



# Local Wine Expenditure Determinants in the Northern Appalachian States

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# Motivation

- Expansion of wineries in the Northern Appalachian states in the last 10 years
- Challenges:
  - Marketing new wines from a new region in a globally competitive industry
  - Reliance on tourism and on-site sales
  - Market expansion
  - Transaction costs and asymmetric information
  - Experience good
  - Reputation



# Research Questions

1. What are the determinants of total wine expenditure?
2. What are the determinants of local wine expenditure?
3. What are the determinants of the probability of purchasing a local wine?



# Data

- Consumer survey
- Mid-September 2012
- 1,609 useable responses
  - Pennsylvania: 25.05%
  - Ohio: 24.92%
  - Kentucky: 24.98%
  - Tennessee: 25.05%
- Only participants who consumed wine within the last 12 months



# Data



1. Wine consumption and frequency of purchase for specific types of wine
2. Wine knowledge and experiences with local wines and winery visits
3. Post-winery visit behavior
4. Local foods, fresh food preparation and demographics

# Data

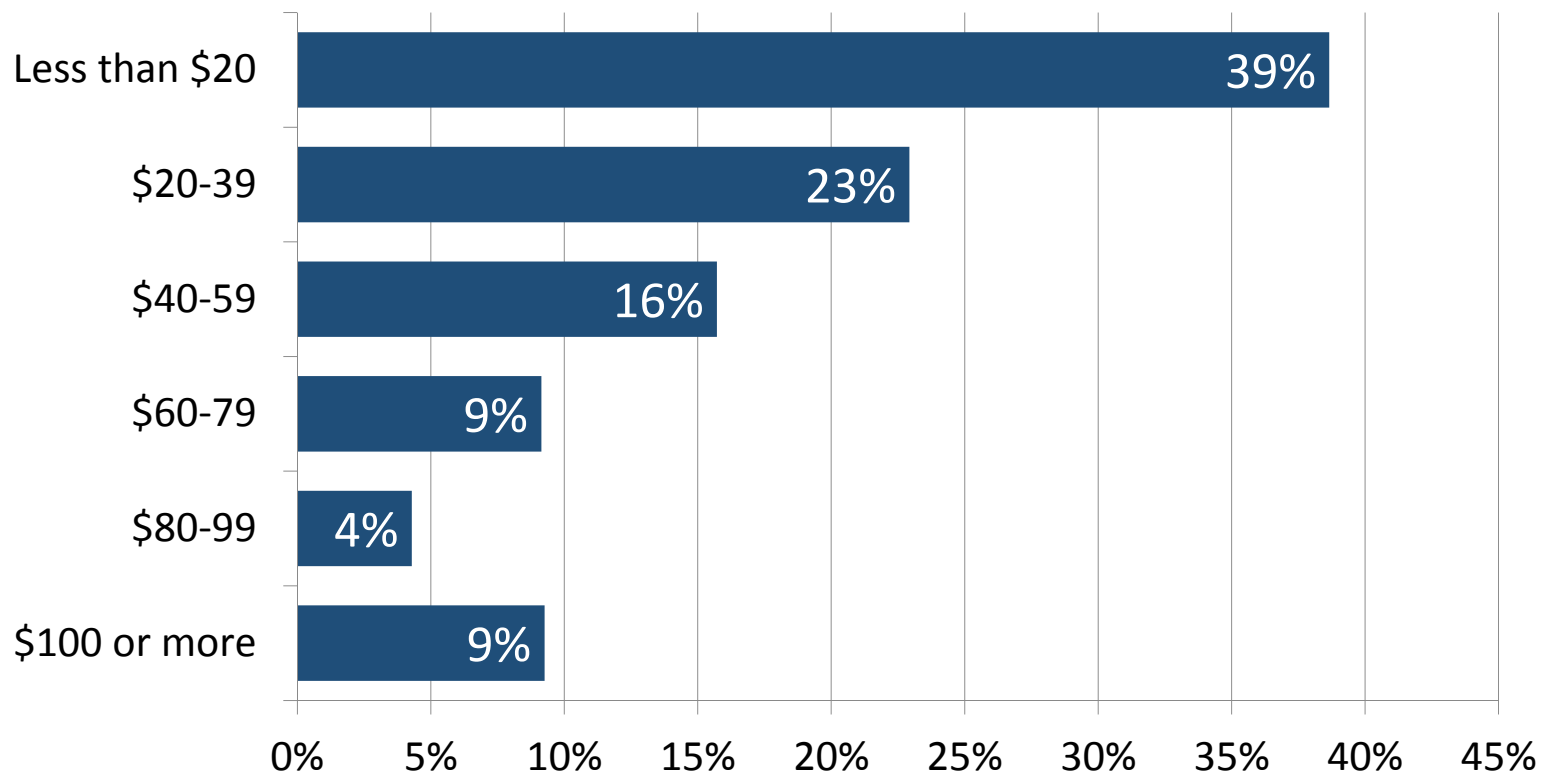
On average, respondents:

- Purchase wine at least once per month (57%)
- Buy more super wine (\$7-\$14 bottle)
- Have average to above average wine knowledge (50%)
- Have tried local wine (40%)
- Have purchased local wine (34%)
- Spend on average \$13.49 on local wine per month (all wine consumers)
- Spend on average \$34.62 on local wine per month (local wine consumers)
- Have visited a local winery (45%)



# Data

- Total monthly expenditure on wine



# Model



- Ordered logit model

- Expenditure on total wine per month
- Expenditure on local wine per month

- Categories:
  1. Less than \$20
  2. \$20-\$39
  3. \$40-\$59
  4. \$60-\$79
  5. \$80-\$99
  6. \$100 or more

- Logit model

- Probability of purchasing a local wine



# Model

***$Y = f(\text{demographics, social \& health factors, wine related attributes})$***

Ordered Logit Model:

*$Y = \text{Total\_Expenditure or Local\_Expenditure}$*

Logit Model:

*$Y = \text{Purchased local wine}$*

# Model

Demographics – *gender, age, number of wine drinkers at home, race, income (^2), education (^2), family with kids, urban vs. rural, state, years of residency*

Social & health factors – *purchase locally produced foods, watch food channel, prepare fresh food at home, how far is local*

Wine related attributes – *wine knowledge, frequency of wine purchasing (not for total expenditure model), types of wine by price category, type of wine (red, white, fruit, sparkling)*

# Model

## Intercept:

- *Female*
- *No kids*
- *OH*
- *Never purchases local foods*
- *Never prepares fresh food at home*
- *Periphery consumer*
- *Never or rarely purchase popular wine*
- *Never or rarely purchase ultra wine*
- *Never or rarely purchase white wine*
- *Never or rarely purchase fruit wine*
- *Non-white*
- *Rural*
- *1-4 years of residency*
- *Does not watch food channel*
- *Little wine knowledge*
- *Never or rarely purchase super wine*
- *Never or rarely purchase luxury wine*
- *Never or rarely purchase red wine*
- *Never or rarely purchase sparkling wine*

# Results – Ordered Logit: Total Expenditure

Variable	Coefficient	Odds Ratio	Variable	Coefficient	Odds Ratio
<i>Male</i>	0.154	1.166	<i>Buy_local3</i>	0.749***	2.114***
<i>Age</i>	-0.002	0.997	<i>Food_channel</i>	0.131	1.14
<i>Wine drinkers</i>	-0.102	0.902	<i>Prep_freshfood2</i>	0.819**	2.269**
<i>White</i>	-0.019	0.980	<i>Prep_freshfood3</i>	0.716*	2.047*
<i>Income</i>	0.002	1.002	<i>Local_range</i>	0.0003	1.000
<i>Income</i> <sup>2</sup>	0.00001	1.000	<i>Wine_knowledge2</i>	0.743***	2.102***
<i>Education</i>	-0.344	0.708	<i>Wine_knowledge3</i>	1.094***	2.987***
<i>Education</i> <sup>2</sup>	0.009	1.009	<i>Popular_wine</i>	0.104	1.110
<i>Kids</i>	-0.01	0.989	<i>Super_wine</i>	0.274**	1.315**
<i>Urban</i>	0.088	1.092	<i>Ultra_wine</i>	0.532***	1.702***
<i>PA</i>	0.027	1.027	<i>Luxury_wine</i>	0.882***	2.415***
<i>KY</i>	0.549***	1.732***	<i>White_wine</i>	0.427***	1.532***
<i>TN</i>	0.539***	1.715***	<i>Red_wine</i>	0.593***	1.809***
<i>Residency2</i>	-0.306	0.735	<i>Fruit_wine</i>	0.164	1.179
<i>Residency3</i>	-0.073	0.928	<i>Sparkling_wine</i>	-0.106	0.898
<i>Buy_local2</i>	0.581**	1.787**			

Intercept 1 = -0.219, Intercept 2 = 0.991, Intercept 3 = 1.942, Intercept 4 = 2.7, Intercept 5 = 3.192

Observations = 1,609; \*\*\* = 0.01, \*\* = 0.05, and \* = 0.10

# Results – Ordered Logit: Local Expenditure

Variable	Coefficient	Odds Ratio	Variable	Coefficient	Odds Ratio
<i>Male</i>	0.318**	1.375**	<i>Food_channel</i>	-0.2	0.818
<i>Age</i>	-0.006	0.993	<i>Prep_freshfood2</i>	1.047	2.849
<i>Wine drinkers</i>	0.178*	1.194*	<i>Prep_freshfood3</i>	1.186	3.274
<i>White</i>	0.176	1.192	<i>Local_range</i>	3.10E-05	1
<i>Income</i>	0.012**	1.012**	<i>Wine_knowledge2</i>	0.570***	1.769***
<i>Income<sup>2</sup></i>	-6.5e-05**	0.999**	<i>Wine_knowledge3</i>	1.105***	3.021***
<i>Education</i>	0.596	1.816	<i>Mid-level</i>	0.719***	2.053***
<i>Education<sup>2</sup></i>	-0.024	0.976	<i>Core</i>	1.159***	3.188***
<i>Kids</i>	-0.104	0.901	<i>Popular_wine</i>	-0.082	0.921
<i>Urban</i>	-0.279*	0.756*	<i>Super_wine</i>	0.169	1.184
<i>PA</i>	0.191	1.211	<i>Ultra_wine</i>	0.256	1.291
<i>KY</i>	0.072	1.074	<i>Luxury_wine</i>	0.499***	1.647***
<i>TN</i>	-0.019	0.98	<i>White_wine</i>	0.264*	1.303*
<i>Residency2</i>	-0.173	0.841	<i>Red_wine</i>	0.117	1.124
<i>Residency3</i>	0.267	1.307	<i>Fruit_wine</i>	0.867***	2.380***
<i>Buy_local2</i>	0.793	2.211	<i>Sparkling_wine</i>	-0.219	0.803
<i>Buy_local3</i>	1.417***	4.124***			

Intercept 1 = 9.49, Intercept 2 = 10.54, Intercept 3 = 11.22, Intercept 4 = 11.69, Intercept 5 = 11.88

Observations = 1,609; \*\*\* = 0.01, \*\* = 0.05, and \* = 0.10

# Determinants of Expenditure

- Monthly expenditure on all wine (Total Expenditure)
  - ↑ KY, TN, purchase locally produced foods, prepare fresh food at home, wine knowledge, buying more expensive wines more often, buying white and red wines more often
- Monthly expenditure on local wine (Local Expenditure)
  - ↑ Male, number of wine drinkers at home, income (at a decreasing rate), purchase locally produced foods, wine knowledge, frequency of total wine purchases, buying the most expensive wines more often, buying white and fruit wine more often
  - ↓ Urban areas

# Results – Logit: Local Purchase

Variable	Coefficient	Marginal Effect	Variable	Coefficient	Marginal Effect
<i>Male</i>	0.323**	0.063**	<i>Food_channel</i>	0.043	0.008
<i>Age</i>	-0.006	-0.001	<i>Prep_freshfood2</i>	0.272	0.051
<i>Wine drinkers</i>	0.057	0.012	<i>Prep_freshfood3</i>	0.507	0.092
<i>White</i>	0.371*	0.067*	<i>Local_range</i>	0.0004	7.3e-05
<i>Income</i>	0.010**	0.002**	<i>Wine_knowledge2</i>	0.526***	0.098***
<i>Income<sup>2</sup></i>	-5.7e-05**	-1.1e-05**	<i>Wine_knowledge3</i>	0.955***	0.194***
<i>Education</i>	1.227**	0.229**	<i>Mid_level</i>	0.173	0.032
<i>Education<sup>2</sup></i>	-0.041**	-0.008**	<i>Core</i>	0.456**	0.089**
<i>Kids</i>	-0.102	-0.019	<i>Popular_wine</i>	-0.016	-0.003
<i>Urban</i>	-0.343***	-0.065***	<i>Super_wine</i>	0.492***	0.0903***
<i>PA</i>	-0.132	-0.024	<i>Ultra_wine</i>	0.287**	0.055**
<i>KY</i>	-0.202	-0.037	<i>Luxury_wine</i>	0.250	0.048
<i>TN</i>	-0.706***	-0.126***	<i>White_wine</i>	0.329***	0.062***
<i>Residency2</i>	-0.362	-0.065	<i>Red_wine</i>	0.197	0.037
<i>Residency3</i>	-0.015	-0.003	<i>Fruit_wine</i>	0.872***	0.169***
<i>Buy_local2</i>	0.719**	0.127**	<i>Sparkling_wine</i>	-0.274	-0.050
<i>Buy_local3</i>	1.263***	0.244***	<i>Constant</i>	-12.51***	-----

Observations = 1,609; \*\*\* = 0.01, \*\* = 0.05, and \* = 0.10

# Determinants of Purchasing a Local Wine

- Likelihood of purchasing a local wine increases with:
  - ↑ Male, white, income (at a decreasing rate), education (at a decreasing rate), purchase locally produced foods, wine knowledge, core consumers, mid-range priced wines, buying white and fruit wine more often
- Likelihood of purchasing a local wine decreases with:
  - ↓ Urban, TN



# Conclusions

## Consumption of local wine:

- Income, education, non-urban
- Enthusiasm for local and fresh foods
- Average or above average wine knowledge
- Frequency of total wine purchases
- Purchasing mid-range priced wines
- Preference for white and fruit wines



# Thank you!

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