Role of Demand in Production Investment Decisions:
The Case of the Virginia Wine Industry

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Executive Summary

There is interest in expanding the Virginia wine industry. Studies to estimate the economic impact of Virginia wines have been done by Johnson and Wade (1993) and the Center for Public Policy, Virginia Commonwealth University (2002). Other researchers have looked at the cost of producing wine grapes and wine in Virginia. A statewide wine study group is looking at promotion and marketing of Virginia wines. But not much attention has been paid to the demand for wine and, specifically, to the demand for Virginia wines.

The level of demand and the elasticity of demand are important. For continuing investments in increased production to have a chance to be profitable, either demand must increase or costs must decrease or both must occur over time. The relationships between the level of demand, how it is changing, prices for wine, and likely impact on profitability of increased wine grape production can be summarized as follows:

Production	Demand	Wine Prices	Profitability of Production
Increasing	Constant	Some decline	Not likely to be profitable
Increasing	Increasing	Not predictable	Likely to be profitable
Increasing	Decreasing	Big declines	Major losses likely

In circumstances where demand is decreasing and production is increasing, all wine grape production, not just the expanded production, is likely to be unprofitable. The importance of what is happening to the level of demand cannot be overstated when expanded production investments are being considered.

Whether demand is constant or changing, the property of demand called elasticity, a price-quantity response relationship, will be very important in determining profitability. It is convenient to discuss this elasticity property with demand held constant. The important relationships are as follows:

Production	Demand Elasticity	Wine Prices	Profitability of Production
Increasing	Elastic	Some decline	Profits are possible
Increasing	Inelastic	Big declines	Profits virtually impossible

Costs of production are obviously a factor in profitability, but in the face of declining demand or a constant but inelastic demand, it is virtually impossible to reduce costs enough to maintain profitability over time when productions levels are increasing. Decreasing demand or increased production if demand is inelastic will mean rapid wine price declines and total receipts from a larger level of production will decline. This article elaborates on these issues, examines what is happening to the level of demand, examines whether demand for wines is elastic or inelastic, and presents a synthesis of the analyses needed to guide investment decisions in expanded production in the Virginia wine industry.

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Background

Wine grape acreage and wineries are increasing rapidly in Virginia. Bearing and non-bearing vineyard acres increased from 1,228 in 1998 to 1,737 in 2001 (Va. Wines). As of January 2003, Virginia had 75 wineries. Another winery is scheduled to open in April. Projections show that by 2004, Virginia might well have 100 wineries (Zoecklein). As new and expanded investments in grape growing and wine making are considered, an analysis of the demand for wine must be included in the strategic planning process. In the short run such as from year to year, changes in supply are the dominate reason for price movement in most food or beverage products. But across two or more years and when long run investments in production and processing capital and equipment are being considered, final consumer demand will largely determine the chances for profitability and the eventual economic viability of those investments. Both the *level of demand* and how it is changing and the price-quantity interaction property of demand called *elasticity* are important.

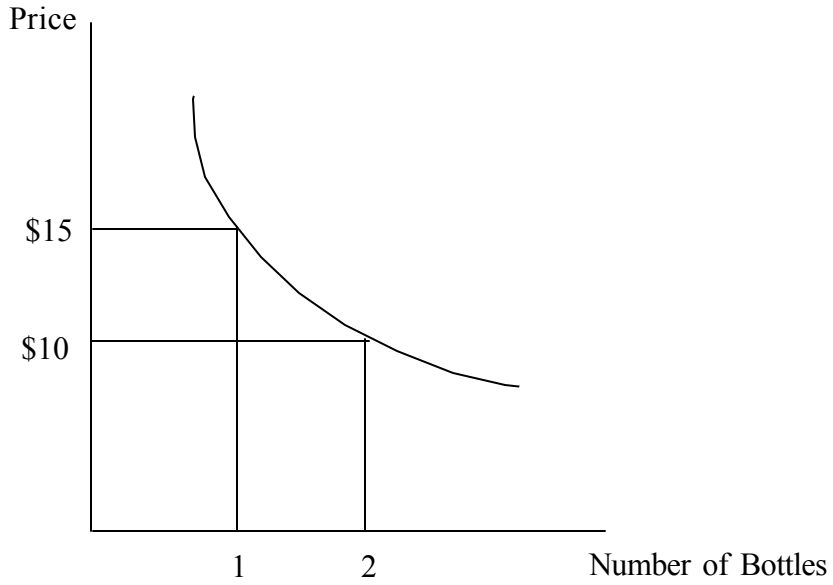
Level of Demand

Demand is the schedule of quantities that consumers will take at alternative prices. At any particular point in time, the price-quantity schedule follows a "law of demand" which says consumers will take more only at lower prices. Intuitively, we would expect quantities purchased of a product such as wine to be related to the price of wine, the price of wine substitutes, consumers' incomes, and consumers' tastes and preferences.

A price-quantity schedule for a typical consumer can be represented by a demand curve as shown in Figure 1. For a particular bottle of wine, at a price of $15, the typical consumer represented might buy one bottle. If the price is reduced to $10, that same consumer might buy two bottles. All the price-quantity combinations in a particular consumer's demand schedule are represented by one demand curve, and the *level of demand* is the same for all combinations along the curve. If we combine all wine consumers, we get an aggregate demand curve that has consumers moving in and out of the market and making decisions on how many bottles to buy at alternative prices. A separate demand curve would exist for each bottle size, quality, and distinctive wine.

Demand has not changed until a curve such as the one shown in Figure 1 shifts up or down, reflecting a change in the underlying price-quantity schedule for consumers. As changes occur in consumers' income, prices of substitutes, consumers' preferences, or some combination of these, the level of demand will shift.

Figure 1. Demonstration of a Typical Demand Schedule and Related Demand Curve



Examination of price-quantity data can show whether demand is shifting over time and in which direction shifts are occurring. The direction of movement in demand is extremely important to the investment in new or expanded production and processing. If the demand curve is shifting up and to the right, demand is increasing and consumers will (1) take more at the same price, (2) pay a higher price for a fixed quantity, or (3) pay a higher price for a larger quantity. All three alternatives represent increases in demand brought on by increasing consumers' incomes, increasing prices of substitutes, changing preferences such as enjoying better quality wines, or some combination of the three demand shifters.

In the U. S., wine entering trade channels (including imports) was at 480 million gallons in 1980. It increased to a record high 587 million gallons in 1986, decreased to 449 million gallons in 1994, and then increased again to 563 million gallons in 2001 (Wine Institute). Figure 2 is a scatter plot of sales and quantity data through 2001. The sales data used in Figure 2 have been adjusted for inflation. This adjustment is necessary to eliminate the impacts of overall price inflation from the underlying supply/demand picture. If the influence of overall price inflation is not removed, drawing any conclusions on what is happening to demand is difficult.

Figure 3 demonstrates the way in which the data in Figure 2 should be interpreted. For a given supply of wine in a particular year, Supply(1), the price will be low [Price(1)] in that year if Demand(1) prevails and price will be high [Price(2)] if Demand(2) prevails. Economists use the term "identification" when looking at the cause of movement from one price-quantity combination to another. Shifts in supply, in demand, or in both can be the sources of price-quantity changes, but any move up and to the right to new price-quantity coordinates must be an increase in demand. If both price and quantity increase, it is impossible to stay on the original demand curve, Demand(1), and a shift to some higher demand curve such as Demand(2) has occurred.

Figure 2. Scatter Plot of Wine Quantities for Sale and Inflation Adjusted Retail Sales Dollars (CPI, 19982-84 = 100), 1980-2001

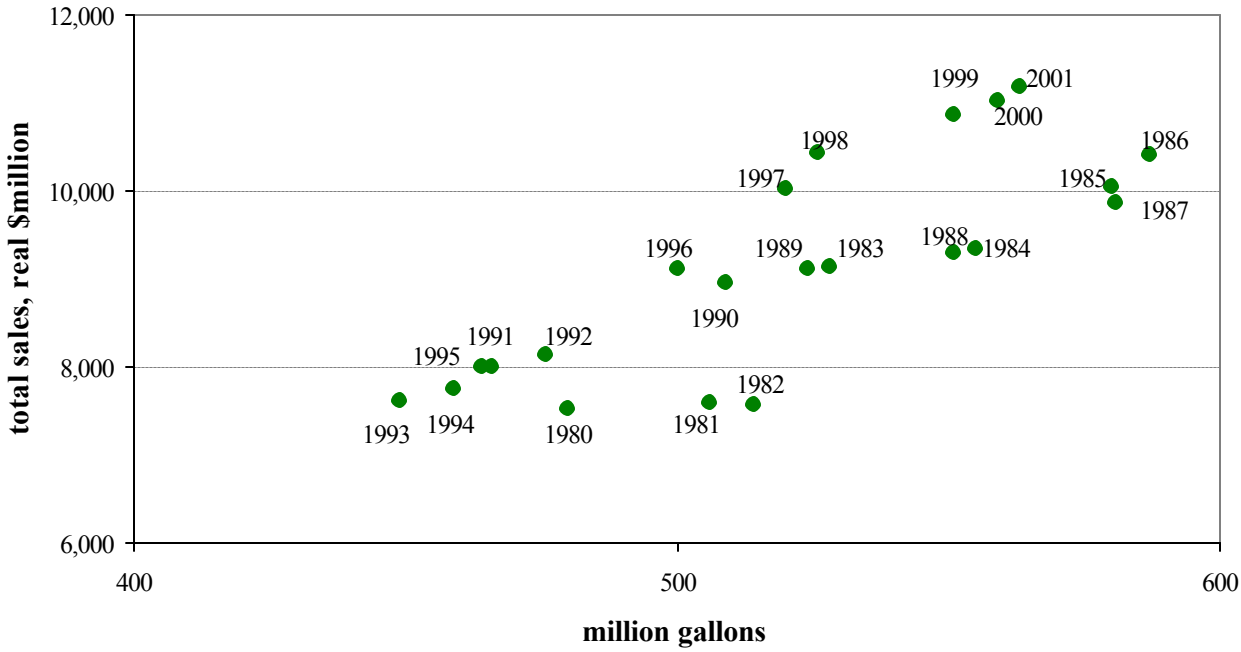
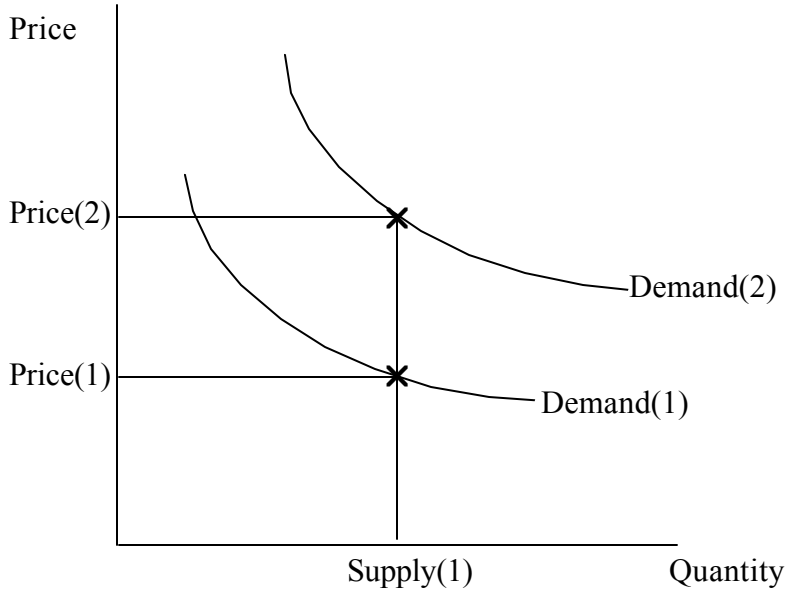


Figure 3. Demand Curves and Shifts in Demand



By using this insight to interpret the price-quantity data in Figure 2, we see that the underlying, downward sloping demand curves shifted up and to the right from 1980 through 1986, shifted down and to the left to a low in 1993, and then shifted up and to the right through 2001. Some of the late 1980s and early 1990s

decreases in demand (shifts down and to the left) may have been associated with health warnings added to labels in 1989 (ICAP). The increases in demand (shifts up and to the right) later in the 1990s may reflect research suggesting that moderate wine consumption might be beneficial to health (Goldfinger, et al., NCDACS, SUNY, Waterhouse, and others). The supply for each year after 1993 was also increasing. The 563 million gallons in 2001 was above that of the late 1990s and 2000. The reason the large 2001 supply did not push prices down sharply was because the demand in 2001 was also well above demand in the 1990s. The strong demand increases resulted in higher inflation-adjusted prices paid for increasingly larger levels of production. Investment capital pulled into the sector by the higher prices caused the wine sector to grow. Clearly, the impact of demand on price can be huge. *What is happening to demand will dictate the price for a certain level of production and will, thereby, largely dictate whether investments in expanded production will succeed or fail.*

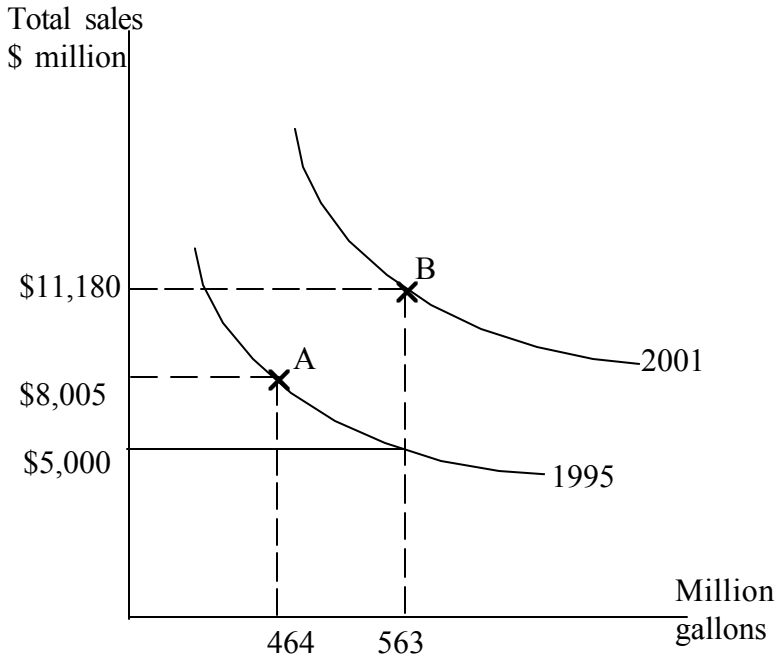
In any given year, the *price* for the available supply of wine that year is determined directly by the *level of demand*. Wine can move into and out of inventories, but supply of wine grapes in a particular year has been largely predetermined by production decisions made in earlier years. Supply of wine grapes is, therefore, essentially fixed at a certain quantity level for any particular year. A negatively sloped demand curve with roughly a 30 to 40 degree slope can be envisioned passing through the price-quantity coordinates for each year in Figure 2. Inferences on what is happening to wine demand and, indirectly, what is happening to demand for wine grapes can be drawn based on the set of demand curves that could be sketched on the graph.

To illustrate this point, in Figure 4 we sketch typical demand curves for two years, 1995 and 2001, from the set of demand curves that could be sketched on Figure 2. If the 563 million gallons of wine in 2001 is placed on the demand curve that passed through 1995, that 563 million gallons would have been valued at about $5,000 million (intersection at A)—less than half the $11,180 million (intersection at B) valuation actually seen in 2001. It is true that we cannot know the precise slope and shape of the 1995 demand curve to the right of the 464 million gallons actually observed in 1995, or exactly what the 563 million gallons offered in 2001 would have sold for if the demand curve were still at the 1995 level. But we *do* know that the 1995 demand curve would have sloped down to the right of the 1995 coordinates of 464 million gallons and $8,005 millions in accordance with the law of demand. If the actual demand curve in 1995 took the shape demonstrated in Figure 4, total sales in 2001 would have been sharply lower. The $5,000 million valuation that we use to demonstrate the enormous importance of the higher level of demand for 2001 production may be slightly too high or too low, but the overall conclusion holds*: the 563 million gallons produced in 2001 would have cleared the market at values well below $8,005 million if the level of demand had not increased significantly from 1995 to 2001*.

During the 1993 to 2001 period, therefore, demand appears to have increased, helping wine producers and supporting growth in the sector. More recently, anecdotal evidence suggests that the picture may not be as positive. Reports in newspaper articles from Australia in 2002 and from Los Angeles in 2002 and 2003 tell of wine grape gluts. These gluts suggest ongoing changes that are likely related to the production increases coming as a response to the favorable demand and price picture of the late 1990s. A wine specialist at the California Department of Agriculture says that vineyard owners are indeed facing gluts of grapes and declining prices. One California winery reportedly bought grapes at $60 per ton, well below the usual $200 per ton for Central Valley grapes (Brown). These price decreases hurt grape producers and threaten the viability of their investments. In addition,

> On December 18, 2001, the United States signed a Mutual Acceptance Agreement . . . on . . . wine making practices with Canada, Australia, Chile and New Zealand. . . . It is hoped that South Africa will officially join, bringing the membership total to seven countries and nearly 30 percent of the world's wine trade (USDA (a)).

Figure 4. Lower Price Necessary to Sell the 2001 Quantity if Demand Had Been at the 1995 Level.



Imported wine increased from 16 percent to 23 percent of the volume entering trade channels from 1995 to 2000 (USDA (b))—another expected response to increasing demand and the rising wine prices of the late 1990s. Whether domestically produced or imported, increased wine supplies entering the trade pipelines will force price down unless demand is increasing significantly at the same time. An initial interpretation of the anecdotal evidence of plunging grape prices (Brown and Fulmer) in California suggests that demand increases might have slowed in 2002 and 2003 or supplies are now increasing as fast as or faster than any continued growth in demand. The smaller increase in demand from 2000 to 2001 in Figure 2 may be an indication that any demand growth is at a slower rate than in the late 1990s.

Short run price declines attract media attention, but the emerging data suggest the demand picture continues to be largely positive. Record production of 3.361 million tons of wine grapes in California in 2000, where, on average, 90 percent of all U. S. wine is produced, combined with growing imports to boost available supplies in the U. S. A drop in California production to 3.052 million tons in 2001 helped boost U. S. retail wine prices by 10.2 percent over 2000 prices (calculated from *Noncitrus Fruits and Nuts* and Bureau of Labor Statistics data). Figure 2 shows increases in wine entering U. S. trade channels during 2001, and California production increased again by about 1.5 percent in 2002. But U. S. wine prices were up 4.5 percent, on average, in 2002 (calculated from Bureau of Labor Statistics data). That 4.5 percent price increase raises the possibility that when more complete data are available, demand for 2002 could have increased again compared to 2001.

Additional evidence from existing wineries and retailers and/or market surveys could be used to update the lagged publicly available data. The anecdotal evidence from preliminary data gives reason to believe that the demand picture continued to be positive in 2002 and into 2003. Clearly, decisions on investments in expanded production in 2003 and beyond will need to be based on information on what is happening to the level of demand since 2001. If the reported price problems to grape producers during 2002 were, in fact,

from a short-term increase in supply because of favorable growing conditions or from a temporary faltering of demand due to the cyclical weakness in the U. S. economy, the long-term pattern of growing demand may still be intact and still further expansion might be justified. But if the problems are due to a change from the recent patterns of growing demand to slower rates of growth or even decreasing demand, the difficulties can be long term and put new investments in production and processing at risk. As data become available, more analysis of what happened to demand in 2002 and 2003 will be important.

An Indispensable Property of Demand

As suggested, the level of demand for any product like wine will largely determine the long-term economic viability of production and whether production can be increased without major price decreases. Increases in demand for wine from 1993 through 2001 justified expanded wine production. Increased demand pushed the inflation-adjusted wine prices higher in the presence of increased supplies, showing that demand is indeed a powerful economic force in the marketplace.

An important property of the demand for any product or service is *elasticity*. Demand elasticity is the percentage change in quantity divided by the percentage change in price. Elasticity is, thus, a measure of consumer responsiveness to a price change. Consumer demand for a product like wine is considered *elastic* when a 1.0 percent decrease in price prompts a greater than 1.0 percent increase in the quantity purchased by consumers. Demand elasticity is always negative since price and quantity changes move in opposite directions along negative sloping demand curves. The size of the coefficient is what is important. The continuum divides into elastic and inelastic demand at a coefficient of –1.0. At higher prices on a demand curve, the coefficient moves to –1.5, to –2.0, etc. and becomes more elastic as prices go up. At lower prices on the same demand curve, the coefficient moves from the –1.0 that separates the curve into elastic and inelastic portions down to –0.75, to –0.5, etc., and demand becomes more and more inelastic.

Illustrations will help explain what elasticity can tell us. If wine prices are reduced to attract consumers to a winery or to a retail outlet, we would want elasticity to be as large as possible, reflecting a substantial increase in quantity purchased in response to a reduced price. Advertising a 10 percent price reduction will prompt big increases in customer purchases if the research estimates of demand elasticity are around –1.5, but only a small change in purchases if the demand elasticity estimate is –0.5. For example, we will assume the elasticity coefficient is –1.5, and we have a 10 percent decrease in price. The result would be a 15 percent increased in quantity purchased. The simple calculations to find X, the unknown change in quantity consumed, are as follows:

$$\text{Elasticity} = \frac{\%\,\text{change in Quantity}}{\%\,\text{change in Price}}$$

$$-1.5 = \frac{X}{-10}$$

$$X = (-1.5)\,(-10)$$

$$X = 15\%\ \text{increase in quantity purchased}$$

If the price change is –10 percent, then X = +15 percent and the 10 percent reduction in price has prompted a larger 15 percent increase in quantity taken.

If the elasticity coefficient is –0.5, a 10 percent decrease in price would prompt only a smaller 5.0 percent increase in quantity purchased. When the quantity response to a price change is small, consumer demand is considered to be *inelastic,* and consumers are not responsive to price changes. Advertising a 10 percent price reduction for a wine with an inelastic demand and an elasticity coefficient around –0.5 may be a waste of time and money.

In addition and very importantly, *demand elasticity dictates what will happen to total sales receipts if new investments in production and processing increase supply*. If demand is inelastic and the level of demand is constant (the demand curve is not shifting), *increasing supply will decrease total sales receipts to producers*. Increasing supply in the presence of an inelastic demand will devastate profits since total costs are higher for the larger supply, but *total revenue is lower for the larger supply*. The revenue-enhancing impact of producing and selling a larger supply is more than offset by the large decreases in price required to get consumers to take the increased supply.

To illustrate, we will assume a small, imaginary market with 100 bottles of wine selling at $10 per bottle. Total revenue or total sales receipts are $1,000. If demand is constant and demand elasticity is –0.5, a 10 percent increase in supply to 110 bottles will require a 20 percent price decrease to get consumers to take the larger supply. Price is now $8.00 per bottle, and total sales receipts are $880 [(110) ($8.00)]. This illustration can be expanded to millions of bottles or gallons, and the negative impact on profitability is apparent. *Supply increases, when demand is inelastic, bring increases in total costs and decreases in total revenue* causing profits to disappear.

Conversely, if demand is *elastic* and is not shifting, *increasing supply will increase total sales receipts to producers*. Consumers will respond and purchase the increased supply at only a slightly lower price. Using the small market described above but with an elastic demand elasticity coefficient of –1.5, the same 10 percent supply increase to 110 bottles would prompt only a 6.67 percent decline in price to $9.33 per bottle. Total sales receipts are $1,026.30 [(110) ($9.33)], $26.30 greater after the supply increase.

Profits and economic viability in the face of increases in supply are not completely assured when demand is elastic since profitability will also depend on costs, but the chances for profits and success are much better when demand is elastic. *Clearly, any planned expansion in wine output needs to consider demand elasticity as a primary determinant of what will happen to total revenue and to potential profitability.*

Research on Demand for Wines

Much of the research on the demand for wine has been done using beer and spirits as substitutes (Nelson and Moran; Nelson; Chaloupka et al.; Gao, Wiles, and Kramer; Chang, Griffith, and Bettington). Researchers have found that the demand for beer, wine, and spirits is typically inelastic. The ACNielsen Beverage Alcohol Team found white wine has 40 percent of the market share in food stores; red wine has 28 percent of sales; blush has 23 percent of sales (AgJournal). Buccola and VanderZanden found different elasticities for red and white Oregon wines. These researchers estimated demand elasticity coefficients for white wine to be –1.3 to –1.5, an elastic demand. The elasticity coefficients for red wines were around –0.5, indicating demand for red wine is inelastic.

Since the demand for white wine is elastic, total receipts from wine sales should increase if wine grape growers expand production of white wine grapes. Using an elasticity coefficient of –1.5, a 3.0 percent increase in output of white wine would be absorbed by consumers with only a 2 percent decrease in price if the level of demand is not changing and if the only thing happening is expanded production. Total revenues

would increase because a 3 percent increase in output contributes more to total revenue than is taken away by the smaller 2 percent decrease in price. Profitability is not guaranteed, but if demand is stable, profitability of expanded production is much more likely with an elastic demand. If demand is also increasing, of course, the chances for profitability are very good.

If grape production for red wines is increased and if the demand for red wine is, in fact, inelastic as reported by Buccola and VanderZanden, total receipts would decrease. With an elasticity coefficient of –0.5, each 3 percent increase in production would require a 6 percent decrease in price to clear the market of the larger supply. Given increased total costs for higher production levels, net revenues or profits to the red-wine sector would plummet. *When production is increased and demand is inelastic, significant and sustained increases in demand or reductions in costs or both would be required to give producers and processors a reasonable chance at profitability and economic viability over time.*

Elasticity is obviously a property of a specific level of demand. To analyze the implications of changing supplies in the presence of elastic or inelastic demand, the level of demand must be held constant. Specifically, the demand curve is not allowed to shift while using elasticity to examine the price implications of supply shifting *along* the demand curve. If the simplifying assumption of constant demand is dropped, the situation becomes more complex, but the analytical framework is even more powerful.

If demand is increasing, increased production of products such as red wines that face an inelastic consumer demand can still be justified and can still be profitable. But barriers to sustaining profitable operations are high and are difficult to overcome. Consistent, sustained increases in demand are difficult to achieve. They require repeated efforts to offer more and more utility to consumers or in some other way to continually boost demand. Therefore, reviewing in more detail the economic factors that shift demand over time is useful.

Research on Wine Demand Shifters

Changes in Income

A significant demand shifter is change in income. Income elasticity is a measure of quantity response to changes in income. All prices are held constant in the analysis so that the response to income changes can be isolated and measured. The research generally shows strong, positive income elasticity levels for wine. Chang, Griffith, and Bettington found statistical evidence that as income increases, the demand for better quality wine increases. Their findings mean that as incomes go up, consumers tend to increase purchases of better quality wine at prevailing prices. An income elasticity of 0.5 indicates that a 10 percent increase in income will prompt a 5 percent increase in wine consumption at constant prices of wine and competing products. The available research shows income elasticities range from 0.2 to an unusually large 5.0, depending on the data used and the method of calculation (Nelson; Nelson and Moran; Chang, Griffith, and Bettington; Gao, Wiles, and Kramer). In the 2002 to 2003 economy, inflation-adjusted disposable incomes are not increasing as rapidly as they did in the mid- to late-1990s, and many people who were working are no longer employed. At least part of the reported short-term pressure on prices in 2002 and 2003 could, therefore, be coming from income-related decreases in the demand for wines or, at a minimum, slower rates of demand growth than were evident in the late 1990s

Examining trends in income and income levels in the area where expanded production is being considered is, therefore, very important. Increasing demand for wine as incomes rise can make the difference between success and failure. Whatever the income trends, the income level of the typical consumer in a particular

market area will be a significant determinant of the correct marketing strategy. High quality and relatively high priced wines will fare well in a high income area where consumers can afford the premium prices but not nearly as well in a lower income market where the consumer choice might be between a lower priced wine and a substitute such as beer.

Investments, production plans, varieties of grapes and wine, and pricing strategies should be matched to the income profile of the typical consumer in the surrounding market. Income levels and changes in income over time will determine, to a significant extent, the level of demand and how demand changes over time.

Changes in Prices of Substitutes

Changes in the prices of substitutes will also shift demand. White and red wine are generally considered substitutes for each other. Buccola and VanderZanden not only found a difference in the demand elasticity of red and white wines, they also found differences in the cross elasticity for California red and white wines with Oregon red and white wines. Cross elasticity measures the quantity change in one product in response to a price change in a related product, usually a substitute product. The researchers found a positive and relatively large cross elasticity between Oregon and California wines. This research finding on cross elasticity means California red and white wines will quickly be substituted for Oregon red and white wines if the prices of California wines decline relative to the Oregon prices.

In a strategic pricing plan, this finding suggests that Oregon wine makers should make sure that prices for their wines follow prices for California wines. Lower prices of California wines will decrease demand for Oregon wines. Similarly, higher prices for California wines would increase demand for Oregon wines. This demand shifting effect of changing prices of substitutes means competitive costs of production will be important. Oregon wine makers, for example, could not continue to reduce prices to match reduced California prices in efforts to maintain market share if the reduced price levels are below the production costs in Oregon but not below costs of production in California.

Changes in Tastes and Preferences

Preference patterns change slowly and over time, but changes in preferences can be important demand shifters. The possible demand-boosting impact of recent research suggests that moderate wine consumption, especially in the red varieties, could have positive health impacts. This news enters the demand picture by changing the consumer's attitude toward wine. Efforts to differentiate a particular wine can influence consumers' preferences and make a difference to both the level of demand and elasticity of demand. Brand names and efforts to feature wines from a particular production area or from a particular state or country can influence consumers' preferences. If a particular label can be effectively differentiated, the level of demand for that label can be increased. Higher levels of demand directly impact profitability and sustainability.

Efforts to differentiate a label can also make the demand more inelastic. While we have suggested that an elastic demand is often desirable, especially if expanded production is being considered, efforts to differentiate a particular wine can have the result of changing the elasticity of demand. Trying to convince the consumer that a particular wine is the one and only wine to buy, for example, can make demand more inelastic. Consumers will tend to continue buying the particular wine even if prices go up. If the strategic plan is to control or reduce wine output and raise price, perhaps to cover rising costs, making consumer demand more inelastic would be desirable. Total sales receipts are increased by holding quantity offered constant or reducing the quantity offered and raising price when demand is inelastic. The sharp increases in price more than offset the negative impact on revenue of selling a reduced quantity.

Conclusions

Part of the recently reported grape glut is apparently caused by vines planted four to five years ago now coming into production. Anecdotal evidence suggests that demand could still be strong, but it is not apparent whether demand will continue to increase in a sustained fashion in future years. In the face of this uncertainty, potential wine grape growers and wine makers should exercise caution before making long-term investments to significantly increase output. In strategic planning for investments and for expanded production, a number of guidelines will prove useful.

- Analyze trends in consumer income in the particular market for which the grapes and wine are intended to see whether demand might be expected to increase based on income growth.

- Divide the broad market into segments featuring consumers with similar socio-economic profiles, and base decisions on the price and quality of the product array on the profile of the typical consumer in each identified market segment.

- To the extent possible, focus expanded production in the white wines where the demand appears to be elastic. But bear in mind that this possible competitive advantage for white wine disappears if the demand for red is shifting up and increasing significantly due to the demand shifting influence of income and/or preference changes.

- If, as some studies show, consumers shift to higher quality wines when incomes increase, segmenting the market to provide the right quality mix based on consumers' changing income profiles will be important to future success and profitability.

- Production, processing, and distribution locations in any market will move toward a low-cost network over time. Virginia's costs of production, processing, distribution, prices, and possible prices, for Virginia wine relative to prices in other producing areas should be carefully evaluated when new investments to expand production in Virginia are being considered.

- Perhaps most importantly, research is needed on the level and nature of the market for Virginia-produced wines and how much price premium (if any) can be expected for a Virginia wine. Buccola and VanderZanden found that Oregon wine prices cannot increase relative to California wine prices or demand for Oregon wines will decline and California wines will be substituted for the higher priced Oregon wines. Undoubtedly, a similar price threshold exists at which Virginia wines will be by-passed for California wines, wines from other states, or imported wines. Analysis of the demand and market for Virginia wines and analysis of what price relationships can be sustained in Virginia relative to other producing states, regions, or countries will be important as investments to expand Virginia's grape and wine industry are considered.

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