Revisiting the Coming Grape Shortage

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The cover story of the April 2008 issue of Wine Business Monthly warns of “The Coming Grape Shortage” in California. In the article, wine industry analyst George Schofield analyzes demand and supply factors for wine grapes in California and concludes that demand will outpace supply and thus result in a shortage of grapes. On the demand side, the author argues that strong growth in past sales volume of the top three selling wine varietals Chardonnay, Cabernet Sauvignon and Merlot will continue in the future. On the supply side, however, the author projects a decrease in the tons of grapes harvested in California of those same varietals: The inevitable result of these forecasts being an impending grape shortage. What does all this mean for buyers and sellers of wine grapes and by extension the buyers and sellers of wine? Conventional economic theory tells us that, as long as markets are unobstructed, shortages and surpluses will be reflected in the price of those goods. When there is a surplus of grapes, the price of grapes should fall. When there is a shortage, the price of grapes should rise. The good news then is that grape growers can expect to sell their grapes at a premium, while for grape buyers (i.e., wineries) the bad news is that they can expect to pay a premium for grapes.

If Mr. Schofield’s predictions are correct, we can expect the price of California produced Chardonnay, Cabernet Sauvignon, and Merlot to increase. The California wine market, however, like all markets does not operate in isolation. Even in the highly segmented wine market, consumers can be expected to react. Rising prices of California produced wines relative to non-California produced wines will result in consumers switching consumption to lower priced imported (outside of California) wines which can have negative consequences for California’s wine industry. Clearly, then, an impending grape shortage, as indicated by Mr. Schofield’s analysis can have significant ramifications for the California grape and wine industries.
Because of the potential impact of a coming grape shortage, I take a closer look at Mr. Schofield’s model. For each of the varietals examined by Mr. Schofield, he identifies, according to his model, periods of disequilibrium between the supply and demand for wine grapes. If conventional economic theory is correct, when Mr. Schofield’s model indicates a surplus of grapes, we should observe the price of those grapes falling. Similarly, when Mr. Schofield’s model indicates a shortage, we should observe the price of those grapes rising. The approach I take is simple. I examine the price of grapes to see if price falls in those years where Mr. Schofield’s model indicates a surplus and if price rises in those years where Mr. Schofield’s model indicates a shortage. Using data from the California Grape Crush reports for the same years examined by Mr. Schofield, I calculate the mean and median price of wine grapes for the three varietals examined in the original article. I use these prices as signals indicating disequilibrium between supply and demand in the California grape market. This approach seems reasonable since, as Mr. Schofield correctly points out, correlating the supply of wine grapes with the demand for wine is “tricky.” Fortunately, however, observing price is not.

Consider first, the supply and demand for Chardonnay grapes in California. In Exhibit 1 of the original WBM article (reproduced here for comparison), Mr. Schofield identifies four periods of either surplus or shortage. I re-examine each using the price per ton of California Chardonnay grapes as an indicator of shortage or surplus. Figure 1, shows the mean and median price per ton of Chardonnay grapes in California with the relevant periods clearly identified.

- Mr. Schofield begins his analysis in 1996 when his model shows that supply and demand are roughly in equilibrium. However, from 1996 to 1999, Mr. Schofield’s model clearly shows a period of surplus with supply rising above demand through 1997 and returning to equality with demand in 1999. We clearly identify this period in Figure 1 so that we can compare Mr. Schofield’s model with actual prices during that time. If Mr. Schofield’s model is correct, throughout the period of surplus we should observe prices falling and then stabilizing as the
surplus increases and then decreases. Instead, however, we observe both mean and median prices rising throughout the entire period.

- In the second period, beginning in 1999 when once again supply and demand are approximately equal, Mr. Schofield’s model indicates another surplus until about 2003. Again where we should observe prices falling and then rising, we instead observe the opposite. Mean and median prices rise until about 2000 and 2001 respectively, when the surplus is at its peak. Prices then begin to fall as the surplus subsides when they should be rising or at least stabilizing.

- In the third period, from approximately 2003 to 2004, Mr. Schofield’s model indicates a shortage, which would normally be associated with a rise in prices. Instead of observing prices rise, however, Figure 1 clearly shows mean and median prices falling.

- Finally, in 2005 where Schofield’s model indicates a spike in grape supply and resulting surplus, mean prices remain stable while median prices fall, which is consistent with an economic surplus.

For California Chardonnay grapes, in three out of four periods of disequilibrium, Mr. Schofield’s model fails to comport with the trend in actual prices.

- Consider next, Mr. Schofield’s analysis of the supply and demand for California Cabernet Sauvignon grapes. Exhibit 2 of the original WBM article shows the supply and demand for Cabernet Sauvignon grapes. Figure 2 shows the mean and median price per ton of California Cabernet Sauvignon grapes. For Cabernet Sauvignon, Mr. Schofield identifies three main periods of disequilibrium between supply and demand. Mr. Schofield’s model indicates a slight grape shortage from 1996 through 1999 with supply and demand reaching equality in 1999. Over this time mean and median grape prices rise rapidly for California Cabernet Sauvignon, consistent with economic theory.
• However, from 1999 through 2004, when Mr. Schofield’s model indicates a large surplus peaking in 2001, grape prices continue to rise. From 2001 to 2004 as the surplus diminishes according to Mr. Schofield, prices should begin to stabilize. Instead, while mean prices go from rising to stabilizing, median prices actually begin to fall.

• In 2004, Mr. Schofield’s model shows supply outpacing demand resulting in a dramatic surplus peaking in 2005 and continuing until 2007 when supply and demand eventually return to equality. Surely a spike in supply of this magnitude, without a corresponding spike in demand, can be expected to have detrimental effects on the price of grapes. Over this time, however, from 2004 to 2005 prices remain relatively stable.

For Cabernet Sauvignon, Mr. Schofield’s model improves slightly by failing to accurately predict only two out of three periods of disequilibrium.

Finally, in Exhibit 3 of the original WBM article, Mr. Schofield examines the supply and demand for Merlot grapes. Figure 3 shows the price per ton of California Merlot grapes. Mr. Schofield’s model identifies three main periods of disequilibrium between supply and demand.

• From mid 2000 to mid 2004, Mr. Schofield’s model shows a shortage of Merlot grapes with demand above supply for the entire period. The magnitude of the shortfall, however, differs greatly. For example, from 2000 to 2002, Mr. Schofield’s model shows a slight shortage between supply and demand. Figure 3 indicates the price of Merlot grapes rising during this time consistent with economic theory.

• However, when Mr. Schofield’s model shows a significant increase in the size of the shortage from 2002 to 2004, instead of observing the price of Merlot grapes rise, the price of Merlot grapes actually falls.
Exhibit 3

Annual Supply And Demand - Merlot

Mild Shortage 2000-2002
Shortage 2002-2004
Surplus 2004-2006

George Scholfield, Wine Business Monthly, April 2, 2008

Figure 3

Price of Merlot

Mild Shortage 2000-2002
Shortage 2002-2004
Surplus 2004-2006

Mean Price Median Price
Finally in mid 2004, Mr. Schofield shows a surplus of grapes peaking in 2005. Grape prices do in fact fall consistent with a surplus, but that decline began well before the surplus when prices should have been rising according to Mr. Schofield’s model.

Across the three varietals examined, using price as an indicator of shortage or surplus, Mr. Schofield’s model is correct two, maybe three times out of ten depending on how you read the data. While this is a crude measure, at best, of testing Mr. Schofield’s model, it is a start and should lead to some apprehension regarding the use of Mr. Schofield’s model to predict future shortages. Now it should be noted that predicting the future is always fraught with pitfalls, and one might be willing to give Mr. Schofield the benefit of doubt concerning his model’s predictions of a future grape shortage. However, what this article shows is not that Mr. Schofield’s model fails to predict the future (that remains to be seen) but rather that Mr. Schofield’s model fails to accurately predict the past. This is truly disconcerting. If a model cannot accurately predict what has already happened, what chance does it have in predicting what is about to happen. This is not to say that a wine grape shortage will not occur in the future. In fact, given that persistent shortages and surplus’s in agricultural markets are the norm, there is a 50-50 chance that a shortage will occur. While this would be an improvement on Mr. Schofield’s model, it would be nice if we could provide a more accurate forecast beyond simply flipping a coin. As an alternative to Mr. Schofield’s model, those concerned should consult Bill Turrentine’s Wine Business Wheel of Fortune, a mainstay in the wine and grape industry or for a more formal model of wine grape prices see my own Forecasting California Wine Grape Supply Cycles (WBM December 2005).

Mr. Schofield’s model fails in the same way Malthus’s model failed. Specifically, it fails to account for the dynamic forces of consumers and producers responding to rising prices. On the demand side of the market, as the price of California wines increase, more particularly Napa and Sonoma wines, consumers will seek out lower priced substitutes. On the supply side of the market, rising prices will induce wine makers into the market. This can already be seen, for example, even within California, where the central valley, long relegated to low end wines, has recently begun to produce some highly rated wines. As have the states of Oregon and Washington. Let’s not forget about Australia, Chile and
Argentina which have also established themselves as quality alternatives to California wines across all price points. For those who would scoff at the idea of these wines posing a threat to premium Napa and Sonoma wines, I remind you that US car producers once scoffed at idea of Japanese cars posing a threat to the domestic high end luxury car market. Of course many will argue that wine is not cars, so a bit closer to home, we should not forget that there was a time when French and Italian wine producers scoffed at quality wines being produced in America.