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Economic analysis of import tariffs in the wine markets of China and the Republic of Korea

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Foreword

Following the rapid growth in wine exports over the past twenty years the wine industry has become an increasingly important agricultural industry in Australia. Australia ships wine principally to North American and European markets. However, over the past decade Australian wine exports to the new and emerging markets of China and the Republic of Korea have grown strongly and the potential of these markets is drawing more attention from Australian wine exporters.

While growth in Australian wine exports over the past decade has been significant, going forward the industry faces many challenges. Chief among them are the tariffs imposed on imported wine, which raise the price of Australian wine in foreign markets. Australian wine is at a further disadvantage in the world market when competing with wines from countries that have negotiated free trade agreements with wine-importing nations, and are therefore not subject to the same tariffs.

This report demonstrates the challenges posed by import tariffs on the Australian wine sector by focusing on the wine markets of China and the Republic of Korea. These two countries are expected not only to become more important destinations for Australian wine, but they are also two countries that impose a tariff on wine imports. By phasing out existing wine import tariffs, both the Australian wine industry and the consumer stand to gain from the resulting lower retail price and potential increase in sales.

Kim Ritman
A/g Executive Director
ABARES

July 2012

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Summary

The Australian wine grape industry has expanded significantly over the past two decades, with wine grape production growing, on average, by 8 per cent a year (ABS 2011). Between 1990–91 and 2010–11 the volume and gross value of wine production tripled. The industry's development was largely driven by a steadily increasing demand for Australian wine in export markets. By 2010–11, Australia exported wine to 123 countries and held a 7 per cent share of the global wine trade (UN Comtrade 2012; Wine Australia 2011). Wine exports in 2010–11 were 727 million litres, with an estimated value of \$2 billion — around 6 per cent of the total value of Australia's agricultural exports (ABARES 2011).

Over the past five years, global competition for imported wine has increased significantly. This has placed downward pressure on the price of both wine and wine grapes. Looking ahead, it is expected the Australian wine industry will continue to face strong competition in both the domestic and traditional export markets. However, while demand in Australia's traditional wine markets is not expected to increase significantly in the foreseeable future, in new and emerging markets, such as China and the Republic of Korea, the prospects could be different.

The value of Australian wine exports to China grew by 58 per cent a year, on average, between 2001–02 and 2010–11. For the Republic of Korea, a much smaller market, the value of Australian wine exports increased more than five-fold between 2001–02 and its peak in 2007–08, when it climbed from \$3 million to \$16 million (in constant 2010–11 dollars). Following the global financial crisis, total Korean wine imports from all countries fell significantly, although Australia maintained its market share in value terms. Australia's export growth to these markets has been achieved despite an applied import tariff on Australian wine by both countries.

While Australian wine remains subject to import tariffs by China and the Republic of Korea, China has negotiated a free trade agreement (FTA) with Chile and New Zealand. This has resulted in a negotiated phase-out of the tariffs on wine imported from these countries. Under their respective FTAs, a zero tariff rate has been applied to New Zealand wine imports as of 1 January 2012 and will be applied to Chilean wine imports as of 1 January 2015. The existing FTA between the Republic of Korea and Chile, which was signed in 2005, now applies a zero tariff rate to wine imports from Chile. Exports of wine from Chile and New Zealand to both China and the Republic of Korea have increased markedly since the FTAs were negotiated.

In this analysis, estimates of the benefit to the Australian wine sector of a similar FTA arrangement with China and the Republic of Korea are presented. In the case of China, it is estimated that if the applied tariffs on imported Australian wine were reduced to zero, the total value of Australian wine imports by China would increase by between \$13 million and \$32 million compared with the base year. For the Republic of Korea, it is estimated that a similar tariff cut would increase the total value of imported Australian wine in that market by between \$630 000 and \$1 million relative to the base year.

1 Introduction

The new emerging markets of China and the Republic of Korea are becoming increasingly important export markets for Australian wine. Australian wine exports to these two markets have grown strongly over recent years, albeit from a low base. Between 2001–02 and 2010–11, for example, the value of Australian wine exports to China increased, on average, by around 58 per cent a year and exports to the Republic of Korea increased by 18 per cent a year on average (UN Comtrade 2012). By 2010–11 China had become the fourth largest export market for Australia, with export returns worth \$181 million. The Republic of Korea remains a minor export market for Australia, with export returns worth \$6.9 million in 2010–11, equivalent to 0.35 per cent of total Australian exports.

Both China and the Republic of Korea are expected to become more important destinations for Australian wine exports in the future. One reason is a slowing in the growth in demand in Australia's traditional wine markets, such as the United Kingdom and the United States. A second reason is expected future growth in consumption of imported wine in these markets.

This analysis estimates the potential for further increases in Australian wine exports to these markets if the tariffs on Australian wine imports were phased out. The tariffs on imports of Australian wine in China are 14 per cent for bottled wine and 20 per cent for bulk wine. The Republic of Korea applies a 15 per cent tariff on imports of Australian bottled and bulk wine.

In both China and the Republic of Korea, the wine tariffs for certain competitor countries are lower than for Australia. China has negotiated free trade agreements (FTAs) with Chile and New Zealand that have resulted in the phasing out of wine tariffs on imports from both these countries. A zero tariff has been applied to New Zealand wine imports as of 1 January 2012 and will apply to imports from Chile starting 1 January 2015 under the respective FTAs with China. Exports from these countries to China have increased significantly since the signing of the FTAs, even though the import tariff has still not been completely phased out. Exports of Chilean wine to the Republic of Korea have also increased markedly since the signing of the FTA between the two countries in 2005. A zero tariff has applied to Chilean wine since 1 January 2009 (Lee, Huang, Rozelle & Sumner 2009).

This analysis models a hypothetical phasing out of the wine tariffs facing Australian imports in both countries over a six-year period starting in 2009. Specifically, the tariff applied in China on imported Australian bottled wine is reduced by 3 per cent in the first two years and 2 per cent a year thereafter, while the tariff for imported Australian bulk wines is reduced by 3 per cent a year. For the Republic of Korea, the modelling phases out the tariffs on Australian wine by 2.5 per cent a year.

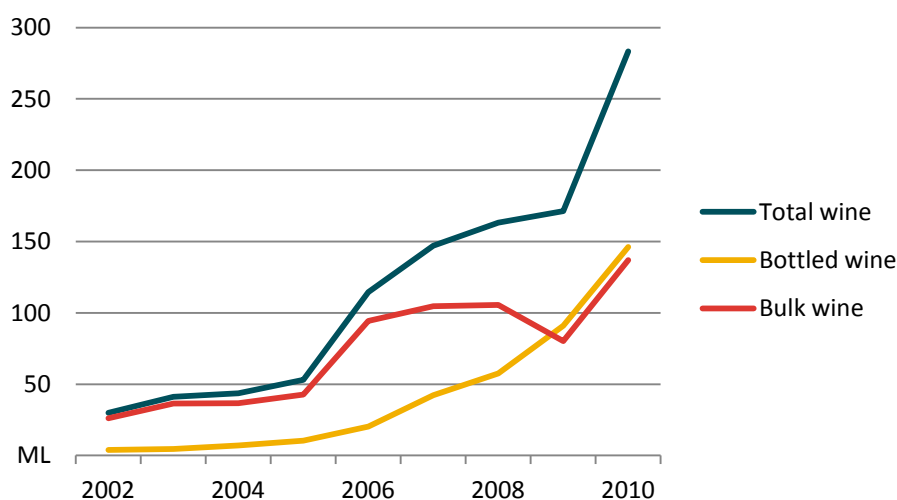
In both import markets, all imported wine (including wine from Australia) is also subject to a range of additional taxes, duties or fees, such as a liquor tax, an education tax, value-added taxes and consumption taxes. These taxes, duties and fees are taken into account in the analysis which estimates the impact of a tariff reduction on the retail price of Australian wine in these markets. All values in this analysis are reported in terms of Australian dollars in 2010 prices.

2 The wine markets of China and the Republic of Korea

The Chinese wine market

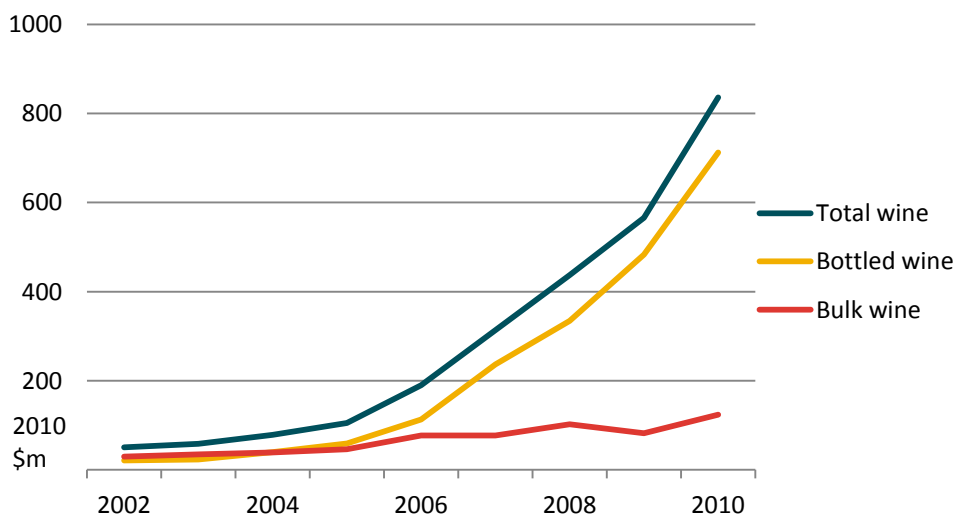
The market for imported wine in China has expanded dramatically over the past decade. The volume and value of wine imported by China has increased from about 30 million litres in 2002 to 283 million litres in 2010. In value terms, this was equivalent to \$50 million (in 2010 Australian dollars) in 2002 and \$836 million in 2010 (figures Figure 1 and Figure 2).

Figure 1 Volume of wine imported into China, 2002–10



Source: General Administration of Customs of China 2011

Figure 2 Value of wine imported into China, 2002–10



Source: Computed from General Administration of Customs of China 2011; ABARES 2011

The key factors driving the strong growth in imported wine over this period have included rising incomes (as evidenced by an expanding middle class) and an associated change in consumer preferences in favour of imported wine over other alcoholic beverages, including domestically

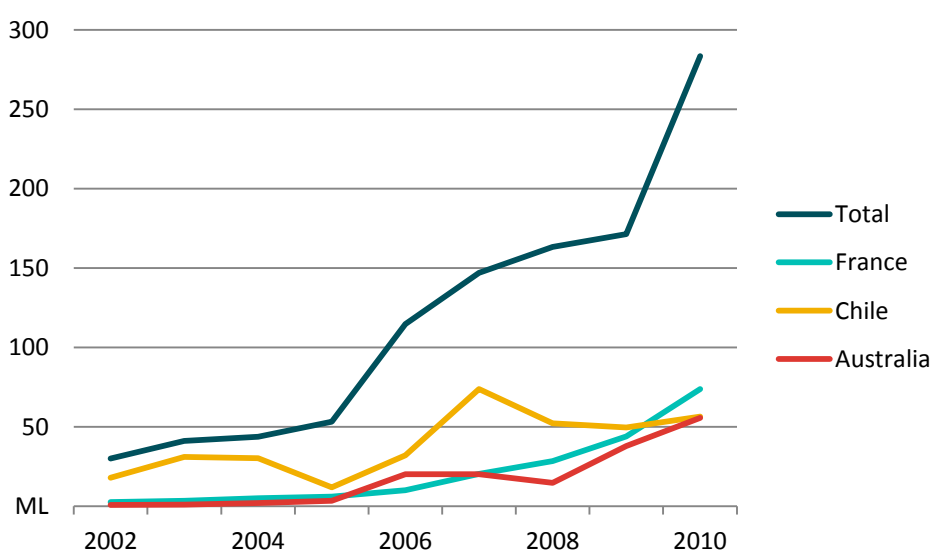
produced wine (New Zealand Trade and Enterprise 2009; Rabobank 2010). A notable feature of the recent growth in imports has been stronger demand for bottled wine, in comparison with bulk wine, especially for high-end wines. This is reflected in the steep increase in the unit value of Chinese wine imports between 2006 and 2010. Unit import values, in 2010 dollars, increased by an average of 17 per cent a year over this period, from \$1.66 a litre to \$2.95 a litre, compared with an average of 1 per cent over the previous 4 years.

Another feature of the Chinese imported wine market is a strong preference by consumers for red wine (Rabobank 2010), which accounts for around 85 per cent of total value of imported wine. Red wine is popular with Chinese wine consumers because it is associated with an image of vintage, sophistication, heritage, investment value and good health (Rabobank 2010).

The retail price of imported wine tends to be higher than domestically produced wine in China because it is generally sold in different strata of the retail sector. Sales of domestic wine are mainly concentrated at the low-end price range. In 2009 around 80 per cent of Chinese wines were sold by shops or retailers for less than RMB 30 (\$4.55) per 750 ml bottle in the off-trade distribution channel and consumed off the premises. In contrast, sales of imported wines are concentrated in the higher-end price range, starting from around RMB 150 (\$22.75) per 750 ml per bottle. Imported wine tends to be sold in the on-trade distribution channel, in licensed establishments, such as restaurants or bars, where alcohol is consumed on the premises (Rabobank 2010). Because of these two distinct markets, the modelling for this project is based on the assumption that sales of Australian wine do not compete directly with lower-priced Chinese wine.

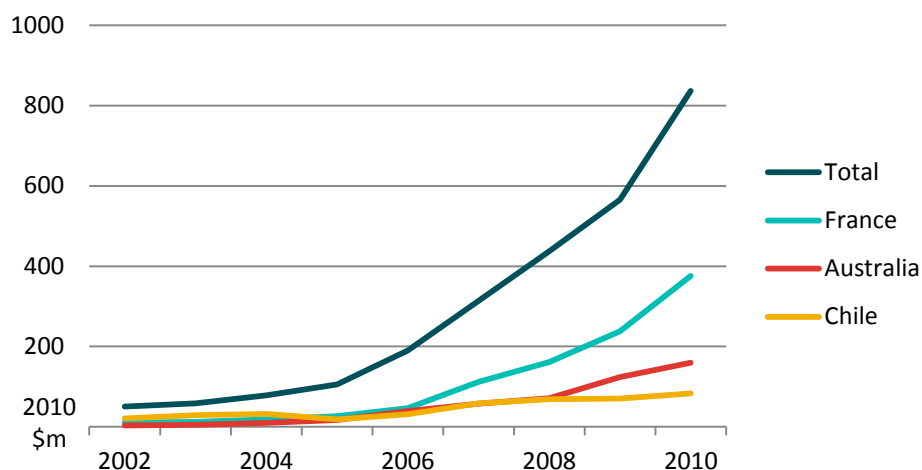
France, Australia and Chile are the three major wine exporters to China. Until 2010, when it was surpassed by France, Chile had been the single largest exporter of wine to China. In terms of export value, however, Chile was the third major source because the majority of what it exports to China is lower-valued bulk wine. In contrast, the majority of wine exported by France and Australia to China is bottled wine, which commands a higher price compared with bulk wine. Consequently, France and Australia are the two leading wine exporters to China in terms of total export value (figures 3 to 6). In 2010, 46 per cent of the volume of imported bottled wine in the Chinese market was from France, followed by Australia at 20 per cent (GACC 2011).

Figure 3 Volume of total wine imported by China from selected countries, 2002–10



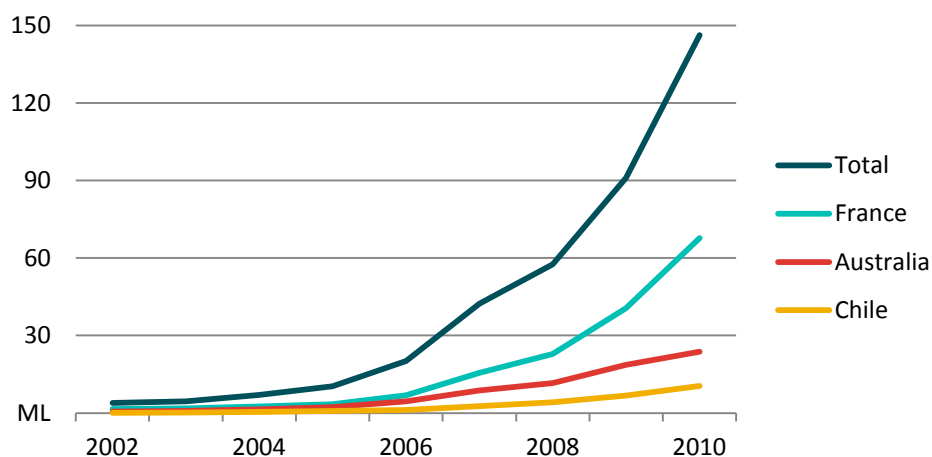
Source: General Administration of Customs of China 2011

Figure 4 Value of total wine imported by China from selected countries, 2002–10



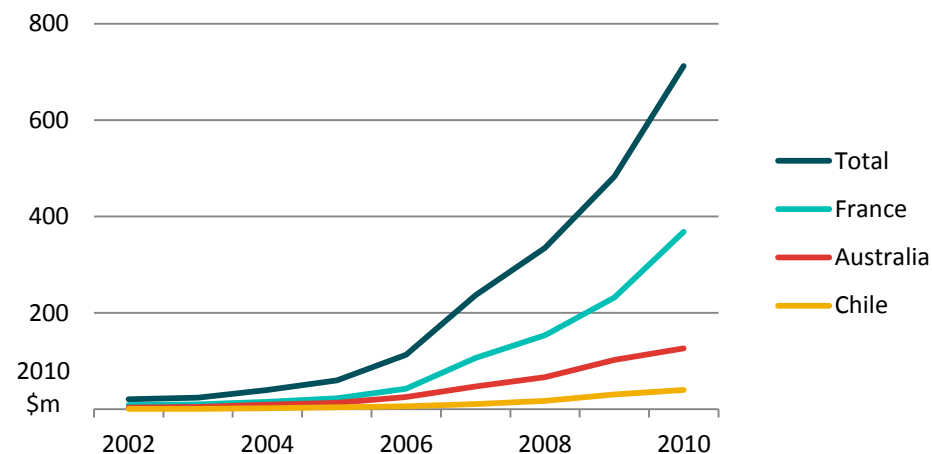
Source: Computed from General Administration of Customs of China 2011; ABARES 2011

Figure 5 Volume of total bottled wine imported by China, 2002–10



Source: General Administration of Customs of China 2011

Figure 6 Value of total bottled wine imported by China, 2002–10



Source: Computed from General Administration of Customs of China 2011; ABARES 2011

A 2010 study by Rabobank projected that, by 2015, consumption of imported wine in China will increase by 25 per cent a year. This forecast is driven by two factors: an expected switch from domestic wines to entry-level imported wines and an increase in average discretionary spending on wine by wealthier consumers. Rabobank also projected that those domestic wines that are not competitive will be squeezed out of the market and replaced by entry-priced imported wines.

The Rabobank study also suggested that the Australian wine industry's capacity to increase its exports to China will be influenced by a range of factors. The majority of Chinese consumers assess the quality of imported wine based on perceived factors, including (in order of priority) price, country of origin, packaging, labelling and image. It also noted that many Chinese wine consumers had a stronger preference for packaging and labelling than for taste, and that climate and cuisine styles can affect demand for wine in China (Rabobank 2010).

Seasonal wine consumption is also an apparent characteristic of the Chinese market. About 60 per cent of annual wine sales occur during Chinese New Year and the Mid-Autumn Festival, when family and businesses gather to celebrate. Sales of bottled wines packaged in gift boxes (often together with bottle openers) are popular during these times (Rabobank 2010).

In 2009 wine consumption per person in China was around 1.15 litres a year. This figure is low compared with the world average of 3.47 litres per person a year, and even neighbouring Japan where the average is 1.86 litres per person a year (Wine Institute 2011). This suggests there is significant potential for further increases in wine consumption, and hence imports, in China.

Australian wine exports to China

Between 2001–02 and 2010–11, the value of Australian wine exports to China (in 2010–11 dollars) grew at an average rate of 58 per cent a year. Red wine accounts for about 88 per cent of the total value of Australian table wine exported to China (bulk and bottled wine only). However, the average unit export value of wine to China fell from \$4.95 a litre in 2007–08 (in 2010–11 dollars) to \$3.60 a litre in 2010–11 on account of a large increase in bulk wine exports to China. In 2010–11, bulk wine accounted for 47 per cent of total Australian wine exports by volume to China, compared with only 22 per cent in 2007–08 (ABS 2011).

According to Rabobank (2010) major opportunities and challenges exist for increasing Australia's wine exports to China. Australian wine sales have achieved good market penetration in the four highest per capita income cities (Shanghai, Beijing, Guangzhou and Shenzhen) and southern China. Australia accounts for a large market share in the high-end wine market, with a price range of RMB 200–400 (\$30.30–\$60.60) per 750 ml bottle. However, Australian wine lacks extensive distribution channels across other parts of China. Additionally, while Australian wine is considered to be appealing and of good quality by consumers (because of clearly defined wine varieties and flavours), and of consistently good value (price-for-quality), consumers generally do not have a strong awareness of Australian wine compared with French wine.

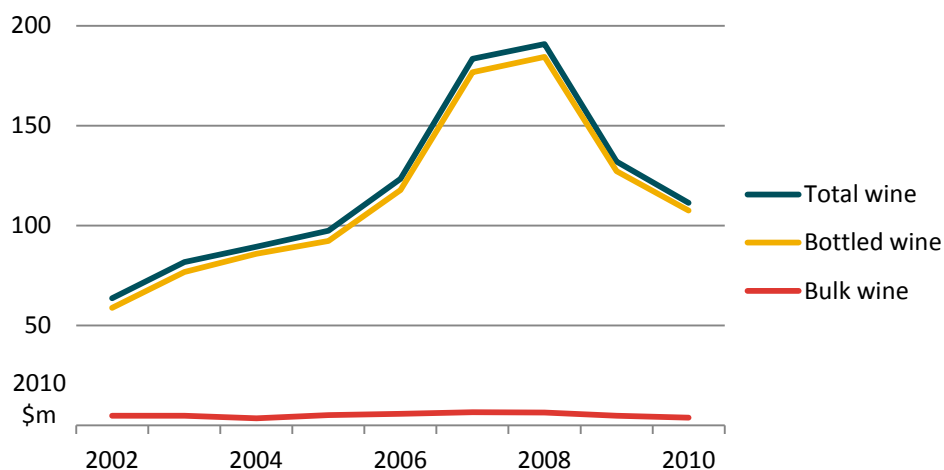
The most significant challenge facing Australia is the fiercely competitive nature of the imported wine market in China. Although Australia has a comparative advantage in freight over some competitors (in terms of cost and time), competition has been increasing in the high-end and premium market segments from wine exporting countries such as France, the United States, Italy and New Zealand. Competition is also strong in the mid-range market segments.

The Republic of Korea wine market

According to Lee, Kennedy and Hilbun (2009) the consumption of alcoholic beverages in the Republic of Korea is considered an important part of social and business occasions, as well as part of everyday life. In recent years, there has been a shift away from consumption of hard liquor to consumption of low-alcohol wine. This shift appears to have coincided with growing health concerns, increased interest in physical wellbeing, and an increase in the number of female workers in the workforce in the Republic of Korea.

A number of factors limit the growth of domestic wine production in the Republic of Korea, including high agricultural land prices, unfavourable weather conditions and a lack of price competitiveness and quality relative to imported wines. As a result, wine imports have increased significantly in recent years to meet the growing demand. Between 2002 and the peak in 2008, the total value of wine imported by the Republic of Korea rose from \$64 million to \$190 million (in 2010 Australian dollars), a three-fold increase (Figure 7) (UN Comtrade 2012). Wine imports declined in 2009 and 2010, largely reflecting the effect on economic activity, and hence import demand, of the global financial crisis.

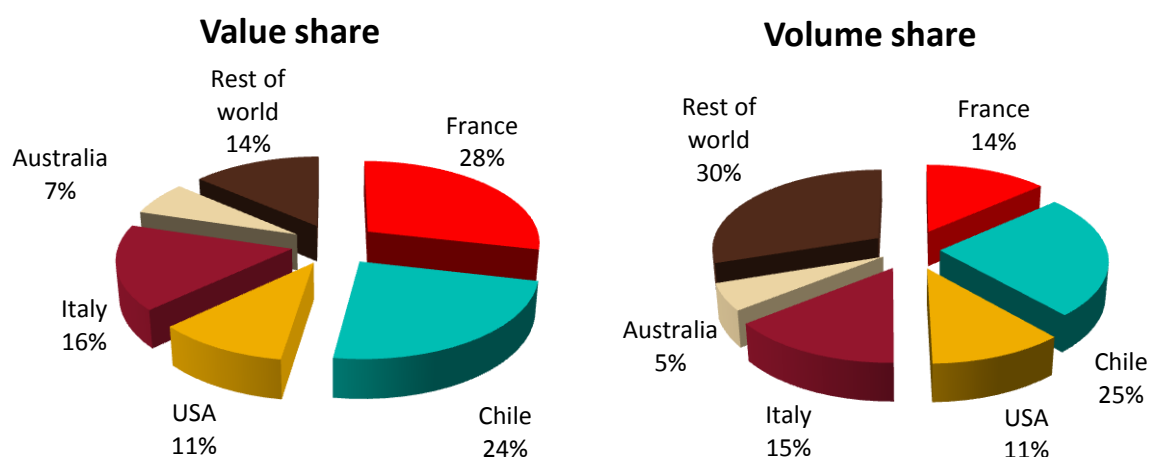
Figure 7 Value of total wine imported by the Republic of Korea, 2002–10



Source: ABARES 2011; Macro assumptions; UN Comtrade 2012

Sales of imported red wine far exceed sales of imported white wine in the Republic of Korea. Red wine accounted for 70 per cent of the total volume of imported bottled and bulk wine in 2010 (Korea Customs Service 2011). Imports of white and sparkling wines are expected to increase as the concept of wine–food pairing becomes more established (Lee, Kennedy & Hilbun 2009).

The value of imported wine in the Republic of Korea in 2010 was \$112 million (in 2010 Australian dollars), of which bottled wine accounted for 97 per cent of the total value. The top five countries from which the Republic of Korea imports its wine are: France, Chile, the United States, Italy and Australia (Figure 8). In 2010, the value of wine imports (in 2010 Australian dollars) from the top five countries was: France \$32 million, Chile \$27 million, Italy \$19 million, the United States \$12 million and Australia over \$7 million (UN Comtrade 2012).

Figure 8 Market share of imported wine by value and volume in the Republic of Korea, 2010

Source: UN Comtrade 2012

The importance of Chile as the Republic of Korea's second largest import market for wine by value can be in part attributed to the free trade agreement (FTA) between the two countries, in addition to the relatively low import prices of Chilean wine. The Republic of Korea–Chile FTA came into effect in 2005. At that time, the import tariff on both bulk and bottled wine was 15 per cent. The FTA included a schedule for phasing out the Korean import tariff on Chilean wine by 2010. In 2005 Chile was the third largest source of imported bottled wine in the Republic of Korea market by value. By 2007, two years after the FTA took effect, Chile had surpassed the United States to become the second largest exporter of wine (by both value and volume) to the Republic of Korea. By 2010, Chile still had the second largest share of the imported wine market in terms of value (24 per cent) but had the largest share of the market in terms of volume at 27 per cent, up from 21 per cent in 2007 (UN Comtrade 2012).

The reduction of the applied tariff on imported Chilean wine over the five-year implementation period, combined with the lower priced wine relative to France, provided Chile with a competitive advantage in the Republic of Korea relative to other wine exporting countries (Chung 2003; Hae-kwan 2003). Based on Chile's experience, it is reasonable to assume that a reduction in the applied tariff on imports of Australian wine would have a positive effect on sales of Australian wine in the Republic of Korea.

Wine pricing and regulation

According to Austrade (2009), the cost of advertising and promotions, payment conditions (for example, cash versus 60 days credit), and sales volume contribute to the observed price differences in different retail markets. In addition, the Republic of Korea Liquor Act prevents retailers and end users from purchasing from other retailers or discount stores for resale purposes, a practice which explains why different prices are charged by different retailers for the same wine.

The retail price of a bottle of premium wine can differ between discount stores, between supermarkets and liquor stores, and between luxury hotel restaurants. For example, the retail price for a premium variety of bottled red wine at discount stores can range between US\$22.59 and US\$25.10; the retail price at supermarkets and liquor stores ranges between US\$29.29 and

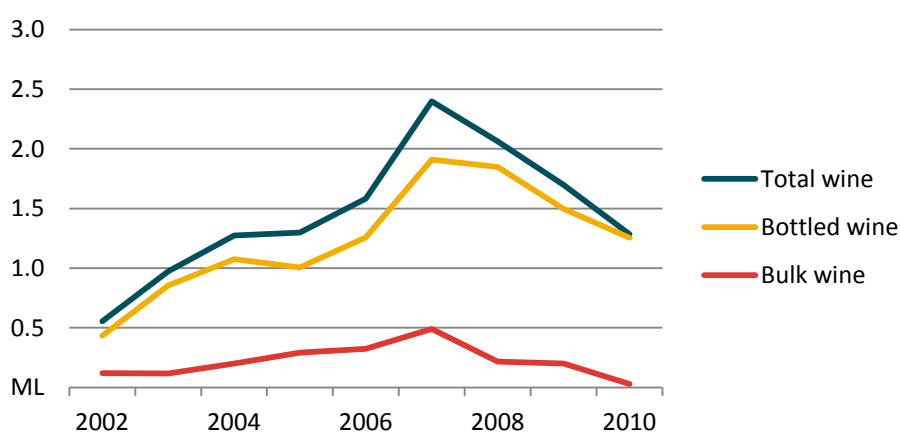
US\$31.54; and the retail price at luxury hotel restaurants ranges between US\$45.06 and US\$90.12 (AWBC 2009).

The Republic of Korea has a Liquor Purchase Credit Card program as a safeguard to prevent the black market sales of liquor products between suppliers and trade buyers. The regulation requires buyers to use special credit cards to pay suppliers when purchasing alcoholic beverage products. Banks issue these credit cards exclusively for this program (AWBC 2009).

Imports of Australian wine by the Republic of Korea

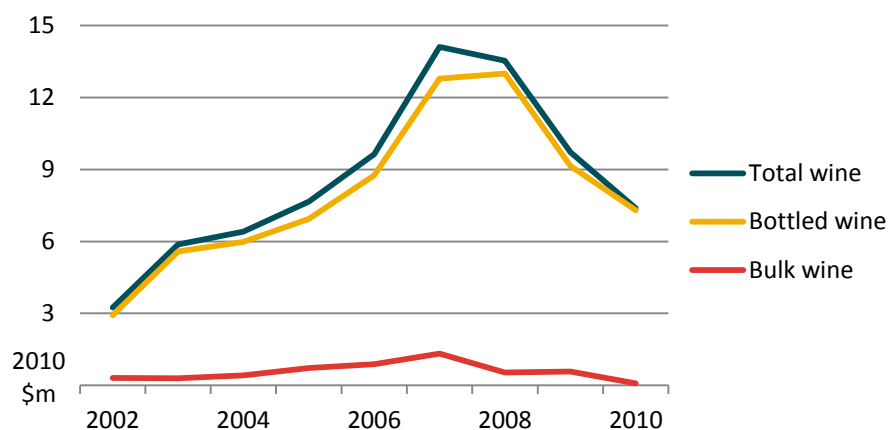
Although the share of Australian wine (by volume) imported by the Republic of Korea is relatively small compared with other major exporting countries (5 per cent in 2010), the actual volume increased by an average of 36 per cent annually between 2002 and 2007, from 0.55 million litres (valued at \$3.2 million in 2010 dollars) in 2002 to 2.4 million litres (valued at \$14.0 million) in 2007. The global financial crisis led to a significant decline in wine imported by the Republic of Korea from all countries (figures Figure 9 and Figure 10). Imports of Australian wine have declined by an average of 19 per cent annually since 2007, to 1.3 million litres (valued at \$7.4 million) in 2010.

Figure 9 Volume of Australian wine imported by the Republic of Korea, 2002–10



Source: UN Comtrade 2012

Figure 10 Value of Australian wine imported by the Republic of Korea, 2002–10



Source: ABARES 2011; UN Comtrade 2012

3 Economic framework to estimate tariff reductions on Australian wine exports

In both China and the Republic of Korea imported wine from Australia (and most other countries) is subject to tariffs as well as a range of other taxes, duties or fees, such as a liquor tax, an education tax, a value-added tax (VAT) and a consumption tax. To evaluate how a reduction in an import tariff will change the demand for Australian wine in the foreign market, it is necessary to first estimate how it will change the retail price by breaking down the retail price into its components. This requires an understanding of precisely how all the tariffs and additional charges are applied to the import price. Once the change to the retail price is known, the effect of this price change on the demand for Australian wine can be estimated.

Effect of a tariff reduction on the retail price of Australian wine in China

According to the USDA–FAS (2009a) the total import duty collected for every litre of wine in China (duty) is given by

$$(1) \quad \text{duty} = \text{CIF} \left(\frac{\overbrace{t_M}^{\text{import tariff}} + \overbrace{t_{CON}}^{\text{consumption tax}} + \overbrace{(1+t_M)t_{VAT}}^{\text{value added tax}}}{1-t_{CON}} \right)$$

where CIF represents the price of imported wine (including insurance and freight charges); t_M is the *ad valorem* import tariff, t_{VAT} is the value-added tax and t_{CON} is the *ad valorem* consumption tax (also known as the sales tax). *Ad valorem* taxes are expressed as a percentage of the value of the item rather than as a fixed amount on the quantity, size or weight of the item. Equation (1) demonstrates how the total duty collected on wine is comprised of the sum of the import tariff, t_M , consumption tax, t_{CON} , and value-added tax, t_{VAT} , (which is applied to the price of the wine only after the import tax has been applied). If the value-added tax, t_{VAT} , and the consumption tax, t_{CON} , remain constant, the amount by which the final duty falls (in percentage terms) following a decrease in the import tariff will be less than the percentage reduction in the import tariff, t_M . For example, if the import tariff, t_M , is reduced by 50 per cent, the final amount of the duty collected, *duty*, will fall by less than 50 per cent. In particular, if the tariff rate is reduced by Δt_M , the new total duty per litre of wine in China will be reduced to *duty** where

$$(2) \quad \text{duty}^* = \text{CIF} \left(\frac{(t_M - \Delta t_M) + t_{CON} + (1 + (t_M - \Delta t_M))t_{VAT}}{1 - t_{CON}} \right)$$

Ignoring wholesale and retail mark-ups, the retail price of imported wine in the Chinese market can be expressed as

$$(3) \quad P_{\text{retail}} = \text{CIF} + \text{duty}$$

Effect of a tariff reduction on the retail price of Australian wine in the Republic of Korea

The total duty collected per litre of imported wine in the Republic of Korea includes revenues from numerous taxes and fees. These include revenues from an import tariff (tax_{import}), a liquor tax (tax_{liquor}), an education tax ($tax_{education}$), a value-added tax (VAT) (tax_{VAT}), as well as fees for customs clearance (fee) (USDA 2009). The total import duty per litre of wine in the Republic of Korea, ($duty$), can be represented by Equation (4) such that

$$(4) \quad duty = \underbrace{tax_{import}}_B + \underbrace{tax_{liquor}}_C + \underbrace{tax_{education}}_D + \underbrace{tax_{VAT}}_F + \underbrace{fee}_G$$

Equations (5) to (9) explain formulaically how the components of the duty from Equation (4) are calculated. First, the CIF price of wine is represented by the letter A. Equation 5 then calculates the amount of the import tax added to the CIF price, denoted by B. The liquor and education taxes (equations 6 and 7) are derived from the CIF price inclusive of the tariff (C and D). The VAT tax (Equation 8) is derived from the sum of the CIF price and the previous taxes, while the customs fees (Equation 9) stem solely from the CIF price. In the equations 5 to 16, t_M , t_{liquor} , $t_{education}$, t_{VAT} and f are the rates of the *ad valorem* import tariff, the liquor tax, the education tax, the value-added tax and the fee associated with customs clearance, respectively.

$$(5) \quad B = tax_{import} = \underbrace{CIF}_A t_M$$

$$(6) \quad C = tax_{liquor} = (A + B)t_{liquor}$$

$$(7) \quad D = tax_{education} = C t_{education}$$

$$(8) \quad F = tax_{VAT} = \underbrace{(A + B + C + D)}_E t_{VAT}$$

$$(9) \quad G = fee = CIF f$$

If the tariff rate is reduced by Δt_M , the total duty collected per litre of wine in the Republic of Korea will be reduced by $\Delta duty$, as expressed in Equation (10), such that

$$(10) \quad \Delta duty = \Delta B + \Delta C + \Delta D + \Delta F + \underbrace{\Delta G}_{=0}$$

where

$$(11) \quad \Delta B = CIF \Delta t_M$$

$$(12) \quad \Delta C = \Delta B t_{liquor} = 0 + CIF \Delta t_M t_{liquor}$$

$$(13) \quad \Delta D = \Delta C t_{education} = CIF \Delta t_M t_{liquor} t_{education}$$

$$(14) \quad \begin{aligned} \Delta F &= (\Delta B + \Delta C + \Delta D) t_{VAT} \\ &= CIF \Delta t_M (1 + t_{liquor} + t_{liquor} t_{education}) t_{VAT} \end{aligned}$$

Substituting equations (11) to (14) into Equation (10) provides an expression for the amount by which the final duty is reduced following the change in the import tariff, Δt_M ,

$$(15) \quad \Delta duty = (CIF \Delta t_M (1 + t_{liquor} + t_{liquor} t_{education})) (1 + t_{VAT})$$

The new duty collected per litre of wine in the Republic of Korea will be reduced to $duty^*$, as expressed in Equation (16)

$$(16) \quad duty^* = CIF \left(1 + (t_M - \Delta t_M) \right) \left[\frac{(t_M - \Delta t_M)}{(1 + (t_M - \Delta t_M))} + t_{liquor} (1 + t_{education}) + t_{VAT} (1 + t_{liquor} + t_{liquor} t_{education}) \right] + CIF \cdot f$$

Effect of tariff reduction on Australian wine exports

Demand and supply for wine in an importing country

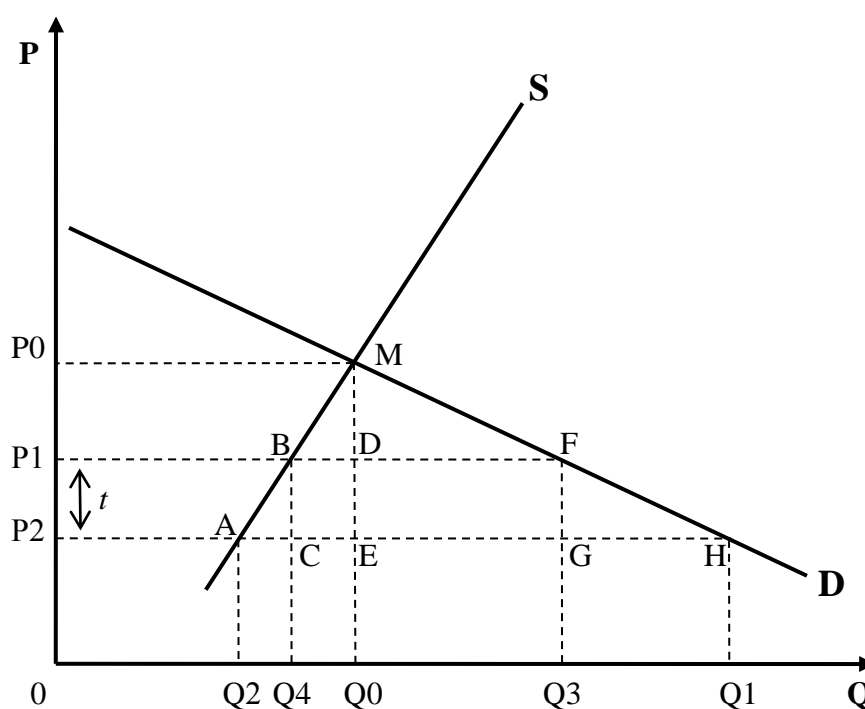
A simple demand and supply framework is used to estimate the gains to Australian wine exporters from a tariff reduction in an importing wine market (Figure 11). Based on the analysis by Nicholson and Snyder (2007), a tariff reduction improves economic welfare for both wine consumers in the importing country and Australian wine exporters.

Figure 11 illustrates the domestic wine market of a wine importing country. The wine market in that country is represented by a supply curve of wine production (S) and a demand curve of wine consumption (D). In the absence of international trade, the domestic equilibrium price for wine would be $P0$ and the quantity of domestic consumption would be $Q0$. Should the foreign country start to import wine from Australia, the CIF price of Australian wine, $P2$, is lower than the prevailing domestic price, $P0$ under the assumption of free trade (that is, no import tariffs) and no other taxes are applied. By importing Australian wine into the domestic market, the price of all wine in that market falls to $P2$. The drop in the price of all wine causes total consumption to increase to $Q1$. Consumption of domestic wine falls from $Q0$ to $Q2$ while consumption of imported wine from Australia is represented by the distance $Q1-Q2$.

The potential gains from trade (the difference between consumers' surplus and producers' surplus) from importing the Australian wine are measured by the area AMH . Consumers' surplus is defined as the difference between the maximum price a consumer is willing to pay and the actual price they do pay. Producers' surplus is defined as the difference between the amount that a producer receives from the sale of a good and the lowest amount that same producer would actually be willing to accept for that good.

When an import tariff is applied, the price paid by consumers rises to $P_1 = P_2 + t$. This price rise causes total wine consumption to fall from Q_1 to Q_3 and domestic production to expand from Q_2 to Q_4 . The amount of imported wine from Australia falls from $Q_1 - Q_2$ to $Q_3 - Q_4$. The potential gains from trade when an import duty is imposed are lower than when wine is imported tax-free. Specifically, the gains from trade are reduced by the area $ABFH$ (or area AMH - area BMF). Part of the reduction in the gains from trade is the tax revenue from the tariff, represented by area $BCFG$ or $t(Q_3 - Q_4)$. Therefore the net welfare loss to the economy of the wine importing country is measured as the sum of the area of the two triangles ABC and FGH . The loss to the Australian wine industry from the fall in imports in the foreign market is the loss of export revenue (assuming no transport and insurance costs), measured as a multiplication between $Q_1 - Q_3$ and the price (also depicted by rectangle Q_3Q_1GH).

Figure 11 Effect of tariff reduction on Australian wine in an imported wine market



Given the demonstrated effect of an import tariff on consumers in the importing country and on the wine industry of the exporting country, it is clear that any reduction in the tariff rate will have the opposite effect: the retail price for wine in the import market would fall; demand for Australian wine in the foreign market would increase; and Australian wine shipments to the importing country would increase.

Sensitivity of demand and supply to a change in price

A tariff has the effect of raising the price of wine in the domestic market from P_2 to P_1 . In theory, the extent to which producers adjust the supply of wine on the domestic market for a change in

price will depend on the steepness of the supply curve. Similarly, the extent to which consumers adjust their purchases of wine in response to the higher price will depend on the steepness of the demand curve. The steepness of these curves reflects the sensitivity, or responsiveness, of producers and consumers to a change in the price of wine. The measurement of this sensitivity of supply and demand to a change in price is known as the price elasticity of supply and the price elasticity of demand.

The price elasticity of supply of imported wine (e_s) is defined as the percentage change in the quantity of wine supplied to the market (ΔQ_s) for every 1 per cent change in the retail price (ΔP), or

$$e_s = \frac{\% \Delta Q_s}{\% \Delta P} = \frac{\partial Q_s}{\partial P} \frac{P}{Q_s} \quad (17)$$

The price elasticity of demand for imported wine (e_D) is defined as the percentage change in the quantity of wine demanded for imported wine (ΔQ_D) for every 1 per cent change in the retail price (ΔP), or

$$e_D = \frac{\% \Delta Q_D}{\% \Delta P} = \frac{\partial Q_D}{\partial P} \frac{P}{Q_D} \quad (18)$$

A price elasticity greater than 1 is defined as price elastic, meaning that the response by producers or consumers is sensitive to a change in price. A price elasticity smaller than 1 is defined as price inelastic, or not very sensitive to a change in price. So, if a product is price elastic in demand, then the quantity demanded of that product will increase significantly more in percentage terms than for an inelastic good following a 1 per cent decline in the price.

In the analysis in the next chapter, values for the price elasticities of supply and demand in both China and the Republic of Korea are included in the model in order to estimate the effect on imports of Australian wine in those markets following a phase-out of the existing import tariffs. For China, the values are sourced from previous research by Fang and Pan (2003) and Huan-Niemi and Niemi (2008). One feature of the estimate of price elasticity of demand for wine in China is that it predominantly reflects demand for red wine.

4 Effect on Australian wine exports to China of a phased removal of tariffs

Tariffs and taxes on imported wine in China

Wine is heavily taxed in China. The tariff rates on imported wine, including Australian wine, are 14 per cent for bottled wine and 20 per cent for bulk wine. In addition, there is a value-added tax of 17 per cent and a consumption tax of 10 per cent. The final rate of the duty applied to the CIF price can be derived from Equation (1) and is equal to 48 per cent for bottled wine and 56 per cent for bulk wine. These duties account for about 31 per cent and 35 per cent of the retail price of bottled and bulk wine, respectively.

In order to estimate the effect on Australian wine exports to China from a reduction in the import tariff, the model first calculates the total duty at given existing tariff and tax rates. The tariff is then steadily reduced over a six-year period so that by the end of the six years, the tariff rate on both bottled and bulk wine is zero.

Evaluation of a tariff reduction on Australian wine in China

For every year the tariff is reduced, the model estimates the new lower retail prices of bottled and bulk wine according to equations (2) and (3). The values used in Equation (2), which estimates the new lower duty, $duty^*$, are the 5-year average (2005–09) CIF price of bottled and bulk wine in 2010 Australian dollars, as published by the General Administration of Customs of China (GACC 2011), the existing consumption tax and VAT, and the assumed tariff reductions set out above.

To estimate the effect of a phased removal of the import tariff on Australian wine, certain assumptions are made which relate to the responsiveness of demand to changes in both the price of wine (price elasticity of demand) and in consumers' income (income elasticity). For China, the price elasticity of demand and the income elasticity for wine used in the model are based on research conducted by Fang and Pan (2003). Because elasticity estimates can vary considerably depending on the prior research undertaken, a lower bound and an upper bound of the price elasticity of demand are obtained from Huan-Niemi and Niemi (2009). By setting such bounds, the model can calculate a small demand response to a change in the retail price of wine, as well as a strong demand response. The economic model also employs an estimate for the sensitivity of supply to changes in price (price elasticity of supply) and the sensitivity of demand to changes in income (income elasticity). Estimates of these two elasticities are also provided by Fang and Pan (2003).

The annual effect of the phased tariff cuts on the retail price of imported Australian bottled and bulk wine, as well as on export sales of Australian wine to China, are reported in tables 1 to 4. All changes to export sales are calculated relative to a 2009 base year. Tables Table 1 and Table 2 report the estimated effects on Australian exports of bottled wine, while tables Table 3 and Table 4 report the same results for bulk wine. The first column of each table indicates the year of the phase-out. Column 2 reports the value of the import tariff applied in that year. Column 3 reports by how much the retail price has declined since the first year. Columns 4 to 6 report the volume or value (in thousand litres or millions of Australian dollars) by which wine exports have increased compared with the base year of 2009. These results include low, high and average estimates, reflecting the range of elasticities used.

Retail price

The results from the model indicate that if the tariff rate for bottled wine (14 per cent) is phased out over 6 years, the retail price of Australian bottled wine in China at the end of the implementation period would be 12 per cent lower than in the base year. Similarly, if the tariff rate for bulk wine (20 per cent) is phased out over the same period, the retail price of Australian bulk wine in China would be 17 per cent lower than in the base year. Note that in both cases the drop in the retail price at the end of the implementation period is less than the total decline in the tariff rate (–14 per cent and –20 per cent). This occurs because the value-added tax and consumption tax continue to be applied to wine sales which, when applied to Equation 2, results in the new lower duty rate of 30 per cent for both bottled and bulk wine. A lower duty payable on every litre of wine constitutes a smaller share of the retail price, where the retail price is the sum of the CIF price of wine and the duty.

Imports of Australian wine

For Australian bottled wine the phased reduction of the tariff to zero over the 6-year period is estimated to increase the volume of Australian wine imported by China by between 1.9 million litres and 4.6 million litres, relative to the base year. The range of this increase occurs because of the estimates for the price elasticity of demand that are used in the model. When a low estimate is used (reflecting a low sensitivity of demand for wine to a change in price), a smaller increase in imports will result following a decline in the retail price, while a higher value for the price elasticity of demand will have a greater effect on demand for wine. The estimated increase in the value of imports resulting from the increased sales ranges from \$10.2 million to \$25.3 million (in 2010 Australian dollars) relative to the base year (Table 2). These estimates are equivalent to an increase in imports of Australian bottled wine of between 10 per cent and 24.7 per cent relative to 2009 import values, when imports of Australian bottled wine by China totalled \$102.4 million.

For Australian bulk wine, reducing the tariff to zero in China could increase the volume of bulk wine imports from Australia by between 2.6 million litres and 6.6 million litres relative to the base year. The corresponding estimated increase in import values ranges from \$2.9 million to \$7.1 million (tables Table 3 and Table 4). This is equivalent to an increase in imports of Australian bulk wine of between 13.7 per cent and 33.6 per cent relative to 2009 import values, when imports of Australia bulk wine by China totalled \$21.1 million.

Table 1 Effect of tariff reductions in China on the import volume of Australian bottled wine

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import volume ('000 litres)		
			Lower bound	Average	Upper bound
Base year	14	0	–	–	–
1	11	3	398	638	987
2	8	5	797	1277	1974
3	6	7	1063	1703	2633
4	4	9	1328	2128	3291
5	2	11	1594	2554	3949
6	0	12	1859	2980	4607

Table 2 Effect of tariff reductions in China on the import value of Australian bottled wine

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import values (\$ mil)		
			Lower bound	Average	Upper bound
Base year	14	0	–	–	–
1	11	3	2.2	3.5	5.4
2	8	5	4.4	7.0	10.9
3	6	7	5.8	9.4	14.5
4	4	9	7.3	11.7	18.1
5	2	11	8.8	14.0	21.7
6	0	12	10.2	16.4	25.3

Table 3 Effect of tariff reductions in China on the import volume of Australian bulk wine

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import volume ('000 litres)		
			Lower bound	Average	Upper bound
Base year	20	0	–	–	–
1	17	3	393	629	973
2	13	6	916	1469	2271
3	9	9	1440	2308	3568
4	6	12	1833	2937	4542
5	3	14	2226	3567	5515
6	0	17	2619	4196	6488

Table 4 Effect of tariff reductions in China on the import value of Australian bulk wine

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import values (\$ mil)		
			Lower bound	Average	Upper bound
Base year	20	0	–	–	–
1	17	3	0.4	0.7	1.1
2	13	6	1.0	1.6	2.5
3	9	9	1.6	2.5	3.9
4	6	12	2.0	3.2	5.0
5	3	14	2.4	3.9	6.0
6	0	17	2.9	4.6	7.1

5 Effect on Australian wine exports to the Republic of Korea of a phased removal of tariffs

Tariffs and taxes on imported wine in the Republic of Korea

Almost all of the wine sold in the Republic of Korea is imported. Except for those countries with which the Republic of Korea has negotiated a free trade agreement, the import duty on wine, including Australian wine, is 15 per cent. Given the combination of taxes, the import tariff and the high distribution costs and mark-ups that are applied to imported wine, retail wine prices in the Republic of Korea are significantly higher than in Australia (AWBC 2009).

The tariff and tax rates applied to wine sold in the Republic of Korea are:

- import tariff 15 per cent
- liquor tax 30 per cent
- education tax 10 per cent
- value-added tax 10 per cent

There are additional charges that may be applied to a bottle of imported wine that drive up the price even further. Specifically, the CIF price will incur an additional charge of between 7 and 8 per cent because of various fees associated with customs clearance, such as warehousing and transportation. The exact amount of these fees depends mainly on the type of inspection to which the shipment is subject. For example, the warehousing fee will be higher if a detailed inspection is required because of the time required for that inspection.

Evaluation of a tariff reduction on Australian wine in the Republic of Korea

To model the effect of a phased removal of the import tariff in the Republic of Korea, the 2008-09 CIF price, as reported by UN Comtrade, is used. As with the model for China, estimates for the price elasticity of demand and income elasticity, as determined by Lee, Kennedy and Hilbun (2009), are applied to the model for the Republic of Korea. In order to allow for uncertainty in the estimated price elasticity of demand an upper and lower bound of 10 per cent is applied.

Retail price

Following equations (4) to (9) presented in Chapter 3, column 3 of Table 5 sets out the method by which each of the taxes is applied to the CIF price of imported wine in the Republic of Korea to calculate the duty on every litre of wine. Given an import tariff of 15 per cent, the rate of the final duty is about 76 per cent, which comprises about 43 per cent of the retail price for wine.

It is worth noting that because the taxes are applied to the CIF price inclusive of the import tariff, any reduction in the import tariff has implications for the revenue collected from each of the other taxes. Consequently, the final duty applied to the CIF price per litre of wine is also affected, as is the share of the retail price attributed to the duty. The effect on these variables and on the

resulting retail price following the removal of the import tariff (that is, a 100 per cent reduction) is estimated using Equation 15 and is reported in column 4.

Table 5 Effect of a tariff cut on tax revenues and the retail price in the wine market of the Republic of Korea

1	2	3	4
	Components of the retail price	Calculation method	Percentage change (%)
A	CIF price		
B	Import tariff	$A*15\%$	-100
C	Liquor tax	$(A+B)*30\%$	-13
D	Education tax	$C*10\%$	-13
E	Subtotal	$A+B+C+D$	-13
F	Value-added tax	$E*10\%$	-13
G	Fees for customer clearance	$A*8\%$	0
	Total duty		-28.8
	Retail price		-12.5
	Share of the retail price attributed to the total duty		-18.7

Source: USDA-FAS 2009b

As shown in Table 5, if the import tariff rate were to be reduced to zero, then the revenue collected from the liquor tax, the education tax and the value-added tax would each fall by 13 per cent. The total duty would fall by 28.8 per cent, from the original duty rate of about 76 per cent to around 54 per cent. As a result, the retail price of bottled and bulk Australian wine in the Republic of Korea would decrease by around 12.5 per cent. The lower incidence of the duty would also be reflected in the lower share of the duty as a proportion of the retail price.

Imports of Australian wine

The annual effect of the phased tariff cuts on the retail price and sales of Australian wine in the Republic of Korea are reported in tables 6 to 9. Tables Table 6 and Table 7 report the estimated effects on imports (volumes and values) of Australian bottled wine relative to a 2009 base year, and tablesTable 8 and Table 9 report the same results for bulk wine. The results are organised identically to those in Chapter 4.

For Australian bottled wine, reducing the import tariff to zero is estimated to increase the volume of imports by between 98 000 and 160 000 litres compared with the 2009 base year (tables Table 6 andTable 7). The corresponding estimates of increased imports in values ranges from \$590 000 to \$960 000. This is equivalent to an increase in imports of Australian bottled wine of between 6.6 per cent and 10.7 per cent relative to 2009 values, when imports of Australian bottled wine by the Republic of Korea totalled \$8.98 million.

For Australian bulk wine, reducing the tariff to zero is estimated to increase the volume of Australian bulk wine exports by between 23 000 litres and 37 000 litres relative to the 2009 base year (tables Table 8 and Table 9). The corresponding estimates of increased import values range from \$40 000 to \$80 000. This is equivalent to an increase of between 5.9 per cent and 11.8 per cent of 2009 import values, when imports of Australian bulk wine by the Republic of Korea totalled \$680 000.

Table 6 Effect of tariff reductions in the Republic of Korea on the volume of Australian bottled wine imports

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import volume ('000 litres)		
			Lower bound	Average	Upper bound
Base year	15.0	0	0.00	0.00	0.00
1	12.5	2	16.35	24.74	26.64
2	10.0	4	32.71	49.47	53.29
3	7.5	6	49.06	74.21	79.93
4	5.0	8	65.42	98.94	106.58
5	2.5	10	81.77	123.68	133.22
6	0.0	13	98.13	148.41	159.86

Table 7 Effect of tariff reductions in the Republic of Korea on the value of Australian bottled wine imports

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import values (\$ mil)		
			Lower bound	Average	Upper bound
Base year	15.0	0	0.00	0.00	0.00
1	12.5	2	0.10	0.15	0.16
2	10.0	4	0.20	0.30	0.32
3	7.5	6	0.29	0.45	0.48
4	5.0	8	0.39	0.59	0.64
5	2.5	10	0.49	0.74	0.80
6	0.0	13	0.59	0.89	0.96

Table 8 Effect of tariff reductions in the Republic of Korea on the volume of Australian bulk wine imports

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import volume ('000 litres)		
			Lower bound	Average	Upper bound
Base year	15.0	0	0.0	0.0	0.0
1	12.5	2	3.8	5.7	6.2
2	10.0	4	7.6	11.4	12.3
3	7.5	6	11.4	17.2	18.5
4	5.0	8	15.1	22.9	24.7
5	2.5	10	18.9	28.6	30.8
6	0.0	13	22.7	34.3	37.0

Table 9 Effect of tariff reductions in the Republic of Korea on the value of Australian bulk wine imports

1	2	3	4	5	6
Year	Tariff rate (%)	Decrease in retail price (%)	Increase in import values (\$ mil)		
			Lower bound	Average	Upper bound
Base year	15.0	0	0.00	0.00	0.00
1	12.5	2	0.01	0.01	0.01
2	10.0	4	0.01	0.02	0.03
3	7.5	6	0.02	0.03	0.04
4	5.0	8	0.03	0.05	0.05
5	2.5	10	0.04	0.06	0.07
6	0.0	13	0.04	0.07	0.08

6 Remarks

Import tariffs provide an effective barrier to trade by raising the price of a commodity in the importing country. As a result, demand for the imported good falls. Australian exporters of wine, facing an increasingly competitive global wine market, are at a competitive disadvantage relative to Chile and New Zealand in both China and the Republic of Korea. The strong growth in export volumes to China in recent years by Chile and New Zealand in part reflect the market advantage granted by their respective free-trade agreements. Australian wine exporters could significantly benefit from similar preferential tariff treatment with the fast-growing wine markets of China and the Republic of Korea.

This analysis provides a quantitative assessment of the change in wine trade flows stemming from the removal of existing import tariffs on Australian wine in China and the Republic of Korea. Wine consumption in both countries has grown significantly in recent years for a number of reasons, including falling prices. This analysis is based on the assumption that these factors will remain largely unchanged. Other factors that have affected the demand for wine, such as income growth, changing tastes, education, and exchange rate fluctuations are not considered. This analysis isolates the effect on the wine trade with Australia resulting from a complete removal of the tariff by both China and the Republic of Korea, while holding existing consumer taxes and fees in both countries constant.

The results for China indicate that the removal of the import tariff on Australian wine could cause the retail price for Australian wine to fall by 12 per cent for bottled wine and 17 per cent for bulk wine. In response to the lower price, demand for Australian wine would increase. It is estimated that the total import value of Australian wine (bulk and bottled) would increase by between \$13 and \$32 million relative to the base year, equivalent to an increase of between 10.5 per cent and 26 per cent of the value of Australian wine imported by China in 2009.

The opportunities for growth in Australian wine exports to the Republic of Korea under free trade are more limited, given the existing volume of trade and taxes applied to all wine sales. A zero tariff on Australian wine in the Republic of Korea would result in a 13 per cent fall in the retail price of Australian bottled and bulk wine in that market. This would stimulate stronger demand for Australian wine, which could potentially lead to an increase in imports of between \$630 000 and \$1 million compared with the base year. This would be equivalent to an increase of between 6.5 per cent and 10.4 per cent of the total value of Australian wine imported into the Republic of Korea in 2009.

The results from this analysis indicate that sales of imported wine increase following the removal of the import tariff. This is a desirable result for any wine exporter. However, the removal of the import tariff in China and the Republic of Korea does not translate into an equivalent reduction (in percentage terms) of the retail price for wine. The amount by which the retail price falls is mitigated by the additional taxes and charges applied to the price of wine in both countries. Consequently, the positive effect on the demand for Australian wine is not as high as it would be in the absence of these taxes and fees.

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