

Whilst Wine?

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The Situation

It's early January 2016, David Retsof is working on fulfilling his dreams of opening a winery in the Charlottesville, VA area.¹ He is anxious about the decision to quit his current job and start this new venture because the financial viability of this project is uncertain. Retsof is prepared to work hard and take the risks necessary to open the winery, but first he wants to do some additional analysis to choose among his growth options. Ideally, he would like to choose a growth option that allows him to obtain profitability within the next ten years.

Background

Retsof is 36 years old and has been working as a government consultant for about 13 years. He has invested wisely and is able to invest approximately \$500,000 of his own funds in the start-up. Though limited in experience with wine making, Retsof has been brewing beer for approximately 10 years. He grew up as part of a family of farmers and is therefore well-versed in the basics of agriculture. Retsof has also talked to the local bank, Country Farmers, and is qualified for a 30-year secured loan on the business property of up to \$450,000 at an interest rate of 5.5 percent, should he need it.

Retsof has found a farm property near Charlottesville, VA listed for \$510,000. The farm consists of 25 acres of field and woodlands; five acres of which soil analysis indicates would be good for growing grapes. Existing buildings on the farm include a 115-year-old farmhouse, which Retsof would live in, and three barns in good condition that Retsof would use for the winery.

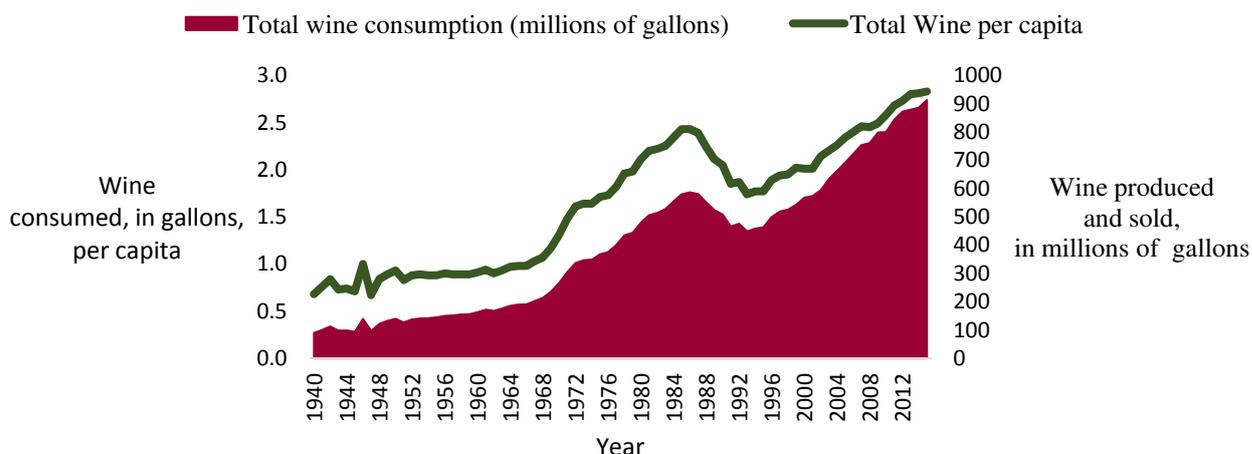
The state of Virginia has two primary wine regions: The Northern Virginia wine region the northernmost part of the state, and the Monticello region of Charlottesville. As of 2015, 33 vineyards were located within a 30-mile radius of the city of Charlottesville and the region produced more wine grapes than any other region in Virginia in 2014 (Teeter, 2014). Given the farm's close proximity to Charlottesville and the fact that the farm is only one mile from a major highway between Charlottesville and Washington D.C., Retsof expects to draw a great deal of traffic from weekend escapees from the D.C. region as well as other tourists to the Charlottesville area.

The Growing Wine Industry

As demonstrated in Exhibit 1, the wine industry in the United States has been growing rapidly in terms of the wine produced and sold and in terms of wine consumed per capita.

¹ This case is based on a real start-up winery in the Monticello wine region. The facts of the case are all real but names have been changed.

Exhibit 1. Wine produced and sold, and wine consumption, 1940-2015



Source of data: The Wine Institute

The wine industry in Virginia is booming along with the US market for wine. In the 1980s the state had less than 20 wineries and now boasts nearly 300. As shown in Exhibit 2, with approximately 275 wineries in 2015, a record 556,500 cases of wine were sold from state wineries. This is a six percent increase from 2014 and a 34 percent increase from 2010. The boom is attributed, in part, to the influx of younger drinkers of wine. Once viewed as a drink primarily for special occasions or for people over the age of 40, wine has become more popular amongst consumers in their 20s. As of 2015, millennials accounted for 36 percent of all wine consumers, beating out baby boomers who account for 34 percent (Thach, 2016).

Exhibit 2: Selected wine production statistics for State of Virginia

	2004	2008	2012	2015
Number of farm wineries	78	135	230	275
Bearing acreage	1,900	2,500	2974	3173
Tons produced	3,700	7,000	7,532	9,100
Average price per ton	\$1,300	\$1,530	\$1,670	1,850
Case sales	298,000	372,000	471,000	556,500

Sources of data: Virginia Wine Board and The Enterprise

Though Virginia is the fifth-largest viticulture state in the United States, wineries are having trouble keeping up with the growing demand.^{2,3} New plantings are increasing as “the number of new plantings in Virginia has grown 58 percent to 672 acres, up from 425 acres in 2014” (Bhattarai, 2016). As of 2015 there are 3,173 acres of wine grapes statewide. Virginia is also quickly becoming a winery vacation destination for tourists. Almost two million people visited wineries in Virginia in 2015, with sales of wine close to one billion dollars statewide (Virginia Wine Sales, 2016).

² As of early 2015, the other four largest Wine States by # of Wineries: California 4054, Washington = 718, Oregon, 689, NY = 367. Source: Wine Institute. Available at <http://www.wineinstitute.org/resources/statistics>.

³ The largest producer is California, which grew 608,000 acres in 2015 and accounts for 85 percent of the total grown in the United States. Source: Wine Institute. Available at <http://www.wineinstitute.org/resources/statistics>.

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Forty percent of US adults are wine drinkers. Projections over the next few years are strong for wineries. In 2016 growth is expected to be around 10 percent in Virginia (Economic Impact, 2017). In 2015, the most popular wine varietals in the U.S. include Chardonnay, Red Blends, Pinot Noir, Sauvignon Blanc, and Pinot Grigio. Virginia is best known for Chardonnay and red blends, though Viogniers are also popular. Wine consumption is also split approximately equal between red and white wines. 46.3 percent of all wine consumed is red, 44.3 percent is white, and 4 percent of wine consumed is pink. Wine is expected to continue to be dominated by female drinkers as 57 percent of wine consumption is by females (Thach, 2016).

Choices for Winery Setup

Retsof is trying to choose the best course of action for building his winery. He decided that he will set up his operations as an LLC but will account for the taxes in the cash flow estimates of the business itself. He estimates an approximate 35 percent tax on income. With this venture he will also have operating cash flows from taxes pertaining to alcohol and planting costs. After discussions with several other winery owners in the area, Retsof has determined that he has three potential courses of action for starting up his business.

Choice 1

The first option would be to grow his own supply of grapes and use these grapes to make the wine for his winery. His plan is to plant one half of the crop as white grapes, and the other as red grapes. The benefit of this plan is complete control over the supply of grapes, which acts as a natural hedge and limits the uncertainty in supply prices. Further, he could keep working at his current consulting job at for three years while he waits. He estimates that he could contribute approximately \$50,000 of his consulting income towards the winery during this period of time. The main disadvantage of this plan is that growing one’s own grapes requires more time, including a three-year minimum wait to make wine. Exhibit 3 contains an estimate of the grape tonnage expected after the third year per acre. Because of processing times, Retsof estimates that he could produce white wine only in the fourth year and produce red wine after the fifth year. Because he wants a full menu of options, Retsof predicts he could open to the public at the start of his sixth year of operations. However, he would still need capital in the interim to build out the facilities, including the wine-making equipment at the end of the third year. Additionally, since he only has five acres on the property, with each acre producing an average of four tons of grape (a ton is approximately six cases or 720 bottles of wine), supply would be capped at 1,200 cases unless he chooses to buy more farm acreage and plant after his first two growing years. With this limitation, Retsof assumes he will need to purchase another five acres and acreage in the area sells for approximately \$12,000 per acre. Retsof estimates he will purchase these five acres in his second year of operations.

Exhibit 3. Average Grape Variety Annual Yields

Year	Tons per acre expected for	
	white grapes	red grapes
3	2	1
4	3	2
5+	5	4

Source: Wunderlich et al., 2015

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Should Retsof decide on this choice, his initial capital investment in Year 0 would need to include all planting and farm costs, tasting room renovations and winery processing setup costs. Estimates for these costs are provided in Exhibit 4. His yearly costs after that point would include all maintenance for vineyards and winery. Revenues from wine sales could not begin until the beginning of year six. He also would need to purchase additional land in year two. With this plan he estimates a need of two tasting room workers for 20/hr per week once the winery opens in year six and one field laborer also working 20/hr per week starting in year one after vine planting. Tasting room workers would increase to three once cases sold pass 1,600 and will increase by one worker for every 600 additional cases after that point. Tasting room workers in Virginia typically are paid \$10/hr plus tips. Retsof believes these costs should increase with inflation at 2.5 percent each year.

Choice 2

The second option would be to buy other vineyard's grapes and start making wine immediately. Virginia Commonwealth Law considers leased acres of vineyards as part of a winery's land acreage so Retsof could lease acres of grapes from other wineries in the fall of 2016 and start making wine immediately. This is a common practice for many wineries as it allows for more wine and additional varieties of wine to be made. An acre of grapes on the market costs between \$1,600 and \$2,300 depending on the variety. \$1,600 is the average for white grapes and \$2,300 is the average for red grapes.

The advantage of buying grapes is that it eliminates the need to wait three years before production begins, and more varieties are available. Another advantage is that it allows the decision of the proportion of white and red grapes to purchase and produce into wine to vary more easily with changing trends.

The disadvantage is that there is still a need to take the time to make the wine on premises, with the expectation of selling after two years. Additionally, there is a grape shortage so prices are likely to rise faster than overall inflation over time, and supply of certain varieties is uncertain. Instead of keeping pace with inflation, Retsof believes that variable costs would increase at a rate of 4 percent per year from wine suppliers due to the tightening supply, though it could increase at rates higher than that. There are several reasons for the shortage of quality wine grapes in Virginia including not enough of wineries planting grapevines, the cost of planting and maintaining new vines is high, and there are too many vines planted on sites not well-suited for the varieties planted.

Should Retsof decide on this choice, his initial capital investment in year 0 would include tasting room renovations and winery processing setup costs as presented in Exhibit 4. The yearly costs after that point would include building maintenance costs for the winery. Building maintenance costs would include two buildings with this plan since the tasting room and processing building would need to be maintained. Revenues could not begin until year three under this option. With this plan he estimates needing two tasting room workers for 20/hr per week. Tasting room workers would increase to three once cases sold pass 1,600 and will increase by one worker for every 600 additional cases after that point.

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Choice 3

The third option would be to buy wine wholesale from other wineries and start selling immediately in year 1. Retsof has been in contact with several wineries that have excess supply of wines and are willing to wholesale the wines to him for \$13 per bottle on average for red wines and \$11 per bottle on average for white wines. He could use these wines under his own label and begin selling immediately.

The advantage of this is that Retsof could begin to earn revenues in the first year after finishing the tasting room renovations. He would only have to maintain one building on the property as he would not have to build out a winery processing building on site since the wines would be processed by his supplier. Estimates of these upfront costs are provided in Exhibit 4.

The disadvantage of this option is that the profit margins per bottle of wine are much slimmer. Additionally, given the grape shortage projections, it is likely that the variable costs per bottle would increase sharply over time and Retsof would have to pay the increase since the suppliers would have all the bargaining power. He believes that the wholesale bottle supplies would also likely increase at a rate of 4 percent per year from wine suppliers due to the tightening supply.

Should Retsof decide on this choice, his initial capital investment in year 0 would include tasting room renovations. Given that with this choice Retsof will not be building out the winery processing building and securing the loan on it, he would only be eligible for a \$185,000 loan from the bank. The yearly costs after Year 0 would include building maintenance costs and other winery variable costs. Revenues would begin in year 1 under this option. With this plan he estimates needing two tasting room workers for 20/hr per week beginning in year one. Tasting room workers would increase to three once cases sold pass 1,600 and will increase by one worker for every 600 additional cases after that point.

Retsof has done market research and has been able to obtain estimates for the costs associated with the choices and compiled the projections in Exhibit 4. The expected costs associated with each choice are indicated. He initially assumes that wine retail costs and any variable costs (excepting grape purchases and wholesale bottle prices) not started in 2016 will increase with inflation at a rate of 2.5 percent each year. The exceptions to this are his own wages -which he will on increase for the first ten years - and the yearly cost of road signs once the winery opens as that is a flat rate that is not subject to inflation. Exhibit 5 contains a timeline of startup costs and winery opening times assumed with each choice that Retsof would like to use in his analysis.

Exhibit 4. Estimated costs associated with wine operations

		Choice 1	Choice 2	Choice 3
Fixed Asset Costs				
Property costs (all options).	\$ 510,000	X	X	X
Tasting room renovations	\$ 100,000	X	X	X
Winery processing building renovations	\$ 125,000	X	X	
Winery machinery	\$ 200,000	X	X	
Initial Planting renovations (deer fence, etc)	\$ 15,000	X		

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Cost of planting an acre (vines and supports)	\$ 2,000	X		
Tax breaks for planting vines: 10% on the cost of planting an acre	10%	X		
Purchase price of additional five acres	\$ 60,000	X		
Farm machinery	\$ 30,000	X		

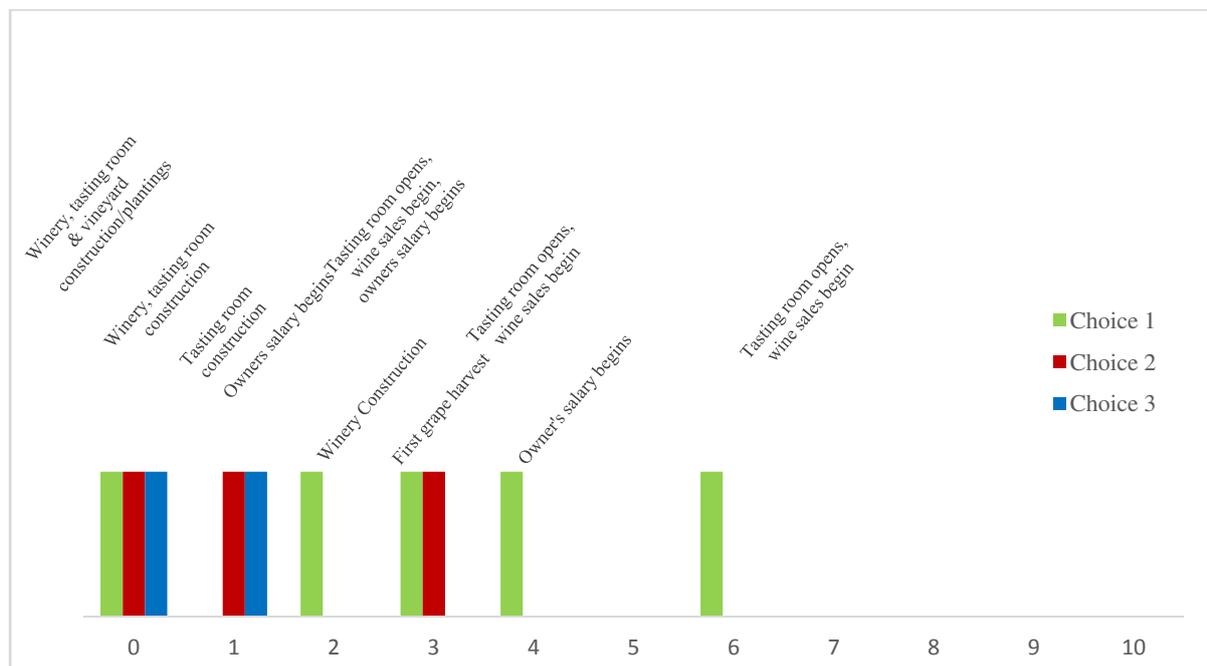
Variable Costs and Revenues (inflation projection is 2.2% per year)

Average wage of workers in tasting room and field labor per hour	\$ 10	X	X	X
Grounds maintenance (mowing, flowers, landscaping projects) per year	\$ 1,500	X	X	X
Building operating costs (utilities, etc) per year, per building	\$ 1,500	X	X	X
Yearly costs of road signs (not subject to inflation)	\$ 2,000	X	X	X
Yearly costs of advertising for events, website maintenance, festival fees, etc*	\$ 2,000	X	X	X
Market average of retail price of a bottle of wine (white)	\$ 22	X	X	X
Market average of retail price of a bottle of wine (red)	\$ 25	X	X	X
Taxes on each bottle: 6% of market retail price	6%	X	X	X
Cost per acre of purchased white grapes	\$ 1600		X	
Cost per acre of purchased red grapes	\$ 2300		X	
Variable cost per bottle produced (barrels, bottles, labels, etc)	\$ 5	X	X	
Cost of maintaining each planted acre per year	\$ 1,000	X		
Variable cost per bottle of purchased wine (white)	\$ 11			X
Variable cost per bottle of purchased wine (red)	\$ 13			X

*Note: if Retsof should spend more on the advertising, then he would expect demand to grow faster.

Data Source: Fickle, Folwell, Ball and Clary

Exhibit 5: Choices Revenue and Cost Timelines



Retsof believes that his projections of demand are the largest unknown assumptions. Given the location of the winery, Retsof expects 1,000 cases sold per year in the first year of operations. Because of the booming wine industry in the state and the documented rapid growth of startup wineries, he also projects growth of 14 percent per year for the first three years after the winery opens, growth of 9 percent per year for the next three years, and then growth to grow at a pace closer to the overall industry after that point at 7 percent (Peters, 2016). However, he knows that this demand is largely a function of how much advertising he does to draw in tourist traffic. Given the trend of white and red wine consumption, he also believes that he will need to sell both red and white wine varieties and sales will keep to current trends of selling approximately equal amounts between the two types. Retsof intends to plant or buy grapes and wines accordingly.

Analysis and Recommendations

Retsof is uncertain as to which path to choose and has come to you for help. While he is determined to start a winery, he is uncertain regarding the path to take. He needs you to compare and contrast the three different options. In your analysis he would like you to consider the following questions:

1. What are the main advantages and disadvantages of the three organizational choices?
2. Compare the three choices by performing baseline valuations. Determine the expected cash flows per year for each choice for the first 10 years and, using a 14 percent discount rate, determine the net present value of the project cash flows over the first 10 years only.⁴
3. Using your baseline projections, which choice would you recommend to Retsof? Why?

⁴ Retsof estimates this discount rate based on the 5.5% debt interest rate and his own required rate of return for this investment of 25%.

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4. How would you adjust your analysis if you wanted to compare the three choices based on cash flows extending beyond the tenth year? If Retsof were willing to wait longer than ten years for the venture to become profitable, would this impact your recommendation?
5. Identify the risks associated with each choice, and discuss how these risks affect your valuations and, ultimately, your recommendation. Does your recommendation change if you consider the sensitivity of each choice to the inputs?
 - a. Create an NPV profile for discount rates ranging from 0 percent to 30 percent.
 - b. Assume you have narrowed down your recommended choice between Choice 2 and Choice 3. Conduct a sensitivity analyses and graph the results for each of the two remaining choices given the fact that you are uncertain of your estimates of your three estimates of inflation and of the cases sold. Vary each of the following inputs +/- 15 and 30 percent:
 - i. Inflation on retail
 - ii. Inflation on costs
 - iii. Grape cost inflation assumption
 - iv. Cases sold per year
6. Conduct scenario analyses for the two remaining choices given a 50 percent chance of the base scenario and 25 percent change for each of the best and worst case scenarios. *Note: For any number of cases sold less than 700, Retsof expects to have only spent \$500 on advertising for the first year. For cases between 700 and 1500 sold per year, Retsof estimates spending 2000 in advertising and for cases sold over 1500, Retsof expects to spend \$3500 on advertising in the first year.*

Consider the following scenarios:

	Cases Sold, year 1	Advertising	Variable Cost Inflation	Retail Price Inflation	Grape Purchase Inflation
25% Best	1,500	\$3,500	1.50%	3.00%	2.00%
50% Base	1,000	\$2,000	2.50%	2.50%	4.00%
25% Worst	700	\$500	3.00%	1.50%	7.00%

7. Given that the choice of how many acres to plant will depend on the initial assumptions of demand, assume you determine Choice 2 needs additional analysis. Conduct a Monte Carlo Simulation for this choice assuming the following parameters:
 - i. Retail price inflation: 2.5% mean, standard deviation = 1.1%
 - ii. Variable cost inflation: 2.5% mean, standard deviation = 1.1%
 - iii. Grape supply increase: 4% mean, standard deviation = 3%
 - iv. Discount rate: 14% mean, standard deviation of 5%
 - v. Cases sold: Mean 1000, standard deviation = 450
8. Are there any other qualitative factors that you may need to consider? Are there any other costs not known with certainty that you would suggest considering in your risk analysis?
9. Suppose it is possible to combine Choice 2 and Choice 3 with Choice 1. Would this option potentially change your recommendation? What type of analysis would need to be done to compare this new option?

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