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The Empirical Analysis of Terroir Versus Wine Pricing Relationships- the Case of the BC VQA Wines from the Okanagan and Similkameen Valleys

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The Empirical Analysis of Terroir Versus Wine Pricing Relationships- the Case of the BC VQA Wines from the Okanagan and Similkameen Valleys

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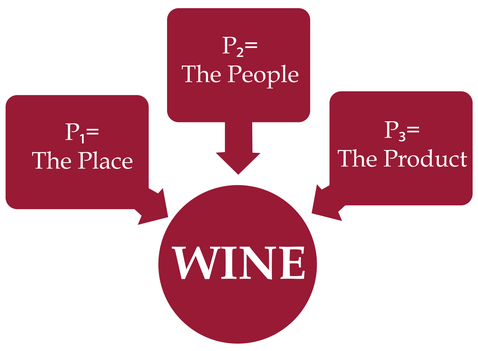
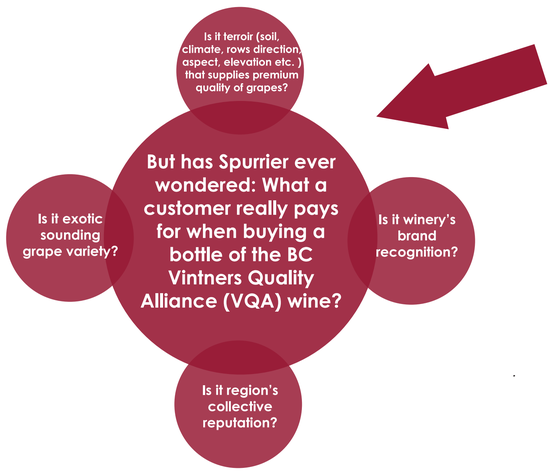
Introduction

In the Decanter's article from August 2016, Steven Spurrier, British wine expert and merchant said that to him wine was about 3 Ps:



Spurrier made this statement in reference to his very recent visit in the BC Wine Country (The Okanagan and Similkmeen Valleys) where he had a chance to taste regional wines and familiarize himself with the local approach to winemaking.



If these questions run through your head while paying for the BC VQA wine, you are in the right place. The author of this research has been wondering about it since at least 2012. Is it *terroir* or something else that influences prices of the BC VQA wines?

The goal of this research is to examine how natural elements of a vineyard like soil, climate, elevation, rows direction, distance to lake, aspect, also known as terroir influence wine pricing of the BC VQA wines produced in the Okanagan and Similkameen Valleys of BC.

Methods

BRITISH COLUMBIA LIQUOR DISTRIBUTION BRANCH DATA

The British Columbia Liquor Distribution Branch (BCLDB) scanner pricing data set for years 2011-215 was obtained. All BC VQA wine sales in BC together with accompanying wine attributes(e.g.: alcohol, volume of sales, time of sales, vintage year, brand) were extracted

WINERIES DATA

33 Okanagan and Similkameen Valleys wineries agreed to provide data on the origin of grapes used for production of their VQA wines. After data collection 252 SKU numbers from the BCLDB data set were matched with specific vineyards that supplied grapes used for their production. Total number of wine observations: n=6875 (due to repeated purchases)

VINEYARDS/ TERROIR DATA

The specifics of *terroir* for each vineyard that sourced grapes for these 252 wines were collected using the Google Earth Pro Software and included: soil type, rows direction, aspect, average elevation, distance to lake, temperatures data (minimum and maximum tempertaure intervals)

HEDONIC PRICING MODEL

Hedonic pricing methodology was used and regression of price on *terroir* and wine specific variables was implemented. Formally, in the empirical analysis two specifictions for hedonic models were employed and compared:

$$Price_{it} = \alpha + X'_{it}\beta + \varepsilon_{it}$$

$$lnPrice_{it} = \alpha + X'_{it}\beta + \varepsilon_{it}$$

Literature Cited

Ashenfelter, O. and Storchmann, K. (2010). Using Hedonic Models of Solar Radiation and Weather to Assess the Economic Effect of Climate Change: The Case of Mosel Valley Vineyards. The Review of Economics and Statistics, 92(2): 333- 349.

BC Wine Appellation Task Group. (2015). Wine Industry Turning Point. Recommended Changes to the British Columbia Wines of Marked Quality Regulations. http://bcwinetaskgroup.ca/report/

Bowen, P.A. et al. (2005). Use of Geographic Information System Technology to Assess Viticulture Performance in the Okanagan and Similkameen Valleys, British Columbia. Geoscience Canada,34 (4): 161-176.

Cross, R., Plantinga, A.J., and Stavins, N. (2011). What is the Value of Terroir? The American Economic Review, 101(3): 152-156.

Rosen, S. (1974). Hedonic prices and Implicit Markets: Product Differentiation in Pure Competition. Journal of Political Economy, 82(1): 34-55.

Acknowledgements

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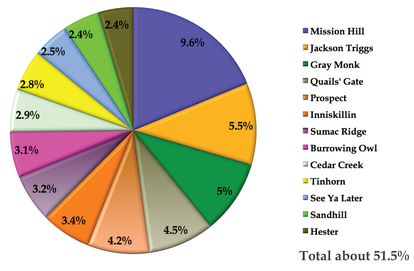
Further Information

This poster presentation is based on one of the chapters coming from the author's doctoral dissertation (expected degree completion date- summer 2017). For more information about this research please email: katarzyna.pankowska@ubc.ca, or katepankowska@gmail.com.

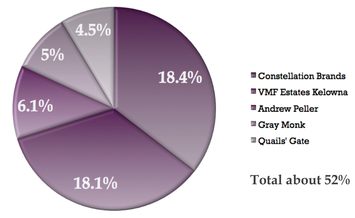
Some Vintners Quality Alliance (VQA) Wine Industry Facts

Top brands- contributors to the value of all BC VQA wines sold in BC between 2011-2015



Total about 51.5%

The biggest market players in terms of value of the BC VQA wines sold in BC between 2011-2015



Total about 52%

Data Descriptive Statistics

Model Continuous Variables	Mean	St. Dev.	Min.	Max.
Price (in CAD $)	19.49	8.59	9.61	90.66
Volume (in litres)	227.32	423.74	0.75	5846.25
Volume_Lag (lagged by one period)	212.42	417.84	0	5846.25
Wine age (in years)	3.83	2.95	0	15
Model Indicator Variables			**Min.**	**Max.**
Brand	33 indicator variables		1	33
Variety	24 indicator variables		1	24
Year	5 indicator variables		2011	2015
Alcohol content (in %)	3 indicator variables		1	3
Soil	2 indicator variables		1	2
Rows direction (compass direction))	4 indicator variables		1	4
Aspect (compass direction)	8 indicator variables		1	8
Average Elevation (in metres)	3 indicator variables		1	3
Distance to lake (in metres)	3 indicator variables		1	3
Additional Information				
Vineyard (source of grapes)			1	71
Wine color (red or white)			1	2
Proposed sub-appellations			1	15
SKU#/Wines				252
N				6785

- The origin of grapes used for the production of these 252 BC VQA wines employed in this analysis can be traced to 71 different vineyards located in both, the Okanagan and Similkameen Valleys
- Some of the vineyards coincide with the location of the estate of the 33 wineries/brands that delivered their data on vineyards, but numerous are located in different, sometimes quite distant areas in comparison to the location of the estate winery e.g.: a winery with estate situated in Kelowna uses grapes from Osoyoos (123km away)
- All vineyards that supplied grapes for the production of wines used in this analysis are located within 14 different proposed sub-appellations (as per demarcation proposed by the BC Wine Appellation Task Group in November 2015), plus one area (Similkameen Valley) that wasn't included in the subappellations proposal

Results:

Non-*terroir* variables

Table 1. Regressions results for non-*terroir* variables (variety)

	price	lnprice
volume	-0.000369+	-0.0000230**
	(0.0002)	(0.0000)
volume_lag	-0.000244	-0.0000143**
	(0.0001)	(0.0000)
VARIETY (comparison group: Gewurztraminer)		
BACO NOIR	6.317***	0.312***
	(0.8920)	(0.0329)
CABERNET FRANC	7.443*	0.344**
	(2.7870)	(0.1010)
CABERNET SAUVIGNON	13.34***	0.424***
	(2.3830)	(0.0699)
EHRENFELSER	12.25**	0.455**
	(4.9760)	(0.1170)
GAMAY NOIR	3.405+	0.0667
	(1.6610)	(0.0988)
MARECHAL FOCH	3.705**	0.150**
	(0.8640)	(0.0383)
MERLOT	3.755**	0.170**
	(1.0330)	(0.0465)
PINOT BLANC	-2.705*	-0.219**
	(1.1800)	(0.0602)
PINOT NOIR	5.192**	0.233***
	(1.2910)	(0.0551)
RIESLING	3.338*	0.106+
	(1.5240)	(0.0544)
SANGIOVESE	14.19**	0.649***
	(4.6280)	(0.1120)
SYRAH	6.542**	0.294**
	(2.1650)	(0.0974)
TREBBIANO	-3.285***	-0.206***
	(0.5940)	(0.0242)
VIOGNIER	2.746**	0.108*
	(0.8950)	(0.0487)
ZWEIGELT	6.821*	0.258**
	(2.3160)	(0.0753)
TEMPRANILLO	3.638	0.134*
	(2.2640)	(0.0594)
N	6785	6785
R-sq	0.751	0.815
adj. R-sq	0.747	0.812
F	-	-

Standard errors in parentheses
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001
SE clustered on 15 proposed sub-appellations

Table 2. Regressions results for non-*terroir* variables (brand)

	price	Inprice
BRAND (comparison group: Qualis' Gate)		
ANCIENT HILL	-11.12*	-0.4519**
	(4.1100)	(0.1740)
BLACK HILLS	27.25***	1.095***
	(2.7100)	(0.1080)
CROWSNEST	-8.196**	-0.398**
	(2.5670)	(0.1190)
D'ANGELO	-6.564+	-0.294*
	(3.6770)	(0.1240)
FAIRVIEW	8.195*	0.156
	(4.1190)	(0.1680)
GEHRINGER BROTHERS	-9.502+	-0.455*
	(4.7620)	(0.1570)
HAINLE	17.08***	0.571***
	(3.5440)	(0.1180)
HILLSIDE	-6.129+	-0.241+
	(2.9070)	(0.1150)
HOUSE OF ROSE	-6.991*	-0.310*
	(2.8670)	(0.1170)
HOWLING BLUFF	3.598*	0.175*
	(1.6430)	(0.0813)
TINHORN	15.19***	0.683***
	(3.1250)	(0.1060)
POPLAR GROVE	2.943	0.171*
	(2.0090)	(0.0725)
SPERLING	3.616	0.337*
	(4.7030)	(0.1550)
ST.HUBERTUS&OAK	-4.249	-0.169+
	(3.2580)	(0.0898)
N	6785	6785
R-sq	0.751	0.815
adj. R-sq	0.747	0.812
F	-	-

Standard errors in parentheses
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001
SE clustered on 15 proposed sub-appellations

Terroir variables

Table 3 Regressions results for significant *terroir* variables (topographic)

	price	inprice
SOIL (comparison group: moderately well-suited)		
well-suited	2.126+	0.0945+
	(1.1090)	(0.0497)
ROWS (comparison group: East-West)		
North-South	-2.395*	-0.0863**
	(0.9840)	(0.0286)
ASPECT (comparison group: Eeastern)		
Southern	6.154+	0.191
	(3.2440)	(0.1220)
AVGELEV (comparison group: avg. elevation: 0-200m)		
avgelev201-400m	-3.712*	-0.225**
	(1.5470)	(0.0560)
N	6785	6785
R-sq	0.751	0.815
adj. R-sq	0.747	0.812
F	-	-

Standard errors in parentheses
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001
SE clustered on 15 proposed sub-appellations

Table 4 Regressions results for significant *terroir* variables (climate/HEAT)

	price	Inprice
HEAT (comparison group: middle interval for each month) Max. temp. buckets		
april<11C	0.307*	0.0105*
	(0.1070)	(0.0045)
april>19C	0.892**	0.0321**
	(0.2700)	(0.0101)
june>29C	0.293+	0.0108
	(0.1570)	(0.0073)
july<25C	-0.629+	-0.0153
	(0.3300)	(0.0117)
july>33C	-0.543**	-0.0188**
	(0.1680)	(0.0059)
august<24C	-0.467**	-0.0121+
	(0.1390)	(0.0057)
october<10C	-0.406*	-0.0168*
Min. temp. buckets	(0.1680)	(0.0060)
may>11C	-0.597*	-0.0225**
	(0.2070)	(0.0067)
june>15C	-0.786**	-0.0276*
	(0.2440)	(0.0099)
july>18C	0.314*	0.00979+
	(0.1200)	(0.0047)
august<11C	-0.396*	-0.0139*
	(0.1360)	(0.0059)
N	6785	6785
R-sq	0.751	0.815
adj. R-sq	0.747	0.812
F	-	-

Standard errors in parentheses
+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001
SE clustered on 15 proposed sub-appellations

VARIETY MATTERS
BRAND MATTERS
RESULTS AS EXPECTED
EXTREME TEMPERATURES MATTER

Final Conclusions:

- Role of *terroir* variables in pricing of the BC VQA wines is not as important as it could be expected
- The significance of *terroir* in the winemaking process is likely having more of marketing, than winemaking importance
- The newly proposed sub-appellations might prove to have more of marketing importance than actual *terroir*-grapes-wine dependent wine pricing influence
- The results of this research support findings coming from *terroir* related research pursued elsewhere e.g.: Cross, Plantinga & Stavins (2011), *What is the Value of Terroir? The American Economic Review, 101(3): 152-156;*
- This research finds its continuation in the author's spatial econometrics analysis of the influence of distance to main road, as well as presence of famous winery neighbours on wine pricing of the BC made wines (another chapter of the same dissertation)