

Projecting the Australian wine grape and wine sectors to 2015

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Introduction

The Australian grape and wine sectors have undergone massive structural changes over the past two decades. In this time, Australia has gone from being at times a net importer of wine to the leading New World exporter. Such changes entail considerable adjustment pressures. Grape growers in particular are vulnerable to these pressures. Red winegrape prices soared in Australia for seven consecutive vintages in the 1990s, leading to a massive supply response. Consequently, prices have fallen in warm climate, inland regions where most of the grapes are grown. The main point of this study is to examine whether the red winegrape price trough of the 2004 and 2005 vintages is going to persist in future vintages, or whether these vintages represent a point in time at which supply growth temporarily has jumped ahead of demand growth. Prices realized from the 2004 and 2005 vintages have led to a wave of pessimism among some in the industry.

This paper uses a formal modelling framework to combine past industry-specific data with other economic variables to project medium-term prospects for the industry. We have at our disposal a regional, dynamic CGE model, TERM (The **E**normous **R**egional **M**odel, Horridge *et al.* 2003). This enables us to combine the theory of the model, observed data on grape prices and wine exports, and macroeconomic forecasts for the national and state economies, to project TERM ahead to 2015. The focus of this study is on regional wine grape and wine sectors from 2004 to 2015. The period from 1999 to 2004 is also examined. This is of particular interest to the Australian wine industry, as prices received by grape growers in some regions fell sharply in this period. Moreover, we are able to distinguish between regions. The story drawn from warm inland grape-growing regions is quite different from that of most other regions.

The 1990s wine boom and the apparent bust of the new millennium

Booms and busts tend to be a feature of plantation crops, including vineyards, in which considerable capital is required in the planting stage, with a lag of a number of years before commercial yields occur. In the case of annual crops, we expect year-by-year supply responses to price variations. For plantation crops, prolonged periods of either low or high prices may prevail. Price rather than quantity adjustments tend to persist in the medium term by virtue of the lag between planting and commercial production, in the case of rising prices, and the reluctance by producers to remove vines or trees due to the high initial investment costs, in the case of falling prices.

Earlier boom and bust cycles

Crises are not new to Australia's wine industry: it entered a sustained phase of prosperity in the late 1980s that lasted more than a decade. This had an unlikely beginning. In 1986, the then Commonwealth government and the state government of South Australia responded to concerns of a grape oversupply by financing a vine-pull scheme. Within months, the scheme ceased as conditions in the industry improved — but not before a reduction in the area of vineyards of 9 per cent in South Australia and 6.5 per cent nationally (Osmond and Anderson 1998). New plantings began in the late 1980s and, apart from a brief period in the early 1990s when industry growth stalled during the global recession, the industry has grown rapidly. The first signs of an end to the price boom did not appear until the 1999 vintage in warm climate growing regions, and several vintages later in cooler climate regions.

Osmond and Anderson (1998) have documented the historical pattern of booms and busts in the Australian wine industry. The first boom, in the 1850s, followed the gold rush. This boom was overwhelmingly domestic, with high duties and high transport costs hindering both inter-colonial and international trade. The second, from the 1880s, benefited from a relatively open British market and lower transport costs. Most international sales, accounting for one-sixth of production, were of generic, bulk red wine to Britain. The second boom ended with World War I. Soldier settlement after World War I, combined with irrigation and land development subsidies, a wine export subsidy, and an imperial tariff preference in the British market for fortified wine, all contributed to the third boom, which started in the mid-1920s. By the mid-1930s, with the Depression driving down Australia's wine consumption, exports rose and peaked at one-quarter of production before World War II. During and following the war, the industry floundered. The export subsidy was removed and, after the war, Britain imposed a huge increase in the tariff on fortified wine. And with war-time grain rationing removed, Australians returned to beer consumption, thereby slowing growth in domestic wine consumption.

After a quarter-century of slow growth, a fourth wine boom started in the mid-1960s which was entirely domestic. Consumer tastes became more European, liquor licensing and trade practice laws changed and, with the industry being dominated increasingly by large corporate wineries, marketing improved and innovations accelerated. Among these, casks attracted new consumers to the market, particularly for white wine. Per capita consumption of wine, which had languished at around 5 litres per year in the 1950s, rose to over 8 litres in the late 1960s. By the late 1970s, consumption approached 15 litres by capita. The peak occurred in 1986 (21.6 litres, ABS 2004), ironically at a time when red winegrape growers were experiencing severe financial difficulties. Concerns in the late-1970s and the 1980s over the histamine content of red wines may have dissuaded consumers from turning to reds. A rather simpler interpretation may be pertinent: Australian wineries produced wine of a higher quality on average than local consumers were prepared to drink.

Fears for the premium wine industry, as mediocre wines flooded the market in response to domestic demand, gradually faded with a rise in exports in the early years of the most

recent boom. In addition, the premium red segment started to benefit from an increasing domestic preference for wine, following the emergence of evidence of the health benefits of moderate red wine consumption which ended the histamine scare.

Many of the fundamental strengths of the domestic industry had been established for decades, notably R&D investments in viticulture and winemaking, and training of winemakers (Anderson 2000). Such strengths would have been news to the Senate Standing Committee (1977) of several decades earlier, which gravitated towards the notion that wine producers had to find the cheapest means possible of providing Australian consumers with the palatable bulk wine they favoured. Marketing, however, was not a strength. Britain's most notable wine writer, Hugh Johnston (1983) wrote of the number of wineries, wines and 'styles' the Australian industry supported and the importance of wine to Australians. He noted, however, the weakness of Australian labelling practices in the following terms:

Extraordinarily little of the buzz of Australian winemanship penetrates overseas — largely because her best wines are made in vast variety but small quantities, and partly, I believe, because lack of any kind of central direction make Australian labels a pathless jungle. .. Until Australia begins to develop an appellation system the only means of selection will be through the maker's name. (p. 462)

Johnson went on to describe the Australian industry as 'one of the world's most exciting wine countries in late, difficult and protracted adolescence.' Developing and adhering to a system of appellation has played only one part in expanding Australia's exports since then, with the defining of geographical indications and their inclusion on wine labels. A converse perspective is that strict appellation laws may have prevented Europeans from adapting to changing market conditions. Indeed, in many markets Australia has led the New World producers in showing the Old World producers of Europe how to adapt rapidly to changing consumer demands.

The unprecedented supply response and two landmark vintages

Since the beginning of the 1990s, grape growers have experienced a long upward price cycle followed by a downward price cycle. The fluctuation has been greatest in the warm climate, irrigated inland grape regions of the Murray-Darling Basin. Rising red winegrape prices coincided with the introduction of water trading by irrigators, in the second half of the 1990s. Water trading may magnify the response of producers to changing relative output prices in irrigation industries. In the Swan Hill area of the Mallee, this happened with vineyards in the late 1990s and with almonds after the turn of the millennium. Water trading has provided a mechanism to move irrigation production towards market-oriented outcomes. A downside is that there may be a tendency to over-invest in a particular plantation industry.¹ There is also a potential upside: given that supply booms are relatively predictable for crops with long lags, there is sufficient time for industry research and marketing to proceed. The best possible outcome is that demand growth arising from research and marketing occurs in tandem with supply growth. The

¹ Accelerated depreciation provisions in tax laws also contributed to growth.

wine industry appears to have managed this by design rather than accident, as argued by Anderson (2000).

The two vintages of 1999 and 2004 are landmarks. In 1999, the vineyard plantings boom had peaked.² Yet, only in warm climate inland regions were there any signs that winegrape prices were falling: in warmer regions, the lag before production is shorter. Even so, in the Murray Lands statistical division of South Australia, the average price per tonne for red winegrapes was still \$1,044 (calculated from tables 1 and 2). This represented a very high rate of return for the year. In succeeding vintages, red winegrapes from warm climate, inland regions continued to fall in price as supply increased. In other cooler climate regions, in which the time between establishing a vineyard and realizing commercial yields is longer, 2003 loomed as the yield in which there might be dramatic supply increases. The extraordinary nationwide drought of 2002 delayed this for another vintage, leaving 2004 as the first vintage of severe downward price pressures outside the grape-growing regions of the Murray-Darling Basin.

Table 1: Wine grape production volume, 1999 and 2004, kilotonnes

	Red			White		
	1999	2004	%	1999	2004	%
MurrayLndsSA	117.5	264.5	125.1	141.5	175.6	24.1
SouthEastSA	40.2	135.4	236.6	23.6	37.1	57.3
MurrumbidgeeNSW	57.2	131.0	129.0	97.4	126.8	30.2
MurrayNSW	36.3	88.6	143.8	126.7	118.6	-6.4
OtrAdelaidSA	25.8	75.1	191.3	7.5	28.3	276.4
MalleeVIC	35.0	82.8	136.5	123.2	115.2	-6.5
AdelaideSA	34.8	62.3	78.9	20.0	16.3	-18.7
BarossaSA	32.7	58.1	77.5	30.9	28.8	-6.8
YorkLwrNthSA	9.9	22.4	126.0	9.8	10.6	8.7
MelbourneVIC	3.6	14.7	308.4	3.8	9.0	135.3
NorthWestNSW	8.0	16.5	104.7	6.0	4.8	-19.8
SouthEastNSW	1.7	8.4	409.1	2.3	3.0	32.1
Other	46.1	63.7	38.2	68.5	50.2	-26.7
Total	448.9	1,023.4	128.0	661.2	724.3	9.5

Source: AWBC database

Table 1 shows both red and winegrape production volumes by regions for 1999 and 2004. The Murray-Darling Basin irrigation regions of the Murray Lands (mostly Riverland) in South Australia, Murrumbidgee and Murray in New South Wales and the Mallee (Sunraysia and Swan Hill) in Victoria accounted for 370 kilotonnes of the national red winegrape increase of 575 kilotonnes between 1999 and 2004.³ The other regions with

² 1999 was also the first vintage in which detailed winegrape price became available for regions outside South Australia. All comments in this article concerning prices for vintages prior to 1999 follow the assumption that prices for winegrapes grown in other states tracked those for comparable regions (i.e., warm climate v. cooler climates) in South Australia.

³ Throughout this study, we use statistical divisions rather than vine regions to define areas.

largest increases were the South East (South Australia, +95 kilotonnes) and Outer Adelaide (+49 kilotonnes). In most regions, other than Outer Adelaide and Melbourne (i.e., Mornington Peninsula and Yarra Valley), white winegrape output changes were smaller, even shrinking in various regions.

In table 2, we see the extent to which falling prices in some regions have occurred as output has risen. In each of the four Murray-Darling Basin regions shown, red winegrape prices have fallen by more than 40%. In the Murray Lands, the value of production grew by only 5.1% as output more than doubled. Rising white winegrapes price did little to compensate: total winegrape output in the region increased from 259 kilotonnes to 440 kilotonnes (70%) while the value increased from \$194 million to \$244 million (26%). The average price for all winegrapes in the Murray Lands fell from \$749 per tonne to \$555 per tonne (-26%). Such falls in prices while not appearing to be catastrophic, may have reduced prices from some growers to the extent where they did not cover annual costs of production. For established growers, the very high prices of the mid- to late-1990s would have more than compensated for the low prices in 2004 and 2005. New growers would have been most vulnerable following these recent vintages.

Table 2: Wine grape production value, 1999 and 2004, \$m

	Red				White			
	1999	2004	% value	% price	1999	2004	% value	% price
MurrayLndsSA	122.7	128.9	5.1	-53.3	71.3	105.1	47.3	18.7
SouthEastSA	74.3	142.6	91.8	-43.0	24.9	46.0	85.1	17.7
MrmbridgeeNSW	49.9	56.8	13.8	-50.3	43.0	69.5	61.5	24.0
MurrayNSW	36.2	49.3	36.2	-44.1	55.3	69.9	26.4	35.1
OtrAdelaideSA	40.9	90.7	121.6	-23.9	10.8	41.5	285.1	2.3
MalleeVIC	35.8	45.3	26.3	-46.6	54.7	67.1	22.8	31.2
AdelaideSA	58.8	84.2	43.1	-20.0	21.3	19.7	-7.5	13.8
BarossaSA	54.4	76.8	41.2	-20.4	27.2	31.6	16.2	24.7
YorkLwrNthSA	16.1	30.7	91.2	-15.4	9.8	14.7	50.3	38.3
MelbourneVIC	7.4	23.9	223.0	-20.9	6.6	16.3	147.1	5.0
NorthWestNSW	7.7	19.6	155.1	24.6	5.4	5.5	1.1	26.1
SouthEastNSW	1.7	12.7	658.1	48.9	2.2	4.4	99.5	51.1
Other	60.6	77.2	27.5	-7.7	67.5	60.6	-10.2	22.5
Total	566.6	838.6	48.0	35.1	400.0	551.8	38.0	26.0

Source: AWBC database.

Why did red winegrape prices in the South East (-43%) fall further than in the Barossa region (-20%) in this period? Two reasons seem most pertinent: (1) as is evident in table 1, red winegrape production in the South East more than trebled between the 1999 and 2004 vintages, whereas in the Barossa, it expanded by a relatively modest 78%; and (2), the reputation of Barossa Shiraz grew in the rapidly expanding North American market.

Wine exports: 1999 and 2004

The growth in Australian wine exports that started in the late 1980s continues. By the end of the calendar year 2004, Australia's annual wine exports had reached 643 megalitres (table 3), worth \$2,744 million, a far cry from the 24 megalitres of wine exported in 1986 (ABS 2004).

Table 3: Wine exports by state, 1999 and 2004

	1999		2004	
	Vol. ML	Val. \$m	Vol. ML	Val. \$m
NSW	51.8	224.4	176.6	665.5
VIC	21.6	137.0	99.0	479.8
QLD	0.0	0.5	0.5	3.1
SA	182.2	695.1	359.3	1,538.2
WA	1.6	13.7	6.8	53.9
TAS	0.2	2.5	0.3	3.4
Total	257.5	\$1,192.3	642.6	\$2,744.0

Source: AWBC database; ABS 2004

Wine export data indicates that global demand for Australian wine has grown rapidly, and has been almost sufficient to match the increase in Australia's export supply. In 1999, when 257.5 megalitres of wine were exported, the average unit value of exported bottled wine was \$5.20 per litre. In 2004, when the Australian dollar had appreciated against the US dollar (from 64.5c in 1999 to 73.6c in 2004), the unit value of bottled wine was \$4.98 per litre (AWBC database; <http://fx.sauder.ubc.ca/cgi/fxdata>). Given the downward price pressures arising from a rising Australia dollar, this relatively modest fall in the unit value of bottled exports since 1999 appears to be consistent with steadily growing demand, in view of the export supply growth at the same time. While a strong Australian dollar will continue to exert significant competitive pressures on Australian exporters, there appears to be no statistical evidence yet of any global softening of demand for Australian wine.

Details of the TERM model used to project to 2015

Applications of TERM are based on a master database containing input-output data for 167 sectors and 58 regions. In applications, we aggregate the model to the focus of the study. For the present application, we use a 10-region aggregation of the master database. The 10 regions reflect the winegrape and wine focus of this study, including Murrumbidgee, Murray and the rest of the state in New South Wales, Mallee and the rest of the state in Victoria, Greater Adelaide, Barossa, Murray Lands and the rest of the state in South Australia, and a single composite region comprising the states of Queensland, Western Australia, Tasmania and the two territories. TERM is best used with aggregations reflecting the focus of the study. The composite region includes some well-known wine regions, but none account for a significant share of their region's economic activity.

Red wine grapes, white wine grapes, multipurpose grapes, red wine, white wine and bulk wine are represented separately in the sectoral detail of the model. Horridge *et al.* (2003) describes the preparation of the master database. Inputs from the AWBC and ABS (2004) have helped in the preparation of the grape and wine sectors.

The theory of TERM is much the same as that in national dynamic CGE models such as MONASH (Dixon and Rimmer 2002). Each industry in TERM selects inputs of labour, capital and materials to minimise the costs of producing its output. The levels of output are chosen to satisfy demands, which in turn reflect prices and incomes. Investment decisions in each industry are driven by rates of return. Capital stocks depend on past investments and depreciation. Unlike the MONASH model, for example, each industry and commodity in the model is represented at the regional level. TERM imposes a fixed exchange rate and free trade between regions, and common external tariffs. In this sense, TERM remains a national model, rather than international. This means that behaviour in foreign markets is determined outside the model (i.e. exogenously).

In this application, we impose historical data on grapes prices and outputs, wine exports and macro variables on the model to update it from 1999 to 2004. Then, TERM is run in forecasting mode. We take as inputs forecasts of macro and trade variables, together with trend forecasts of demographic, technology and consumer-preference variables. The information contained in the baseline simulation includes our trend forecast for growth in vineyard capital stocks and land usage of bearing vineyards, based on observed plantings. The lag between plantings and winegrape production allows us to estimate the increase in capital and land usage some years into the future without drawing on the investment theory of the dynamic model.

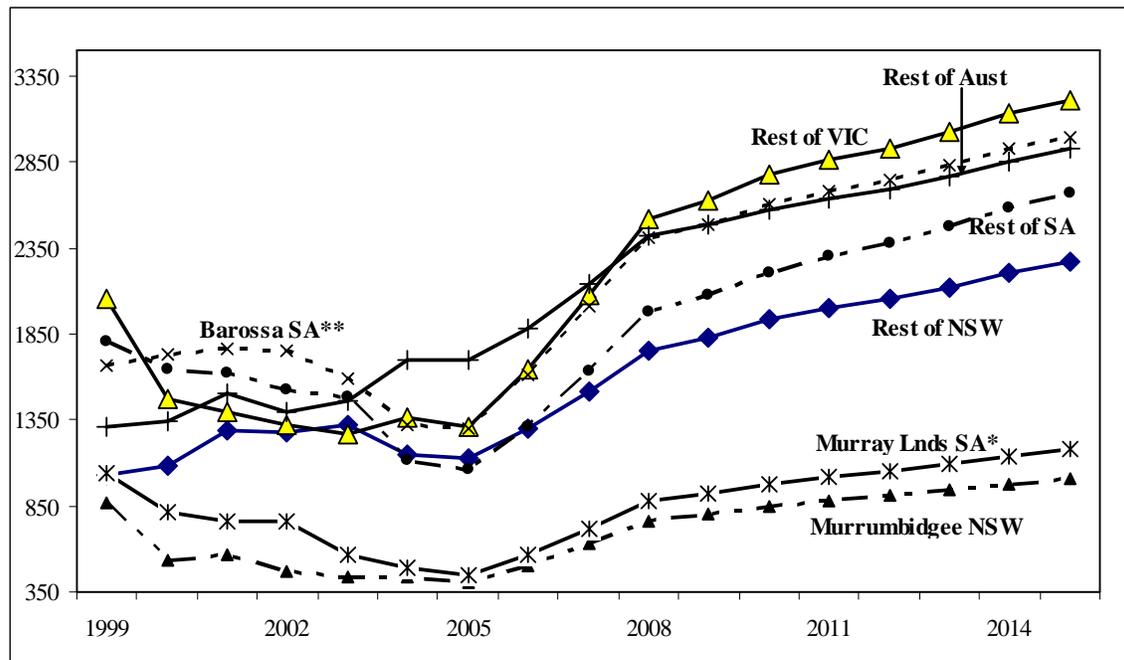
Projection to 2015

In this part of the study, we use available plantings data, and various macro and micro-related forecasts to project a grape and wine focused aggregation of TERM to 2015. Key assumptions include:

- In foreign markets, demand for Australian wine will continue to grow.
- In the domestic market, a pronounced taste swing towards red wine will continue, with a more moderate swing towards white wine, and a taste swing against non-premium wine.
- Macroeconomic household consumption will continue to grow, with a positive income effect driving up domestic wine consumption.

In the price projections, we do not correct for inflation. Therefore, figures 1 and 2 show nominal prices. The CPI is projected to increase by 27% between 2005 and 2015.

Figure 1: Red winegrape prices by region, 1999 to 2015 (\$/tonne)^a



^a Observed data for 1999 to 2004, forecast for 2005 to 2015.

* Mallee Vic and Murray NSW follow similar price paths to Murray Lnds SA

** Outer Adelaide SA follows a similar price path to Barossa SA

Several points are worth noting about the price projections shown in figures 1 and 2. Winegrape quantities projected into the future are relatively predictable, for reasons explained earlier concerning lags. For example, the only unexpected outcome since 1998 has been the quantity of grapes produced in the 2003 vintage following the extraordinary drought of 2002. Projections for prices are rather more problematic. We assume that Australia gradually consolidates its position in rapidly expanding export markets. In turn, winegrape prices will rise from the heavily discounted levels of the record vintages of 2004 and 2005. We cannot be confident about the timing or magnitude of the recovery. That red winegrape prices in our projection are relatively flat after the 2008 vintage simply reflects our assumption that most adjustment to the extraordinary supply shocks of the preceding vintages will have occurred by then.

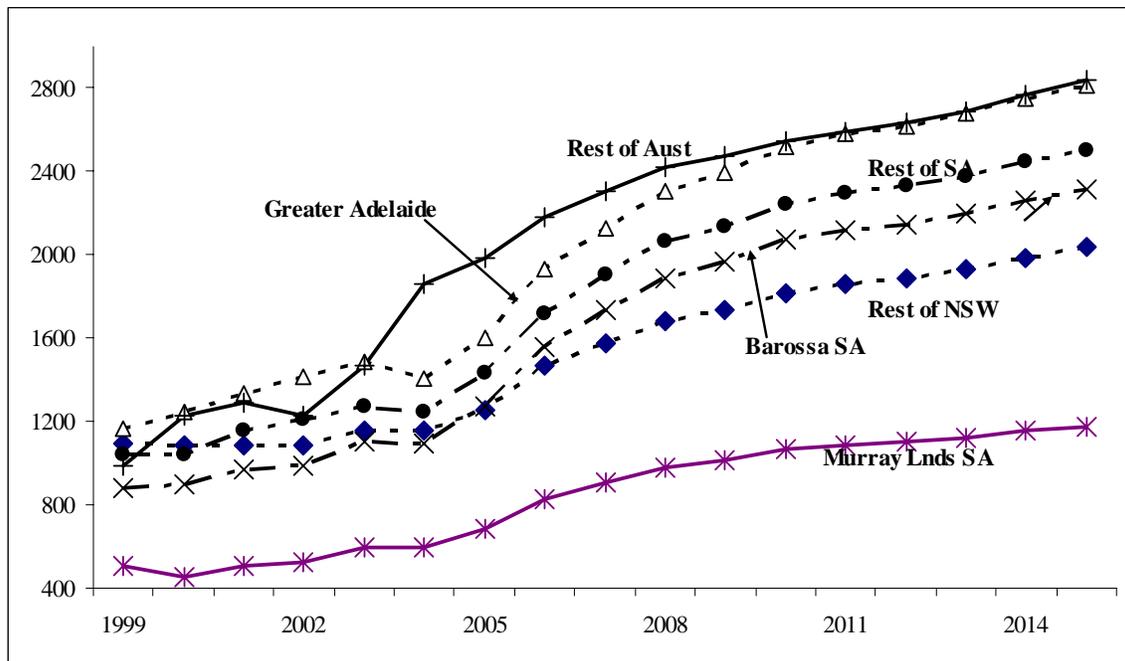
New World competitors are the most likely source of export demand shocks that hinder a recovery in red winegrape prices. Data indicated that Chile has usually occupied an average price point in export destinations one rung below Australia on the quality ladder. Since bottled wine even in the commercial premium end of the market has a degree of product differentiation, it is unlikely that increased price competition would threaten Australia.⁴ A bigger threat from Chile would arise through sustained efforts to raise the

⁴ Indeed, an Australian company that discounted heavily in export markets in 2004 has found that instead of raising sales volume significantly, such discounting led to a loss of confidence in the company's wine among foreign consumers.

quality of the nation's wines. This is more likely to occur over the medium term than the short term.

Producers in the United States may benefit from a sustained depreciation of the US dollar against other currencies. When we consider the composition of domestic US sales versus US exports, the story becomes more complex. The US sales pattern is unusual in that average quality of wine consumed domestically is higher than that exported, as defined by price points. In Australia, for example, exports are dominated by bottled wine while domestic consumption is still dominated (in volumetric terms) by bulk wine (figure 3). At the same time, the US market is a major destination for Australian wines. For two reasons, a US dollar depreciation is potentially detrimental to Australian exports. First, it is likely to lower US domestic consumption levels relative to no depreciation. Second, the price competitiveness of US producers against Australian wines will improve in all markets including the US market. However, US wine exports on average are at lower price points than Australian wine. It will be a new game for US producers to promote higher quality wines in export markets in closer competition with Australian wines.

Figure 2: White winegrape prices by region, 1999 to 2015 (\$/tonne)^a



^a Observed data for 1999 to 2004, forecast for 2005 to 2015.

White winegrapes in warm climate regions have not suffered the same sharp price drops as red winegrapes. For example, Murrumbidgee prices fell by more than 50% for red winegrapes, while rising by 24% for white winegrapes between 1999 and 2004 (table 2). This does not necessarily mean that the future for the white segment of the industry is more assured than for the red segment. Much depends on Australia maintaining its reputation for high quality, value-for-money wine. It is possible that there is greater competition in the rest of the world for white wines that offer value for money, particularly among German producers, than is the case for red wine. If Australia's white

wines were to be perceived to be losing their value-for-money advantage against competing wines, their export demand growth could slow or even stall. Australia is able to maintain a diverse base in the quality range, unlike New Zealand, for example, whose exports are concentrated in the high quality end of the market. Such diversification is an advantage to the Australian industry, as it can adapt in response to changing global conditions, be the trend towards growing consumer discernment or towards value-for-money.

Figure 3: Domestic wine consumption, 1999 to 2015 (ML)

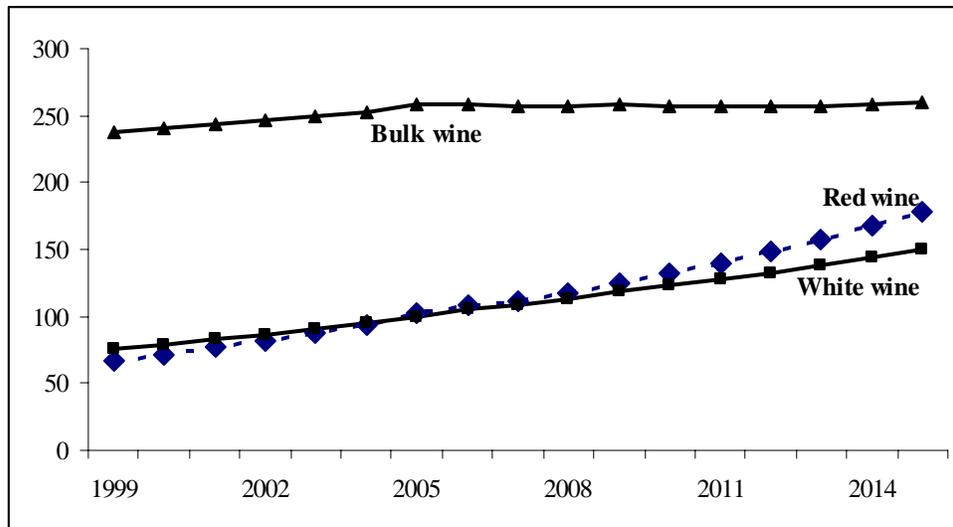


Figure 3 shows projected domestic consumption. While the trend towards increased quality will continue, reflected in bulk wine's share of total consumption falling, the domestic market is one of a number of important markets without being dominant. For example, in 2004, domestic sales of bottled Australian wine totaled 175 ML. Bottled exports to UK totaled 196 ML, while those to the US amounted to 170 ML. Among smaller wineries, the domestic market will continue to account for most sales, while such wineries should gain from the projected increasing domestic consumption of bottled wine.

Figures 4 and 5 show historical estimates and future projections for red and white wine export volumes respectively. South Australia's wine sectors are more export-focused than those in both Victoria and New South Wales, reflecting both larger output and a smaller local market (due to a much smaller population) than is the case in the eastern states.

As more data on vineyard plantings become available, the projections can be updated. At present, we assume that following the 2008 vintage, wine exports reach a plateau for both red and white wine bottled exports. It may emerge that red wine exports plateau earlier than white wine, although as discussed above, red wine may remain more differentiated on the global market and equally able to maintain export demand growth.

Figure 4: Red wine export volumes by state, 1999 to 2015 (ML)

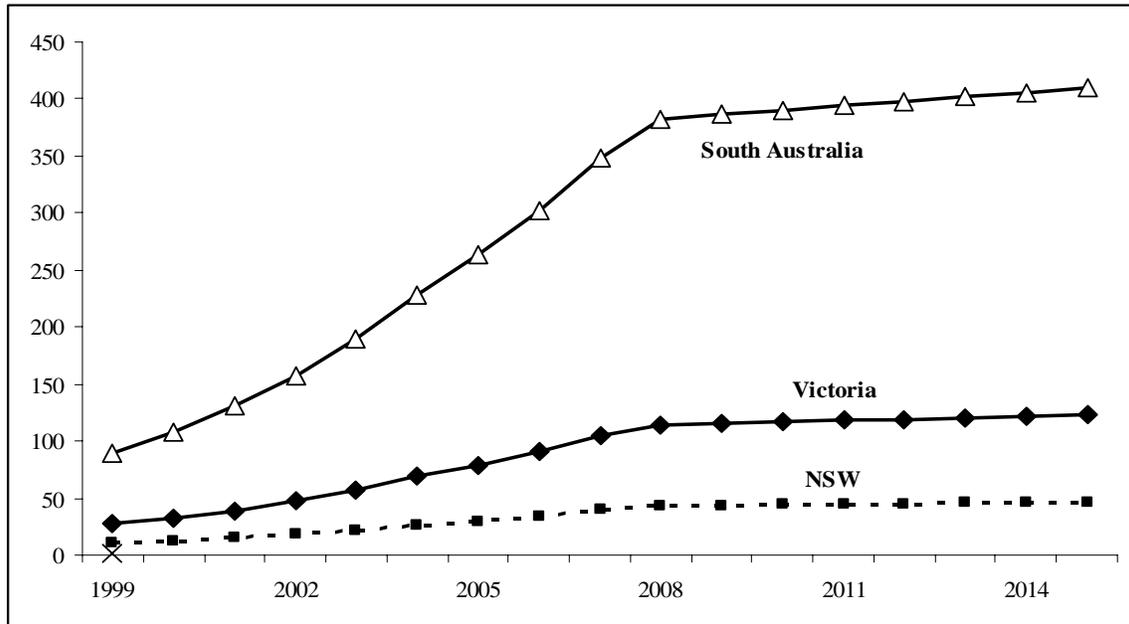
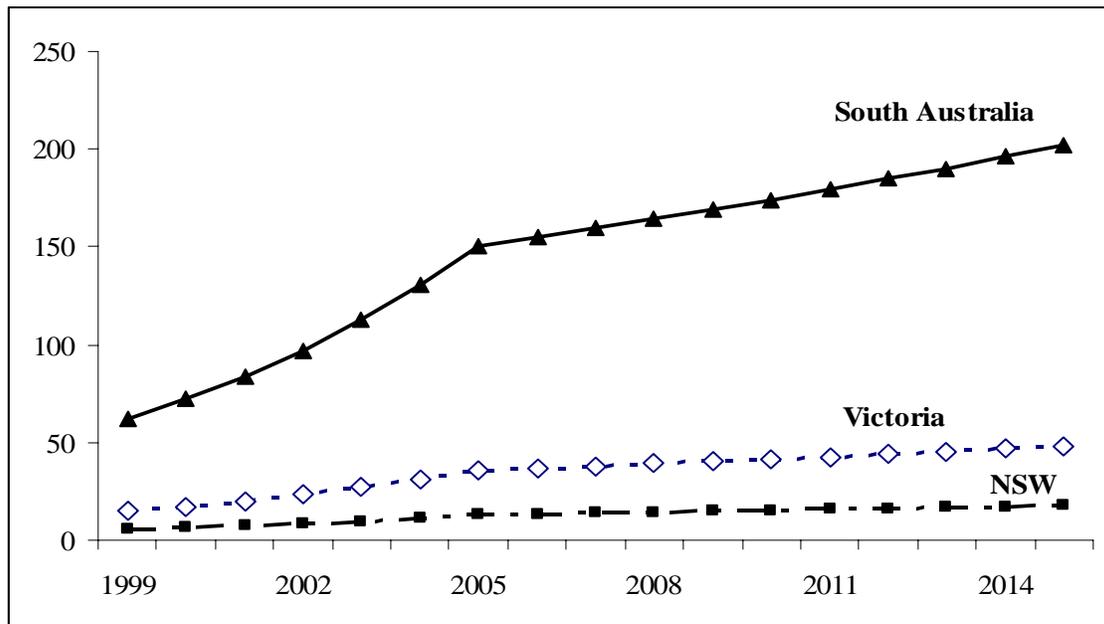


Figure 5: White wine export volumes by state, 1999 to 2015 (ML)



Conclusion

It is understandable that some producers have been concerned by low winegrape prices in the vintages of 2004 and 2005. However, the lag between planting and commercial yields in vineyards makes grape growers vulnerable to temporary price slumps. While producers seek to earn profits each year, more than likely there will be some vintages of extraordinary profits and others of losses, particularly so in a phase in which the industry has undergone substantial growth. It appears to be appropriate to assess the financial viability of the grape and wine sectors on a number of years, rather than draw to undue pessimism on the basis of two vintages in which output growth has temporarily exceeded export demand growth. That said, the challenge remains for the Australian grape and wine sectors to maintain and further enhance the reputation they have won over the past 15 years.

Since the plantings boom started in the early 1990s, the Australian wine industry has transformed itself from domestically-focused to highly export-oriented. In this time, Australia has moved from being a net importer of wine in some years to the world's third largest exporter in value terms after France and Italy, having overtaken Spain in 2004. Australia's volume of exports will soon exceed half of production, after reaching 44% in 2004 (Wittwer and Anderson, 2005). The key to a recovery in prices for grapegrowers is further export growth. So far, there has been steadily growing export demand, as is indicated by the relatively small change in bottled wine unit values between 1999 and 2004 despite exports increasing by 150% in this time. Since continuing export growth is likely to be accompanied by much slower growth in winegrape supply than has occurred in the 2004 and 2005 vintages, it is highly probable that producer prices will start to rise in the next vintage or so. While they are unlikely once again to reach the peaks in real terms attained in the 1998 vintage, such increases should be sufficient to ensure that growers earn sufficient returns to ensure sustainability.

The rapid growth phase of the Australian wine industry has been quality driven. We expect export markets to mature. Super-premium and ultra-premium Australian wines may receive growing recognition in the North American market, with commercial premium wines maintaining international competitiveness elsewhere. It is also possible that Australia will make further inroads into non-English speaking markets with good growth prospects (i.e., Germany, Japan and China), in which Chile appears to have a slight edge at present.

As indicated in figures 1 and 2 by the growing gap between warm climate and cooler climate prices, price premia for higher quality winegrapes are likely to grow as exports of higher quality wine grow. This is not necessarily bad news for warm climate growers, as their yields per hectare are much higher. In addition, any diversification of Australia's export base should contribute to a rise in the price of warm climate grapes.

In this study, we have not considered variations in export demand growth and how they might affect winegrape prices. Wittwer and Rothfield (2005) explore this issue a little further, using a global model containing different qualities of grapes and wine, but without distinguishing red grapes and wine from white grapes and wine. Overall, it would

appear that winegrape prices have fallen due to very rapid output growth, and that global demand conditions over the next few years are likely to underpin a gradual rise in prices.

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