Wine quality returns to scale: evidence from a Portuguese wine region
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Evidence based knowledge on the ideal scale of production concerning wine quality is an important tool for wine industry policy decision making. Knowing the right scale for better quality would greatly help in the process of designing incentive systems targeting quality development for a particular wine region. However this sort of evidence is scarce in published research. This paper aim is to report evidence on the quality returns to scale for red and white wines, using as a case study the Portuguese Dão Wine Region.

Quality of wine is of paramount importance, for the importance of quality on consumers’ demand and thus on price formation. One of the wine quality factors is likely to be the scale of production, but for opposite reasons. On one hand, the smallest the scale, the more care can be given to the wine making process and this would positively impact on quality. On the other hand, the higher the scale the more efficiently expensive technology might be in use, e.g. refrigeration capacity, and this would also positively impact on wine quality. However this trade-off is likely to apply differently to red wines and to white wines, as the quality of the later is likely to be more technologically demanding as compared to red wines, mainly because of the greater biologically and chemically instability of white wines, particularly concerning colour stability.

Dão wine region is one of the classic Portuguese wine region, with production and trade geographically delimited and regulated back in 1908. Covers currently 11 000 hectares of licenced vineyards for Dão wine production, with an average production of 31 million litres, of which two thirds submitted to Dão wine certification. The region is known both for its red and white still wines, for its elegance and aging capacity. Currently the red wines predominate as they represent c. 80% of the total regional production, but white wine share in Dão is increasing.

Dão wine making involves licencing by Dão Commission. There are 5 categories of licenced Dão wine producers, namely, (i) co-operative, (ii) producer-wholesaler, (iii) viticulturalist-wine maker-bottler, (iv) viticulturalist-wine maker, and (v) producer-bottler. These 5 categories in this order correspond to a decreasing scale of production. Measured in yearly average Dão wine declared production, the average scale for those producers’ categories are, 1 745, 290, 40, 26, and 18 thousand litres, respectively.

The current process of Dão wines production regulation and quality control also involves a compulsory submission to the Comissão Vitivinícola Regional do Dão (Dão Commission) of samples of the wine lots aiming at origin and quality certification. These wines samples are checked against Dão wine quality standards on its chemical and on its sensorial characteristics. The former check is done in the Dão Commission laboratory, and the later check is done by an experienced professional sensorial tasting board, both checks following rigorous and systematic procedures, always blind regarding submitting producers. Sensorial quality classification is given under a 0-100 scale, with 58 the minimum sensorial quality score for certification. For the brackets 68-74, 75-89, and 90-100, additional premium quality categories are given, namely, outstanding, very outstanding, and noble, respectively.
Data analysed concerned wine samples submitted and approved for origin and quality certification to the Dão Wine Commission from January 2011 to December 2014. Using as unit of analysis wine samples submitted for certification, data analysis consisted mostly in comparing producer’s category (with differing production scale), with the sensorial quality classification given by the Dão Commission’s sensorial tasting board to the submitted wine samples. Data was weighted by wine volume associated to each wine sample submitted, to account for representativeness of the results concerning volumes certified.

The major results were that the average quality score for red wines by producer’s category was highest for producer-bottlers (68.1) and lowest for co-operatives (63.2), and for the whole lot of categories the highest the average scale of production the lowest the average quality score. On the contrary, the average quality score for white wines by producer’s category was highest for co-operatives (67.9) and lowest for producer-bottlers (65.0), and for the whole lot of categories the highest the average scale of production the highest the average quality score.

Concluding, the evidence for Dão region points out that, for the years 2011 to 2014, red wines quality decreased with production scale, while, on the contrary, white wines quality increased with the scale of production.

Keywords: returns to scale, wine quality, white wine, red wine, Dão wine Region, Portugal.