International Journal of Wine Research

Dovepress

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ORIGINAL RESEARCH

Regulatory and institutional developments in the Ontario wine and grape industry

This article was published in the following Dove Press journal:
International Journal of Wine Research
25 September 2012

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Abstract: The Ontario wine industry has undergone major transformative changes over the last two decades. These have corresponded to the implementation period of the Ontario Vintners Quality Alliance (VQA) Act in 1999 and the launch of the Winery Strategic Plan, "Poised for Greatness," in 2002. While the Ontario wine regions have gained significant recognition in the production of premium quality wines, the industry is still dominated by a few large wine companies that produce the bulk of blended or "International Canadian Blends" (ICB), and multiple small/mid-sized firms that produce principally VQA wines. This paper analyzes how winery regulations, industry changes, institutions, and innovation have impacted the domestic production, consumption, and international trade, of premium quality wines. The results of the study highlight the regional economic impact of the wine industry in the Niagara region, the success of small/mid-sized boutique wineries producing premium quality wines for the domestic market, and the physical challenges required to improve domestic VQA wine retail distribution and bolster the international trade of wine exports. Domestic success has been attributed to the combination of natural endowments, entrepreneurial talent, established quality standards, and the adoption of improved viticulture practices.
Keywords: Ontario, wine, quality standards

Introduction

The Canadian wine industry underwent a major transformation following the enactment of the Canada/US Free Trade Agreement (CUSFTA) in 1989 and the adoption of policies in the early 1990s to promote the production of premium quality wines. The Ontario Vintners Quality Alliance (VQA) Act (1999) allowed consumers to identify quality wines made in Ontario, based on the origin of the grapes, quality of the vintage, and production methods.[1] Such regulatory measures created incentives for small (<20,000 cases per annum) and mid-sized wineries (20,000–100,000 cases per annum) to alter production strategies and improve consumer acceptance.

Ontario accounts for the bulk of Canadian premium wine production, produces 90% of the wine, and grows 80% of the harvestable grapes in Canada. This wine region demonstrates how a minor wine-producing area in the international wine industry can develop a dynamic, competitive industry within a relatively short time, through the combination of innovation, entrepreneurial talent, and increased wine tourism.

This paper analyzes the performance of the Ontario wine and grape industries in terms of a combination of institutional, structural, and market development factors. The role the Liquor Control Board of Ontario (LCBO), industry organizations, support institutions, and regulations have played in the development and

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Dovepress
http://dx.doi.org/10.2147/IJWR.S33523

enhanced competitiveness of the Ontario wine region is also considered. The next section reviews the Canadian and Ontario wine and grape industries, wine distribution, and industry policies. Government regulations and their influence on the importation and interprovincial movement of wine products and effects on direct market sales across provincial boundaries, are addressed in this section. The third section examines the Ontario grape industry in terms of varietals grown and pricing practices. The fourth section examines the role of technological change and Research and Development (R&D) institutions in providing improved viticulture innovations for uptake by the grape and winery establishments. Concluding remarks are provided in the final section.

The Canadian wine industry

The Canadian wine industry has a long history, starting in 1927 when the LCBO was instituted to regulate the import and retail sale of alcoholic beverages, to the establishment of the 1999 VQA appellation system to develop standards rating and certifying quality wines.[2] In the early days, the Canadian wine industry was based on the cultivation of hardy native grape species (eg, *Vitis labrusca*) and the production of fortified and sweet table wines.[3,4] The 1960s were marked by a shift in Canadians' consumption habits to drier wines, mainly port and sherry types.[5] The development of the modern Canadian wine industry commenced with the advent of the CUSFTA in 1989 and the subsequent adoption of wine regulations to promote the production of premium quality wines. New wine regulation resulted in the phase-out of Canada's protectionist wine tariff structure, increased plantings of European grape varieties (*V. vinifera*), and improved wine quality and global competitiveness of Canadian wines.[5]

The Canadian wine industry is small by North American standards when compared with large US wine regions such as California and Washington. Canadian manufacturing wine value-added totaled CAD $593 million (mln) and total employment of 3567 persons in 2009.[6] Since 1998, the Canadian wine sector has accounted for about 0.3% of the manufacturing sector with an average annual real GDP growth rate of 7.6%.[7] The expansion of the Canadian winery industry since the late 1990s is attributed to improved quality standards and expanded promotion of Canadian wines.[2,3]

The bulk of the Canadian wine industry is concentrated in Ontario followed by British Columbia (BC), Quebec, and Nova Scotia. In 2009, there were 364 Canadian grape wineries, up from 299 in 2006, with most of them located in BC and Ontario.[8] Canadian wineries, liquor stores, and agencies reported wine sales valued at CAD $5.8 billion in 2010, up from CAD $2.4 billion in 1998.[9] The growth of sales value exceeded the growth of volume. The corresponding increase in volume sales is 76%, from 259.9 million liters (milL) in 1998 to 456.4 milL in 2010. Much of the growth in wine sales can be attributed to the rising popularity of red wines; red and rosé wines account for 62% of total volume sales.[10] Import volumes accounted for approximately 50% of Canadian domestic wine sales with Canadian import volumes increasing by 73% from 203 milL in 1998 to 350 milL in 2010 (Table 1).[11] There has been a slight declining trend in Canadian bulk wine imports from the US over the last few years.[12] Bulk wines are less expensive to transport and account for about 40% of Canada wine imports from the United States.

Canada is a relatively small player on the international wine market with export sales totaling CAD $28 mln in 2010, up from CAD $6 mln in 1998. As shown in Table 2, Canadian wine exports to the world had increased from 1.2 milL in 1998 to 14.9 milL by 2010 with the bulk destined for the United States.[11] Wine exports from Ontario represent a large portion of the country's total wine exports' share, which declined from 49.5% in 1998 to 24.1% in 2010. Although more wine has been exported in relative and absolute terms from Ontario and Canada recently, the American market is slightly less important for Ontario wines (Ontario's 89.7% versus Canada's 94.0%) than Canadian overall wine shipments. The most noticeable difference in wine exports from Ontario and Canada has been the almost complete cessation of exports to major Asian markets, with the exception of the emerging wine market in China. Also, the importance of the European market has diminished, except for, surprisingly, the increase in wine exports from Ontario to France. National export wine programs have been developed by the federal government to bolster the exports of Canadian wine to selected foreign markets and US cities.[13]

Shifting trends in the production of higher quality wines have impacted the structure of the Canadian wine sector. In the 1990s, Vincor International Inc (Canada's largest winery), consolidated its operations by acquiring vineyards and investing in the growing of the high-quality premium European grapes required to produce premium wines.[14] Vincor's expansion strategy in foreign markets included strengthening its technical capability by procuring wine-making technology, wine makers, and vineyard managers from reputable wine-producing countries. Vincor acquired a portfolio of mid-sized or estate wineries in Canada along with sales distribution networks in California. By 2004, Vincor had extended its operations

Table 1 A comparison of Ontario and Canadian wine imports between 1998 and 2010[a]

Importing country	1998			2010		
	Volume (liters)	Volume (percent)	Rank	Volume (liters)	Volume (percent)	Rank
Canada						
US	38,677,950	19.1	2	49,828,185	14.2	4
Total	202,925,488			350,058,992		
Ontario						
France	22,839,257	30.5	1	13,138,840	11.7	4
Italy	13,629,242	18.2	2	24,412,330	21.7	1
US	13,377,131	17.8	3	14,562,208	12.9	3
Australia	4,067,805	5.4	5	16,218,596	14.4	2
Chile	7,944,644	10.6	4	12,069,803	10.7	5
Portugal	2,078,395	2.7	7	2,464,892	2.2	
Germany	2,237,038	2.9	6	2,077,645	1.8	
Spain	1,910,071	2.5	8	6,518,684	5.8	7
South Africa	1,899,736	2.5	8	6,072,532	5.4	8
New Zealand	289,331	0.4		3,103,502	2.8	
Argentina	985,370	1.3		9,846,907	8.7	6
Greece	847,926	1.1		378,598	0.3	
Hungary	973,238	1.3		1,024,605	0.9	
Bulgaria	552,624	0.7		33,535	0.03	
Israel	136,581	0.2		122,406	0.1	
Others	1,002,677	1.3		659,016	0.6	
Total	74,771,066	100		112,704,099	100	

Note: [a]Includes wine of fresh grapes including fortified wines, iced wines, and grape must.
Based on data from Guilbault (2011).[11]

globally through the acquisitions of product brands in the US, New Zealand, Australia, and South Africa.[15]

Canadian wine demand, distribution and regulations

The increasing popularity of wines is attributed to the popularity of red wines. The consumed wine volume per adult for both red and white wines increased from 11.3 liters in 1998 to 16.8 liters in 2010.[16] Canadian wine consumption levels are relatively low when compared on a global basis, but this is likely to be influenced in the near future by the changing demographic make-up of wine drinkers.[17] Most of the growth in Canadian wine consumption has been associated with a rapid increase in the consumption of premium quality wines. Ontario VQA table wine sales increased by an impressive 78% from CAD $162 mln in 2001/02 to CAD $288 mln in 2010/11 but in relative terms were outpaced by the British Columbia VQA wine sales, which increased by 175% from CAD $70 mln to CAD $193 mln over the same period.[18,19]

After Canadian Prohibition was repealed in 1927, the responsibility to regulate the sale of alcohol was assigned to provincial governments through the enactment of Canada's federal Importation of Intoxicating Liquors Act in 1928. This Act granted the provincial liquor control boards monopolistic power over the importation, inter-provincial shipment, and retailing of wine in Canada.[20] The boards are the only entities that can legally import wine into Canada and, with the exception of Alberta, own and operate retail stores.[21] Alberta privatized alcohol retailing in 1993.

In general, the bulk of wine retail sales occur through Provincial Government-owned and licensed liquor stores. However, the two large wineries (Vincor, Andrew Peller Ltd) in Ontario that have brand recognition own most of the 368 private retail stores in Ontario.[22] VQA premium quality wines produced by small/mid-sized wineries are generally sold through on-site winery stores, off-site private stores, and restaurants. Inter-provincial wine trade restrictions have limited business opportunities in Ontario to domestic wine sales within provincial jurisdictions. It is still illegal, for example, to ship wine directly to customers across provincial borders in Canada without going through their liquor control board. The limited production of small boutique wineries impedes them from shipping to government retail liquor stores and restricts Canadians' access to some of the best wines. The removal of the inter-provincial trade restrictions would offer an alternative distribution channel, and allow direct sales from small wineries to consumers in provinces without a wine industry.

Table 2 A comparison of Ontario and Canada wine volume exports to principal importing countries in 1998 and 2010[a]

Country	1998		2010	
	Volume (liters)	Volume (percent)	Volume (liters)	Volume (percent)
Canada				
US	134,537	11.0	14,007,231	94.0
Taiwan	387,392	31.7	24,144	0.2
Hong Kong	132,294	10.8	170,253	1.1
China	5,530	0.4	462,132	3.1
Japan	145,890	11.9	23,476	0.2
Singapore	40,082	3.2	17,575	0.1
Australia	–	–	16,086	0.1
Chile	96,000	7.8	27	0.0002
UK	83,143	6.8	44,817	0.3
Germany	28,248	2.3	16,971	0.1
France	–	–	29,997	0.2
Switzerland	10,960	0.8	11,560	0.1
Sweden	81,282	6.6	–	–
Others	76,662	6.3	68,994	0.5
Total	1,222,020	100	14,893,263	100
Ontario				
US	114,903	19.0	3,219,552	89.7
Taiwan	208,402	34.5	9081	0.2
Hong Kong	59,375	9.8	37,793	1.0
China	580	0.1	171,322	4.7
Japan	82,846	13.7	20,335	0.6
Singapore	40,082	6.6	16,875	0.4
Malaysia	–	–	3777	0.1
Australia	–	–	16,086	0.4
UK	32,981	5.4	14,327	0.4
Germany	28,248	4.6	15,575	0.4
France	279	0.04	18,292	0.5
Switzerland	10,960	1.8	8171	0.2
Netherlands	1125	0.2	–	–
Others	24,916	4.1	37,455	1.0
Total	604,697	100	3,588,641	100

Note: [a]Wine of fresh grapes including fortified wines, iced wines, and grape must.
Based on data from Guilbault (2011).[11]

The Ontario wine industry

The Ontario wine industry contributes to the local economy in multiple ways including manufacturing, processing, and tourism. An economic impact evaluation of the Ontario VQA wine industry estimated the value-added contribution of the sector to be CAD $191 mln with the creation of 1300 jobs during the last five years.[23]

There are two categories of wine, namely VQA and ICB wines.[24] ICB wines are regulated under Ontario's Wine Content Act.[5] In 1999, the legitimization of the VQA Act established an "Appellation of Origin" system akin to the French Appellation d'Origine Contrôlée (AOC) system, which allowed consumers to identify VQA quality wines made in Ontario, based on the appellation origin of the grapes, quality of the vintage, and viticulture methods.[25] In fiscal year 2007/08, there were over 140 licensed wineries (grape and fruit wineries) with 108 producing VQA wines.[26] Wineries that are registered grape growers account for roughly 25%–30% of the wine grape crop and grow about 50% of the *V. vinifera* grapes used to manufacture premium quality wines.[27]

In Ontario, the grape and wine industry can be considered an amalgamation of several institutions and industry organizations, such as the Wine Council of Ontario (WCO) and the Grape Growers of Ontario (GGO).[28] Although the GGO and LCBO seem to naturally fit the Ontario wine clusters, neither institution has played a significant role in promoting innovation and growth within the Ontario wine cluster.[29] The LCBO retailing and market promotion practices have not provided measurable success for the sales performance of small and medium-sized-VQA wineries because the LCBO's mandate as a provincial monopoly is to maximize profits, purchasing wines both locally or imported to optimize its retail shelf space and advertising promotional expenditures.[30]

There are several challenges regarding wine policies and industry-specific characteristics that must be addressed for the sector to improve competitiveness and develop a regional cluster identity with distinct wine styles and flagship grape varieties.[31] Some of the regulatory, institutional, and structural changes that have taken place in the Ontario wine sector over the last four decades are shown in Table 3.[2,5,22,32,33]

Regulatory changes

Since 1972, the Wine Content Act has been amended multiple times to allow manufacturers of blended or ICB wine to meet consumer demand. The Wine Content amendments between 1972 and 2010 have all focused on blending imported wines with domestic wines or the minimum share of Ontario-grown product. The 1972 amendment allowed wineries to blend up to 25% of imported wine per bottle, which increased to 90% in 1993. In parallel, Ontario wine-labeling regulations established the minimum amounts of Ontario-grown product in a bottle of wine starting with the minimum of 30% in 1989, increasing to an average of 40% of Ontario-grown product by 2010. The loosened Ontario wine-labeling laws have tarnished the image of Canadian wines by allowing wineries to use up to 70% imported product in their wines and merchandizing them as Canadian wines in provincial liquor stores.[34]

Table 3 Evolutionary regulatory, licensing, institutional, and structural changes in the Ontario wine industry

Year/period	Regulatory, organizational, and industry structural changes
Regulatory	
1927	Establishment of the Liquor Control Board of Ontario (LCBO)
1972	Wine Content Act amended to allow wineries to blend up to 25% imported product in a bottle of wine
1975	Inniskillin Winery obtains Ontario's first new winery license since 1929
1980	Wine Content Act amended to allow blending up to 30% imported product in a bottle of wine
1989	Wine Content Act amended to allow a minimum of 30% Ontario-grown product in a bottle of wine
1989	Voluntary Vintner's Quality Alliance (VQA) Program established by Ontario wine industry
1993	New wineries licensed post-1993 can manufacture and or sell wines made only with 100% Ontario grapes
1993	Wine Content Act amended to allow blending up to 90% imported product in a bottle of wine
1994	Wine Content Act amended to allow a minimum of 25% Ontario-grown product in a bottle of wine
1999	The VQA Act legalized in the Ontario Provincial Legislature
2001	Wine Content and Labelling Act amended to allow a minimum of 30% of Ontario-grown product
2010	Wine Content and Labelling Act amended to have blended wines packaged after September 1, 2010 and before March 31, 2014, to have 40% (average) minimum domestic content
Institutional	
1974	Wine Council of Ontario established
1989	Canada-US Free Trade Agreement established – eliminates preferential treatment for domestic wines
2002	A Strategic Framework established for the Ontario Wine Industry titled "Poised for Greatness"
2004	Environmental Program created titled "Sustaining Wine making in Ontario: An Environmental Charter"
2004	VQA Ontario announced the establishment of 11 Sub-appellations in the Niagara Peninsula
2008	Wine Council of Ontario developed national export wine strategy partially funded by the government
Structural change	
1811	Johann Schiller established first commercial winery in Ontario
1874	Thomas Bright and FA Shirriff established Niagara Falls Wine Company
1906	Establishment of the Vineland Research Station that experimented with hybrid varieties
1946	Adhemar de Chaunac (French scientist) experiments with European vines, including Chardonnay
1960s	Canadian consumption patterns shift from fortified wines to drier wines
Pre-1972	Ontario's wines produced from 100% Ontario-grown grapes
1986	Brights Wine Company acquires Jordan and St Michelle Cellars
1992	Cartier Wine Company acquired Inniskillin wine company
1993	Vincor Wine Company established and launches the Jackson-Triggs label brand
1996	Vincor acquired Dumont Vins et Spiritueux, Quebec, and Okanagan Vineyards in British Columbia
1998	Vincor acquired RJ Spagnols Wine and Beer Making Supplies and other wineries in Quebec
2000	Vincor acquired Sumac Ridge and Hawthorne Mountain Vineyards in British Columbia
2001	Vincor acquired Hogue Cellars of Washington State and established Niagara winery in Ontario
2002	Vincor acquired Goundrey Wines of Western Australia
2003	Vincor acquired Kim Crawford Wines of Auckland, New Zealand
2004	Vincor acquired Amberley Estate of Australia and Western Wines in the United Kingdom
2006	Constellation Brands (New York) acquired Vincor, Canada

Based on data from Wine Council of Ontario (2001)[5]; Asple[2]; Grape Growers of Ontario (2012)[32]; Bramble et al[22]; Bramble.[33]

The Wine Content Act has not benefitted the marketing of VQA wines by small/mid-sized wineries because wine policies have facilitated the production of ICB wines by large wineries for sale in LCBO retail stores, reducing the available shelf sale for VQA wines. Less than 2.5% of the LCBO monopoly wine product listings are dedicated to VQA wines, while ICB wines dominate the limited shelf space allocated to domestic Canadian wines in LCBO retail stores.[35] It appears that the VQA Act that allowed product differentiation based on wine quality and region of origin did not improve access to the LCBO distribution system and therefore wine tourism offers an alternative distribution channel, although of limited capacity.

Institutional developments

Institutional changes that affected the structure of the wine industry include the 1974 establishment of the Wine Council of Ontario. In 1989, the CUSFTA eliminated the preferential treatment of domestic wines and increased the competition from imported wines on the Ontario market. These institutional changes created the voluntary VQA Program in 1989, which was legalized in 1999 by the Ontario Provincial Legislature. In 2004, the VQA Ontario undertook additional action to further differentiate Ontario wines from imported wines and established 11 sub-appellations in the Niagara Peninsula.

Structural changes

Structural changes were characterized by acquisitions and mergers of multiple wineries. The first major acquisition took place in 1986 followed by the acquisition of Inniskillin by Cartier Wine Company in 1992. In 2006, Vincor itself was purchased by Constellation Brands of New York. The interests of 90 small/mid-sized wineries are represented by the WCO, which is a non-profit trade association. Effective November 2009, two large wineries and four smaller ones with a significant VQA portfolio left the WCO to form the Winery and Grower Alliance of Ontario.[36]

Wine marketing strategies have differed markedly between the small/mid-sized and large wineries.[37] Large wineries have tended to augment their competitive advantage by carrying a wider range of product brands and package containers that appeal to consumers of varying tastes, preferences, and price points.

Ontario wine demand and distribution

Between 1998 and 2010, Ontario wines sales increased by 116% from CAD $875 mln to CAD $1.8 billion.[9] Most of the domestic wine sales increases were attributed to higher import volumes, which increased by 51% from 75 milL in 1998 to 113 milL in 2010, as illustrated in Table 1.[11] There has been a noticeable shift in the New World volume wine supply to the Ontario market, particularly from countries such as Australia, Chile, and Argentina. Among Old World wine producers, Italy is the only wine supplier that significantly increased its supply to the Ontario market. Ontario consumers are drinking more wine and wine sales per adult increased from 10.5 liters in 1998 to 14.3 liters in 2010.[16] These rapid increases in wine sales per adult are partly attributed to higher incomes, with the Ontario median family income averaging CAD $65,414 over the 2005–2009 period.[38]

Since 1990, domestic retail sales of Ontario wines (VQA, non-VQA) have increased from 30 milL in 1991 to 56 milL in 2010, with VQA wines accounting for roughly 21% of total Ontario retail wine sales over the last five years, as shown in Figure 1.[39] Sales of Ontario non-VQA wine by volume were increasing until 2006 and have stagnated since then, while the volume of VQA wine sales stagnated between 2001 and 2007 and has been trending upward since then. Crop failures in 2003 and 2005 affected the volume of VQA wine sales. Ontario VQA wines have sold at a higher unit value than non-VQA wines, as illustrated in Figure 2.[39] As unit prices for non-VQA wines have trended upward since 1999, the VQA wine prices showed a downward tendency between 1996 and 2003. VQA prices have started to strengthen since 2003, and reached CAD $16/liter in 2010.

The LCBO is the principal distribution channel. VQA wine prices per bottle range from less than CAD $8 per 750-mL bottle equivalent to those that retail at greater than CAD $15 per bottle, as shown in Figure 3.[39] Most imported table wines are sold in price ranges of less than

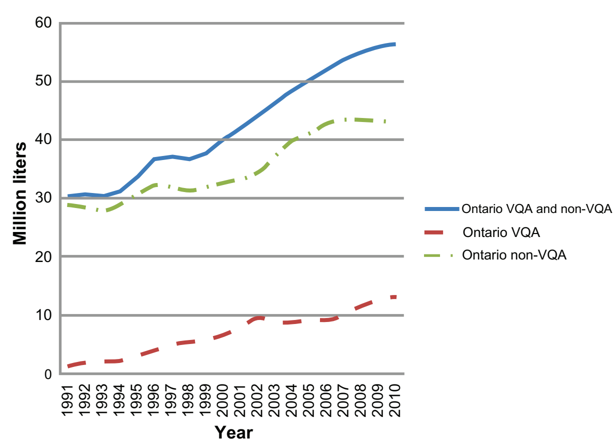

Figure 1 Ontario (VQA, non-VQA) domestic wine sales.
Based on data from Wine Council of Ontario (2012).[39]
Abbreviation: VQA, Vintners Quality Alliance.

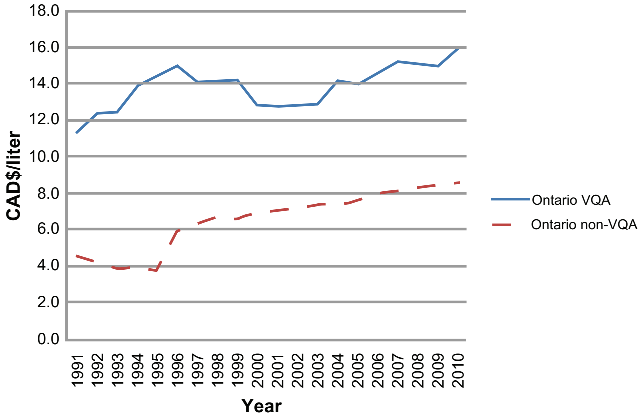

Figure 2 Unit values for Ontario VQA and Non-VQA wines.
Based on data from Wine Council of Ontario (2012).[39]
Abbreviation: VQA, Vintners Quality Alliance.

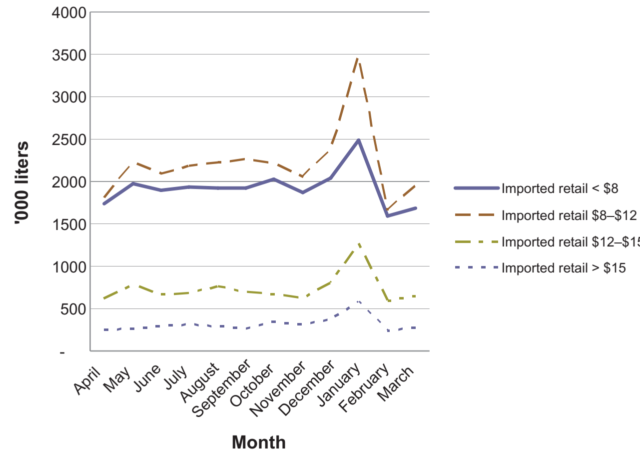

Figure 4 Price categories (750-mL equivalent) for monthly imported table wines retailed at LCBO stores, April 2010–March 2011.
Based on data from Wine Council of Ontario (2012).[39]
Abbreviation: LCBO, Liquor Control Board of Ontario.

CAD $8 or CAD $8–12 per 750-mL bottle equivalent, as illustrated in Figure 4.[39] VQA wines are differentiated by their quality and, not surprisingly, the volume sold at less than CAD $8 per 750-mL bottle equivalent was very small. Similarly, the volume in the most expensive category, CAD $15 or more, also sold in low volume. The LCBO stores, which allocate a very limited shelf space to Ontario wines in general, may not provide adequate exposure to Ontario VQA wines, especially the most expensive wines. Indeed, it seems to be the choice that wineries, which produce VQA wines in relatively small volumes, select not to market their most expensive wines in LCBO stores. The bulk of VQA table wines sold at retail in two price ranges, CAD $8–12 or CAD $12–15 per bottle, had the highest volume sales in October and January.

Retail shipments of VQA wines to LCBO retail stores increased by 53.9% between 2002/03 and 2010/11, growing faster than shipments to restaurants (44.3% shipment growth) and much faster than shipments to winery retail outlets (22.7% volume growth), as shown in Table 4.[18] All wineries are now able to deliver VQA wines directly to restaurants and retain a larger share of the markups otherwise designated for the provincial LCBO monopoly.[40] A recent study argued that, while wineries are not a homogenous group, the sales performance of smaller wineries could benefit if they had greater access to the LCBO distribution system and provided greater shelf space for their products.[30]

The Ontario provincial government has been committed to enhancing the reputation of VQA wines. Since 2010, it has invested (CAD $6 mln annually) in VQA support programs over a period of 5 years. The Ontario provincial government also invested in tourism-related activities with an annual investment of CAD $3 mln over the same period.[41] Although wine tourism provides additional opportunities for sales, it is highly seasonal and reaches a particular segment of the population, which includes few core wine consumers. The

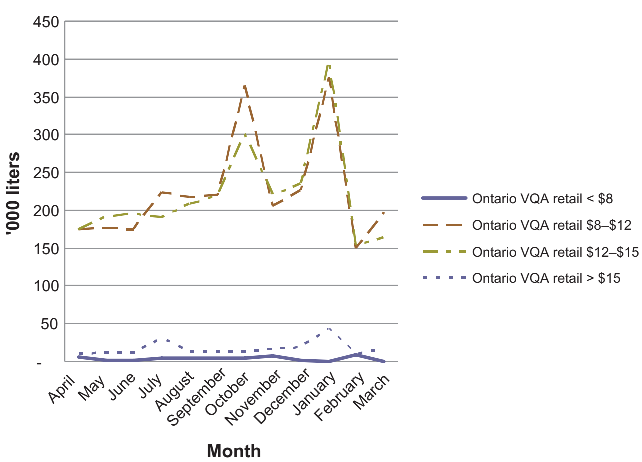

Figure 3 Price categories (750-mL equivalent) for monthly VQA table wines retailed at LCBO stores, April 2010–March 2011.
Based on data from Wine Council of Ontario (2012).[39]
Abbreviations: VQA, Vintners Quality Alliance; LCBO, Liquor Control Board of Ontario.

Table 4 Ontario VQA retail wine sales by marketing channel ('000 liters), 2002–2010 fiscal years

Market channel	Fiscal year				
	2002/03	2004/05	2006/07	2008/09	2010/11
Winery retail	3650	3269	2815	4041	4480
Licensees (eg, restaurants)	2073	1629	2811	2813	2991
LCBO (shipped)	4386	3276	3501	5288	6751
Outside of Ontario and miscellaneous	1253	965	818	1243	1345
Total	11362	9139	9945	13385	15567

Based on data from VQA Ontario (2011a).[18]
Abbreviation: VQA, Vintners Quality Alliance; LCBO, Liquor Control Board of Ontario.

value of VQA impact on wine tourism accounted for about CAD $10 mln in 2010.[23]

To reduce the foreign grape content in Canadian wines and enhance the reputation of Canadian-produced wines, the Ontario government announced regulatory changes that encourage local wineries to manufacture wines entirely from domestic grapes and strengthened labeling regulations to allow consumers to differentiate Canadian-content wines from blended wines.[42]

Ontario wine grape production

Ontario has four principal designated viticulture areas (DVAs): Niagara Peninsula, Lake Erie North Shore, Pelee Island, and Prince Edward County. The Niagara Peninsula is Ontario's largest viticulture area and accounts for over 90% of Ontario's grape volume production.[26]

The viticulture industry is well established in the province's four DVAs, with the production emphasis on premium *V. vinifera* grapes. The number of grape growers in Ontario decreased from 535 in 1998 to 481 in 2010,[43] while planted grape area increased from 6680 hectares (ha) in 1998 to 7136 ha in 2010.[44] Commercial plantings of *V. vinifera* grapes increased from 5304 ha in 2000 to 6603 ha in Ontario and account for 60% of Canadian *V. vinifera* plantings in 2010, as illustrated in Figure 5.[44] The expansion of the *V. vinifera* area in Ontario increased its share in the total grape area planted from 74% in 2000 to 93% in 2010. It is anticipated that the Ontario *V. vinifera* grape area will climb to 8097 ha by 2015.[45] Ontario grape growers seem to have adapted to the changes resulting from consumer demand, with *V. vinifera* grape area plantings peaking at 7324 ha in 2009.

Grape (*V. labrusca, Hybrids, V. vinifera*) production has fluctuated over the years, declining to 53,747 tonnes (t) in 2010 from a peak of 64,178 t in 2006.[43] Between 1998 and 2010, Ontario grape production increased by 22%, from 44,175 t in 1998 to 53,747 t in 2010, as shown in Figure 6.[43] It continued to increase in the latter half of the first decade of 2000 after the weather-induced declines in 2003 and 2005. The shift in wine grape production was attributed to the demand shift for wine type and a greater area planted in *V. vinifera* varieties. In 2010, Ontario *V. vinifera* grape production was 32,371 t, which doubled the 1998 production volume. *V. vinifera* grapes account for roughly 60% of the Ontario wine grape production harvest, while hybrids account for 32%. The vast majority of French hybrids are grown by independent growers who do not also operate wineries.[27] While *V. vinifera* grape production has continued an upward trend since 2005, hybrid grape production has somewhat declined since 1999, as illustrated in Figure 6.[43] Historically, more than 50% of Ontario's grape crop was earmarked for the lower priced blended wines manufactured primarily

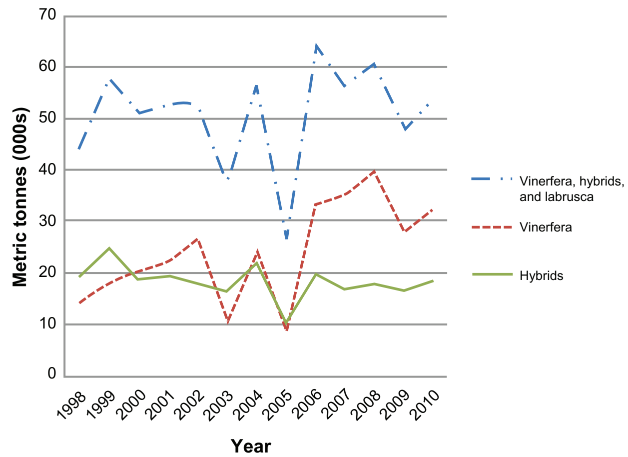

Figure 6 Ontario wine grape production.
Based on data from Grape Growers of Ontario (2011).[43]

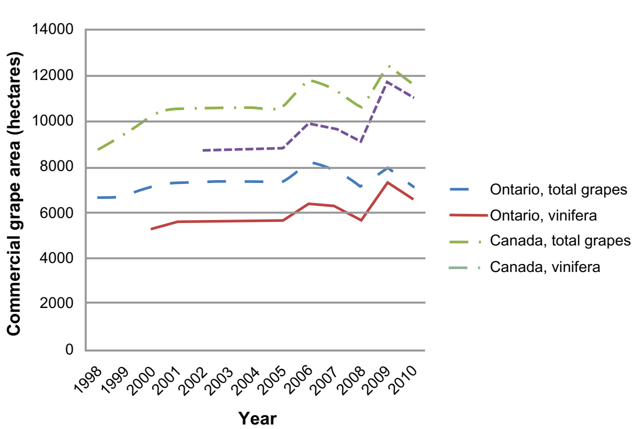

Figure 5 Commercial grape planted area in Canada and Ontario.
Based on data from Athwal (2011).[44]

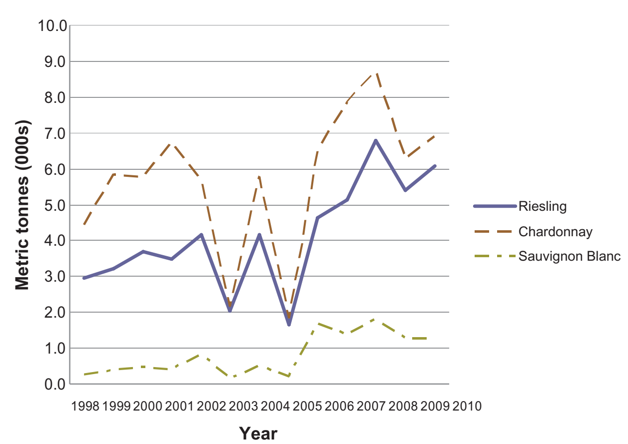

Figure 7 Ontario white wine grape production by selected *V. vinifera* varieties.
Based on data from Grape Growers of Ontario (2011).[43]

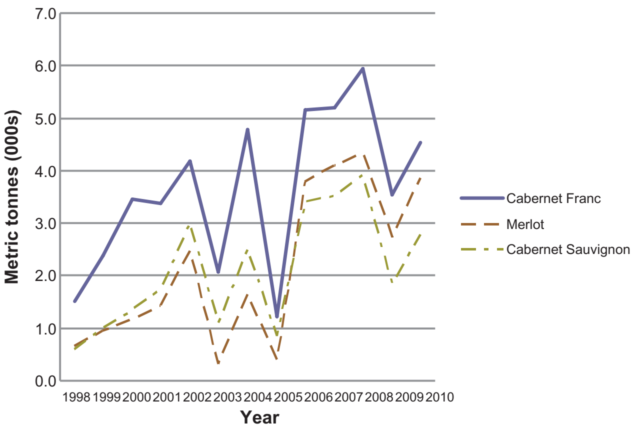

Figure 8 Ontario red wine grape production by selected *V. vinifera* varieties.
Based on data from Grape Growers of Ontario (2011).[43]

by the larger wineries.[46] However, this trend has changed over the last few years, with greater plantings of *V. vinifera* grape varieties for the premium VQA wine market.

The top *V. vinifera* grape varietals grown in Ontario, in terms of production volume, were "Chardonnay," "Riesling," "Cabernet Franc," and "Merlot" (Figures 7 and 8).[43] It is argued that grape varietal choices in Ontario have been influenced more by winery demand or grower perception than by climatic conditions.[47] Ontario's Chardonnay wine grape production increased by 56%, from 4424 t in 1998 to 6900 t in 2010, while Cabernet Franc increased by 199%, from 1515 t to 4532 t during the same period (Figures 7 and 8).[43]

The popular grape varietals in the United States, based on Nielsen off-premise wine sales, were Chardonnay followed by Cabernet Sauvignon, Merlot, Pinot Gris, and Pinot

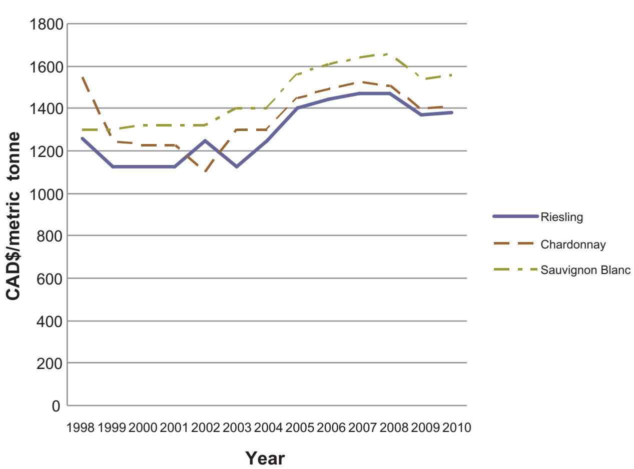

Figure 9 Ontario white wine grape prices of selected *V. vinifera* varieties sold for processing.
Based on data from Grape Growers of Ontario (2011).[43]
Abbreviation: CAD, Canadian dollar.

Figure 10 Ontario red wine grape prices of selected *V. vinifera* varieties sold for processing.
Based on data from Grape Growers of Ontario (2011).[43]
Abbreviation: CAD, Canadian dollar.

Noir.[48] Some of these varietals have good market potential and grow well in Ontario. Minimum prices for white wine *V. vinifera* grapes have been lower than red varieties sold for processing (Figures 9 and 10).[43] Among white grape varieties, average unit prices for Sauvignon Blanc were higher than either Chardonnay or Riesling. Since 2004, Cabernet Sauvignon and Merlot minimum prices have been increasing, with both varieties fetching an average base price of approximately CAD $1900/t in 2010 (Figure 10).[43] Grape price differences, however, are attributed to varietal differences, soil conditions, and the retail demand for the finished product.

Negotiating equitable and fair grape prices between grape growers and wineries has been fraught with difficulty over the last 6 decades. Negotiated prices established prior to the late 1980s between the WCO and GGO created antagonistic relationships between grape growers and wineries, since grape prices were not based on grape quality and did not reflect the location of the vineyards where the grapes were produced.[22] Solutions adopted in other countries offer some guidelines as to how to address the conflict. In California, the offering of multiyear planting contracts by wineries to growers has resulted in more predictability in investment decisions by growers and consequently resulted in larger grape plantings.[49]

Since the late 1990s, negotiated grape prices have been based on a sugar scale. However, since July 2010, a pilot pricing model has been established for four grape varieties (Chardonnay, Riesling, Cabernet Franc, and Cabernet Sauvignon) based on their Brix levels. The pricing model includes stepping the scale from the base price to recognize higher quality grapes.[50]

Technology development and research institutions

In Ontario, the earlier grape research undertaken by Agriculture Canada's Vineland Horticultural Research Station has now been assumed by the Cold Climate Oenology and Viticulture Institute (CCOVI) at Brock University. CCOVI has established the research and technological capability to support the technology needs of the Ontario grape and wine sector. The National Research Council of Canada, through the Industrial Research Assistance Program (IRAP), has also provided contributions directly to wineries to bolster their research capacity in developing innovative processes for wine making and viticulture.

In Ontario, the utilization of new oenology technologies, such as refrigeration techniques to control juice and wine temperatures; the application of processing procedures to maintain wine quality; and the adoption of grape presses and fermenters to provide for greater control over wine composition did not occur until the early 1990s after the adoption of the CUSFTA and the establishment of VQA wine quality standards.[22] Progressive wineries have adopted innovations that include oenology technologies such as yeasts to reduce chemical residues, temperature controls for precision fermentation, and higher quality Canadian oak barrels for maturing premium wines.[31] Associated with the adoption of new developments in oenology is the global exchange of technical information embodied in the sharing of knowledge and the movement of "Flying Winemakers" from New World countries to Canada.[51] These trained individuals have bolstered the human capital capacity of Ontario wineries with their expertise in new technologies ranging from refrigeration systems for cooling fermenting juice to processing techniques that mitigate microbial spoilage of wine.

Shifting grape cultivation from hybrid to *V. vinifera* grapes presented production challenges for grape growers in canopy management, rootstock, soil management, and clonal selection. Ontario grape growers have made significant investments in labor saving, quality enhancing, and better winter survival technologies.[47] Specifically, growers are employing improvements in pruning and leaf thinning and wind machines to reduce grape winter injury.

To mitigate the effects of adverse weather conditions and reduce the incidence of pest and disease problems, integrated grape/winery operations have been growing improved high-quality wine grape cultivars that are winter hardy, disease resistant, require less labor to prune and train the vines, and are adapted to local conditions.[52] Growers have also experimented with non-traditional varieties of hybrid grapes for their cold hardiness and natural disease control. Growing grapes in Ontario under environmentally sustainable viticulture practices has increased over time and a few wineries have adopted organic and biodynamic production practices.[53]

Conclusion

Despite a myriad of government regulations operating at different segments of the grape/wine supply chain, the Ontario wine sector has made significant gains over the last decade, as characterized by aggressive new plantings of *V. vinifera* varietals, expansion in the number of VQA wineries, technology innovation in viticulture and oenology, and greater recognition of Ontario as a region that produces premium quality wines. Despite increasing import competition, sales of VQA wines are increasing, especially at higher price points (eg, CAD $12–15), attributed to increasing disposable incomes and lifestyle changes of the aging population.

The wine regulatory regime, as manifested by policies such as VQA and the wine labeling laws, has been amended over the last few years to improve the competitiveness position of small/mid-sized wineries. These policy changes are likely to be useful in the future as Ontario increases its exports of premium quality wines. Because of economies of scale and increasing land values, small- and medium-sized Ontario wineries cannot compete with imported wines at less than CAD $8/bottle of wine (750-mL equivalent sales). The lower priced wines are the price categories where the large wine companies would have a competitive edge, since they produce and market larger volumes of ICB-branded products, coupled with a wider network of domestic retail stores to merchandize their product.

The survival of the Ontario wine industry (eg, small/mid-sized winery operations) calls for greater retail access, "getting prices right," and developing product and process innovations, including flagship varietals. Multiple-year grape price contracts to provide greater predictability in vineyard investment decisions ought to be established. These need to reflect wine quality and geographical differences among sub-appellations.

Public/university/industry R&D partnerships have recently been established, as evidenced by the Developing Innovative Agri-Products (DIAP) project to improve wine quality and develop better information tools to protect growers from cold weather events.[52] An increase in vine productivity, given the limited amount of land for vineyard expansion, must be addressed through the development of improved grape vine cultivars. Although the Plant Breeders' Rights (PBR) Act was enacted in 1990, there is little evidence in

Canada to suggest it has stimulated the development of many new grape vine cultivars. To date, of the nine grapevine PBR applications filed in Canada, five are for *V. vinifera*, three of which were filed by the University of Minnesota cold hardy grape breeding program.[54]

Disclosure

The authors report no conflicts of interest regarding their published work.

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