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Abstract

Despite favourable growing conditions, Australia's production or exports of wine did not become significant until the 1890s. Both grew in the 1920s, but only because of government support. Once that support was removed in the late 1940s, production plateaued and exports diminished: only 2% of wine production was exported during 1975-85. Yet over the next two decades Australia's wine production quadrupled and the share exported rose to two-thirds – before falling somewhat in the next ten years. This paper explains why it took so long for Australia's production and competitive advantage in wine to emerge, why it took off spectacularly after the mid-1980s and why it fell in the ten years to 2015. It concludes that despite the recent downturn in the industry's fortunes, the country's international competitiveness is now firmly established and commensurate with its ideal wine-growing climate, notwithstanding the likelihood of further boom-slump cycles in the decades ahead.

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1. Introduction

Why was Australia a net importer of wine until the 1890s? Why did exports then grow somewhat but then cease after World War II? And why, in just two decades from the mid-1980s, did Australia's wine production quadruple and the share of production exported rise from less than 2% to more than 60%?[1] Answers to these questions are of great interest not only to current producers but also to potential industry investors (particularly from abroad). In addressing them, this paper seeks to explain why it took so long for Australia's production of and international competitiveness in wine to emerge, why the industry grew so spectacularly after the 1980s, and why it slipped back somewhat in the most recent decade before beginning to return to profitability after 2016. Such an explanation requires a perspective that is inter-sectoral (since other industries were expanding also in this settler economy) as well as international (since other settler countries in the New World also had the potential to become wine exporters).

The paper begins by outlining the determinants and empirical indicators of wine industry competitiveness and trade specialization. It then reviews briefly the long-run growth path for the industry as the domestic alcohol consumption pattern evolved and in the light of global wine market developments. A fuller explanation of why the country's production and trade in wine emerged as it did is then provided, by looking at each of several boom-plateau cycles the industry has gone through in the past 160 years. The final section summarizes the findings.

[1] Between 1985 and 2010 the volume of Australian exports grew more than one hundred fold for wine while rising less than 80% for all other rural products (ABS 2018, Table 25).

2. Determinants and indicators of an industry's intersectoral and international competitiveness

Standard Heckschler-Ohlin trade theory suggests a price-taking small open economy's export specialization is determined by supply factors (relative factor endowments, and the relative factor intensities of production) assuming technologies and tastes are the same across countries and markets are undistorted by governments. Leamer (1987) developed that model for many goods and three factors of production: natural resource capital, produced capital and labour. If the stock of natural resources is unchanged, rapid growth by one or more countries relative to others in their availability of produced capital per unit of available labour time would cause those economies to strengthen their comparative advantage in non-primary products. By contrast, a discovery of minerals or energy raw materials or a rise in their real international price would strengthen that country's comparative advantage in mining and weaken its comparative advantage in agricultural and other tradable products. It would also boost national income and hence the demand for nontradables, which would cause mobile resources to move into the production of nontradable goods and services (Corden 1984, Freebairn 2015). As domestic transport infrastructure is developed, more of the country's products would move from the nontradable to the tradable category, and a fall in ocean transport costs also widens the range of products traded globally (Venables 2004). This is especially helpful for those countries most distant from key markets, but the benefit is not shared equally across the product range.

An important part of natural resource capital pertinent to wine is terroir, which refers to various aspects of such attributes as climate, topography, soils, geology that determine the quality of the vine's growing environment. Experience has determined the best sites and most-suitable grape varieties in long-established wine regions, while in new regions and where climate is changing rapidly, science is being used to speed the selection process (Gergaud and Ginsburgh 2008). The conventional wisdom is that winegrapes grow best between the 30° and 50° temperate latitude bands where rain is concentrated in the winter and summer harvest times are dry. Southern Australia is one of relatively few regions of the world with those climatic conditions.

Technologies are certainly transferable across countries, and for wine that transferability process has accelerated over the past two decades via both fly-in/fly-out vignerons and foreign direct investments. But new technologies in agriculture tend to be

developed to save the scarcest factor of production, as reflected in relative factor prices. Thus new labour-saving technologies can help high-wage countries remain competitive in winegrape growing.

For countries whose trade costs are too high for their wines to be internationally tradable, production is determined by the domestic demand for wine – which historically has differed greatly across countries, even controlling for income differences (Holmes and Anderson 2017b). Domestic demand also is relevant to smaller firms unable to cover the fixed cost of entering export markets, and even to a complete industry if it is too small to be able to afford generic promotion abroad. For these reasons the size of the domestic market can be a contributor to an industry's productivity and hence competitiveness (Linder 1961, Krugman 1980), and can help explain a home-country bias in wine demand (Friberg et al. 2011).

In addition to these standard determinants of industry competitiveness, production and trade specialization are affected also by market-distorting policies at home and abroad. Excise taxes on alcoholic beverage sales are common, and many countries also impose import taxes on beverages, especially those they do not produce. Hence those taxes vary greatly across countries (Anderson 2010). Tariff preferences and export subsidies also affect wine trade patterns. Protection from imports for a country's other manufacturers weakens the international competitiveness of that country's wineries, while tariffs on wine imports themselves reduce competition from abroad but that tends to slow the speed with which quality of the domestic product is raised to the global frontier.

The most common empirical indicator of national industry's comparative advantage in international trade is Balassa's (1965) 'revealed' comparative advantage (RCA) index: the share of wine in a nation's merchandise export earnings divided by that share for the world as a whole. The more that ratio is above (below) unity, the stronger is the country's comparative advantage (disadvantage) in wine as revealed by actual trade data – bearing in mind that those actual trade data may be affected by governmental interventions in markets.

Also helpful as indicators of competitiveness are national volume indicators such as the share of wine production exported relative to those of other countries or the world, and wine production divided by wine consumption (the self-sufficiency indicator). The share of consumption imported also is worth referring to, but it needs to be kept in mind that intra-industry trade (that is, simultaneous exporting and importing of a product) is to be expected the more heterogeneous is that product in terms of quality, variety, or style – attributes that are demanded increasingly as incomes rise.

3. Australia's wine production and trade experience: long-run trends

With the above influences on trade specialization in mind, a brief overview of long-run developments in Australia's wine markets is provided in this section. It begins with domestic demand and imports before looking at domestic production and exports, and then places these developments in global perspective. The following section focuses on explaining how these developments affected the country's wine industry development during each of several boom-plateau cycles around an upward long-run trend.

3.1 Domestic demand for and imports of wine

Domestic alcohol consumption during the first 50 years of European settlement in New South Wales relied predominantly on imported spirits along with modest volumes of imported wines and beers, supplemented gradually by domestic (including illicit) spirits and beer production. Consumption rose hugely in the 1850s with the influx of male migrants and the boost in per capita incomes, thanks to that decade's gold mining boom in Victoria. As the dominance of adult males in the population gradually fell during the next few decades, so too did the volume of per capita alcohol consumption. It was down to 5 litres of alcohol per capita in the 1890s, to 4 litres by the late 1920s, and below 3 litres during the Great Depression of the early 1930s. Thereafter it rose steadily to a peak of 10 litres in the mid-1970s, mostly of beer, before falling back to around 8 litres by the early 1990s (Anderson 2015, Chart 34).

Spirits dominated in the first 100 years of European settlement partly because that was what was drunk by the settlers' peers back in Britain and Ireland, and partly because it was the cheapest beverage per unit of alcohol to ship to the antipodes and was least likely to deteriorate on the trip. Meanwhile, beer was costly to produce domestically because Australia was a net importer of grain prior to the 1870s.

Even though wine continued to be the preferred beverage of only a small fraction of the population, its share of total alcohol consumption reached an average of 7% by the late 1860s and 12% during 1890-1913. While this was low by the standards of southern Europe, it contrasts with Britain and New Zealand, where wine's share was barely 2% in that latter period, and with the US where it was 3% (Anderson and Pinilla 2017). It rose further during the two world wars when grain was kept for food rather than for making beer, but otherwise

showed a flat trend until the 1960s. By then, beer again comprised three-quarters of all alcohol consumption in Australia, with just one-eighth of the volume coming from wine (Anderson 2015, Chart 35).

Since the early 1960s, however, Australia's wine consumption per capita has trended upwards faster than per capita income, at the expense of beer – the opposite of the trend globally: the share of wine in Australia's total alcohol consumption was only half that of the world as a whole in 1960 but, by the mid-1970s, annual wine consumption per capita was twice its early 1960s average of 7 litres in Australia, and it reached three times that earlier level by the turn of the century (Holmes and Anderson 2017b). Its per capita consumption level is now above the much-diminished levels of Argentina, Chile and Spain, and more than half those of France and Italy. In 2015 it was three times the world average. Beer consumption has converged down to the world average, and spirits consumption has remained below half the global average (Anderson and Pinilla 2017).

Imports were the main source of wines consumed in Australia prior to 1860, but their share was below 20% for the next four decades and then below 5% for most of the 20th century. They expanded a little during the country's first big export-demand-driven mining boom that began in the mid-1970s, and expanded substantially in the subsequent mining investment boom from around 2005 (Figure 1).

3.2 Domestic production and exports of wine

During their first 50 years, European settlers in New South Wales certainly experimented with imported vines and made wine to help satisfy their own demand (McIntyre 2012), but annual production (including for distillation into brandy) had yet to reach 100 kilolitres by 1840. Even as new migrants began settling in Victoria, South Australia and Western Australia from the late 1830s, grape production expanded only slowly. It would have grown more had the demand for wool for Britain's booming textile mills not been so strong throughout the 19th century. Wool's high price and relatively low transport cost per dollar of product meant it dominated exports of Australia in every decade up to the early 1960s, apart from short periods when gold dominated during and following the gold rushes of the 1850s in Victoria and the 1890s in Western Australia (Anderson 2014).

Nonetheless, Australia's vine area, wine production and wine exports trace out rising trends over most of the past two centuries (Figure 2). Their respective annual compound growth rates over the 173 years from 1843 to 2016 are 2.8%, 4.3% and 5.0%. Exports

expanded from the 1880s, and accounted for 10-20% of wine production for the first four decades of the Federation, but then shrank to around 5% for the subsequent four decades. It took until the late 1980s before the industry took off with an export-led boom (Figure 1).

Two other indicators of the long-run trend in the wine industry's competitiveness vis-à-vis other industries in Australia are worth mentioning, since they are also useful in indicating cycles around long-run trends. One is the vine intensity of cropping: the area under vine has grown at about the same pace as the country's total crop area on average since the mid-19th century. The other is growth in production of wine relative to all products nationally (captured as the volume of wine production per $ of real GDP): Australia's wine output has grown only marginally faster than the economy's total output over the past two centuries.

3.3 Australia's wine production and trade in global perspective

Data are now available to allow a cross-country comparison of that last-mentioned indicator. Table 1 reveals that the volume of wine production per $ of real GDP in Australia was miniscule pre-World War II compared with the main European producers, and small even relative to Argentina, Chile and South Africa. Since the 1950s that indicator has fallen greatly for those key producers, however, and is now only about twice Australia's. Similar convergences between Australia and these other countries have occurred in the share of vines in total crop area and in wine production per capita (Anderson, Nelgen and Pinilla 2017, Tables 123 and 134).

As for trade, only twice before the 21st century did the export share of wine production in Australia exceed the world average, namely, in the lead-up to World War I and in the 1930s. Apart from the 1930s and World War II, the share of wine in Australia's total merchandise exports was always below that for the world as a whole until the 1990s. That is, Australia had a comparative disadvantage in wine pre-1990, according to the Balassa (1965) 'revealed' comparative advantage (RCA) index. Figure 3 shows that this index for Australia was never above unity prior to the late 1980s, and it was always well below 0.5 until 1925.

Even so, leaving aside the Western Cape of South Africa (whose vignerons have been producing for export markets since the mid-17th century), Australia led the way among New World countries[2] in reaching self-sufficiency during the first globalization wave (Figure 4).

[2] The New World refers to those temperate climate countries settled by Europeans since the 1500s in the Americas, Australasia and South Africa.

Leading up to World War I and during the inter-war period, among the New World countries Australia also had the highest index of revealed comparative advantage in wine – although it was still less than unity and far lower than those of Europe's main wine exporters (Table 2). Like those other New World countries, it became self-sufficient with the help of import tariff protection. Then from the 1890s Australia was a net exporter of wine. Its export propensity slumped somewhat during 1915-25, rose over the subsequent two decades, but then dropped suddenly soon after World War II and stayed low for four decades before rising dramatically from the late 1980s (Figure 1). The most-recent rise lasted nearly two decades. During that time Australia again led the New World in terms of its value of wine exports, but Chile and then New Zealand took the lead in terms of the comparative advantage index for wine as Australia's wine industry went into yet another slump from 2007 (Table 2).

4. The boom-slump cycles around Australia's wine growth path

As with most industries based on perennial crops, the wine industry is cyclical in all wine-producing countries. Even though Australia's area under vine has grown at about the same pace as the country's total crop area on average since the mid-19th century, and its wine output has grown only marginally faster than total GDP, around those long-run trends have been several distinct production cycles (Figure 5). This section examines the key developments contributing to the evolution of the Australian wine industry's inter-sectoral and international competitiveness within each of those cycles.[3]

4.1 Australia's first wine cycle: 1855 to 1882

The gold rush of the 1850s caused Australia's white population to almost treble and real GDP per capita to rise by 50% that decade. Despite the expanded supply of labour, wages rose dramatically in the early 1850s as many local men went to the Victorian goldfields too. That squeezed grape and wine production and profitability initially, with wine output in 1855

[3] In the absence of producer price and hence production value data, the turning points of each cycle are chosen simply by inspecting annual vine bearing area and wine production data, both absolutely and relative to other sectors of the economy (as depicted in Figures 2 and 5, respectively). Each cycle starts with a boom in vine area, which is followed by a longer plateau (or a best a much slower rise) in planting that is associated with a fall in the share of vines in total crop area and in the production of wine relative to all products (captured by the volume of wine production per dollar of real GDP). Unless otherwise specified, the source of data referred to in this Section is Anderson (2015).

being only 70% of that in 1851. However, the increases in the continent's population and income were perceived correctly to lead to an expansion in demand for wine. In response, the area of grapevines began to increase rapidly and by 1871 had expanded ten-fold, and wine production had increased 16-fold in those two decades.

The consequent growth in wine supplies was so fast that it outstripped the growth in domestic demand in each of Australia's colonies, so export outlets were sought. Inter-colonial trade within the continent was one option. However, land and river transport costs were high, and each colony also sought to protect its local producers by imposing high import tariffs.[4] Fortunately, ocean shipping costs began to fall in this period, and Britain in 1860 abolished the import tariff preference for South African wine and in 1862 lowered its tariff on still wines by four-fifths. The cuts in UK table wine tariffs, together with the creation of off-licence retailing (thanks to Chancellor Gladstone's legislative changes in 1861), helped Australia's exports to Britain to quadruple over the 1860s and double again by the mid-1870s. This, however, was from a very low level first established in the mid-1850s: throughout the 1860s and 1870s Australia's modest wine exports amounted to less than 3% of its production (Figure 1).

Early exports from Australia were inhibited not only because the wine it produced was generally of extremely low quality (mostly dry red, shipped bulk in hogsheads only weeks after the grapes had been crushed), but also because up until then very little had been invested in securing quality packaging, marketing and distribution arrangements in Britain (Bell 1994). So producers suffered very low returns from the late 1860s as the rapid supply expansion outstripped demand growth. So poor were returns that the area of grapevines fell 10% during the 1870s. Nonetheless, following the International Exhibition in Vienna in 1873, the official British report praised Australia's wines, and similar accolades (along with some critical reports) flowed from the International Exhibition of 1882 in Bordeaux.

4.2 The second cycle: 1882 to 1915

Successes in International Exhibitions, together with the prospect of forming an Australian Federation by the turn of the century which would see the removal of the high inter-colonial trade restrictions, encouraged growers to expand the area under winegrapes in the 1880s.

[4] In 1860 the duties on wine coming into South Australia, Victoria and New South Wales were already quite high, but by the early 1890s they had been raised to near-prohibitive levels, equal to more than 100% of the average export price of Australian wines.

True, there were phylloxera[5] outbreaks in Geelong in the late 1870s and gradually in other parts of Victoria. But the Victorian Government responded with compensation for forced removal of diseased plants, and in 1890 offered subsidies of two pounds per acre ($10 per hectare) to replant with resistant stocks over the subsequent three years. As a result, Victoria's vine area more than doubled between 1889 and 1894. That planting, plus expanding vineyards in South Australia in anticipation of Federation, meant Australia's overall vineyard area and production of wine grew substantially during the 1880s/early 1890s. Unfortunately that occurred just as the 1890s' Depression hit and domestic alcohol sales were plummeting.[6] So while wine production per capita doubled in the decade to 1895, wine consumption per capita fell by one-third during 1891-94.

Australia's vineyard expansions were soon followed by expansions of winery capacity and improvements in winemaking technology. This was associated with a concentration of winery ownership, which contributed to the industry's success in disposing of surpluses through exporting as the new century approached (Simpson 2011). By the turn of the century production was three times its 1880 level, and one-sixth of the country's wine production was being exported (Figures 1 and 2). Australia's exports early in this cycle were helped partly by the reduced competition from France and other suppliers to Britain following the arrival and devastating spread of phylloxera in Europe in the 1870s and 1880s, with the vineyard area in France alone shrinking by two-fifths between 1870 and 1913. In the first decade of Federation Australia had a stronger index of wine comparative advantage than other New World countries, but it was still only a tiny fraction of that for Europe's wine-exporting countries (Table 2).

The build-up in Australia's exports during that first export boom was sustained through to World War I. The lowering of ocean transport freight rates and travel times contributed to the export take-off, thanks especially to the development of the steamship. Ocean transport costs from Australia were still non-trivial though, especially compared with those faced by expanding competitor wineries of southern Europe and North Africa.

Also influencing wine's competitiveness in the early years of Federation were new industry policies. Dried vine fruits were one of the first to be protected, receiving tariff protection that doubled the local price when first introduced in 1904. That year also saw the

[5] Phylloxera is an insect pest originally native to eastern North America that infected France from the 1860s and spread to most of Europe's vineyards and to some in the New World (Campbell 2004).
[6] Between 1889 and 1894, real GDP per capita fell by 18%, alcohol consumption per capita fell by 22%, and wine consumption per capita fell by 26%. It took until 1907 for real GDP per capita, and until 1905 for both wine and alcohol consumption, to return to their 1889 levels (Anderson 2015).

formation of the Australia Dried Fruits Association, which controlled over 90% of domestic production and was able to raise the domestic price of grapes by diverting supplies to distilleries and/or to the dried fruit export market with the help of a government export subsidy. Higher grape prices raised the cost of producing wine, but that was offset by a tax on wine imports (which has prevailed to the present, although the most-favoured-nation rate is only 5% currently).

Meanwhile, French producers invested heavily in vineyards in North Africa, especially Algeria. As soon as Algeria's vines were mature, their wine's access to the French market was assisted by the raising of near-prohibitive barriers to imports from the rest of the world (Meloni and Swinnen 2014). This trade policy development depressed prices for wines in Europe and contributed to the plateauing of Australia's vine area, wine production and wine exports during 1900-15.

4.3 The third cycle: 1915 to 1967

Towards the end of and following World War I there was another rapid expansion in Australia's vine area and wine output, both absolutely (Figure 2) and relative to other crops and to real GDP (Figure 5), followed by a long period of slow growth plus some disruptions during World War II and then a downturn in the 1950s. This was encouraged by the subsidized settlement on farms of ex-servicemen, particularly in the newly developed Murrumbidgee Irrigation Area of New South Wales and along the Murray River. Annual output of wine more than doubled in the decade to 1925, leading to a grape glut. Having been fuelled by assistance with land development and irrigation infrastructure, the Australian Government felt obliged to further assist producers in the newly developed areas by offering from 1924 an export bounty on fortified wines. The bounty provided the equivalent of 8.8 cents per litre at a time when the average unit value of Australia's wine exports was less than 10 cents per litre.

Since an export subsidy is the equivalent of a production subsidy and a domestic consumption tax, this bounty dampened domestic fortified wine sales and table wine production, at the same time as boosting production and exports of fortified wines – and more so for lower-valued grapes and fortified wines, since the export bounty was a specific rather than an *ad valorem* duty. Australia's table wine production diminished substantially over the inter-war period, reaching one-fifth of its 1923 level by the late 1930s.

Then in its June 1925 budget, the British Government introduced a tariff preference for wines from the British Empire. As a result, Australian exporters faced British per gallon tariffs of just two shillings on table wines and four shillings on fortified wines, compared with double those rates for wines imported by Britain from Europe. In the first two decades of the 20th century, France, Portugal and Spain supplied more than 80% of UK wine imports when Australia's share was less than 10%, but the latter rose to 24% in the 1930s when Australia exported more to Britain than did France (Anderson and Pinilla 2017). This is reflected in Australia's 'revealed' comparative advantage index, which in the interwar period averaged more than twice that just prior to World War I (Table 2). The total area of vines in Australia grew very little between the mid-1920s and the mid-1960s though, and it was five decades before the annual level of wine exports achieved in the late 1930s (artificially boosted to build stocks in Britain for the foreshadowed war) was again reached.

During World War II domestic wine consumption rose. This was partly because beer and spirits sales were rationed, to boost foodgrain availability. Interstate trade in alcoholic beverages was banned during the war also, to conserve fuel. And the United Kingdom placed severe restrictions on wine imports from January 1941, providing only a small quota for Australia. That plus difficulties in obtaining space on ships meant Australia's annual wine exports to Britain during 1940-45 were only one-fifth those in the 1930s.

Following World War II, consumers in the United Kingdom moved away from wine once their wartime rationing of grain used in beer production was lifted. Partly this was because of long-established consumer preferences, but two policy changes gave a helping hand. One was that Britain raised its tariff on fortified wines five-fold in 1947 and kept it very high until the end of the 1950s (when it was lowered but was still double the inter-war rate). The other was that, in Australia, the wine export bounty was no longer provided after 1947-48.

As for supply, despite new irrigation schemes at Loxton in South Australia and Robinvale in Victoria, the area of vines and wine production grew only slowly from the mid-1940s to the mid-1960s (Figure 3). During that time the Korean War-induced wool price boom and then subsidies to other farm products such as wheat, milk and tobacco appealed more to farmers. As well, tighter restrictions on imports of manufactured goods boosted the import-competing industrial sector, while the removal in the early 1960s of a ban on iron ore exports triggered a mining boom. Both of those trade policy changes indirectly dampened producers' incentives in other industries producing tradables, including wine. As a consequence, wine production grew only 3% per year between 1946 and 1966, and wine

exports remained flat. Australia's index of comparative advantage in wine, which had risen to 0.8 by the 1930s, more than halved by the end of this cycle (Table 2).

The industry continued to be assisted throughout this cycle. Instruments included an import tariff on wine and brandy, a sales tax of 15% on imported but not domestically produced wine, excise taxes on beer and spirits but not on wine, and a lower excise tax on brandy than on other spirits. The import tax on wine was non-trivial, which helps explain both the low share of imported wine in domestic consumption (Figure 1) and the relatively low overall level of wine consumption throughout this cycle.

The extent to which those support measures raised the domestic prices of grapes and wine is indicated by estimated nominal rates of assistance (NRAs). The NRA for drying grapes averaged 35% in the interwar period and 10% in the two decades thereafter. Meanwhile, the NRA for wine and brandy just from import tariffs averaged 24% over the 1950s and 1960s, which was above the average for other manufactures and nearly four times the average NRA for the agricultural sector (Table 3). This protection helped to stave off imports, but did not improve export competitiveness.

4.4 The fourth cycle: domestic demand changes, 1967 to 1986

Britain hiked its tariff on fortified wines again in the late 1960s, and then joined the European Economic Community (EEC) in 1973 which provided duty-free access for wines from other EEC members. Meanwhile, a mining boom at home was reducing the competitiveness of Australia's non-mineral exporters, and simultaneously boosting incomes domestically. So for both demand and supply reasons, wine exports remained flat from the mid-1960s to mid-1980s and exports to the UK fell by nine-tenths. This drove the index of wine comparative advantage back to pre-World War I levels (Table 2). Grape and wine prices also remained low, particularly for reds.

Yet domestic demand began to grow, for several reasons. One was brand advertising plus generic promotion domestically by Australia's Wine Bureau. Another was the influx of wine-preferring immigrants from Southern Europe, who also influenced the per capita consumption of non-alcoholic beverages: tea-drinking shrunk by three-quarters while coffee-drinking expanded six-fold in Australia in the second half of the 20th century. Yet another factor was the fall in the real cost of air travel and of discounts for under 25-year-olds. That encouraged young people to travel to Europe, where they were exposed to cultures in which wine is integral. As well, Australia's Trade Practices Act of 1974 made retail price fixing

illegal and stimulated the emergence and gradual spread of liquor chain stores and wine discounting throughout the country.[7] Meanwhile, exports remained of minor and declining importance.

4.5 Australia's fifth cycle: export take-off from 1986

The fifth boom began in 1986 not with a vine planting expansion but rather with a steady increase in exports to take advantage of the historically low value of the Australian dollar, while domestic consumers moved away from quantity and towards higher-quality wines as their disposable incomes grew. The export boom was so large as to raise wine's share of Australia's total merchandise value above 1% for the first time in 1999, and to 2.3% in 2004 just as mineral exports were taking off. Australia's wine export volume and value continued to grow until 2007, as did its share of global wine exports and its index of wine comparative advantage (Figures 1 – 6 and Table 2).

Associated with these changes were hikes in the prices of Australian wines, which stimulated vine plantings. The average price received for winegrapes in 1999 was four times that in 1986, even though the export price had risen 'only' 140% (Figure 7). An important contributor to this production and export growth was ownership concentration. This provided the opportunity to reap economies of scale not only in winemaking but also distribution and brand promotion, by producing large volumes of consistent, popular wines for specific supermarkets abroad.

The timing for this export surge was catalysed by a substantial depreciation of the Australian dollar in the mid-1980s, which was due to a sharp fall in prices of Australia's coal, grain and other primary export products. Together with low domestic prices for premium red grapes at the time, that depreciation – which persisted until the early 2000s – increased substantially the incentive to invest in developing overseas markets for Australian wine. Other factors that expanded demand abroad for Australian wine were food-safety scares associated with Chernobyl in April 1986 and scandals involving additives in Austrian and Italian wines. Meanwhile, competition from other New World countries was minimal: from South Africa because of anti-apartheid sentiment, from South America because of that

[7] Similar income growth and deregulation of wine retailing in the UK and New Zealand led to the share of wine in their alcohol consumption growing even faster than Australia's, albeit from a lower base of 5% in 1965 compared with Australia's 10%. By 2010 those shares were 31% for the UK and 35% for both Australia and New Zealand (Anderson and Pinilla 2017).

region's macroeconomic and political instability, and from the United States because of the high value of its dollar relative to European currencies.

While this fifth boom was largely market-driven, it was also influenced by changes in government interventions. A steady reduction in Australia's manufacturing protection and in assistance to some of its other agricultural industries paralleled and thus offset the price-reducing effect of reductions in nominal rates of assistance to grape and wine producers (Table 3). Also, the imposition from 1984 of a wholesale sales tax on wine dampened domestic sales and thereby encouraged exporting.

In 1994-95 the wine industry developed and published a *Strategy 2025* document, laying out its targets for 30 years hence (AWF 1995). At the time those targets were considered rather optimistic, since they involved a three-fold increase in the real value of wine production, 55% of it for the export market. Getting half way to those targets required having 80,000 hectares of winegrapes bearing enough for a crush of 1100 kt to produce 750 million litres of wine at a wholesale pre-tax value of $3 billion ($4/litre) in 1995-96 Australian dollars. By the turn of the century – that is, in just five vintages – the industry had reached the half-way point for achieving its targets 30 years out.

Meanwhile, several New World countries had begun to emulate the Australian export-led experience, leading to a growth spurt in their wine exports just a few years behind Australia's. Also, declining domestic consumption led several Old World suppliers plus Argentina and Chile to expand their exports. Thus Australian exporters began to face increasing competition just as the historically low value of the Australian dollar began its decade-long appreciation after 2001 in the wake of Australia's latest mining investment boom. The latter contributed greatly to the decline from that time in the local-currency price of Australia's wine exports (Anderson and Wittwer 2013), while other New World exports continued to grow (Figure 6). The volume of Australia's exports continued to expand each year until 2007 though, such was the need to dispose of rapidly growing stocks. The extent of the fall in the average wine export price from 2001 is as spectacular as its rise in the previous decade (Figure 7), as is the spike over those two decades in the index of wine comparative advantage (Figure 3). Meanwhile, the US$ average price of wine exports globally had risen to the Australian average price by 2007, and over the next seven years the Australian price dropped to just 70% of the world average (Anderson and Pinilla 2017).

The appreciating value of the Australian dollar also encouraged wine imports, which grew dramatically from the turn of the century (Figure 1). The surge in imports from New Zealand was particularly sharp from 2005, when the Australian Government agreed that New

Zealand wineries could receive the same rebate as Australian producers of the 29% wholesale tax on their wines sold in Australia (up to the ceiling of A$500,000 of sales per winery per year).

Has this fifth wine cycle ended? The two indicators in Figure 5 had not turned up as of 2016, and the 20% depreciation of the real exchange rate between the March quarters of 2013 and 2016 reversed itself in the following seven quarters (a 5% appreciation). However, the export volume and value indicators in Figures 1 and 2 have begun to turn, and the average AUD prices of both winegrapes and wine exports have been rising since 2014 (Figure 7). An important contributor to that recent improvement has been the rapid growth in wine demand in Asia, especially China (Anderson and Wittwer 2015). If 2016 turns out to be the end of the latest wine cycle, then the fifth cycle will have had a similar length to the average of the previous four (a little over 30 years). However, and very importantly, the latest boom was nearly twice as long, and the following plateau or slump was less than half as long, as the average of earlier cycles.

5. Conclusion

The competiveness of Australia's wine industry, while firmly established during the current globalization wave, did not happen earlier for several reasons. One was high ocean transport costs for exporting wine relative to those for gold and wool which dominated Australia's exports for more than a century.

A second had to do with the smallness of Australia's economy and of its domestic wine market, which together meant the industry was unable to reap the economies of scale needed to export sustainably to distant markets in the 19th century. That, more than French protectionism against all wine imports other than Algerian, explains why Australian wineries – like other New World producers – were unable to benefit from the production losses in Europe due to the phylloxera outbreak in the half century prior to World War I.

Third, the interwar period exports were artificially stimulated by an export bounty plus a UK tariff preference, which favoured exports of low-quality fortified wines at the expense of higher-quality table wines. Those exports promptly collapsed when those supports were removed in 1947.

Fourth, the wool boom of the early 1950s and the mining boom of the latter 1960s and 1970s reduced the international competitiveness of other tradables industries including wine,

as did import quota and tariff protection to Australia's least-competitive manufacturing industries through to the 1980s. Mining's impact on the real exchange rate again dampened the wine industry's export performance increasingly through the first dozen years of the present century.

And fifth, the tariff import protection and relatively low excise taxation of wine and brandy shielded the wine industry somewhat from international competition, which would have slowed the speed with which technologies improved in the 20th century and the quality of the domestic industry's exports converged on the global quality frontier.

What of the future? The dramatic rise in the industry during its latest boom, and the rapid recovery from the latest slump, showed it is now capable of competing intersectorally and internationally as well as that of other key wine-exporting countries, notwithstanding the likelihood of more boom-plateau cycles of firm profitability in the decades ahead.

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Table 1: Volume of wine production per $m of real GDP, 1860 to 2016 (KL)

	1860-1909	1910-1959	1960-1989	1990-1999	2000-2009	2010-2016
Australia	1.2	1.8	1.7	1.7	2.5	1.9
New Zealand	0.0	0.1	0.7	0.9	1.6	2.7
Argentina	5.7	13.9	11.9	5.5	4.4	3.3
Chile	9.5	15.5	9.5	2.6	3.6	4.2
South Africa	4.8	7.1	5.7	5.6	4.5	3.9
France	50.9	31.4	10.6	5.1	3.8	3.2
Italy	54.4	32.4	12.4	6.1	4.3	4.1
Spain	71.5	34.5	12.7	5.8	5.5	4.9
Portugal	61.1	58.7	19.7	6.2	4.4	4.4
Greece	26.5	24.9	7.2	3.4	2.6	2.1
Bulgaria	18.7	16.5	9.5	5.9	3.1	2.0
Hungary	16.7	12.6	7.9	6.7	4.9	2.9
Romania	16.0	28.5	10.6	8.4	6.1	4.2

Source: Anderson, Nelgen and Pinilla (2017, Table 135)

Table 2: Index of 'revealed' comparative advantage in wine,[a] key exporting countries,[b] 1900 to 2017

	France	Italy	Portugal	Spain	Greece	Bulgaria	Hungary	**Australia**	New Zealand	United States	Argen-tina	Chile	South Africa
1900-09	5.8	3.3	41.9	6.9	20.4	1.7	n.a.	**0.3**	0.0	0.1	0.0	0.1	0.0
1910-19	4.2	5.7	52.5	10.6	11.0	0.9	n.a.	**0.2**	0.0	0.1	0.1	0.2	0.1
1920-29	3.8	3.9	58.1	18.6	11.5	1.2	7.2	**0.5**	0.0	0.0	0.1	0.4	0.3
1930-39	3.5	3.2	22.6	3.6	4.3	0.3	3.2	**0.8**	0.0	0.0	0.0	0.8	0.9
1950-59	4.3	3.6	23.8	1.8	5.9	4.6	2.8	**0.3**	0.0	0.0	0.0	0.9	0.5
1960-69	5.3	3.0	23.7	12.4	4.1	11.8	4.9	**0.4**	0.0	0.0	0.0	0.4	0.5
1970-79	5.9	4.2	25.1	9.8	4.1	8.6	7.5	**0.2**	0.0	0.0	0.4	1.1	0.3
1980-89	8.1	4.3	17.3	6.4	2.4	6.2	6.2	**0.5**	0.2	0.1	0.5	1.4	0.2
1990-99	7.8	3.9	10.7	5.1	3.0	10.2	3.1	**2.7**	1.2	0.2	1.5	7.8	1.8
2000-09	7.8	5.3	8.5	4.9	2.0	4.2	0.7	**8.4**	7.2	0.4	3.7	12.6	4.9
2010-17	9.4	6.8	8.0	5.5	1.3	1.1	0.5	**4.4**	14.8	0.5	6.4	13.4	4.4
1900-2017	***6.0***	***4.3***	***26.6***	***7.8***	***6.4***	***4.6***	***4.0***	***1.7***	***2.1***	***0.1***	***1.1***	***3.5***	***1.3***

[a] Balassa's (1965) 'revealed' comparative advantage index is defined as the share of wine in a nation's merchandise export earnings divided by that share for the world as a whole.

[b] Two other countries with high RCAs are Georgia and Moldova, whose annual RCAs during 1992-2017 averaged 28 and 63, respectively. During 1900-69, Algeria's RCA averaged 67.

Source: Updated from Anderson and Pinilla (2017)

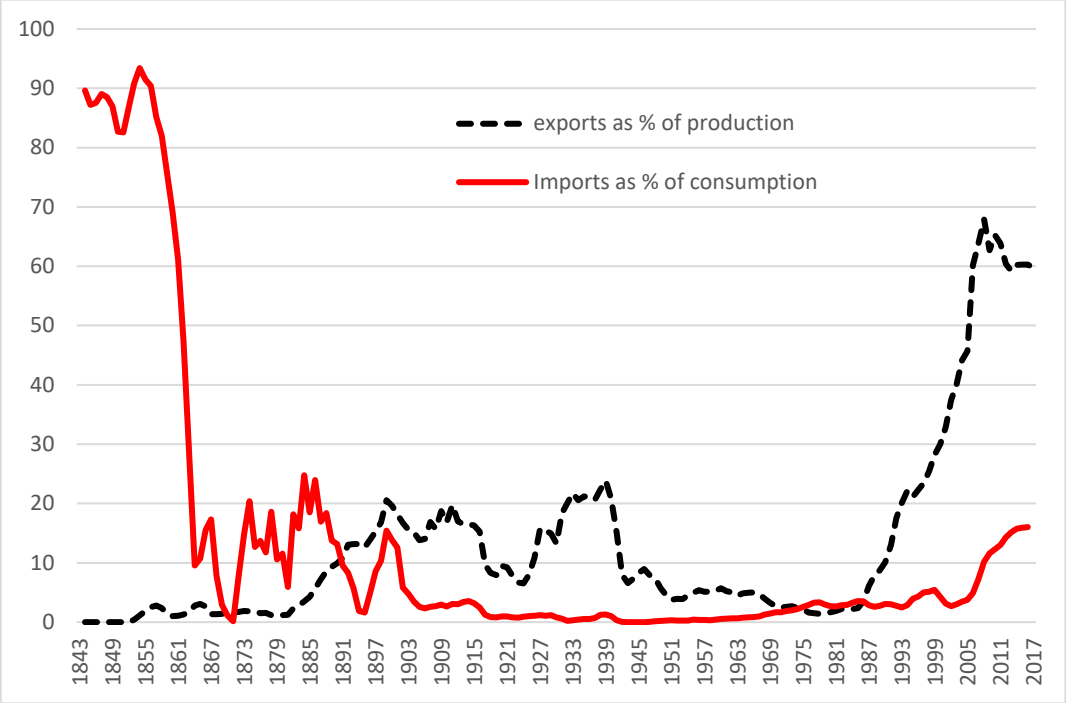
Table 3: Nominal rates of assistance to grape growing, wine making, all agriculture, and all manufacturing, Australia, 1904 to 2017

	Drying grapes	Wine grapes	All agriculture	Wine and brandy	All manu-facturing
1904-09	91	na	8	na	31
1910-19	62	na	7	na	29
1920-29	35	na	4	na	30
1930-39	34	na	7	na	51
1940-49	6	na	3	na	42
1950-59	7	na	4	19	24
1960-69	13	na	9	30	22
1970-79	20	38	8	39	18
1980-89	20	18	5	20	13
1990-99	13	10	4	9	6
2000-17	<3	<4	1	<3	2

[a] The nominal rates of assistance for wine and brandy manufacturing is underestimated for 1950-68 as it is just customs revenue as % of import value.

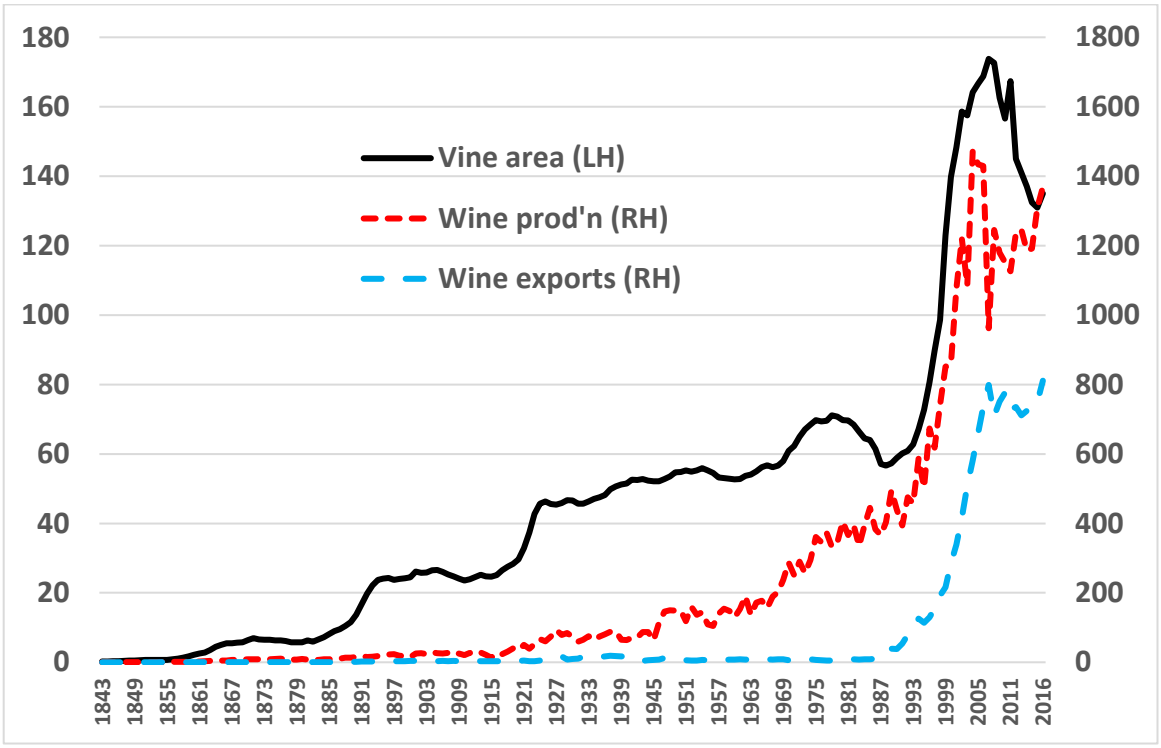
Source: Updated from Anderson (2015, Table A9).

Figure 1: Exports as a % of wine production and imports as a % of wine consumption volume, 1843 to 2017 (3-year moving average around year shown)



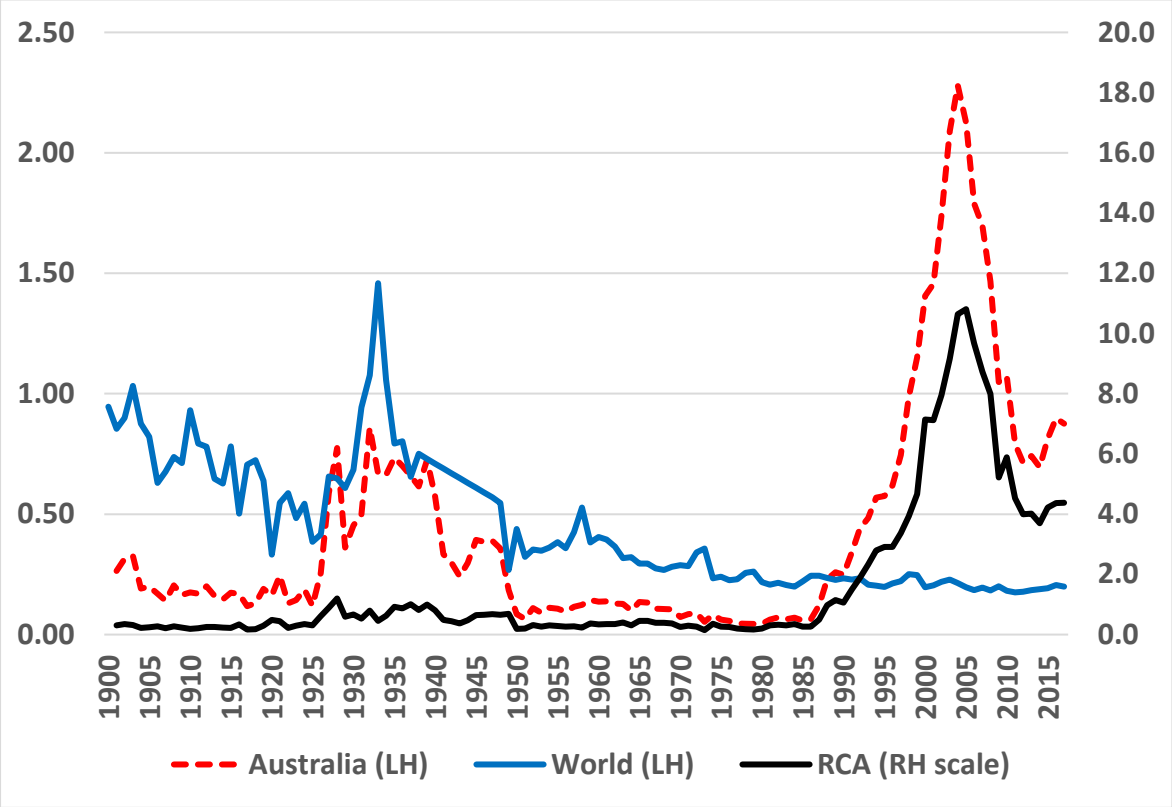
Source: Updated from Anderson and Pinilla (2017).

Figure 2: Vine bearing area, wine production and wine exports, Australia, 1843 to 2017 ('000 ha and ML)



Source: Updated from Anderson and Pinilla (2017).

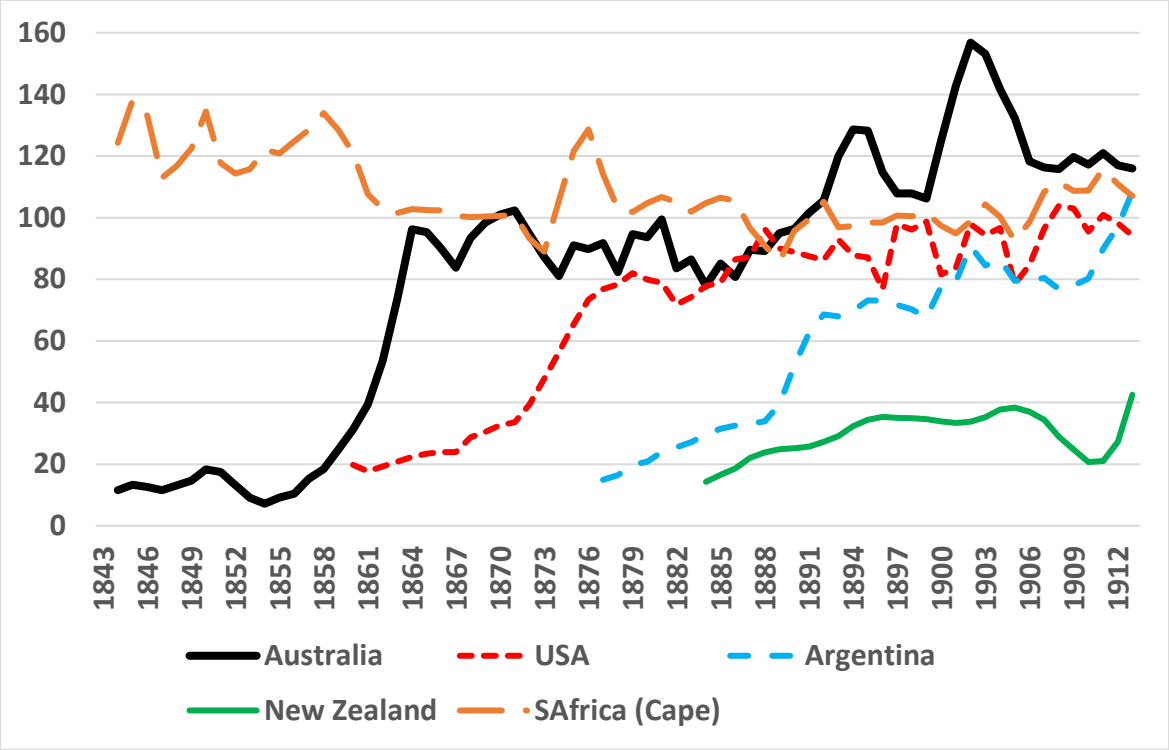
Figure 3: Wine exports as a % of total merchandise export value, Australia and the world (3-year moving average around year shown), and Australia's RCA index,[a] 1900 to 2017



[a] RCA refers to Balassa's (1965) index of 'revealed' comparative advantage in wine, defined as the share of wine in a nation's merchandise export earnings divided by that share for the world as a whole.

Source: Updated from Anderson and Pinilla (2017).

Figure 4: Wine self-sufficiency,[a] Australia and other New World wine exporters,[b] 1843 to 1914 (%, 3-year moving average around year shown)

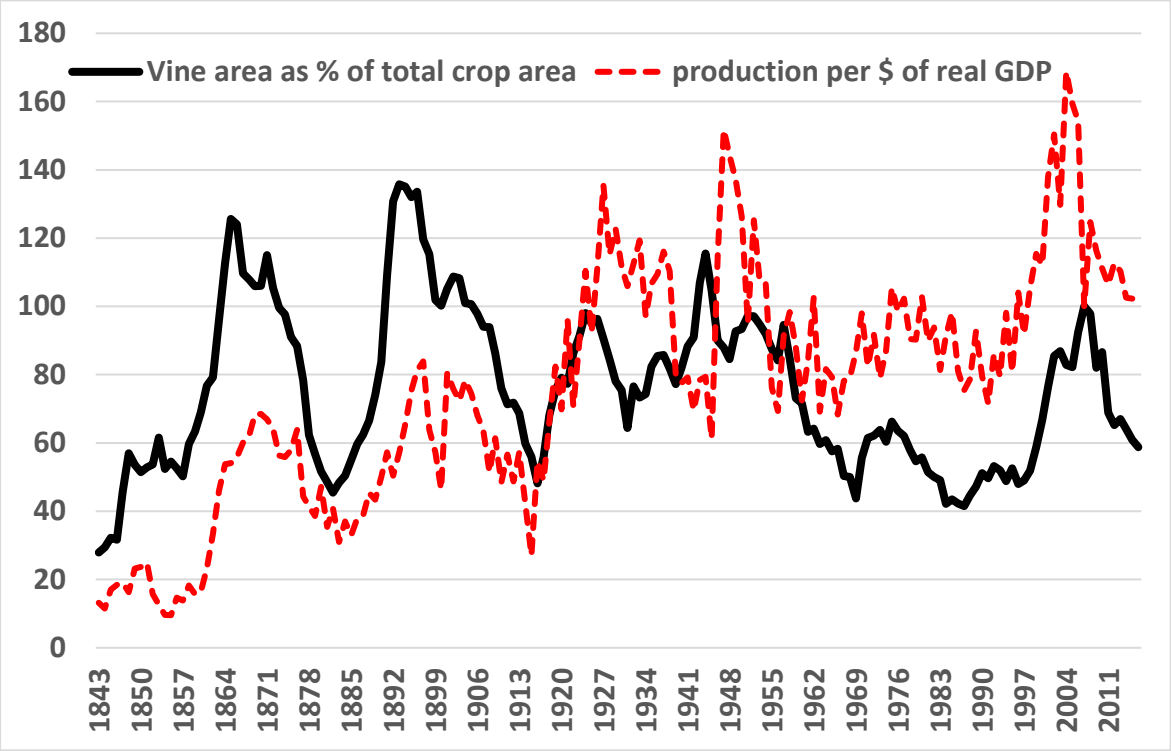


[a] Domestic production as a % of domestic consumption in volume terms. In value terms these lines would be lower, because the average price of New World imports were several times that of their exports.

[b] Chile was less than 1% away from being 100% self-sufficient in wine during 1860-1914.

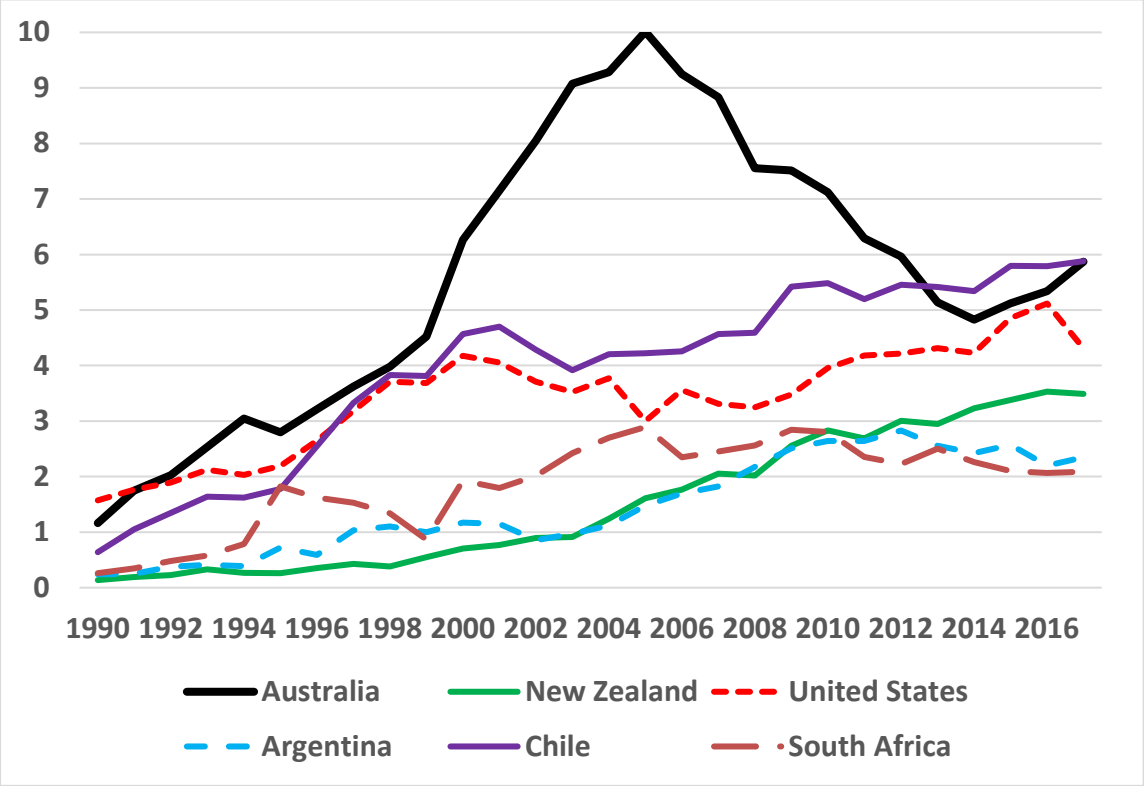
Source: Anderson and Pinilla (2017).

Figure 5: Vine area as % of total crop area and wine production per $ of real GDP, 1843 to 2016 (2007 = 100)



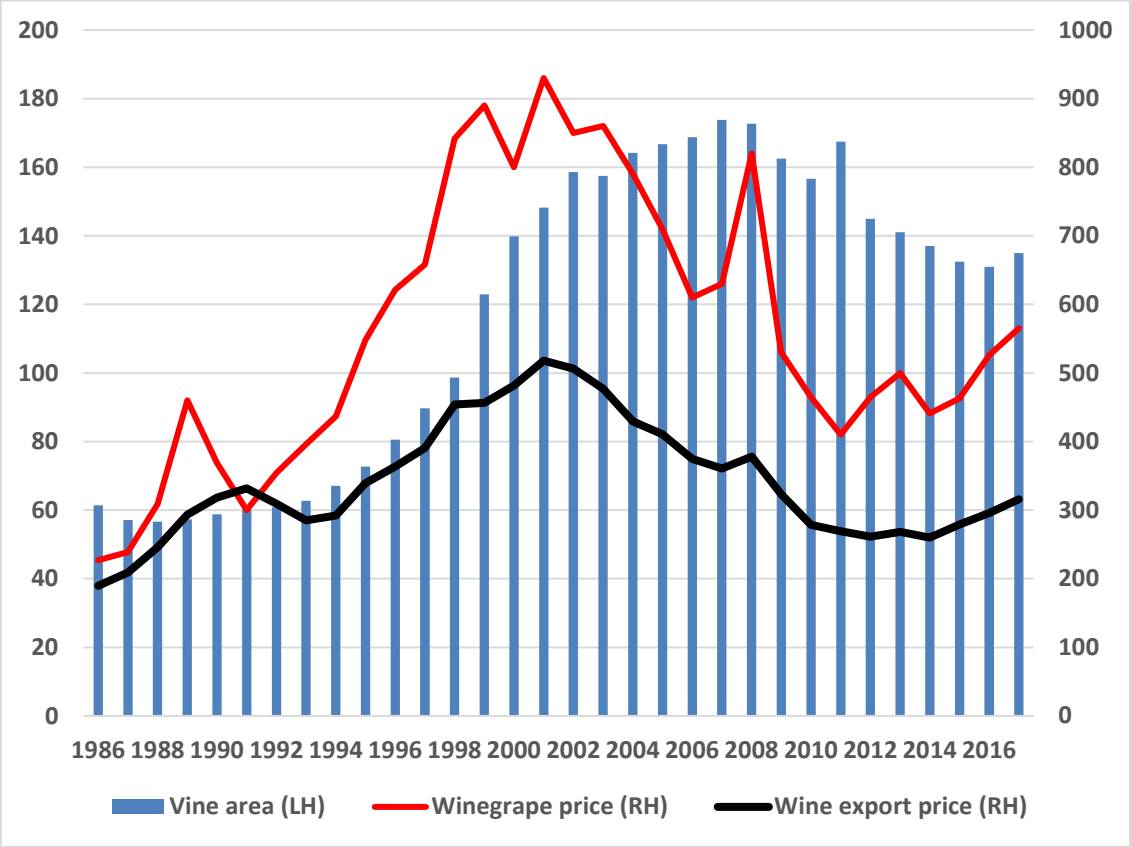
Source: Anderson and Pinilla (2017).

Figure 6: National shares of value of global wine exports, Australia and other New World countries, 1990 to 2017 (%)



Source: Updated from Anderson and Pinilla (2017).

Figure 7: Vine bearing area, average winegrape price, and wine export price 1986 to 2017 (‘000 ha, A$ per tonne, and A$ per hectolitre)



Source: Updated from Anderson (2015).