Is this a bubble in my Bordeaux?
Optimizing cellar management using price forecasts
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Abstract:

There is a significant body of literature on wine as an investment (see Aytac, Van Hoang and Mandou 2014 for a recent example). Findings suggest that average returns are mediocre but uncorrelated with more traditional investment vehicles. These conclusions are generally based on auction prices (e.g., Fogarty & Jones 2011, Masset & Weisskopf 2010) where wine investment is considered as an aggregate asset whose value is tracked with various indexes.

In this paper we examine the question from the perspective of a cellar owner who must decide what to drink or sell as time passes. Here the decision shifts from whether a wealth maximizing investor should invest more or less in wine, to a decision on whether one will drink a Chateau Haut Brion or a Chateau Lafite to go with tonight’s roast. With bottles fetching prices in the hundreds if not thousands of dollars, the impact on the long-term value of a wine portfolio may be very significant.

We use monthly retail prices as provided by wine-searcher.com to explore how prices vary over time and whether the signal has some potential to improve cellar management.

While still very much a work in progress, it is abundantly clear that the price path of investment-grade wines is both fairly predictable in the short term and wildly divergent in the long term. For instance, the priciest wine as of this writing is probably the Romanée Conti (Burgundy), at close to $14,000 for a 750ml bottle. Over the course of the past 4 years, a bottle of 2007 ($5,400 in early 2010) has appreciated at 20.5% CAGR. Over the same period of time, a Chateau Petrus 2007 (Pomerol) worth $1,350 has appreciated at 10.3% CAGR; Chateau Haut Brion (Bordeaux) went from $400 to $451, or roughly 2.5% CAGR; while Opus One (Napa Valley) went from a more affordable $170 to $329 for a 14% CAGR, in an almost linear fashion.

The story behind each price path defies simple explanations. Critics' score are uniformly high, the wines mentioned above still have plenty of life ahead of them and the production volume is weakly, if not spuriously, correlated with price levels and without any clear impact on price paths.

We compare forecasts generated by various time-series techniques, including Singular Spectrum Analysis (Golyanadina et al. 2000). In essence, SSA decomposes a time series in a set of frequencies that are grouped into three broad classes: trend signal (low frequencies), cycling/seasonal signal (well structured frequencies that coincide with a theoretically meaningful periods) and noise (arbitrary frequencies). Unlike other techniques, SSA can provide useful insights on short series and flag turning points, which is particularly relevant in our case.

We then simulate the impact of improved decision making on a cellar, assuming a constant purchasing rate and optimized attrition.

References:

