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The New World challenge: Performance trends in wine production in major wine-exporting countries in the 2000s and their implications for the Australian wine industry

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Abstract

Anderson, K., Nelgen, S., 2011. Global Wine Markets, 1961 to 2009: A Statistical Compendium. University of Adelaide Press, Adelaide publication of an index of revealed comparative advantage suggests that the Australian wine industry had come under increased competition from other "New World" producers in the first decade of this century. We examine this influence by comparing the transformation of winegrapes into wine volume and value in the 11 largest wine-exporting countries during the years, 2000–2009. Our focus is on the challenge issued by other New World producers from the Southern Hemisphere to Australian producers, and the continuing challenge to Old World global supremacy by New World producers and its response. Four performance measures are used this study. Two key trends are evident. First, all countries migrated to higher price points, albeit with differing degrees of success: slightly declining productivity in transforming winegrapes into wine output was overwhelmed by price/quality effects, leading to substantial gains in transforming winegrapes into wine value. Second, New World producers plus Portugal and Spain were much more successful in achieving gains in their export value proposition than they were in extracting value in their domestic markets. Results show that Australian wine producers had lost some of their competitive advantage during the 2000s as their pre-existing strategy dominated by the export of high-volume wines by large companies at low to medium price points, and their reliance on a reputation for reliable good quality for the price point was beginning to fail in the face of competition from both New World and Old World producers. Acknowledgement of this outcome has led to a good deal of introspection, and recognition of the need to promote the wine regions of Australia, based on higher-quality wines, and to select and promote quality indicators.

Keywords: Australia; Competitiveness; Export; New World; Value proposition; Wine

1. Introduction

During the final two decades of the 20th century, the internationalisation of wine production and consumption continued apace. Robinson (2006) observed that the broad delineation between the Old World producers of France, Germany, Italy, Portugal and Spain and the Southern Hemisphere New World (SHNW) wine-producing countries – particularly Australia, Argentina, Chile, New Zealand and South Africa – as discrete markets continued to be eroded. New markets developed, traditional markets diversified and the mapping of the international wine trade became increasingly routinised (see, for example, Anderson and Nelgen (2011)).

During these two decades, the Australian wine industry exemplified this internationalisation, in particular the challenge that the SHNW represented to the Old World producers. Silverman et al. (2001) described Australia's achievement during this time as "pioneering wine as a universal first choice lifestyle beverage". However, by the turn of the century, the export strategy first adopted by the Australian wine industry had been followed by other SHNW wine-producing countries, notably Argentina, Chile, New Zealand and South Africa,

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while the Old World had begun to respond to the challenges of the new. In their recent study comparing the relative performance of the major wine-producing countries for the year 2000, Grant et al. (2015, p. 1) observed the pegging back of Australian *primus inter pares* status amongst New World producers. They concluded that "the hunter became the hunted" in the competition for profitable wine exports.

Was this indeed the case? The changes in export volume and export value for Australia and other SHNW wine-producing countries for the decade 2000–2009 are presented in Table 1. The export value growth rates of New Zealand and Argentina are particularly conspicuous. New Zealand's share of the total export value of the five SHNW countries listed in Table 1 increased from 5 per cent in 2000 to 12 per cent in 2009. Over the same period Argentina's export value share increased from 8 per cent to 12 per cent. These increases came largely at Australia's (and to a lesser extent Chile's) expense. While Australia's share of total export volume of the five SHNW countries listed fell only slightly (around 3 per cent) its export value contribution fell by 11 per cent (from 46 per cent in 2000 to 35 per cent in 2009), suggesting that Australia conceded significant ground to some of its SHNW competitors.

In this study we explore these changes in detail. Following from Grant et al. (2015) and utilising the same performance measures of the transformation of the core input – winegrapes – into wine output volume and value, we compare the performance of the five Old World wine producers (France, Germany, Italy, Portugal and Spain) and their five New World counterparts for the decade 2000–2009 inclusive.

The paper is divided into five parts. In the following section, we set out the rationale for the study. Section 3 provides an account of the adaptation of the method and data following from Grant et al. (2015), distinguishing in particular between efficiency measurement in standard productivity analysis and the performance indices developed by Grant et al. (2015). In Section 4 we examine the relative performance of the wine-exporting countries for the decade 2000–2009, focusing on the salient features of each measure across the cohort of wine-exporting countries. The paper concludes in Section 5 by reflecting on the implications of the findings for the Australian wine industry and reiterating some qualifications of the data utilised.

Table 1
Changes in export volume and value: SHNW producers, 2000–2009.
Source: Anderson and Nelgen (2011, pp. 72, 95).

Country	Volume (million litres) 2000	Volume (million litres) 2009	% Increase	Value (US$m) 2000	Value (US$m) 2009	% Increase
Australia	311	772	248	897	1802	201
New Zealand	20	129	645	90	637	708
Argentina	73	291	399	150	636	424
Chile	297	692	233	577	1374	238
South Africa	155	429	277	243	711	293

2. Rationale for the study

The aims of the study are fourfold. First, to highlight the trend in competitive advantage in international wine trade towards quality away from low cost. Second, to provide a more finely nuanced empirical account of the competitive relationships between the 10 major wine-exporting economies than is revealed by international trade data (see, for example, Anderson and Nelgen (2011)). Third, to offer an explanation for the relative positions of these wine-producing economies in terms of both the performance of their wine production and their relative success in international markets. Fourth, to canvass the implications for the Australian industry noting the limitations of public policy in this regard.

Defining national wine industry performance is central to achieving these aims. Performance by these industries can be judged in different ways according to the policy milieu. The simplest measure is export penetration: the extent to which winegrapes can be transformed into wine that can find a buyer in export markets. Increasingly, being able to compete profitably in export markets depends also on the price points at which the wines can be exported: the higher the price points, the more valuable the exported wine to the industry. The second measure we use, export value proposition, takes this value creation into account and is defined in this context as an affirmation why a foreign wine buyer should purchase a particular wine based on the rationale that this wine will add more value to the buyer's transaction in the export market for which it is destined than would any other wine.

Being competitive in export markets is, however, only a partial measure of an industry's overall performance; it also depends on its ability to defend its domestic market share. Our third measure, productivity, is integral to an industry's ability simultaneously to succeed in both its export markets and domestic market. The fourth and broadest measure of industry performance that we use is its total value proposition, defined as an affirmation why a wine buyer – whether domestic or foreign – should purchase a particular wine based on the rationale that this wine will add more value to the buyer's transaction in the market for which it is destined than would any other wine.

3. Method and data

As indicated above, we compare the relative performance of the major wine-producing countries using the same four performance measures of the transformation of winegrapes into wine output volume and value used by Grant et al. (2015). They are (1) an export market penetration index, defined by the transformation of winegrapes into wine export volume; (2) an export value proposition index, defined as the ability of exporters to capture value from the perceived quality of wine exports; (3) a productivity index, defined as the transformation of winegrapes into total wine output, taking into account the industry servicing both its domestic and export markets; and (4) a global value proposition index, defined as the ability of wine producers to capture value from the perceived quality of

total wine output. Whereas Grant et al. (2015) confined their analysis to the "pivotal" year of 2000 when Australia had reached the peak of its dominance among New World producers, our analysis compares subsequent performance covering the years 2000–2009.

For all four performance measures used in this study we employ the same assumptions and the same method of calculation used by Grant et al. (2015). A key assumption relates to the absence of national winery input data that forces us to assume that data on capital, labour, materials and services used in wine production and marketing are constant across national industries and, for the current study, also over the study period. This assumption means that we are unable to compare national wine industries on the preferred basis of their profitability. By assessing national industries as a whole we are assuming that all sections of each industry experienced the same changes in their competitive position. This assumption is more important than in the study by Grant et al. (2015) because we analyse performance changes over time. Also, we focus on wine-making, ignoring events in viticulture except for how they affect wine production. Another important assumption is that the quality of wine, as perceived by buyers, is determined independently of the level of inputs used in its production and marketing. The need to remedy these data deficiencies is discussed in the final section.

We adopt an output orientation to the analysis of wine industry performance, which implies that the wine industries attempt to maximise their output of wine at the highest possible prices employing a fixed set of inputs (including winegrape output). The econometric software, *DPIN3.0 Professional*, was used to calculate the four performance measures and decompose them into aggregate wine performance frontier shifts and technical, scale and mix efficiency effects (O'Donnell, 2011) at the industry level.

O'Donnell (2011) measured annual productivity change as the change in total factor productivity (TFP), which is the product of the changes in the three efficiency components (technical, scale and mix) and technical change. He defined technical change by a shift of the production frontier, whereas we define changes in each of the performance measures as a shift of the frontier of the sampled countries.[1]

Whereas efficiency measures in standard productivity analysis refer to distance from a production frontier, we use efficiency measures to reflect distance from each specified performance frontier. Technical efficiency occurs when an industry produces the maximum feasible level of a performance measure for a given amount of inputs of winegrapes. Scale efficiency occurs when an industry operates at its optimal scale. An industry achieves mix efficiency when it produces an optimal mix of outputs of bottled still wine, bulk still wine and bottled sparkling wine. The product of these three efficiency components is denoted total efficiency, a parallel term to TFP efficiency as specified by O'Donnell (2011).[2] A fully efficient wine industry would be operating on all performance frontiers given the technologies used to transform winegrapes into wine. Four outputs were included in the model: three variables of wine export volumes and prices, decomposed into bottled still, bulk and bottled sparkling wines, and one domestic supply variable measured as revenue. Input data comprise solely winegrapes in the absence of data on other inputs. The US GDP deflator was applied to deflate prices in US dollars in year 2000 values. We used Anderson and Nelgen (2011) as the data source for the output and input variables.

For brevity, discussion of cross-country variations and trends in efficiency components are confined to changes in the two performance measures involving value propositions (performance measures 2 and 4). The cross-country comparisons presented throughout the paper are reported as indexes with the Australian wine industry set at a value of unity in the year 2000.[3]

4. Results and discussion of performance change, 2000–2009

4.1. Export market penetration

Table 2 shows the export market penetration estimates for the 11 countries in the year 2000. Annual rates of change in export market penetration (transformation of winegrapes into export volumes) during the 2000s are presented in the second column of Table 3.

The aggregate export volume frontier expanded by 4.5 per cent per year over the decade (Table 3) to satisfy an expanding demand for wine worldwide (4.2 per cent) (Anderson and Nelgen, 2011, p. 77). However, not all countries shared equally in the expansion. In offering explanations for this divergence in trends, we now examine the particular characteristics of national wine industries and offer some comparative observations, focusing mainly on Australia and three of its major competitors, Argentina, Chile and New Zealand.

4.1.1. Australia

Australia continued to improve its export market penetration moderately during the 2000s, achieving a growth rate for export market penetration of 7.4 per cent. It finished the decade with an index slightly higher than both New Zealand and Chile. The momentum of Australia's export success in the 1990s saw total grapevine area harvested increase by nearly 4

[1]The third of our measures is indeed productivity, which follows exactly O'Donnell's definition. We have avoided using the term "productivity" for the first two and last performance measures because they are strongly influenced by factors (such as exchange rate and wine demand) that lie outside the influence of the wine industries in sampled countries.

[2]TFPE differs from TFP in that the latter measure for the most productive industry is normalised at unity, and the TFPE values of less productive industries are set as the ratio of their TFP to the TFP of the most productive industry. In other words, the overall performance of each country's wine industry is relative to that of the best-performing country.

[3]The transitive and multiplicatively complete Färe–Primont index was employed to enable a multilateral comparison of levels and trends in performance indicators and their components over the period of study from 2000 to 2009.

Table 2
Performance indices in the year 2000.
Source: Grant et al. (2015).

Country	Export market penetration index	Export value proposition index	Productivity index	Global value proposition index
New World				
Argentina	0.192	0.243	1.148	0.328
Chile	1.078	2.179	0.896	0.990
New Zealand	1.243	0.830	1.018	0.871
South Africa	0.577	0.805	1.148	0.738
USA	0.429	0.364	1.117	0.750
Old World				
France	1.045	1.115	1.029	0.912
Germany	0.882	0.552	1.051	0.374
Italy	0.970	1.134	0.953	0.605
Portugal	0.580	0.679	1.034	0.537
Spain	1.139	0.907	1.047	0.646

Note: Australia = 1.0 for all indices.

Table 3
Annual rates of change in performance indices, 2000–2009.

Country	Export market penetration index (per cent)	Export value proposition index (per cent)	Productivity index (per cent)	Global value proposition index (per cent)
New World				
Argentina	18.4	18.9	−1.9	5.4
Australia	7.4	13.3	−3.5	4.4
Chile	3.8	4.4	−2.6	2.9
New Zealand	n.s.	17.7	n.s.	14.0
South Africa	6.6	14.8	−2.3	7.6
USA	n.s.	14.8	−0.5	6.6
Old World				
France	2.9	3.7	n.s.	4.3
Germany	5.9	14.0	−0.8	10.4
Italy	5.2	5.8	n.s.	4.4
Portugal	7.7	12.7	−2.0	6.3
Spain	2.7	7.2	−1.5	4.3
Frontier shift	4.5	6.1	−1.0	5.6

Note: n.s. not significant at 0.05 level of significance.

per cent per annum from 111,000 ha in 2000 to 170,000 ha in 2009. Australia's share of world wine production volume in 2009 was 4.4 per cent, up from 3.5 per cent in 2000, but down on its 5.2 per cent peak in 2005 (Anderson and Nelgen, 2011, p. 47). Over the same period, Australia's share of world wine export volume grew from 4.9 per cent to 8.9 per cent with exports as a percentage of domestic wine production increasing twofold (Anderson and Nelgen, 2011, pp. 83, 87).

While Australia's total export volume more than doubled over the decade (Anderson and Nelgen, 2011, p. 72), the percentage of bulk wines in its still wine exports rose markedly. In 2000, this figure was 12 per cent; by 2009, it was touching 40 per cent. Anderson (2010) explained that although some of that recent growth can be attributed to consumer concerns about the carbon footprint associated with shipping bottled wine and to supermarkets developing their own labels, much of the increase was a consequence of over-supply.

4.1.2. Chile

Chile's relatively low growth rate of 3.8 per cent can be largely attributed to its already high index at the beginning of the period. Its continued expansion during the 2000s was driven by an increase in wine production of 5.34 per cent per year (Anderson and Nelgen, 2011, p. 45). Given stagnant consumption in the domestic market, exports as a percentage of total wine production volume increased from 45 per cent in 2000 to 70 per cent in 2009, a mean annual increase of 9.6 per cent (Anderson and Nelgen, 2011, p. 83). This was considerably higher than the proportions of other major wine-exporting countries except Australia (66 per cent) and New Zealand (63 per cent). The industry associations, Viñas de Chile and ChiledVid, pressed for a greater presence in export markets during the 2000s. They were "created or renewed" in the latter part of the 1990s in response to the growth taking place in the industry (Kunc and Bas, 2009, p. 11) and a need to achieve greater penetration in export markets. Their impact was reinforced later in the decade by the initiation of Wines of Chile as the international promotional arm of Vinos de Chile, which in turn was an amalgamation in 2007 of Viñas de Chile and ChiledVid. The initiation and development of Wines of Chile were a major step forward in strengthening the export orientation of the wine industry. Its membership of 93 wineries represents 90 per cent of Chile's bottled wine exports. Concha y Toro extended its domination of Chilean wine exports and by the end of the decade its export share was greater than 60 per cent with wines being sold at numerous price points (Morss, 2010). It was rated the second most powerful wine brand in the world in 2009 by Intangible Business (2010), cited by Anderson and Nelgen (2011, p. 68).

4.1.3. Argentina

A very high growth rate in export market penetration achieved by Argentina during the decade – much higher than in any other country – begs explanation. Stein (2008, p. 18) and Morrison and Rabellotti (2014, p. 20) have suggested that it was mainly a "catching-up" process. Argentina's long tradition of wine production and consumption was based on a large domestic market, which provided the springboard to export development, permitting "producers to take relatively large risks in the export area because they have strong backup within their own country". Stein (2008, p. 19) also observed the positive effect of a change in local drinking habits towards a more discerning choice of premium wines, which strengthened the complementarity between the domestic and export markets.

This large domestic base for the industry began to diminish in the 1980s although it remained important, accounting for 76 per cent of the total production volume in 2009 (Anderson and

Nelgen, 2011, p. 83). Anderson and Nelgen (2011, p. 151) reported that the mean domestic consumption of beverage wine per person more than halved from 82 litres in the period 1975–79 to 36.4 litres by 1995–99, and total beverage wine consumption continued to decline throughout the 2000s by 2.07 per cent per year (Anderson and Nelgen, 2011, p. 48). This decline, described by Stein (2008, pp. 17–18) as "a driving force behind the resolve to export", contributed to a change by the wine industry from a strategy focused on the domestic market to a vent-for-surplus strategy. This process of *reconversión* was achieved not only through the implementation of an industry strategy; it also entailed the formation of strategic partnerships and relationship management (Thach and Cuellar, 2010). Leading wineries in the industry began to seek new export markets from the late 1980s during the *reconversión*.

Measures were put in place by the industry to shift the export demand function for Argentine wines (Wines of Argentina, 2011). Wines of Argentina embarked on an ambitious export development plan in 2000 following the creation of a special fund to promote wine exports to UK and USA in 1999. The aim was to achieve a 10 per cent share of the global wine market by 2020. It conducted fairs, tours and other activities abroad, organised wine tastings and invited influential people in the global wine industry to visit wine regions and wineries in Argentina. Some major wineries initiated strategic partnerships to source funds and improve distribution channels abroad (Thach and Cuellar, 2010). Stein (2008, pp.7–8) described the efforts to develop the export market by some of the major pioneers of the industry inclusive of "The pursuit of international consumers … Concentration on the production of wines that could attain sufficient quality to compete internationally … sweeping upgrades in technology both in the winery and in the vineyard focused on quality improvement [and] a fundamental change from a producer-centred to a consumer-centred industry model". The *Plan Estratégico Vitivinicola 2020* (Wine Strategic Plan 2020) was developed in 2004 with the primary aim of increasing wine export values (San Martín et al., 2008, p. 2). Not all of these efforts have been an unequivocal success (Stein, 2008, pp. 26–28). Nevertheless, they paid dividends given the dramatic increase in exports that was achieved. By 2009, the four largest wine firms in Argentina (Peñaflor (1.1 per cent of world wine sales volume), FeCoVitA Coop, RPB and Bodegas y Viñedos Garbin) accounted for 60.5 per cent of wine sales volume (Anderson and Nelgen, 2011, p. 66).

4.1.4. New Zealand

The New Zealand industry experienced highly erratic movements over the first lustrum: its exports as a percentage of wine volume produced increased from 34 per cent in 2000 to 93 per cent in 2003, and then back to 49 per cent by 2006 (Anderson and Nelgen, 2011, p. 83). This high variability in wine exports as a percentage of wine volume produced stabilised in the second lustrum to range between 57 per cent and 63 per cent in the years 2007–2009 such that the annual average growth rate for the decade computed to a statistically insignificant 0.49 per cent (Anderson and Nelgen, 2011, p. 83). Yet, this benign statistical relationship between wine exports on one hand and total wine production on the other hand belies the dramatic increase in overall wine export volume for the decade: In 2000, New Zealand exported 19.2 million litres of wine; by 2009 this had increased to 112.6 million litres (or by a factor of 6 in 10 years). Further, this figure accelerated in the second lustrum, from 51.4 to 112.6 million litres in 2005–2009 compared with moving from 19.2 million litres to 31.1 million litres in 2000–2004 (NZW, 2009, p. 2). It also reveals that domestic wine consumption increased – from 16.68 litres per capita in 2000 to 20.16 litres per capita in 2009 – to maintain its position relative to the increase in export volume (Anderson and Nelgen, 2011, p. 83).

4.1.5. Other countries

South Africa had started the decade with a penetration index well below those in fellow SHNW countries – New Zealand, Chile and Australia (see Table 2) – and made little progress in closing the gap over the decade despite moderate growth in export market penetration of 6.6 per cent (Table 3). Davidson et al. (2009) reasoned that the progress that was made owed a good deal to the efforts of the wine industry to transform itself and become more competitive in the global market. While UK was the major market destination for export penetration, wine exporters achieved some success in diversifying their exports to other market destinations.

The US index of wine export market penetration did not change significantly throughout the decade. Among Old World producers, the export market penetration indices for Portugal, Germany and Italy improved moderately during the decade (Table 3). The growth rate in Portugal was from a much lower base than other Old World producers. Modest growth rates were recorded in France and Spain.

4.2. Export value proposition

Examining column 3 of Table 3, estimates of the export value proposition index for transforming winegrapes into export value provide a different picture for some countries from that reported above for export market penetration. The index growth rate for New World producers was substantially higher in all countries except Chile where it was only slightly higher (4.4 per cent against a mean of 15.9 per cent for the other New World exporters). Again, we offer some observations by way of explanation.

4.2.1. Sources of change in the export value proposition index

The export wine value frontier shifted outwards strongly (by 6.1 per cent annually) during the study period. This was considerably higher than the rate of outward shift of the export wine volume frontier discussed above.

There were also major changes in technical efficiency. Countries with low commencing technical efficiency indices substantially improved their conversion of winegrapes into wine export value. Argentina, South Africa, USA and Germany increased their technical efficiency indices by more than

the export wine value frontier shift (11.9 per cent, 7.1 per cent, 7.0 per cent and 10.1 per cent per year, respectively). These increases were from relatively low bases and mean technical efficiency for Argentina, South Africa, USA and Germany over the study period was still below their fellow New World and Old World producers at 0.26, 0.74, 0.49 and 0.61, respectively. Mean technical efficiency for the study period across the 11 countries increased by 2 per cent per year from 0.74 to 0.85, and finished not far below the level of technical efficiency achieved in the Australian and a number of other industries (1.0) and near to the frontier. The implication of this trend is that differences in the technical efficiency in which the sampled countries transformed winegrapes into value obtained from wine exports narrowed markedly.

Mean scale efficiency was high at 0.85 (Table 4), varying little over the study period. With the exceptions of Italy and Spain, which had lower scores, it suggests that the scale of the wine industry was not an important factor influencing the efficiency with which winegrapes were transformed into export wine value.

Mean mix efficiency increased annually by 2.4 per cent over the decade across all producers, due mainly to increases in the scores for Portugal (8.9 per cent per year), Argentina (5.4 per cent per year), Australia (3.8 per cent per year) and South Africa (2.3 per cent per year). The mix of wines exported by the industries in these countries met with greater willingness to pay by international buyers over the decade. Portuguese exports of *vinho verde* wines and Argentine exports of Malbec wines particularly found favour with global consumers during the study period (Cortez et al., 2009; Pesme and Ruseler, 2011). Mean mix efficiency scores varied across countries for the study period, from 0.99 for Chile to 0.49 for France (Table 4). The relatively low score for France deserves comment. In contrast to its high technical efficiency score, its low mix efficiency score reflects the very high prices received in export markets for sparkling wines relative to the prices of France's more numerous still wine exports (about four times as high) and the sparkling wine prices of other countries (at least twice as high) according to Anderson and Nelgen (2011, p. 110). The message from the low score is that the industry in France should increase its sparkling wine exports at the expense of bottled and bulk still wines. We return to this French example below.

Table 4
Mean efficiency indices in the export and total value models, 2000–2009.

Country	Technical efficiency		Scale efficiency		Mix efficiency		Total efficiency	
	Export	Total	Export	Total	Export	Total	Export	Total
New World								
Argentina	0.256	0.432	0.810	0.969	0.780	0.719	0.163	0.301
Australia	1.000	1.000	0.924	1.000	0.753	0.934	0.705	0.934
Chile	1.000	1.000	0.983	0.983	0.987	0.905	0.972	0.889
New Zealand	1.000	1.000	1.000	1.000	0.588	0.711	0.588	0.711
South Africa	0.737	0.970	0.937	0.968	0.818	0.799	0.572	0.750
USA	0.494	0.978	0.665	0.994	0.799	0.721	0.251	0.702
Old World								
France	1.000	1.000	1.000	1.000	0.492	0.839	0.492	0.839
Germany	0.612	0.652	0.933	0.964	0.717	0.797	0.420	0.501
Italy	0.933	0.933	0.577	0.648	0.808	0.880	0.437	0.532
Portugal	0.720	0.740	0.831	0.912	0.715	0.806	0.430	0.544
Spain	0.997	0.652	0.730	0.964	0.580	0.797	0.422	0.501

4.2.2. Australia

The rate of growth in the export value proposition for Australian wine, while high at 13.3 per cent per year, lagged behind all other New World producers except Chile (Table 3), with the mean for the remaining New World producers computing to 16.55 per cent. Ostensibly, Australia's initial export accomplishments were underpinned by its market penetration strategies in the UK and US supermarket sectors and its wine export volumes more than doubled from 2000 to 2009. But over the same period, the unit value of wine exports fell on average by 0.25 per cent per annum (Anderson and Nelgen, 2011, p. 425). Anderson and Nelgen (2011, p. 375) reported that the export value share of super-premium grade Australian still wine by the end of the study period (2009) was only 8 per cent. This share compares with a global figure of 17 per cent, 21 per cent for the major European exporting countries and 60 per cent for one of Australia's major New World competitors, New Zealand, in the same year.

As a result, Australia's TFPE score over the study period was depressed by a relatively low mix efficiency score of 0.75. This score can be explained by the fact that the price data reported by Anderson and Nelgen (2011, p. 110) show a substantially lower and declining export price of Australian bulk wines relative to the export prices of bottled still and sparkling wines in a period when the proportion of bulk wine exports trebled (Anderson and Nelgen, 2011, p. 73).

Morrison and Rabellotti (2014, p. 20) cited Aylward (2006, 2008) asserting that the Australian wine industry suffered "structural weaknesses of the domestic model of wine production, based on R&D, centralisation, on rather standardised and homogeneous products and on the dominance of large firms", with the outcome that demand changes in the 2000s requiring greater differentiation and sophistication to capture unit price increases caught it unprepared as it had "got stuck into once successful routines and practices".

Consequently, Australian wines encountered strong competition from other SHNW wines in key export markets from 2000 onwards. This competition was particularly noticeable in the second lustrum from New Zealand Sauvignon Blanc and Argentine Malbec. There were ancillary adverse effects on the demand for Australian wines from stagnant per capita consumption in the UK and declining per capita consumption in USA (Anderson and Nelgen, 2011, p. 51), and the strength of the Australian dollar was influential in the decline in Australia's international competiveness from 2007 (Anderson and Wittwer, 2013a, b).

4.2.3. Chile

The Chilean wine industry began the decade from a high point, with the highest TFPE that was maintained until 2006.

This position owed a lot to the strategy adopted by the industry of its wines being "good value for money", which was successful for most of the past three decades (copying the earlier Australian strategy). However, arguably the industry failed to shake off the tag of being good value but cheap (Universia Knowledge@Wharton, 2003; Veseth, 2011). Further, buyer perceptions of cheapness have made it difficult for the industry to consolidate a niche among the premium market segments. This perception of Chilean wines was disputed by Chadwick (2003), who contended that quality has improved in the classic varieties of Cabernet, Merlot, Sauvignon and Chardonnay to which have been added exciting new varieties of Carménère and Syrah. Chadwick (2003) pointed to "a new generation of talented young viticulturists and winemakers" leading the way with improved production techniques. Nevertheless, the persistence of pricing as the main strategic weapon by many wine companies has continued to threaten Chile's image as a quality wine producer. An increased proportion of bulk wine sales during the 2000s strengthened the perception of cheapness, with the mean price of bulk wine declining in real terms from USD0.86 per litre in 2000 to USD0.60 per litre in 2010 (Anderson and Nelgen, 2011). According to Chadwick (2003), Chile still lacks a clear national image as a wine producer. Unlike the Argentine wine industry, the wine industry in Chile has not developed its so-called signature varietal wine despite efforts to brand Carménère as such a wine. Veseth (2011) concluded that it is "still unclear how many of Chile's Merlot vines are really Carmenere". Stein (2008, pp. 5–6) observed that this wine had not yet achieved the central role in export growth that the Argentine industry had achieved with Malbec. Efforts to encourage Chile's wine identity have been intensified in recent years by Wines of Chile (Chadwick, 2003), whose *Strategic Plan 2020* is based on four pillars: diversity and quality; sustainability; country image; and innovation (Wines of Chile, 2011). All pillars are directed towards emphasising Chile's unique proposition in the global market.

4.2.4. Argentina

The wine industry in Argentina began the decade with an extremely low TFPE of 0.12. Its export value proposition growth rate (18.9 per cent per year) was impressive even if it was only similar to the rate of growth in the penetration index. The growing need to dispose of wine in export markets resulting from reduced domestic consumption was partly responsible for a precipitous decline in export unit values in the first half of the 2000s (along with the effects of devaluation of the peso, described above). The mean unit value of total wine exports fell from USD2.05 per litre in 2000 to USD1.29 per litre by 2006, but recovered to USD2.18 per litre by 2009 (Anderson and Nelgen, 2011, p. 111) as quality improvements began to take effect in response to institutional innovations (Silverman et al., 2001).

This recovery in the unit value of wine exports reflects the success achieved in gaining international acceptability among buyers for its wine exports, particularly Malbec wines. Measures had been put in place in the 1990s to overcome a problem of low-quality wines with the realisation that an ambitious strategy of export penetration (particularly away from the traditional Latin American market towards the markets of high-income countries such as USA) would be successful only if it was accompanied by a considerable improvement in wine quality. Despite chaos in the general economy in the first lustrum of the decade, the process started to yield dividends by the second lustrum. The top wineries that led the move into export markets, such as Peñaflor and *Bodegas Esmeralda* (the fine wine division of Catena Wines), were also to the fore in improving the quality of wine exports (Stein, 2008, pp. 8–12). Pricing was a key feature of their strategy, exploiting consumers' perceptions that high-quality wines should have a high price (Stein, 2008, pp. 28–31). Creating an image of quality wines in the premium market would have trickle-down effects for wine exports in the lower-priced market segments. Major wineries have in recent years initiated numerous price points "from entry level to icon" (Stein, 2008, p. 39).

4.2.5. New Zealand

The mean TFPE of 0.71 for the New Zealand wine industry during the study period (Table 4) hides a major change in its export fortunes. The industry had begun the period in sixth place with a relatively low score of 0.40 but attained the highest score among the 11 countries by the end of the period. It switched strategies from volume expansion in the first lustrum to increasing the export unit value by moving to higher price points, especially for Sauvignon Blanc wines, in the second lustrum. This enabled it to achieve a rate of growth in its export value proposition only slightly below that achieved by the Argentine industry (17.7 per cent for the former; 18.9 per cent for the latter) despite no upward trend in export market penetration throughout the decade. The extent to which New Zealand's increase in its export value proposition for the decade was dependent on one variety – Sauvignon Blanc – is difficult to overstate. Of the five main grape varieties harvested in the years 2000–2009, the quantity of Cabernet Sauvignon decreased (from 3792 tonnes in 2000 to 2304 tonnes in 2009) while both Riesling and Chardonnay and Sauvignon Blanc enjoyed nominal growth (from 4070 tonnes to 6216 tonnes and from 23,593 tonnes to 34,393 tonnes respectively). Pinot Noir production increased by a factor of 4 – from 6319 tonnes to 27,5487 tonnes; and Sauvignon Blanc increased from 15,472 tonnes to 177,647 tonnes (NZW, 2009, p. 25).

The subsequent branding of New Zealand wine as quality Sauvignon Blanc, and, to a lesser extent, Pinot Noir, sharpens when examining inter-regional trends. While the number of grape growers in Gisbourne and Hawkes Bay remained relatively constant over the decade, in Marlborough, where 76 per cent of vines were Sauvignon Blanc in 2009, the number of grape growers increased from 254 in 2003 to 568 in 2009. Similarly, in Central Otago, where Pinot Noir comprised 78 per cent of all vines in 2009, grape growers increased from 42 to 77 over the same period (NZW, 2009, pp. 3, 18, 22). This entry of new capital into highly branded, variety-specific

regions (against any trend toward consolidation, for example) indicates that new capital saw the value in investing in these regionally-branded varieties destined for export, particularly in the second lustrum, where global prices were affected by what Stuart Smith, Chair of New Zealand Wine, described as the "combined effects of the 2008 supply shock and the global financial crisis" (Smith, 2011, p. 4). This is reflected in the unit value of wine exports increasing at over 9 per cent per annum from 2000 to 2009 despite the rapid expansion in the volume of wine exports in the same period (from 20 million litres to 129 million litres (Anderson and Nelgen, 2011, p. 426).

4.2.6. Other countries

The export value proposition index increased by 14.8 per cent apiece in USA and South Africa during the decade (Table 3), slightly higher than the rate in Australia, despite the industries in both countries having lower rates of increase in export market penetration. Morrison and Rabellotti (2014) noted that South Africa was the first among the SHNW industries to adopt a nationwide institutional strategy of market-oriented R&D similar to that adopted in Australia. Innovations in technology accompanied by training, social promotion, the provision of industry information and the development of key markets (Morrison and Rabellotti, 2014, p. 14) enabled the industry to achieve moderate increases in the unit values of its wine exports during the 2000s.

In USA, the investments to improve viticulture and oenological techniques that began late in the 20th century (Morrison and Rabellotti, 2014, p. 12) paid dividends in enabling its wine exporters to improve their export value proposition in the 2000s. As a comparison, the mean unit price of US still wine exports in 2000 was only US$2.07 compared with US$3.17 in Australia; the comparable figures in 2009 were US$4.37 and US$3.61 (Anderson and Nelgen 2011, p. 108). This movement by the US industry to higher price points to increase unit values was led by major Californian exporters such as Robert Mondavi Corporation, E&J Gallo and Beringer Wine Estates (Silverman et al., 2001).

With the exception of France and Italy, the export value proposition index was much higher than the export market penetration index for Old World producers (11.3 per cent mean for Germany, Portugal and Spain). These advances were brought about principally by the response by Old World producers to the challenge from New World producers in which they emphasised wine quality across distinctive regions, undertook better promotion, marketing and structural investments, and adopted a more scientific approach to growing wine grapes and winemaking (Morrison and Rabellotti, 2014, pp. 15–20).

4.3. Total wine productivity

The fourth column in Table 3 shows the trends in productivity in transforming winegrapes into total wine volume. The aggregate volume frontier shifted downwards

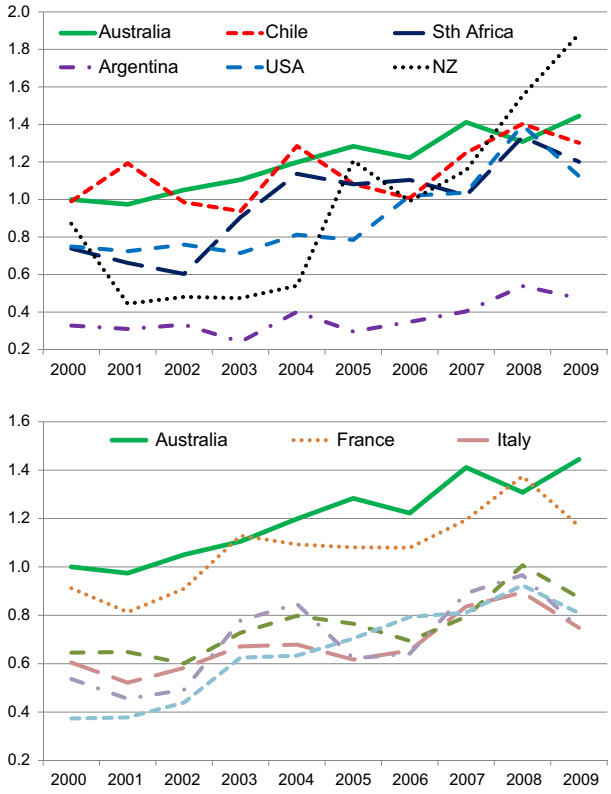

Fig. 1. Trends in global value proposition indices: comparison of Australia with other New World producers and Old World producers, 2000–2009.

by 1.0 per cent per year (Table 3), partly due to incursions into the domestic markets of these countries by cheaper exports from other wine-producing countries (Anderson and Nelgen, 2011).

As might be expected, the productivities are quite tightly bunched throughout the decade but there is some minor variation across countries. The largest productivity declines occurred in Australia and Chile (−3.5 per cent and −2.6 per cent, respectively). This outcome in Australia was partly due to lower sales into the domestic market but also a lack of water for grape production arising from drought conditions throughout much of the second lustrum that resulted in grapes with relatively low liquid content. In Chile, stagnant supplies to the domestic market for wine explain the reversal of a slight productivity increase in wine export market penetration to a small wine total productivity decline: wine consumption per head declined slightly over the decade (Anderson and Nelgen, 2011, p. 53).

The most dramatic turnaround between export penetration and productivity occurred in Argentina where the annual rate of growth in transforming winegrapes into export volume was 18.4 per cent whereas there was an annual rate of decline in transforming wine grapes into total wine volume of 1.9 per cent (Table 3). A major factor at play here, noted above, was the 3.0 per cent annual decline in wine consumption per head (Anderson and Nelgen, 2011, p. 51) that interacted with an inability of firms supplying the domestic market to compete

with imported wines and led to a comparable rate of decline in supply to the domestic market. The rate of decline in wine consumption was much higher than in neighbouring Chile, which is not surprising given that wine consumption per adult in Chile was less than one-half the level in Argentina at the beginning of the decade (Anderson and Nelgen, 2011, p. 53).

On the other hand, New Zealand, France and Italy avoided productivity declines while the declines in Germany and USA were small. In the case of New Zealand, as we have seen, the fulfilment of the strategy of focusing on quality and branding in the second lustrum resulted in its export value proposition increasing during this period, save for a minor correction in 2009 (Anderson and Nelgen, 2011, p. 426).

4.4. Total wine value proposition

Fig. 1 shows the trends in indices of total wine value proposition and the final column in Table 3 provides the mean annual percentage change in these indices.

4.4.1. Sources of change in total wine value proposition

Technical change was the major factor influencing change in indices of total wine value proposition with the total wine value frontier shifting outwards at an annual rate of 5.6 per cent, slightly lower than the rate of 6.1 per cent for the export wine value frontier. Given that the volume frontier shifted downwards by 1.0 per cent per year, the value shift was due to the various demand and supply effects on wine prices, particularly improvements in perceived quality.

Mean technical efficiency estimates in the total wine value proposition model changed little over the decade, hovering around 0.9 and not far from the total revenue frontier (Table 4). The only country experiencing a significant change in technical efficiency was Germany (7.2 per cent per year). As for the transformation of winegrapes into export value, mean scale efficiency was also high and invariant over the study period around an average of 0.94 (Table 4), suggesting that scale was not an important factor influencing the efficiency with which winegrapes were transformed into wine value. A lack of trend in the mean scale efficiency was mirrored by no significant changes in individual countries. On the other hand, a lack of trend in mix efficiency, with a mean of 0.8 over the study period (Table 4), hid minor individual country changes. Increases in mix efficiency were recorded in New Zealand and Argentina driven by their greater specialisation in bottled still white wine (Sauvignon Blanc) and bottled still red wine (Malbec), respectively. These gains were offset by a 1.7 per cent decline in Chile (for reasons outlined above) and a 1.6 per cent decline in Germany slightly offsetting its substantial increase in technical efficiency score.

4.4.2. Comparative analysis

Chile and Australia began the decade with the highest value proposition indices, with scores of 1.00 and 0.99, respectively (Table 2). By the end of the decade, they had forfeited their position of ascendancy to New Zealand and had almost been caught by South Africa and USA. This was partly a result of the decline in productivity in transforming winegrapes into wine volume in the former two countries. Another factor causing slow growth in Chile was stagnant domestic consumption of wine.

All countries except France experienced substantially lower growth rates in their total wine value propositions than in the growth rates in their export value propositions (Table 3). New Zealand and Germany were the only countries to experience double-digit growth rates in the former index. Stagnant or declining supply to the domestic market was the major factor causing this divergence; all countries except New Zealand, South Africa and USA experienced significant declines in domestic supply and the annual rate of decline in domestic supply was particularly great in Australia. Exports of Australian wine as a share of domestic wine production volume doubled from one-third in 2000 to two-thirds in 2009 and in 2007 comprised 81 per cent (Anderson and Nelgen, 2011, p. 425). As mentioned earlier, bulk wines increasingly comprised a larger proportion of still wine exports. During this time, Australia's wine self-sufficiency (the volume of wine production divided by beverage wine consumption expressed as a percentage) fell on average by just over 2 per cent per year. Concurrently the domestic market came under siege from increasing import volumes which were assisted by advantageous currency changes. The imports were predominantly from New Zealand (Sauvignon Blanc and Pinot Noir) in the super-premium category, but also from France (sparkling wine) and Italy (commercial-premium wine) (Anderson and Wittwer, 2013b, p. 140).

Australia achieved a growth rate in its total wine value proposition similar to the rates attained in most Old World producers except Germany. Of the five Old World producers, Germany was the standout performer being the only country to experience annual growth in both production and per capita consumption over the 10-year period. Imported wine volume as a share of domestic wine consumption remained relatively steady while average growth rates in total and unit export values were double those of the import growth rates. Using Australia as a comparison, imported wine volume as a share of domestic wine consumption grew by 15 per cent per annum and average growth rates in total and unit import values far exceeded their export growth rate counterparts (Anderson and Nelgen, 2011, pp. 400–426).

New Zealand was at the forefront of the New World producers. The high rate of growth in total wine values in New Zealand occurred because export values were supported by a constant volume supplied to the domestic market. However, more than just domestic consumption increasing from 16.68 litres per capita in 2000 to 20.16 in 2009 (as previously noted) the growth in the volume of wine imports was negative over the decade, averaging −2.89 per cent and falling from 42 million litres in 2007 to 32 million litres in 2009 (Anderson and Nelgen, 2011, p. 83). By comparison, for example, in the same period, the volume of wine imported to Australia accelerated from 44 to 61 million litres, averaging 18.73 per cent for the decade, despite it being negligible in the first lustrum (Anderson and Nelgen, 2011, p. 425).

The industries in South Africa and USA achieved impressive growth rates in their total value wine propositions of 7.6 per cent and 6.6 per cent per year, respectively. Growth rates due to price effects were highest in New Zealand and South Africa and moderate for the other New World producers.

Finally, we expected that firms within a wine industry engaged in exporting would be more capable of improving their total value propositions than the non-exporting firms (that is, transforming winegrapes into export value would be higher than transforming them into total value). The results reported above provide prima facie support for this proposition, but not uniformly so across the 11 countries. Differences in export and total value proposition growth rates were most marked in New World countries (with the slight exception of New Zealand) plus Portugal and Spain. This result suggests that the wine industries in these countries were more successful in creating value in export markets than in defending value in their domestic markets from import competition.

5. Review and prospects for the Australian wine industry

5.1. Review

Grant et al. (2015) reported that in the year 2000 the Australian wine industry had a strong comparative advantage in wine production and export, had the highest global value proposition index among the 11 countries under study, and was on the crest of a wave in international markets in a number of ways. They noted that the industry's strategy in the previous two decades had earned it a reputation as a producer of "technically faultless wine", but also observed that other countries were beginning to challenge its pre-eminent position.

The 2000s was a tumultuous decade for the industry, as it was for all SHNW wine industries, with increased competitiveness in wine price and quality against a backdrop of growing wine surpluses in the global market. By the end of the decade, all countries had developed strategies to improve the export quality of their wines, in order to move to higher price points, and diversifying their offerings. And all were concerned about the impact of their exchange rates and the adverse impacts of a wine glut on the profitability of their export industries.

No country was the scrutiny greater than in Australia. The central finding of our discussion is that Australia lost its competitive edge over many other major wine producers in the decade under study. In terms of the rate of growth of the export value proposition index, although the Australian industry enjoyed an increase of 13.3 per cent per year it was outstripped by all other New World producers except Chile (with an average increase of 16.6 per cent for Argentina, New Zealand, South Africa and USA). Furthermore, two Old World producers, Germany and Portugal, achieved similar scores to Australia (14 per cent and 12.7 per cent, respectively) over the same period. As such, it was not merely a matter of other New World producers taking over Australia's export markets (as well as meeting expanding overall demand). The situation was far more nuanced.

Our analysis has suggested that the reasons why this occurred are complex. Nevertheless, they can be divided into those internal and external to the Australian economy. First, in terms of significant exogenous events several factors proved significant in the course of the decade. With respect to Australia's competitors, we have suggested that both Argentina and New Zealand developed successful national-based marketing strategies around specific varieties, while Chile attempted to do so throughout the course of the decade. While the points have been canvassed in the discussion above, the more general observation is that the political economy of these highly successful strategies – the relationships among producers, winemakers and peak representative bodies that assumed at least some responsibility for the strategic direction for the wine industry at the national level and directed toward international markets – was crucial to the success enjoyed.

Second, in terms of internal factors, we have seen that the Australian industry has been characterised as being trapped in once-successful but now outmoded routines and practices. Yet other domestic factors were largely out of the control of the Australian wine industry. Arguably the most salient of these was the growth in the value of the Australian dollar, especially in the second lustrum, which affected the competitiveness of Australian wines in its export markets. The other side of the exchange rate impact was also extremely important: plentiful cheap foreign wines, and now affordable previously expensive French and German wines, flooded into the domestic market. Between 2000 and 2009, the total wine import volume increased from 16 million litres to 61 million litres and wine import value grew from USD64 million to USD365 million (Anderson and Nelgen, 2011, pp. 77, 99). Our discussion also noted that the varying availabilities of water over the decade affected wine volumes.

Yet other events were equally as important, particularly the Australian industry's inability to reverse the declining price per litre of exported wines, reflected in the changes in the total value proposition index, which records Australia scoring an equal third last (with Italy) among all major producers. Further, Australian consumers were taking advantage of the high Australian dollar while the industry neglected to develop a strategic approach to boost the domestic consumption of Australian wines. Australian wine producers suffered more than those in other SHNW countries from the combined impact of an appreciating real exchange rate and an oversupply of wine on the domestic and export markets during the 2000s.

5.2. Prospects

In essence, any action taken by or on behalf of the Australian wine industry at the collective level does not, strictly speaking, fall under the auspices of public policy. Both the farming of winegrapes and the manufacturing of wine take place in a deregulated (as opposed to ideal-type "free market") context where government intervention that characterised both industries until the mid-1980s has been thoroughly eschewed (see, for example, Gow and Grant (2010)). The strategic positioning of the industry conceived at a national

level is the responsibility of a statutory authority – Australian Grape and Wine Authority (formerly Wine Australia) as well as voluntary groups of producers rather than falling under direct government control. As such, public policy in this arena is limited in both scope and scale. Further, our discussion reveals that the reasons for the changing comparative positions of all major wine-exporting economies are complex; any search for a "silver bullet" solution is misconceived.

Nevertheless, recent strategic thinking in Australia exemplifies the approaches now being adopted in all SHNW countries. On its website, Wine Australia (2013) summarised its approach to an export marketing strategy thus:

> Wine Australia promotes the quality, diversity and value of Australian wine through a number of marketing initiatives in Australia and overseas, to support winemakers' strategies in key markets. The objective of Wine Australia's marketing approach is to [r]ecapture the excitement about Australian wine and evolve our positioning towards a stronger perception of quality, diversity (style, region, place and story) and value.

Coelli (2013) tells a similar story, succinctly summing up the recent experiences of the Australian wine industry evidenced by the results reported above: "Our competitors have caught up." He argues persuasively that a past strategy of exports of "high volume wines from large companies" with "low to medium price points" and "reliable good quality for the price point" is not the answer for the future and concludes that future growth will rely on promoting the wine regions of Australia, promoting more high-quality wines, and selecting and promoting quality indicators.

How successful SHNW countries are in achieving these sorts of strategic goals will depend partly on whether global over-supply is reversed and what the future trends are in real exchange rates. There is a glimmer of hope. Pomarici (2013) observed that "The wine market is currently facing something new: scarcity." He identified two main drivers that could "determine a pressure to reduce supply and, at the same time, determine deep changes in the geographical distribution and organisation of the wine industry around the world": climate change and a combination of slower production growth and stronger demand.

Anderson and Wittwer (2013c) gave a glimpse of the mid-term future for Australian wine, observing that profitability could return to the industry if certain conditions prevailed. They examined Australia's wine prospects over the next five years, "focusing in particular on the roles not only of further changes in bilateral exchange rates but also of a return by consumers to higher-quality wine purchases and of continuing rapid growth in wine demand in emerging economies, especially China". Modelling results showed that the "recent devaluation of the AUD, if sustained, could benefit Australian winemakers and hence grape growers by 2018" (Anderson and Wittwer, 2013c, abstract). They also examined an element of one of the themes of Pomarici (2013) of demand growth, and noted "how quickly China could become a major destination for Australian wine exports", a market that is also being eyed by other SHNW producers (e.g. Wines of Chile, 2013) and Old World producers (e.g. Robinson, 2013).[4]

5.3. A cautionary note

Results reported in this paper should be treated with caution in light of the lack of data on inputs other than winegrapes in wine production and marketing. It would aid policy makers if the relevant institutions in the major wine-producing countries could collaborate to develop a dataset that includes all inputs used in producing and marketing wine, and their costs, which would enable a profit-based comparison of their performance. It would also be a useful extension of this study to be able to assess identifiable sections of national industries (for example, cool-climate wine-producing regions versus warm-climate bulk wine-producing regions) as they are likely to have experienced different changes in their competitive position. Finally, it would be helpful to examine events in viticulture as well as wine production.

The partial nature of the analyses of export performance should also be treated with caution. The example of the low French mix efficiency score in the export value model referred to above demonstrates this point. A naïve response to low mix efficiency score would be to conclude that the mix of French wine exports was highly inefficient and should be changed to include more sparkling wine and less bottled and bulk still wine. This response would ignore (a) the differences in the costs of other inputs in the production and marketing of Champagne and other wines, (b) the geographical limits to expanding the use of winegrapes for Champagne, and (c) the important domestic market for Champagne (the mix efficiency score in the total wine value model is much higher, at 0.84 compared with 0.49 in the export value model).

Notwithstanding these caveats, the French wine industry was well aware of the mix inefficiency by the mid-2000s and did very much want to increase Champagne exports in response to the increased global demand that brought about the high export prices. Decanter (2007) reported that the French national appellations body, *Institut National de l'Origine et de la Qualité*, began to consider adding 40 new communes to the Champagne region in late 2007. This expansion was approved in 2008 but its effects on exports will not be fully felt for several years as new plantings start to yield. Deluze (2010) reported that new plantings are strictly controlled but the suppression of planting rights will be lifted by 2017.

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[4] China is currently Australia's third-largest export market by value (ABARES, 2013).

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