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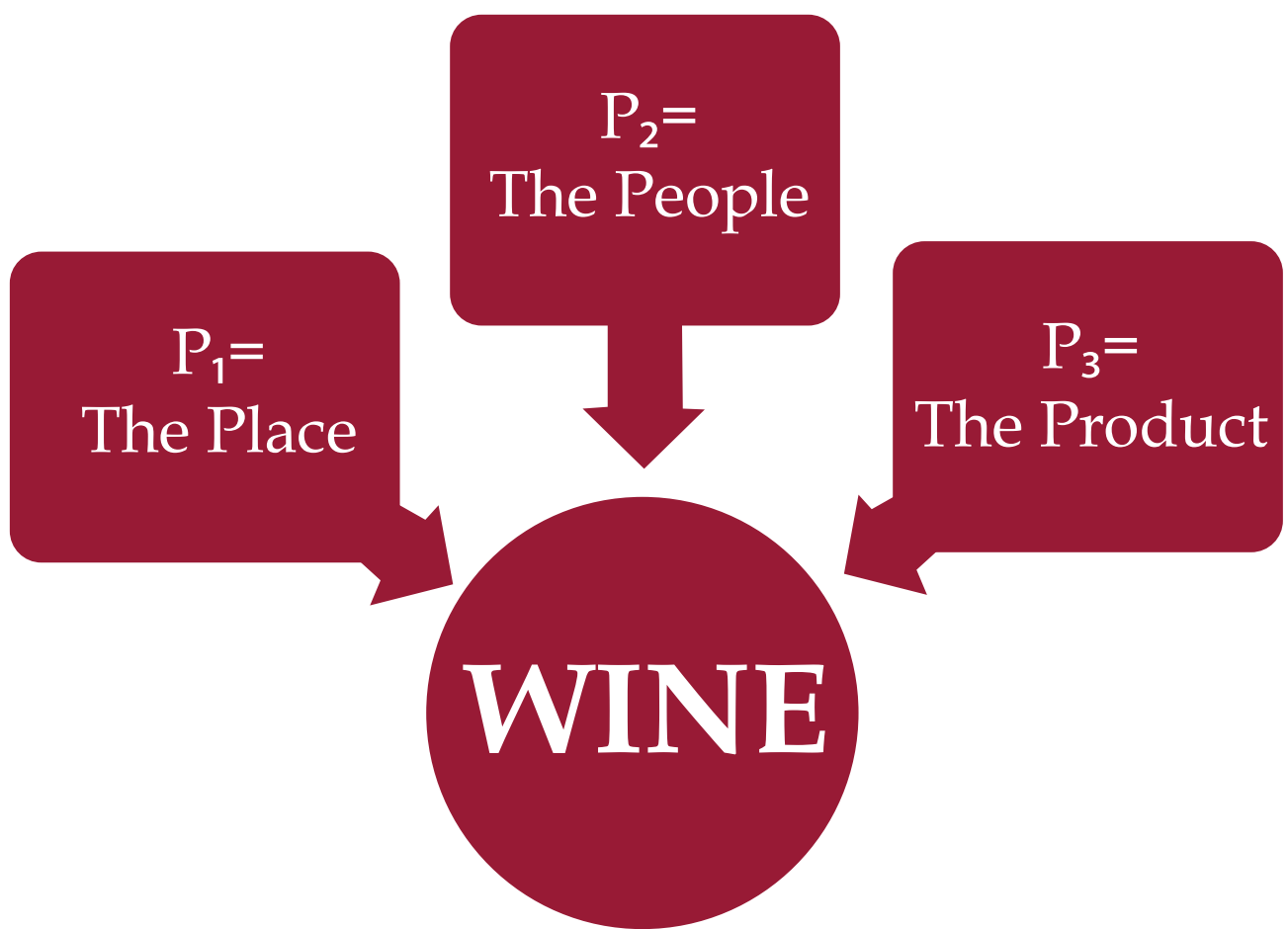
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The Empirical Analysis of Terroir Versus Wine Pricing Relationships- the Case of the BC VQA Wines from the Okanagan and Similkameen Valleys

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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 Similkameen 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



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

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)

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)

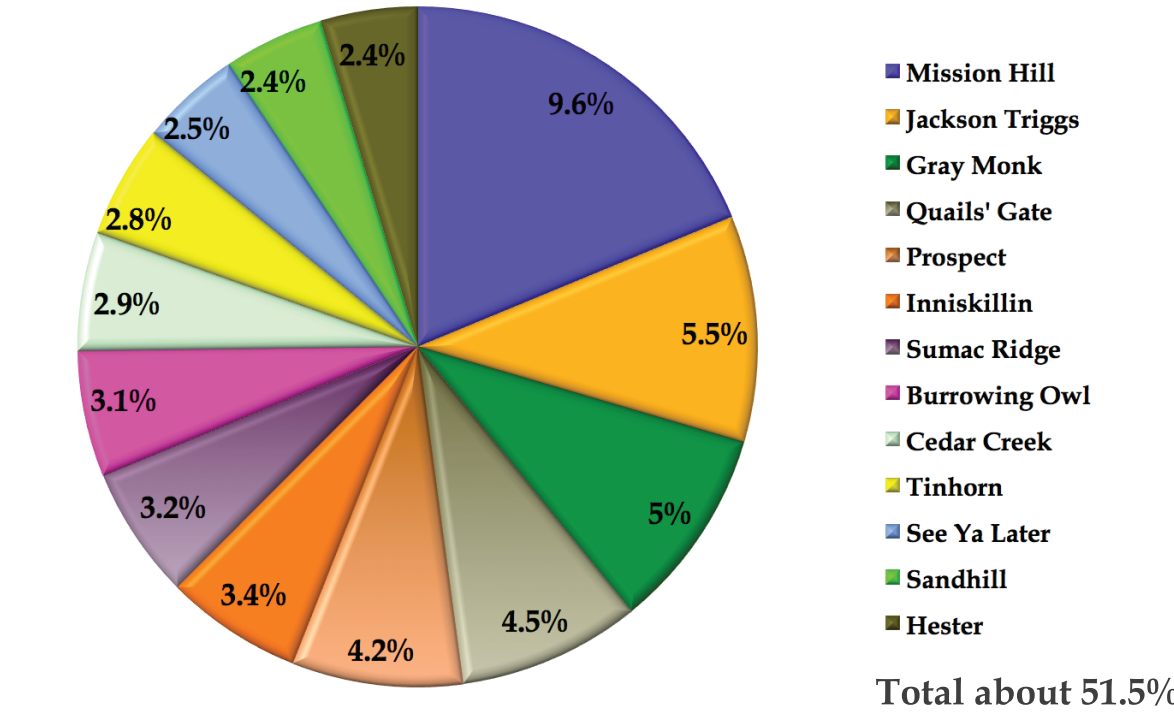
Hedonic pricing methodology was used and regression of price on *terroir* and wine specific variables was implemented. Formally, in the empirical analysis two specifications for hedonic models were employed and compared:

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

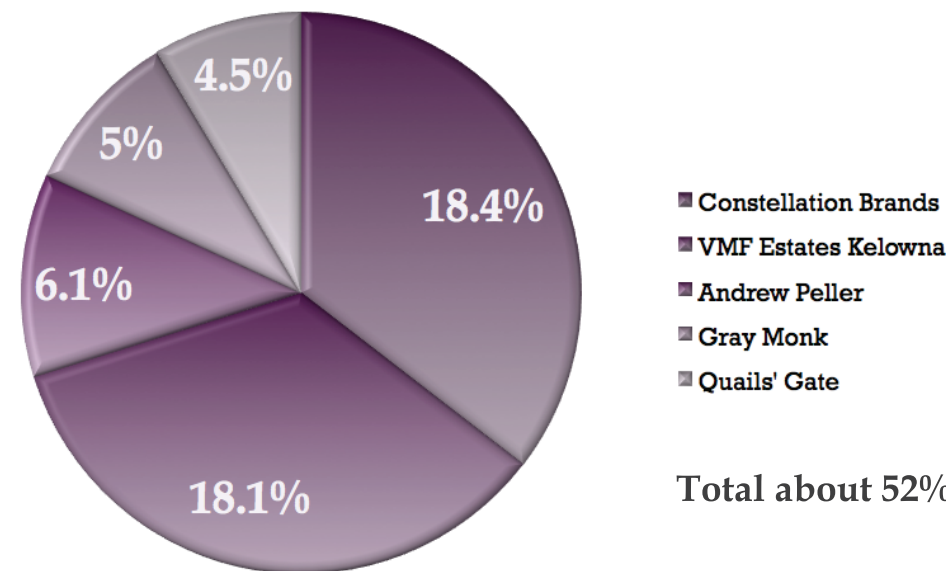
$$\ln Price_{it} = \alpha + X'_{it} \beta + \epsilon_{it}$$

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



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



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	2 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)	1 indicator variables		1	1
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

Results:

Non-terroir variables

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

	price	lnprice
volume	-0.000369* (0.0002)	-0.000230*** (0.0001)
volume_lag	-0.000244* (0.0001)	-0.000148*** (0.0001)
VARIETY (comparison group: Gewürztraminer)		
BACCO NOIR	6.315*** (0.8920)	0.322*** (0.0229)
CABERNET FRANC	7.443*** (2.7938)	0.344*** (0.1010)
CABERNET SAUVIGNON	13.34*** (2.8820)	0.469*** (0.0699)
EBRENTESLER	12.22*** (4.9766)	0.455*** (0.1170)
GAMAY NOIR	1.466*** (0.6610)	0.0988 (0.0888)
MARECHAL FOCH	3.788*** (0.8640)	0.1589* (0.0383)
MERLOT	3.975*** (1.1630)	0.1709* (0.0465)
PINOT BLANC	-2.708* (1.1800)	-0.218** (0.0621)
PINOT NOIR	5.192*** (2.2910)	0.233*** (0.0551)
RIESLING	3.338* (1.5240)	0.106* (0.0544)
SANGIOVESE	14.19*** (4.6280)	0.649*** (0.1120)
SYRAH	6.542*** (2.1650)	0.294*** (0.0941)
TREBBIANO	-3.385*** (0.9540)	-0.206*** (0.0242)
VIOGNIER	2.746*** (1.4780)	0.108* (0.0487)
ZWITZELI	6.821* (2.7160)	0.258** (0.0753)
TEMPRANILLO	3.638 (2.2840)	0.134* (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	lnprice
BRAND (comparison group: Qualis' Gate)		
ANCIENT HILL	-11.12* (4.1100)	-0.451** (0.1100)
BLACK HILLS	27.25*** (2.7100)	1.095*** (0.0800)
CROWNSNET	8.196*** (2.5670)	0.280*** (0.1790)
D'ANGELO	-6.564* (1.6770)	-0.294** (0.0200)
FAIRVIEW	4.399* (1.1190)	0.156 (0.1600)
GERBRUGER BROTHERS	-0.862 (4.7820)	-0.454* (0.1570)
HAINLE	17.105*** (1.5440)	0.571*** (0.1180)
HILLSIDE	-0.129 (2.9070)	-0.245 (0.1110)
HOUSE OF ROSE	0.891* (2.9670)	0.117* (0.1170)
HOWLING BLUET	1.598* (1.6450)	0.173* (0.0813)
TINHOON	15.199*** (3.1220)	0.683*** (0.1000)
POPULAR GROUND	2.943 (2.0000)	0.171* (0.0725)
SPEERLING	3.616 (4.7000)	0.337* (0.1500)
ST. HUBERTUS OAK	-4.249 (12.2500)	-0.169* (0.0590)
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	lnprice
SOIL (comparison group: moderately well-suited)		
well-suited	2.126* (1.1090)	0.045+ (0.0497)
ROWS (comparison group: East-West)		
North-South	-2.385* (0.9380)	-0.0863** (0.0286)
ASPECT (comparison group: Eastern)		
Southern	3.154* (3.2440)	0.191 (0.1220)
AVELEV (comparison group: avg. elevation 0-200m)		
avelev201-400m	-3.712** (1.5270)	-0.2225** (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	lnprice
HEAT (comparison group: middle interval for each month)		
Max. temp. buckets		
april<11C	0.307* (0.1070)	0.00185* (0.0045)
april>19C	0.822** (0.2700)	0.0321** (0.0101)
june>29C	0.291* (0.1570)	0.0108 (0.0073)
july>29C	-0.820* (0.3900)	-0.0153 (0.0117)
july>33C	-0.543** (0.1600)	-0.0188** (0.0069)
august>24C	-0.467** (0.1790)	-0.0121* (0.0087)
october>19C	-0.406* (0.1600)	-0.0168* (0.0060)
Min. temp. buckets		
may>11C	-0.307* (0.2070)	-0.0223** (0.0067)
june>19C	-0.746** (0.2440)	-0.0276* (0.0099)
july>18C	0.314* (0.1200)	0.00979* (0.0047)
august>11C	-0.396* (0.1560)	-0.0139* (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

Final Conclusions:

Two the most important variables in wine pricing of the BC VQA wines are:
• Wine (grape variety), with "exotic sounding" varieties being sold with premium e.g.: Baco Noir, or Sangiove
• Individual brand recognition

The most important terroir variables in wine pricing of the BC VQA wines are:
• Soil type (well suited soil class)
• Rows direction (East-West)
• Average elevation (201-400 m)
• Aspect (Southern)
• Temperature (no temp. extremes in April, July, August, October)

Insignificant variables in wine pricing of the BC VQA are:
• Alcohol content
• Wine age
• Distance to lake

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)

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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.