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Title
Scenarios and Prospects for the Swiss Wine Market

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Keywords
Wine economics; Panel VAR; IRF; Sign restrictions; Forecasting.

Research Question
What are the main influence factors of supply and demand shocks in the Swiss wine market ?

Methods
Panel vector autoregressive model and impulse responses functions with sign restrictions.

Results
The results shows price persistence variation for selected types of wines. This is a major finding that could help producers or supermarkets to be more precise when using price promotions.

Abstract
The main objective of this study is to provide different scenarios and prospects for the Swiss wine market. In order to model and forecast wine consumption and prices, we use retail market data available from Nielsen Company (2016) which allows us to identify quantities and prices for about 100 different wine label specifications among six Swiss wine regions, colors (red, white and rosé) and grape varietal (Chasselas, Pinot noir, Merlot, etc.). We therefore set up a panel data which provides monthly data over a 5-year period (2012-2016) on all types of wines sold in the major supermarket chains in Switzerland, as scanned at the till. Nielsen Company provides quantity and price variables as well as promotion data.
Panel vector autoregression (Panel VAR) seems to be the model that best fits the requirements of this project, allowing a priori to integrate the two above-mentioned dimensions jointly with the error term in one single equation (see Canova and Ciccarelli (2013) and Giannone et al. (2015)). Panel VAR model assumes that the forecast period, say consumption2017, depends linearly from previous observations (consumption2016, consumption2015, etc.) and it allow us to take into account the heterogeneous structure of Swiss wine, unlike other non-differentiated goods such as wheat or oil (see Kilian (2009) and Peersman and Van Robays (2012)). Impulses response function (IRF) gives a first mean of forecasting the wine market, simulating a shock trough one standard deviation in the error term in order to observe the reaction on both wine consumption and price.
This paper provides a better understanding of prospects for the Swiss wine market, through modeling and forecasting analysis. Results show a strong heterogeneity for impulse responses functions (IRF) as well as supply-demand ratios in explaining forecasting error terms among different wine specifications such as region of origin, color and grape varietal. Panel vector autoregressive model (Panel VAR) and forecasting estimation allow for longitudinal analysis as well as cross-section data for specific types of wines. Sign restrictions strategy enables us

to disentangle demand and supply shocks effect on two main variables: quantity and price equilibrium. Finally, this study provides an important tool for understanding price change persistence for both producers and consumers. The methodology used is the Panel VAR approach in order to forecast and give prospectives for wine consumption in Switzerland, disentangling supply and demand shocks through sign restrictions strategy. Impulses responses functions (IRF) allow us to study in detail the persistence of a price variation due to an exogenous shock and its respective return to an equilibrium. Forecasting methods based on technical analysis, factor of influence and mainly the forecasting error term, complete the methodology.

The results shows price persistence variation for selected types of wines. This is a major finding that could help producers or supermarkets to be more precise when using price promotions in order to trigger more sales. This operation can actually give a bad price signal image to the customers by making it difficult to convince them that a further rise in price is justified. High response heterogeneity across individuals to supply or demand shocks demonstrate that these two phenomena should be treated in a separate way, allowing for different adapted answers. Coming to the forecasting analysis, we noticed that it is more difficult to make projections with aggregate panel data than a forecasting estimation individual by individual. The latter statement could seem to be trivial but it shows that longitudinal data are not always a panacea and cannot resolve all economic and econometric issues. General results show that demand shocks lead to more persistence in both wine consumption and prices. Even through for Swiss AOC wine supply shock seems to have a higher importance in explaining the forecasting error term, rosé wines have a higher part of demand shocks compared to red and white wines. Foreign wines, which are by definition more heterogeneous given that they are identified only by country and color, seem to be driven far more by demand shocks, totally the inverse of Swiss wines. This actually also corroborate the graphical regression results for foreign wines presented in Section 2.5.2. In addition, the strength of the Swiss franc and foreign dumping prices should not be strangers in explaining this situation.

This contribution extends previous analysis in VAR approaches by dealing with forecasting and taking into account several economic, climatic and agricultural factors. Disentangling supply and demand shocks with sign restriction in wine economics is also quite innovative, and this method allows us to go beyond current knowledge on wine price persistence. This research paper can help producers in taking a decision whether to decrease their prices with the aim of producing a positive reaction from Swiss consumers.

Reference study: Mondoux, A. (forthcoming, 2018) "Four Essays in Wine Economics: an Empirical Approach with Swiss Panel Data", Doctoral Thesis, KOF Swiss Economic Institute, ETH Zurich.