Is Bordeaux wine an alternative financial asset?

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Abstract

The turbulence that has affected traditional financial asset classes (shares, bonds, etc.) since the beginning of the subprime crisis and the appearance of stock market co-movements (Forbes and Chin, 2004) has threatened the gains achieved by international diversification of portfolios, i.e. an optimum trade-off between expected profitability and risk (Solnik, 1974). It is an appropriate time to investigate the relevance of investing in alternative financial asset classes. Besides real estate and hedge funds, works of art and even wine are among the types of asset classes that may be used to diversify investor portfolios.

In this article, we study wine as an investment and analyse its characteristics as a financial asset class. In this case, wine is not purchased for consumption purposes, but for future resale. The issue is, therefore, whether wine represents an investment likely to enhance the performance (expected profitability – risk) of a portfolio. Wine has a number of unusual qualities as an investment product. Performance is highly variable, depending on the label and vintage. Consequently, selecting wine for investment purposes requires specialised know-how. Wine does not pay dividends or interest and requires optimum storage conditions to avoid breakage and maintain its quality, which entails costs. Furthermore, unlike traditional financial products, it cannot necessarily be sold immediately.

To our knowledge, only Samming, Shaffer, and Sharatt (2008) have used both the CAPM and the Fama and French three-factor model (1993) to calculate the return of wine as a financial asset class. Using data collected from the Chicago Wine Company auction house for 90 red wines over the period 1996 – 2003, including classified growths and other Bordeaux in vintages ranging from 1898 to 1998, the authors found two outcomes. Firstly, the Jensen's alpha for wine as an asset was positive, i.e. its return was higher than that predicted by the model. Secondly, it was poorly-correlated with the risk factors.

The objective of this article is not to define a price formation model. The aim is to compare the return of an atypical investment, wine, with that of a traditional asset class, shares, to determine whether this product is a good source of diversification. The method consisted of testing the results obtained by Samming *et al* (2008) using a different database. The first section presents the database, the second, the methodology used. And the third part describes the results.

1. The database:

Our data was drawn from wine auctions, known for their intensity and geographical concentration. These auctions only concerned classified growths from Bordeaux, including a single sweet white wine, Château Yquem.

The market is highly fragmented due to the irregularity of auctions in any given location, the large number of different labels, and the fact that the product can be sold in different units (bottles, cases, etc.). This scatter effect is one of the main characteristics of this market, which is difficult to represent statistically, as sales of a particular product (defined by the chateau and vintage) rarely reach the volume and continuity required to study them properly. Table 1 gives an overview of this dispersion.

Table 1 – Transactions volume and structure

	Number de châteaux	Number of vintage	Transactions number
USA	250	101	21 330
UK	307	117	8 944
France	477	113	22 880
Total	*486*	*131*	*53 153*

For statistical reasons (law of large numbers), the analysis had to be restricted to products available frequently enough in sufficiently large quantities on homogeneous markets. Only sales in local currency in the United States, Great Britain, and France met these criteria.

In view of the individual nature of the product and the annual variations in quality, it was essential to distinguish between the various labels on two levels: the producer, known as a "chateau" in the Bordeaux wine business; the year of production, or vintage. On this basis, 486 chateaux were identified and transactions for 131 vintages had been recorded.

This fragmentation reduced the flow of sales per product unit. It was, therefore, necessary to select chateaux/vintages with a sufficiently large sales volume: at least 50 transactions over the 16-month period covered, or approximately 3 per month. These criteria were applied within each zone studied, to ensure market homogeneity.

2. Methodology:

Both models usually applied in finance for estimating the return on financial products were used, i.e. CAPM (Sharpe, 1964) for all of the markets and the three-factor model (Fama and French, 1993) for the American market. We, therefore, tested the following equations:

$$(1) \quad R_{it} - R_{ft} = \alpha_i + \beta_i(R_{Mt} - R_{ft})$$

$$(2) \quad R_{it} - R_{ft} = \alpha_i + \beta_{i1}(R_{Mt} - R_{ft}) + \beta_{i2}SMB_t + \beta_{i3}HML_t$$

Where R_{it} is the return for chateau/vintage i in period t

3. Results: The American case

Starting from the hypothesis that wine was an alternative asset class, differences in return were not accounted for by variations in the corresponding stock markets. We therefore tested:

H0: $\beta = 0$ and $\alpha = 0$

Against H1: α and β significantly different from 0

In the American case, the results for β are summarised in table 2.

Table 2- β value for American market *(abstract)*

Models	Size	Number of models	β_i estimated mean	Standard deviation mean	Minimum	Maximum
CAPM(Nasdaq)	*All*	*109*	*0,10*	*0,38*	*-0,87*	*1,07*
CAPM(DJ)	*All*	*109*	*0,18*	*0,63*	*-1,52*	*1,96*
CAPM(US)	*All*	*109*	*0,14*	*0,48*	*-1,09*	*1, 37*

The distribution of β seems to be around 0.10 - 0.2, depending on sample size. The mean standard error for the regression coefficient was 0.38 for the Nasdaq model, 0.63 for the Dow Jones model, and 0.49 for the US model. The null hypothesis was, therefore, accepted. The β distribution graphs confirmed this result (*See* Graph 1). In other words, the return of wine as an asset class was not correlated with American stock market returns.

The following values were obtained for the constant, α:

Table 3 – α value (Abstract)

| Models	Size	Number of models	α_i estimated mean	Standard deviation mean	Minimum	Maximum
CAPM(Nasdaq)	*All*	109	-0,9	5,2	-7,1	11,8
CAPM(DJ)	*All*	109	-0,8	5,2	-7,3	12,2
CAPM(US)	*All*	109	-0,8	5 ,2	-7,2	11,8

The mean value was: -0.8. However, in view of the mean estimated standard-error (5.2), it was concluded that $\alpha = 0$. The distribution graphs confirmed this result (*See* Graph 2). The profitability of wine as an asset class was not, therefore, higher than the value predicted by the model.

Our results (α and β not significantly different from 0) may be compared with those of Samming *et al* (2008, p.67), who concluded that:

- According to the sample tested, α varied from 0.168 for regressions by chateau and vintage to 0.88 for regressions by vintage and classification (the most prestigious wines), i.e. significantly different from 0, according to the authors. These results are very different from our findings.

- β was not significantly different from 0, which is consistent with our conclusions.

Nevertheless, the analysis of overall significance presented by Samming *et al* (2008) is debatable. Both graphs presenting the distribution of α and β and their significance (p.66 for α and p.68 for β) revealed a very small minority of significant coefficients and a large concentration around 0. Under these conditions, it was difficult to accept the authors' conclusion that α was globally significant. Our analysis of the p-value clearly showed that α was not globally significant, even for the most prestigious appellations. In fact, even if there were slight differences between the conclusions of Samming *et al* (2008) and our own on the issue of excess return, a careful examination of both analyses revealed relatively clear agreement. Readers are invited to form their own opinion by referring directly to the article (Samming *et al*, 2008).

Graph 1- p-values Distribution (β null): the US case
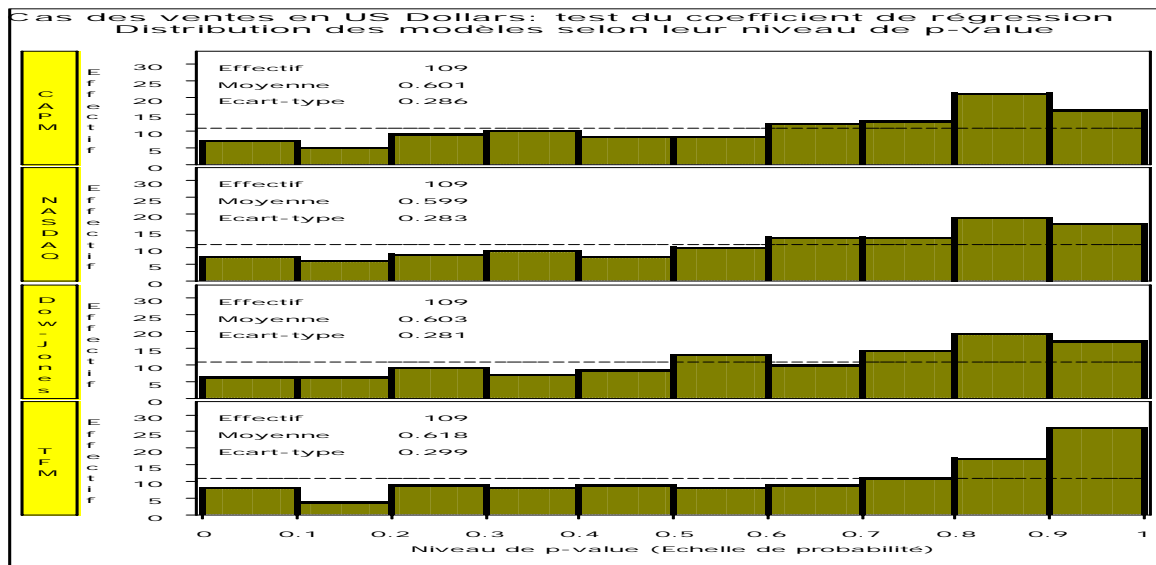
Graph 2 - p-values Distribution (α null): the US case
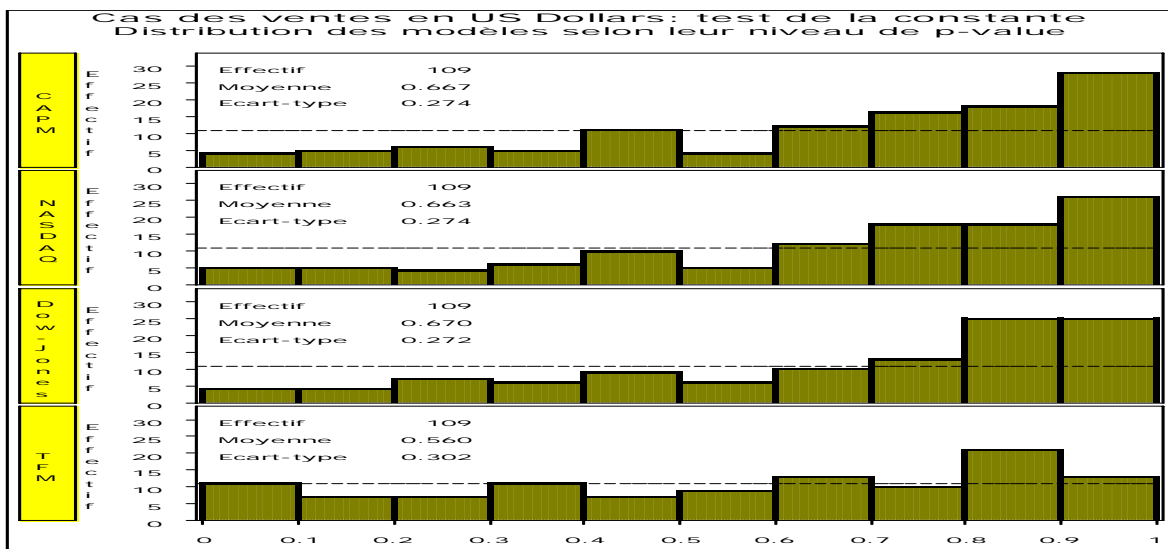
In the previous paragraph, we explained how models of a similar type with a similar population could be compared. However, when the populations are different, it is impossible to compare the usual indicators directly, as they are dependent on size. This is true of most indicators but not *p-value*, which is a probability, measuring the likelihood of the hypothesis tested. For that reason, the *p-value* distribution is presented as a bar chart, where the values are consolidated in 10% increments, from 0 to 1. The reference case, with no link at all, would result in a uniform numerical distribution, with the same number in each class, represented here by a dotted line. On the contrary, any link, even a weak one, would lead to a "bulge" in the classes with a low *p-value*.

It is quite clear that, in each case (see graphs 1 and 2), nothing in the *p-value* distribution of the tests for a zero regression coefficient indicates any real link. If there had been any link, the distribution would have been skewed towards the low values, to the left of the graph. That was not the case. Certainly, a few models had a low *p-value*, which, in the case of a single model, could be taken to indicate the existence of a link. However, testing 100 models with a threshold of 0.05, there should be an average of 5 models with *p-values* below 0.05, which was not the case.

A global evaluation of the models, therefore, confirmed that the value of α and β was zero. In other words, wine did not have an excess return, but could be considered an alternative investment product, as variations in return were not explained by fluctuations in the local financial markets. From that standpoint, wine does constitute an asset class for portfolio diversification, especially if co-movements in financial markets continue to develop.

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