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Australia's Changing Competitiveness in Global Wine Markets

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Principal Investigator: **Kym Anderson**

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Australia's changing competitiveness in global wine markets

Kym Anderson

Principal Investigator and Executive Director,
Wine Economics Research Centre, and
Professor Emeritus of Economics,
School of Economics and Public Policy,
University of Adelaide, Adelaide SA 5005
Phone 0414 254 121
kym.anderson@adelaide.edu.au

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Introduction

Given the close link between Australia's wine export prices and wine grape prices, both grape growers and wineries, along with their industry leaders, input suppliers and others along the value chain, need to understand the forces altering Australia's international competitiveness in the world's wine markets. These include changing consumer tastes and technological developments in Australia and elsewhere plus macroeconomic shocks to income growth, exchange rates, consumer and investor confidence, and new/prospective bilateral and regional trade agreements and changes to excise tax and other regulations affecting wine and other alcohol consumption.

Up-to-date data on and a global model of those markets are essential to adequately analyse such developments and provide plausible estimates of their likely impacts on Australian grape growers and wine makers, marketers and exporters.

In addition, to get insights into the consequences of those national impacts on wine regions within Australia, a model of the Australian economy with a focus on the nation's wine regions is needed. Furthermore, given the impact of not just market developments but also climate change on the profitability of different winegrape varieties in the various grape-growing regions of the world, up-to-date data on which winegrape varieties are grown where is needed as part of assessing Australia's changing international competitiveness in producing wine.

Vignerons are aware of the impact that climate changes (higher temperatures, altered precipitation, more frequent and more extreme weather events) are having on the quality of their winegrapes and on vineyard yields, prices and production costs. Adaptation strategies include switching to warmer-climate or more-resilient grape varieties. In some cases re-locating or investing in a region at a higher latitude or elevation to retain the current mix of grape varieties in each vigneron's portfolio may be considered. Especially in Australia and other New World countries, where regions are still trying to identify their varietal comparative advantages and where regulations do not restrict varietal choice, winegrowers are continually on the lookout for attractive alternative varieties that do well in climates similar to what they expect theirs to become in the decades ahead.

Updating and revising the global database on which varieties are grown in which regions of the world was needed to get a better sense of how the bearing hectares by variety in each of the world's wine regions was evolving.

Throughout this project the annual *Global Wine Markets* database was updated each year. The database of *Regional, National and Global Winegrape Bearing Areas by Variety* was updated in 2020 to the 2015/16 vintage. A new annual database comprising *Global Bilateral Beverages Trade*, from 1995 was added in 2024. And three *annual winegrapes databases* covering several decades have been compiled, for Australia, Argentina and California.

The contributions of this project to datasets have far exceeded what was originally planned.

The analyses undertaken with the benefit of those databases and the two models developed in this project covered such topics as changes in excise taxes and import tariffs, the growth and slump in China and other parts of Asia, developments in vignerons' mixes of winegrape varieties, climate change impacts on vineyards, and the causes of the current crisis and ways forward.

Markets and policies will continue to evolve, and occasionally they will be shocked in unexpected ways just as they have over recent decades during the industry's current cycle (as at February 2025). The slump part of the current cycle since 2007, and pressures on growers to adapt to on-going climate changes and to become more sustainable in their production and distribution of wine will continue. Thus, there will be a continuing need to update and improve pertinent databases, and to employ up-to-date models to analyse the consequences of market and policy developments and shocks. The development of a National Vineyard Register initiated in 2024 has the potential to contribute greatly in terms of vineyard data and will allow more-precise analyses of future regional and varietal developments.

The University of Adelaide's Wine Economics Research Centre (WERC) was well placed in 2018 to undertake this research project. Previous projects included a major study of wine globalisation

(Anderson and Pinilla 2018) for which it had developed an annual database and ebook of global wine markets from 1860 to 2016 (Anderson, Nelgen and Pinilla 2017). Another was a global study of nations' wine, beer and spirits consumption from 1950 to 2015 (Holmes and Anderson 2017a and 2017b), and their alcohol consumption tax regimes (Anderson 2014). And a third was the publication of a global database and ebook on which winegrape varieties are grown where in the world (Anderson 2013). Each of those two freely available >600-page ebooks had been downloaded more than 70,000 times from the University of Adelaide website by the time this project began in mid-2018.

We are grateful for financial support that supplemented Wine Australia's grant, most notably that which came from the University of Adelaide's School of Agriculture, Food and Wine and its Faculty of Arts, Business, Law and Economics (and its predecessor, the Faculty of the Professions), as well as from the Office of the Deputy Vice-Chancellor (Research). Office facilities and admin support were generously provided by the University of Adelaide's School of Economics and Public Policy, including for Kym Anderson who formally transitioned at the time the project started (1 July 2018) to become a Professor Emeritus.

Thanks are due to the three industry leaders who very generously served on the project's Industry Reference Group (IRG). They were Brett McKinnon, Peter Hayes and Marc Soccio. All three attended each 6-monthly meeting, a total of twelve meetings. The IRG members reviewed progress and made many constructive comments and suggestions throughout the project's 6.5 years, including occasionally out of session between meetings. They also helped by providing some data and other materials that assisted our research.

Finally, we are very grateful not only for Wine Australia's financial assistance but also for assistance from Wine Australia staff, notably Jo Hargreaves who supervised the project and Peter Bailey and Sandy Hathaway who gave generously of their time to comment on and contribute to our compiling of data.

About the project

The primary aims of the project were to:

- revise and continue to update the databases on and model of global beverage markets;
- build a dynamic model of the Australian economy that provides details of the nation's various wine regions, based on CoPS's TERM model at Victoria University;
- update and revise the first (2013) edition of our database and ebook entitled *Which Winegrape Varieties are Grown Where? A Global Empirical Picture*;
- use these databases and models to analyse the impacts of market trends in and policies affecting global beverage markets and Australia's regional grape and wine production to 2025;
- via professional conferences and seminars, get feedback from peers on those analyses and then revise and submit them for publication in scholarly journals; and
- communicate the results of those studies to those engaged in grape and wine production in Australia, via industry forums and industry journals.

Data compiling is a laborious task, but that was made easier by Kym Anderson employing and guiding research assistants (typically undergraduate students) in the University of Adelaide's School of Economics and Public Policy.

Model constructing, revising, and the running of simulations was undertaken by Professor Glyn Wittwer of the Centre of Policy Studies at Victoria University (one of the world's top economic modeling groups). Kym Anderson and Glyn Wittwer jointly devised model simulation experiments to assess a wide range of market and policy developments. They then together wrote articles and prepared PowerPoint presentations for disseminating the results of their empirical analyses.

Other analyses that drew on and added to the new databases, but did not involve the use of the project's two formal models, were undertaken in the University of Adelaide's Wine Economics Research Centre.

The project benefitted by its researchers interacting throughout the six years with the three industry leaders who very generously served on the project's Industry Reference Group: Brett McKinnon, Peter Hayes and Marc Soccio. All three attended each of the dozen 6-monthly IRG meeting, at which the IRG members reviewed our research progress and made many constructive comments and helpful suggestions.

The analyses also benefitted greatly from comments by industry participants, conference paper discussants and eventually journal referees and editors, for which the authors are very grateful.

Discussion points

(a) Datasets

The contributions of this project with respect to datasets have far exceeded what was promised at the outset. As reported in Appendix 5, the annual *Global Wine Markets* database was most recently updated to 2023 (Anderson and Pinilla 2024). That involved forensic work for some countries, most notably in Asia. Anderson and Harada (2018) put considerable effort into estimating wine production and consumption in China, Hong Kong and Japan, and further efforts were made to more accurately capture the changing consumption trends in other Asian countries (Anderson 2020a), particularly China (Anderson 2023). The updated data, together with the long historical series in that global database, made it possible to put Australia's evolving and latest wine production and alcohol consumption trends into an international context (Anderson 2018, 2020b, 2025a).

The database of *Regional, National and Global Winegrape Bearing Areas by Variety* was updated in 2020 to the 2015/16 vintage (Anderson and Nelgen 2020a). We have since been compiling winegrapes data also for the 2022/23 vintage and hope to complete that global compilation by mid-2025.

We have recently added to the WERC website a new annual database comprising *Global Bilateral Beverages Trade*, covering 1995 to 2022 and easily updatable as each year's new data are released by BACI based on UN COMTRADE data. The latest version will be used when the database in the global beverage markets model is next updated. The first paper using these data sought to explain evolving patterns in bilateral wine trade (Anderson, Puga and Sharafeyeva 2022).

Unexpectedly, we have been able to add a further three new annual winegrapes databases that are proving to be very useful in analysing reasons behind changes in the varietal mix and total vineyard bearing areas and crush by region and variety over several decades. The first (in 2021) covered just South Australian regions but, at the request of Wine Australia, German Puga devised a way to estimate bearing areas by variety in all the other Australian wine regions. That allowed us to assemble a complete dataset for Australia that includes also prices and so not just vine yield (tonnes per hectare) but also gross revenue per hectare by variety and region for the two decades 2001 to 2023. That allowed also the calculation of many derivative indicators such that the Excel file includes 161 tables. That same format has now been applied to data for Argentina from 2002 to 2022 and for California from 1991 to 2023 (and soon to be stretched back to 1980), as reported in Appendix 5. Those new time series databases will enable direct comparisons across the three countries in developments in their grape and wine markets. A first effort in that regard is a comparison between Australia and Argentina this century (Puga and Anderson 2024a).

(b) Models

The global beverage markets model was updated early in this project and used to project those markets to 2025 (Wittwer and Anderson 2020, 2021a). It was then further enhanced in several ways (Wittwer 2021). One reason for the latest enhancements was to better model the changing consumption patterns during COVID-19 (Wittwer and Anderson 2021b). The model's database was fine-tuned to include the latest consumer excise taxes and import tariffs on all alcohol products, drawing on Anderson (2020b).

A bespoke economy-wide model of Australia that details its wine regions has been developed (Wittwer 2020). It proved to be useful for estimating the quite varied impacts of COVID-19 across regions (Wittwer and Anderson 2021c).

(c) Changes in excise taxes and import tariffs

Throughout this project these have been numerous changes to various countries' excise taxes and import tariffs, including the signing of bilateral free trade agreements and the withdrawal of the UK from the EU (Brexit). The cumulative effects of some of those FTA changes were simulated by Anderson and Wittwer (2018a, 2018b), while the effects of US tariffs on EU wine and spirits were examined by Anderson and Wittwer (2019) and of an FTA with India were speculated by Anderson

and Wittwer (2022a). The recent changes in the UK's alcohol excise tax regime also have been analysed using our global beverage market model (Anderson and Wittwer 2022b, 2022c).

(d) China

The rapid growth in East Asia's wine imports in the 2010s was a boon for Australia, especially China's (Anderson 2020a). But the imposition by China of punitive tariffs on Australian packaged wine from end-2000 brought that trade effectively to a halt overnight (Anderson 2023). When those tariffs were removed at end-March 2024, Australian exporters were unsure how much to return to that market. To assist their decision-making, Anderson (2025b) explored the long-term growth prospects and concluded – based on comparative developments in other growing economies – that almost certainly the demand for wine in China would return to growth once the Chinese economy's growth prospects brightened.

(e) Vignerons' varietal choices

The updated global database documenting which winegrape varieties are grown where shows a continuing trend toward reduced varietal diversity and increased varietal concentration in the world's vineyards (Anderson and Nelgen 2021, Anderson and Puga 2023a). This was true also in this nation's vineyards (Anderson and Nelgen 2020b). But what has also been exposed is a tendency for the warm inland regions to become more like the nation's average varietal mix (Anderson and Puga 2023b). The latter study also reveals that the average gross revenue per hectare in the warm inland regions is not much different from that in other mainland regions. A follow-up study documented the development of emerging varieties, even though they remain a very small share of the nation's vineyard (Anderson and Puga 2024a).

(f) Climate change impacts on vineyards

Given vignerons' concerns about climate change, we explored econometrically the effects of climate change (especially growing season temperature and precipitation) on grape prices (Puga, Anderson and Doko Tchatoka 2022), on yields (Anderson, Puga and Doko Tchatoka 2023), on variability of winegrape revenue (Anderson and Puga 2024b), and thus on the evolving mix of varieties in Australian vineyards (Anderson, Jones, Puga and Smart 2022, Puga and Anderson 2024b). The conclusion that emerges from those studies is that vignerons will be under pressure from climate change either to alter their varietal mix of their vineyards toward more resilient cultivars or to source their traditional varieties' grapes from higher latitudes or elevations.

(g) Causes of the current crisis and ways forward

Australia's current wine industry cycle, as defined by prolonged growth and then a plateau or prolonged decline in vine bearing area, has been ongoing for nearly four decades. The boom lasted two of those decades, but since the global financial crisis many producers have been struggling, apart from those who took advantage of the boom in imports by China in the latter half of the 2010s. In 2024 Kym Anderson was commissioned by Wine Australia to provide an Independent Review as a background paper for the Working Group that was to advise Federal and State Ministers of Agriculture on the nature, extent and effects of the crisis and on what could be done about it. That review (Anderson 2024) was prepared to a tight timeline, but it provided raw material that was potentially able to be developed further in subsequent publications. Two have since been completed. One focused on clarifying various historical contributions to the current crisis (Anderson 2025c); the other sought to explain why, even though international trade in wine has grown hugely and Australia is still a relatively small contributor, becoming export focused does not mean cycles will necessarily be less volatile than in the past (Anderson 2025a).

Several key messages emerged from that Independent Review, as follows:

- In parts of the industry there is a view that Australia should reduce its bearing area of red winegrapes, perhaps by as much as 30%, while others (particularly in the warm inland regions) believe the problem is insufficient marketing effort abroad to boost demand for Australian wine.
- While not diminishing the industry's challenges in the face of climate change and wine consumers drinking less and choosing higher value wines (premiumisation), a refreshed focus

and a more positive vision for the industry is long overdue: it is not inconceivable that Australia, like New Zealand over the past decade or so, could capture a bigger share of the world market through boosting its marketing efforts and its investments in innovation.

- To invest more in generic promotion and R&D so as to get back onto a more sustainable, premiumising growth path requires raising producer levy revenue.
- Those generic investments will have a higher payoff the more they are matched by greater investments by wine businesses in the sustainability of their production and in export marketing.

Conclusion

The project has overdelivered relative to all its planned objectives and outputs, in part due to the project's extension from three to 6.5 years thanks to a huge underspend during the COVID-19 years. That extension allowed time for much more output to be generated than was originally planned, even though there was no change in total expenditure of Wine Australia funds.

The main benefits from the project have and will continue to come from the insights emerging from the market and policy analyses highlighted above.

Markets and policies will continue to evolve, and sometimes they will be shocked in unexpected ways, just as they have over recent decades during the industry's current cycle, as laid out in Anderson (2025a). The slump part of that cycle has yet to end, and pressures on growers to adapt to on-going climate changes and to become more sustainable in their production and distribution of wine will continue. Thus, there is a continuing need to update and improve databases, and to employ models to analyse the consequences of market and policy developments and shocks.

The development of a National Vineyard Register (a project that started in 2024) has the potential to contribute greatly in terms of vineyard data, allowing more-precise analyses of various regional and varietal developments. Meanwhile, Glyn Wittwer at the Centre of Policy Studies at Victoria University is available should the industry wish to commission him to update and further employ his models for future analyses and projections.

Appendix 1: Communications

Communicating via conference presentations has been prolific along with short non-technical articles in wine industry journals such as the *Australian and New Zealand Grapegrower and Winemaker,* the *Wine and Viticulture Journal* and *IVES Technical Reviews.* In total, 41 conference presentations were given (6.3 per year, see Appendix 6), and 27 industry journal articles and technical reviews have been published over the project's 6.5 years (4.2 per year, see Appendix 7).

Several of the project's studies have been picked up independently by international media. Two recent examples are by *Meininger International* and *The Drinks Business.* First, Robert Joseph of *Meininger International* summarised in early 2024 a late-2023 article on China's changing market that was published in the *Journal of Wine Economics* (Anderson 2023). At the end of 2024 he reported that that news item was ranked the 2nd most important of all *Meininger* articles in 2024. Second, in February 2024 James Bayley reviewed our 2017 assessment (Anderson and Wittwer 2017) of what Brexit would do to the world's wine markets by 2025. He concluded that our study "was right in identifying currency and income effects as the major disruptors, rather than tariffs alone" (Bayley 2025). That study's implications for Australia were subsequently communicated to local vignerons via an article in Australia's *Wine and Viticulture Journal* (Anderson and Wittwer 2018b).

As well, Anderson has been contacted from time to time for comments on research outputs and more broadly on wine issues by ABC Radio, *The Australian, The Age,* and *The Sydney Morning Herald*, as well as by international media such as Bloomberg, *The Wall Street Journal*, various Chinese media, and the top financial press in Japan and in South Korea.

Anderson was commissioned by Wine Australia to provide an independent review of *Australia's Wine Industry Crisis and Ways Forward,* as a background paper for the Final Report on the crisis to Ministers by the Viticulture and Wine Sector Working Group in 2024. Anderson also was called as a witness to the Senate's Rural and Regional Affairs and Transport References Committee for its review of *Australian Winegrape Purchases Code of Conduct*, 7 February 2025.

In order for industry participants and others to be able to read the results of our analyses as soon as possible, both scholarly articles and those destined to appear in industry journals are made available in advance in either the Working Papers or Wine Briefs series in our Centre's website at https://economics.adelaide.edu.au/wine-economics/publications

Appendix 2: Intellectual property

As stated in the research project's original proposal, all the intellectual property generated in this project (datasets, economic models, and research articles) has been made freely available on the WERC website at https://economics.adelaide.edu.au/wine-economics and, in the case of many journal articles, also available through Open Access (at no expense to the project).

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Appendix 4: Staff

The Principal Investigator, Professor **Kym Anderson**, Executive Director of the University of Adelaide's Wine Economics Research Centre (WERC) remained with the project throughout its six years despite having become a Professor Emeritus in the UofA's School of Economics and Public Policy just as this project began in July 2018.

German Puga enrolled as a PhD student at the University of Adelaide in February 2020 (at the start of COVID-19). He graduated in September 2023 when he became a WERC Post-Doctoral Fellow for nine months (to early July 2024). He then became a Research Fellow in an ARC-funded project at the University of Western Australia, focused on the behavioural economics of rural innovation adoption including by vignerons.

Professor **Glyn Wittwer** of Victoria University's Centre of Policy Studies generated the TERM-Wine model of the Australian economy and the economic model of global beverage markets, and co-authored papers with Kym Anderson that estimated empirically various national wine market and international wine trade consequences of various structural and policy disruptions in Australia and abroad.

Dr **Signe Nelgen**, a former doctoral student at the University of Adelaide, worked remotely with Kym Anderson to generate the statistical compendium on which winegrape varieties are grown where (Anderson and Nelgen 2020). She subsequently took up a wine research fellow position at Geisenheim University in Germany.

Appendix 5: Research project outputs: Datasets and models

All **datasets** generated in the course of this research project have been freely available, since their completion, on our Centre's website at https://economics.adelaide.edu.au/wine-economics/databases.

They include the following:

Anderson, K. and V. Pinilla, *Annual Database of Global Wine Markets, 1835 to 2023*, Wine Economics Research Centre, updated November 2024.

Anderson, K. and G. Puga, *Global Bilateral Beverages Trade Database from 1995*, Wine Economics Research Centre, University of Adelaide, November 2024.

Anderson, K. and G. Puga, *Database of Californian Winegrape Vine Area, Crush, Price and Per Hectare Volume and Value of Production, by Region and Variety, 1991 to 2023*. Wine Economics Research Centre, November 2024.

Puga, G. and K. Anderson, *Database of Argentinian Winegrape Vine Area, Crush, Price and Per Hectare Volume and Value of Production, by Region and Variety, 2002 to 2022*, Wine Economics Research Centre, March 2024.

Anderson, K. and G. Puga, *Database of Australian Winegrape Vine Area, Price, Crush Volume and Value, and Per Hectare Yield and Value, by Region and Variety, 1956 to 2023*. Wine Economics Research Centre, December 2023.

Anderson, K. and G. Puga, *Database of South Australian Winegrape Vine Area, Production, Price, and Per Hectare Volume and Value of Production, by Region and Variety, 2001 to 2021*, Wine Economics Research Centre, December 2021.

Anderson, K. and S. Nelgen, *Database of Regional, National and Global Winegrape Bearing Areas by Variety, 1960 to 2016,* Wine Economics Research Centre, June 2020.

The two **models** developed for market and policy analysis in the course of this project's research are documented in the following:

Wittwer, G. (2021), "Expanding the Global Bev Model to Enhance Analysis of Trade Policy, COVID Impacts and Other Wine Industry Issues", Wine Economics Research Centre Working Paper 2021-05, University of Adelaide, and CoPS Working Paper No. G-319, Centre of Policy Studies, Victoria University, September. https://www.copsmodels.com/elecpapr/g-319.htm

Wittwer, G. and K. Anderson (2020), "A Model of Global Beverages Markets", *Journal of Wine Economics* 15(3): 330-354.

Wittwer, G. (2020), "The 2019-20 Australian Economic Crisis Induced by Bushfires and COVID-19 from the Perspective of Grape and Wine Sectors", CoPS Working Paper No. G-319, Centre of Policy Studies, Victoria University, March. https://www.copsmodels.com/ftp/workpapr/g-299.htm

Appendix 6: Research project outputs: Conference presentations

Anderson, K. (2025), "Globalization and National Commodity Cycles: The Case of Wine in Australia". Presented at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, Brisbane, 11-14 February 2025.

Anderson, K. (2024), "China and Global Wine Markets: What Next?" Presented at the *International Wine Law Association (Australasian Section) Conference*, Adelaide, 1-2 November 2024.

Anderson, K. (2024), "National and Global Wine Cycles (and the role of R&D in pulling Australia out of its current slump)", Presented as a Keynote Paper at the *Crush 2024 Conference*, Adelaide Convention Centre, 25-26 September 2024.

Puga, G. and K. Anderson (2024), "How Can We Best Use Statistical Methods to Quantify the Impact of Climate Change on the Wine Industry? A Case Study for Australia". Presented at the *Crush 2024 Conference*, Adelaide, 25-26 September 2024.

Puga, G. and K. Anderson (2024), "What Explains Changes in Grape Varietal Mixes in Australia's Wine Regions?" Presented at the *Annual Conference of the American Association of Wine Economists*, Lausanne, Switzerland, 1-5 July 2024. Presented also at the *Annual Conference of the [American] Agricultural and Applied Economics Association*, New Orleans, 28 July - 1 August 2024, thanks to an AAEA-AARES award to travel and present at that conference. Presented also at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, ANU, Canberra, 7-9 February 2024.

Puga, G. and K. Anderson (2024), "How Can We Best Use Econometrics to Quantify the Impact of Climate Change on the Wine Industry? A Case Study for Australia". Presented at the *Annual Conference of the American Association of Wine Economists*, Lausanne, Switzerland, 1-5 July 2024. Presented also at the *6th Wine and Hospitality Management Workshop*, Reims, France, 25-28 June 2024, and at the *5th Anniversary Celebration of the Harvard Data Science Review*, Harvard University, Cambridge MA, 13-14 June 2024.

Anderson, K. (2024), "National Wine Industry Cycles in a Globalized Wine Market: The Case of Australia". Presented as a Keynote Paper at the *Annual Conference of the European Association of Wine Economists*, Lecce, Italy, 11-14 June 2024.

Puga, G. and K. Anderson (2024), "The Impact of Climate Change on the Australian Wine Industry". Presented at a seminar at *Universidad Católica*, Santiago, 10 June 2024.

Anderson, K. (2024), "East Asian Benefits From, and Contributions to, Wine's Globalization". Presented to the *Annual Asian Leadership Conference*, Seoul, 22-23 May 2024.

Anderson, K. (2024), "Crisis in Australia's Wine Industry: Origins, Hiccups, and Ways Forward". Presented as a seminar/webinar to the *Australasian Agricultural and Resource Economics Society*, Adelaide, 23 April 2024.

Puga, G. and K. Anderson (2024), "A Climatic Classification of the World's Wine Regions and Winegrape Variety Concentration". Presented at *IVES Annual Meeting*, Napa CA, 26 February - 1 March 2024, thanks to an IVES invitation and funding to travel and present at that conference.

Puga, G. and K. Anderson (2024), "Climate Change, Viticulture and Winegrape Varieties". Presented at a seminar at the *Robert Mondavi Institute*, UC Davis, 23 February 2024.

Puga, G. and K. Anderson (2024), "Climate Change Econometrics and Wine". Presented as a poster at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, ANU, Canberra, 7-9 February 2024.

Anderson, K. (2024), "Cabernet's Evolving Place in Australia's Wine Regions". Presented at the *2024 Australian Cabernet Symposium*, Coonawarra, 1-2 February 2024.

Anderson, K. (2023), "Boost Wine Industry Productivity, Premiumization and Sustainability by Reforming Producer Levies". Presented at the *Concerned Elders Group* chaired by Louisa Rose, 27 November 2023.

Anderson, K. (2023), "Global Wine Market Prospects in a More-Uncertain Trading Environment". Presented virtually to the *6th Annual Ghvino Forum*, Austin TX, 14 November 2023.

Puga, G. (2023), "Climate Change Impact Assessments". Presented at a seminar organised by the *Australasian Agricultural and Resource Economics Society*, Adelaide, September 2023.

Puga, G., K. Anderson and F. Doko Tchatoka (2023), "Statistical Methods to Quantify the Impact of Climate Change". Presented at the *Climate Adaptation 2023 Forum*, Adelaide, 25-27 July 2023.

Puga, G. and K. Anderson (2023), "Climate Econometrics and Wine". Presented at the *Annual Conference of the American Association of Wine Economists*, Stellenbosch, South Africa, 28 June - 2 July 2023.

Anderson, K. and G. Puga (2023), “Grape Varietal Trends in Australia’s Wine Regions”. Presented at the *Annual Conference of the American Association of Wine Economists*, Stellenbosch, South Africa, 28 June - 2 July 2023.

Puga, G., K. Anderson and F. Doko Tchatoka (2023), “The Use of Statistical Methods to Quantify the Impact of Climate Change on Grape and Wine Research”. Presented at *Crush 2023: The Grape and Wine Science Symposium*, Adelaide, 14 June 2023.

Puga, G., K. Anderson, and F. Doko Tchatoka (2023), “The Impact of Temperature on Grape Prices: Evidence from Australia”. Presented at the *Annual Conference of the American Association of Wine Economists*, Tbilisi, Georgia, 28 June - 2 July 2023, thanks to an AAWE scholarship to travel and present at that conference.

Puga, G., A. Sharafeyeva, and K. Anderson (2023), “Global Wine Trade”. Presented at the *Annual Conference of the American Association of Wine Economists*, Tbilisi, Georgia, 28 June - 2 July 2023, thanks to an AAWE scholarship to travel and present at that conference.

Puga, G., K. Anderson, G. Jones, and R. Smart (2022). “Climate and the Evolving Mix of Grape Varieties in Australia’s Wine Regions”. Presented at the *2nd ClimWine Symposium and 14th International Terroir Congress*, Bordeaux, France, 3-8 July 2022.

Puga, G. and K. Anderson (2022). “The Impact of Climate Change on the Australian Wine Industry”. Presented (orally and as a poster) at the *19th Australian Wine Industry Technical Conference* (AWITC), Adelaide, 26-29 June 2022.

Puga, G., K. Anderson, and F. Doko Tchatoka (2022), “The Impact of Climate Change on Grape Yields in Australia”. Presented at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, University of New England, February 2022.

Anderson, K. and G. Wittwer (2021), “Projecting Global Beverage Markets to 2025”. Presented at the virtual *International Conference of the Academy of Wine Business Research*, Dijon, 6-8 July 2021.

Anderson, K. (2021), “Australia’s Changing Competitiveness in Uncertain Global Wine Markets”. Presented to the *Barossa Next Crop fellows*, National Wine Centre, Adelaide, 9 June 2021.

Wittwer, G. and K. Anderson (2021), “COVID-19’s Impact on Australian Wine Markets and Regions”. Presented at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, University of Sydney, February 2021.

Puga, G., K. Anderson, F. Doko Tchatoka and W. Umberger (2021), “Towards a Climatic Classification of the World’s Wine Regions”. Presented at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, University of Sydney, February 2021.

Anderson, K. and S. Nelgen (2020), “Diversity and Internationalization of Winegrape Varieties: Evidence from a Revised Global Database”. Presented at the *XIIIth International Terroir Congress*, University of Adelaide, 17-19 November 2020.

Anderson, K. and S. Nelgen (2020), “Diversity and Internationalization of Wine Grape Varieties: Evidence From a Revised Global Database”. Presented at the *13th International Terroir Congress*, Adelaide. 15-20 November 2020.

Anderson, K. and S. Nelgen (2020), “Evolution of National Winegrape Varietal Mixes: Georgia in Global Perspective”. Presented at the *3rd Annual Ghvino Forum*, University of California, Davis, 11-12 November 2020.

Anderson, K. and G. Wittwer (2020), “COVID-19 and Global Beverage Markets: Impacts on Australian Wine Industry”. Presented at a joint virtual *Board meeting of Wine Australia and Australian Grape & Wine*, 22 June 2020.

Anderson, K. (2019), “Asia’s Emergence in Global Beverage Markets: The Rise of Wine”. Presented at the annual conference of the *Singapore Economic Review,* Singapore, 7-9 August 2019.

Anderson, K. and G. Wittwer (2019), “A Model of Global Beverage Markets”. Presented at the *Annual Conference of the American Association of Wine Economists*, Vienna, 15-19 July 2019.

Anderson, K. (2019), Convenor of and presenter in a Mini-symposium on “Evolving Alcohol Consumption Patterns” at the *Annual Conference of the Australasian Agricultural and Resource Economics Society*, Melbourne, 12-15 February 2019.

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Appendix 7: Research project outputs: Industry journal articles and technical reviews

Anderson, K. (2025), "China's Wine Market: What Next?" *Australian and New Zealand Grapegrower and Winemaker* 733: 80-85, February.

Puga, G. and K. Anderson (2025), "Winegrape Similarities and Concentrations: Implications", *IVES Technical Reviews,*January. https://doi.org/10.20870/IVES-TR.2024.8456

Puga, G. and K. Anderson (2025), "Winegrape Similarities and Concentrations: A Description". *IVES Technical Reviews,* January, https://doi.org/10.20870/IVES-TR.2024.8456

Anderson, K. (2025), "Clarifying Controversial Contributions to Australia's Current Wine Industry Crisis", *Australian and New Zealand Grapegrower and Winemaker* 732: 61-69, January.

Puga, G. and K. Anderson (2024), "The Climates of the World's Wine Regions", *IVES Technical Reviews,* November. https://doi.org/10.20870/IVES-TR.2024.8361

Puga, G. and K. Anderson (2024), "Evolution of Grape and Wine Production in Argentina vs Australia", *Australian and New Zealand Grapegrower and Winemaker* 731: 73-80, December.

Anderson, K. and G. Puga (2024), "Which are Australia's Emerging Winegrape Varieties?", *Wine and Viticulture Journal* 39(2): 77-81, Autumn.

Anderson, K. and G. Puga (2024), "Cabernet's Evolving Place in Australia's Wine Regions", *Australian and New Zealand Grapegrower and Winemaker* 722: 41-48, March.

Anderson, K. and G. Puga (2024), "Australia's Viticultural Trends: Insights From a New Database", *IVES Technical Reviews*, March. https://doi.org/10.20870/IVES-TR.2024.8028

Anderson, K., S. Nelgen and G. Puga (2024), "Varietal Distinctiveness of World's Wine Regions: An Updated Empirical Picture", *IVES Technical Reviews*, March. https://doi.org/10.20870/IVES-TR.2024.8055

Anderson, K. and V. Pinilla (2024), "Wine's Belated Globalization, 1845 to 2022", *IVES Technical Reviews*, March. https://doi.org/10.20870/IVES-TR.2024.8047

Puga, G. and K. Anderson (2024), "Climate Change and the Australian Mix of Winegrape Varieties", *Australian and New Zealand Grapegrower and Winemaker* 721: 28-35, February.

Anderson, K. (2023), "The Consumer Preference for Lower Alcohol: Are There Lessons from Beer?" *Wine and Viticulture Journal* 38(4): 80-83, Spring.

Anderson, K. (2023), "Boost Wine Industry Productivity, Premiumization and Sustainability by Reforming Producer Levies", *Australian and New Zealand Grapegrower and Winemaker* 717: 86-90, October.

Anderson, K. (2023), "What's Happening to China's Wine Market?" *Australian and New Zealand Grapegrower and Winemaker* 712: 79-82, May.

Anderson, K. and G. Puga (2023), "Two Decades of Grape Variety Trends in Australian Wine Regions", *Wine and Viticulture Journal* 38(2): 65-73, Autumn.

Anderson, K. G. Puga and A. Sharafeyeva (2022) "Explaining Bilateral Patterns of Global Wine Trade, 1962-2019", *Journal of Wine Economics* 17(4): 338-44, November.

Puga, G., K. Anderson and F. Doko Tchatoka (2022), "The Impact of Climate Change on Grape Yields in Australia", *Proceedings of the 12th International Conference of the Academy of Wine Business Research*, Dijon, 8-11 July.

Anderson, K. and G. Puga (2022), "Grape Variety Trends in South Australia's Wine Regions", *Wine and Viticulture Journal* 37(3): 74-79, Winter.

Anderson, K., G. Jones, G. Puga and R. Smart (2022), "Climate Change and the Evolving Mix of Grape Varieties in Australia's Wine Regions", *Proceedings of the XIVth International Terroir Congress and 2nd ClimWine Symposium*, Bordeaux, 3-8 July.

Anderson, K. and G. Wittwer (2022), "How Much will Preferential Tariff Entry into India Boost Australia's Wine Exports?", *Australian and New Zealand Grapegrower and Winemaker* 702: 98-102, July. (Builds on a confidential briefing note by K. Anderson to Wine Australia, "Impact on Australian Wine Exports of Preferential Tariff Entry into India's Wine Market", February 2022.)

Anderson, K. and G. Wittwer (2022), "Proposed Alcohol Tax Reform in the UK: How Much Will it Erode Wine Exporter Gains from FTAs with the UK?", *Australian and New Zealand Grapegrower and Winemaker* 698: 72-75, March.

Anderson, K. and S. Nelgen (2020), "Australia's Declining Winegrape Varietal Distinctiveness", *Wine and Viticulture Journal* 35(4): 66-69, Spring.

Anderson, K. and G. Wittwer (2020), "COVID-19 and Global Beverage Markets: Impacts on Australian Wine Industry", *Wine and Viticulture Journal* 35(3): 61-66, Winter.

Anderson, K. (2020), “Wine Consumer Tax in Australia: A Comparative Perspective”, *Wine and Viticulture Journal* 35(2): 57-62, Autumn.

Anderson, K. (2020), “Asian Wine Market Growth Prospects Still Huge”, *Wine and Viticulture Journal* 35(1): 62-66, Summer.

Anderson, K. and G. Wittwer (2019), “How Might US Tariffs on Imports of Some EU Wine and Whisky Affect Those Countries and Australia?”, *Australian and New Zealand Grapegrower and Winemaker* 671: 81-83, December.

Anderson, K. and G. Wittwer (2018), “Brexit, Follow-on FTAs, and Global Wine Trade”, *Wine and Viticulture Journal* 33(2): 69-72, March/April.

Appendix 8: Research project outputs: Scholarly journal articles

Anderson, K. (2025), "Globalization and National Commodity Cycles: The Case of Wine in Australia", *The World Economy* 48(2): 347-72, February.

Anderson, K. (2025), "The Australian Wine Industry", Ch. in *The Palgrave Handbook of Wine Industry Economics (Revised Edition),* edited by A. Alonso Ugaglia, J.-M. Cardebat and A. Corsi, London: Palgrave Macmillan (forthcoming).

Anderson, K. (2025), "Wine's Gradual Globalization", Ch. in the *Handbook of Eating and Drinking: Interdisciplinary Perspectives, 2nd edition,* edited by H. Meiselman, New York: Springer (forthcoming).

Puga, G. and K. Anderson (2025), "What Explains Changes in Grape Varietal Mixes in Australia's Wine Regions?" *Australian Journal of Agricultural and Resource Economics* 69(1): 121-36, January.

Puga, G. and K. Anderson (2025), "Statistical Methods in Grape and Wine Research for Quantifying the Impact of Climate Change", *OENO One* 59(1): 1-11, January.

Anderson, K. (2024) *Australia's Wine Industry Crisis and Ways Forward: An Independent Review*, Report commissioned by Wine Australia for Federal, State and Territory Ministers of Agriculture, Adelaide, July. https://www.agriculture.gov.au/sites/default/files/documents/wine-industry-crisis-ways-forward.pdf

Hankel, V. and K. Anderson (2024), "Wine", pp. 773-73 in *The Wakefield Companion to* South *Australian History*, New Edition, edited by W. Prest, Adelaide: Wakefield Press.

Puga, G. and K. Anderson (2024), "The Influence of Climate on Varietal Similarities Across Countries", *Agricultural & Environmental Letters* 9: e70001.

Puga, G. and K. Anderson (2024), "Winegrape Yield and Revenue Variability in Australia", Australian *Journal of Grape and Wine Research* 30: 9992528, May.

Anderson, K. (2023), "The Emergence of Lower-Alcohol Beverages: The Case of Beer", *Journal of Wine Economics* 18(1): 66-86, July.

Anderson, K. (2023), "What's Happened to the Wine Market in China?" *Journal of Wine Economics* 18(2): 173-83, November.

Anderson, K. (2023), "Economics of Wine" and "Wine Globalization", in *The Oxford Companion to Wine, 5th edition*, edited by J. Harding, J. Robinson and T.Q. Thomas, London and New York: Oxford University Press.

Puga, G. and K. Anderson (2023), "Similarities and Concentrations in the Mix of Winegrape Cultivars", *American Journal of Enology and Viticulture* 74(1): 0740018, October.

Puga, G., K. Anderson and F.D. Tchatoka (2023), "The Impact of Climate Change on Grape Yields in Australia", *OENO One* 57(2): 219-30, May.

Anderson, K. and S. Nelgen (2022), "The Internationalization of Winegrape Varieties and its Implications for Terroir-Based Cultural Assets", Ch. 40 (pp. 385-95) in the *Routledge Handbook of Wine and Culture*, edited by S. Charters et al., London: Routledge.

Anderson, K. and G. Wittwer (2022), "Proposed Alcohol Tax Reform in the UK: Implications for Wine-exporting Countries", *Journal of Wine Economics* 17(2): 117-26.

Puga, G., K. Anderson and F. Doko Tchatoka (2022), "The Impact of Growing Season Temperature on Grape Prices in Australia", *Australian Journal of Grape and Wine Research* 28(4): 651-57, October.

Puga, G., K. Anderson, G. Jones, F. Doko Tchatoka and W. Umberger (2022), "A Climatic Classification of the World's Wine Regions", *Oeno One* 56(1): 165-77, June.

Puga, G., A. Sharafeyeva, and K. Anderson (2022), "Explaining Bilateral Patterns of Global Wine Trade, 1962-2019", *Journal of Wine Economics* 17(4): 338-44, November.

Anderson, K. and S. Nelgen (2021), "Internationalization, Premiumization, and Diversity of the World's Winegrape Varieties", *Journal of Wine Research* 32(4): 247-61.

Wittwer, G. and K. Anderson (2021), "From Global Economy-wide Modelling to Modelling a Small Product Market: The Case of Wine", Ch. 8 in *Policy Analysis and Modeling of the Global Economy: A Festschrift Celebrating Thomas Hertel*, edited by P. Dixon, J. Francois and D. van der Mensbrugghe, Singapore: World Scientific.

Wittwer, G. and K. Anderson (2021), "Projecting Global Beverage Markets to 2025", Ch. 4 (pp. 16-24) in the *Proceedings of the 12th International Conference of the Academy of Wine Business Research*, Dijon, 6-8 July.

Wittwer, G. and K. Anderson (2021), "COVID-19's Impact on Australian Wine Markets and Regions", *Australian Journal of Agricultural and Resource Economics* 65(4): 822-47, October.
Wittwer, G. and K. Anderson (2021), "COVID-19 and Global Beverage Markets: Implications for Wine", *Journal of Wine Economics* 16(2): 117-30.
Anderson, K. (2020), "Evolving from a Rum State: A Comparative History of Australia's Alcohol Consumption", *Australian Journal of Agricultural and Resource Economics* 64(3): 724-49, July.
Anderson, K. (2020), "Asia's Emergence in Global Beverage Markets: The Rise of Wine", *Singapore Economic Review* 65(4): 755-79, June.
Anderson, K. (2020), "Consumer Taxes on Alcohol: An International Comparison over Time", *Journal of Wine Economics* 15(1): 42-70, February.
Anderson, K. (2020), "Wine's Gradual Globalization", Ch. 152 in the *Handbook of Eating and Drinking: Interdisciplinary Perspectives,* edited by H. Meiselman, New York: Springer.
Anderson, K. and G. Wittwer (2020), "Beverage Market Disruptions and their Trade Consequences", *VoxEU,* 16 February. https://voxeu.org/article/beverage-market-disruptions-and-their-trade-consequences
Wittwer, G. and K. Anderson (2020), "A Model of Global Beverage Markets", *Journal of Wine Economics* 15(3): 330-54, August.
Anderson, K. (2019), "Industrial Organization in the Australian Wine Industry", Ch. 6 in *The Palgrave Handbook of Wine Industry Economics***,** edited by A. Alonso Ugaglia, J.-M. Cardebat and A. Corsi, London and New York: Palgrave Macmillan. Recipient of 2019 OIV book prize.
Meloni, G., K. Anderson, K. Deconinck and J. Swinnen (2019), "Wine Regulations", *Applied Economic Perspectives and Policy* 41(4): 620-49, December.
Anderson, K. (2018), "Australia's Wine Industry Competitiveness: Why So Slow to Emerge?" *Australian Journal of Agricultural and Resource Economics* 62(4): 507-26, October.
Anderson, K. and K. Harada (2018), "How Much Wine is Really Produced and Consumed in China, Hong Kong and Japan?", *Journal of Wine Economics* 13(2): 199-220.
Anderson, K., G. Meloni and J. Swinnen (2018), "Global Alcohol Markets: Evolving Consumption Patterns, Regulations and Industrial Organizations", *Annual Review of Resource Economics* 10: 105-32, October.
Anderson, K. and G. Wittwer (2018), "Cumulative Effects of Brexit and Other UK and EU27 Bilateral FTAs on the World's Wine Markets", *The World Economy* 41(11): 2883-94, November.

Appendix 9: Research project outputs: Books

Anderson, K. and S. Nelgen (2020), *Which Winegrape Varieties are Grown Where? A Global Empirical Picture (Revised Edition)*, Adelaide: University of Adelaide Press. Available for print-on-demand sale at www.amazon.com/WHICH-WINEGRAPE-VARIETIES-GROWN-Revised/dp/1925261867. Also freely available as an e-book at www.adelaide.edu.au/press/titles/winegrapes.

Anderson, K. (2020), *The International Economics of Wine,* London and Singapore: World Scientific.