

## Padua 2017 Abstract Submission

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### Keywords

wine grapes, micro-macro prediction framework, cobb-douglas and translog production functions estimates, input-output analysis, IPCC,

### Research Question

What is the future of the wine-grapes industry in the Italian Veneto Region?  
How to predict?

### Methods

Creation of a short-medium term (2024-2030), micro-macro based, prediction methodology that is based on three main steps and is applied to the wine grapes sector of the Veneto region.

### Results

10% increase in land-use generates a 14.3% increase in wine grapes yields. Under targeted socio/economic/climatic assumptions, this generates 167.3M€ sector-gains; 240M€ gains for agricultural sector and 840M€ regional economy gains.

### Abstract

The traditional challenges to wine grapes growers and producers have aimed at producing wine grapes of enhanced attractiveness while simultaneously developing and implementing sustainable production practices for both grape growing and, often, wine making. More recently, those traditional challenges have been accompanied by new endeavors that include climate change (and related adaptation and mitigation policies adoption), fast changes of the national and international economies' structures, uncertainty in demographic trends and economic growth, anthropological pressures on the resources, including land degradation and increased water scarcity.

"What then is the future of the wine-grapes industry?" is the obvious question that derives from such synthesized evidence and challenges. In particular, for the sake of our study, what is the future of the wine-grapes industry in the Italian Veneto Region?

In this perspective, we attempt to address and answer the latter question. We believe that the focus is to be placed mainly on short-term policies. In fact, the most recent estimates by FAO, OECD and USDA indicate that the demand for food, including wine-grapes, compared to current needs, will increase by 50% in 2030 and by 80 to

100% in 2050, mainly because of world population growth. By 2020 the drivers related to food security, worldwide, can be considered established and consolidated with regard to the requirements, the general trends and the constraints related to food availability. From 2020 to 2030 the demand for food will rise significantly and new strategies and policy objectives in the long term should be defined (e.g. in terms of technology, investment, trade, etc.) Subsequently, from 2030 to 2050 it is estimated that the world population growth rate to stabilize and then reaches the maximum value of the population (although these estimates have been made in the recent discussion). The focus, therefore, should be paid more about key variables such as technology, resources and new social models, with the possible search for new paths of development.

Our prediction methodology framework is based on three steps:

(1) the microeconomics estimation of wine-grapes production functions (both Cobb-Douglas and Translog) in order to compute the marginal product and the value of the marginal product for each production input;

(2) the simulation of variations in the physical yields (grapes total production) and their monetary value in 2024, using both the economic and econometric analysis under point (1) and assuming changes in land use and agricultural labor, under different climate scenarios, that have been tailored to the Veneto region reality by Unive-CREA climate experts, based on regional tailored downscaling of the IPCC scenarios.

(3) the macroeconomic use of input-output analysis that studies how (and how much) the changes (shocks) computed under point (2) are propagated and spread in the Veneto Region economy, given the region economic structure and organization. A social accounting matrix (SAM) for the Veneto Region has been constructed, with the downscaling of national aggregated matrices, and the addition of employment, environmental and other socio-economic information. Multipliers have been computed and selected shock have been simulated.

Microeconomics results show that that the sector produces at a technology characterized by constant returns, where land is the most productive input. Assuming a future with (1) climate change (and related adaptation options), (2) changes in the land use and agricultural labor (according to the Unive-Crea scenarios), and (3) no technological change in wine-grapes production (so that the selected inputs present the same marginal productivity), we perform a prediction exercise on the 2024 wine-grapes agricultural performance (grapes yields and value).

The macroeconomic results show the impact of the agricultural sector, in general, and the wine-grapes production, in particular, on the regional economy (with a focus on labor and environment). The input-output exercise is able to target, elicit and value the impacts of selected shocks (computed in the micro-economic part of the study) and to show, in monetary terms, how those impacts are propagated within the productive sectors in the Veneto Region.

Predictions obviously differ according to the considered assumptions and scenarios. As an instance, we start from the assumption that in 2024, the Unive-Crea scenario "a world characterized by inequalities" will be realized. Under such scenario, most of the world's wealth is concentrated on a few countries, which highly contribute to emissions. These elites demand new, refined products, including wine. In this perspective, Veneto enjoys a comparative advantage and is able to combine the supply of important wines with the peculiar cultural and artistic heritage. In this perspective a (conservative) assumption of a 10% increase in the land use for wine grapes cultivation, may be consider acceptable. According to our estimates and the selected scenario, this implies a 14.3% of the wine grapes yields. In turn, this implies a gain of about 1.8 million tons, for a value of approximately € 167.3 million Euro. The latter figure is used in the input-output calibration. Such exogenous shock generates a 239,16 M€ gain on the agricultural and agro-food sectors and a 840 M€ on the whole regional economy.

A final caveat highlights that our projections are a conditional scenarios based on specific (or implicit) assumptions about the macroeconomic milieu, agricultural and trade policies, the weather, and international developments, among the others. Thus, the projections are not intended to be a forecast of what the future will be, but instead are a description of what would be expected to happen under these very specific assumptions and circumstances. As such, the projections provide a neutral reference scenario that can serve as a point of departure for discussion of alternative farm sector outcomes that could result under different conditions.

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# **What is the Future of the wine-grapes industry in Veneto?**

## **Evidence from a micro-macro-based prediction framework**

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