

Price or Quality Competition?

Old World, New World and Rising Stars in Wine Export

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Abstract. Recent literature distinguishes between price and quality competition in international trade. In this study, we test the theory using wine export data. We estimate a price-distance regression, i.e., a regression of the unit price of wine as a function of the distance and other control variables. We find that overall the Old World, i.e., European countries, competes on quality, while the New World competes in price. A notable exception is South-Africa, which is into quality competition for the whole wine category and for bulk wine in particular.

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1 Introduction

One of the most significant change in wine world trade is the emergence of new producing countries from the “New World”. Argentina, Australia, Chile and the US, just to name a few, have emerged in recent decades to challenge the more consolidated but traditional wine producers based in European countries, such as France, Italy, Spain.

The entry of the new countries, on the other hand, has had an impact also on the perceived quality of the wines coming from both continents. In a now famous event, US wines were among the top selection in a tasting that was done blindly for the first time (after many years of non-blind tasting), thus threatening also the quality reputation “supremacy” of the indisputable leader in world wine market, i.e., France.¹

The competitiveness of the wine industry has therefore become a critical topic, with economists and public agencies striving to provide policy recommendations as to improve the competitiveness of their national industry (see, e.g., Anderson (2000) and Berthomeau (2001)). The basic and recognized fact in international trade is that if an industry or a country cannot “maintain its market share it must be because the variety it proposes on the market is too expensive or its quality too low. Of course, determining whether quality or price competition is crucial because different diagnosis will involve different policy recommendations” (Crozet et al., 2011: p. 1).

In this paper we apply recent developments in trade theory to investigate how different countries - historically or recently present in the wine world market - compete in exporting their wine.

Recent contributions in the theory of trade and firms heterogeneity, starting with Melitz (2003), distinguish between a firm’s product competitiveness as depending upon price (i.e., the cheapest goods are the most competitive) or upon quality, where competitiveness depends upon the quality-adjusted price. When consumers care about quality, the highest priced goods are the most competitive. Given that transportation costs rise with market distance, the former models predict that cheaper products are sold in more distant markets, while the latter set of models predict that more expensive goods travel more.

These clearly opposed empirically testable implications provide the foundation of a testing of these models by Baldwin and Harrigan (2011) and Baldwin and Ito (2008) (BI henceforth), who can thus distinguish between price or quality competition. Our paper uses the BI empirical approach, by

¹For a quite insightful reconstruction of the now famous “Paris Judgement” see Taber (2005).

estimating the price-distance relationship in the wine trade for major exporting countries using panel data. We can then define a list of three types of wine exporting countries: those for which wine exports face price competition, those facing quality competition, and those that cannot be confidently placed in either category. Overall, we find that European countries are more engaged in quality competition, while the countries coming from the New World, i.e., from America, Africa and Oceania, are mostly into price competition or in neither category.

In the next section we provide a short literature review that motivates our choice of the empirical models, which are presented in section three, together with the data used in this study. In section four we present the results, and in the last section we conclude with some policy implications.

2 Trade, distance, and quality

The literature on international trade has been enjoying a renewed interest in the last decade or so, and this section can only give a brief summary of some of the findings that are relevant for our investigation. Many studies have tried to go beyond the more standard models, such as those of Krugman for instance, and have tried to take into account monopolistic competition, firms' heterogeneity, and the quality of the goods. In one important contribution, Baldwin and Harrigan (2011) argue that many recent models have difficulties in explaining two main facts about the US trade. First, the presence of "export zeros", i.e., the fact that potential export flows are not present, and their relationship with distance and importing country size. Second, export unit values are positively related to distance and negatively related to market size. Indeed, "...every well-known, multi-good general equilibrium trade model is inconsistent with at least some of these facts.." (Baldwin and Harrigan, 2011: p. 61).

The critical piece of evidence concerns trade costs. Since Ricardo, trade costs have been recognized as having a significant impact on the trade of homogeneous goods, but Eaton and Kortum (2002) were among the first to model clearly how distance affects trade in a competitive general equilibrium model. In the Eaton & Kortum (EK for short) model, countries compete in every market according to the the price gross of the transportation costs, i.e., the "cost, insurance, and freight" (or c.i.f.)² prices, and the country with the lowest price captures the whole market. In the EK model, like in other Ricardian models, the competitiveness of a country depends on its

²The "free on board" (f.o.b.) prices, on the other hand, are the prices without the transportations costs.

technology, its wages, and trade costs, compared to those of other competing countries. Highly competitive countries export a wider range of goods than less competitive nations, but the average import price of their goods does not change with either competitiveness, size, or distance to the final destination market.³

Another major part of trade theory is that of the monopolistic competition (MC) models, which core elements are imperfect competition, increasing returns and homogeneous firms. They are usually based on Dixit and Stiglitz (1977), which implies that it is optimal to charge the same f.o.b. price to all destinations, i.e., “mill pricing”, with trade costs passed on to importing countries. The predictions of the MC model are pretty stark: given this preference structure, i.e., “love for variety”, consumers buy some quantities of all goods, and so there should be no “export zeros”. Moreover, since trade costs are fully passed on the consumers, the prices net of transportation costs to all destinations are the same and not related to either distance, size, or remoteness.⁴

In a variant of the MC model, Ottaviano et al. (2002) introduce a linear demand for firms so that the price elasticity is not constant as in the Dixit & Stiglitz’s model. In this fashion, producers absorb some of the trade costs and now the prediction is that f.o.b. prices should be lower for more far away markets. In addition, due to linear demand, in the spatial trade configuration zeros are now possible and are more likely to be observed for larger and less remote destination markets.

Starting with Melitz (2003), recent contributions have considered firms’ heterogeneity (we can refer to these as the heterogeneous firms trade (HFT for short) models).⁵ These studies show insightful results, in particular they can explain quite convincingly why some goods are not exported, that is they can explain the “export zeros”. The Melitz model has all the features of MC models, plus two additional ones: beachhead costs (F) and heterogeneous firm-level marginal costs, these latter generated via a stochastic technology process. When a firm is established and gets to know its marginal cost, it learns whether it is profitable to enter into some foreign markets.

In other words, there is a pairwise cutoff, i.e., a threshold marginal cost for every origin and destination country combinations. As for the spatial distribution of zero exports, these depend on the probability that a firm has a marginal cost of producing a certain variety which is below the threshold for

³In Table 1 we report the main predictions of the more important models we review in this section.

⁴Remoteness refers to the fact that if a destination country faces high average trade costs, it will have also high local prices and thus be relatively easy to penetrate.

⁵For a recent survey see, e.g., Melitz and Redding (2012).

that good in the destination country under consideration. Moreover, since the cut-off marginal cost decreases with distance and increases with market size and remoteness, the average f.o.b. price will be decreasing in the distance, while they will be increasing in the size and remoteness of the destination market. The main prediction of Melitz (2003) and this ‘*new new trade theory*’ is that a firm’s product competitiveness depends upon its price: the cheapest goods are the most competitive.⁶

Baldwin and Harrigan (2011) test the predictions of these models using very disaggregated data (at the HS10 code level) for the US imports and exports. They find that the Melitz’s model can explain the “zero export” patterns, but it cannot be consistent with the evidence of a strong positive relationship between export prices and distance. To have a model where predictions match with the empirical evidence, Baldwin and Harrigan (2011) suggest an extension of the heterogeneous firms trade (HFT) model of Melitz to consider explicitly that firms compete on price and quality, i.e., they suggest a quality heterogeneous firms trade (QHFT) model.⁷ In this modified HFT model, competitiveness depends upon the quality-adjusted price: when consumers care about quality, the highest priced goods are the most competitive.

The QHFT model is thus based on Melitz’s but with two major modifications. First, consumers care about quality and regard some varieties as superior to others, with their preferences modeled with an extended version of the CES preferences of Dixit and Stiglitz (1977); their optimal expenditure is an increasing function of the quality-adjusted price of the good. Second, firms are heterogeneous (and thus draw their marginal cost parameter from a random distribution after paying a fixed cost for innovation) but also produce varieties of different qualities. In addition, higher quality comes with higher marginal costs, and as such high costs are not necessarily bad news

⁶Melitz and Ottaviano (2008), in a variant of the Ottaviano et al. (2002) model, use a linear demand specification. Omitting most of the details, it suffices to say that their predictions are similar to those of Melitz (2003), apart from a positive relationship between the size of the destination country and the number of zeros export, and that export prices decrease with market size and distance.

⁷There is a large literature on trade and quality and to give it a summary here is beyond the scope of this study. The interested reader may refer, for instance, to the early theoretical contributions of Grossman and Helpman (1991) and Murphy and Shleifer (1997); to the more recent ones by Sutton (2007) and Verhoogen (2008); and to Hallak and Schott (2008) and Khandelwal (2010) for empirical investigations. Given the empirical specifications that we will be explain in the next section, here it suffices to remember that some studies, e.g., Hallak and Schott (2008), find a relationship between quality and importer’s GDP.

as in the HFT models.⁸ To conclude, Baldwin and Harrigan (2011) argue and show that by amending the HFT model they can add quality in the competitiveness dimension of firms; firms are heterogeneous in terms of productivity and quality, consistently with empirical evidence; and, finally, that the QHFT model is more consistent with the data than the other models which predictions are summarized in Table 1.

Table 1: Model predictions, summary

Model	Distance	Size	Remot.	Distance	Size	Remot.
Eaton-Kortum	+	+	-	-	0	+
Mon. comp., CES	0	0	0	0	0	0
Mon. comp., linear demand	+	0	-	-	0	+
Het. firms, CES	+	-	-	-	+	+
Het. firms, linear demand	+	+	-	-	-	+
Het. firms, CES, quality comp.	+	-	-	+	-	-

Adapted from Baldwin and Harrigan (2011)

To briefly recap, given that transportation costs rise with market distance, the HFT models predict that cheaper products are sold in more distant markets. On the other hand, when consumers care about quality, in the quality heterogeneous firms trade (QHFT) model, the competitiveness depends upon the quality-adjusted price and the highest priced goods are the most competitive. In this latter case, firms with the lowest observed prices are the least competitive. These clearly opposed empirically testable implications provide the foundation of a testing of these models by Baldwin and Harrigan (2011) who, by using disaggregated US import and export data, find evidence that is not consistent with the HFT models.

In a related paper, Baldwin and Ito (2008) (BI henceforth) use export goods (at the HS 6-digit level of disaggregation) of major exporting countries and classify them as facing either quality and price competition. They find a high proportion of quality-competition goods for the major EU countries and a lower proportion for Canada, Australia and China. Their finding is consistent with Fontagné et al. (2008), who find that the developed countries' products are not directly competing with the developing countries' ones. Because of their products' superior quality, EU countries, for instance, have less direct competition with developing countries' products than Japan or the US.

⁸The positive relationship between quality and marginal costs is common in the theoretical literature and confirmed by recent empirical investigations (see, e.g., Kugler and Verhoogen (2012)).

Sintesi di Crozet et al. (2011) Crozet et al. (2012) e altri papers

Our paper starts with the BI empirical approach, by estimating the price-distance relationship in the wine trade for major exporting countries using panel data. We then estimate a variant of the BI’s model suggested by Crozet et al. (2011)...

define a list of three types of wine exporting countries: those for which wine exports face price competition, those facing quality competition, and those that cannot be confidently placed in either category. Overall, we find that European countries are more engaged in quality competition, while the countries coming from the new world, i.e., from America, Africa and Oceania, are mostly into price competition or in neither category.

3 The model and the data

The empirical model we employ is similar to Baldwin and Ito (2008). We look at a given origin nation’s exports of a wine (HS4 and HS6, see Table 2) product to all the major destination countries over a time period as long as possible (1995-2011 for the HS4, shorter for HS6 data). The regression equation is the following:

$$p_{t,d} = \beta_0 + \beta_1 \log(DIST_d) + \beta_2 \log(GDP_{t,d}) + \beta_3 \log(GDPCAP_{t,d}) + \epsilon, \quad (1)$$

where $p_{t,d}$ is the log of the FOB unit value index to destination country d at time t ; $DIST_d$ is the bilateral distance from the country under consideration to the destination country d ; $GDP_{t,d}$ is the destination-country GDP at time t ; $GDPCAP_{t,d}$ is the corresponding GDP per capita; and ϵ is an i.i.d. error. The main idea is that a negative sign of the coefficient β_1 would indicate price competition, while a positive sign would imply quality competition.

Table 2: UN Comtrade wine categories

SH Code	Description
22.04	Wine of fresh grapes
22.04.10	Sparkling wine
22.04.21	Wine in bottles (< 2 lt.)
22.04.29	Wine in bulk (> 2 lt.)

Price data come from UN COMTRADE. For the general “Wine of fresh grapes” category data is available from 1995 to 2011, while for its subcategories only for a shorter period. Bilateral distances between countries are

available from the CEPII database, while GDP and population data are from the World Bank.

For the origin countries, we selected all those that exported at least 1% of the world wine trade (in value terms) in either one of the categories in Table 2, for either the beginning (1995), middle (2003) or end (2012) year of the period under investigation. For each relevant origin country, we selected all destination countries for which exports do exceed 1% of the exports of the origin country. In Table we report the data on trade flows for the selected origin and destination countries.

4 Results

In Table 3 we report the results for the category SH 22.04, that is the aggregate category of wines. It appears that the results are quite stark: European countries overall compete in quality, while the new world countries compete in price or on neither of the two. In Europe, the exceptions are Cyprus, Greece, Macedonia, Romania and Spain, that do not compete in quality (but neither in price). The country where the distance coefficient is biggest, i.e., a stronger quality competition, is France, as one would have expected.

In the new world, Argentina and Australia compete in prices, while the other countries compete neither in quality nor in price. The exception is South-Africa, which - unique among the new world countries - competes in quality.

We can now see the results of the different wine categories. Starting with sparkling wine (Table 4), we find that only four countries show evidence of quality competition, three in Europe (Cyprus, France, Germany) plus Chile in South-America. Other four European countries, such as Austria, Italy,⁹ Portugal and Romania face price competition, while all the others (except Argentina) face neither type of competition.

For the wines traded in bottles (smaller than 2 liters, see Table 5), only European countries compete in quality: Austria, France, Germany, Hungary, Italy, Macedonia, Portugal, and UK. Argentina and Australia compete in prices, while the other countries compete in neither dimension. For this category, probably the most relevant one in the wine industry European countries are still predominant, i.e., competing in quality.

In the last category, that is the wines traded in bulk (i.e., in containers bigger than 2 liters, see Table 6), besides the usual (European) suspects,

⁹For the case of Italy, it must be that the flows of Lambrusco and Prosecco more than offset the trade of more expensive sparkling wines like those produced using fermentation in the bottle, i.e., Champenois methods, coming from Franciacorta and Trentino.

such as France, Germany, Greece, Italy, Portugal, Spain and UK, we find also Australia and South-Africa. The other countries face neither type of competition (except Cyprus, with price competition).

Summarizing the results (see Table 7), we can say that European countries, i.e., the "Old World", overall compete on quality, with France and Germany being the leaders in this league for all wine categories. Still within the quality competitors, the UK (??), Italy and Portugal follow (except for sparkling wine, where they compete on price), and then Austria, and finally Greece and Spain (which both compete in quality however only for bulk wines). Among the newly entered (or soon to enter) countries in the European Union, that is Croatia, Cyprus, Hungary, Macedonia and the Republic of Moldova, they compete on quality for some wine categories.

On the other hand, the majority of the wine trade originated from the new world countries compete on a price basis. This is true for Argentina and Australia (except for bulk wine, for the latter country, for which there is quality competition), that are mostly engaged in price competition. For the USA and New Zealand, it appears that their trade falls into neither category, but probably will evolve into quality competition in the future. Notable exceptions among the new world countries are South-Africa, which is into quality competition for the aggregate wine category (and for bulk wine in particular), and Chile, which sparkling wine category appears based on quality competition.

Overall, most of these results are consistent with practitioners' view of the wine industry, where the major European producing countries have benefitted from a long tradition of production and consumption of large volumes of wines and from their superior perceived quality reputation in the international markets as well. We could discuss on the relative magnitude of the coefficients among European countries, which are not completely consistent with prior expectations (see the performances of Germany and the UK, for instance). However, even more interesting are the results regarding the "old world" countries previously under the Soviet influence, in particular Hungary¹⁰, and the "new world" countries. Australia and Chile are engaged in quality competition, respectively for bulk and sparkling wine. But the rising star, on the other hand, appears South-Africa, which faces quality competition in the aggregate wines category and in the bulk wines.

We believe that overall these results fit in with our priors that nations with a traditional comparative advantage in wine production and trade have a higher incidence of quality-type wines in their export mix. On the other hand, new world exporting countries might enter these markets initially with

¹⁰Probably thanks to the famous and highly appreciated Tokaj.

very competitive wines and eventually reach a good reputation for quality as well, as may be witnessed by the new world's rising star(s).

5 Concluding remarks

Recent literature distinguishes between price and quality competition in international trade. In this short note, we test the theory and its different testable predictions using data on wine export. We estimate a price-distance regression for the major wine producing countries.

Overall, we find that European countries, i.e., the "Old World", compete on quality, with France and Germany leading quality-based trade in all wine categories. UK, Italy and Portugal follow (except for sparkling wine, where they compete on price), Austria, and thus Greece and Spain (which both compete in quality only for bulk wines) follow suit. Among the newly entered (or soon to enter) countries in the European Union, Croatia, Cyprus, Hungary, Macedonia and the Republic of Moldova have some wine categories that compete on quality.

On the other hand, notwithstanding all the hype surrounding recent wine competitions and evaluations of best wines, the majority of the trade made by countries in the new world compete on a price basis. This is true for Argentina and Australia (except for bulk wine, for the latter country, for which there is quality competition), that are mostly engaged in price competition. For the USA and New Zealand, it appears that their trade falls into neither category, but probably will evolve into quality competition in the future. Notable exceptions are South-Africa, which is into quality competition for the whole wine category and for bulk wine in particular, and Chile, which sparkling wine category appears as based on quality competition.

While these results seem quite in line with the perceptions among many practitioners, we believe they can be instrumental for the understanding of the determinants of these performances. Indeed, it may be worth investigating whether a country or region performs well thanks to its comparative advantage in terms of natural climates and soil combinations, or to other man-made choices. Along this line of research, it may be interesting to compare the different firms' structure and the agricultural, marketing, and trade policies to see whether they have an effect, if any, on these performances. These findings would have interesting policy implications, showing how old world countries can maintain their competitiveness by further climbing up the quality ladders, but also helping new world competitors to follow suit by entering a new turf.

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Table 3: Estimated coefficients for wine of fresh grapes (SH 22.04)

Country	Coefficient	St.error	Pvalue	No.obs.	Competition
Argentina	-72.400*	35.94	0.044	661	Price
Australia	-0.704**	0.133	0.000	428	Price
Austria	0.983**	0.215	0.000	308	Quality
Chile	-0.024	0.042	0.55	685	-
Croatia	0.601**	0.163	0.000	347	Quality
Cyprus	-0.617	0.674	0.360	459	-
France	2.048**	0.163	0.000	377	Quality
Germany	0.896**	0.099	0.000	574	Quality
Greece	0.067	0.311	0.831	427	-
Hungary	0.698**	0.144	0.000	472	Quality
Italy	0.737**	0.069	0.000	489	Quality
Macedonia	-1.586	2.738	0.563	346	-
New Zealand	0.227	0.170	0.183	359	-
Portugal	0.551**	0.079	0.000	483	Quality
Rep. of Moldova	1.642*	0.680	0.016	317	Quality
Romania	-0.226	0.197	0.251	473	-
South Africa	0.512*	0.213	0.017	434	Quality
Spain	0.257	0.376	0.495	404	-
USA	0.117	0.106	0.272	560	-
UK	17.680**	1.959	0.000	530	Quality

(**) = 1% s.l.;

(*) = 5% s.l.;

(+) = 10% s.l..

Table 4: Estimated coefficients for sparkling wine (SH 22.04.10)

Country	Coefficient	St.error	Pvalue	No.obs.	Competition
Argentina	-31.498**	9.93	0.002	530	Price
Australia	-0.46	0.267	0.862	426	-
Austria	-2.282*	1.021	0.026	289	Price
Chile	0.175 ⁺	0.105	0.095	552	Quality
Croatia	-6.143	53.243	0.908	134	-
Cyprus	3.797 ⁺	2.158	0.080	193	Quality
France	1.403**	0.225	0.000	377	Quality
Germany	0.384*	0.165	0.020	568	Quality
Greece	-3277.208	2044.215	0.11	282	-
Hungary	-0.330	0.418	0.431	352	-
Italy	-0.460 ⁺	0.247	0.063	489	Price
New Zealand	1.705	1.171	0.146	295	-
Portugal	-0.671*	0.276	0.015	438	Price
Rep. of Moldova	-1.200	8.317	0.885	235	-
Romania	-2.154*	1.036	0.039	240	Price
South Africa	-0.100	0.320	0.755	410	-
Spain	-2249.587	2005.527	0.263	379	-
USA	0.310	0.521	0.552	500	-
UK	-13.969	92.149	0.880	514	-

(**) = 1% s.l.; (*) = 5% s.l.; (+) = 10% s.l..

Table 5: Estimated coefficients for wine in bottles (< 2 lt.) (SH 22.04.21)

Country	Coefficient	St.error	Pvalue	No.obs.	Competition
Argentina	-94.388*	43.721	0.031	654	Price
Australia	-0.604**	0.110	0.000	428	Price
Austria	1.046**	0.222	0.000	344	Quality
Chile	0.026	0.040	0.509	683	-
Croatia	-0.194	0.192	0.313	339	-
Cyprus	0.002	0.666	0.997	444	-
France	1.087**	0.118	0.000	377	Quality
Germany	0.649**	0.081	0.000	574	Quality
Greece	0.156	0.147	0.288	411	-
Hungary	0.586**	0.148	0.000	499	Quality
Italy	0.394**	0.078	0.000	489	Quality
Macedonia	4.779 ⁺	2.826	0.092	305	Quality
New Zealand	0.212	0.159	0.184	359	-
Portugal	0.342**	0.064	0.000	483	Quality
Rep. of Moldova	-1.781	3.088	0.565	285	-
Romania	-0.069	0.104	0.507	453	-
South Africa	0.347	0.234	0.139	434	-
Spain	0.020	0.387	0.959	483	-
USA	0.052	0.125	0.676	588	-
UK	19.227**	1.914	0.000	528	Quality

(**) = 1% s.l.;

(*) = 5% s.l.;

(⁺) = 10% s.l..

Table 6: Estimated coefficients for wine in bulk (> 2 lt.) (SH 22.04.29)

Country	Coefficient	St.error	Pvalue	No.obs.	Competition
Argentina	-88.116	116.078	0.448	480	-
Australia	0.867 ⁺	0.499	0.083	417	Quality
Austria	-7.471	5.195	0.152	256	-
Chile	-0.341	0.519	0.512	552	-
Croatia	0.332	0.789	0.675	172	-
Cyprus	-0.631 ⁺	0.348	0.072	191	Price
France	1.990**	0.236	0.000	376	Quality
Germany	4.876**	1.247	0.000	461	Quality
Greece	0.657*	0.311	0.036	282	Quality
Hungary	0.033	0.083	0.690	348	-
Italy	0.757**	0.142	0.000	480	Quality
Macedonia	-16.382	12.299	0.184	252	-
New Zealand	1.164	2.688	0.665	196	-
Portugal	0.590**	0.144	0.000	425	Quality
Rep. of Moldova	0.310	0.241	0.199	192	-
Romania	0.207	0.519	0.691	336	-
South Africa	0.582*	0.278	0.037	415	Quality
Spain	0.155 ⁺	0.079	0.052	460	Quality
USA	2.986	5.018	0.552	519	-
UK	19.044*	8.993	0.035	431	Quality

(**) = 1% s.l.;

(*) = 5% s.l.;

(+) = 10% s.l..

Table 7: Summary of competitions patterns

Country	All wine (SH 22.04)	Sparkling wine (SH 22.04.10)	Bottled wine (SH 22.04.21)	Bulk wine (SH 22.04.29)
Old world				
Austria	Quality	Price	Quality	–
Croatia	Quality	–	–	–
Cyprus	–	Quality	–	Price
France	Quality	Quality	Quality	Quality
Germany	Quality	Quality	Quality	Quality
Greece	–	–	–	Quality
Hungary	Quality	–	Quality	–
Italy	Quality	Price	Quality	Quality
Macedonia	–	n.a.	Quality	–
Portugal	Quality	Price	Quality	Quality
Rep. of Moldova	Quality	–	–	–
Romania	–	Price	–	–
Spain	–	–	–	Quality
UK	Quality	–	Quality	Quality
New world				
Argentina	Price	Price	Price	–
Australia	Price	–	Price	Quality
Chile	–	Quality	–	–
New Zealand	–	–	–	–
South Africa	Quality	–	–	Quality
USA	–	–	–	–