

DISCUSSION PAPER SERIES

DP14389

**ASIA'S EMERGENCE IN GLOBAL
BEVERAGE MARKETS: THE RISE OF
WINE**

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INTERNATIONAL TRADE AND REGIONAL ECONOMICS



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Discussion Paper DP14389
Published 05 February 2020
Submitted 05 February 2020

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Keywords: Changes in beverage tastes, premiumization of alcohol consumption, impacts of tax and trade policies, beverage market projections

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Acknowledgements

The author is grateful for financial support from Wine Australia under research project PRJ002488

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* Revision of a paper presented at the *Singapore Economic Review* Biennial Conference, Singapore, 5-7 August 2019 Forthcoming in the *Singapore Economic Review* Vol. 65, 2020. The author is grateful for financial support from the Conference and Wine Australia under research project PRJ002488.

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Asia's emergence in global beverage markets: The rise of wine

1. Introduction

Before the 1990s, Asia was barely noticeable in international markets for alcoholic beverages: each country was close to self-sufficient in beer, distilled spirits and rice-based 'wine', and showed little interest in grape-based wine.¹ Since the turn of the century, however, Asia's alcohol consumption volume, and its retail expenditure on each of beer, distilled spirits and grape wine, have more than doubled. In the process, several Asian economies have become significant net importers of beverages, especially grape wine. Demand developments in these markets are therefore of great interest not only to domestic beverage producers but also to exporters of alcoholic beverages in other countries. In China's case, unlike all other Asian countries, it has also become a significant producer of grape wine, raising the question of how self-sufficient it would become in that product.²

With Asia's relatively rapid income growth and opening up to the rest of the world since the 1960s, one would expect the quantity, quality and world shares of Asia's beverage consumption to grow, along with intra-industry trade in these differentiated products so as to broaden the varieties and qualities available to consumers. One would also expect the mix of beverage consumption in Asian countries to converge on that of other countries with similar per capita incomes if all countries had the same taxes on beverage consumption. Also, one would not expect any country to have a strong comparative advantage in grain-based beverages, since grain is relatively freely traded globally and beer and spirits production technologies are well known and easily replicable. Grape-based wine, however, would be expected to be produced in and exported from mainly those countries best suited to produce nontradable winegrapes (which tend to be in the non-humid, temperate-climate parts of the world's 30°-50° latitude zones) and to be imported by all other (including most Asian) countries.

The purpose of this paper is to examine recent trends in Asia's consumption and imports of beer, spirits and wine, and to draw on those findings to project (under various assumptions) possible future developments in Asia and elsewhere using a new model of the world's alcoholic beverage markets.

The paper begins in Section 2 by expanding on what consumption and trade theory lead one to expect of the markets for these products as economic growth, urbanization and globalization proceed. It then points in Section 3 to recently compiled global beverage databases and draws on them in Section 4 to review past trends in Asian beverage consumption and imports, comparing them with those in the rest of the world. These comparative data reveal the very considerable extent to which those trends are consistent with

¹ Rice 'wine' is common in the rice-consuming parts of Asia, but wine made from grapes has had a very minor role traditionally. The exception is West Asia and the Caucasus region, which is where grape wine production began more than 8000 years ago (McGovern, 2003). However, the vast majority of people in Central and West Asia are Muslims and so alcohol consumption is frowned upon or illegal there. South Asia also has been a tiny actor in global wine markets. Although wine importation by India and Sri Lanka is beginning to grow, it is doing so from a very small base (and Bangladesh and Pakistan are Muslim), so the Asian focus in what follows with respect to wine is mostly East Asia.

² 'China' in this paper refers to the mainland, with Hong Kong, Taiwan and Macao treated here as separate economies because they are separate customs territories.

expectations from theory. The data also reveal that Asia's grape wine imports are growing considerably faster than its beer and distilled spirits imports and, since the turn of the century, have exceeded the region's value of imports of each of those two alternative sources of alcohol. In fact, having accounted for just 2% in the mid-1980s, Asia now accounts for more than one-fifth of the global value of wine imports – or close to half if intra-EU wine trade is excluded. Section 5 of the paper therefore drills down on the nature and sources of wine imports, noting that China overwhelmingly dominates that part of the story despite rapid growth until recently in its domestic wine production. The knowledge of past trends in Asia and elsewhere is used in Section 6 to simulate prospects for these markets by 2025, using a briefly described new model of global beverage markets that is detailed in Wittwer and Anderson (2019). The concluding section summarizes the findings and projections, and points to the potential impacts on those market projections of possible changes to taxes and other regulations that also affect alcohol consumption in Asia.

2. Expectations from theory

If all products could be traded costlessly around the world, and there were no government interventions such as consumption (excise) or trade taxes or differences in value added tax rates across jurisdictions, then the retail prices of each type of beverage would be identical throughout the world according to a hypothesis by Stigler and Becker (1977). They suggest the key reason then for major differences in alcohol consumption patterns would be differences in per capita incomes. If all beverages were normal goods, this hypothesis suggests we should expect convergence in the aggregate level and mix of alcoholic (or indeed all) beverages consumed as the influence of cultural differences fades and as national average per capita incomes converge across countries.

In reality, costs of trading beverages across national borders are not zero (even though they have declined greatly over the past 150 years), which means countries have tended in the past to concentrate their consumption on those alcoholic beverages that can be produced at lowest cost locally. Hence the dominance of spirits and beer in countries where appropriate grains can be easily grown, and of wine in countries in the 30° to 50° latitude range near moderating maritime weather influences. Nor are excise and import taxes on beverages similar across countries, and they vary greatly across beverage types too (Anderson 2020). Those taxes in some cases are in place to protect local producers, thereby reinforcing climate-induced differences in the mix of beverages consumed. Value-added taxes also vary across countries. Moreover, temperance movements have had different effects on the social acceptability of alcohol consumption at different times in various places (Phillips, 2014, Chs. 10 and 13). So too have concerns about human health: as per capita incomes rise, people can afford to spend more on alcohol consumption but also choose to limit its volume for health reasons (in some cases, switching to soft drinks including bottled water); and some people are also substituting towards (especially still red) wine because of its perceived positive influence on health when drunk in moderation. Given all the above possible influences on beverage consumption patterns, it would not be surprising if convergence in those patterns was not evident in the data.

As for beverage production, beer, distilled spirits and rice wine are easy to brew at home using grain. With income growth and urbanization, however, domestic commercial production in urban centres tends to out-compete home production, including for quality and safety. International trade in those beverages has been minor historically though, because of the high cost (relative to the pre-tax cost of production) of shipping long distances what is predominantly water and glass. Since grain is relatively freely traded globally and beer and

spirits production technologies are well known and easily copied or transferred via foreign direct investment by multinational firms, few countries have a strong comparative advantage in those grain-based beverages. Only in recent decades has that started to change with the highest-income countries seeking higher quality and variety via higher-priced craft beers and spirits, as revealed in the growth of intra-industry trade in those beverages – a tendency that is common for wine (Anderson et al. 2016) and indeed for all normal products (Eaton and Fieler, 2019).³

By contrast, grape-based wine is produced in and exported from mainly those countries best suited to produce nontradable winegrapes. They tend to be located in the non-humid, temperate-climate regions 30°-50° north and south of the equator. That excludes most of Asia, because even northeast Asia tends to have very humid summers, and the rest of Asia is mostly tropical where almost no winegrapes are grown. China is the only significant Asian producer of grape-based wine (4% of the global total) and Japan is next with its grapes accounting for just 0.1% of the world's wine production (Anderson and Pinilla 2020).

3. Data

The national beverage consumption data in this study are sourced from two annual global databases: one that includes wine, beer and spirits volumes and stretches from 2018 back to the 1880s for eleven high-income countries and back to 1961 for all other countries (Anderson and Pinilla (2020) by drawing on Euromonitor International (2019) data), and another that includes wine, beer and spirits average consumer expenditure data compiled for all countries since the turn of the century and for some high-income countries back to the 1950s (Holmes and Anderson, 2017).

The longer time series on volumes consumed (in litres of alcohol or LAL)⁴ from 1961 includes 48 important wine-producing and/or wine-consuming countries plus five residual regions (treated here as five extra 'countries') which together make up the world. That database has a full panel of data for the period 1961 to 2014 apart from Croatia, Georgia, Moldova and Ukraine, data for which became available only after the breakup of the Soviet Union in 1991. The shorter times series (2001 to 2018) draws from Euromonitor International (2016, 2019) for 80 countries plus, again, five residual regions. Those value data are expressed in current US dollars converted from local currencies using each country's annual average nominal exchange rate. The proxy for real per capita disposable

³ The technologies for producing and marketing both beer and distilled spirits are such that these industries have become highly concentrated. According to Euromonitor International, in 2018 the top four beer firms accounted for 49% of the world's beer sales and the top four in spirits accounted for 20% of global sales, whereas the top four wine firms accounted for just 8% of global wine sales. Even so, those multinational firms often produce in the country of consumption, especially for standard beers. As for craft beer, it now accounts for 12% of beer sales in both the US and Belgium and for more than 5% of sales in eight other countries (Euromonitor International 2019). Yet the share of global beer production that is traded across borders had risen only to 8% by 2016-18 (up from less than 3% prior to 1980). For further details, see Intangible Business (2016) for spirits and wine and Swinnen and Briski (2017) for beer.

⁴ The average alcohol content by volume is assumed to be 4.5% for beer, 12% for wine and 40% for distilled spirits. Ready-to-drink spirits mixers are converted to spirits assuming their alcohol content is 5%. Throughout, 'wine' refers to grape wine. Wine from other fruits is very minor in almost all countries. Rice 'wine', which is made in many Asian countries but each under a different name (sake in Japan, mijiu in China, cheongju in Korea, ...), is included in the spirits category: even though rice wine is fermented, it looks like a clear spirit, is brewed differently than beer, and is typically at least 15% alcohol.

income back to 1961 is the Maddison GDP estimates in 1990 International Geary-Khamis dollars.⁵

Import data are from the author's update of Anderson and Pinilla (2020), based on the COMTRADE database (United Nations, 2019). Wine production and consumption data from Anderson and Pinilla (2020) are revised and updated for China, Hong Kong and Japan by Anderson and Harada (2018).

4. Asian alcohol consumption

Rapid economic growth in Asia has drawn attention to developments in its markets for virtually all products, including beverages. According to Euromonitor International data, retail expenditure on each of beer, distilled spirits and grape wine has more than doubled so far this century, as has the overall volume of alcohol consumption. As a result, between 1998 and 2018 Asia's share of global alcohol consumption volume has risen from 31% to 46%, and of retail expenditure from a little over 20% to 34% (Figure 1).⁶

In per capita terms, recorded alcohol consumption in Asia has grown as average incomes have moved from low to middle and higher levels. Partly this results from substitution away from home production that is not officially recorded or taxed, but mostly it is a result of altered preferences as urbanization proceeds and incomes grow. For Asia as a whole, the volume of alcohol consumption has grown less rapidly than real income since 1960, and appears to have plateaued in the most-recent decade (Figures 2 and 3). This too is not unlike in the rest of the world: Holmes and Anderson (2017) find that across their sample of 80 countries, the peak per capita consumption of total alcohol occurs at a real per capita income (in 1990 International Geary-Khamis dollars) of \$16,900, which is just slightly above the average per capita income of Western Europe in 1990. The average per capita income in Asia reached \$16,900 by 2007, but there is a wide range of incomes and populations across countries of the region so it is too early to be able to conclude that consumption per capita of any of beer, spirits or wine has permanently peaked for Asia. One reason not to draw such a conclusion yet is that China (by far the most significant country in the region) introduced an austerity drive at the end of 2012 that caused alcohol consumption volume to temporarily plateau from 2013.

Commensurate with its rise in average income relative to the rest of the world, Asia moved from one-seventh to three-quarters of the rest of the world's average recorded volume of alcohol consumption per capita between 1961-63 and 2016-18, thanks especially to a large rise in China. Over the same period, the beverage mix has altered considerably: the share of spirits in Asia's consumption has fallen from 90% to 70%, beer's share has trebled from 9% to 27%, and wine's has risen five-fold – but only from 0.5% to 2.5%. While the shares of beer and spirits varied considerably between Asian countries in the 1960s, they are more similar now. By contrast, the share of wine was extremely low in all Asian countries in the early 1960s, whereas it is much more varied across Asia now (Table 1). These changes translate to

⁵ The Maddison numbers, from www.ggd.net/maddison/maddison-project/data.htm, have been updated by taking the latest PPP estimates in 2011 dollars from the World Bank's International Comparison Project at <http://icp.worldbank.org> and splicing them to the Maddison series.

⁶ Shares in the volume of global alcohol consumption are higher than value shares because the average price of many alcohols in Asia's developing countries are well below the world average, although this varies depending on, among other things, the taxes imposed on imports and consumption. The average price of beer in China in 2004-06, for example, was one-quarter of the global average, and that of wine and spirits was three-quarters, according to Euromonitor International data.

risers in Asia's shares of the global volume of recorded alcohol consumption from 31% to 67% for spirits, from 4% to 33% for beer, and from 0.1% to 9% for wine.

The region's transition away from a very strong preference for spirits has occurred gradually over the past half-century (Figure 4). In the rest of the world, the preference for spirits has increased, so the two have converged: the volume share of spirits in Asian alcohol consumption was nearly four times the rest of the world's share in 1961-63, but only two-thirds above in 2016-18. Asia's beer and wine shares also have converged on the rest of the world's, but from below. The change in wine's share of total alcohol is particularly striking in that Asia's is rising rapidly whereas the rest of the world's has fallen by nearly two-thirds (middle bolded three rows of Table 1). Within Asia, it is the more affluent economies of Northeast and Southeast Asia where the per capita level of and growth in wine consumption have been greatest (Figure 5).

China overwhelmingly dominates Asia's increase in aggregate wine consumption: it accounted for barely half of Asia's wine consumption in 2000, but in recent years it has accounted for more than three-quarters. Equally populous India, by contrast, had a wine market that is less than one-seventieth the size of China's in 2016-18, notwithstanding its very rapid income growth during the past decade or so. China's reduction in its wine import tariffs when it joined the World Trade Organization at the end of 2001, from 65% to 20% for bulk wine and to 14% for bottled wines, contributed to the surge in its wine imports over the past dozen years – at a time when India has retained its 150% import tariff on wine (and on spirits, and 100% on beer). China's share of global wine consumption has risen from less than 2% prior to 2005 to 7% since 2015. As of 2016-18 it was ranked fifth in the world in terms of overall wine consumption and only a percentage point behind 4th-ranked Germany.

The convergence in the beverage mix of Asian countries is captured in an index of similarity with the global alcohol mix. The index ranges from 0 to 1 and gets closer to 1 over time if a country's mix is converging on the global mix.⁷ Table 3 shows that such convergence has been happening most for China, Taiwan and Thailand but least for Hong Kong, Japan and Korea.

5. Asia's imports of alcohol

The consumption of beer and spirits in Asian countries has been mostly supplied by domestic production. A little bit of intra-industry trade occurs, and increasingly so in recent years, but generally net imports of both of those beverages, compared with levels of domestic consumption, have been very minor (2% for beer, 4% for spirits in 2015-17). By contrast, apart from China, almost all grape-based wine consumption in Asia is supplied by imports. Hence Asia's wine imports are far more important to wine-exporting countries than might be

⁷ The index uses vector representation to project combinations of variables with lengths determined by the shares of wine, beer and spirits in a country's total alcohol consumption volume. The vector f_{im} is the fraction of beer, wine or spirits consumption in the national alcohol consumption volume in country i , such that these three fractions are between 0 and 1 and sum to 1. The index is defined as:

$$\omega_{ij} = \frac{\sum_{m=1}^M f_{im} f_{jm}}{\left(\sum_{m=1}^M f_{im}^2 \right)^{1/2} \left(\sum_{m=1}^M f_{jm}^2 \right)^{1/2}}$$

where $i = 1, \dots, 53$ countries/country groups spanning the world, $j = 1, \dots, 53$ countries/country groups, and $m = 1, 2, 3$ beverages corresponding to wine, beer and spirits and so $M = 3$. This makes it possible to indicate the degree of beverage mix "similarity" of any country relative to any other country or the average for the world. The denominator normalizes the measure to unity when f_i and f_j are identical. Hence, $0 < \omega_{ij} < 1$, and ω_{ij} will be closer to zero for countries with little similarity in their beverage mix to the world average.

suggested by the small share of wine in Asian alcohol consumption or of Asia in global wine consumption. Indeed since early this century, the value of Asia's wine imports net of its exports exceed Asia's net imports of either beer or spirits (Figure 6).⁸

When Asia's net imports are expressed as a share of global imports, since 1995 it has varied between 0% to 5% for beer volumes and values, and from 2% to 8% for spirits volumes and a little higher for values of spirits.

Asia's shares of global imports of wine, however, have grown dramatically: in volume terms from 1% in the mid-1980s to 3% in the mid-1990s and 11% in 2017-18, and double those shares in US\$ value terms, from 2% to 6% and 21%, respectively. If intra-EU trade is excluded, Asia's share of the world's wine import value is now close to half. This rapid emergence of Asia onto the global wine trade scene is thus worthy of closer attention.

6. Asia's wine production and import growth

Prior to this century (and leaving aside the cradle of wine regions within the former Soviet Union), grape wine was consumed only by Asia's elite, and produced only in tiny quantities and mostly in just Japan and – from the late 1980s – China.⁹ However, as is clear from Section 4 above, income growth and a preference swing towards this traditional European product has changed the consumption situation dramatically.

China is the only Asian country that has been able to significantly expand its area of winegrapes and volume of wine production in response to that rapidly emerging demand. By 2012 it was the world's 5th largest producer of grape wine, up from 17th as recently as 2000.¹⁰ But after 2012 China's wine production growth reversed as some new producers left the industry, so that by 2018 China was ranked 10th in world wine production. That decline in competitiveness was not immediately accompanied by increased wine imports though, because the Chinese leadership introduced austerity and anti-corruption measures from December 2012 that dampened high-quality banquets and gift-giving.¹¹ China's wine import growth returned during 2014-17, but dipped again from 2018, presumably in part as a consequence of the confidence-sapping trade war between the US and China. China's self-sufficiency in wine, measured in volume terms as domestic production as a percent of consumption, fell from its average of above 80% up to 2010 to below 50% in 2018 (Figure 7).

⁸ Net imports of wine are a more useful indicator than gross imports because of the non-trivial entrepôt role of Singapore and Hong Kong.

⁹ Wine production from *Vitis vinifera* grapes began in China more than two millennia ago, having been introduced from Central Asia before 200BC. But wine would have been only for the ruling elite's pleasure (Huang 2000, pp. 240-46; McGovern 2003, 2009). There have been commercial wineries in China since the mid-19th century (Li 2015), but significant production got under way only in the 1990s. It took until June 2004 before a regulation was introduced in China to define wine as being made only from fresh grapes or grape juice.

¹⁰ China is also the world's largest producer of table grapes, with a share exceeding one-third. Its total vineyard area surpassed that of France in 2014, at 799,000 hectares compared with France's 758,000, making it 2nd only to Spain's 931,000 hectares (OIV 2019). Care is needed with wine production data for China, since much of the 'domestic' wine sold is a blend of Chinese and imported bulk wine and so overstates the production from Chinese grapes. Anderson and Harada (2018) have corrected for that and their estimates are used here, which is why they are somewhat lower than the FAO and OIV official wine production data, particularly in decades prior to the present one when the share of bulk wine in imports was much larger.

¹¹ The Chinese Government's austerity drive from 2013, which discouraged consumption of expensive wines and other luxuries, had much less influence on lower-quality wines, which in China are by far the most voluminous. Fluctuating tolerance for excessive alcohol consumption is an abiding theme in China's long history (Sterckx, 2015).

A comparison of Figures 8(a) and 8(b) makes clear that China alone represents most of Asia's grape and wine production¹² and around two-thirds of the volume and half of the value of Asia's wine imports in 2018, while Figure 9 shows that it is since 2009 that China has overwhelmingly dominated Asia's overall value of wine imports (net of exports) and its growth.¹³

East Asia has attracted the attention of wine exporters not only because of the volume growth in imports but also because – unusually for developing countries – those imports include high-quality wines. The average US\$ price of Asia's wine imports has remained close to double the world average even in the decade from the mid-1990s when China chose to import mostly low-priced bulk wine. Over the past three decades, Singapore's import price was more than four times the world average. Furthermore, shortly after removing its tariff on wine imports in February 2008, Hong Kong's average import price rose above Singapore's as Chinese buyers expanded their imports of now-cheaper fine wines (Figure 10). Within the decade since that liberalization, Hong Kong has become the world's most important market for ultra-premium and iconic wines.¹⁴

China's import volume and value shares grew steadily over the decade to 2006, but then accelerated once China began importing more ultra-premium wines for gift-giving and banqueting. A love affair with Bordeaux wines in particular led to a documentary film in 2013 (*Red Obsession*, directed by Warwick Ross) and a spate of books on the phenomenon (e.g., Mustacich 2015).

Since the mid-1990s China has imported a lot of low-priced wine in bulk (whereas most imports by the rest of developing Asia are in bottle), which it would often blend with wine made from Chinese grapes. This was legally possible because national labeling laws, at least up until new regulations came into effect in 2004, were such that a bottle marked 'Product of China' could have as little as 10% local content. Prior to 2008 the average price of those bulk imports was between 60 and 70 US cents per litre. Low as that price is, the quality of those imports may still have been above that of the local product with which it was being blended. However, between then and 2013 the bulk wine import unit value averaged close to US\$1/litre, rising well above the average price in the rest of the world. Over that same period the share of bulk wine in the total volume imported by China fell from more than two-thirds to just one-fifth. That contrasts greatly with the trend elsewhere in the world, where bulk wine has accounted for between 35% and 40% of wine import volumes (Figure 11). However, the annual volume of China's bulk wine imports remained roughly the same between 2007 and 2017, at around 120 million litres.

¹² Official data suggest Japan also is a significant wine producer, but Anderson and Harada (2018) reveal that most of the wine 'produced' on the east coast of Japan is based on unfermented grape juice concentrate that is imported and converted to alcoholic wine simply by adding sugar and water, while another fraction simply involves packaging imported bulk wine. A new law ensures that from October 2018 such wines will no longer be allowed to be labelled 'Product of Japan', a term that is now preserved only for wine made using 100% Japanese grapes. Since 2000, the share of Japan's wine consumption that is produced from Japanese winegrapes has averaged less than 6%.

¹³ An average of 40% of the volume of Hong Kong's wine imports over the period 2010-18 were re-exported, mostly to China, hence the depiction of net imports. During that period Hong Kong's (gross) wine imports averaged 12% of the volume and 70% of the value of China's wine imports. Singapore is the biggest Asian importer not shown separately in Figure 9. During 1990-2007 the value of Singapore's net wine imports averaged almost the same as Hong Kong's, but in 2008-18, following Hong Kong's abolition of wine import tariffs, Singapore's average annual value has averaged just 15% of Hong Kong's.

¹⁴ Some of those purchases are by mainland Chinese buyers who choose to store them in Hong Kong. Their caution in spending after 2012 may explain the temporary plateauing of imports by Hong Kong, before they returned to slower growth after 2015. It is unclear whether those imports will remain in Hong Kong as an investment until they are consumed there or re-sold, or will be eventually re-exported for consumption in China.

The volatility in the quality of wine imported by China is reflected also in rapidly changing shares of various supplying countries in China's volume and value of wine imports. Nonetheless, just six wine-exporting countries have dominated that trade over the past decade. France has been ranked first in both value and volume terms and Australia second in value terms but in 2011-13 was equal third with Spain in volume terms before returning to 2nd place in 2018. Chile has been ranked third in value terms but second in volume terms. The other two exporting countries, Italy and the United States, have had considerably smaller shares than the top four (Table 3(a)). Initial indications in the Global Trade Atlas are that in the first half of 2019, imports by China from not only the United States but also France have slumped and Australia has taken first place in value terms and Chile has taken first place in volume terms.

One contributor to the changing shares of partners in China's imports is preferential tariffs: both Australia and Chile have signed free trade agreements with China in the past decade and now have duty-free access to its wine market. Another contributor is volatility in the shares of each of those wine-exporting countries in global wine exports. To net out that latter effect, it is helpful to calculate the trade intensity index, defined as the share of China's imports from wine-exporting country *i* divided by country *i*'s share of global wine exports. Those ratios, reported in Table 3(b), reveal that while France has had an above-average intensity of trade with China (index >1), the most-intense relationship in value terms is with Australia and in volume terms is with Chile. The United States' index was close to 1 until the bilateral trade war started in 2017-18, Spain's is between one-half and three-quarters, but Italy (and the rest-of-the-world group) have trade intensity indexes well below one-half.

7. What lies ahead?

Since Asia is currently consuming less than half the per capita volume of alcohol consumed in the rest of the world (Table 1), its consumption is expected to keep rising as its economic growth continues. While its mix of alcohols is now much closer to the world average than it was in earlier decades (Figure 4(b)), the share of grape wine in that mix is still very low. A key question in contemplating future market growth is the speed and extent to which wine consumption will continue to increase in Asia.

A glance at evidence from Western European countries that are net importers of wine is instructive. The bottom part of Table 1 reveals that only a very small share of their alcohol consumption was accounted for by wine in the early 1960s. By 2016-18, though, wine accounted for around one-third of their alcohol consumption. That is, there are plenty of precedents for a rapid preference shift toward wine for countries in which wine historically has been an exotic beverage. Figure 12(a) shows those European countries' levels of wine per capita consumption mapped against their per capita income. A similar mapping for Asia, using the same scales, is provided in Figure 12(b). Clearly there is a great deal of scope for Asian wine consumption to grow and to emulate the convergence toward the global alcohol mix as has been happening in Western Europe and elsewhere (Holmes and Anderson 2017; Bentzen and Smith 2018).

To get a sense of what might happen to alcohol consumption in Asia relative to the rest of the world, a recently built model of the world's alcoholic beverage markets is drawn on here. The model has been developed by Wittwer and Anderson (2019). It draws on a model of the world's wine markets first published by Wittwer, Berger and Anderson (2003), to which beer and spirits now have been added. In it, wine markets have been disaggregated into four types, namely non-premium (including bulk), commercial-premium, and super-premium

(including iconic) still wines, plus sparkling wine.¹⁵ There are two types of grapes, premium and non-premium. Non-premium wine uses non-premium grapes exclusively, super-premium and iconic wines use premium grapes exclusively, and commercial-premium and sparkling wines use both types of grapes. Beer and spirits are not split into regular and craft categories, because the latter still involve very small shares of the former in volume terms in both cases. The world is divided into 44 individual nations and 7 composite regions.

The model's database is calibrated initially to 2016-18, based on the comprehensive volume and value data and trade and excise tax data in Anderson and Pinilla (2020) and Anderson (2020). The model has been projected forward to 2025, based on anticipated growth in aggregate national household consumption (a measure of real disposable income) and population together with anticipated changes in real exchange rates that are reported in Appendix Table 1, plus a number of additional assumptions concerning trends in consumer preferences, production, technologies, and capital stocks.

Concerning preferences, there is assumed to be a considerable swing towards all wine types in China, as more Chinese earn middle-class incomes. For the rest of the world, the long trend preference swing away from non-premium wines and toward commercial and super-premium wines is assumed to continue.

Both grape and wine industry total factor productivity is assumed to grow at 1 percent per year everywhere, while grape and wine industry capital is assumed to not grow net of depreciation. China's production is assumed to rise by one-fifth above its 2016 level, so well above its slumped 2018 level. Of course if China's wine production from domestic grapes were to return to more-rapid growth, its wine imports would increase less than projected below.

This global model has supply and demand equations and hence quantities and prices for each of the grape and wine products and for beer and spirits, plus for a single composite of all other products in each country such that it has elements of an economywide CGE model. Grapes are assumed to be not traded internationally, but other products are both exported and imported. Each market is assumed to have cleared before any exogenously introduced shock to the baseline projection of 2025, and to find a new market-clearing outcome following each shock. The inclusion of exchange rate variables explicitly in the model enables a distinction between price impacts as observed in local currency units from those observed in US dollars. All prices are expressed in real (2017) US terms.

Given the uncertainty associated with economic growth in developing Asia due to the US-China trade war, an alternative scenario to the baseline projection to 2025 assumes their aggregate household incomes grow at only two-thirds of the rates shown in column 1 of Appendix Table 1. Comparing the results from this alternative scenario with those of the baseline for 2025 exposes the sensitivity of the model to changes in one of the key assumptions, namely per capita income growth.

Just two sets of results are presented here, to show the growing importance of Asia in global beverage consumption and imports. (More-detailed results are available in Wittwer and Anderson (2019)). Figure 13 suggests if national incomes, populations and real exchange rates change as in the baseline case (Appendix Table 1), then by 2025 China's shares of global beverage consumption are projected to be 1.7 percentage points higher for wine, 2.7 points higher for beer and 2.1 points higher for spirits than in 2016-18. The shares for the rest of Asia would be up too, but only by about 0.5 of a percentage point. Africa also is projected to raise its share of global wine consumption, but only very slightly. By contrast, shares of

¹⁵ Commercial-premium still wines are defined by Anderson, Nelgen and Pinilla (2017) to be those between US\$2.50 and \$7.50 per litre pre-tax at a country's border or wholesale.

countries in Europe, North America and Latin America are projected to be lower in 2025 than in 2016-18, especially Europe's share of wine consumption.

Projected changes in the shares of the global value of imports of wine are shown in Figure 14. Again China stands out, suggesting that its domestic wine production continues to grow slower than its wine consumption: its share of global wine import value rises by 2.6 percentage points between 2016-18 and 2025 in the baseline scenario, and the rest of Asia's rises by 0.5 percentage points. If developing Asia's economies were to grow only two-thirds as fast over this period though, the Asian shares would rise by less than half as much. Africa is the only other region projected to enjoy substantial growth in its share of world wine imports, while Europe is the region whose share is projected to fall, by about 3 percentage points for Western Europe and half a percentage point for Eastern Europe.

8. Summary and conclusions

The findings in this paper can be summarized as follows:

- Alcohol consumption has been growing more rapidly in Asia than in the rest of the world, more than doubling since 1998 and raising the region's share of global alcohol expenditure from one-fifth to one-third;
- Between the early 1960s and 2016-18, Asia's per capita volume of recorded alcohol consumption has risen from one-quarter to two-thirds of the global average;
- Over the same period Asia's shares of the global volume of consumption have grown fastest for wine but from a very low base (from 0.1% to 9%), and slowest for spirits but from a very high base (from 31% to 67%, compared with beer's rise from 4% to 33%), such that Asia's mix of alcohol consumption has converged on the global average mix;
- Wine's share of alcohol consumption in Asia is rising in all Asian economies, but has yet to reach 4% in any of them;
- Within Asia it is the more affluent economies of East Asia where the per capita level of and growth in wine consumption is greatest;
- China is dominating the growth in Asia's total wine consumption, raising its share from half in 2000 to more than three-quarters in 2018 – while India's wine consumption remains less than one-seventieth that of China's;
- Asia's winegrape production is limited mostly to China, where wine production has been expanding slower than wine consumption and has recently declined;
- Imports account in volume terms for barely 2% of Asia's beer consumption and 4% of its spirits consumption, but for almost 100% of its wine consumption (except in China where it had slumped to 40% by 2018 and Japan where it has averaged 6%), such that the annual value of Asia's wine imports now exceeds that of spirits or beer imports;
- The average price of Asia's wine imports is about twice the global average;
- China dominates Asia's wine imports, accounting for two-thirds of its volume and half its value in 2018;
- France and Australia are the leading exporters of wine to China in value terms, with Chile and occasionally Spain also being important in volume terms;
- Bilateral free trade agreements have influenced the sources of Asia's wine imports over recent years;
- China's shares of global consumption of all three alcohols are projected to be around 2 percentage points higher in 2025 than in 2016-18, and the rest of Asia's about half a percentage point higher;

- However, if incomes in developing Asia during 2016-18 to 2025 were to grow only two-thirds as fast as in the baseline projection, Asia's wine imports would be less than half as large.

While the recent and projected rates of increase in per capita wine consumption in China slower than what occurred in several northwestern European countries in earlier decades, it is the sheer size of China's adult population of 1.1 billion – and the fact that grape wine still accounts for less than 4% of Chinese alcohol consumption – that makes this import growth opportunity unprecedented. It would be somewhat less if China's own winegrape production increases faster than currently expected, but that is unlikely to be able to reduce the growth in China's wine imports very much this decade, especially at the super-premium end of the quality spectrum. Of course slower income growth in Asia than assumed in the baseline projection would dampen growth in wine (and many other) imports.

Projections are not predictions. How exchange rates move, and how fast various countries' wine producers take advantage of the projected market growth opportunities in Asia, will be additional key determinants of the actual changes in market shares over the coming years. So will any future bilateral and regional free trade agreements. Should the EU sign an FTA with China, for example, Europe's dominance in China's wine imports may increase, as also in Japan following the signing in December 2017 of the EU-Japan Economic Partnership agreement (Anderson and Wittwer 2018). Also important are taxes and other regulations on alcohol consumption (Anderson, Meloni and Swinnen 2018; Anderson 2020). India potentially could be much more important as an importer of beverages, but very high internal and external trade restrictions and excise taxes on alcohol have to date greatly confined the growth in sales in that populous country. Over the much longer term, climate change will alter the location of winegrape growing, with northern China, Japan and Korea (and Canada and northern European countries) likely to gradually become larger producers in the decades ahead (Morales-Castilla et al. 2020). Home-country bias might then lead also to greater wine consumption in that part of Asia.

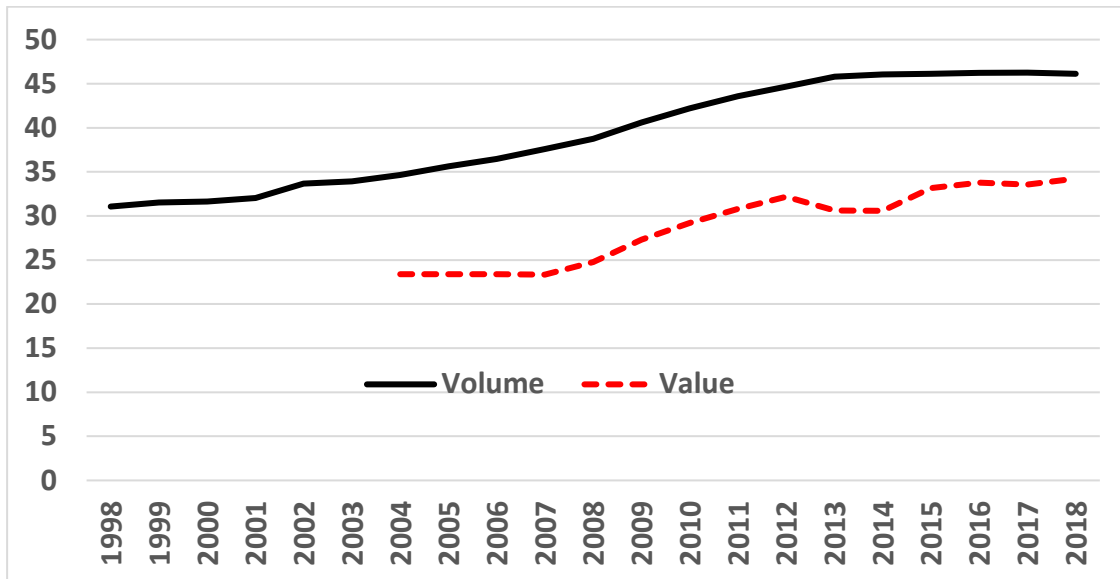
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Figure 1: Asia's share of global alcohol consumption volume and expenditure, Asia, 1998 to 2018

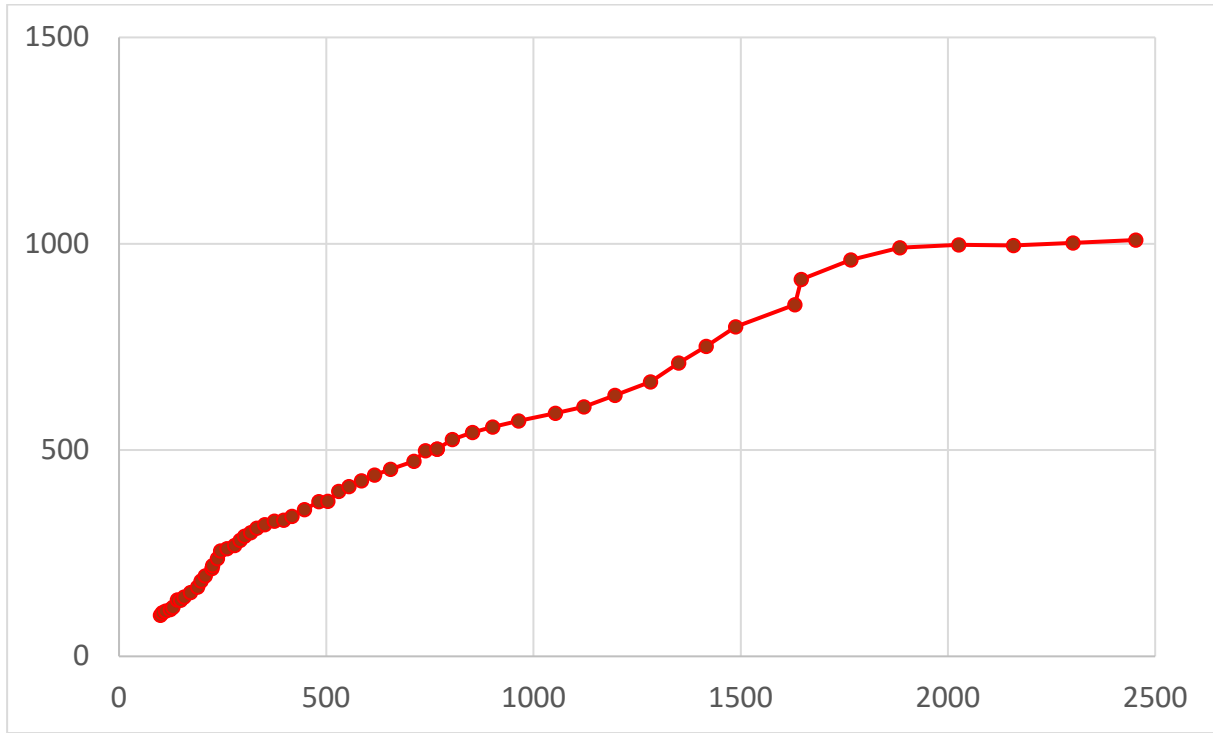
(%)



Source: Author's compilation from Euromonitor International (2019) and Anderson and Pinilla (2020)

Figure 2: Indexes of volume of alcohol consumption (vertical axis) against real gross national income (horizontal axis), 1961 to 2017

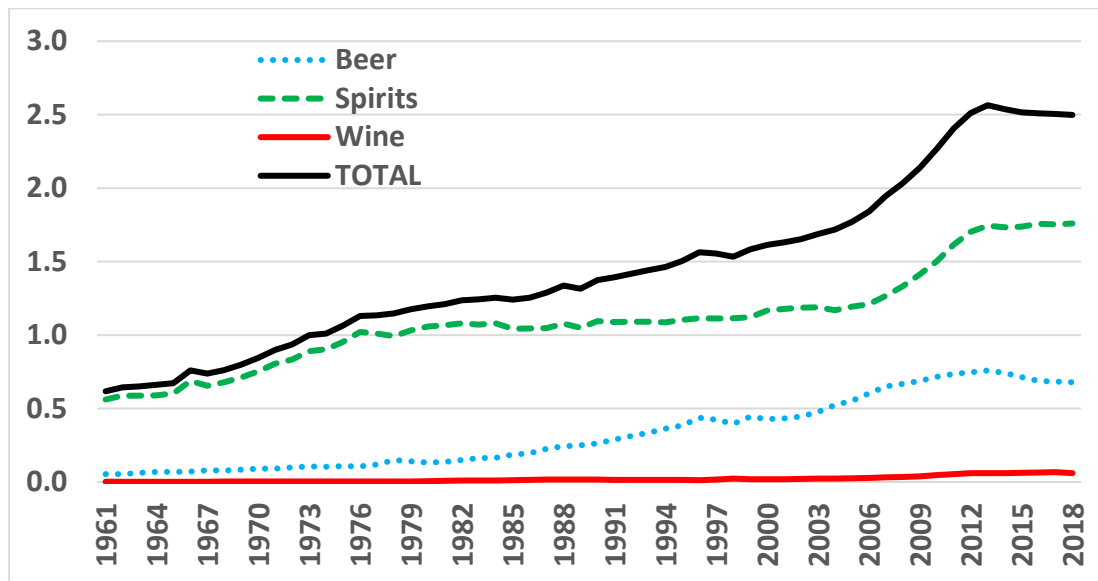
(1961 = 100)



Source: Based on data in Anderson and Pinilla (2020).

Figure 3: Per capita consumption of beer, spirits, wine and all alcohol, Asia, 1961 to 2018

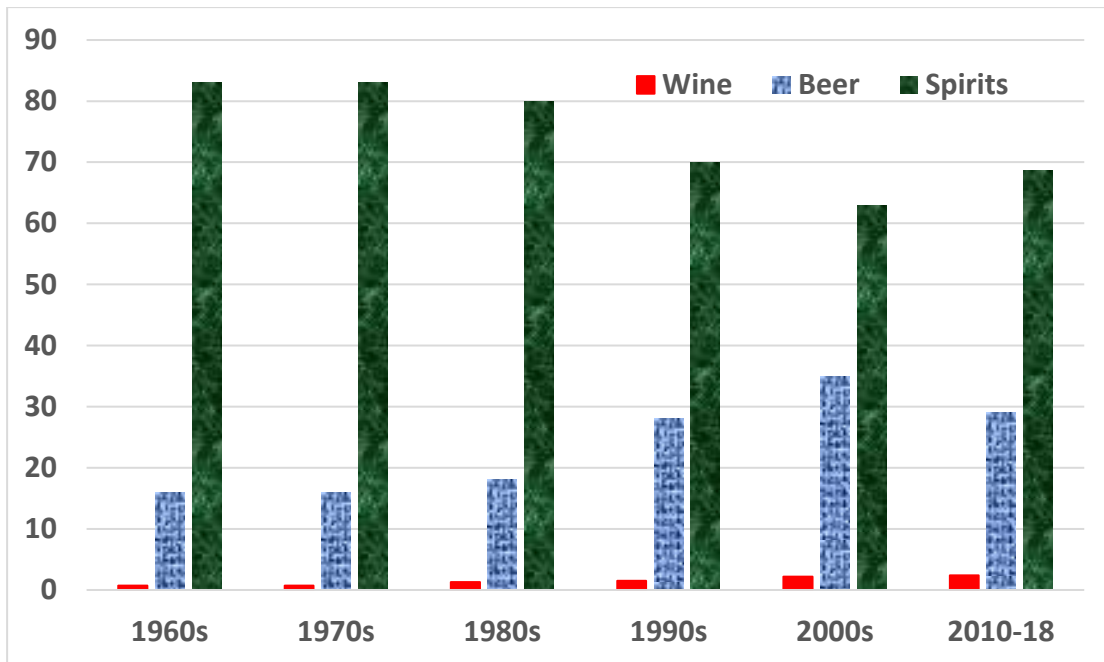
(litres of alcohol)



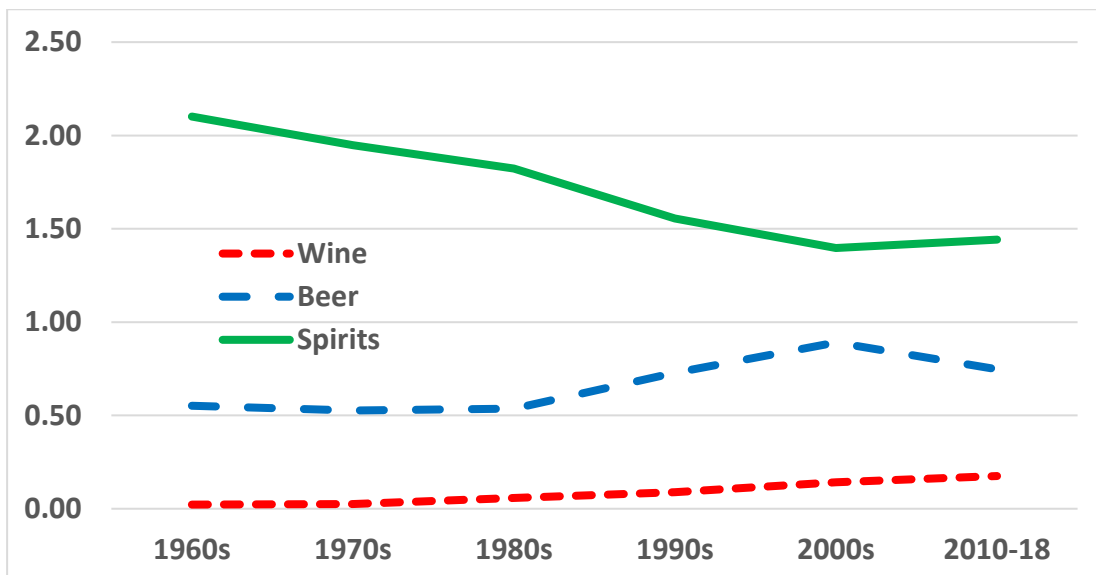
Source: Based on data in Anderson and Pinilla (2020).

Figure 4: Shares of consumption of beer, spirits and wine in the total volume of Asia's alcohol consumption and index of intensity of Asian alcohol consumption,^a 1961 to 2018

(a) Beverage shares in total volume of alcohol consumption in Asia (%)



(b) Asia's index of intensity of alcohol consumption volume, relative to global average (world = 1.00)

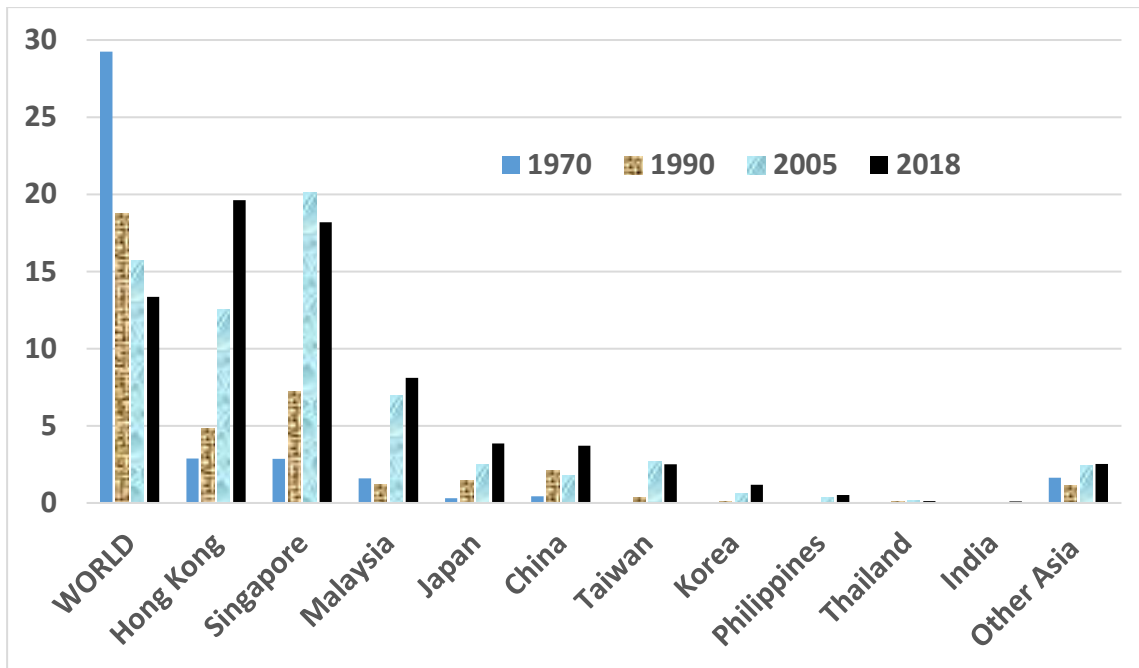


^a The index of intensity of alcohol consumption is the share of a beverage in total alcohol consumption for the region divided by that beverage's share for the world.

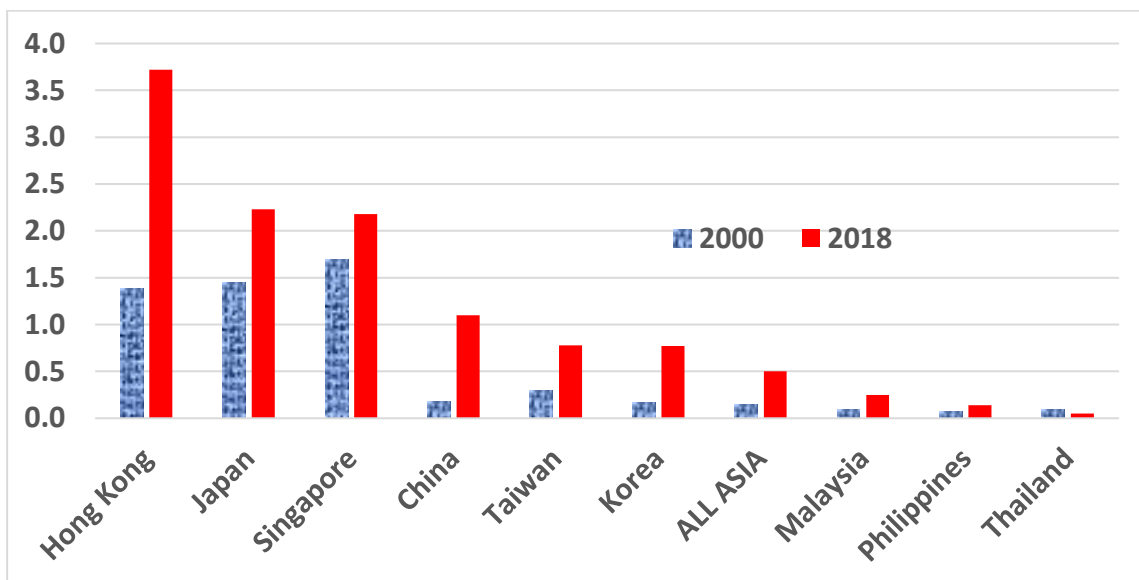
Source: Based on data in Anderson and Pinilla (2020).

Figure 5: Wine's share of national alcohol consumption and wine per capita consumption, by volume, key East Asian economies, 1970 to 2018

(a) Wine's share of national alcohol consumption (%)



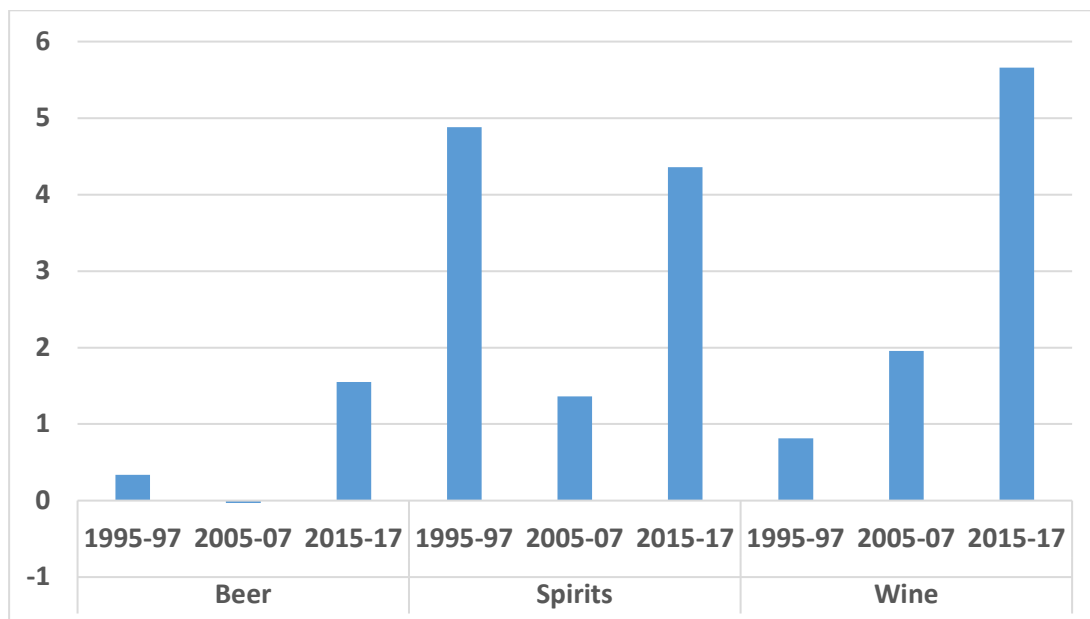
(b) Wine per capita consumption (litres)



Source: Based on data in Anderson and Pinilla (2020).

Figure 6: Value of net imports of beer, spirits and wine, Asia, 1995 to 2017

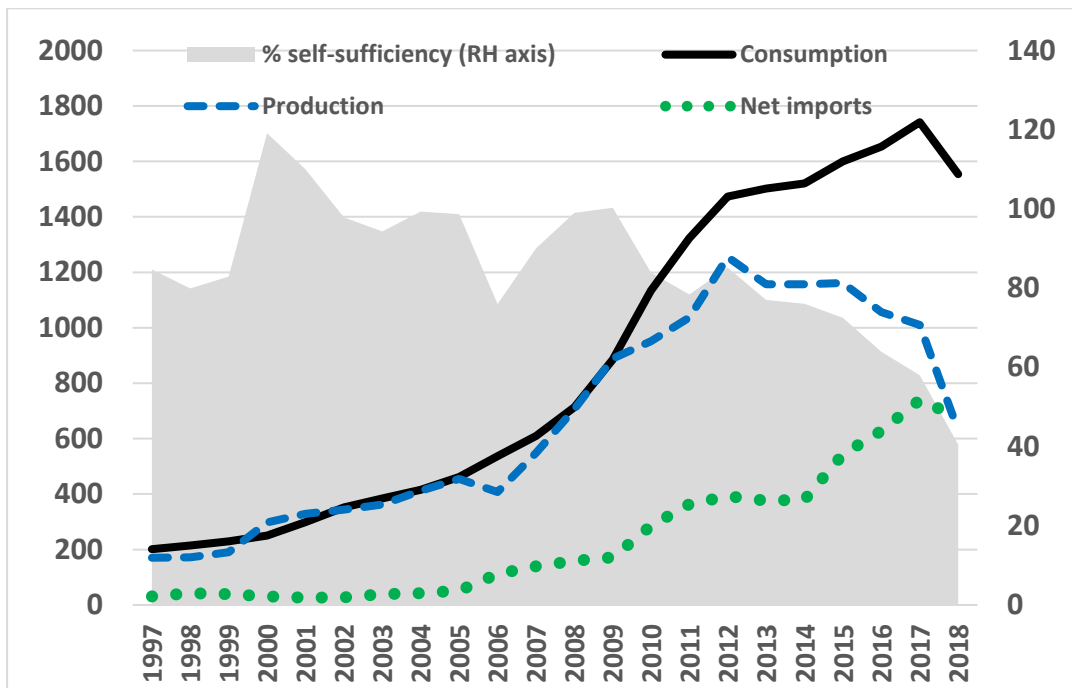
(US\$ billion)



Source: United Nations (2019).

Figure 7: Volume of China's wine production, consumption and net imports, and wine self-sufficiency,^a 1997 to 2018

(ML and %)



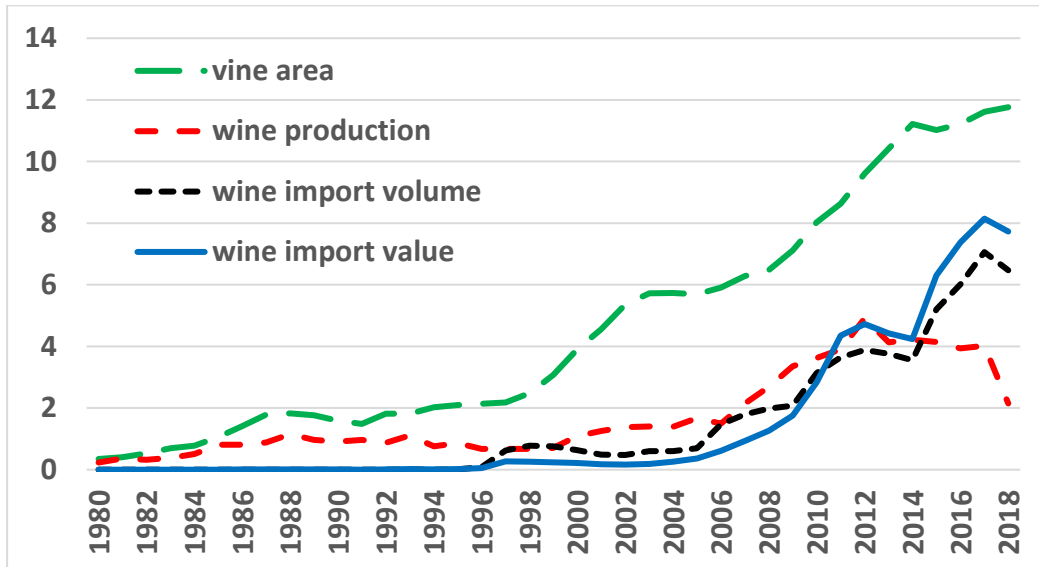
^a Defined as production as a % of consumption volume

Source: Based on data updated in Anderson and Pinilla (2020).

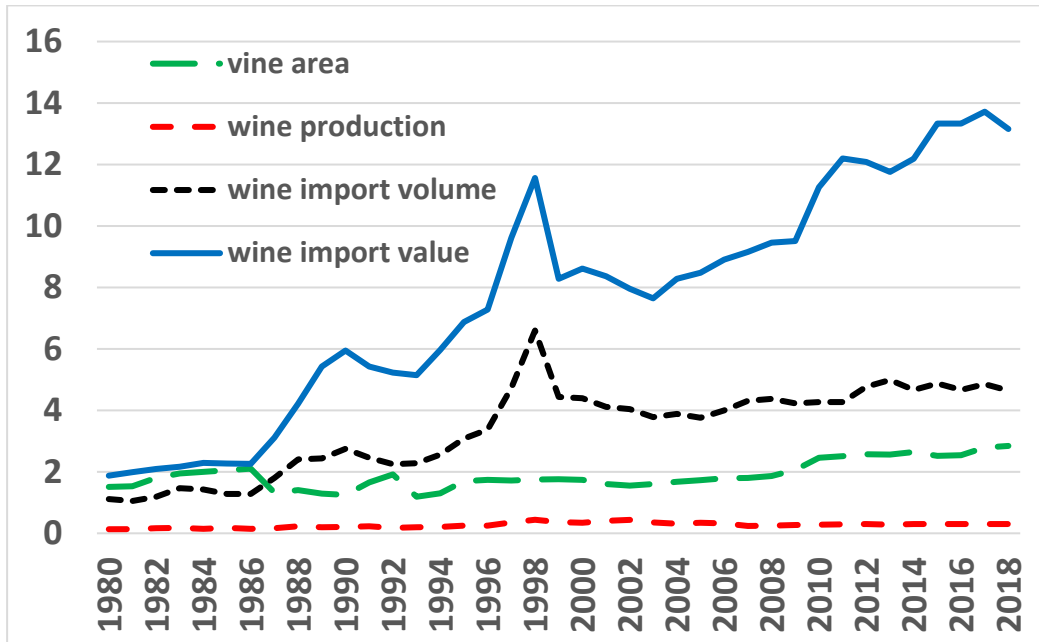
Figure 8: Shares of China and other Asian countries in global vine bearing area, wine production volume, and the volume and value of wine imports, 1980 to 2018

(%)

(a) China

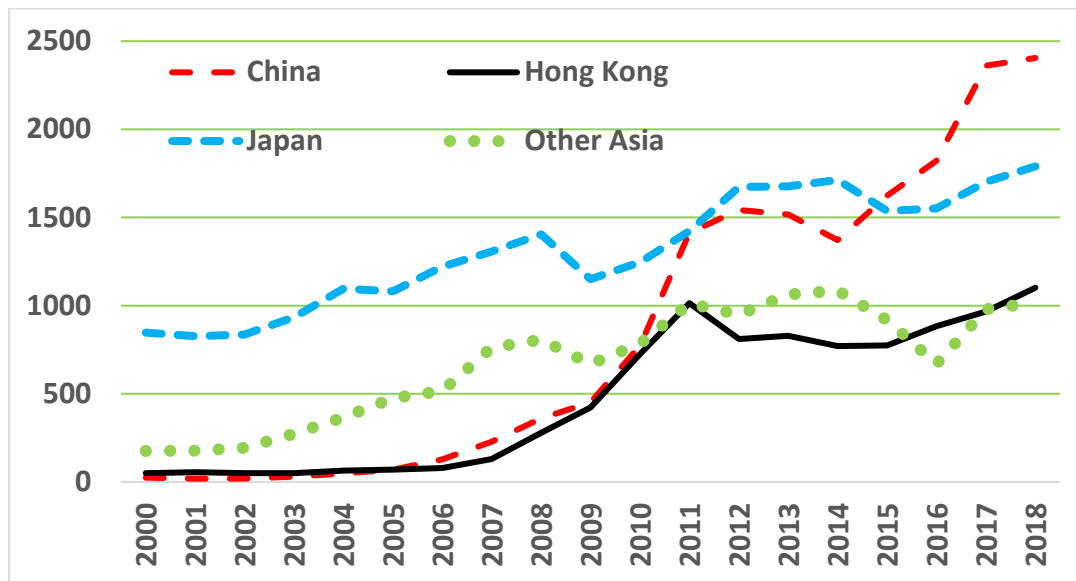


(b) Asia excluding China



Source: Based on data in Anderson and Pinilla (2020).

Figure 9: Value of net imports of wine, China, Hong Kong, Japan^a and other Asian economies, 2000 to 2018
(current US\$ million)



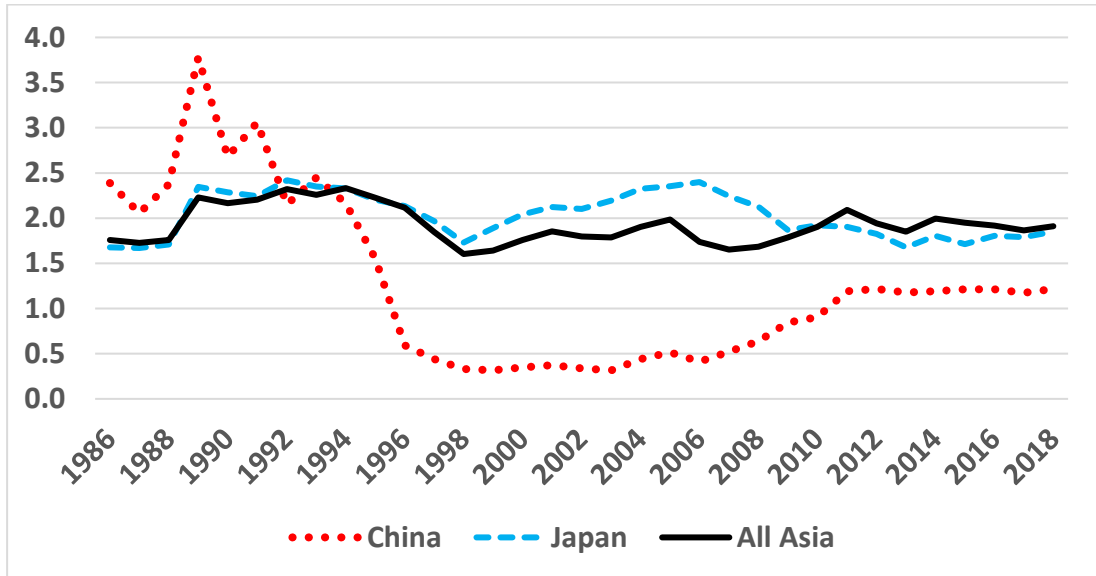
^a For Japan, imports of unfermented grape juice are included, which is mostly converted into basic wine. It adds about 6% to the value of Japan's wine imports.

Source: Based on data in Anderson and Pinilla (2020).

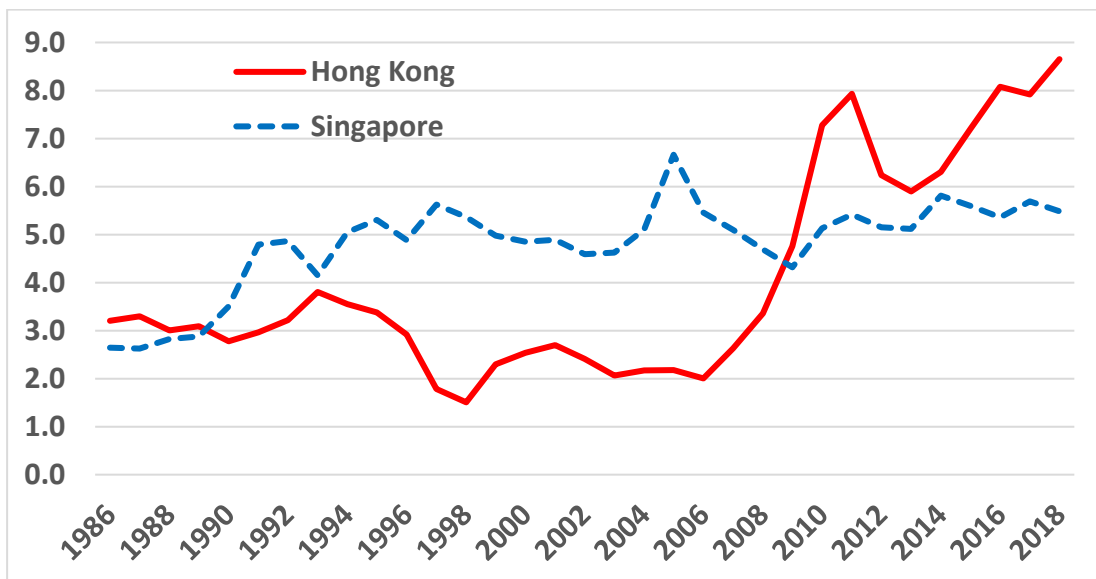
Figure 10: Asian average prices of wine imports relative to the global average import price, 1986 to 2018

(world = 1)

(a) China, Japan and all Asia



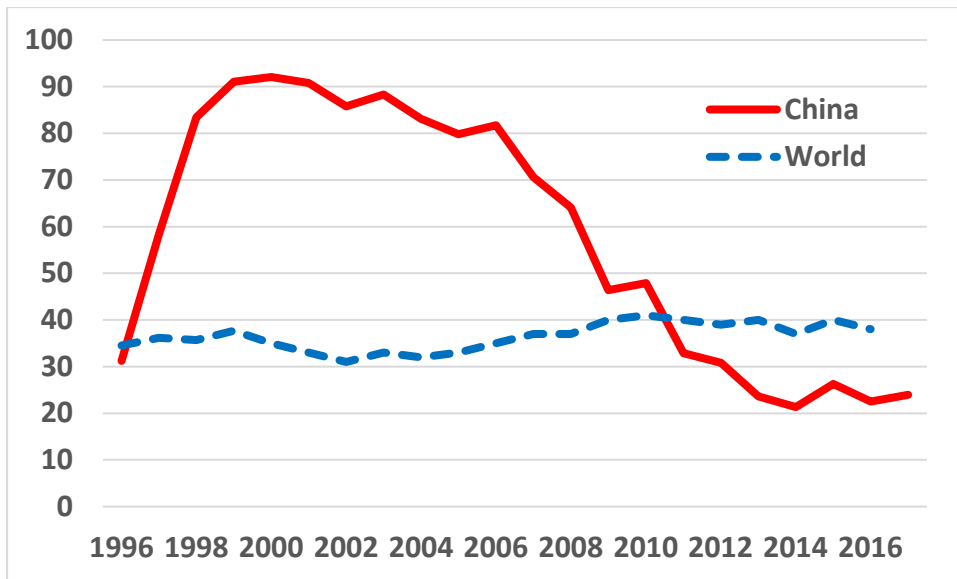
(b) Hong Kong and Singapore



Source: Based on data in Anderson and Pinilla (2020).

Figure 11: Share of bulk wine in the volume of wine imports of China and the world, 1996 to 2017

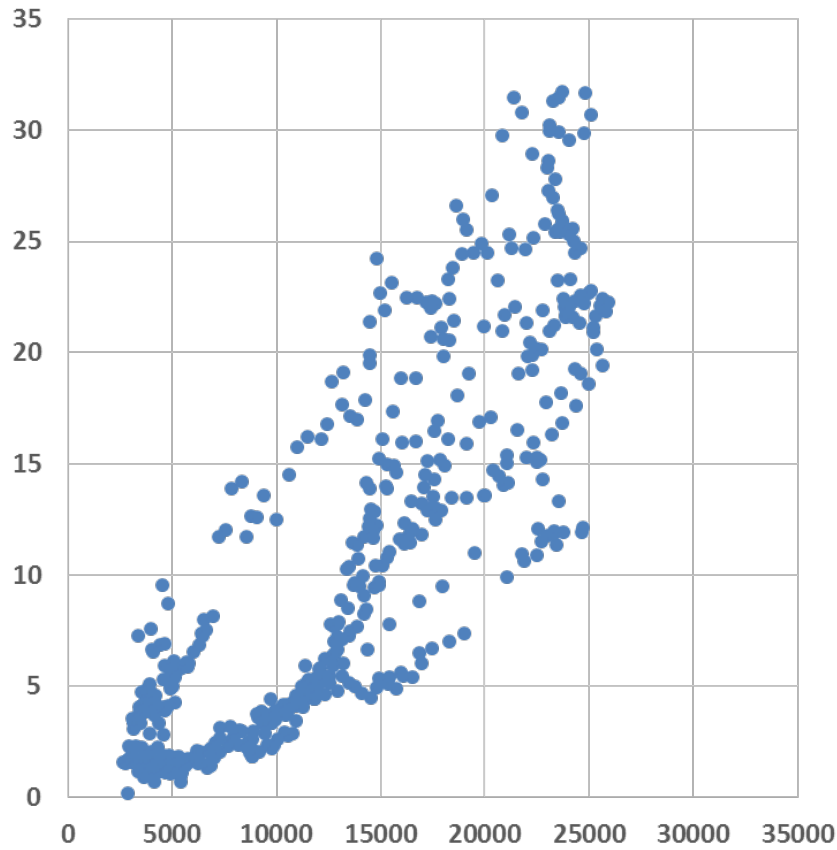
(%)



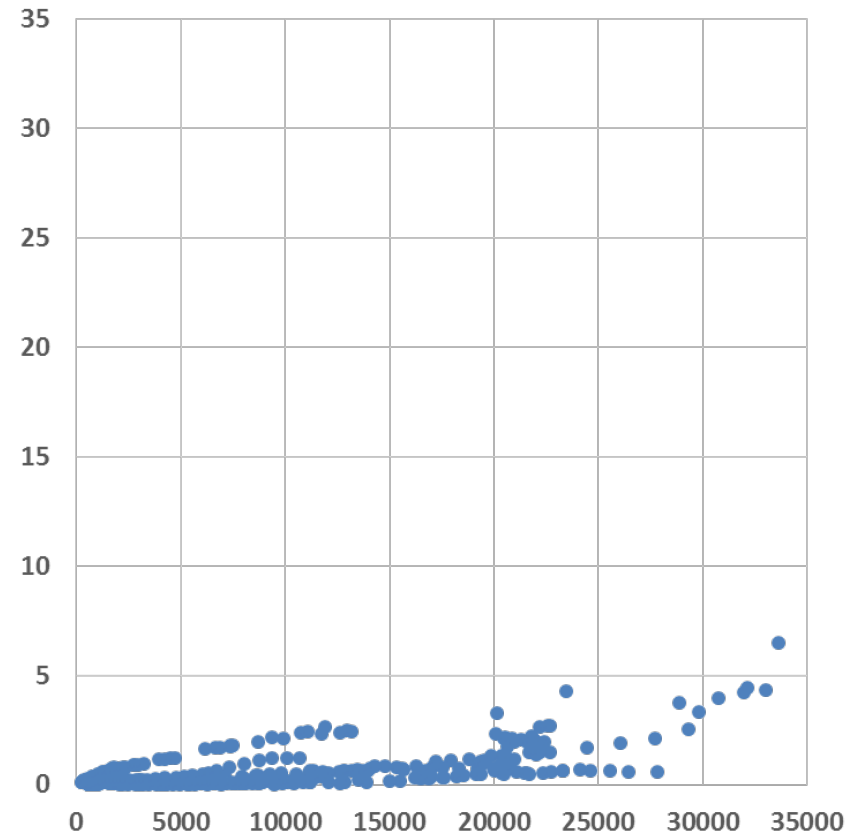
Source: United Nations (2019).

Figure 12: Relationship between real GDP per capita (horizontal axis in 1990 US\$) and wine consumption per capita (vertical axis in litres), 1961 to 2014

(a) Europe's net-wine-importing countries



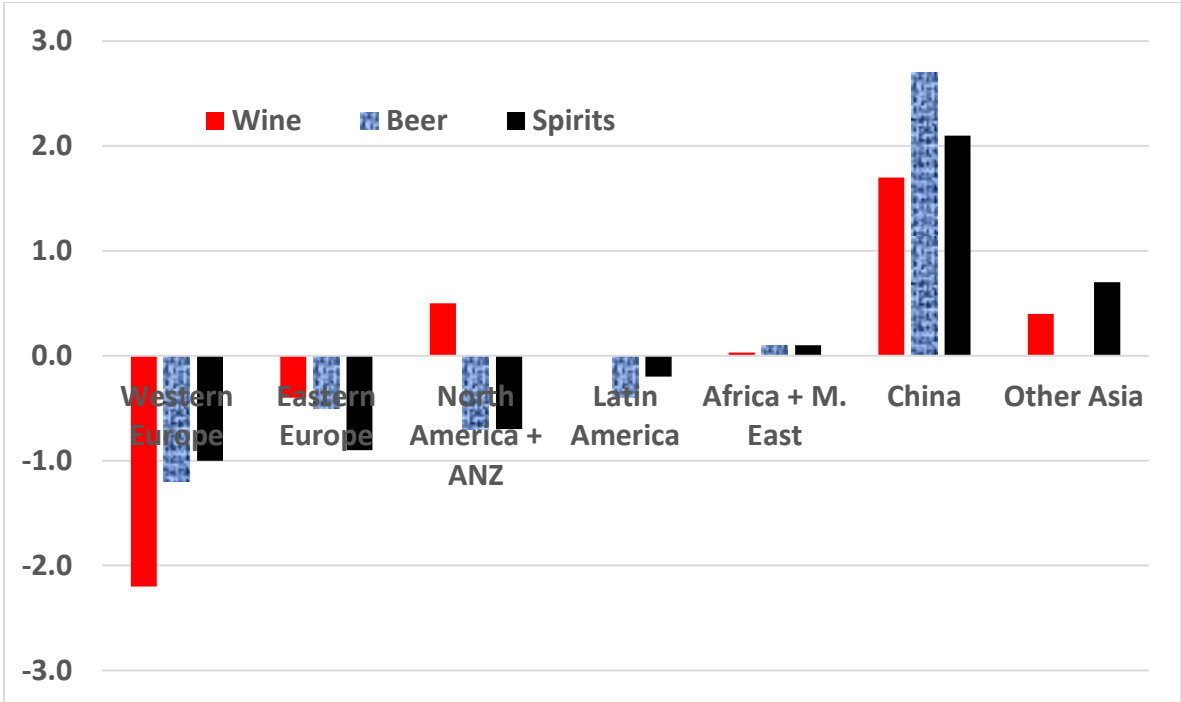
(b) Asian economies



Source: Derived from data in Anderson and Pinilla (2020).

Figure 13: Projected changes in regional^a shares of the global volume of consumption of wine, beer and spirits, 2016-18 to 2025

(percentage points)

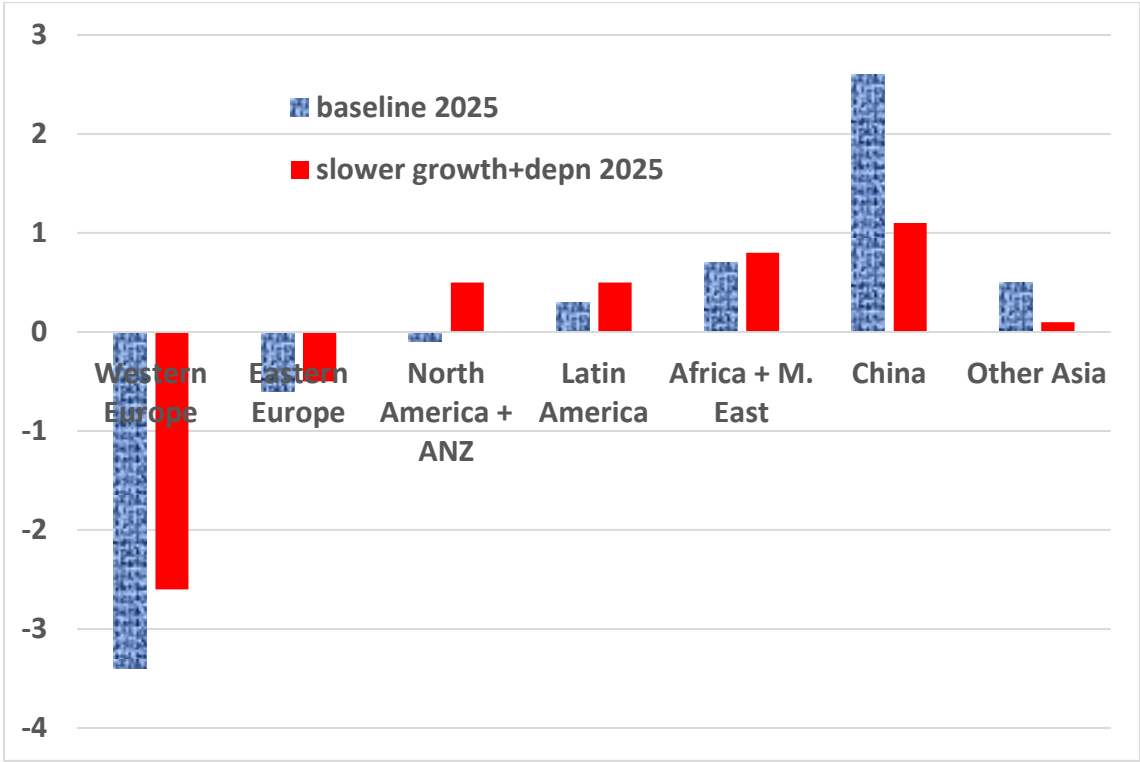


^a ANZ is Australia and New Zealand, M. East is the Middle East.

Source: Wittwer and Anderson (2019).

Figure 14: Projected changes in regional^a shares of the real value of global wine imports, 2016-18 to 2025

(percentage points)



^a ANZ is Australia and New Zealand, M. East is the Middle East.

Source: Wittwer and Anderson (2019).

Table 1: Recorded alcohol per capita consumption volume and shares of wine, beer and spirits in the total volume of alcohol consumption,^a Asia and the world, 1961-63 and 2016-18 (LAL and %)

	Consm (LAL/capita) ^a		1961-63 (%) ^b			2016-18 (%) ^b		
	1961-63	2016-18	Wine	Beer	Spirits	Wine	Beer	Spirits
China	0.4	3.6	1	2	98	4	41	55
Hong Kong	0.8	2.4	2	36	62	25	46	29
India	0.4	2.1	0	1	99	0	4	96
Japan	3.8	7.1	0	19	81	4	29	67
Korea	3.7	7.8	0	1	99	1	21	78
Malaysia	0.3	0.4	2	66	32	8	75	17
Philippines	0.5	3.2	0	49	51	1	29	70
Singapore	1.0	1.5	2	70	28	18	67	15
Taiwan	2.3	3.8	0	2	98	3	26	71
Thailand	0.3	4.8	0	6	94	0	28	72
Other Asia	0.2	0.2	1	5	94	3	13	84
ALL ASIA	0.6	2.5	1	9	90	3	27	70
Rest of world	4.5	3.4	30	26	24	11	30	42
WORLD	2.5	2.9	30	25	45	10	29	61
MEMO: West European net-wine-importing countries								
Belgium	8.3	9.4	12	77	11	31	56	13
Denmark	5.0	7.6	8	77	15	43	39	18
Finland	1.9	6.4	14	51	35	23	53	24
Ireland	5.0	8.4	5	77	18	33	48	19
Netherlands	3.0	7.3	9	47	44	33	50	17
Norway	6.4	7.1	3	27	70	31	33	36
Sweden	4.7	5.5	9	39	52	45	39	16
United Kingdom	5.5	7.3	4	81	15	33	43	24

^a These data are volume-based in litres of alcohol (LAL) per year. Numbers in WHO (2018) are somewhat larger, especially for lower-income countries, because they are expressed per adult and they include WHO estimates of unrecorded alcohol consumption.

^b The bold numbers indicate which beverage has the highest share in total alcohol consumption volume in the period shown.

Source: Based on data in Anderson and Pinilla (2020).

Table 2: Indexes of similarity in the mix of alcohol consumption volumes,^a Asian economies relative to the world average, 1960 to 2014

	1960s	1970s	1980s	1990s	2000s	2010-14
China	0.64	0.68	0.77	0.91	0.96	0.98
Hong Kong	0.82	0.88	0.85	0.93	0.96	0.88
India	0.64	0.68	0.70	0.71	0.75	0.78
Japan	0.81	0.87	0.92	0.96	0.93	0.87
Korea	0.77	0.77	0.76	0.76	0.73	0.70
Malaysia	0.76	0.77	0.79	0.79	0.82	0.87
Philippines	0.80	0.85	0.87	0.85	0.88	0.86
Singapore	0.75	0.86	0.92	0.90	0.85	0.85
Taiwan	0.68	0.82	0.91	0.95	0.97	0.97
Thailand	0.66	0.69	0.71	0.78	0.87	0.86
Other Asia	0.67	0.71	0.73	0.77	0.78	0.77

^a See text for definition of index of similarity.

Source: Holmes and Anderson (2017), based on data in Anderson and Pinilla (2020).

Table 3: Sources of China's wine imports and index of trade intensity,^a by value and volume, 2008 to 2018

(a) China import shares (%)

	Value			Volume		
	2008-10	2011-13	2018	2008-10	2011-13	2018
France	43	49	37	23	36	25
Australia	18	15	25	17	11	18
Chile	12	9	9	27	17	11
Spain	5	7	6	10	17	9
Italy	6	6	6	6	8	5
United States	5	5	3	5	4	2
Others	10	9	14	12	8	30
Total	100	100	100	100	100	100

(b) Index of trade intensity^a

	Value			Volume		
	2008-10	2011-13	2018	2008-10	2011-13	2018
France	1.45	1.61	1.24	1.20	2.40	1.94
Australia	3.05	2.56	4.34	2.09	1.62	2.31
Chile	2.16	1.69	1.76	3.64	2.26	1.26
Spain	0.67	0.73	0.61	0.58	0.74	0.46
Italy	0.25	0.53	0.30	0.28	0.37	0.28
United States	0.72	1.05	0.68	1.11	1.02	0.55
Others	0.28	0.28	0.53	0.56	0.34	1.03
Total	1.00	1.00	1.00	1.00	1.00	1.00

^a The intensity of trade index is defined as the share of China's imports from country i divided by country i's share of global exports.

Source: Author's calculations based on data from United Nations (2019).

Appendix Table 1: Cumulative changes in national real household consumption, population and real exchange rates relative to the US dollar, 2016-18 to 2025 (%)

	Real household consumption	Population	Real exchange rate appreciation
France	16.2	3.5	-4.0
Italy	9.7	1.3	-2.1
Portugal	12.1	-0.1	-2.0
Spain	23.5	6.8	-1.7
Autumn	17.2	3.8	0.1
Belgium	17.8	6.3	-1.8
Denmark	19.7	2.1	-2.2
Finland	18.9	2.9	0.4
Germany	12.5	-1.9	-4.3
Greece	19.1	-0.9	-7.7
Ireland	37.4	10.8	-1.8
Netherlands	18.3	3.7	-2.2
Sweden	21.6	7.9	-6.8
Switzerland	15.6	6.7	-4.5
United Kingdom	28.1	4.9	-1.5
Other W. Europe	18.6	9.2	-0.3
Bulgaria	36.7	-6.2	-1.5
Croatia	18.0	-1.9	-1.2
Georgia	31.1	-0.1	-13.5
Hungary	22.6	-2.7	-3.7
Moldova	43.2	-10.1	-10.9
Romania	39.6	-3.5	-4.3
Russia	16.1	-1.5	1.6
Ukraine	19.3	-4.1	-5.7
Other E. Europe	35.6	-4.5	-10.4
Australia	30.8	10.1	-12.8
New Zealand	28.1	7.6	-5.0
Canada	23.6	7.0	-3.0
United States	27.4	7.1	0.0
Argentina	6.6	8.6	-10.4
Brazil	14.4	6.8	-10.4
Chile	49.0	7.2	-4.1
Mexico	37.5	10.7	0.2
Uruguay	40.2	2.6	-7.3
Other L. America	53.2	9.2	-13.6
South Africa	31.9	10.2	9.5
Turkey	44.4	7.0	-27.5
North Africa	47.4	9.4	-1.2
Other Africa	96.4	16.2	12.5
Middle East	46.0	15.5	-6.9
China	70.3	3.0	3.6

Hong Kong	37.4	2.3	-6.4
India	118.8	11.5	3.0
Japan	10.0	-2.6	-0.5
Korea, Rep.	33.7	0.6	-6.5
Malaysia	55.5	13.6	-8.0
Phillipines	66.5	16.2	-6.6
Singapore	38.8	18.6	-3.7
Taiwan	26.0	1.1	-5.5
Thailand	41.3	2.4	7.1
Other Asia	87.9	8.6	-8.9

Source: Wittwer and Anderson (2019).