



**Vines Portfolio Under Uncertainty and Irreversibility:
Grapes Variety in a Real Options Approach
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One of the most controversial issues among wine experts nowadays refers to the increasing tendency by wine-producers to extirpate and substitute some of the vineyards as considered currently less productive in terms of financial returns, too costly or risky to maintain, or no longer in tune with the current tastes by the public. The trend is particularly evident in many top-range DOCG demarcated areas in Italy, - such as Franciacorta in North Italy, Chianti in Tuscany and Alba in Piedmont -, where the hills suitable to grow vineyards are limited in the extent, but is also common in several emerging wine-producing regions, such as Sicily and Lazio. Clearly, the major concerns regard the loss of age-old vines, the danger of extinction of minor species of grapes with very special and rare aromatic profiles and/or resistance to pests, the gradual and irreversible reduction in the variety of the grapevines and, consequently, of the characteristics of wines brought to the market, the risk of too much homogeneity in supply and tastes.

We propose a formal framework to analyze and empirically test such a phenomenon. In particular, following a real options approach, we first define the value of a portfolio of grapevines which are partial substitutes in wine production. We then characterize the relative optimal strategy by the wine-producing management when the choice of eradicate a particular grapevine is irreversible and the returns from each species are subject to uncertainty.

Consistently with what is observed in many wine regions, we show that “myopic” producers might tend to rank grapevine species only according to their current productivity and cost efficiency, so that production is typically carried out from a sub-sample of the top-ranked vines and irreversible eradication of grapevines is undertaken. We argue, however, that this may be a sub-optimal strategy when the variety choice also keeps into account the uncertainty due to a) random fluctuations by market, tastes and technology variables and b) sudden occurrence of natural events and climate change. We show how variety differentiation does not necessarily decrease the value of the vines portfolio, but on the contrary, it may represent a valuable strategy for the wine-producers, in that it may allow for hedging against different states of nature, in terms of both market and natural scenarios.

Finally, we discuss an empirical validation of our model based on original data collected from the Franciacorta DOCG region in North Italy, including, for each year from 2000 to 2007, extension of the cultivated hectares for each variety of grape, number of produced bottles, weather conditions and selling prices.