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Cultural convergences in world wine consumption

Convergencia cultural en el consumo mundial de vino

Andrea Dal Bianco [1], Vasco Boatto [1], Francesco Caracciolo [2]

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ABSTRACT

This paper addresses the dynamics of world wine consumption over the past 50 years in 26 countries, verifying whether or not there is a macro-tendency towards a common consumption style, despite differences in taxation, economic policies and distribution systems among countries. From an empirical point of view, the σ and β convergence hypotheses were formally tested. Model results confirm the existence of both types of convergences. *Per capita* consumption of wine first experienced a reduction in differences between countries and then converged toward a central value. "Traditional" countries, with historically high levels of consumption, showed a decrease in wine consumption, while emerging countries with historically lower consumption levels showed an increase. These findings not only provide further support to the theory of international convergence of wine consumption on a volume basis, as already observed by other researchers in the European market, but they also offer support for the theory in major world markets. Furthermore, convergence appears to be happening not only at a quantitative level but at qualitative level as well, and this phenomenon may very well reflect the changing tastes of worldwide consumers towards a generalized structure of wine consumption.

Keywords

wine consumption • convergence • international markets

RESUMEN

Este paper compara las dinámicas del consumo internacional de vino de los últimos 50 años en 26 países, con el objetivo de averiguar si existe una tendencia global hacia un estilo de consumo común, al margen de las diferencias impositivas y arancelarias, políticas económicas y sistemas de distribución de cada país. Los resultados del modelo confirman las hipótesis de convergencia de tipo σ y de tipo β: se observa una disminución en la diferencia d-el consumo *per capita* de vino entre países y posteriormente un aumento hacia un valor central, en términos de litros. Los países "tradicionales", con niveles de consumo históricamente altos, han experimentado una disminución del mismo, mientras que países emergentes con menor tradición de consumo de vinos han registrado un crecimiento. Estos resultados no solo apoyan la teoría del consumo internacional del vino desde un punto de vista cuantitativo, ya verificada en mercados europeos, sino que extiende su alcance hacia otros mercados. Se observa también una convergencia cualitativa, fenómeno que podría reflejar un cambio mundial en los gustos de los consumidores hacia un modelo con tendencias a la uniformidad.

Palabras clave

consumo de vino • convergencia • mercado internacional

1 TESAF Department, University of Padua. Viale dell'Università, 16. 35020 Legnaro. Padova, Italy. andrea.dalbianco@unipd.it

2 Department of Agriculture. University of Naples Federico II. Via Università, 96 - 80055 Portici (Na), Italy

INTRODUCTION

In the last few decades wine consumption patterns have undergone some remarkable changes. While in traditional wine producing countries there has been a rapid and significant decrease in domestic demand, new market opportunities have emerged in areas historically lacking in wine culture[a] (19, 27). This latter is the case of Northern European and South East Asian countries where wine is being increasingly appreciated and growing in demand, even partially substituting traditional alcoholic drinks (16).

Some authors affirm that this phenomenon is driven by the overproduction of large European wine producers, which together with decreasing domestic consumption define the need to increase exports. Consequently these countries are launching promotional campaigns to boost wine consumption in emerging wine consuming countries (26). Spain, Italy and France, for instance, account for almost half of world production, but less than a third of world consumption (3) and export annually 40% of their production[b].

The vast literature deals with: consumers' responses to price changes (20, 25); the influence of specific geographical traits and other qualitative wine characteristics on consumer preference (4, 13, 18, 33); ways in which differences between products are communicated to the public (11, 30), among others. Although wine consumption dynamics are continuously monitored by international organizations such as OIV, FAO, WHO, few studies have empirically investigated the role of macroeconomics in the convergence of wine consumption at an international level.

This paper analyses the dynamics of world wine consumption, checking for the existence of a macro-tendency towards a common consumption style, despite differences in taxation, economic policies and distribution systems among countries. Some authors (2, 31) believe that the globalization process is driving to a convergence in wine consumption patterns by creating similar structural models of consumption. This assumption is not surprising at all given that the demand for wine has been historically influenced by social, religious and cultural aspects (5, 24). The internationalization of local markets has likely diminished these cultural differences among countries by means of the so called "taste standardization" process (1).

This research tests the hypothesis of convergence by analyzing *per capita* wine consumption in key world markets over the past 50 years.

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a According to Foster & Spencer (19), since the peak in 1982, there has been a decline in world wine production, partly offset by increases in wine production by the so-called 'New World' countries: Argentina, Australia, Canada, Chile, New Zealand, South Africa, the United States and Uruguay. Historical European producers -France, Italy, Spain, Germany, Portugal and Hungary- are nowadays considered traditional 'Old World' producers.

b Average of the period 2007-2011, calculated according to FAO and Global Trade Atlas data.

MATERIALS AND METHODS

Data

To carry out the temporal analysis of wine consumption in the key countries we used data made available by the World Health Organization (WHO) and the International Organization of Vine and Wine (OIV). For the period 1963-1996[c], we used data published by the WHO, which published *per capita* wine consumption (expressed in liters of pure alcohol) for the population over 15 years of age. For subsequent years, from 1997 to 2009, we used the OIV data, which reports annual *per capita* wine consumption in liters of wine. In order to standardize OIV data, liters of wine were converted into liters of pure alcohol, considering an average alcohol content of 12%, as suggested by the WHO methodology. Subsequently, the obtained values, referring to the entire population, were recalculated considering only the population over 15 years of age, using demographic data supplied by the World Population Prospects from the Department of Economic and Social Affairs of the United States of America. Thus, the constructed panel data included wine consumption information for 27 countries for the period 1963-2009, accounting for 1269 observations.

Methodology

Models of statistical analysis of convergence were used for the first time for the empirical verification of the existence of endogenous or exogenous growth models. In the 1980s, some economists argued that the assumption of decreasing profitability of capital leads the neoclassical model to predict convergence between countries. In contrast, the constant returns of capital in endogenous growth models lead to predict the absence of convergence (32). To study these convergence theories, economists initially started analyzing *per capita* GDP and this methodology was subsequently adopted by Barro & Sala-i-Martin (6) who showed the importance of two different types of convergence, β and σ. The β-convergence is based on the neoclassical model of development, with two implicit cases: the first is that capital returns are decreasing, while the second is that the economies of the countries considered only differ by the diverse level of initial capital. There may be a convergence of type β when countries with a GDP below the average have a higher growth rate than the richer countries.

The σ convergence gained importance with the work of Quah (28), and is defined as follows: a group of countries shows σ convergence if the volatility of GDP *per capita* tends to decrease over time. The term σ stems from the fact that its original proposal was measured by the standard deviation of the logarithm of *per capita* income between countries. If σ_t is the error of y_{it} between countries at time *t*, it will have that:

$$\sigma_t < \sigma_{t-n} \qquad [1]$$

As reported by Quah (28) and Young *et al*. (35) proving β convergence existence is not a sufficient condition for σ convergence existence that, instead, takes explicitly into account the income distribution inequality between countries. These methodologies

c Due to missing information for the years 1961-1962 they were excluded from the analysis. The year 1963 marks the beginning for the statistical analysis.

have rapidly become a standard tool for the study of convergence for different macro sizes, in particular in development economics and price analysis (12, 29, 35). Applying the methodology to wine consumption, there is a convergence of β type when it is verified that countries with a lower than average wine consumption experience higher growth rates than others. From an empirical point of view, given the logarithm of *per capita* consumption of wine y_{it}, in the country i at time t, the measure of convergence β is calculated by the following expression:

$$y_{it} = \alpha + (1 - \beta)\, y_{it-n} + \varepsilon_{it} \qquad [2]$$

Where t-n is the first period of the panel, and the size $(1 - \beta)$ can be estimated by the method of ordinary least squares. Analytically, the parameter β measures the speed of convergence, where a value close to 1 indicates (absolute) convergence, while a value that is not significantly different from zero leads to the conclusion of absence of convergence. If β takes a unit value a "systematic overtaking" phenomenon would occur, or rather, countries with the lower than average *per capita* consumption would face a rapid increase in consumption until surpassing those countries which previously had a higher than average consumption, only to reduce their consumption in a later period. On the other hand, if β is positive but less than one, the speed of convergence will be much slower as many of the countries would be similar in terms of consumption. In such a situation, the study of convergence of σ type becomes important.

There is a vast research on the topic of convergence in the consumption of alcoholic beverages with the application of β and σ convergence; Bentzen *et al.* (7) used the hypothesis of β convergence to provide evidence for the convergence of total European demand for alcohol. Through the use of time series data over a 30 year period there was empirical evidence in favor of the β-convergence hypothesis, even though the hypothesis was not fully supported when the analysis was done separately for different periods within that time series. According to Bentzen *et al.* (8), this ambiguity can be due to a weakness of the β convergence model, in which only the first and last value of the dataset are taken into account when carrying. Consequently the results obtained may be sensitive to specific values of these observations. For this reason, in this study, to analyze the convergence of *per capita* consumption of wine we have chosen to follow the recommendations of Bentzen *et al.* (8), where the estimation is repeated in succession for all years of the series, in order to obtain a series of β.

RESULTS

Evolution of wine consumption

A preliminary analysis of the panel data revealed the following: for most of the countries there were considerable changes in the quantity of wine consumed within the considered period. Figures 1a and 1b (page 223) depict changes in wine consumption. There is a clear distinction between those countries which in 1963 had a *per capita* wine consumption higher than 15 liters per year (medium-high consumption) and those which had a lower consumption value (low consumption).

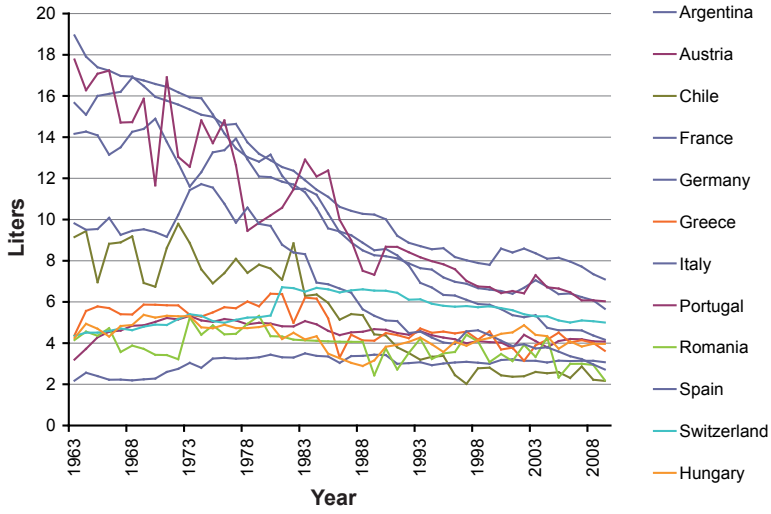

Figure 1a. Evolution of wine consumption in medium and high consumption countries (liters of wine per person/year, for persons over 15 years of age). 1963-2009. Source: WHO, OIV.

Figura 1a. Evolución del consumo de vino per capita en países con consumo medio y elevado (litros de vino por persona, mayor de 15 años por año). 1963-2009. Fuente: WHO, OIV.

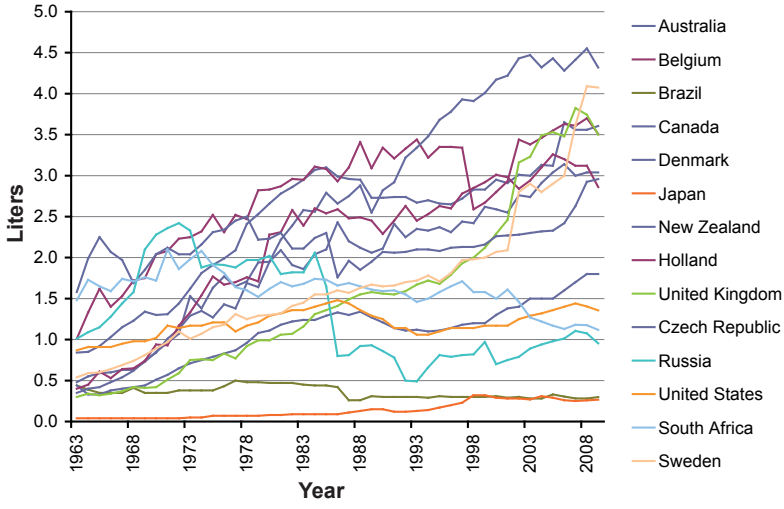

Figure 1b. Evolution of wine consumption in low consumption countries (liters of wine per person/year, for persons over 15 years of age). 1963-2009. Source: WHO, OIV.

Figura 1b. Evolución del consumo de vino *per capita* en países con bajo consumo (litros de vino por persona, mayor de 15 años por año). 1963-2009. Fuente: WHO, OIV.

The figures reveal a clear difference in wine consumption between the two groups. Wine consumption decreased in countries initially categorized as medium to high wine consumers and increased in countries initially showing low wine consumption levels. These relationships were further analyzed by calculating the percentage change in *per capita* wine consumption experienced between the first and the last year considered. The results are shown in table 1, where average wine consumption declined by 29.5%. The overall figure does not explain, however, the large differences among various countries. The countries characterized by a wine consumption higher than 40 liters *per capita*, saw a decrease in their consumption by more than a half, with a decrease ranging from 63% in France to 76% in Chile. Whereas ten of the eleven countries which in 1963 had a wine consumption of less than 8 liters, have experienced a rapid increase in consumption, on average a sixfold increase. For instance, United Kingdom and Japan showed a growth rate of 1067% and 567%, respectively.

Table 1. Wine consumption (liters per person over 15 years of per year) and percent variation in selected markets from 1963 to 2009.

Tabla 1. Consumo de vino (litros por persona mayor de 15 años) y variación porcentual en los mercados seleccionados desde 1963 hasta 2009.

Country	1963	2009	Var. %
France	157.83	59.17	-63
Portugal	148.08	50.25	-66
Italy	130.50	47.25	-64
Switzerland	36.25	41.67	15
Denmark	4.00	36.00	800
Argentina	118.00	34.75	-71
Sweden	4.50	33.92	655
Austria	26.67	33.92	27
Hungary	35.42	33.00	-7
Greece	36.50	30.25	-17
Australia	7.00	30.08	329
Belgium	8.42	29.25	247
UK	2.50	29.17	1067
Germany	18.17	25.58	41
N. Zealand	2.92	25.33	769
Czech Republic	13.17	24.67	87
Holland	3.33	23.83	615
Uruguay	40.92	23.67	-42
Spain	81.75	22.67	-72
Romania	34.58	18.42	-47
Chile	76.25	18.08	-76
Canada	3.67	15.00	309
U. S.	7.25	11.33	56
South Africa	12.33	9.33	-24
Russia	4.00	7.92	98
Brazil	3.67	2.50	-32
Japan	0.33	2.25	567
Average	37.83	26.67	-29.5
St. Dev.	5.77	1.66	-71.2

Source: WHO (1963-1996), OIV (1996-2010).
Fuente: WHO (1963-1966), OIV (1996-2010).

The results in table 1 (page 224) reveal a much smaller standard deviation in 2009 compared to the 1963 one, clearly indicating dynamics of consumption convergence, as each individual country is consuming closer to the global average level.

An analysis of consumption convergence based exclusively on volume is likely to oversimplify the situation, as the level of quality of commercial wines has also changed during this period, as found in our analysis of wine value changes. Table 2 shows a comparison of the expenditure for wine purchase in 1997 and 2011 at constant prices. In Western Europe, where consumption is decreasing, there is a slight increase in purchase value. It is interesting to note that Middle-East and Africa have seen the 3rd highest increase in terms of percent change in total value, which leads us to the assumption that these cultures are opening up to wine.

Table 2. Expenditure for wine consumption per geographical area (in millions of dollars reported in constant price).
Tabla 2. Gasto en consumo de vino por área geográfica (en millones de dólares a precio constante).

	1997	2011	Δ '97-'11 Val.	Δ '97-'11 Vol.	Δ Impl. Price
Asia Pacific	20,168	26,521	31.5%	93.9%	-32.2%
Australasia	3,535	3,759	6.3%	39.9%	-24.0%
Eastern Europe	9,069	10,763	18.7%	24.8%	-4.9%
Latin America	4,722	7,430	57.3%	-6.1%	67.5%
Middle East and Africa	2,144	3,077	43.5%	31.8%	8.9%
North America	11,285	16,909	49.8%	48.7%	0.8%
Western Europe	53,161	53,628	0.9%	-4.8%	6.0%
World	104,083	122,086	17.3%	17.1%	0.2%

Source: Euromonitor, 2012.
Fuente: Euromonitor, 2012.

The value and the volume data were used to quantify the change in the implicit price during the same period. Although worldwide there have not been substantial changes in the unitary price, Eastern Europe, Asia and Oceania have shown a decline, while in the remaining continents it is growing, particularly in Latin America (figure 2, page 226).

Figure 2 also shows that there are different unitary price evolutions in the macro areas, all leading towards Western European price. Interestingly, in Asian and Oceanian countries, where wine has been an elite product for years, wine culture is growing and reaching a growing share of the population. This suggests that wine is moving from being considered a niche product to a widely consumed product. Price is consequently decreasing and distribution channels are changing. In contrast, in Latin American countries, where strong historical colonial ties with Spain and Portugal have influenced public preference towards wine in the past, the opposite trend is verified. Wine is no longer associated with daily nutrition and caloric intake but it is gradually turning into an elite product, basically explained by the progress in wine production and quality in Argentina and Chile, and to a minor degree in Brazil.

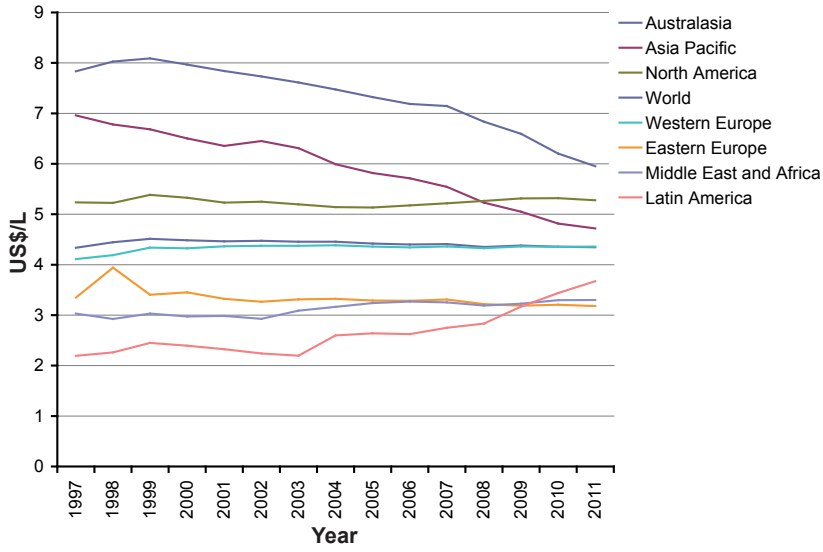

Figure 2. Evolution of the unitary price by macro-area, 1997-2011. Source: Euromonitor, 2012.
Figura 2. Evolución del precio unitario por macro-área, 1997-2011. Fuente: Euromonitor, 2012.

Accordingly, we are able to complete the aforementioned notion of consumption convergence based on volume with the idea of a contemporary convergence on value (quality). These first descriptive analyses lay the foreground for the development of a model that can take accurate measure of these phenomena.

Convergence estimates

The estimation of σ and β parameters were obtained through the methodology described in the Methodolody section (table 3, page 227): in order to reduce the sensitivity of *β* determination in the initial model an average of the first three years (1963-1965) was used. The estimated values of β confirm the hypothesis of convergence, while the standard deviation σ decreases over time.

According to Carree & Klomp (14) and Carree *et al*. (15), the convergence hypothesis σ can also be tested to a given level of significance. The test is based on the estimate of both β and σ to calculate the T_3-statistic using the following formula:

$$T_3 = \frac{\sqrt{N}(\hat{\sigma}_{t-n}/\hat{\sigma}_t - 1)}{2\sqrt{1-(1-\hat{\beta})^2}} \qquad [3]$$

where N is the number of countries. The statistic test has a normal distribution under a null hypothesis of no convergence. The results of applying this test procedure are shown in table 3 (page 227).

Table 3. Convergence Test β and σ.
Tabla 3. Test de convergencia β y σ.

Parameters	Estimate
β	0.676 (s.d. 0.319)
σ_t	0.667
σ_{t-n}	0.345
T_3-test statistic	**6.561**

The value of β found for the last year was 0.676, which implies a global convergence in the consumption of wine. In addition, the statistical T_3 obtained is very high and rejects the null hypothesis at a confidence level of 99%. Thus there is empirical evidence for the presence of convergence of type σ. The values of β obtained for each year through the set of rolling regression are shown in table 4.

Table 4. Results of the rolling regression.
Tabla 4. Resultado rolling regression.

Year	β	95% conf interval		Year	β	95% conf interval	
1980	0.316	0.209	0.424	1995	0.501	0.360	0.643
1981	0.330	0.219	0.442	1996	0.534	0.387	0.680
1982	0.340	0.230	0.450	1997	0.560	0.408	0.713
1983	0.346	0.233	0.458	1998	0.582	0.438	0.726
1984	0.370	0.252	0.488	1999	0.590	0.447	0.733
1985	0.391	0.268	0.513	2000	0.601	0.446	0.755
1986	0.415	0.278	0.552	2001	0.608	0.451	0.765
1987	0.415	0.273	0.557	2002	0.618	0.460	0.777
1988	0.446	0.304	0.587	2003	0.612	0.453	0.772
1989	0.468	0.335	0.600	2004	0.630	0.472	0.788
1990	0.446	0.312	0.581	2005	0.653	0.490	0.815
1991	0.448	0.302	0.594	2006	0.639	0.478	0.799
1992	0.462	0.306	0.617	2007	0.647	0.485	0.808
1993	0.470	0.313	0.628	2008	0.665	0.498	0.832
1994	0.487	0.336	0.638	2009	0.676	0.510	0.843

Extending the end point of the regression from 1980 to 2009, it can be seen that β estimation increases steadily over the years, giving further support to the hypothesis of the convergence as proposed (figure 3, page 228).

A necessary condition for the existence of convergence of type σ is the existence of convergence of type β. However, at the same time the convergence of β type is not a sufficient condition to assert the presence of convergence of type σ. Situations of high β convergence may imply the possibility that countries with a low level of consumption may exceed the countries with a high level of consumption thanks to a very high growth rate.

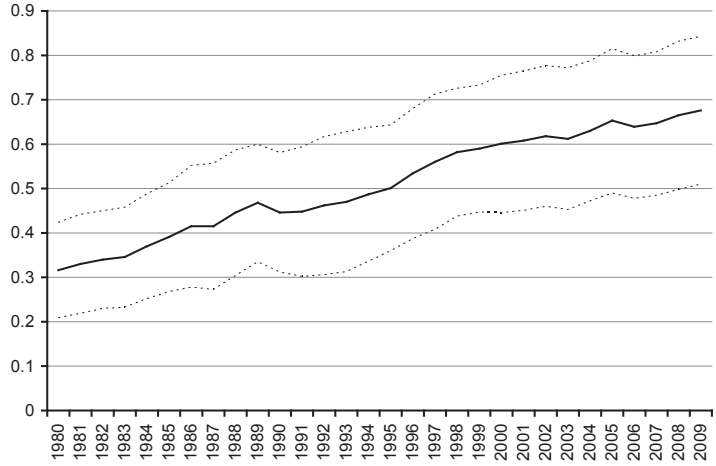

Figure 3. Evolution of the β type convergence rate with a 95% confidence interval. Source: our elaboration from WHO and OIV data.

Figura 3. Evolución de la convergencia de tipo β con un intervalo de confianza del 95%. Fuente: elaboración propia con datos WHO y OIV.

In this case, the dispersion measured by σ may remain unchanged or even increase. What is described is a known problem in the literature, criticized among others by Bernard & Durlauf (9, 10), Greasley & Oxley (22), Harris & Trainor (23). This does not seem to be the case in our study as there is a continuous decrease in the standard deviation between the different countries during the evolution of σ convergence (figure 4). The approach therefore is consistent and appears to appropriately demonstrate the hypothesis of convergence in our study.

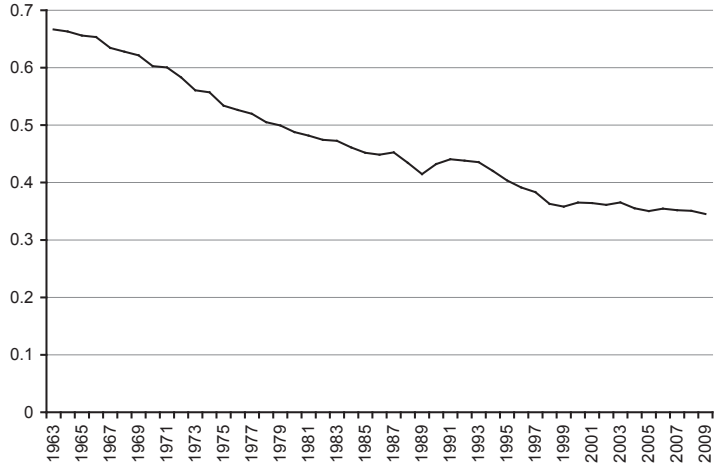

Figure 4. Evolution of σ convergente. Source: our elaboration from data WHO and OIV.

Figura 4. Evolución de la convergencia de tipo σ. Fuente: elaboración propia con datos WHO y OIV.

DISCUSSION AND CONCLUSIONS

In the present work we have used the empirical approach of the convergence analysis suggested by Sala-i-Martin (29) and applied it to the world consumption of wine. The null hypothesis subject to empirical verification was the absence of a general trend in which the *per capita* consumption of wine converges towards the same level (in terms of liters) in all countries, despite the social, political and fiscal differences among the countries.

Empirical results confirm the convergence of type σ and type β. These findings provide further support to the theory of international consumption convergence of wine on a volume basis, as already observed by other authors in the European market (31). Moreover, these results show the theory is also verified for other wine markets. In the period 1963-2009 *per capita* consumption firstly shows a reduction in quantity differences among countries and then converges toward a central value. These results could be integrated with Gennari (21) and Aizenman & Brooks's (1) work showing that a convergence process was taking place in the consumption of many different alcoholic beverages (beer and wine for example).

One possible explanation for convergence in these cases is that this phenomenon reflects consumers' changing tastes towards a generalized structure of consumption, possibly due to the emergence of new consumers (new classes and in many countries, women), with different preferences than those already in the market (34). Even the changes in sales prices and income differences between countries may have helped change the evolution of the observed structure. Aizenman & Brooks (1) suggest that this could be the result of a larger phenomenon, connected to both an increase in migration and tourist flows and to a cultural revolution that, via globalization, is generating a new cultural collective identity. All of these arguments are widely debated in anthropological literature but are often neglected in economics (17).

This research suggests that the phenomenon of convergence is also true at a qualitative level, evident through the trend towards a single average unitary price in the various macro-areas. This may be due to an evolution of wine markets, and in particular to the distribution channels through which this good is sold. In emerging markets, such as Russia, Southeast Asia and Oceania, wine is changing from being a niche product sold at high prices to a *Fast Moving Consumer Good* (FMCG), and is today also sold in supermarkets at much lower prices (16). Conversely, in areas where wine has been part of culture for centuries, and particularly in Latin America, the consumption patterns is changing from daily consumption to occasional one. In this case purchases are mainly concentrated in the on-trade channel[d], where more products of high and medium-high class are sold and thus have a higher added value.

d On trade sales are defined as sales to foodservice establishments. This includes full-service restaurants, cafés/bars, wine shops, fast food outlets, self-service cafeterias, kiosks. Off trade sales are defined as sales through establishments primarily engaged in the sale of goods for home use, preparation and/or consumption. This includes grocery retailers, supermarkets/hypermarkets, discounters, convenience stores, independent small grocers, forecourt retailers, food/drink/tobacco specialists, outdoor markets and non-store retailing such as vending, homeshopping, internet retailing and direct selling.

It should also be noted that in this study only the main wine-consuming countries were taken into consideration, while the rise of consumption in new wine emerging markets, such as China, Hong Kong and Singapore, suggest there will be an increasing convergence phenomenon over the next several years.

In this paper, wine has been treated as a homogeneous good, while acknowledging that there are several wine categories. Even if the analysis of the overall wine category indicates the presence of convergence, it would be reasonable to imagine different dynamics within each wine category as is the case for red wines in Asia, for example. According to Euromonitor (2012) in Asia red wines account for more than 70% of the market and still enjoy a higher growth rate than white and rosé wines. Whereas, in the Western European market red wines account for slightly more than 50% of the market and continue to decline. Another example is the rosé wines market, which are almost absent in Oceania and heavily consumed and with high growth rates in Europe, Africa and Middle East. Thus, further research could investigate the consumption dynamics of specific wine categories in different geographical areas.

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