study community effects on access to credit among export-oriented firms in the garment industry in Tiruppur, South India. They look at output and investment trajectories across communities over time to document the resulting misallocation of capital. As in this paper, results rely on identification of differential age effects in the context of a growing industry, in which cohort effects might be relevant. Munshi (2010) provides a very interesting study of the expansion of a particular Indian community in the diamond industry, and show how network effects can help relatively disadvantaged communities overcome barriers to entry in the industry. Finally, Macchiavello and Morjaria (2010) exploit an intense episode of ethnic violence as a short-run shock to the cost function of Kenya flower exporters to assess the importance of reputation for reliability in export markets. They find that despite the absence of enforceable contracts with foreign buyers and higher prices on the spot market, exporters prioritize shipments to foreign buyers over shipments to the spot market to protect their reputation.

This paper is also related to a recent literature on contracts and intermediation in international trade (see, e.g., McLaren (1999), Rauch (2001), Antras (2003), Kranton and Swamy (2007), Antras and Costinot (2009) for theoretical contributions, and Bernard et al. (2009), Blum et al. (2009) and Ahn et. al (2010) for empirical ones). This literature has paid relatively little attention to the value of reputation and collaborative relationships with foreign buyers, which are, instead, the focus of a large

literature by sociologists and organizational scholars (see, e.g., Egan and Mody (1992) and Gereffi (1999)).[2] In the context of export markets, there is an extensive literature on whether export activity is associated with learning *by* the firm.[3] The focus of that literature is quite different from ours, which emphasizes market learning *about* the firm. Foster et al. (2010) also document outward shifts in demand associated with age effects in a number of homogenous product industries in the United States.

The paper is organized as follows: Section 2 provides background information on the wine industry and describes the data. Section 3 lays out the theoretical model and derives the testable predictions. Section 4 tests the empirical predictions, and Section 5 assesses the quantitative robustness of age effects on FOB prices. Finally, Section 6 offers some concluding remarks and discusses the policy implications of this study.

# 2 Background on the Industry and Descriptive Statistics

Section 2.1 provides basic information on the wine value chain, focusing on the various institutional arrangements that facilitate delivery of quality at all stages in the chain. Section 2.2 describes the data used in the analysis. Finally, Section 2.3 concludes by describing the market for Chilean wines in the UK.

## 2.1 Wine Making and Marketing

A good *terroir*, i.e., geographical conditions that are reflected in soil characteristics and climate, is necessary but not sufficient for winemaking. Production and sale of good wine at competitive prices critically relies on technology, expertise and institutional arrangements that ensure quality delivery at all stages in the chain, from grape growers to consumers. Since contracts for quality and consistency are hard to write and rarely enforceable, parties rely on a variety of institutional arrangements to overcome opportunism at various stages in the chain. The core message of this Section, summarized in Figure A1, is that a winery's reputation for reliability is the key institutional arrangement that helps wineries solving contractual frictions with foreign distributors.

[2] Araujo and Ornelas (2007) embed a model of reputation acquisition by a distributor into an otherwise standard Melitz (2003) model and provide an interesting theoretical exception. The paper explicitly models the evolution of the informational costs faced by an exporter in foreign markets. In our context, in which new suppliers enter an established market, it is more natural to focus on the acquisition of reputation by the exporters.

[3] The literature has considered firms learning by doing (see, e.g., Clerides et al. (1998)) and firms learning about export costs or demand (see, e.g., Albornoz et al. (2009), Eaton et al. (2009)). Verhoogen (2008) and Khandelwal (2010) are two important papers on quality and upgrading in international trade.

The contractual frictions associated with quality delivery in other parts of the chain, instead, are solved by other institutional arrangements.

*Wine Production*

It is said that the quality of wine is made in the vineyards. Wineries solve the problem of guaranteeing the supply of high-quality grapes through vertical integration and intense monitoring of inputs, e.g., irrigation, as well as harvesting time, conditions and techniques. Having sourced grapes of the appropriate quality, wineries crush the grapes, ferment the juice and age and bottle the wine, hiring professional winemakers and investing in modern capital equipment. These investments are monitored by international buyers through visits to the winery and guarantee the production of wine of suitable quality and consistency.

*International Marketing*

The wine is then exported to foreign markets in partnership with a distributor. A well-functioning partnership relies on marketing efforts by the distributor and on reliable supply from the winery. Distributor's marketing efforts are hard to monitor and producers often complain that distributors do not do enough to promote their wine. Wineries, on the other hand, must be reliable suppliers. To enhance the effectiveness of the distributor's marketing efforts and avoid complaints from buyers and retailers further down the chain, wineries must guarantee the availability of different varieties of wines according to the product and delivery requirements of the final buyers.

The distance and uncertainty associated with international trade amplify the costs of monitoring actions required from both sides, and make formal contracts difficult to write and hard to enforce.[4] Contractual parties, therefore, end up being exposed to opportunistic behavior by their partners. As a result, developing a good reputation in relationships with (potential) distributors is a key determinant of a winery's success in the export market.[5]

Not all distributors, however, are equally good. A textbook on international marketing for wines mentions that "the greatest challenge for any exporter is to gain a

[4] Spencer (2005) discusses several reasons why contracts might be especially incomplete and non-linear price schemes unavailable in international transactions.

[5] An interview given to the magazine Wine Business by Eduardo Guilisasti, CEO of Concha-y-Toro, a leading Chilean exporter, illustrates the point:

> **WB**: "What are your greatest strengths?"
> **EG:** "First, we produce quality at very different price levels. People all over the world recognize that fact. Second, we have developed long-term, solid relations to our distributors. Third, we have been investing a lot in building our brands."

See http://www.wine-business-international.com

match with a good agent / distributor" (Thach and T. Matz (2004)). A good distributor has access to distribution channels that best fit the winery's product, i.e., has lower costs for marketing and promotion. Good distributors, however, are in great demand and have higher opportunity costs of "filling a slot" with a winery's product.

*Retailing*

Finally, wine is sold to final consumers by merchants and retailers in the "off-trade" segment and by bars, restaurants, etc. in the "on-trade" segment. Historically, wine merchants and retailers would cheat consumers by mixing wines of different quality (and even diluting wine with water). Today the problem of delivering quality to final consumers is solved by a variety of institutional arrangements, including denominations, wine ratings, reviews and, most importantly, *brands*. Within brands, wineries strive to achieve consistency in the quality of their wines over time and new brands are developed to market wines of different quality. Customers, therefore, can learn the quality and value-for-money of the wine by tasting, purchase and reviews.[6]

Brands, ratings and medals at concourses are not just observable by consumers; but are also observable by the econometrician. In contrast to most studies of industries with highly differentiated products, therefore, it is possible to adequately control for product quality in empirical studies of the wine industry.

## 2.2 Data

This analysis is based on an original dataset containing information on relationships between Chilean wineries exporting to the UK and distributors in that market. The data have been assembled from multiple sources. Firm level data from custom records on yearly volumes and FOB values of exports to the UK have been obtained from industry associations. The sample period for these data covers the years 1999 to 2006 inclusive, i.e., about ten years after the industry started exporting.[7]

The panel of relationships between wineries and their distributors, instead, tracks the complete history of Chilean wines in the UK from the mid-1980s till 2006. The dataset has been constructed from *Harper's Directory of Wine and Spirits Trade* in the UK. The directory reports in each year all the brands of wine available in the

[6] For example, a Casillero del Diablo, a well-known brand by Concha-y-Toro, is meant to have the same taste and style across vintages and deliver the best "value-for-money" at a particular price point. Vintage effects, about which much is written by wine critics, are largely irrelevant for most ordinary and premium bottled wines. This is especially true for wines from New World regions, where warmer and more stable climatic conditions, larger firm size and less stringent regulations over the origins of grapes significantly reduce fluctuations in wine quality over time.

[7] Brand level data on export prices and volumes is available for the years 2002 to 2006 inclusive.

UK market and their distributors. Brand names and, consequently, distributors, have been matched with Chilean wineries in each year. All wineries and importers have been tracked over time. The relatively small number of wineries ever exporting to the UK over the period (just a few over a hundred) makes it possible to cross-check information from a variety of sources, in order to minimize errors due to, e.g., changes in names, etc.[8] In sum, attrition and left censoring are minimal and, therefore, selection and measurement error in the age of the relationships are not a concern.

Distributors' characteristics, such as location, size, age and geographical origin of other wines imported by the distributor, are reported in the *Harper's Directory of Wine and Spirits Trade* in the UK. Information on winery size, location, types of grape and ownership have been obtained from a directory of wineries published in Chile, the *Compendia Vitivinicola de Chile*.[9]

### 2.3 Industry Background and Descriptive Statistics

Since producing and selling wine requires the development of a variety of institutional arrangements that sustain quality delivery throughout the chain, many countries have natural conditions that are suitable for winemaking yet play negligible roles in international markets.[10] For a long time, Chile has been one of those countries. Favoured by ideal climatic conditions, winemaking in Chile dates back to colonial times. However, it was not until the mid-1980s that the industry started exporting wines in noticeable quantities.[11] Today Chile exports about ninety percent of the wine it produces, is the

[8] For example, for the years following 2000, the information contained in the *Directory* has been cross-checked using official records from *Wines of Chile*, the promotional body of the Chilean wine industry in the UK. Various industry publications, commercial catalogues and brochures, as well as wineries, agents and industry associations web pages, have also been used to cross-check the relationships.

[9] We have also surveyed more than 70 owners and export directors through face-to-face interviews conducted during the International Wine Fair in London in May 2007. Interviews were structured around a short questionnaire and focused on the contractual arrangement between wineries and distributors in the UK market, as well as on perceptions of other exporters and distributors in the industry. The information collected through the survey is only used to provide background information on marketing practices in the industry and not to construct variables used in the regression analysis.

[10] For example, the earliest production of wine probably took place around the current border between Armenia and Iran, 8000 years ago. In the early twentieth century, Croatia, Morocco and Algeria exported wine to France and the UK.

[11] The take-off in exports followed the introduction of stainless steel vats and oak barrels by Miguel Torres, a Spanish wine maker, in the early-1980s. These technological improvements demonstrated the possibility of producing wines of quality suitable for export markets at low costs. Shortly after, the industry saw the entry of a number of local established producers, e.g., Vina Concha-y-Toro. A part from the role played by Miguel Torres, foreign direct investment and joint ventures with foreign producers have not played a signifiacant role in the early years of the export boom (see Agosín and Bravo-Ortega (2007)).

tenth-largest producer of wine in the world, and is the fifth-largest exporter in both volumes and values.

Since the early years of the export boom, the UK market has been, along with the United States, the main destination for Chilean wines.[12] Currently Chilean wines have a seven percent share of the British wine market. Figure 1 tracks the number of wineries exporting wines from Chile to the UK, as well as entry and exit flows in the market. The figure shows the rapid entry and very limited entry of wineries into the market. More than a hundred wineries were exporting from Chile to the UK by the end of the sample period.

Table 1 presents summary statistics. The dataset contains information on 114 wineries matched with 136 distributors during the sample period between 1983 and 2006. In total, there have been 288 relationships. The average relationship lasted 3.37 years. There is no left censoring in the duration of relationships. There is, however, right censoring since the end of relationships still ongoing in 2006 is not observed. There are 134 relationships active in 2006, with an average age of 4.2 years. Although the vast majority of relationships lasted for less than seven years, few relationships have lasted for more than ten years, the longest has existed for seventeen years.

On average, wineries entered in the market in 1997, i.e., approximately half-way between the beginning of the industry and the last year in the data (2006). Many wineries only had one brand, though the largest winery was exporting wines under 11 different brands in the early 2000s. On average, each winery has had 2.52 relationships during the sample period.

Distributors vary widely with respect to their experience in the market, proxied by the year of creation of the distributor; their size, proxied by the number of different brands imported; and the geographical composition of their portfolios, proxied by the share of wines from New World regions. On average distributors have had 1.68 relationships during the sample period.

At any point in time, most matches are one-to-one. For instance, the 105 wineries exporting in 2006 had an average of 1.28 distributors in that year. Similarly, the 94 distributors importing in that same year had an average of 1.42 suppliers. Since most distributors operate at the national level, wineries tend not to "hire" multiple distributors covering the same market, unless they produce a wide range of different wines marketed towards different types of consumers, e.g., "on-trade" versus "off-

[12] British traders have historically played a pivotal role in the international trade of wine. Due to a lack of domestic production, British traders were first in importing from traditional producing regions (e.g., Bordeaux and Port) as well as from New World regions (e.g., Commonwealth countries).

trade." Distributors tend not to market multiple wineries from Chile, so as to limit "within-portfolio" competition between Chilean wines that are not perceived to be highly differentiated.[13]

# 3 Model

This Section presents a stylized model that captures, in the simplest form, the key features described in Section 2.1. In particular, it assumes that the returns to the non-contractible marketing effort exerted by distributors depend on the winery's reliability. There are two main ingredients in the model. First, a winery's reliability is initially uncertain to all parties in the market. Second, distributors are vertically differentiated: good distributors have lower cost of marketing but higher opportunity cost of "filling a slot" to distribute the winery's product. Given the evidence in Figure 1, the model does not solve for the industry steady state and squarely focuses on successful trajectories of new wineries in the market. The model delivers four sets of predictions on i) age effects on FOB prices, ii) age effects in the conditional likelihood of relationship breakdown, iii) age effects on the impact of marketing costs on FOB prices, iv) re-matching patterns.

*Set Up*

There are $N_W$ wineries from country $\mathcal{C}$ that would like to sell wine in market $\mathcal{E}$. In order to enter market $\mathcal{E}$, a winery from country $\mathcal{C}$ needs to form a partnership with one, and only one, distributor. There are two types of distributors, good and bad. Denote by $N_G$ and $N_B$ the number of good and bad distributors respectively and assume that $\min\{N_B, N_G\} > N_W$.

Each distributor can sell the product of only one winery from country $\mathcal{C}$. To do so, the distributor incurs two costs: first, there is an opportunity cost $\phi_i$ of "filling" a slot with a winery from country $\mathcal{C}$ stemming from, e.g., having to divert marketing effort away from other products. Second, upon forming a partnership with a winery, a distributor of type $i \in \{B, G\}$ has to exert marketing effort $m$ at cost $C(m) = c_i \frac{m^2}{2}$ to sell the wines. Good distributors have higher opportunity costs and lower marketing costs, i.e., $\phi_G > \phi_B > 0$ and $c_B > c_G > 0$.

[13] This is consistent with the evidence from the survey. The survey data confirm that contracts between Chilean wineries and British distributors are highly incomplete. Exclusivity clauses are often the only contractual provision explicitly mentioned in the written contract, so called "cartas de compromiso", if one is written at all. Common agency theory (see, e.g., Barnheim and Whinston (1998)) suggests that exclusivity clauses are adopted in the presence of incomplete contracts on distributor's marketing effort to limit the negative effects of "within-portfolio" competition. Accordingly, matches tended to be even more one-to-one in earlier years when Chilean wines were perceived to be even less differentiated.

Upon exerting non-contractible marketing effort $m$, the distributor can sell $m$ units of wine at price $v$ with probability $\widetilde{\theta}$. With probability $1-\widetilde{\theta}$, instead, no revenue is generated.[14] The probability $\widetilde{\theta}$ depends on whether the winery is reliable or not and, for simplicity, we assume $\widetilde{\theta} \in \{\theta, 1\}$. The type of the winery is initially unknown to all parties in the market. Denote with $\mu_0 = \Pr(\widetilde{\theta} = 1)$ the initial prior belief that the winery is reliable and let $\theta_0 = \mu_0 + (1-\mu_0)\theta$ be the initial expected reliability. As soon as the winery fails to be reliable, it becomes known that $\widetilde{\theta} = \theta$. Denote by $\overline{\mu}_t$ the probability that a winery is reliable given a history of $t$ consecutive successes, i.e., $\overline{\mu}_t = \frac{\mu_0}{\mu_0+(1-\mu_0)\theta^t}$ and define $\theta_t$ accordingly.

All parties are risk neutral. Due to enforcement problems, long-term and non-linear contracts are not available. Effectively, this means that at the beginning of each period, the distributor and the winery agree on a unit price $p_t$ that the distributor will pay to the winery for each unit of wine sold in period $t$.[15] For simplicity alone, let us assume that the winery has zero production and opportunity costs and no funds in the initial period, and that all profits are distributed to shareholders that live only for one period. Effectively, this implies $p_t \geq 0$ for all $t$ and that each period can be treated separately.

All distributors in the market perfectly observe each winery's entire history. Conditional on the winery having been reliable for $t > 0$ periods, with probability $\pi_i$ the winery has the opportunity to form a new relationship with a distributor of type $i \in \{B, G\}$, paying a small non-pecuniary cost. For simplicity, let $0 < \pi_G \leq \pi_B = 1$. At the end of each period, relationships end with an exogenous probability $\lambda$.

We consider a particular date $T$, and focus on wineries that keep a clean history, i.e., wineries that have been reliable for all $t \leq T$. We assume $T$ is large enough so that the following assumption holds:

**Assumption A1:** $\frac{\theta_T v}{2} > \sqrt{2c_G\phi_G} > \theta_0 v > \sqrt{2c_B\phi_B} > \frac{\theta_0 v}{2}$.

*Dynamics*

Since long-term contracts are not available and marketing effort is non-contractible, the winery and the distributor negotiate period by period the unit price $p_t$. The Assumption $\min\{N_B, N_G\} > N_W$ guarantees that in each period the winery has all the

[14] The empirical evidence focuses on FOB prices rather than export volumes. It is possible to reinterpret $m\widetilde{\theta}$ as the probability of selling an inelastically supplied unit of wine in the market at the cost of greater notational complexity without affecting any of the predictions derived from the model.

[15] The contractual assumptions, therefore, are well in line with arguments in Spencer (2005) on contractual limitations in international trade in general, as well as with evidence from the survey of Chilean wineries exporting to the UK.

bargaining power, i.e., that the price $p_t$ is chosen to maximize the expected profits of the winery subject to the incentive compatibility and participation constraints of the distributor. Given beliefs $\theta_t$, therefore, the problem in period $t$ can be written as:

$$\max_{p_t} \theta_t p_t m_t \tag{P1}$$
$$\text{s.t.} \begin{cases} m_t \in \arg\max \theta_t (v - p_t) m_t - \frac{c_i m_t^2}{2} \\ \theta_t (v - p_t) m_t - \frac{c_i m_t^2}{2} \geq \phi_i. \end{cases}$$

After substituting for the solution to the first constraint, i.e., $m_t = \frac{\theta_t (v - p_t)}{c_i}$, the problem can be rewritten as

$$\max_{p_t} \frac{\theta_t^2 (v - p_t)}{c_i} p_t, \text{ s.t. } \frac{\theta_t^2 (v - p_t)^2}{2c_i} \geq \phi_i. \tag{P2}$$

Consider first a winery that is just entering the market. In the initial period, all wineries are identical and have expected reliability $\theta_0$. The assumption $\sqrt{2c_G\phi_G} > \theta_0 v$ guarantees that such a winery cannot form a partnership with a good distributor. To see why this is the case, note that even setting $p_0 = 0$ would not satisfy the participation constraint of a good distributor, i.e., $\frac{(\theta_t v)^2}{2c_G} < \phi_G$. In contrast, the assumption $\theta_0 v > \sqrt{2c_B\phi_B}$ guarantees that the winery can enter the market with a bad distributor.

The unconstrained solution to the winery's problem gives $p_t^* = \frac{v}{2}$ for all $t$. The assumption $\frac{\theta_0 v}{2} < \sqrt{2c_B\phi_B}$, however, implies that a winery just entering the market cannot set $p_0 = \frac{v}{2}$ since this would violate the participation constraint of the bad agent, i.e., $\frac{(\theta_0 v)^2}{8c_B} < \phi_B$.

Finally, the assumption $\frac{\theta^T v}{2} > \sqrt{2c_G\phi_G}$ guarantees that a winery with a long enough history of successes will eventually be matched with a good distributor. The condition ensures that there exists a $\widetilde{\tau}_s < T$ such that for $t > \widetilde{\tau}_s$ the winery can set $p_t = \frac{v}{2}$ if matched with a good agent, since $\frac{(\theta_T v)^2}{8c_G} > \phi_G$. The unconstrained optimum with a good distributor, however, always gives higher profits than what can be achieved with a bad distributor, since $c_G < c_B$. It follows that, after enough successes, the winery switches to a good distributor as soon as the possibility arises.

In sum, the winery enters the market matched with a bad distributor and for the first periods set prices at $p_t = v - \frac{\sqrt{2c_B\phi_B}}{\theta_t}$. Initially, therefore, the unit price received by the winery is *i*) increasing in the reputation of the winery, $\theta_t$, and *ii*) decreasing in the distributor marketing and opportunity costs. As the winery acquires a reputation for reliability FOB prices increase and, eventually, the winery switches to a better

distributor.

*Predictions*

We focus on predictions that hold conditional on the winery being always reliable and regardless of parameter configurations.[16] The model yields four sets of predictions:

**Prediction 1: Age Effects on FOB Prices**

**1a** *During the course of a relationship, there is a positive age effect on FOB unit prices:* $p_t$ *(weakly) increases over time with* $\theta_t$*;*

**1b** *Positive age effects on FOB prices get weaker, both across and within relationships, and eventually vanish over time.*

**Prediction 2: Conditional Likelihood of Relationship Breakdown**

*The conditional likelihood of breakdown increases with the age of the relationship.*[17]

**Prediction 3: Age Effects of Marketing Costs on FOB Prices**:

**3a** *FOB prices are (weakly) decreasing in marketing costs, i.e.,* $\frac{\partial p_t}{\partial c_i} \leq 0$.

**3b** *The effects of marketing costs on FOB prices get weaker, both across and within relationships, over time and eventually vanish, i.e.,* $\partial \left| \frac{\partial p_t}{\partial c_i} \right| / \partial t \leq 0$.

**Prediction 4: Re-Matching Patterns**

**4a** *Distributors involved in second relationships have longer-lasting relationships.*[18]

**4b** *Distributors involved in second relationships pay higher FOB unit prices.*[19]

[16] Conditional on a history of successes, the winery can either first acquire a level of reputation that allows to price at $p_t = \frac{v}{2}$ and then switch to a better distributor, or vice versa. Which path occurs in equilibrium depends on parameter values in a way which is simple, but tedious, to derive.

[17] Strictly speaking, the model predicts that the conditional likelihood of breakdown increases with age only in the first relationship, and decreases with age in the second relationship. The logic of the model, however, can be extended to the case in which there are $\mathcal{N} \geq 3$ different types of vertically differentiated distributors (e.g., very good, good, quite bad, etc.). In this case, the model predicts that the conditional likelihood of a relationship breakdown monotonically decreases with the age of the relationship only for the *last* relationship, i.e., the one in which the winery is matched with a distributor of the best possible type.

[18] This happens because relationships with good distributors only end for exogenous reasons, while relationships with bad distributors end for both exogenous *and* endogenous reasons, i.e., re-matching.

[19] This happens because good distributors pay higher prices since $c_G < c_B$ *and* they are matched with wineries with better reputation, i.e., relationships with good distributors are observed when $\theta_t$ is high.

*Competing Explanations for Positive Age Effects on FOB Prices*

In the empirical Section we begin by documenting positive age effects on FOB prices (Prediction 1a). It is worth discussing competing explanations for positive age effects on FOB prices during a relationship.[20] A first possibility is that $\widetilde{\theta}$ is a characteristic of the match, rather than of the winery. If this was the case, however, there would be no (endogenous) reasons to re-sort wineries and distributors conditional on success. To endogenize relationship breakdown, suppose that at the end of every period the winery receives the opportunity to switch to a newer agent which has costs $\phi$ and $c$, drawn from a joint distribution $G(\phi, c)$. A relationship with the alternative distributor starts again from initial priors $\theta_0$. Given a draw $\phi$ and beliefs $\theta_t$, there exists an endogenous threshold $\widehat{c}(\theta_t, \phi)$ such that the winery changes distributor if and only if $c \leq \widehat{c}(\theta_t, \phi)$ and $\frac{\partial \widehat{c}(\theta_t, \phi)}{\partial \theta_t} < 0$. The conditional likelihood of a relationship breakdown, therefore, would be *decreasing* in the age of the relationship. This is in contrast with Prediction 2 of the model.

The conditional likelihood of breakdown also increases with the age of the relationship in models in which participants in the market learn about the distributor rather than the winery. Positive learning about the distributor could lead to higher prices paid by final customers and, through bargaining, to positive age effects on FOB prices as well. Intuitively, if learning about distributors' characteristics is the only force driving the increase in FOB prices, positive age effects should not be found in relationships that involve distributors for which $\widetilde{\theta}$ is known, e.g., distributors that have been in the market for a very long time.

Other possible explanations for positive age effects are given by decreases in $\phi_i$ and $c_i$ during the course of a relationship. The opportunity cost of a slot for the distributor, $\phi_i$, depends either on market conditions or on distributor capacity. In the empirical specification, market conditions are controlled with time fixed effects while time invariant determinants of distributor capacity can be controlled with distributor fixed effects. The marketing costs $c_i$ could decrease with the age of the relationship if the distributor becomes better at marketing the product of the winery. However, this again would imply that, conditional on the age of the relationships, the gains from re-matching with an alternative distributor decrease over time and, therefore, the conditional likelihood of a relationship breakdown should also decrease.

[20] We do not discuss alternative explanations based on time or firm effects since the empirical specifications control for *both* firm and time effects.

# 4 Empirical Evidence: Testing the Predictions

This Section and the next Section present the empirical results. For the sake of expositional clarity, this Section focuses exclusively on the four sets of predictions delivered by the model. It first establishes positive age effects on FOB prices (Section 4.1) and then tests the other three sets of predictions (on the likelihood of relationship breakdown (Section 4.2), on the effects of marketing costs on FOB prices (Section 4.3), and on re-matching patterns (Section 4.4)). Qualitatively, we find empirical support for all the predictions of the model. Quantitatively, positive age effects on FOB prices could, in principle, be driven by a variety of factors. For this reason, Section 5 checks the robustness of the estimated age effects on FOB prices by considering alternative samples (Section 5.1), alternative identification assumptions (Section 5.2), and alternative explanations, i.e., supply (Section 5.3) and product quality (Section 5.4) effects.

## 4.1 *Prediction 1*: Age Effects on FOB Prices

*Identification of Age Effects*

The first set of predictions of the model is about positive age effects on FOB prices. Age effects have been used to uncover learning and reputation effects in a variety of different contexts (see, e.g., Banerjee and Duflo (2000) for contractual terms in a cross-section of firms, Farber and Gibbons (1996) in labor economics). In general, identifying age or experience effects is a challenging statistical problem, even with panel data, if the underlying environment is changing. In particular, it is well understood that it is not possible to separate time effects, cohort effects and (the linear component of) experience, or age, effects (see, e.g., Deaton (1997)). This limitation is particularly severe in a context like ours, which looks at exports in a growing industry. First, firms entering the market at different points in time are likely to be different in ways that affect FOB prices, i.e., there are cohort effects. For example, it is possible that relatively larger wineries exporting large volumes of ordinary wines entered the industry first and were followed in later years by smaller "boutique" wineries specializing in production of superpremium wines. If that was the case, and cohort effects are not controlled for, the data would reveal a negative correlation between experience and FOB prices, simply because older firms specialize in wines marketed at lower price points. Controlling for cohort effects through the inclusion of year of entry fixed effects, however, would rule out the possibility of controlling for time effects. This is also problematic since exchange rates or aggregate demand shocks in the export market are likely to affect FOB prices. For instance, if demand for Chilean wines decreases

over time due to aggregate economic recession or entry of foreign competitors into the market, the data will reveal a negative correlation between experience of the winery in the market and FOB prices simply because less favorable conditions occur in later years, i.e., when experience is higher.[21]

To overcome these difficulties, the theoretical model delivers predictions about age effects on FOB prices during the course of the relationship between wineries and distributors and about how these age effects change over time. This naturally leads to an empirical strategy that controls for *both* time and cohort effects by exploiting changes in relationships between wineries and distributors over time. It identifies experience effects by studying how FOB prices and volumes evolve with the age of the relationship between wineries and distributors, rather than with the experience of the winery in the market.

The basic regression we estimate, therefore, takes the following form

$$p_{twd} = \beta_1 AGE_{wdt} + \eta_w + \mu_t + \psi X_{wd} + \varepsilon_{wdt}. \tag{1}$$

Here, $p_{twd}$ is (log of) FOB unit prices in year $t$, between winery $w$ and distributor $d$, $AGE_{wdt}$ is the age of the relationship between winery $w$ and distributor $d$ in year $t$, $X_{wd}$ are time invariant characteristics of the relationship between winery $w$ and distributor $d$, and $\varepsilon_{wdt}$ is a mean-zero disturbance term which collects all the exogenous idiosyncratic shocks that the relationship receives over time.[22] The variation in the data allows to control for several fixed effects. First, we include winery fixed effects, $\eta_w$, that control for all characteristics of the wineries that do not vary over time. In particular, winery fixed effects control for cohort effects, i.e., the fact that early entrants might have higher or lower prices than later entrants for reasons unrelated to experience. Second, we can include time fixed effects, $\mu_t$, which control, in a flexible way, for all time varying shocks that affect all relationships in the industry, e.g., exchange rates and aggregate demand shocks. As noted above, at any point in time, the vast majority of matches between wineries and distributors are one-to-one. This

[21] The quantitative importance of time and cohort effects is illustrated in Figure A3. Failing to control for either cohort *or* time effects significantly biases the results and delivers *negative* estimates of age effects on FOB prices.

[22] All the specifications report results in which standard errors are clustered at the relationship level to allow for arbitrary serial autocorrelation in the error term during a relationship lifetime. Specifications that estimate non-nested clustered standard errors at the relationship and distributor-year level (see Cameron et al. (2009)) allow for arbitrary correlation patterns across wineries within a distributor portfolio. Unreported results show that these specification deliver significantly smaller standard errors.

prevents the inclusion of distributor-specific time effects.[23]

*Testing Prediction 1a: Positive Age Effects on FOB Prices During a Relationship*

The first prediction of the model is that, within relationships, there are positive age effects on FOB Prices. Table 2 reports the results. Column I finds positive age effects on FOB prices: on average, an additional year in the relationship increases prices by about two percent. The inclusion of firm fixed effects implies that the identified age effect is not driven by time invariant firm characteristics, including cohort effects. Year fixed effects control for common time-varying shocks that affect FOB prices, e.g., movements in the exchange rates and aggregate demand fluctuations in the UK market.

This effect, however, is biased if there are cohort effects at the relationship level. Column II, therefore, includes time invariant characteristics of the relationships, $X_{wd}$ and gives the specification that is used as a baseline in the remainder of the paper. In particular, it controls for exchange rates at the time the relationship was started, $e_{wd}$, a proxy for (and, perhaps, determinant of) relationships' cohort effects. It also controls for other characteristics, such as the winery's number of previous relationships. As expected, the results show larger age effects. On average, FOB prices increase by five percent with every additional year in the relationship.

The model implies that wineries have longer relationships when matched with "better" distributors that pay higher prices. To account for this, Column III includes distributor fixed effects, $\phi_d$, which control for time invariant distributor characteristics, and provides a lower bound to the age effect. This controls for the endogenous rematching effect, which is directly tested in Section 4.4. The inclusion of distributor fixed effects also brings the specification closer to the alternative identification assumptions discussed in Section 5.2, which control for relationship fixed effects. As expected, controlling for distributor fixed effects reduces the estimated age effect to about three percent.

The specification imposes linear age effects on FOB Prices. Figure 2 plots the estimated year-by-year coefficients in a non-parametric way. After ten years in a relationships, prices are about forty percent higher than in the first year. The Figure, furthermore, also shows that age effects are not just large, they also slowly build up over several years.

*Testing Prediction 1b: Positive Age Effects on FOB Prices get weaker over time*

[23] The specification above controls for both time and winery fixed effects and, therefore, the identification is obtained from switches across relationships. We postpone to Section 5 the discussion of several robustness checks to the identification strategy, including issues of selection and cohort effects in the formation and breakdown of relationships.

The model also implies that positive age effects on FOB prices become weaker over time, both across and within relationships. Table 3 and Figure 3 both show that there is empirical support for this prediction. Column I in Table 3 reports the baseline specification in Column II of Table 2. Column II in Table 3 checks whether, within the course of a relationship, the age effect weakens over time. Although the coefficient is not precisely estimated, it appears that the increase in FOB unit prices is stronger in the first years of a relationship. Column III distinguishes the age effect on FOB prices between the winery's first and subsequent relationships. On average, the age effect on FOB prices is about two percent weaker in subsequent relationships relative to the age effect in the first relationship. Column IV confirms the results when both interactions are considered at the same time.

Figure 3 plots the coefficient of the age effect estimated in four different points in time during the life of the winery in the market, first, in the early and late years of the first relationship respectively, then in the early and later years of subsequent relationships. The Figure shows that the age effects becomes weaker over time, both within and across relationships. Interestingly, the fact that the age effect at the end of the first relationship is similar in magnitude to the age effect at the beginning of subsequent relationships suggests that the increase in FOB prices is driven by factors that the winery brings to its next relationship, e.g., a reputation for reliability, rather than factors that are specific to the relationship. This issue is further discussed when looking at Prediction 2, to which we now turn.

## 4.2 *Testing Prediction 2*: Conditional Likelihood of Relationship Breakdown

*Testing Prediction 2: Conditional Likelihood of Breakdown Increases with Relationship Age*

The second prediction of the model is that the conditional likelihood of a relationship breakdown increases with age. This happens because of the endogenous rematching between wineries and distributors as information is revealed over time.

Table 4 shows results from the estimation of a discrete time process model that allows the probability of a relationship breakdown to depend on the age of the relationship. Effectively, the Table reports results that fits a logit model in which the likelihood of a relationship breakdown depends on the logarithm of the relationship age, but models that rely on alternative functional form assumptions deliver similar results. Analogously to the specification used in Tables 2 and 3, the specification always

controls for both year and winery fixed effects.[24]

Column I shows that the likelihood of a relationship breakdown increases with the age of the relationship, though the effect is not statistical significant. It turns out that a relatively high fraction of relationships ends immediately after the first year. In restricting the sample to relationships that last more than one year, Column II finds very strong evidence that the likelihood of a relationship breakdown increases with age.

As noted above, the (logic of the) model suggests that the likelihood of a relationship breakdown should decrease with the age of the relationship for the "last" relationship of the winery in the market, i.e., the relationship in which the winery is eventually matched with a distributor of the highest possible type. Unfortunately, we do not observe the "last" relationship in the data. The logic of the model, however, suggests that we should expect the positive effect of age on the likelihood of a relationship breakdown to decrease over time across relationships. Column III, therefore, distinguishes the first relationship from subsequent relationships. While the likelihood of a relationship breakdown still increases with age, on average, during subsequent relationships, the results show that the effect of age on the likelihood of breakdown is stronger in the first relationship.

This result is illustrated non-parametrically in Figure 4. The Figure reports non-parametric estimates of the conditional likelihood of breakdown for the first six years of the first relationship and of subsequent relationships separately. The Figure clearly illustrates that the positive effect of age on the likelihood of a relationship breakdown is much stronger in the first relationship.

*Implications of Prediction 2 for Alternative Explanations*

A model in which parties learn about match-specific attributes could also predict positive age effects on FOB prices, but would also predict that the conditional likelihood of a relationship breakdown decreases with the age of the relationship. The results in Table 4 and Figure 4, therefore, distinguish learning about match-specific attributes from a model, like the one presented in Section 2, that emphasizes learning about attributes that are specific to a contractual party.[25]

[24] Note that since these regressions only rely on information about the relationships, the sample period covers the entire history of Chilean wines exports to the UK.

[25] As mentioned above, there is some evidence that the likelihood of a relationship breakdown is very high in the first year of a relationship. This is consistent with parties learning in the first year whether they are good matches or not. Figure 2, and further results in Section 5, however, show that positive age effects on FOB price persist after the first year in the relationship. For simplicity, the model in the theoretical Section has abstracted from this effect.

The evidence, however, leaves the door open to models that emphasize learning about *distributors* or about the winery *product*. Before directly testing the remaining Predictions 3 and 4, Table 5 provides evidence suggesting that neither forms of learning accounts for the positive age effects on FOB prices.

Positive age effects on FOB prices could be due to learning by, or about, distributors. For example, distributors might acquire a good reputation in the retail market, leading retailers to pay higher wholesale prices and, through bargaining with the winery, higher FOB prices as well. In contrast to transactions between wineries and distributors, data on transactions between distributors and retailers are not observable. Learning about distributors, however, should not be important for more established distributors. We take advantage of variation in distributors' experience in the market to assess the importance of learning about distributors. Some distributors in the sample were established long before Chile started exporting wines to the UK. For instance, the median distributor in the sample was established in 1985, just a few years before Chilean wines took off in the UK market. About a quarter of distributors in the sample were established before 1965, and a few others have imported wines for more than a century.

Columns I-II in Table 5 repeat the specifications in Columns II and III in Table 2 respectively, adding the interaction between the age of the relationship and a dummy taking value equal to one if the distributor was established after 1985. The dummy is included as further control in Column I to saturate the equation. The main coefficient on the age of the relationship confirms the magnitude of the positive age effect on FOB prices found in Table 2. The interaction between the dummy variable and the age of the relationship is positive, but small and far from being statistically significant. The evidence suggests that the age effect on FOB prices is not driven by learning effects involving distributors.[26]

Positive age effects on FOB prices could also be due to learning about a winery's product in the retail market. As wines acquire recognition in the market, wineries might be able to negotiate higher FOB prices by threatening to take their products to other distributors. The resulting increase in FOB prices should be stronger for wineries that sell branded wines rather than wineries selling unbranded wines, since the former are able to "walk away" from the relationship taking successful brands with them. Variation across wineries in the share of wines that are branded can be used to assess the importance of this effect.[27]

[26] Results are robust to the use of alternative definitions of the dummy for established distributors.

[27] Successful wineries could negotiate with distributors to sell a higher shares of branded wines. We

Columns III-IV in Table 5 repeat the specifications in Columns II and III in Table 2 respectively, including the interaction between the age of the relationship and a dummy taking value equal to one if the winery only exported branded wines in 2002. The main coefficient on the age of the relationship is positive and statistically significant, although slightly smaller than the corresponding estimates in Table 2. The interaction between the dummy variable and the age of the relationship is positive, small and almost statistically significant at conventional levels. While there is some evidence that learning about the product could explain part of the positive age effect on FOB prices, the magnitude of this effect is not large enough to fully account for the age effect on FOB prices.[28]

### 4.3 *Prediction 3*: Age Effects of Marketing Costs on FOB Prices

*Exogenous Variation in Marketing Costs*

The third set of predictions regards the effects of marketing costs on FOB prices. The starting point to test Prediction 3, therefore, is to construct an exogenous measure of the cost of marketing Chilean wines for a given distributor. To do so, we start by noting that a key preoccupation of export directors is to gain sufficient attention from distributors. Distributors must spend significant time and resources to market Chilean wines. Chilean wineries compete against producers from other countries that belong to their distributor's portfolio. Profit margins earned on wines imported from other countries, therefore, determine distributors' opportunity cost of dedicating time and resources to market Chilean wines.

Exchange rates are important determinants of the margins earned by distributors on the wines in their portfolios. First, FOB prices are sensitive to exchange rate movements. Second, there is a significant amount of evidence that exchange rates are not completely passed through to wholesale or retail prices (see, e.g., Goldberg and Knetter (1997)). As a consequence, the opportunity cost of marketing Chilean wines depends on exchange rates of *other* countries. For instance, an appreciation (depreciation) of the South African rand implies that margins earned on South African wines are lower (higher). This in turn lowers (raises) the opportunity cost of exerting effort and committing resources to promote Chilean wines.

There is substantial variation in the geographic origin of wines across distributors'

use the share of branded wines for 2002 (the earliest year for which brand level data are available) to limit endogeneity concerns.

[28] Similarly, distributors might specialize in "off-trade" (i.e., supermarkets and high street retail) or "on-trade" (i.e., restaurants and pubs). Some information in this respect is provided in the *Directory*. Age effects do not appear to vary according to the specialization of the distributor.

portfolios. This cross-sectional variation can be combined with time variation in exchange rate dynamics to obtain an exogenous measure of the (opportunity) costs of marketing Chilean wines. For example, in a given year, changes in the value of the South African rand impact Chilean wineries matched with distributors that import wines from South Africa, but not wineries that are matched with distributors that do not.

The measure of the opportunity costs of marketing Chilean wines is constructed as follows. For each distributor $d$, denote with $sh_{wdc}$ the share of brands imported from country $c$ in the distributor's portfolio in the year in which the relationship with winery $w$ was formed.[29] Wine producers from New World regions are the main competitors of Chilean producers. For this reason, brands from Australia, New Zealand, South Africa and the United States alone are considered. Brands from Old World regions (i.e., France, Italy, Spain, Germany and Portugal) are not considered close competitors of Chilean wines and are, therefore, excluded. Denote by $e_{ct}$ the exchange rate between country $c$ and the British Pound in year $t$. Denote by $e_{cwd}$ the exchange rate between country $c$ and the British Pound in the year in which distributor $d$ and winery $w$ started their relationship. The portfolio adjusted exchange rate is given by

$$e^*_{wdt} = \sum_{c \in NW} sh_{wdc} \times \left( \frac{e_{ct}}{e_{cwd}} \right).$$

The variable $e^*_{wdt}$ gives an exogenous measure of the (opportunity) cost of marketing Chilean wines which is both time-varying and relationship-specific.[30]

*Testing Prediction 3a: FOB prices decrease in marketing costs*

Table 6 reports the results. Column I adds $e^*_{wdt}$ to the baseline specification in Column II of Table 2. The opportunity cost of marketing has a negative impact on FOB prices. The coefficient implies that a ten percent depreciation in the exchange rates of a country in the distributor portfolio translates into a reduction in FOB prices of almost four percent times the share of that country in the distributor portfolio. This effect is in addition to the overall effect induced by exchange rate dynamics from, e.g., aggregate demand effects, which is absorbed in the year fixed effects.

[29] The shares $sh_{wdc}$ are computed at the time the relationship started to limit potential endogeneity concerns arising from distributors adjusting the composition of their portfolios depending on the evolution of the relationship with the Chilean supplier.

[30] Figure 3 illustrates the time variation in the exchange rates as well as in the average measure of the opportunity costs of marketing over the sample period. The Figure shows that, while exchange rates dynamics display significant variation both across countries and over time, the average opportunity cost of marketing across relationships is stable over time. The proxy for marketing costs, therefore, genuinely reflects idiosyncratic shocks to the relationships and does not pick up time trends.

*Testing Prediction 3b: The effect of marketing costs on FOB prices becomes weaker, both across and within relationships, over time.*

Columns II, III and IV in Table 6 show that the effect of marketing costs on FOB prices gets weaker over time. First, Column II distinguishes early years from later years in the average relationship. The results show that, relative to the first years, the effect of marketing costs on FOB prices in later years is weaker and, in fact, not statistically different from zero. Similarly, Column III shows that the effect of marketing costs on FOB prices also becomes weaker in the second and subsequent relationship. The interaction coefficient is positive, but not statistically significant. However, the overall effect of changes in marketing costs is no longer statistically significant at conventional levels after the first relationship. Finally, Column IV combines the two effects.

The decreasing magnitude of the effect of the opportunity cost of marketing on FOB prices is illustrated in Figure 6. The Figure shows that over time, both across and within relationships, FOB prices become less sensitive to changes in the opportunity cost of marketing.[31]

### 4.4 *Prediction 4*: Re-Matching Patterns

Finally, we turn to Prediction 4, according to which distributors involved in second relationships have longer-lasting relationships and pay higher FOB unit prices on average. The test provides direct evidence on the re-matching patterns induced by wineries' acquisition of a good reputation. The test relies on documenting systematic differences in the quality of distributors between first and second relationships for the winery in the market. We consider two different proxies for the quality of a distributor, both implied by the theoretical model.

*Testing Prediction 4a: Distributors in Second Relationships have Longer-Lasting Relationships*

To test the prediction, we focus on the first and second relationships of the wineries in the market. A first measure of a distributor's quality is the share of relationships in the portfolio that are five or more years old at the time the relationship was started. Columns I and II in Table 7 reports the results and show that the distributor involved in the second relationship of the winery has a higher share of long-lasting relationships

[31] It is worth noting that the results in Table 6 and Figure 6 do not reflect insurance considerations. Distributors are more diversified than wineries, especially during the early years of the first relationship of the winery in the market. If anything, distributors should provide insurance against shocks to marketing costs in the early years of the first relationship, rather than later.

than the distributor involved in the first relationship. This correlation is robust to the inclusion of several distributor and winery controls.

*Testing Prediction 4b: Distributors in Second Relationships Pay Higher FOB Prices*

A second measure of a distributor's quality is given by distributor fixed effects on FOB prices estimated from the specification in Column III of Table 2.[32] Columns III and IV in Table 7 report the results. Both columns show that the distributor involved in the second relationship pays, on average, about eight percent higher FOB prices than the distributor with whom the winery had its first relationship. This effect is in addition to winery, year, and age effects since these are controlled for in the estimation of distributor fixed effects.

# 5 Robustness of Age Effects on FOB Prices

The theoretical Section has laid down a simple theoretical model that derives four sets of predictions from the assumption that wineries acquire a reputation for reliability over time. From a qualitative point of view, the previous Section found empirical support for all four sets of predictions derived from the model. Whether reputation acquisition is also quantitatively important depends on the magnitude of the estimates of the age effect on FOB prices which could, in principle, be driven by a variety of factors. This Section, therefore, checks the robustness of age effects results reported in Table 2. It first considers robustness to alternative samples and identification strategies and then shows that positive age effects are not driven by shifts in supply nor by improvements in product quality.

## 5.1 Alternative Samples

The baseline specification in Table 2 controls for both time and winery effects. The identification of age effects on FOB prices, therefore, is obtained from switches across relationships. If relationships in which wineries are paid low (resp. high) FOB prices selectively break down, the estimated age effect is upward (resp. downward) biased. Furthermore, if wineries change relationships in anticipation of lower (resp. higher) prices, the estimated age effect would be biased upward (resp. downward). This

[32] The inclusion of winery fixed effects in the specification in Column III of Table 2 precludes the estimation of fixed effects for distributors that are involved in relationships in which both parties have had only one partner. There are twentythree such relationships in the data. This could potentially induce selection bias in the set of distributors considered.

Section, therefore, reports results from a variety of robustness checks that rely on different samples (Table 8) and different identification assumptions (Table 9) to confirm the estimates of positive age effects on FOB prices.

Column I in Table 8 reports the baseline specification of Column II in Table 2. Column II includes dummies for the first year and the last year in the relationship. These dummies isolate specific conditions that might affect FOB prices in the first and last year of a relationship. The estimated coefficient for the age effect is almost four percent, slightly lower than in Column I, and statistically significant at conventional levels. The coefficient for the first-year dummy is negative. Although it is not statistically significant, the coefficient implies that first-year FOB prices are almost five percent lower than in other years. This effect comes on top of the effect associated with exchange rates at the time the relationship started. The dummy for the last year is close to zero, and far from being statistical significant.

Column III reports results estimated only on the first four years of the relationships and provides evidence that the positive age effect on FOB prices is not driven by positive selection of relationship duration on prices. The estimated coefficient is similar to the one estimated in Column I. Column IV, instead, focuses on relationships that lasted at most four years and finds a slightly higher estimate than Columns I and III.[33] In sum, the results in Table 8 show that selection concerns of various kind are not driving positive age affects on FOB prices.

### 5.2 Alternative Identification Assumptions

Including relationship fixed effects in the specification allows to control for unobserved relationship characteristics, e.g., cohort effects and the quality of the match, which are fixed over time, and would reduce selection and other endogeneity concerns. Unfortunately, the same logic described above implies that it is not possible to separately identify age of the relationship effect from time effects and cohort effects in the formation of relationships.

It is, however, possible to include relationship fixed effects by either omitting time fixed effects or by assuming non-linear age effects. The first route is given by the following specification

$$y_{twd} = \beta_2 AGE_{wdt} + \eta_{wd} + e_t + \varepsilon_{wdt}; \tag{2}$$

[33] Note that this is consistent with faster increases in FOB prices being associated with a quicker relationship breakdown, as implied by the model.

which includes both relationships fixed effects and exchange rates $e_t$. Relationship fixed effects, $\eta_{wd}$, control in a flexible way for winery characteristics, distributor characteristics and match-specific characteristics, such as relationship cohort effects, that do not vary over time.

The results corresponding to the specification in equation (2) are reported in Column II of Table 9 (Column I reports the baseline specification in Column II of Table 2). The estimated coefficient is statistically significant, close to the estimates in Column III of Table 2, which also included distributor fixed effects. The coefficient gives an average age effect of about three percent on FOB prices.[34]

In the specification (2) the inclusion of relationship fixed effects precludes the inclusion of time effects, $\mu_t$. The specification controls for exchange rates at time $t$, $e_t$, an important determinant of FOB prices. It is possible to estimate age effects including both relationship and year fixed effects by assuming non-linear age effects, as in the following specification

$$y_{twd} = \beta_3 \overline{AGE}_{wdt} + \eta_{wd} + \mu_t + \varepsilon_{wdt}; \tag{3}$$

where $\overline{AGE}_{wdt}$ is defined as

$$\overline{AGE}_{wdt} = \begin{cases} AGE_{wdt} \text{ if } AGE_{wdt} < \widetilde{T}, \\ \widetilde{T} \qquad\quad \text{if } AGE_{wdt} \geq \widetilde{T}. \end{cases}$$

In other words, the identification assumption in (3) is that the age effect on FOB prices vanishes after $\widetilde{T}$ years in the relationship. Under this assumption, year fixed effects are identified from relationships that lasted more than $\widetilde{T}$ years, cohort effects are absorbed by the relationship fixed effects, and the age effect is recovered for the first $\widetilde{T}$ years of the relationships. Column III in Table 9 reports results corresponding to the specification (3) when $\widetilde{T} = 7$. The estimated coefficients are remarkably robust and similar to those estimated in Column II.[35]

In sum, the evidence in Table 2, 3, 5, 8 and 9 suggests that positive age effects on FOB prices are remarkably robust across a range of empirical specifications relying on different samples and identification assumptions. Once (endogenous) re-matching of wineries with distributors is taken into account, we find that FOB prices increase by about three percent with every additional year.

[34] Unreported results find similar estimates in samples that exclude longer relationships or focus on the first years in the relationships, as in Table 8.

[35] Results are not sensitive to the choice of $\widetilde{T}$. In particular, unreported results find almost identical age effects setting $\widetilde{T} = 4$ or $\widetilde{T} = 10$.

### 5.3 Outward Shifts in Demand and Product Quality

We conclude the empirical section by ruling out two other candidate explanations for positive age effects on FOB prices: upward shifts in wineries' supply curves (Table 10) and increases in product quality (Table 11).

*Outward Shifts in Demand*

FOB prices could increase with relationship age if wineries's supply curves shift upward over time. The remarkable success of the industry spurred intensive planting of new vineyards in Chile. *Prima facie*, therefore, upward shifts in supply curves in a growing industry run against intuition. However, it takes approximately three to five years for a new vineyard to produce grapes. Supply curves might be relatively inelastic in the short run. Furthermore, successful wineries with longer relationships might try to expand in other markets as well. This could effectively imply a reduction in the supply of wines available for the UK market as the relationship with a distributor unfolds.

If supply curves shift upward over time, the data should reveal *negative* age effects on export volumes. Columns I-III in Table 10 show that this is not the case. Columns I, II and III reproduce the corresponding specifications in Table 9 with export volumes (in logs) as the dependent variable. The results show small positive and, in Column III, close to marginally statistically significant, age effects on export volumes.

The increase in volumes is consistent with downward shifts in the supply curve of wineries due to, e.g., investments in capacity, or learning. Downward shifts in supply alone, however, cannot account for higher FOB prices. Positive age effects on FOB prices must be explained by outward shifts in the demand, as illustrated by Figure 7. The Figure plots on the horizontal axis export volumes. FOB prices are plotted on the vertical axis. To control for time effects, both volumes and FOB prices are in deviations from year-averages. For illustrative purposes, observations have been assigned different colors depending on whether they are from years one and two, three and four, or later, in any given relationship. Linear fits for the different age groups shift out in a parallel way as the relationship ages.

*Product Quality*

Apart from improvements in the efficiency of distribution channels, the focus of the theoretical model and empirical evidence in Section 4, improvements in product quality are the main alternative explanation to account for outward shifts in demand.

To control for improvements in product quality we take advantage of two features

of the wine industry. First, wines are marketed under brand names, and data on FOB prices by brand are available.[36] Second, other measures of product quality, e.g., medals at wine competitions, are also available. These two features of the industry allow to control for the quality of the wine.

Within brands, producers strive to achieve consistency in the quality of wines over time. Consumers can easily recognize wines according to their grapes and brand names. Consumers can also purchase reviews about specific wines and brands.

Column I in Table 11 reports positive age effects on FOB prices using brand-level data. The specifications include distributor fixed effects as in Column III in Table 2, with brand fixed effects replacing winery fixed effects. The coefficient of interest is positive and statistically significant. The estimate implies that one additional year in the relationship increases the FOB price received on a particular brand by five percent.

Measures of the quality of wines are also available.[37] We use medals won at wine exhibitions organized by the promotional body of Chilean wines in London between 2003 and 2006 as a proxy for the quality of wines marketed under a given brand. These data offer a comparable measure of product quality for all wineries and years in the sample. All the exporters participate in the annual exhibition of Chilean wines in London. Each producer is automatically invited to submit a limited number of wines for tasting. Gold, silver and bronze medals are awarded. We use the number of medals as well as a dummy for whether any medal has been awarded in a given year to the brand as a measure of quality, but alternative classifications yield qualitatively similar results.[38]

Columns II and III in Table 11 show that (the number of) medals awarded to the brand have a positive effect on the average FOB price. The estimate of the age effect on FOB prices is positive, statistically significant, and very similar in magnitude to the estimate in Column I. The available evidence suggests that improvements in product

[36] The data at the brand level are available for a shorter period covering 2002 to 2006. For this reason they are not used in the baseline analysis.

[37] See, for example, Crozet et al. (2009) for an application to international trade of Champagne wines.

[38] Wines also receive ratings from a variety of well-reputed raters, e.g., Robert Parker, *Wine Spectator* in the US and *Decanter*, Jancis Robinson in the UK. Using these measures to control for the quality of wines is complicated because of limited comparability, small coverage and selection. Comparability issues arise because different sources use different systems. For example, Robert Parker use a one hundred point scale, Jancis Robinson in the UK prefers a twenty point scale with half-points, and the *Decanter* uses a scale based on five stars. There is no consensus on how to compare these measures. Problems of small coverage arise because a large number of wines produced by a small number of producers is rated. Finally, the set of wineries receiving attention from established raters is not a random subset of the sample since distributors bring those wineries with whom they have more successful relationships to the attention of established raters in the market.

quality do not account for the positive age effect on FOB prices.

# 6 Conclusions

In this paper we set out to look for evidence that reputation acquisition matters in export markets, and used an original dataset of relationships between Chilean wineries and distributors in the UK market as the setting for our analysis. We first laid down a simple theoretical framework of learning and matching about firms in new markets and found empirical support for all of the qualitative predictions of the model. In particular, wineries are initially matched with distributors with relatively high costs of marketing that have a relative comparative advantage in discovering new wineries that have not yet established a good reputation. As the winery acquires a good reputation, FOB prices increase and become less sensitive to shocks to marketing costs. Eventually, wineries move on to better distributors that pay higher FOB prices and have longer-lasting relationships. As a result of reputation acquisition, FOB prices increase by at least three percent every year and these positive age effects last for several years.

These are quantitatively important effects. Figure A2 reports a value chain decomposition provided by the Chilean wine association. The Figure shows that variable costs alone account for three-quarters of the average FOB price for ordinary wines. Given the substantial capital investments involved in wine production, the age effects on FOB prices identified in this paper imply that the average winery is likely to incur losses for at least a few years before acquiring a good reputation and obtaining higher prices. This is exactly what theory predicts. Reputation acquisition is a form of investment: when an exporter enters a new market, there is an initial phase in which the exporter incur losses to build a good name (see, e.g., Shapiro (1983) for an early theoretical treatment). This implies that deep pockets, or good access to trade finance, can enormously facilitate access to export markets.

The fact that building a reputation takes time implies that, at least for a while, prior beliefs matter. This also has important implications.[39] Prior beliefs might be determined, at least in part, by the country's reputation. Apart from potentially providing a rationale for common marketing efforts and promotion at the country/industry level,

[39] In the case of the specific market under consideration, prior beliefs of low differentiation in Chilean wines might explain why distributors do not market more than one Chilean winery at a time. This, in turn, creates significant barriers to entry for other wineries which might either not find an agent, or might have to choose from a small pool of low-quality agents. Some support for this argument is given by the marketing efforts made in recent years by the industry association to advertise grape and regional differentiation within Chile.

the logic also points to the critical role of "pioneers", i.e., early entrants.[40] Perhaps Chile has been "lucky" in having a good pool of early entrants that established a good reputation for themselves and for the industry as a whole, opening up the market for subsequent cohorts of entrants. There is some anecdotal evidence for this view. During a survey of winery owners and export directors conducted at the International Wine Fair in London in May 2007, we asked respondents to name other Chilean wineries that, in their view, had acquired a particularly good reputation in the market. An overwhelming majority of answers clustered on two very early entrants. A respondent from a small "boutique winery" specializing in high quality wines noted that if it had not been for the efforts of these early entrants, she "would have not been (t)here". This view was shared by several other respondents. But perhaps Chile wasn't just lucky: in a country in which markets do not allocate resources to the most efficient firms, those with better "connections" end up being more likely to export. Pioneers will then not be the most efficient firms and might fail to be catalysts for further industry expansion. A better understanding of the importance of reputation in export markets has the potential to yield several policy implications. Providing further direct evidence on the quantitative importance of the resulting externalities is a challenging, but important, task for future research in the area.

[40] Hausmann and Rodrick's (2003) self-discovery approach also points to the importance of early entrants in promoting export growth. The logic is however quite different from one based on reputation. Exploring the connections between the two approaches is a promising avenue for future research.

## References


[1] Agosín, M. and C. Bravo-Ortega (2007) "The Emergence of New Successful Export Activities in Latin America: The Case of Chile", mimeo Universidad de Chile

[2] Ahn, J.B., A. Khandelwal, S.J. Wei (2010) "The Role of Intermediaries in Facilitating Trade," mimeo Columbia

[3] Albornoz, F., H. Calvo-Pardo, G. Corcos, and E. Ornelas (2009) "Sequential Exporting", mimeo LSE

[4] Andrabi, T., M. Ghatak and A. Kwhaja (2006) "Subcontractors for Tractors: Theory and Evidence on Flexible Specialization, Supplier Selection, and Contracting", *Journal of Development Economics*, April 79 (2): 273-302.

[5] Antras, P. (2003) "Firms, Contracts, and Trade Structure," Quarterly Journal of Economics, 118(4), 1375–1418.

[6] Antras, P. and A. Costinot (2009) "Intermediated Trade", mimeo MIT

[7] Araujo, L. and E. Ornelas (2007) "Trust Based Trade", mimeo LSE

[8] Bar-Isaac, H. and S. Tadelis (2008) "Seller Reputation", *Foundations and Trends in Microeconomics*, Vol. 4:4, 273-351.

[9] Banerjee, A. and E. Duflo (2000) "Reputation Effects and the Limits of Contracting: A Study of the Indian Software Industry." *Quarterly Journal of Economics* 115: 989-1017.

[10] Banerjee, A. and K. Munshi (2004) "How efficiently is capital allocated? Evidence from the knitted garment industry in Tirupur". *Review of Economic Studies* 71(1): 19-42.

[11] Bernard, B., B. Jensen, S. Redding and P. Schott (2009) Wholesalers and Retailers in U.S. Trade, mimeo Dartmouth

[12] Bernheim, D., and M. Whinston (1998) "Exclusive Dealing", *Journal of Political Economy* 106: 64-103.

[13] Blum, B., S. Claro, and I. Horstmann (2009) "Facts and Figures on Intermediated Trade", mimeo Toronto

[14] Cameron, C., J. Gelbach and D. Miller (2008) "Robust Inference with Multi-way Clustering", mimeo, University of California-Davis.

[15] Clerides, Sofronis K., Saul Lach, and James R. Tybout (1998), "Is Learning By Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico, and Morocco," Quarterly Journal of Economics, pp. 903-947.

[16] Crozet, M., K. Head and T. Mayer (2009) "Quality sorting and trade: Firm-level evidence for French wine", CEPR DP 7295.

[17] Deaton, A. (1997) *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*, Baltimore: The Johns Hopkins University Press.

[18] Eaton, J., M. Eslava, M. Kugler, C. Krizan and J. Tybout (2009) "An Empirical Model of Search and Learning in Export Markets", mimeo NYU.

[19] Egan, M.L. and Mody, A. (1992) "Buyer-Seller LInks in Export Development", World Development, 20, 321-34.

[20] Farber, H. and R. Gibbons (1996), "Learning and Wage Dynamics", *Quarterly Journal of Economics* 111: 1007-47

[21] Foster, L., J. Haltiwanger and C. Syverson (2010) "The Slow Growth of New Plants: Learning about Demand", mimeo Chicago

[22] Gereffi, G. (1999) "International trade and industrial upgrading in the apparel commodity chain," Journal of International Economics, 48, 37–70.

[23] Goldberg, P. and M. Knetter (1997) "Goods Prices and Exchange Rates: What Have We Learned?," *Journal of Economic Literature*, Vol. 35(3): 1243-1272

[24] Hausmann, R. and D. Rodrik (2003) "Economic Development as Self Discovery," *Journal of Development Economics*, 72(2): 603–33.

[25] Khandelwal, A. (2010) "The Long and Short (of) Quality Ladders," *Review of Economic Studies*, forthcoming

[26] Kranton, R. and Swamy, A. (2007) "Contracts, Hold-Up and Exports: Textiles and Opium in Colonial India", *American Economic Review*, forthcoming.

[27] Macchiavello, R. and A. Morjaria (2010) "The Value of Relational Contracts: Evidence from a Supply Shock to Kenya Flower Exporters", mimeo Warwick.

[28] McLaren, J. (1999) "Supplier Relations and the Market Context : A Theory of Handshakes," Journal of International Economics, 48.

[29] McMillan, J. and C. Woodruff (1999) "Inter firm Relationships and Informal Credit in Vietnam", *Quarterly Journal of Economics*, 114: 1285-1320.

[30] Melitz, M. (2003) "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, Vol. 71: 695-1725.

[31] Munshi, K. (2010) "Strength in Numbers: Networks as a Solution to Occupational Traps", mimeo Brown

[32] Rauch, J. E. (1999) "Business and Social Networks in International Trade", *Journal of Economic Literature*, 39(4), 1177–1203.

[33] Rauch, J. E. (2001) "Business and Social Networks in International Trade," Journal of Economic Literature, 39(4), 1177–1203.

[34] Shapiro, C. (1983) "Premiums for High Quality Products as Returns to Reputations" *Quarterly Journal of Economics*, 98(4): 659–79.

[35] Spencer, B. J. (2005) "International Outsourcing and Incomplete Contracts," NBER Working Paper.

[36] Thach, L. and T. Matz (2004) "Wine: A Global Business" L. Thach and T. Matz (Eds.), Miranda Press.

[37] Verhoogen, E. (2008) "Trade, Quality Upgrading and Wage Inequality in the Mexican Manufacturing Sector," *Quarterly Journal of Economics*, 123 (2), 489-530

[38] Woodruff, C. (1998) "Contract Enforcement and Trade Liberalization in Mexico's Footwear Industry", *World Development* 26:6, 979–991.

**TABLE 1: SUMMARY STATISTICS**

| Variable | N. Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| *Relationships* | | | | | |
| Length | 288 | 3.37 | 2.97 | 1 | 17 |
| Length in 2006 | 134 | 4.2 | 3.79 | 1 | 17 |
| *Wineries* | | | | | |
| Year of Entry | 114 | 1997 | 5.01 | 1983 | 2006 |
| Number of Brands in 2006 | 114 | 1.46 | 1.13 | 1 | 11 |
| Number of Relationships | 114 | 2.52 | 1.37 | 1 | 7 |
| Average FOB Price per case, in $, in 2006 | 105 | 41.22 | 30.89 | 6.03 | 176.9 |
| Export Volumes, in Liters, in 2006 | 105 | 15278.8 | 57132.5 | 40 | 461392 |
| Number of Agents in 2006 | 105 | 1.28 | 0.44 | 1 | 3 |
| *Distributors* | | | | | |
| Year of Creation | 136 | 1957 | 66.65 | 1705 | 2005 |
| Number of Relationships | 136 | 2.11 | 1.13 | 1 | 8 |
| Number of Brands Imported in 2006 | 94 | 31.42 | 30.62 | 1 | 159 |
| Share of New World Wines in 2006 | 94 | 0.53 | 0.29 | 0 | 1 |
| Number of Relationships in 2006 | 94 | 1.42 | 0.86 | 1 | 4 |

Relationship Length and Relationship Length in 2006 are from author calculations from the *Harpers Directory of Wine and Spirit in the UK*, various issues. Winery year of entry is from *Harpers Directory*. Number of Brands is from *Harpers Directory* and *Nuevos Mundos*. Number of relationships is from author calculation from *Harpers Directory*. Average FOB prices per case (in US Dollars) and Export Volumes are from *Wines of Chile* and *Chilevid*. The Number of agents is from author calculation from *Harpers Directory*. All figures for distributors is from the *Harpers Directory* and author calculations.

**TABLE 2: AGE EFFECTS ON FOB PRICES - *BASELINE***

| **Dependent Variable:** | **FOB Prices** | | |
|---|---|---|---|
| | **I** | **II** | **III** |
| Relationship's Age | 0.019** | 0.051*** | 0.039** |
| | [0.008] | [0.019] | [0.019] |
| **Fixed Effects and Controls** | | | |
| Year Fixed Effects | Yes | Yes | Yes |
| Winery Fixed Effect | Yes | Yes | Yes |
| Distributor Fixed effects | No | No | Yes |
| Initial Exchange Rates | No | Yes | Yes |
| Sample Years | 1999-2006 | 1999-2006 | 1999-2006 |
| R-squared | 0.88 | 0.89 | 0.94 |
| Number of Observations | 565 | 565 | 565 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices are in logs (Sources: *Chilevid, Wines of Chile*, *NuevosMundos*). Average FOB Prices are in US Dollars. Relationships age is in years (Source: author calculations from *Harpers Directory*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 3: AGE EFFECTS ON FOB PRICES - *DIFFERENTIAL EFFECT OVER TIME***

| **Dependent Variable:** | **FOB Prices** | | | |
|---|---|---|---|---|
| | **I** | **II** | **III** | **IV** |
| Relationship's Age | 0.051*** | 0.066*** | 0.070*** | 0.084*** |
| | [0.019] | [0.026] | [0.024] | [0.030] |
| Relationship's Age x **I**[Relationship's Age >4] | | -0.015 | | -0.015 |
| | | [0.013] | | [0.013] |
| Relationship's Age x **I**[2nd or more Long Relationship =1] | | | -0.024 | -0.023 |
| | | | [0.018] | [0.018] |
| **Fixed Effects & Controls** | | | | |
| Year Fixed Effects | yes | yes | yes | Yes |
| Winery Fixed Effect | yes | yes | yes | Yes |
| Initial Exchange Rates | yes | yes | yes | Yes |
| R-squared | 0.89 | 0.89 | 0.89 | 0.89 |
| Number of Observations | 565 | 565 | 565 | 565 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices are in logs (Sources: *Chilevid*, *Wines of Chile*, *NuevosMundos*). Average FOB Prices are in US Dollars. Relationships age is in years (Source: author calculations from *Harpers Directory*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. The First Long Relationship is defined as the first relationship the winery has had in the market that lasted at least two years. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 4: CONDITIONAL LIKELIHOOD OF RELATIONSHIP BREAKDOWN**

| **Dependent Variable:** | **Relationship's Breakdown** | | |
|---|---|---|---|
| | **I** | **II** | **III** |
| Relationship's Age (ln) | 0.527 | 4.743*** | 5.853*** |
| | [0.398] | [0.753] | [0.969] |
| Relationship's Age (ln) x I[2nd or more Long Relationship =1] | | | -1.760** |
| | | | [0.858] |
| **Fixed Effects, Controls and Sample** | | | |
| Year Fixed Effects | yes | Yes | yes |
| Winery Fixed Effect | yes | yes | yes |
| Initial Exchange Rates | yes | yes | yes |
| Only Relationships Lasting > 1 Year | no | yes | yes |
| Sample Years | 1986-2006 | 1986-2006 | 1986-2006 |
| Pseudo R-squared | 0.21 | 0.35 | 0.36 |
| Number of Observations | 1058 | 962 | 962 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Relationship's Breakdown takes value equal 1 in the last year of the relationship and zero otherwise. Logit models are estimated. Column II and III exclude relationships that lasted only one year. Relationships age is in logs. Columns III includes a dummy for whether the relationship is the 2nd or more long relationship of the winery in the market to saturate the specification. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 5: COMPETING EXPLANATIONS FOR AGE EFFECTS ON FOB PRICES**

| **Dependent Variable:** | **FOB Prices** | | | |
|---|---|---|---|---|
| | **I** | **II** | **III** | **IV** |
| Relationship's Age | 0.042** | 0.031* | 0.035** | 0.031* |
| | [0.020] | [0.017] | [0.018] | [0.017] |
| Relationship's Age x Recent Distributor | 0.012 | 0.008 | | |
| | [0.011] | [0.010] | | |
| Recent Distributor | -0.027 | -- | | |
| | [0.024] | | | |
| Relationship's Age x Share of a Winery Branded Wines in 2002 | | | 0.015 | 0.014 |
| | | | [0.014] | [0.012] |
| **Fixed Effects and Controls** | | | | |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Winery Fixed Effect | Yes | Yes | Yes | Yes |
| Distributor Fixed Effect | No | Yes | No | Yes |
| Initial Exchange Rates | Yes | Yes | Yes | Yes |
| Sample Years | 1999-2006 | 1999-2006 | 1999-2006 | 1999-2006 |
| R-squared | 0.88 | 0.94 | 0.89 | 0.95 |
| Number of Observations | 565 | 565 | 565 | 565 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices are in logs (Sources: *Chilevid, Wines of Chile, NuevosMundos*). Average FOB Prices are in US Dollars. Relationships age is in years (Source: author calculations from *Harpers Directory*). Recent distributor takes value equal to one if the distributors has been established after 1985 and zero otherwise (Source: *Harpers Directory*). Branded wines takes value equal to 1 if the winery only exported bottled branded wine in the UK in 2002 (Source: author's calculation from *NuevosMundos*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 6: EFFECTS OF MARKETING COSTS ON FOB PRICES OVER TIME**

| **Dependent Variable:** | **FOB Prices** | | | |
|---|---|---|---|---|
| | **I** | **II** | **III** | **IV** |
| Relationship's Age | 0.058*** | 0.058* | 0.055*** | 0.055*** |
| | [0.021] | [0.022] | [0.021] | [0.022] |
| Opportunity Cost of Marketing | -0.389* | -0.469* | -0.463* | -0.591* |
| | [0.230] | [0.293] | [0.277] | [0.349] |
| Opportunity Cost of Marketing x **I**[Relationship's Age >4] | | 0.124 | | 0.157 |
| | | [0.272] | | [0.275] |
| Opportunity Cost of Marketing x **I**[2nd or more Long Relationship =1] | | | 0.171 | 0.217 |
| | | | [0.321] | [0.331] |
| F-Test (Effect after 4 years) | | Prob > F = 0.17 | | |
| F-Test (Effect in 2nd Long and Beyond Relationship) | | | Prob > F = 0.28 | |
| F-Test (Effect after 4 years in 2nd Long and Beyond Relationship) | | | | Prob > F = 0.49 |
| **Fixed Effects & Controls** | | | | |
| Year Fixed Effects | yes | yes | yes | yes |
| Winery Fixed Effect | yes | yes | yes | yes |
| Initial Exchange Rates | yes | yes | yes | yes |
| R-squared | 0.89 | 0.89 | 0.89 | 0.89 |
| Number of Observations | 565 | 565 | 565 | 565 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices (in US Dollars) are in logs (Sources: *Chilevid, Wines of Chile, NuevosMundos*). Opportunity Cost of Marketing is a distributor-specific weighted-average of exchange rates with Australia, New Zealand, South Africa and US. The weights are given by the share of brands in the distributor portfolio at the time the relationship was started. The corresponding exchange rates are normalized relative to the time in which the relationship was started (Sources: author calculations from *Harpers Directory*). Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 7: COMPARISON OF FIRST AND SECOND DISTRIBUTORS**

| **Dependent Variable:** | **% Relationships 5+ years old in Distributor Portfolio** | | **Distributor FE, on FOB Prices** | |
|---|---|---|---|---|
| | **I** | **II** | **III** | **IV** |
| 2nd Long Relationship | 0.071** | 0.101** | 0.034 | 0.082* |
| | [0.036] | [0.046] | [0.041] | [0.047] |
| Controls | no | yes | no | yes |
| R-squared | 0.07 | 0.13 | 0.01 | 0.04 |
| Number of Observations | 125 | 125 | 111 | 111 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. The dependent variable in Columns I and II is the share of relationships older than four years in the distributor portfolio at the time the relationship was started. Distributor Fixed Effects estimated in Column III of Table 2 are the dependent variable in Columns III and IV. Regressions are at the relationship level and consider only the first and second long relationships of wineries in the market. Controls are distributor turnover, location, share of brands from Australia, South Africa, New Zealand and US and a measure of firm size. Robust standard errors clustered at the winery level are reported in parenthesis.

**TABLE 8: AGE EFFECTS ON FOB PRICES - *ROBUSTNESS***

| **Dependent Variable:** | **FOB Prices** | | | |
|---|---|---|---|---|
| | **I** | **II** | **III** | **IV** |
| Relationship's Age | 0.051*** | 0.037** | 0.054** | 0.065** |
| | [0.019] | [0.018] | [0.028] | [0.033] |
| First Year Dummy | | -0.048 | | |
| | | [0.032] | | |
| Last Year Dummy | | 0.014 | | |
| | | [0.029] | | |
| **Fixed Effects and Sample** | | | | |
| Year Fixed Effects | yes | Yes | Yes | Yes |
| Winery Fixed Effect | yes | Yes | Yes | Yes |
| Initial Exchange Rates | yes | Yes | Yes | Yes |
| Only First 4 Years | no | no | Yes | no |
| Short Relationships Only | no | no | no | Yes |
| Sample Years | 1999-2006 | 1999-2006 | 1999-2006 | 1999-2006 |
| R-squared | 0.88 | 0.88 | 0.89 | 0.91 |
| Number of Observations | 565 | 565 | 398 | 273 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices are in logs (Sources: *Chilevid*, *Wines of Chile*, *NuevosMundos*). Average FOB Prices are in US Dollars. Relationships age is in years (Source: author calculations from *Harpers Directory*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 9: AGE EFFECTS ON FOB PRICES - *ALTERNATIVE IDENTIFICATION STRATEGIES***

| **Dependent Variable:** | **FOB Prices** | | |
|---|---|---|---|
| | **I** | **II** | **III** |
| Relationship's Age | 0.051*** | 0.036** | 0.033* |
| | [0.019] | [0.018] | [0.018] |
| **Fixed Effects, Controls, Sample and Identification** | | | |
| Year Fixed Effects | yes | no | Yes |
| Winery Fixed Effect | yes | -- | -- |
| Relationship Fixed Effect | no | Yes | Yes |
| Initial Exchange Rates | yes | -- | -- |
| Exchange Rates | -- | yes | -- |
| Non-Linear Age Effects | no | no | Yes |
| Sample Years | 1999-2006 | 1999-2006 | 1999-2006 |
| R-squared | 0.88 | 0.94 | 0.95 |
| Number of Observations | 565 | 565 | 565 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices are in logs (Sources: *Chilevid*, *Wines of Chile*, *NuevosMundos*). Average FOB Prices are in US Dollars. Relationships age is in years (Source: author calculations from *Harpers Directory*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. Exchange Rates are analogously defined for the year the observation refers to. The specification in Columns III assumes that age effects vanish after the $7^{th}$ year in the relationship. [--] denotes fixed effects or controls absorbed by other fixed effects included in the specification. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 10: AGE EFFECTS ON EXPORT VOLUMES**

| **Dependent Variable:** | **Export Volumes** | | |
|---|---|---|---|
| | **I** | **II** | **III** |
| Relationship's Age | 0.000 | 0.029 | 0.105 |
| | [0.066] | [0.064] | [0.070] |
| **Fixed Effects** | | | |
| Year Fixed Effects | yes | no | yes |
| Winery Fixed Effect | yes | -- | -- |
| Relationship Fixed Effect | no | yes | yes |
| **Controls** | | | |
| Initial Exchange Rates | yes | -- | -- |
| Exchange Rates | -- | yes | -- |
| Sample Years | 1999-2006 | 1999-2006 | 1999-2006 |
| R-squared | 0.89 | 0.95 | 0.95 |
| Number of Observations | 565 | 565 | 565 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Export Volumes are in logs (Sources: *Chilevid*, *Wines of Chile*, *NuevosMundos*). Relationships age is in years (Source: author calculations from *Harpers Directory*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. The specification in Column III assumes that age effects vanish after the $7^{th}$ year in a relationship. [--] denotes fixed effects or controls absorbed by other fixed effects included in the specification. Exchange Rates are analogously defined for the year the observation refers to. Robust standard errors clustered at the relationship level are reported in parenthesis.

**TABLE 11: AGE EFFECTS ON FOB PRICES - *WITHIN BRAND RESULTS***

| **Dependent Variable:** | **FOB Prices** | | |
|---|---|---|---|
| | **I** | **II** | **III** |
| Relationship's Age | 0.049* | 0.049* | 0.052** |
| | [0.026] | [0.028] | [0.027] |
| Medal Awarded to Brand (0-1 Dummy) | | 0.064* | |
| | | [0.036] | |
| Medals Awarded to Brand (#) | | | 0.017 |
| | | | [0.013] |
| **Fixed Effects and Controls** | | | |
| Year Fixed Effects | yes | yes | yes |
| Winery Fixed Effect | -- | -- | -- |
| Distributor Fixed effects | yes | yes | yes |
| Brand Fixed Effects | yes | yes | yes |
| Initial Exchange Rates | yes | yes | yes |
| Sample Years | 2002-2006 | 2002-2006 | 2002-2006 |
| R-squared | 0.92 | 0.92 | 0.92 |
| Number of Observations | 691 | 691 | 691 |

***, ** and * mean statistically significant at 1%, 5% and 10% respectively. Average FOB Prices are in logs (Sources: *Chilevid*, *Wines of Chile*, *NuevosMundos*). Average FOB Prices are in US Dollars. Relationships age is in years (Source: author calculations from *Harpers Directory*). Number of Medals refers to awards received by the brand at the Wines of Chile Exhibitions between 2002 and 2006 (Source: author calculations from *Wines of Chile*). Initial Exchange Rates are logs of the average exchange rates between British Pound and US Dollar and between US Dollar and Chilean Peso in the year the relationship was started. [--] denotes fixed effects or controls absorbed by other fixed effects included in the specification. Robust standard errors clustered at the relationship level are reported in parenthesis.

**FIGURE 1: ENTRY AND EXIT FLOWS IN THE INDUSTRY**

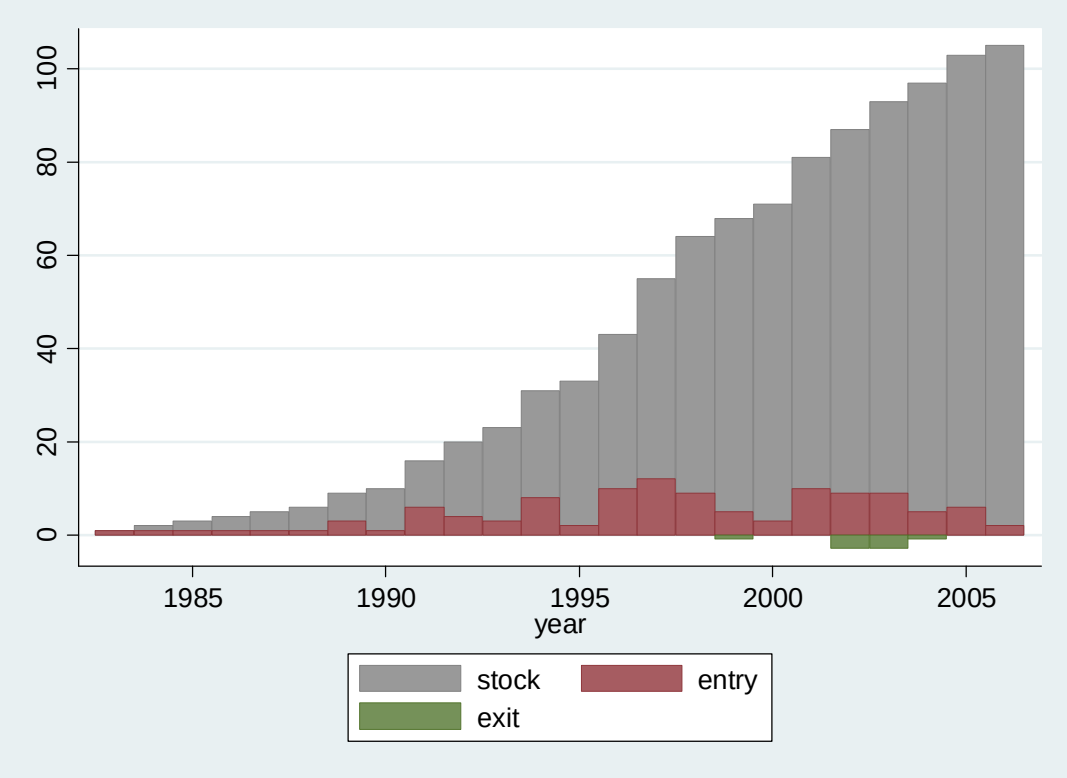



Figure 1 reports the number of Chilean wineries entering, exiting and exporting to the UK market in any given year (Source: author's calculations from *Harpers Directory* and other sources).

**FIGURE 2: AGE EFFECTS ON FOB PRICES**

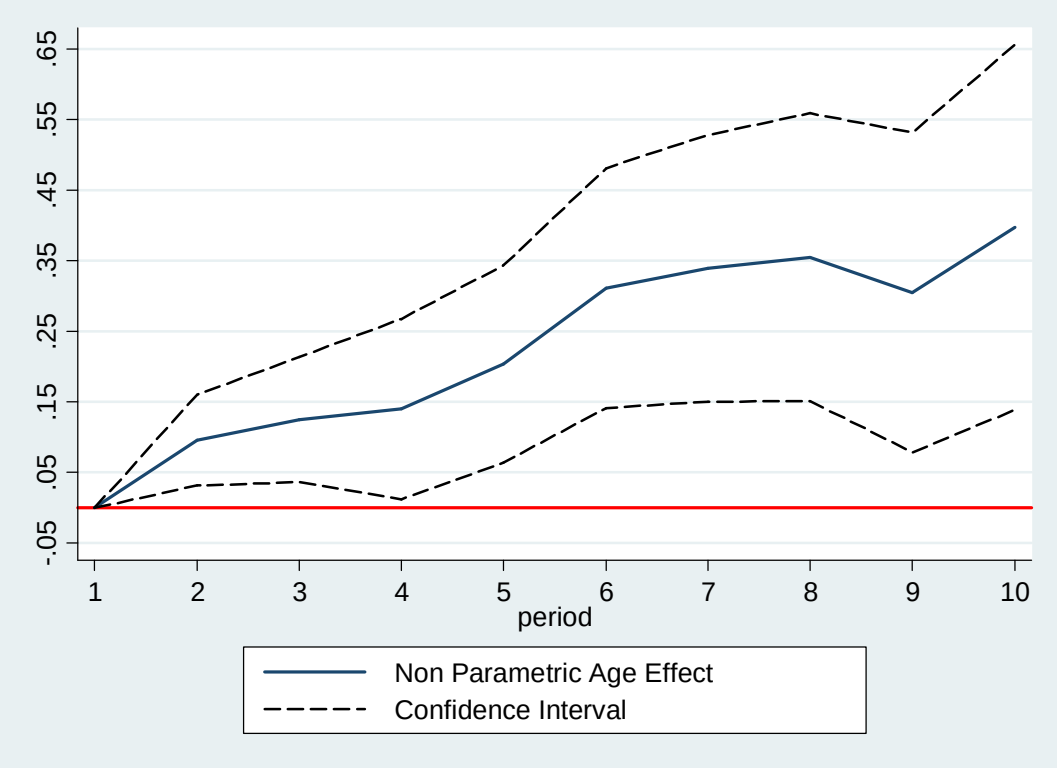



Figure 2 reports on the vertical axis estimated coefficients of the first ten year dummies (on the x-axis) on FOB prices (in logs) estimated from the baseline specification in Columns II of Table 2, alongside with 95% confidence interval.

**FIGURE 3: AGE EFFECTS ON FOB PRICES OVER TIME**

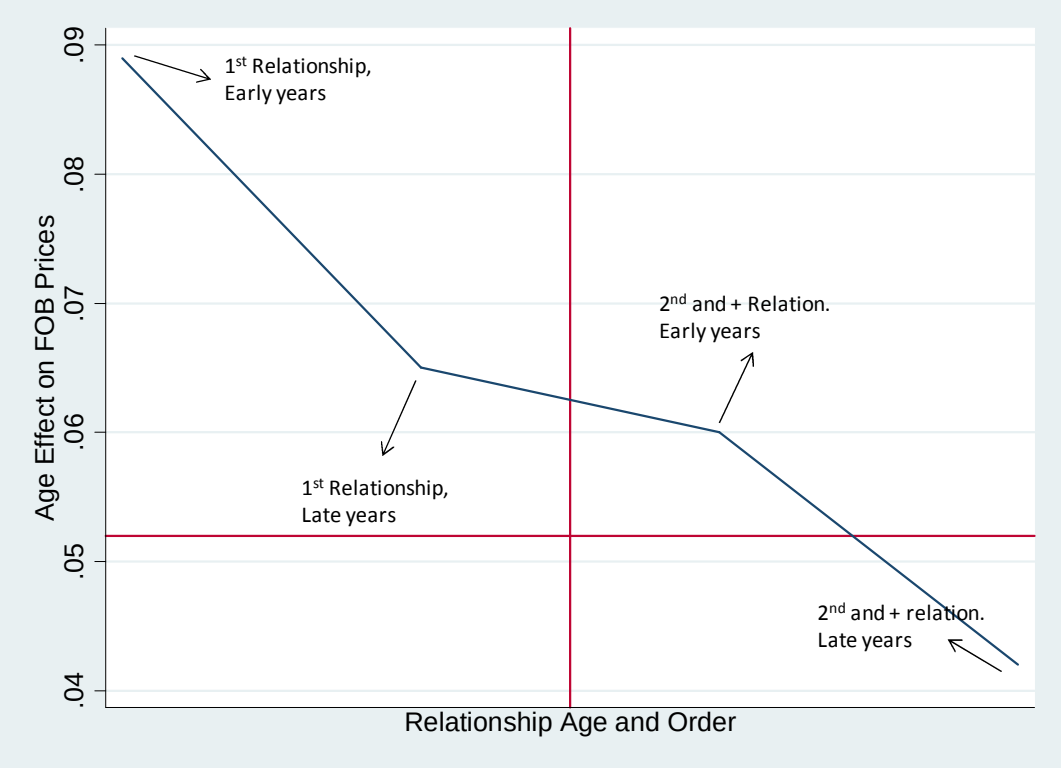



Figure 3 reports on the vertical axis estimated coefficients of age effects on FOB prices (in logs) from the baseline specification for the early and late years in the first long and subsequent relationships respectively.

**FIGURE 4: CONDITIONAL HAZARD RATE OF RELATIONSHIP BREAKDOWN**

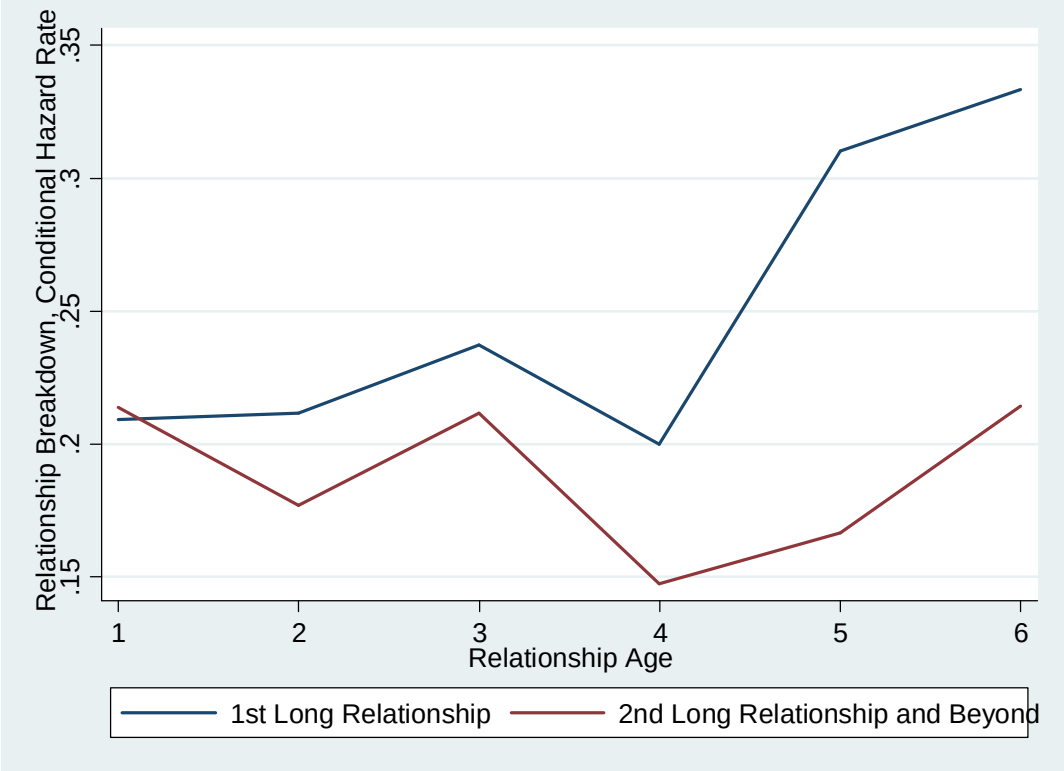



Figure 5 reports non parametric estimations of Conditional Hazard Rates of a Relationship Breakdown for the first six years in the relationships for the First Long Relationship and for the Second (and beyond) Long Relationship of the winery separately.

**FIGURE 5: EXCHANGE RATES AND MARKETING COST DYNAMIC**

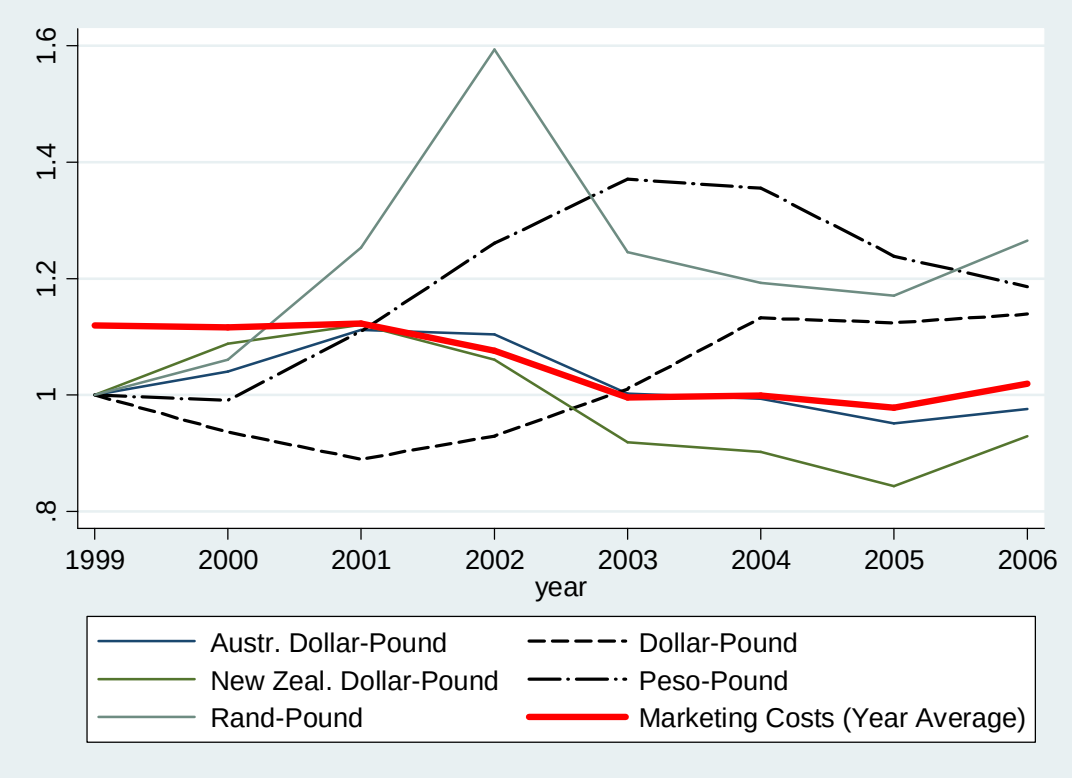



Figure 3 reports exchange rates between the British Pound and the currency of the main New World producing countries (Australia, Chile, New Zealand, South Africa and the United States) during the sample period. The value of the exchange rates is normalized to its value at the beginning of the sample period, in 1999. The Figure also reports the average opportunity cost of marketing across relationships. The measure combines cross-sectional variation in the geographical origin of wines imported by different distributors with time variation in exchange rates dynamics. To construct the measure exchange rates have been normalized for their values at the beginning of the relationship.

**FIGURE 6: EFFECTS OF MARKETING COSTS ON FOB PRICES OVER TIME**

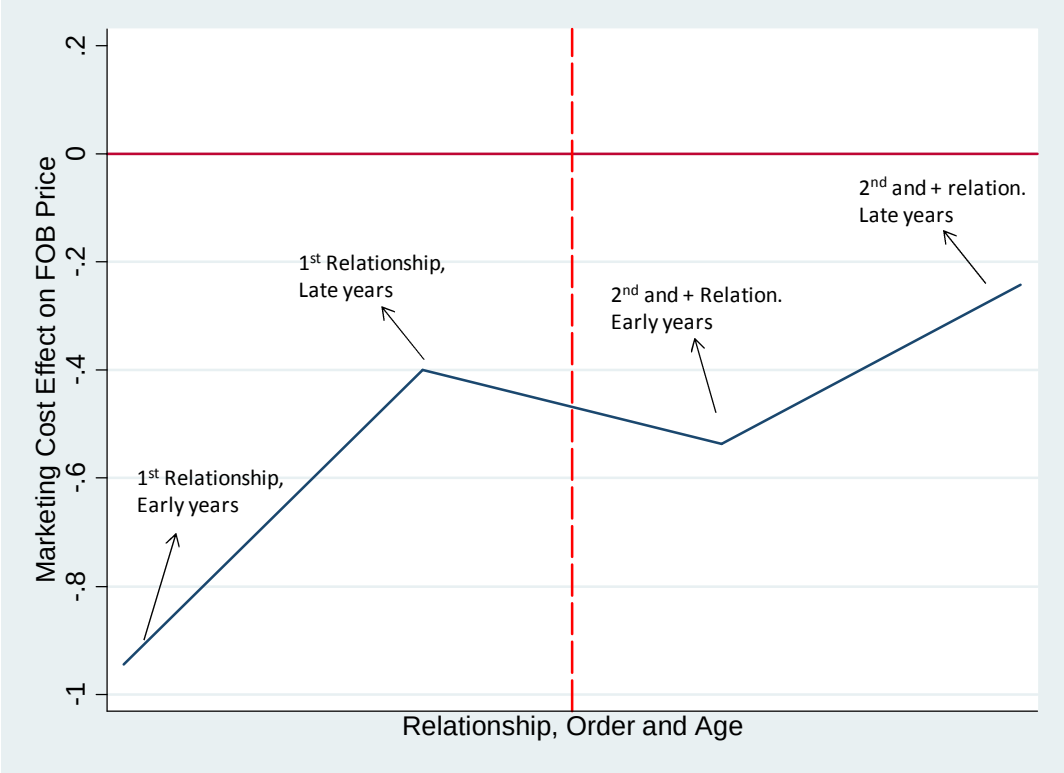



Figure 6 reports on the vertical axis estimated coefficients of the effects of distributor marketing costs on FOB prices (in logs) for the early and late years in the first long and subsequent relationships respectively.

**FIGURE 7: OUTWARD SHIFTS IN DEMAND**

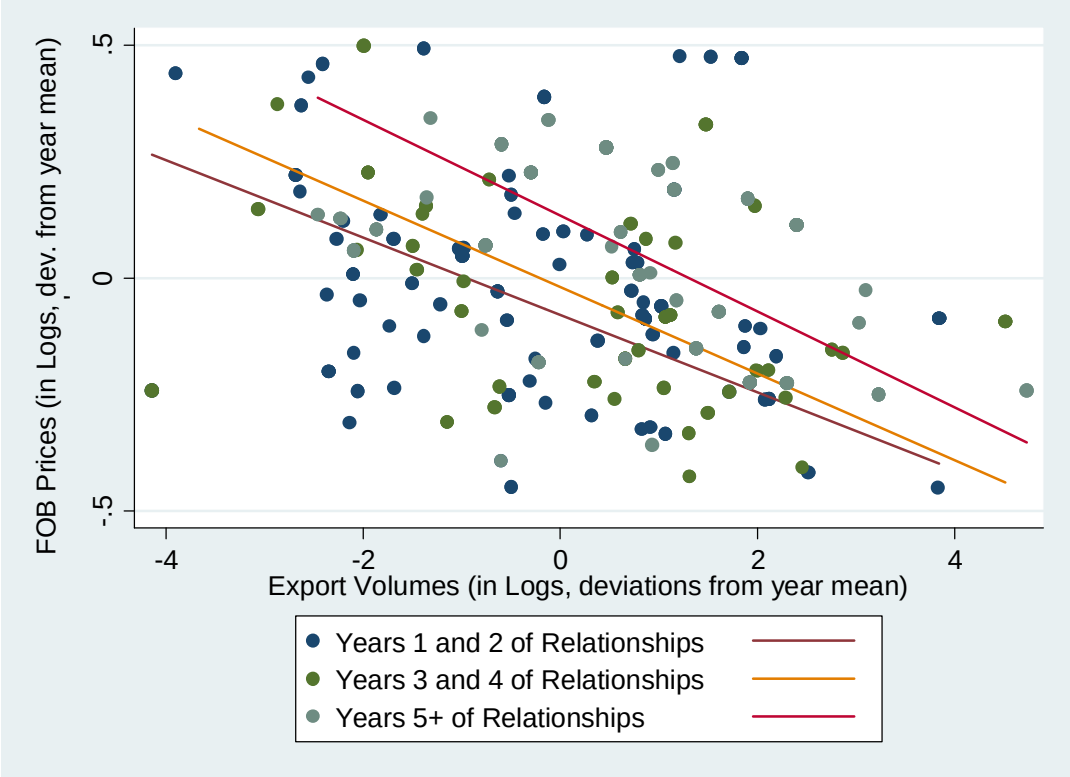



Figure 2 reports on the vertical axis FOB prices (in logs) and on the horizontal axis Export Volumes (in logs). Both Prices and Volumes are in deviations from year averages. Linear fits are reported for observations in years 1 and 2, 3 and 4 and 5 and above of the relationships.

**FIGURE A1: QUALITY AND INSTITUTIONAL ARRANGEMENTS IN THE WINE VALUE CHAIN**

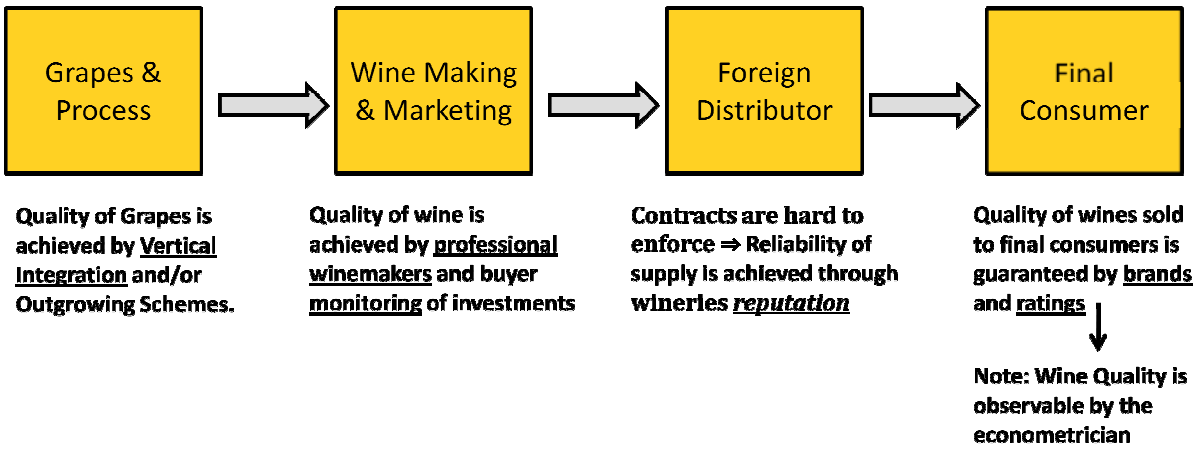
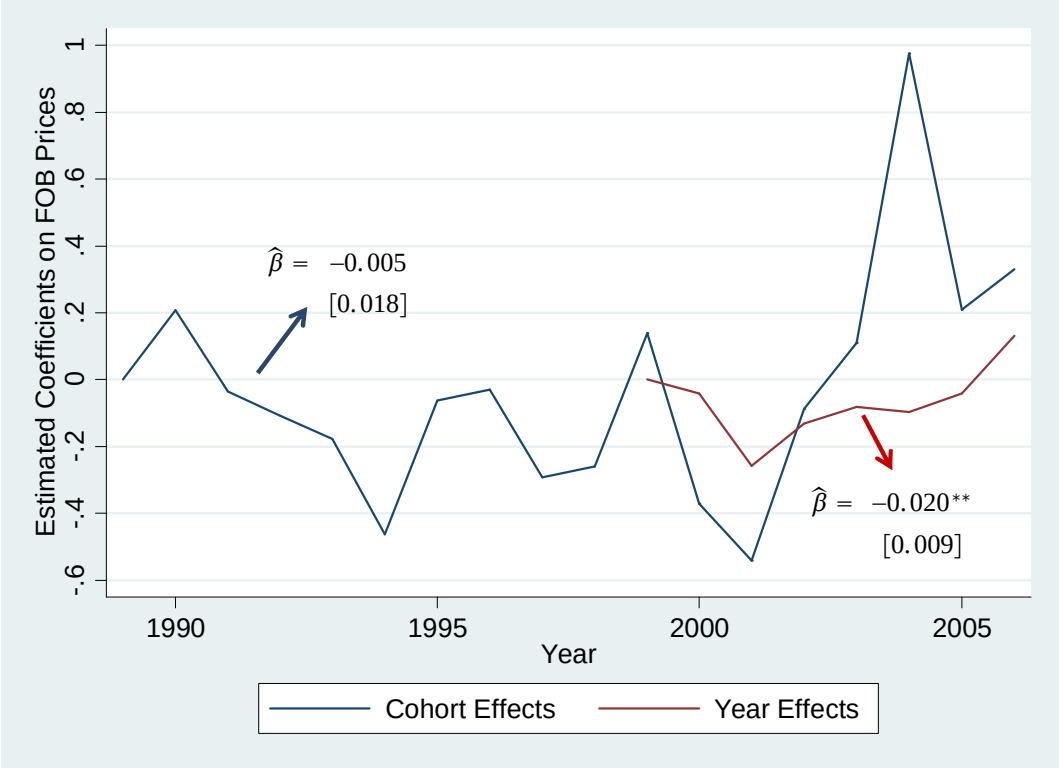



**FIGURE A2: VALUE CHAIN DECOMPOSITION - *TYPICAL FIGURES***

| Critical Points in Value Chain | USD/Litre | Margins | % FOB price |
|---|---|---|---|
| Cost of wine before bottling | 1.28 | 41.04% | |
| Bottling & labelling Costs | 1.03 | 33.03% | |
| Total cost of Wine Ex-Fab. | 2.32 | | 74.36% |
| Transportation to FOB | 0.04 | 1.39% | |
| COST of Bottle | 2.36 | | 75.76% |
| FOB price | 3.12 | 24.24% | 100.00% |
| UK importer Costs | 3.41 | 9.29% | 109.29% |
| Costs after Excise + Handling Costs | 4.32 | 26.87% | 138.66% |
| Cost at Wholesaler | 5.19 | 20.00% | 166.39% |
| Retail Price (Margins + TVA) | 8.54 | 64.50% | 273.71% |

Source: authors calculations from *Wines of Chile*.

FIGURE A3: COHORT, YEAR EFFECTS AND BIAS FROM THEIR OMISSION




The Figure reports estimates from two different specifications on FOB prices: a) including winery's age and winery cohort effects but not year effects, b) including winery's age and year effects, but not winery cohort effects. The cohort and time effects are reported in the Figure, alongside with the corresponding estimates in the winery age effect. The Figure shows sizeable cohort effects (ranging from about -50% to +60%) and time effects (ranging from about -20% to almost +20%) on FOB prices. The corresponding estimates of age effects on FOB prices, about -0.5% and -2% in the two specifications respectively, illustrate the significant bias induced by omitting to control for either time or cohort effects and the benefits of the empirical strategy used in the paper to identify age effects.