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## Does belonging to an appellation make a difference? New evidence from Ontario Viticultural Areas

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**Abstract.** Assuming that wine markets are efficient, ultimately a bottle of wine's cost and therefore its price should reflect its vintage, grape variety as well as how it is vinified. Yet, being an experiential good, a wine's price is also closely related to its place of origin. If the designated viticultural area of wine is coming from is not considered, even in a relatively new wine country, wine makers may end up over-estimating the premium attached to vintage, variety as well as how it is vinified. Regression results indicate that, for Ontario wines, the over-estimations vary between 1% points and 18% points.

**Keywords:** appellation, AVA, price.

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### INTRODUCTION

Until recently, Canadian wine was almost an oxymoron. Other than its infamous ice wine, even well-informed wine drinkers were not aware of Canadian wines. The reason being that Canada resides out of conventional wine growing zone between 30 and 50 degrees latitude north and south of the equator; Canada was dismissed as a wine country. Yet, Canadians have been making wine for centuries. (Phillips, 2017). Moreover, recently their wine industry is growing at an accelerating rate. For instance, from 2011 to 2018, Canadian wine sales in Canada went up by 41%, from 1.67 to 2.35 billion CAN\$; while the imported wine sales were up by 34% during the same time period. (Source: Statistics Canada via Statista.) In particular, wineries in the Ontario region are building a good reputation and market share in Canada. With 6,663 hectares of wine grape area, Ontario region has 60% of the Canadian bearing vineyard area. (VQA Ontario Wine Appellation Authority, 2019.)

Since 1999, Canadian wine industry has been heavily regulated. (Carew and Florkowski, 2012.) For instance, Vintners Quality Alliance, or VQA Ontario Wine Appellation Authority is a regulatory agency responsible for “maintaining the integrity of local wine appellations and enforcing win-

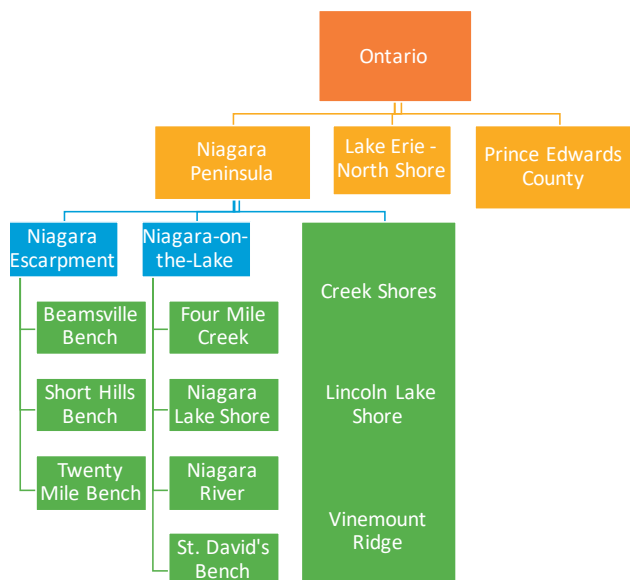


Figure 1. Ontario appellations.

emaking and labelling standards in Ontario.”<sup>1</sup> As is shown in Figure 1, VQA Ontario divides Ontario into three primary Viticultural Areas or appellations of origin: Niagara Peninsula, Lake Erie North Shore, and Prince Edward County. Within the Niagara Peninsula appellation, ten sub-appellations are identified; four of them on the plains close to Lake Ontario (Four Mile Creek, Niagara Lake Shore, Niagara River, and St. David’s Bench) and three on the bench lands of the Niagara Escarpment (Beamsville Bench, Short Hills Bench, Twenty Mile Bench). The other three sub-appellations are Creek Shores, Lincoln Lake Shore, and Vinemount Ridge. Thus, there are effectively four layers of appellations within the Ontario wine region.

Cross, Plantingab and Stavins (2011) shows the economic importance of the concept of terroir but not the reality of terroir – as proxied for by locational attributes on the sale prices of vineyards. Similarly, as is argued in Gokcekus and Finnegan (2017, p. 345-346), “... it is well established that terroir can have a demonstrable effect on wine’s worth, but there is no consensus on whether terroir matters as a fundamental reality or solely economically due to the perceived reputation of a particular area. Nevertheless, the prices at which winemakers can sell their wines vary depending on the wines’ geographic origins.” (Matthews, 2016; Landon and Smith, 1997, Lecocq and Visser, 2006; Patterson and Buechsenstein, 2018).

<sup>1</sup> For details, see VQA Ontario Wine Appellation Authority’s web page: <https://www.vqaontario.ca/Home>.

Table 1. Summary statistics for 4,213 Ontario wines.

Variable	Average
Price	\$ 23.12
Price (2002)*	\$ 17.81
Single Variety	86%
Named Vineyard	11%
Estate Bottled	7%
White Wine	53%
Chardonnay	16%
Riesling	14%
Pinot Noir	10%
Cabernet Franc	10%

\*Real, 2002 prices (Canadian consumer price index is used in deriving real prices.)

In this study, we ask the following questions: Does it make a price difference whether a wine is coming from a particular Ontario appellation? In particular, is there a regional reputation premium attached to a particular appellation or sub-appellation? Moreover, does the premium for vintage, variety, and vinification change whether the regional differences are taken into account or not?

## DATA

For 4,213 table wines from Ontario wine region, between 2015-2018, we have information regarding their retail price, vintage, size, grape variety(ies), appellation, as well as vinification—whether they are from a name vineyard or estate bottled. Table 1 provides summary statistics for these wines.

## CALCULATIONS AND FINDINGS

To set a benchmark, first, as an ad-hoc regression model, the real price of each bottle of Ontario wine is set as a function of vintage, variety, and vinification<sup>2</sup> without taking appellations differences into account.

<sup>2</sup> The wine must be made from at least 85% of the grape variety named to be considered a single variety. Estate Bottled are variations such as “Estate Grown” or “grown, produced and bottled by” are permitted if the wine qualifies for the estate bottled designation, close variations are not permitted for non-VQA wines. Vineyard (any named vineyard indicating origin is not permitted for non-qualifying VQA wines or non-VQA wines, two or more vineyards may not be named but general references to vineyards or multiple but unnamed vineyards are permitted).

$$\ln(\text{Price}_i) = \beta_0 + \beta_1 \text{Vintage}_i + \beta_{2j} \sum_{j=1}^7 \text{Variety}_{j,i} + \beta_{3k} \sum_{k=1}^4 \text{Vinification}_{k,i} + \varepsilon_i$$

where,  $\ln$  is natural logarithm operator; *Vintage* is the age of the wine; *Variety<sub>j</sub>* is a dummy variable, where  $j$  = chardonnay, pinot noir, cabernet sauvignon, cabernet franc, riesling, sauvignon blanc, merlot, or pinot grigio; *Vinification* is a dummy variable, where  $k$  = single variety, estate bottled, named vineyard, or named vineyard and estate bottled; finally  $\varepsilon_i$  is a well behaving error term.

According to the robust regression results, as is summarized in column (2) of Table 2, there is a statistically significant relationship between real price and vintage, variety, and vinification: (1) Vintage matters; (2) there is a premium for red wines—pinot noir, cabernet sauvignon, cabernet franc, and merlot as well as a white wine, chardonnay; (3) making wines by using a single variety and estate or/and named vineyard bottling increases the price.

Second, the real price of each bottle of Ontario wine is set as a function of vintage, variety, vinification as well as fifteen appellation/sub-appellations:

$$\ln(\text{Price}_i) = \beta_0 + \beta_1 \text{Vintage}_i + \beta_{2j} \sum_{j=1}^7 \text{Variety}_{j,i} + \beta_{3k} \sum_{k=1}^4 \text{Vinification}_{k,i} + \beta_{4l} \sum_{l=1}^{15} \text{Appellation}_{l,i} + \varepsilon_i$$

Column (3) of Table 2 presents the robust regression results for this specification. These findings indicate that for Ontario wine prices ‘terroir’ matter. For example, compared to an Ontario wine with no particular appellation designation, a wine from Four Mile Creek acquires an additional 35% premium of which 19% is due to having its own sub-appellation, 7% for being under Niagara-on-the-Lake, and 9% for a Niagara Peninsula appellation. The size of the premium differences from one appellation to another is striking: It varies between 5% (Lake Erie North Shore) and 39% (St. David’s Bench). These differences highlight the importance of appellation designations even in a relatively new and also small wine region of Ontario.

Another finding is about the size of the over-estimation regarding the premium attached to vintage, variety, and vinification, if we ignore appellation/sub-appellation differences. According to the regression results in Table 2 – the difference between column (2) and column (3) – the estimated coefficients for vintage, variety and vinification variables were over-estimated by between 1% points and 18% points. For instance, premium attached to grape varieties pinot noir, chardonnay, and cabernet franc are 7.2%, 4.2%, and 4.1% points respectively were over-estimated unless appellation designations were taking into account. Similarly, regarding vinification, over-

estimations are 17.6%, 8.7%, 7.4%, and 6.8% points for name vineyard and estate, named vineyard, estate bottled, and single variety, respectively. These differences are not only statistically significant; indeed, they are economically significant too.

**Table 2.**  $\ln(\text{wine price}_{2002}) = f(\text{wine characteristics})$ ; robust regression results.

Characteristics	(2)		(3)	
	coefficient	t-stat	coefficient	t-stat
<b>Vintage</b>				
Wine Age	4.56%	11.94***	3.88%	10.66***
<b>Variety</b>				
Chardonnay	9.34%	5.39***	5.16%	3.07***
Pinot Noir	25.40%	12.59***	18.23%	9.25***
Cabernet Sauvignon	25.47%	11.12***	23.02%	10.4***
Cabernet Franc	16.81%	8.47***	12.67%	6.61***
Riesling	-0.99%	-0.55	-4.16%	-2.36**
Sauvignon Blanc	-1.42%	-0.55	-3.28%	-1.33
Merlot	22.69%	10.02***	20.09%	9.2***
Pino Grigio	-1.01%	-0.40	-3.45%	-1.43
<b>Vinification</b>				
Single variety	22.04%	13.83***	15.27%	9.88***
Estate bottled	14.97%	7.29***	7.61%	3.69***
Named vineyard	30.48%	17.46***	21.80%	8.59***
Named vineyard and estate	34.87%	13.81***	17.25%	9.31***
<b>Appellation/sub-appellation</b>				
Beamsville Bench			4.69%	1.26
Creek Shores			8.34%	1.79*
Four Mile Creek			18.69%	6.1***
Lincoln Lake Shore			22.99%	7.78***
Niagara Lake Shore			-8.81%	-2.33**
Niagara River			10.09%	2.62***
Short Hills Bench			-2.37%	-0.37
St. David’s Bench			22.27%	5.8***
Twenty Mile Bench			2.47%	0.62
Vinemount Ridge			20.04%	5.53***
Niagara Escarpment			17.70%	5.6***
Niagara-on-the Lake			7.15%	3.41***
Niagara Peninsula			9.28%	6.14***
Lake Erie – North shore			5.14%	1.8*
Prince Edwards County			32.50%	13.28***
Constant	2.315	124.27***	2.289	125.57***
Obs. No.		4,213	4,213	
adjusted- R <sup>2</sup>		0.27	0.34	
F(13, 4199)		119.99***		
F(28, 4184)			78.48***	

Note: Significance levels (two-tailed) 1% (\*\*\*), 5% (\*\*), and 10% (\*)

## DISCUSSION

To summarize, these findings 1) highlight the economically significant effect of terroir or a regional reputation even in a relatively new wine region; 2) indicate that ignoring the importance of terroir clearly could result in an overestimation of the premiums attached to different vintages, varieties, and vinification; and, moreover, 3) show that these premiums are not uniformly overestimated; there are variations among vintage, varieties as well vinification. Consequently, a wine maker should be paying attention to things that they can choose or control, but meanwhile they should keep in mind the location of their winery in order to set realistic expectations for the return on their investments and efforts.

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