Doctoral School of Business Administration

THESIS SYNOPSIS

Jeremiás Máté Balogh

An empirical analysis of world wine trade

Ph.D. dissertation

Supervisor:

Dr. Imre FERTŐ, DSc
Professor

Budapest, 2016

Department of Agricultural Economics and Rural Development

THESIS SYNOPSIS

Jeremiás Máté Balogh

An empirical analysis of world wine trade

Ph.D. dissertation

Supervisor:

Dr. Imre FERTŐ, DSc
Professor

Table of Content

1. RESEARCH BACKGROUND AND OBJECTIVES

Since 1980, the world's total vineyard area had been decreasing continuously while New World wine producer countries became considerable and strengthened their activity in international and in European markets. Furthermore, New World countries increased their vineyards by new plantations thus accounted for a notable boost of wine production and trade. In addition, the New Wine World had a large growing wine consumption (Labys and Cohen, 2004) and they also gained increasing market shares at the same time as the Old World's market shares have declined (Anderson and Norman, 2003).

The European Union (EU) is the world's leader in the wine industry, with nearly half of the global vineyards and approximately 65 percent of production by volume (USDA, 2015). In EU, the member states hold the largest export market shares worldwide, more specifically: France is the world leader in value and Italy in volume on the export market for bottled wine while Spain is the world leader in value and volume for bulk wine (European Commission, 2014, p. 39). However, since the 80s, France, Italy and Spain have suffered a remarkable drop in domestic wine consumption at the same time as New World's countries have increased their production potential and induced new demand in foreign markets (Cembalo et al., 2014). Initially, the USA, Australia and later emerging wine exporter countries such as Chile, New Zealand and South Africa have gained increasing market shares both in volumes and in values exported (Morrison and Rabellotti, 2014 p. 2). Meanwhile totally new market players also came up such as China.

These new players endanger the position of traditional wine producers by exporting high amount of low-priced quality wines to European wine markets thus conquering export market from Old Wine World. At this time, almost half of the global wine is consumed outside of a country of production; by contrast, this fact can be rarely associated without an extra trade cost (Bianco et. al., 2014).

Moreover, after 2008, the European wine industry was strongly affected by changing regulations of the Common Agricultural Policy (CAP) for wine, with a particularly attractive grubbing-up prime that has lead a very large share of wine producers in EU member states to ask to benefit from this measure (OIV, 2013 p. 10).

However, small wine producers in EU such as Hungary, Croatian, Slovakia, Slovenia and Romania also tried to maintain their market position on international wine market they had

less benefit from the new market environment. Besides the small countries, these market trends also had a negative effect on the market share, the market dominance and the trade competitiveness of major European wine exporter countries. Although the market power of European Wine World had been declining year by year, the traditional wine producers still remained the most competitive market players and have higher wine export share than New World's competitors. Furthermore, the changes on global wine market historically have been accompanied by a geographical relocation of wine consumption due to the colonisation and migration. The former European conquistadors such as Spain, Portugal, France, England and the Netherlands colonised much of the world, conquered the territory and opened new trade routes in the 16th, 17th and 18th centuries. Most of the conquerors had a period of almost complete power in world trade thus reshaped the culture and the language spoken in their colonies hence brought in the culture of winemaking and established new trade relation with them. Consequently, besides economic aspects wine trade has a geographical and a cultural dimension as well.

In the globalised world, the analysis of international trade has been gaining growing importance in international economics. The increasing number and availability of international trade statistics provided by World Bank, WTO, OECD, United Nations and European Union's EUROSTAT databases facilitated to calculate plenty of econometric trade models. More and more importance can be attributed to the analysis of international wine trade, confirmed by the establishment of European (EAWE) and American Association of Wine Economists (AAWE) that organise conferences and publishing scientific journals especially in the field of wine economics.

However, several types of research are published investigating the global wine industry and trade from different aspects (Dascal, 2002; Anderson 2003; Anderson, 2013; Bianco et al., 2013a, 2013b, 2014; USDA 2015; European Commission, 2014; OIV, 2015), a comprehensive analysis investigating the recent situation of world wine trade by econometric models discovering deeper factors is understudied yet. To date, there has been limited attention to analysing the trade competitiveness (Anderson, 2003; Van Rooyen at al., 2010; Anderson, 2013) and long-term export specialisation patterns in the wine industry. The recent studies are focusing only on a given country or country groups; in contrast, the analysis of the determinants of wine trade competitiveness including the global market players is missing part of the literature.

However, historical and cultural background is a key factor in international trade (Tinbergen, 1962; Anderson, 1979; Anderson and van Wincoop, 2003; Bacchetta et al., 2012) and it can

also has an influence on wine trade relations; this research field is scarcely investigated in wine trade literature, especially considering all of the most important market players and their trade relations.

Since the quantity of wine exported by the traditional wine world has dropped due to the quality upgrading, the EU countries are still dominants players in the wine trade. Therefore, it is important to investigate how the world largest traditional wine producers can compete in their foreign wine export markets. Such preliminary studies can be only found in crop, meat and beer industry (Saghaian and Reed, 2004; Griffith and Mullen, 2001; Fedoseeva and Werner, 2014) while the research of wine industry is still neglected.

The objective of the research is to investigate the aspects of international wine trade by three different trade models based on representative samples covering major wine exporter and importer countries in the world. My dissertation is an empirical study that can be divided into three main parts reflecting the research fields analysed.

1. The first part of my empirical research provides insight into the export competitiveness of major wine producer countries on global markets and investigates the determinants of wine trade competitiveness at country level.

2. The second part of the dissertation covers the factor influencing trade costs among major market players and their trading partners in the global wine industry and reveals the cultural-linguistic factors behind wine trade.

3. The third part researches the role of exchange rates effects and the price discrimination behaviour of the biggest traditional wine exporters across their export markets.

In order to analyse the research topics mentioned above my dissertation posts five research questions and tests fifteen hypotheses (discussed in research methodology part of thesis synopsis). In order to analyse the world wine industry and trade, I applied three trade models, in particular: comparative trade advantage (Ricardo, 1817; Balassa, 1965), gravity model of international trade (Tinbergen, 1962; Anderson and van Wincoop, 2003) and pricing to market (PTM) model (Krugman, 1987; Knetter, 1993; Goldberg and Knetter, 1997). The aim of applied models are to evaluate the changes in comparative advantage of wine export, to take into consideration the role of trade costs in wine trade and to discover the pricing strategy of major European market players by help of econometric methods. I employ representative samples of world wine industry including 32 wine exporter and importer countries[1] for a

---

[1]Algeria, Argentina, Australia, Austria, Bulgaria, Canada, Chile, China, Croatia, Cyprus, Czech Republic, France, Georgia, Germany, Greece, Hungary, Italy, Lebanon, Malta, Moldova, New Zealand, Portugal, Romania, Russia, Slovakia, Slovenia, South Africa, Spain, Switzerland, Turkey, United Kingdom, United States

period of 2000 and 2013. The wine trade data derived from World Bank World Integrated Trade Solution (World Bank, 2014a) and EUROSTAT (2015) database in HS-6 level, product code 2204[2] for all models. To date, such complex research exploring the key factors behind wine trade is missing from the trade literature.

---

[2] Product code 2204 comprises wine of fresh grapes, including fortified wines and grape must.

2. RESEARCH METHODOLOGY

On purpose to analyse the three research field: comparative trade advantage, trade costs and pricing to market (PTM) in wine industry my dissertation posts five research questions and tests fifteen hypotheses.

Analysing the determinant of comparative advantage in wine trade

With trade liberalisation on global wine markets, the crucial factor for long-term business survival is the export competitiveness, which determines opportunities in the business prosperity of wine products on the world wine market.

Since the 80s the market dominance of the European traditional wine exporter countries has been permanently failing in the world wine market while the New World wine producers have extended their export to world markets and became significant in the global wine industry (Cembalo et. al., 2014).

Regarding the wine production, terroir, tradition, and technology are particular importance for country's comparative advantage (Anderson 2013, p. 5.). Old Wine World have comparative advantage in tradition, history and culture, by contrast, changing consumer tastes and preferences on the demand side created an international market opportunity for the New World wines (Halliday 1996). However, New World producers also have advantages such as higher productivity while wine traditions may decrease this factor (Tóth and Gál, 2014, p. 98). Between 2000 and 2013, EU wines improved their overall competitive position in the world market in value terms, despite an overall loss of market shares in volume (European Commission, 2014, p. 76).

To date, there has been limited attention to the wine export competitiveness and the export specialisation patterns of global market leaders. We cannot find a relevant study in wine economics literature that deals with the factors affecting wine trade competitiveness at a country level. Therefore my first research question (RQ1) aims to discover how the relevant market players can keep their position in a rising global competition and determine the driving forces enhancing international trade competition.

Research question 1 (RQ1): What determines a country's comparative advantages in world wine market?

8

The first empirical part aims to identify the revealed comparative advantages of major global competitors in world wine industry by Balassa (1965) type comparative advantage indices (Vollrath, 1991, Hoen and Oosterhaven, 2006, Yu et al. 2009; 2010).

First, it investigates which countries are more competitive then it discovers which wine producers are the winners and the losers of the last decades in international trade. I applied several techniques in order to check the robustness of the empirical results. I conducted consistency tests (Ballance et al., 1987) and checked the possible convergence of revealed comparative advantage indices using first and second generation panel unit root tests (Im et al., 2003; Maddala and Wu, 1999; Choi, 2001; Levin-Lin-Chu, 2002; Harris-Tzavalis, 1999; Breitung, 2000; Pesaran, 2007). Furthermore, I also tested the cross-sectional dependence as well as serial correlation by applying Pesaran (2004) CD and Wooldridge (2002) tests.

Finally, I investigated the main driving forces of global wine export competitiveness using panel regression models. The econometric models test six hypotheses and explain the determinants of the comparative advantage considering the factor endowments, productivity, market size, wine quality and the role of free trade in the wine industry.

The panel regression model explaining wine trade competitiveness is based on the empirical econometric models of Couillard and Turkina (2014), Sarker and Ratnasena (2014).

The indicators of competitiveness as dependent variables are represented by Balassa's RCA and its additional indices (RTA, ARCA and NRCA) calculated for wine trade relating to world wine market (all countries), between 2000 and 2013. In accordance with previous empirical research of comparative advantage, the following hypotheses are tested reflecting the first research question (RQ1):

H1.1: Higher factor endowments increase a country's comparative advantage on world wine market.

Factor endowments play a significant role in the wine industry (Anderson, 2003; Anderson, 2013; Boriraj, 2008) influencing positively the trade competitiveness.

Most professionals suggest that trade-off exists between the quantity of grape and the quality of wine produced. If so, increasing grape yields to reduce costs also lowers wine quality (Thornton, 2013 p. 61). In addition, OIV confirms that wine productivity is growing especially in the countries that produce non-fermented products and table grapes (OIV, 2012). Therefore, a negative sign is expected for the productivity in wine industry.

H1.2: Higher grape productivity in the wine industry weakens the competitiveness of wine export because higher grape yields result in a lower quality of wine.

Taking the set of products available on a market the home bias means that consumers often prefer to buy home goods, therefore, trade cost reflected in higher prices of imports or weaker distribution networks for imported goods (Friberg et. al., 2010). Anderson and van Wincoop (2004) suggest that the trade between two Canadian provinces was 20 times greater than trade between a Canadian province and the USA due to the home bias. Hence, higher size (population) of a given wine exporter or importer country does not necessary foster comparative advantages. Market size of a wine producer country is measured by country's population (number of country's inhabitant).

H1.3: Larger market size negatively influences the comparative advantages of world wine trade due to home bias.

According to Alcalá (2016), in the case of several products a positive correlation can be shown between the export unit value and the exporting country's revealed comparative advantage (RCA), where the unit value is interpreted as a proxy for quality.

As concerns the relationship between wine export values and volumes: we can observe that for France, New Zealand, Australia and the USA, market shares in value are larger than market shares in volume, therefore; these countries achieve, on average, a higher unit value (average prices) of wine export. In particular, New Zealand and France are competitive in terms of high-quality wines, both in bottles and bulk wine (European Commission, 2014 p. 39). Bisson et al. (2002) reinforce that in the USA, consumers have chosen to drink more expensive wine in a search for quality, a trend that seems to be true for European wine consumption as well. In my model, the wine export unit value captures the quality of exported wine.

H1.4: The better the quality of wine exported is, the higher comparative advantages of wine trade are.

The reason why most types of political initiatives aimed at facilitating market access and generating competitive advantage (European Commission, 2014, p. 142) free trade agreements have a significant role in trade advantage. The tariff reductions should increase

trade flows indicating positive WTO effects (Tomz et al., 2007). As a result, the subsequent hypothesis tests the effect of free trade on wine export:

H1.5: Free trade agreements can enhance the competitiveness of wine trade by reducing trade barriers and lowering trade costs.

In the recent decades, New Word wine producers have extended their vineyards at a much faster pace than the Old World (OIV, 2014). Consequently, their wine exports have grown faster implying that variables are likely to have behaved differently between Old and New Wine World. Tóth and Gál (2014) confirmed that it is a significant difference between the major Old and New World winemaking countries in terms of technical efficiency. In addition, wine policies in traditional wine producers are often claimed to be responsible for the decreasing competitiveness of wine industry. For this reason, the model implies a variable to distinguish between Old and New World wine producers, included by a dummy.

H1.6: New World wine exporter countries perform better in terms of trade on global wine market due to the higher technical efficiency.

Here I employ panel databases[3] incorporating the majority of world wine producer countries for the time period of 2000-2013. The sample consists of annual export-import data of 24 traditional and 8 New World wine producers (identical wine exporter countries are available for the gravity model).

I used a number of scale and dummy variables referring to factor endowment, production factors, market size, trade liberalisation, export unit values. The wine export and import data were obtained from World Bank World Integrated Trade Solutions (WITS) database (World Bank, 2014a), used at HS-6 level, product code 2204[4] targeted to the world market (all country). The variables representing the determinants of revealed comparative advantage derived from World Bank World Development Indicators (WDI) database (World Bank, 2014b); Food and Agriculture Organization of the United Nations (FAO) database (FAO, 2014) and the data of World Trade Organisation (WTO, 2014).

---

[3] Dependent variables and a few the independent variables are strongly balanced while other independent variables are unbalanced.
[4] Product code 2204 comprises wine of fresh grapes, including fortified wines and grape must.

My panel data set includes 32 major wine exporter countries and 14 years period (2000-2013) with 448 observations. However, dependent variables are strongly balanced; this condition is not held for all independent variables.

Preliminary test confirms the presence of heteroscedasticity; autocorrelation and cross-sectional dependence, therefore panel corrected standard error estimation (PCSE) was applied which controls for heteroscedasticity, the AR(1) type of autocorrelation and contemporaneous correlation across panels (Beck and Katz, 1995; 1996). The second empirical part of the dissertation analyse the determinants of trade costs in world wine trade.

The role of trade costs in world wine trade

At the end of the 20th century, France, Italy and Spain have suffered a remarkable drop in domestic wine consumption while New World wine producers have increased their production potential and induced new demand in foreign markets (Cembalo et. al., 2014). These changes also have been accompanied by a geographical relocation of wine consumption (Aizenman and Brooks, 2008). Currently, almost half of the global wine is consumed outside of a country of origin generally accompanied by extra trade costs (Bianco et. al., 2014).

The effect of cultural and geographical similarity on trade cost has already been proved in international trade literature by the help of gravity models. According to Tinbergen (1962) the size of bilateral trade flows between any two countries can be approximated by the so-called "gravity equation" on the analogy of the Newtonian Gravitation theory.

After Tinbergen (1962), Anderson (1979) provided a theoretical basis for gravity models. In work of Anderson (1979), Bergstrand (1985; 1989), Eaton and Kortum (2002), Helpman et al. (2008) and Chaney (2008) also developed the model and contributed to the trade gravity literature.

The gravity equation (Anderson and van Wincoop, 2003) is evidence for a relationship between the size of economies, their distances and the amount of their trade. According to the gravitation model of trade, physical and cultural proximity (language, tradition and history) between exporting and importing countries are related to costs of trade (Bacchetta et al., 2012).

A few articles were already published in international literature on wine trade explored by gravity equation models (Dascal, 2002; Bianco et al., 2013b; Fertő et al. 2013; Lombardi et al., 2016). However, we cannot find relevant comprehensive study including the most

important wine exporter countries analysing the impact of cultural-linguistic clusters on trade costs. Therefore my second empirical part investigates the geographical and cultural dimension of wine trade costs answering the following research question:

Research question 2 (RQ2): What factors influence costs of wine trade between wine producers and their trading partners?

Based on the empirical evidence of gravity literature (Pinilla and Serrano, 2008; Dascal, et al. 2002; De Blasi et al., 2007; Fertő et al., 2013; Lombardi et al. 2016) in the wine industry, the following hypotheses were tested, reflecting the second research question (RQ2):

H2.1: Demand for wine increases by market size, therefore, larger countries export more wine.

In empirical gravity models, larger countries export more, therefore, exporters' and importers' GDP have a positive effect on trade (Bacchetta et al., 2012) that is expected to be true for wine trade. Bacchetta et al. (2012), Head and Mayer (2013) also confirm that trade costs increase with geographical distances.

H2.2: Wine trade costs increase with geographical distance.

If the trader countries are landlocked that makes the trade more expensive (Bacchetta et al., 2012) since the sea access enables the water transport that reduces transport costs.

H2.3: Wine trade costs are higher in the case of landlocked countries.

Trade costs are lower in those countries that are similar culturally because they know better each other's culture and business practise (Bacchetta et al., 2012; Pinilla and Serrano, 2008) that is probably true for wine export.

H2.4: Countries with common cultural features export more wine each other's market because trade costs are lower between culturally similar countries.

Lower trade barriers stimulate trade by reducing trade costs (Bacchetta et al., 2012, p. 106; Bianco et al., 2013b). In this model, free trade variables are included by WTO membership and regional trade agreements (RTA).

H2.5: Free trade agreements facilitate wine trade by reducing trade costs.

While the wine producer countries are mainly Latin European, Germanic, Latin American, and Anglo-Saxon countries therefore I establish the following hypothesis for language clusters (Filippaios and Rama, 2011) between countries analysed:

H2.6: Trade relations are more developed in identical language clusters (Latin European, Germanic, Latin American, and Anglo-Saxon) than between different country clusters.

Cultural-linguistic clusters (Filippaios and Rama, 2011) are investigated without and with a common official language variable in order to measure the extra trade effects of language clusters.

My panel gravity model includes bilateral trade data of 32 considerable wine exporter countries and their 216 trading partners for a period of 2000-2013.

The dependent variable of the model comes from bilateral wine export data of World Bank World Integrated Trade Solution (WITS) database in HS-6 level, product code 2204[5], used in level and log form (World Bank, 2014a) in line with the sample investigating the revealed comparative advantage (Chapter 3).

The explanatory variables of the model are economic size (exporter, importer country's GDP), bilateral distances (shortest distances between capital cities) and cultural distances (common official language, past colonial relationship, common religion, island-landlocked dummies).

The set of bilateral covariates comes from the database of Research and Expertise Centre on the World Economy (CEPII, 2014). Information on WTO memberships can be found on the WTO website (WTO, 2014). The regional trade agreement (RTA) variable models the impact of bilateral regional trade agreements between countries, comes from International Economics Data and Programs of José de Sousa (De Sousa, 2014).

---

[5] Product code 2204 comprises wine of fresh grapes, including fortified wines and grape must.

A religion variable derived from data of La Porta et al. (1999). To measure the cultural distance between the home and the host country, I employed language cluster variables from data of Filippaios and Rama (2011).

I employ four different estimation methods: pooled OLS, Random Effects (Baier and Bergstrand, 2009), Pseudo Poisson maximum likelihood (PPML) estimation (Santos and Tenreyro, 2006) and Heckman two-stage approach (Heckman, 1979) to estimate the gravity equation for the wine trade. In all models, country fixed effects were included by country-pairs and time fixed effects. To avoid dropping zero trade values in logarithm form, I added a small value of 1 dollar to wine export variables to correct zero trade flows (Bacchetta et al., 2012).

Price discrimination behaviour of European wine market leaders

Price is a crucial factor for wine trade since exchange rates have had a relatively large impact on the competitive performance of wines (European Commission, 2014, p. 75).

As concerns, the wine-importing countries whose exchange rates appreciated most (e.g. China and Japan) would be expected to import more wine, all other things being equal. Meanwhile, for those experiencing depreciation, e.g. the United Kingdom, wine imports would be expected to fall (Anderson and Wittwer, 2013 p. 136). Hence, the important relation can be observed between export prices and international exchanges rates. Anderson and Wittwer (2013) also confirm that real exchange rates have played a dominant role in the fortunes of some countries' wine markets in recent years.

The methodology for modelling price discrimination behaviour induced by bilateral exchange rates changes called pricing to market (PTM) in the empirical literature. Pricing to market (PTM) refers to the "destination-specific adjustment of mark-ups in response to exchange-rate changes" Knetter (1993, p. 473).

In the beginning, the pricing to market models (Krugman, 1987) analysed the industrial products in US-German trade relationship. Knetter (1993) suggests that the extent of PTM vary widely between industries and exporting countries. On the other hand, policy-makers have become increasingly interested in pricing behaviour in agri-food trade as well. The majority of the PTM studies in food sector focus on wheat, meat (Saghaian and Reed, 2004), rice (Griffith and Mullen, 2001) and beer industry (Fedoseeva and Werner, 2014). However, the investigation of pricing strategy in several agri-food products attracts significant research

interest, PTM effects in the wine industry is quite understudied yet, particularly in the case of European Union's wine market leaders.

To date, mainly European traditional wine exporters dominated the world wine trade, for that reason, my third empirical part investigates the pricing strategy of France, Spain, Italy, Portugal and Germany across their foreign wine export markets. It aims to answers the following three research questions:

Research question 3 (RQ3): Are the major European wine exporter countries able to price discriminate across their EU extra wine export destinations?

Research question 4 (RQ4): How can the market structure be characterised on EU extra wine export markets?

Research question 5 (RQ5): How the depreciation and appreciation of wine exporter's exchange rates can influence international wine prices on European wine export markets?

To follow the previous theoretical literature (Knetter, 1989; Knetter, 1993; Krugman, 1987) and in line with the RQ3-RQ5, the PTM model tests the following hypothesis:

H3.1: The major European wine exporters are able to price discriminate across their EU extra wine export markets.

The major European wine exporters play a dominant role in global wine market (export share at 70 %) hence; they might apply price discrimination across their wine export destination markets. It reflects the third research question (RQ3).

If the European wine exporters dominate the world wine market, their export destinations, wine markets are characterised by imperfect competition i.e. monopolistic or oligopolistic market structure. H3.2 hypothesis corresponds to the fourth research question (RQ4).

H3.2: The main EU export destination markets (EU-27 extra export) are not competitive.

The interaction term of the dummy variable with the exchange rate capture the effect of asymmetry. If the coefficient of asymmetry is statistically significant and has a positive sign, it suggests that the effect of the appreciation of wine exporter's currency on wine export prices is greater than in depreciation (Byrne et al., 2010). Final hypothesis tests the asymmetric effects on exporter's exchange rates on wine export prices (RQ5):

H3.3: Asymmetric effects have a significant impact on wine export prices in case of European wine exporters by appreciation or depreciation of destination specific exchange rates.

The PTM model comprises monthly wine export data of top 5 European wine exporters for EU extra wine export destination markets, from January 2000 to December 2013. The strongly balanced panel includes a number of export destination countries and 14 years period. Wine export data for the analysis derived from EUROSTAT (2015) international trade database in HS 6-digit level, product code 220421[6] given in euro and in kg. International exchange rates are based on the European Central Bank, Statistical Data Warehouse (European Central Bank, 2015) database (local currency in euro).

In PTM model, the wine export prices as dependent variables are represented by wine export unit value (as average monthly wine export prices) and the exchange rates expressed as units of the importer's currency per unit of the exporter's currency. The country effects are included by country fix effects dummies and the asymmetric effect by interaction terms. Time fixed effects are included by the estimation method (panel corrected standard error model - PCSE).

---

[6] Product code 220421 comprises wine of fresh grapes, incl. fortified wines, and grape must whose fermentation has been arrested by the addition of alcohol, in containers of smaller than 2 litre, excl. sparkling wine.

3. RESEARCH RESULTS

The major empirical parts of the research presented in my dissertation provides a theory consistent answers to the five research questions posted and hypothesis tested relating the econometric analysis of international wine trade. Here, I present the results of the three empirical trade models along with the novelty, the practical relevance of the research, the limitations and areas for future research.

Results of the model determining comparative advantages in wine trade

First part of the dissertation evaluated the competitiveness of wine exporter countries employing four revealed comparative advantage indices (RCA, RTA, ARCA and NRCA). The trade indicators imply that besides traditional producers (Italy, France, Spain, Portugal, Georgia and Moldova), the New World wine producers also (Argentina, Australia, Chile, New Zealand, South Africa) exhibit a strong comparative advantage in the wine trade. However, the comparative advantage of traditional wine exporters declined compared to the beginning of the period. The declining comparative advantage of traditional wine exporters is principally caused by global and EU specific reasons. First, the introduction of the EU CMO reform in 2008 reduced the wine production in many EU member states. Most of the minor EU wine producers were affected negatively by these new market changes.

Second, the world financial and economic crisis also affected negatively the global wine consumption and trade. Finally, while EU reduced their wine sector, the New World wine producers enhanced their activity in international wine markets by extending their vineyards and production.

Referring to the interpretations of indices as cardinal, ordinal and dichotomous measure, I applied consistency tests for each index (Ballance et al., 1987). To check convergences or divergence in the revealed comparative advantage indices first (Im et al., 2003; Maddala and Wu, 1999; Choi, 2001; Levin-Lin-Chu, 2002; Harris-Tzavalis, 1999; Breitung, 2000) and second generation panel unit root (Pesaran, 2007) tests were used. Moreover, I also investigated the potential for cross-sectional dependence as well as serial correlation in RCA indices, by applying Pesaran (2004) CD and Wooldridge (2002) tests.

Consistency tests confirmed that applied trade indices perform very well in terms of binary and ordinal measures while they work less efficient as a cardinal indicator.

The panel unit root tests provided a strong support for the existence of unit root in dependent variables indicating a divergence in comparative advantage indices over time. Since the unit root tests of independent variables suggests mixed result and panel time period is relatively small, plus explanatory variables are unbalanced, that is why cointegration tests are not held for my database.

As a consequence of the cross-sectional dependency and the serial correlation, I employed panel corrected standard error (PCSE) technique for RTA, ARCA and NRCA model and feasible generalised least squares (GLS) estimations for RCA assuming cross-sectional independence.

Regression estimates show that productivity (grape yields) and county size (country's population) influence negatively the revealed comparative advantages, while factor endowments (agricultural employment, grape area harvested) and wine quality (export unit value) have positive impacts on the wine trade competitiveness. In addition, New Wine World performs better in international trade plus WTO agreements enhance wine trade competitiveness. The estimated coefficients confirm the hypothesis analysed on revealed comparative advantage in the wine industry. The results provide new evidence for the determinants of competitiveness and identify the major factors of trade advantage.

Results of the determinants of trade costs in world wine trade

In recent decades, the wine trade accompanied by geographical relocation of wine consumption in particular, by increasing wine consumption in North America and Asia. Currently, almost half of the global wine is consumed outside of a country of production that is often associated with an extra trade cost for trading countries.

The effect of the cultural and geographical similarity on international trade has already been proved by international trade literature in help with applying gravity trade equations. Second empirical part analysed the hypothesised effects of cultural and geographical proximity on wine trade, calculating for the world major wine producer countries, employing panel gravity models for a period of 2000-2013. I employed four different estimation methods (OLS, Random Effects, PPML and Heckman two-stage approach) to ensure robustness of the results. Gravity regression models investigated the role of cultural variables and language clusters in the wine trade costs. Results suggest that the exporter and importer country's common official language, colonial history, religion variables affected the wine export positively. This evidence can contribute to the magnitude of cultural similarity in terms of wine export. The

results also confirm the hypothesis that larger countries export more wine, the transport costs increase in line with the geographical distance and they are higher for landlocked trading partners. The costs of wine export could be lower if trading partners have common cultural relations or both have trade agreements. As a result of the language clusters, Anglo-Saxon, Germanic and Latin American countries export wines predominantly to each other's market. The additional effects of country clusters suggest that wine trade costs are the lowest within Latin American language cluster.

In conclusion, this new empirical evidence proves that historical and cultural background has a significant role in wine trade and culturally similar countries have remarkable trade advantage.

Results of the price discrimination analysis of the top European wine exporters

Despite the empirical evidence in the agri-food sector, analysing the pricing to market behaviour in wine trade has relatively understudied yet. However, it is crucial to investigate whether the European (World) largest wine exporter countries are able to price discriminate across their wine export destinations. Third empirical part investigated the price discrimination behaviour of top 5 European wine exporters applying PTM model for a period of 2000 and 2013. Moreover, the asymmetric effects on exchange rates were also investigated. The third model was based on a strongly balanced panel data set including monthly wine export data for France, Italy, Spain, Portugal, Germany and their wine export destination countries.

To check the robustness of the results, I performed second generation panel unit root tests to take into account possibility of the non-stationary of data, employing time lags. The Maddala and Wu (1999) along with Pesaran (2007) panel unit root tests rejected the hypothesis of the unit root in dependent variables (export unit values) for all country; by contrast, the independent variables (exchanges rates) of Italy, Spain, Germany, Portugal were non-stationary therefore panel cointegration tests cannot be calculated.

On the other hand, because of the presence of serial correlation and cross-sectional dependence (CD), I applied panel corrected standard errors (PCSE) estimation allowing autocorrelation of order one and contemporaneous correlation across panels.

In sum, my estimations suggest that France and Italy had market dominance and were able to apply price discrimination across their export markets. In the case of Spain, Portugal and

Germany, the price discrimination behaviour in EU extra wine export markets could not be observed.

The local currency price stability was higher than price discrimination effect during the entire period in case of Canada, Russia, South Africa, Switzerland (French wine), Singapore, Hong Kong (Italian wine) and Philippines' (Spanish wine). The analysis of the asymmetric effects of exchange rates on wine export prices revealed that depreciation of the Australian, Hong Kong's; Singaporean and Canadian dollar relative to euro had a greater impact than the appreciation while appreciation of Australian dollar in term of Italian wine export, as well as Canadian dollar and Singaporean dollar relative to euro in term of Spanish wine export exceeded the effect of depreciation.

Novelty of the research

This research mostly contributes to existing research in the field of evaluating world wine trade and competitiveness. First, it applied three trade models to world wine industry. While previous research analysed only a given country or a wine region, my research took into consideration all major wine producer countries and concentrated on the role of top market leaders.

Second, the research also has various contributions to the empirical trade literature. Unlike previous research, this study investigated first time the determinants of revealed comparative advantages in the wine industry by an econometric panel model employing Balassa (1965) and its transformed indices (Vollrath, 1991, Hoen and Oosterhaven, 2006, Yu et al. 2009; 2010). It discovered the deterministic role of cultural and language clusters between trade relations and highlighted the positive effects of trade liberalisation on wine export. In addition, my dissertation is the first to analyse the price discrimination behaviour of major European wine exporters across their wine export destination by pricing to market (PTM) model exploring imperfect competition on wine export markets.

This research employed representative samples of world wine industry (32 countries), contained three panel data sets for a period of 2000-2013. The employed panel econometrics carried out at country level for a disaggregated wine product category: 2204 at HS-6 classification level.

My regression models provide significant and consistent results in line with the previous empirical literature and draw up policy implementation for decision makers, researchers and wine economist. The robustness of results was provided by graphical analysis as well as

several tests such as investigating consistency, unit roots, cross-sectional dependence and serial correlations.

Theoretical and practical relevance of the research

My results suggest that it is crucial to improving the market position of European wines on European internal and external markets by product differentiation techniques such as labelling, quality standard and brand building.

My first model calls the attention that besides factor endowment and natural resources, the wine quality and the reduction of trade barrier are the key components of export competitiveness.

The second model points out that EU wine export should target primary the culturally similar countries and wine markets e.g. within Latin European countries wine trade cost are lower than between Latin European and Germanic countries. European wines should be exported mainly to those third countries which can be considered as former colonies of Europeans since they already have well-established trade relations.

The third model recommends that world dominant wine market players can set their prices to market as a consequence wine prices are driven by the market leaders in export markets. Small countries need strong marketing tools to differentiate their wine products from these dominant wine exporters. Finally, for wine exporters, the variation of international exchange rates has to be permanently studied because they are significant factors to rising or pushing down wine export prices.

As for the practical applicability of this research, it would be primarily interesting for wine economist, international or national statistical organisation – OIV, FAO, EC – being responsible for analysis of world wine industry.

Limitations and areas for future research

Concerning the limitations of the research, I would like to highlight the followings: It is important to note that the employed wine trade data were measured at macro (country) level. In addition, the applied models assume that wine products across countries are homogenous. Furthermore, the employed trade indices measuring comparative advantage can also be distorted by agricultural and trade policies. Moreover, some wine producer countries were

omitted from the database to obtain balanced dependent variables (e.g. Brazil, Bosnia and Herzegovina).

It should be mentioned that in case of small time period, panel unit root tests have weak power and there is the potential risk of concluding that the whole panel is non-stationary even when there is a large proportion of stationary series in the panel (Baltagi, 2005, p. 247). For that reason, testing unit roots in panel data may require additional techniques to obtain more consistent results.

However, the first and the second empirical trade models assume perfect competition on world wine market; by contrast the third empirical model revealed that wine export markets are not competitive.

Finally, my research can also be extended in the future with focusing on other important determinants of competitiveness and factors of trade costs for more disaggregated level in the wine industry. It would be advisable if future research also concentrates on the pricing to market strategy of New Wine producers on European Union's wine market.

4. MOST IMPORTANT REFERENCES

Aizenman, J., Brooks, E. (2008). Globalization and taste convergence: the cases of wine and beer. *Review of International Economics,* 16(2), pp. 217–233. http://dx.doi.org/10.1111/j.1467-9396.2007.00659.x

Alcalá, F. (2016). Specialization across goods and export quality. *Journal of International Economics*, 98, pp. 216-232. http://dx.doi.org/10.1016/j.jinteco.2015.09.005

Anderson, J. E. (1979). A theoretical foundation for the gravity equation. *American Economic Review*, 69(1), pp. 106-116. *Available at:* http://www.jstor.org/stable/1802501?seq=1#page_scan_tab_contents

Anderson, J. E., van Wincoop, E. (2003). Gravity with gravitas: a solution to the border puzzle. *American Economic Review,* 93(1), pp. 170–92. http://dx.doi.org/10.1257/000282803321455214

Anderson, J. E., van Wincoop E. (2004). Trade Costs. *Journal of Economic Literature*, 42(3), pp. 691-751. https://doi.org/10.1257/0022051042177649

Anderson, K. (2013). Is Georgia the Next "New" Wine-Exporting Country? *Journal of Wine Economics,* 8(1), pp. 1-28 http://dx.doi.org/10.1017/jwe.2013.7

Anderson, K., Norman, D. (2003). Global Wine Production, Consumption and Trade, 1961 to 2001: A Statistical Compendium, Centre for International Economic Studies, University of Adelaide.

Anderson, K., Wittwer, G. (2013). Modeling Global Wine Markets to 2018: Exchange Rates, Taste Changes, and China's Import Growth. *Journal of Wine Economics,* 8(2), pp. 131–158. http://dx.doi.org/10.1017/jwe.2013.31

Bacchetta, M., Beverelli, C., Cadot, O., Fugazza, M., Grether, J-M., Helble, M., Nicita, A., Piermartini R. (2012). A practical guide to trade policy analysis. *World Trade Organisation and United Nation,* June 2012, Switzerland p. 106. *Available at:* https://www.wto.org/english/res_e/publications_e/wto_unctad12_e.pdf

Bai, J., Ng, S. (2004). A PANIC attack on unit roots and cointegration. *Econometrica*, 72(4), pp. 1127-1177. http://dx.doi.org/10.1111/j.1468-0262.2004.00528.x

Baier, S. L., Bergstrand, J. H. (2009). Bonus vetus OLS: a simple method for approximating international trade-cost effects using the gravity equation. *Journal of International Economics,* 77(1), pp. 77–85. http://dx.doi.org/10.1016/j.jinteco.2008.10.004

Balassa, B. (1965). Trade liberalization and revealed comparative advantage. *Manchester School of Economic and Social Studies,* 33(2), pp. 99–123. http://dx.doi.org/10.1111/j.1467-9957.1965.tb00050.x

Ballance, R. H., Forstner, H., Murray, T. (1987). Consistency tests of alternative measures of comparative advantage. *The Review of Economics and Statistics,* 69(1), pp. 157-161. http://dx.doi.org/10.2307/1937915

Baltagi, B. H. (2005). Econometric analysis of panel data. John Wiley & Sons Ltd, The Atrium, Southern Gate, Chichester, West Sussex, England

Beck, N., Katz, J.N. (1995). What to Do (and Not to Do) with Time-Series Cross-Section Data. *American Political Sciences Review*, 89(3), pp. 634-647. http://dx.doi.org/10.2307/2082979

Beck, N., Katz, J. N. (1996). Nuisance vs. Substance: Specifying and Estimating Time-Series Cross-Section Models. *Political Analysis,* 6(1), pp. 1-36. http://dx.doi.org/10.1093/pan/6.1.1

Bergstrand, J. H. (1985). The gravity equation in international trade: some microeconomic foundations and empirical evidence. *The Review of Economics and Statistics,* 67(3), pp. 474–81. http://dx.doi.org/10.2307/1925976

Bergstrand, J. H. (1989). The generalized gravity equation, monopolistic competition and the factor-proportions theory in international trade. *The Review of Economics and Statistics,* 71(1), pp. 143–53. http://dx.doi.org/10.2307/1928061

Bianco D. A., Boatto V., Caracciolo F. (2013a). Cultural convergences in world wine consumption *FCA Uncuyo.* 45(2), pp. 219-231. *Available at:* http://www.scielo.org.ar/pdf/refca/v45n2/v45n2a17.pdf

Bianco, D. A., Boatto, V., Estrella-Orregob, J., Gennari, A. (2013b). Is gravity pushing Argentinean wine exports? A gravity model applied to Argentinean wine. VDQS XX Enometrics Conference, Talca - Chile, September 2013, *Available at:* http://www.wineecoreports.com/Working_Papers/Abstract/WP_2013/DAL-BIANCO_ESTRELLA-ORREGO_BOATTO_GENNARI.pdf

Bianco D., Boatto, A,. Caracciolo, V. L. F., Santeramo, F. G. (2014). Tariffs and non-tariff frictions in the world wine trade. *European Review of Agricultural Economics* pp. 1–27 http://dx.doi.org/10.1093/erae/jbv008

Bisson L. F., Waterhouse A. L., Ebeler S. E., M. Walker A., Lapsley J. T. (2002). The present and future of the international wine industry. *Nature* 418, 696-699 (8 August 2002), *Available at:* http://www.nature.com/nature/journal/v418/n6898/full/nature01018.html

Boriraj, J. (2008). Analysing and Modelling International Trade Patterns of the Australian Wine Industry in the World Wine Market. Thesis, School of Applied Economics Faculty of Business and Law, Victoria University, Australia, August 2008, *Available at:* http://vuir.vu.edu.au/2037/1/boriraj.pdf

Breitung, J. (2000). The local power of some unit root tests for panel data. *In Advances in Econometrics*, Volume 15: Nonstationary Panels, Panel Cointegration, and Dynamic Panels, ed. B. H. Baltagi, 161-178. Amsterdam: JAI Press. *Available at:* http://mapageweb.umontreal.ca/perrob/breitung.pdf

Byrne, J. P., Chavali, A. S., Kontonikas, A. (2010). Exchange rate pass through to import prices: Panel evidence from emerging market economies. Business School - Economics, University of Glasgow, pp. 1–31. Working Paper 19. A*vailable at* https://ideas.repec.org/p/gla/glaewp/2010_19.html

Cembalo, L., Caracciolo, F., Pomarici, E. (2014). Drinking cheaply: the demand for basic wine in Italy. *Australian Journal of Agricultural and Resource Economics,* 58(3), pp. 374–391. http://dx.doi.org/10.1111/1467-8489.12059

CEPII (2014). Centre de recherche français dans le domaine de l'économie internationale, GeoDist and Language database. *Available at:* www.cepii.fr, *Accessed: 10/09/2014*

Chaney, T. (2008). Distorted gravity: the intensive and extensive margins of international trade. *American Economic Review,* 98(4), pp. 1707–21. http://dx.doi.org/10.1257/aer.98.4.1707

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance,* 20(2), pp. 249–272. http://dx.doi.org/10.1016/s0261-5606(00)00048-6

Couillard, C., Turkina, E. (2014). Trade Liberalisation: The Effects of Free Trade Agreements on the Competitiveness of the Dairy Sector *The World Economy,* 38(6), pp. 1015-1033. http://dx.doi.org/10.1111/twec.12181

Dascal, D., Mattas, K., Tzouvelekas, V. (2002). An Analysis of EU Wine Trade: A Gravity Model Approach International *Advances in Economic Research*, 8(2), pp. 135-147 http://dx.doi.org/10.1007/bf02295344

De Sousa, J. (2014). International Economics Data and Programs Regional Trade Agreements *Available at:* http://jdesousa.univ.free.fr/data.htm#RegionalTradeAgreements *Accessed: 10/01/2016*

Eaton, J., Kortum, S., (2002). Technology, Geography, and Trade. *Econometrica,* 70(5), pp. 1741–1779. http://dx.doi.org/10.1111/1468-0262.00352

European Central Bank (2015). Statistical Data Warehouse database. Reports, Statistics Bulletin, Exchange rates, Bilateral exchange rates. *Available on the Internet:* http://sdw.ecb.europa.eu/browseSelection.do?DATASET=0&FREQ=M&CURRENCY=&node=bbn233 *Accessed: 20/02/2015*

European Commission (2014). Study on the competitiveness of European wines Final report. COGEA S.R.L. Represented by Francesca Antilici, October 2014, Rome, Italy. *Available on the Internet:* www.enterprise-europe-erbsn.ro/download/1973/

EUROSTAT (2015). International Trade database. Wine export data, *Available on the Internet:* http://ec.europa.eu/eurostat/data/database *Accessed: 02/02/2015*

FAO (2014). FAOSTAT Database: Food and Agriculture Organization of the United Nations. *Available at the website:* http://faostat.fao.org/site/342/default.aspx *Accessed: 05/04/2014*

Fedoseeva, S., Werner, L. M. (2014). Questioning Pricing-to-Market Linearity: Partial Sum Decomposition Approach Applied to Beer Export EAAE 2014 Congress 'Agri-Food and Rural Innovations for Healthier Societies' August 26 to 29, 2014 Ljubljana, Slovenia, *Available at Agecon search:* http://ageconsearch.umn.edu/bitstream/182784/2/Fedoseeva_Werner.pdf

Fertő, I., Pollmann, O., Podruzsik, Sz. (2013). Cultural Similarity, Communication Costs and Wine Trade in the European Union 7th AAWE Conference, Stellenbosch, South Africa 26-29 June 2013

Filippaios, F., Rama, R. (2011). Cultural Distance and Internationalization: The World's Largest Food and Drink Multinationals. *Agribusiness*, 27(4), pp. 399–419 http://dx.doi.org/10.1002/agr.20283

Friberg, R., Paterson, R. W.,. Richardson, A. D. (2010). Why is there a Home Bias? ACase Study of Wine CEPR Discussion Paper No. DP7885 *Available at:* http://www.eco.uc3m.es/temp/Friberg_enter.pdf

Goldberg, P. K., Knetter, M. M. (1997). Goods prices and exchange rates: What have we learned? *Journal of Economic Literature,* 35(3), pp. 1243. http://dx.doi.org/10.3386/w5862

Griffith, G., Mullen, J. (2001). Pricing to market in NSW rice export markets *The Australian journal of agricultural and resource economics,* 45(3), pp. 323-334 http://dx.doi.org/10.1111/1467-8489.00146

Halliday, J. (1994). A History of the Australian Wine Industry, Winetitles, Cowandilla SA.

Harris, R. D. F., E. Tzavalis. (1999). Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics,* 91(2), pp. 201-226. https://doi.org/10.1016/s0304-4076(98)00076-1

Head, K., Mayer, T. (2013). Gravity Equations: Workhorse,Toolkit, and Cookbook. CEPII Working Paper (Centre d'études prospectives et d'informations internationales) No 2013–27 September http://dx.doi.org/10.1016/b978-0-444-54314-1.00003-3

Heckman, J. (1979). Sample selection bias as a specification error. *Econometrica*, 47(1), pp. 153-161 http://dx.doi.org/10.2307/1912352

Helpman, E., Melitz, M., Rubinstein, Y. (2008). Estimating Trade Flows: Trading Partners and Trading Volumes. *Quarterly Journal of Economics,* 123 (2), pp. 441–487. http://dx.doi.org/10.1162/qjec.2008.123.2.441

Hoen, A. R., Oosterhaven, J. (2006). On the measurement of comparative advantage. *Annals of Regional Science,* 40(3), pp. 677–691. *Available at:* http://dx.doi.org/10.1007/s00168-006-0076-4

Im, K., Pesaran, H., Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics,* 115(1), pp. 53–74. http://dx.doi.org/10.1016/s0304-4076(03)00092-7

Jin, H. (2008). Competitive structure of Canadian wheat exports in the world market. *Applied Economics Letters,* 15(13), pp. 1059-1064. http://dx.doi.org/10.1080/13504850600993531

Kang, H., Fratianni M. (2006). International Trade, OECD Membership, and Religion, *Open Economies Review,* 17(4), pp. 493-508. https://doi.org/10.1007/s11079-006-0361-y

Knetter, M. M. (1989): Price discrimination by US and German exporters. *American Economic Review*, 79(1), pp. 198-210. *Available at:* http://econpapers.repec.org/article/aeaaecrev/v_3a79_3ay_3a1989_3ai_3a1_3ap_3a198-210.htm

Knetter, M. M. (1993). International comparisons of pricing-to-market behaviour. *American Economic Review,* 83(3), pp. 473-486. http://dx.doi.org/10.3386/w4098

Krugman, P. (1987). Pricing to market when exchange rate changes. In Arndt, S.W. & Richardson, J. D. (eds), Real Financial Linkages Among Open Economies. *Cambridge, MA and London*: MIT Press, pp. 49-70. http://dx.doi.org/10.3386/w1926

La Porta, R, Lopez-de-Silanes, F., Shleifer, A., Vishny, R. (1999). The Quality of Government. *Journal of Law, Economics and Organization,* 15(1), pp. 222-279. http://dx.doi.org/10.3386/w6727

Labys, W. C., Cohen, B. C. (2004). Trends or Cycles in Global Wine Export Shares. Division of Resource Management Working Paper RESMWP-04-03, Paper prepared for the Oenometrics XI conference of the VDQS-AEA, Dijon France, May 20-22.

Available at:

http://www.ibrarian.net/navon/paper/TRENDS_OR_CYCLES_IN_GLOBAL_WINE_EXPORT_SHARES.pdf?paperid=8089296

Levin, A., Lin, C.-F., Chu, C.-S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics,* 108(1), pp. 1-24. https://doi.org/10.1016/s0304-4076(01)00098-7

Lombardi, P., Dal Bianco A., Freda, R., Caracciolo, F. and Cembalo, L. (2016). Development and trade competitiveness of the European wine sector: a gravity analysis of intra-EU flows. *Wine Economics and Policy*, 5(1) pp. 50-59. http://dx.doi.org/10.1016/j.wep.2015.12.002

Maddala, G. S., Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics,* 61(1), pp. 631–652. http://dx.doi.org/10.1111/1468-0084.0610s1631

Morrison, A., Rabellotti, R. (2014). Gradual catch up and enduring leadership in the global wine industry. *American Association of Wine Economists* Working paper No. 148 Business *Available at:* http://www.wine-economics.org/dt_catalog/aawe-working-paper-no-148-business/

OIV (2012). Organisation Internationale de la Vigne et du Vin *Vine and Wine Outlook* 2010-2011, p. 29, *Available at:* http://www.oiv.int/oiv/info/enstatistiquessecteurvitivinicole#bilan *Accessed: 28/11/2014*

OIV (2013). Organisation Internationale de la Vigne et du Vin *Vine and Wine Outlook* 2008-2009, p. 8-10. *Available at:* http://www.oiv.int/oiv/info/enstatistiquessecteurvitivinicole#bilan *Accessed: 28/11/2015*

OIV (2014). State of the vitiviniculture world market EN Press release OIV 10/11/14 *Available at:* http://www.oiv.int/public/medias/2231/en-press-release-oiv-10-11-14.pdf *Accessed: 11/10/2015*

OIV (2015). Organisation Internationale de la Vigne et du Vin Statistics *Available at:* http://www.oiv.int/en/databases-and-statistics/statistics *Accessed: 20/01/2016*

Pesaran, H. (2004). General Diagnostic Tests for Cross Section Dependence in Panels, University of Cambridge Working Paper, 0435. *Available at:* http://www.econ.cam.ac.uk/research/repec/cam/pdf/cwpe0435.pdf

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), pp. 265-312. http://dx.doi.org/10.1002/jae.951

Pinilla, V., Serrano, R. (2008). The Agricultural and Food Trade in the First Globalization: Spanish Table Wine Exports 1871 to 1935-A Case Study. *Journal of Wine Economics,* 3(2), pp. 132-148 http://dx.doi.org/10.1017/s1931436100001176

Ricardo, D. (1817). On the Principles of Political Economy and Taxation. London, Chapter 7 http://dx.doi.org/10.1017/cbo9781107589421

Saghaian, S. H., Reed, M. R. (2004). Integrating Marginal Cost into Pricing-to-market Models for U.S. Agricultural Products. *A Journal of the Canadian Agricultural Economics Society* Agriculture, Food & Resource Issues, 5, pp. 187-203 http://dx.doi.org/10.1017/s1074070800021891

Santos, S. J. - Tenreyro, S. (2006). The log of gravity, *The Review of Economics and Statistics* 88: 641–58. http://dx.doi.org/10.1162/rest.88.4.641

Sarker, R., Ratnasena, S. (2014). Revealed Comparative Advantage and Half-A-Century Competitiveness of Canadian Agriculture: A Case Study of Wheat, Beef and Pork Sectors.

Canadian Journal of Agricultural Economics, 62(4), pp. 519-544 http://dx.doi.org/10.1111/cjag.12057

Thornton, J. (2013). American Wine Economics: An Exploration of the U.S. Wine Industry Hardcover University of California Press, Berkeley, California, pp. 357-359 http://dx.doi.org/10.1017/jwe.2013.38

Tinbergen, J. (1962). An Analysis of World Trade Flows, in Shaping the World Economy. *Twentieth Century Fund*, New York http://dx.doi.org/10.1002/tie.5060050113

Tomz, M., Goldstein, J. L., Rivers, D. (2007). Do we really know that the WTO increases trade? Comment. *American Economic Review*, 97(5), pp. 2005–2018 http://dx.doi.org/10.1257/aer.97.5.2005

Tóth, J., Gál, P. (2014). Is the New Wine World more efficient? *Studies in Agricultural Economics* 116, 95-96. http://dx.doi.org/10.7896/j.1411

USDA (2012). EU-27 Wine annual Report and Statistics USDA Foreign Agricultural Services Gain Report Global Agricultural Information Network, *Available at:* http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Wine%20Annual_Rome_EU-27_3-1-2012.pdf *Accessed: 10/10/2015*

USDA (2015). Wine annual Report and Statistics 2015. USDA Foreign Agricultural Services Gain Report Global Agricultural Information Network http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Wine%20Annual_Rome_EU-28_3-16-2015.pdf *Accessed: 23/10/2016*

Van Rooyen, J., Stroebel, L., Esterhuizen, D. (2010). Analysing Competitiveness Performance in the Wine Industry: The South African case. AARES conference, Adelaide, Australia, 7-9 February 2010 *Available at:* https://www.adelaide.edu.au/wine-econ/events/2030workshop/pubs/van_WC0210.pdf

Vollrath, T.L. (1991). A theoretical evaluation of alternative trade intensity measures of revealed comparative advantage. *Weltwirtschaftliches Archiv,* 130(2), pp. 263–279. http://dx.doi.org/10.1007/bf02707986

Wooldridge, J. M. (2002). Econometric Analysis of Cross Section and Panel Data. Cambridge, Massachusetts: The MIT Press.http://dx.doi.org/10.1007/s00712-003-0589-6

World Bank (2014a). World Bank's World Integrated Trade Solution (WITS) database *Available at:* http://wits.worldbank.org/ *Accessed: 05/04/2014*

World Bank (2014b). World Development Indicators (WDI) database *Available at:* http://data.worldbank.org/data-catalog/world-development-indicators *Accessed: 10/04/2014*

WTO (2014). World Trade Organisation Members and Observers: *Available at:* www.wto.org, *Accessed: 20/09/2014*

Yu, R., Cai, J., Leung, P. S. (2009). The normalized revealed comparative advantage index. *Annals of Regional Science,* 43(1), pp. 267–282. http://dx.doi.org/10.1007/s00168-008-0213-3

Yu, R., Cai, J., Loke, M. K., Leung, P. S., (2010). Assessing the comparative advantage of Hawaii's agricultural exports to the US mainland market. *Annals of Regional Science,* 45(2), pp. 473–485. http://dx.doi.org/10.1007/s00168-009-0312-9

5. RELEVANT PUBLICATIONS OF THE AUTHOR

Publications in Hungarian language

Academic volumes, chapters in academic volumes:

Balogh Jeremiás (2006): Az európai uniós tagság következményei a magyar szőlő- és borszektorban In: Tamás Csaba Gergely (szerk.) Magyarország és az Európai Unió: Díjnyertes pályaművek, 2005-2006. Budapest: Országgyűlés Hivatala, 2006. pp. 17-67.

Participation at conferences with publication of the full paper submitted:

Balogh Jeremiás Máté (2016): Minőségirányítási rendszerek a borágazatban. *Taylor: gazdálkodás- és szervezéstudományi folyóirat.* Virtuális Intézet Közép-Európa Kutatására Közleményei (8/2):23, pp. 79-86. ISSN 2064-4361 Available: http://vikek.hu/wp-content/uploads/2016/05/Taylor2016.2.számNo23.pdf

Balogh Jeremiás (2014): Mi befolyásolja a tradicionális és az újvilági bortermelő országokban a nemzetközi borkereskedelmi versenyképességet? LVI. Georgikon Napok. Konferencia Keszthely, 1-2 October 2014, pp. 35-47. ISBN 978-963-9639-60-7 *Available:* http://napok.georgikon.hu/cikkadatbazis/cikkek-2012/cat_view/3-cikkadatbazis/24-2014/27-ix-szekcio-szoleszet-boraszat

Peer-reviewed journals:

Balogh Jeremiás Máté (2016): A földrajzi távolság, a kulturális hasonlóság és a szabadkereskedelem hatása a borkereskedelemre. *Közgazdasági Szemle* 63:(7-8), pp. 858-881.

Balogh Jeremiás Máté (2016): A versenyképesség meghatározó tényezői a borágazatban. *Statisztikai Szemle* 94:(3), pp. 279-299.

Balogh Jeremiás Máté (2015): A borkereskedelem versenyképességének elemzése a hagyományos és az újvilági bortermelő országokban. *Gazdálkodás* 59:(5), pp. 475-487.

Balogh Jeremiás (2006): A magyar szőlő- és borágazat versenyképessége. *Gazdaság és Statisztika* 18:(5), pp. 55-73.

Foreign language publications

Participation at foreign language conferences with publication of the full paper submitted:

Balogh Jeremiás Máté, Jámbor Attila (2016) On the Duration of Comparative Advantages of Top European Wine Producers XXIII Enometrics Conference, Colmar, France May 25-28, 2016, Colmar, France. *Available:* http://www.vdqs.net/2016Colmar/documents/publications/text/BALOGH_JAMBOR.pdf

Jeremiás Balogh, Imre Fertő (2015): Drivers of Export Competitiveness in Wine Sector. 29th ICAE Conference, August 9-14, 2015, Milan, Italy, *Available:* http://ageconsearch.umn.edu/handle/211197

Academic volumes, chapters in academic volumes:

Jeremiás Balogh What role geographical distances and cultural proximity play in bilateral wine trade of Hungary? In: Erzsébet Hetesi, Zsófia Vas (szerk.) New Ideas in a Changing World of Business Managament and Marketing. University of Szeged, Doctoral School of Economic, Szeged, Hungary, 19-20 March 2015, pp. 35-45. ISBN 978-963-306-385-9 *Available:* http://www.eco.u-szeged.hu/download.php?docID=46191

Peer-reviewed journals:

Balogh Jeremiás, Jámbor Attila (2016): Determinants of revealed comparative advantages: the case of European cheese trade. *Acta Alimentaria*, Akadémia Kiadó Paper on-line.

Attila Jambor, Jeremias Balogh, Peter Kucsera (2016): Country and industry specific determinants of intra-industry agri-food trade in the Baltic Countries. *Agricultural Economics Czech.* 62:(6), pp. 280-291. (2016)

Imre Fertő, Szilárd Podruzsik, Jeremiás Balogh (2016) Intra-industry trade in the wine sector in the enlarged European Union. *Review of Agricultural, Food and Environmental Studies* 2016: pp. 1-14.

Balogh Jeremiás (2014): The evaluation of competitiveness of the Hungarian wine sector. *Tér–Gazdaság–Ember*, 2(4), pp. 33-46. Available: *Available:* http://kgk.sze.hu/images/dokumentumok/folyoirat/TGE_II_evf04.pdf

Research Studies:

Imre Fertő, Jeremiás Máté Balogh (2016): Are the major European wine exporters able to price discriminate across their EU extra wine export destinations? MTA Discussion papers MT-DP – 2016/24 *Available:* http://www.econ.core.hu/file/download/mtdp/MTDP1624.pdf