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Trade competitiveness in table grapes: a global view

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Abstract

International trade in table grapes has expanded tremendously over the last few decades, with out-of season fresh produce now being traded and consumed globally. Trade intensification has been driven by emerging traders that have changed the economic geography of table grapes. Improving competitiveness in global markets is a main goal for entrepreneurs and policymakers. However, whilst the global trade in table grapes has become very important, empirical papers on the topic are limited. In this study, we empirically investigate the global dynamics in trade of table grapes between 1961 and 2011 and characterize the time series properties of the market shares for the leading table grape exporting countries. Our analysis shows how trends in market shares of historical exporters and emerging countries have differed over the last few decades. Our comparative analysis provides useful insights to forecast the prospects for the international fresh food trade.

Keywords: Export; Import; Fruit; Market share; Trends; Convergence

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Trade competitiveness in table grapes: a global view

Introduction

Worldwide production of table grapes is in excess of 21 million tons and shows a growing trend over the last decade. The countries involved in production exceed 50, with China producing 12% of global production, followed by Italy (9.1%), the USA (8.7%), France (7.6%), Spain (7.4%), Turkey (5.5%), and Chile (4%) (FAO, 2012). In recent years, these countries have been affected by different dynamics: particularly, among the leading countries China and Turkey have shown an increasing trend, Iran, Italy and others have shown stability or, in some cases, a decrease in production; moreover, it is important to highlight that Peru, while not being part of the main producing countries, is experiencing an upward trend with a strong export orientation.

Traditionally, fruit and vegetable (F&V) consumption is associated with rising incomes, urbanization and increases in levels of information and education (Regmi and Dyck, 2001). In addition, research suggests that besides income and price, other demographic variables also determine the rate and composition of changes in food consumption (Regmi and Dyck, 2001; Gracia and Albisu, 2001; Cranfield et al. 2012). Table grapes is now a seasonally adjusted product with all the major consuming countries accustomed to the availability of grapes in each season contributing to the growth of world exports. Currently, Chile has the leading market share of exports with >20%, followed by the USA and Italy (12%), the Netherlands (7.5%), South Africa (6.7%), Turkey (5.7%) and China (5.4%) (OIV, 2011).

In recent decades market shares have largely evolved, gained and been lost by exporters with great swiftness. There has been an increase in the share of exports from both a group of countries which, whilst being traditionally among the main producers, were exclusively oriented to the domestic market, such as China, Turkey and India, and a group of countries which are not yet included among the top ten producers such as Mexico and Peru. In other words, nowadays the main global exporters are not only many of the traditional producers, but also those where the production of table grapes has developed more recently. As a result new players have emerged and overturned the economic geography of grapes trade leading to an increase in competitiveness on the international market. The tremendous gain in market share observed for such countries in recent decades requires investigation as it is a clear signal of successful competition in global markets. An increasing volume of research has been dedicated to an analysis of trade competitiveness (Galanopoulos et al., 2009; Contini et al., 2012), evolution of demand (Rana, 2011; Knutson et al., 2014), trade determinants (Seccia et al., 2009), tariff barriers (Cioffi et al., 2011; Santeramo and Cioffi, 2012), and non-tariff measures

(Tudela-Marco et al., 2014; Dal Bianco et al., 2015) of F&V at country-level; however there are no known studies that have studied in depth the trade competitiveness for table grapes at a global level. Our paper aims to address this gap by conducting a careful examination of dynamics in market shares in order to provide insights in the global trade dynamics of table grapes. Data on global trade from 1960 to 2011 were collected from FAOSTAT website. A series of market shares have been computed and analyzed using statistical techniques, in particular the trend and cyclical components of time series have been characterized. The results provide a useful insight to assess the current geography of global trade of table grapes.

Global grape trade

International trade in table grapes has expanded since the 1980s as a consequence of notable changes in factors related to consumer preferences, technological innovations in production, storage and transportation, trade agreements and institutional characteristics. These factors have played a major role in enhancing access to markets, relaxing constraints due to climate conditions, places of production and harvest season, leading to a global market. Given their rapid rate of urbanization and income growth, middle-income countries have become relevant markets for grapes. Changing consumer preferences are also evident in the year-round consumer demand for fresh fruit and vegetables which matches year-round availability, with consumers willing to pay more for imported out-of-season fresh products.

Technological developments have also made international transactions easier, increasing the profitability for shippers exporting table grapes and making produce available to consumers globally, at affordable prices. Innovations in new varieties and in trellis systems have allowed growers in the northern hemisphere to expand their production season and innovations in post-harvest and transportation techniques have helped reduce delivery time, and thus to maintain product quality and to cut shipping costs. Communication and information technology, such as electronic technologies, have enabled shippers to track their cargos around the world to monitor quality, reduce risks of liability claims and cut delivery time. Technology has advantaged the seasonal differences expanding exports. In addition to the counterseasonal imports (i.e. importing during the months in which production is zero), in the northern hemisphere the southernmost countries can produce grapes earlier in spring or later in autumn than countries further north. Imports of off-season grapes in the northern hemisphere grew very quickly in the 1980s, as some southern hemisphere countries enhanced their production and then kept growing through the 1990s.

Regional trade agreements, such as North American Free Trade Agreement (NAFTA) and European Union free trade area (EU), bilateral and multilateral agreements, harmonization of sanitary and phytosanitary regulations, and dispute settlements under the World Trade Organization (WTO), have

also significantly influenced trade patterns. Reduction of constraints and decrease of transaction costs allow firms to design strategies for sourcing at a global level. Data in Table 2 shows that the international market of grapes is currently less concentrated than five decades ago: the first four exporters account for 53% compared to almost 70% in the first period; moreover, only Italy, USA, Spain and South Africa ranked in the first ten positions in both periods while many new competitors have gained market shares.

Chile is the world's leading exporter accounting for more than 21% of the export market share in 2009-2011 (Table 2). The main destinations are North American countries (USA, Canada and Mexico), Europe (mainly the Netherlands and United Kingdom) Asia (Hong Kong and Japan) and other South American countries. Chilean and North American grape harvest schedules are complementary, so that consumers in the NAFTA region are provided with winter imports of grapes from Chile (Plattner and Perez, 2013).

The United States, which follows Chile with a world export share of 12% in 2009-2011 (Table 2) exports grapes mainly to Canada, Mexico and East Asian countries during summer and autumn, while import nearly 90% of fresh grapes from Chile in winter and spring, when also a small amount is imported from Mexico, helping to extend supply on a year-round basis. US grape imports were very low and fairly constant during the 1950s, 1960s, and much of the 1970s; since the early 1980s they have risen steadily, boosted by imports from Chile which increased almost eightfold in value between 1980-1994 (Alston et al., 1997). Currently, table grapes are considered a staple in US food retailers and its year-round availability has accounted for its increase in consumer demand.

The European Union plays an important role both in table grape production, with Italy, Spain and Greece accounting for 93%, and in trade with Italy, the Netherlands and Spain as main exporters (Table 2). The Netherlands, fourth in the world with 7.6% market share, is also the largest European importing country serving mainly as a trans-shipping point of grapes year-round from both hemispheres not being a producer. The EU-28 is a net importer of fresh table grapes, with South Africa and Chile the leading suppliers (almost 168000 tons and 123000 tons, respectively in 2013) followed by Egypt (53,193 tons), India (51,272 tons), Peru (40,464 tons), Brazil (38,548 tons), Turkey (23,007 tons) (USDA, 2013). After a dramatic fall in the last decade, the European cultivated area continues to decrease because of reduced profitability, due to increasing production costs and emerging competition from suppliers located in extra-EU countries.

Italy is the main European producer and exporter and ranks third in world's export share (12% in 2009-2011) following Chile and the US (Table 2). Production is supplied from May to December and mainly exported to Germany, France, Poland, Russia, Switzerland and the UK, where Italian grapes compete with the production from US. During winter and spring Italy imports from Spain, the Netherlands, Egypt and Chile. Spain is the second European producer country for exports, shipping

over 85% of its exports within the EU: United Kingdom, Germany, Portugal, France and the Netherlands. The main suppliers of the Spanish market are Italy, Chile, France, South Africa and Peru. Greece, as the third European producer-exporter, has a harvest schedule from late July to the end of September providing continental markets: Germany, United Kingdom, the Netherlands and Eastern European countries such as Poland, Macedonia, Bulgaria and Romania (USDA, 2013).

South Africa is the second export country of the southern hemisphere and fifth in the world (market share 6,7%) (Table 2). The leading export destination is the Netherlands, contributing over half (63%) of fresh grape exports towards the EU in 2011, followed by the UK, Germany and Portugal.

China is the largest producer of table grapes globally (12% market share) and the highest consumer (3.8 million tons per annum) (Huang and Gale, 2006). In 2011 its grape production for table consumption was 6.5 million tons, increased by 3.5 times compared to output of 2000 (OIV, 2011). WTO membership in 2001 and the return of Hong Kong, which is the main hub for import-export, have contributed to increase the international trade. The US are the main supplier of fresh grapes while Chile is increasing its market share in winter. Exports of China are increasing very fast with main destinations Asian countries, particularly in South and Southeast Asia.

Methodology

This research aims to highlight the structural characteristics of the time series of the market shares of the leading grapes exporter countries. A set of countries were selected according to the ranking of exporters at the beginning and end of the available time series data. In order to reduce the bias induced by extraordinary low or high market shares for 1961 and 2011 the market shares have been averaged for three years. The selected countries are given in Table 2. In particular all current major exporters and the main exporters in the 1960s have been considered. The analysis has been conducted on time series of market shares (MS) as defined by the following formula:

$$MS_{it} = \frac{exp_{it}}{exp_{wt} - IMP_{it}} \quad (1)$$

Where the numerator is the export at time t of the i -th country, the denominator is the difference between the world export and the import for the i -th country. By using the above specification we avoid possible distortions due to differences in the balance of trade specialization. Put differently, the naïve approach of using the share of exports would have led to biased conclusions depending on the net-exporter or net-importer nature of the country under consideration.

As well known, economic processes are generally related to several factors (e.g. demographic, social, etc.) that contribute to the overall trend of the phenomenon. A strong interest is therefore devoted to the study of historical processes in order to highlight their salient features, and to produce credible forecasts (Tsay, 2005). Time series can be decomposed into three or four components, depending on

the frequency of the data, respectively annual or seasonal. Those components are trend, cycle, seasonality and the stochastic component or accidental component (Chatfield, 2013). Assessing the stationarity of time series is the first step to characterize the phenomenon. In our specific case the market shares series are bounded between zero and one by definition, thus they have to have a mean-reverting process. Thus, we may neglect stationarity tests and focus on the other components. Trends are easy detected: by regressing market shares on a time trend we are able to estimate the trend component. As for the cyclical component, it should be noted that it is rather difficult to hypothesize a strong component, thus it would be inappropriate to model these components by using the trigonometric functions of sine and cosine. A better approach would be to verify the presence of cyclicity by assessing the statistical significance of the second lag order of the detrended series (Tsay, 2005). In fact, in differenced stochastic equations the cyclical component can be observed only if complex roots exist: by their nature, complex roots exist only for autoregressive processes of second or higher order. A similar analysis has been conducted by Labys and Cohen (2006) on wine market.

The macro-evolution of market shares (MS) of the main exporters can be characterized through the following equations:

$$MS_{it} = (\alpha_0)T^{\alpha_1} \quad (2)$$

$$MS_{it} - (\widehat{\alpha_0})T^{\widehat{\alpha_1}} \equiv \hat{\varepsilon}_t = \gamma_0\hat{\varepsilon}_{t-1}^{\gamma_1}\hat{\varepsilon}_{t-2}^{\gamma_2} \quad (3)$$

Where the coefficients α_1 and γ_2 refer, respectively, to the time trend and to the cyclical component. After linearization, the equations are estimated stepwise. The post estimation analysis allows us to assess if market shares present trends and/or cyclical components.

Finally, we assessed if market shares are converging over time. Analyses of convergence are becoming very popular (Galanopoulos et al., 2011; Bruno et al., 2012). According to recent literature, (Quah, 1993 and 1999) we can distinguish between two different types of convergence: beta-convergence and sigma-convergence. The former considers the convergence in growth: growth rates are such that the stock variables tend to convergence over the time; the latter deals with sample variability: stock variables should tend to be more and more evenly distributed over time. The parallelism with macroeconomics is strong. The interested reader may refer to Barro and Sala-i-Martin (1992) for further insights. The empirical investigation of beta and sigma convergence is straightforward. The former is tested by estimating the following model:

$$MS_{it} = \beta_0 MS_{i0}^{(1-\beta_1)} \quad (4)$$

Where β_1 measures the speed of convergence, and is expected to be close to the unity for converging phenomenon. For instance, if we estimate the following regression: $MS_{i2000} = \widehat{\beta_0} MS_{i1950}^{(1-\widehat{\beta_1})} + \varepsilon_t$, the higher the value of β_1 the higher the support for convergence in market shares. A drawback of this approach is that equation (4) relies on two data points. A generalization, proposed by Bentzen et al.

(2001) would consist in estimating recursively equation (4) by using different end-points. In this specification, β_1 should be higher for close-to-the-end subsamples. Put differently, if market shares are beta-converging over time, β_1 has to be higher when MS_{i1990} is regressed on MS_{i2000} rather than when MS_{i1950} is regressed on MS_{i2000} . Finally, the sigma-convergence implies that the following condition is satisfied: $\sigma_t \leq \sigma_0$. Put differently, sigma-convergence implies that the variability is lower for more recent observations. When the above condition holds with strict inequality we may refer to strict sigma-convergence. However it should be remembered that standard deviations are not scale-invariant, therefore we have considered the following condition:

$$CV_t \leq CV_0 \quad (5)$$

Where CV represents the coefficient of variation.

Results

The results are reported in Tables 3 to 5 and in Figure 1. Table 3 shows the trends of market shares in selected periods. Trends appear to be very different across countries and periods. For the period 1960-1980 the coefficients on time trends are positive and statistically significant for a vast majority of countries (Argentina, Brazil, Chile, Greece, India, Italy, Mexico, Netherlands, Peru), negative and statistically significant for few countries (Algeria, Australia, Bulgaria, Hungary and South Africa), and statistically not significant for the rest of exporters (e.g. China). In the second time series (1981-1994) the dynamic is even more evident: 12 of 23 countries show a positive trend. Finally, during the last two decades (1995-2011) ten countries have expanded their market shares, and in particular the Netherlands, Turkey, and China an average rise in market share of $>2\%$ per annum.

Table 4 shows the trends and cyclical components of market shares for five decades (1960-2011). First, it should be noted that a vast majority of countries (14 of 23) have increased their market share, while Afghanistan, Algeria, Bulgaria, Hungary, France, Italy, Romania, and Spain have lost market share. It is also worth noting that Chile has shown a sharp increase in global share, while Bulgaria has lost, on average, more than 3% each year. Note that a coefficient 0.61 indicates that, on average, the market share has increased by 6% every year. The analysis of cyclical components shows that only a few exporters, namely Bulgaria, Egypt, Hungary, Italy, Mexico, Peru, Romania, and South Africa, have markets shares that show a cyclical behavior, while the main tendency is that market shares do not fluctuate, indeed are quite stable over time.

The results on the analysis of convergence are shown in Table 6 and Figure 1. The coefficients β_1 estimated through specification (4) are statistically significant (exception made only for the first period, 1961). We found strong evidence for beta-convergence in that the coefficients β_1 are larger in value for closer-to-the-end observations. However, as pointed by Young et al. (2008) beta-

convergence is a necessary but not sufficient condition for sigma-convergence in that the former considers growth rates, the latter deals with the equality of the distribution. The analysis of standard deviations and estimates of the coefficient of variations show that market shares are sigma-converging during the last decades.

Discussion

An important first point is the dramatic loss of market share for European countries which were the main players at the beginning of the reference period. Italy, which accounted for almost a quarter of the world market during the 1960s, after having expanded its market share before the 1980s, has lost its advantage showing a sharp decline during the next 30 years with current market share now halved. Other former important European exporters as Spain, France and Greece have also lost position during the period. The reduced competitiveness of the European countries, which are important grape producers too, has been sharpened during the second and the third considered periods. It is important to notice that starting from the mid 80s, these countries, as members of the EU, have undergone a progressive process of reduction of protectionist measures for agricultural products and of opening to extra EU products. Moreover, the process of trade liberalization in the frame of the World Trade Organization (WTO) after 1994 has allowed the increasing competition by countries characterized by lower production costs and by more efficient supply chains, leading to the decrease of the revenues of the European vine-growers and to a loss of competitiveness.

The same above reported motivations have fostered the growing role in grapes world market for another EU country: the Netherlands. In fact, this country, with an insignificant domestic production, currently ranks as the fourth exporter with 7.6% as market share and is, at the same time, the largest importer in the EU. During the last 30 years the Netherlands has gained high specialization in serving as trans-shipping country for many agricultural commodities taking advantage of the increasing process of trade liberalization. Several large trade companies import and re-export grapes through the hub of Rotterdam, supplying retail chains in order to offer year-round availability. During the spring-summer period in the northern hemisphere, grapes are supplied from Mediterranean producing countries (Italy, Spain, Greece, Egypt, Turkey, Morocco) while during the off-season (October - May) most product is imported from South Africa (32%) and Chile (20%) followed by India (7.4%) and Brazil (5.4%); the main markets are European countries and the Russian Federation (CBI, 2011).

The 2009-2011 rank in Table 2 and dynamics shown in Table 3 highlight that some extra European countries have taken advantage from the loss of competitiveness (with the exception of The Netherlands). It is evident the performance of Chile whose export market share has shifted from 1% at the beginning of the considered period to more than 21% currently, ranking first. It means that more than one fifth of table grapes exported in the world comes from Chile. The positive trend is evident in

the first two periods, while in the third period (1995-2011), Chile has slightly lost competitiveness as new players have gained market shares. The growth of Chilean grapes exports is the result of many combined factors both at national and international level: the agrarian reform during the 1960s and 1970s, the undervalued currency between 1975 and 1980, government tax incentives, a strongly market-oriented regulatory system in 1980s, the return to democracy in 1990, the membership in WTO in 1995 and the signature of trade agreements with many countries have resulted in an impressive increase in exports. At the same time, the increasing revenues in more advanced economies, the changes in consumer preferences, the developing of large retail chains and the increasing role of fruit transnational corporations with high logistical specialization and high bargain power, have contributed to make Chile the first exporter. The main export market is North America, particularly the United States, which is also a big world player as producer and exporter (Tables 1 and 2). Table 2 shows that it is the only country with a fairly steady market share (12%) both at the beginning, when it ranked third, and at the end of the period when it ranks second. Looking at Table 3, the USA has expanded its market share in the period 1981-1994 when, after a very gradual growth until 1985, export began to increase much more rapidly. In addition to the goal of expanding exports in existing markets, as Canada, attention was also focused on obtaining access to countries with high trade barriers, particularly in Asia and Latin America. So, while the signing of NAFTA in 1994 has significantly increased the U.S. grape market to Canada and to Mexico, much of the growth in overseas exports is the result of the California Table Grape Commission's export-promotion programs, begun in the late 1970s, which have targeted Asian, in particular Singapore, the Philippines, Hong Kong, Taiwan, Malaysia, Indonesia, Japan, and Europe, particularly the United Kingdom (Alston et al., 1997). It is relevant to highlight for both Chile and the United States the loss of market share in the third period (Table 3), but that is not due to their lower competitiveness but mostly to the appearance, in an increasingly wider market, of new competitors which have been benefited from the above mentioned international changes and specific national new contexts.

Emerging exporters, with positive significant trends in the second and third periods (Table 3) are China, Egypt, India, Mexico and Turkey in the Northern Hemisphere and Argentina, Brazil, Peru and South Africa in the Southern Hemisphere. South Africa could not be considered an "emerging exporter" as it ranked seventh between 1961-1963 (Table 2), shipping grapes overseas on the basis of its privileged trade relationship with European markets, particularly the Netherlands and the UK. Its competitiveness increased in the decade 1980s and the lifting of sanctions in the early 1990s together with a considerable process of liberalisation, sustained by the WTO membership in 1995, promoted trade growth. The country granted access to the US market, particularly after the signing of the Africa Growth and Opportunity Act (AGOA) in 2000, to the EU market with the Trade, Development and Cooperation Agreement (TDCA) signed in 1999 and to other African countries with the free trade area of South African Development Community (SADC) signed in 2001. In order to diversify markets, the

South African Table Grape Industry (SATGI) considered a shift towards Russia, Asian markets and other countries in the Southern African region. Main competitors of Chile and South Africa from the Southern Hemisphere are Argentina, Brazil and Peru which show positive trends in the three periods with increasing competitiveness (Table 3).

In the northern hemisphere China shows an increase in competitiveness over the last two periods (Table 2). The appearance of China on the world trade scene is the result of a process that started with market reforms in the late 1970s, when the country's economic decisions were decentralized, followed by the reduction of the State role in foreign trade during the 1990s. Trade growth rate has increased rapidly since 2001, when the country joined the WTO and two initial meetings were held to discuss the creation of the ASEAN–China Free Trade Area. Over the last decade economic reforms, the market dynamics, the availability of rural labour, favorable agronomic conditions and low costs of production, have contributed to a substantial increase in grape production, making China now the largest grape producer globally. At the same time, China's high per capita income growth led to a sharp rise in domestic demand which absorbs most of the increase in production, which may have also contributed to the sluggish growth of exports. In recent years China has become a leading exporter (Table 2 and 3) the last showing the increased competitiveness between 1995 and 2011. It is important to highlight the substantial developments in shipping, transportation technologies, cold chain facilities and in other logistic issues. Main destinations of grapes are Thailand, Vietnam, Indonesia, Russia and other South-Eastern Asian countries.

Among the main producers, an increasing player for export is Turkey which ranks 6th globally as both a grower and exporter (market share 5.77%). Result for the last period presents the highest increase of market share compared with other countries (Table 3). Priority markets include EU countries particularly Germany and Austria and the Russian Federation.

The emerging exporters in the northern hemisphere are Mexico, India and Egypt (Table 3). Mexico which ranks 8th was characterized by a consolidated trade relationship with the US enforced by the signing of NAFTA. By the late 1990s the Indian grape export has shifted from Gulf countries, as the United Arab Emirates (UAE) to EU countries, particularly the Netherlands, UK and Belgium. Finally, Egypt, takes advantage of a two-month period when in Europe the supply of table grapes is reduced and prices increase, between May and July. The main market is the EU but increasing volumes are now being shipped to Russia while a small amount of product is exported to the Middle East, South Africa and South East Asia (Diab et al., 2009).

Conclusions

Traditionally grown in few countries (Italy, France, USA, Spain and Turkey), table grapes are now cultivated globally. Driven by the need for year round consumption, table grapes are now a product

seasonally adjusted. During the last decades new actors have come to play on the global ground and China is nowadays the main world producer, accounting for almost 12 percent of global production, while Chile is the main exporter accounting for over one fifth of the world exported grapes. The economic geography of grapes and its evolution over the last decades is an interesting topic, yet still under investigated. Our results show that market shares have changed considerably over the last decades and that the dynamics substantially differ along the decades. In particular, European countries, the main players during the 1960s, have considerably reduced their market shares: the decline has been sharpened starting in the late 1980s. On the other hand, the increasing process of trade liberalization has fostered the competitiveness of emerging countries which have made relevant improvements in quality of production, in the supply chain techniques and in shipping and transportation logistics. As a result, the market shares of European producers have been eroded by new competitors, and the US is the only historical producer which has managed to keep the same market share over time. In the Northern Hemisphere new competitors are China, Egypt, India, Mexico and Turkey, while in the Southern Hemisphere, along with the two main competitors Chile and South Africa, emerging players are Argentina, Brazil and Peru.

A few caveats are relevant to this study. First, our dataset include annual data collected over a 50 year period for more than 20 countries. Although we rely on a long time series and account for more than 80% of global trade, our results may not capture intra-seasonal dynamics that may reveal heterogeneous comparative competitiveness in specific periods of the year. Indeed, our findings allow entrepreneurs and policymakers to capture the global dynamics and enjoy an overview of trade flows for grapes. Another drawback is that we have not considered trade flows by destination, thus we cannot inform knowledge of the dynamics of market shares per trade-routes. Our findings would offer additional insights if such information were available.

To the extent that promoting competitiveness in trade is a major target for entrepreneurs and policymakers, empirical work on trade dynamics in agro-food markets represent a promising area of research. The countries located in the Southern Hemisphere show a slight increase of their market shares, generally more pronounced than those observed for the "new" exporters. As for countries in the northern hemisphere, declining trends are observed for European producing countries, while new European countries have shown pronounced annual growth rates acquiring significant market shares on the world stage.

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Table 1 – Main producers – market share (%) for selected time periods

Country	1961-1970	1971-1980	1981-1990	1991-2000	2009-2012
China	0.2	0.2	0.8	3.3	11.8
Italy	19.9	19.1	16.6	15.6	9.1
USA	6.2	6.7	7.9	9.5	8.7
France	18.7	17.6	14.1	12.1	7.6
Spain	8.1	9.0	8.6	8.4	7.4
Turkey	6.4	5.8	5.3	6.0	5.5
Chile	1.6	1.6	1.6	2.5	4.0
Argentina	5.1	5.3	4.6	3.9	3.6
Iran	1.0	1.5	2.3	3.4	2.8
South Africa	1.4	1.5	1.9	2.3	2.3
Australia	1.2	1.2	1.3	1.7	2.2
Brazil	1.0	1.0	1.0	1.4	1.9
Egypt	0.2	0.4	0.7	1.4	1.7
Germany	1.5	1.9	2.2	2.4	1.5
India	0.2	0.2	0.5	1.3	1.4
Uzbekistan	0.0	0.0	0.0	0.0	1.4
Greece	2.8	2.5	2.4	2.1	1.2
Portugal	3.1	2.4	1.9	1.7	1.1
Romania	1.8	2.2	2.2	1.9	1.0
Republic of Moldova	0.0	0.0	0.0	0.0	0.7

Table 2 – Current and past main exporters by market share (%)

Country	1961-1963	2009-2011
Chile	1.00	21.55
USA	11.91	12.07
Italy	23.94	11.96
Netherlands	0.25	7.57
South Africa	3.76	6.76
Turkey	0.77	5.77
China	0.09	5.38
Mexico	0.03	3.85
Spain	10.21	3.38
India	< 0.01	2.80
Peru	< 0.01	2.21
Egypt	0.01	2.18
Uzbekistan	NA	2.06
Greece	2.79	1.91
Brazil	< 0.01	1.53
Argentina	0.70	1.38
Afghanistan	1.61	0.52
France	4.45	0.42
Hungary	3.34	0.04
Bulgaria	22.21	0.03
Romania	5.89	0.01
Algeria	2.13	< 0.01

Source: FAOSTAT

Table 3 – Trend components in selected periods

Country	1960-1980	1981-1994	1995-2011
Afghanistan	0.076	-0.175 ⁺⁺	-0.028
Algeria	-0.114 ⁺⁺	<i>no obs</i>	<i>no obs</i>
Argentina	0.039 ⁺⁺	0.028 ⁺	0.077 ⁺⁺
Australia	-0.006 ⁺⁺	0.042 ⁺	0.002
Brazil	0.001 ⁺	0.030 ⁺⁺	0.121 ⁺⁺
Bulgaria	-0.744 ⁺⁺	-0.450 ⁺⁺	-0.005 ⁺
Chile	0.216 ⁺⁺	1.218 ⁺⁺	-0.152
China	0.005	0.024 ⁺⁺	0.227 ⁺⁺
Egypt	0.001	0.004 ⁺	0.142 ⁺⁺
France	-0.089	-0.129 ⁺⁺	-0.034 ⁺⁺
Greece	0.159 ⁺⁺	-0.289 ⁺⁺	-0.227 ⁺⁺
Hungary	-0.169 ⁺⁺	0.005	-0.002
India	0.001 ⁺⁺	0.058 ⁺⁺	0.157 ⁺⁺
Italy	0.773 ⁺⁺	-0.542 ⁺	-1.016 ⁺⁺
Mexico	0.048 ⁺⁺	0.110 ⁺⁺	0.012
Netherlands	0.008 ⁺⁺	0.230 ⁺⁺	0.295 ⁺⁺
Peru	0.002 ⁺	0.007 ⁺	0.133 ⁺⁺
Romania	-0.048	-0.423 ⁺⁺	0.001
South Africa	-0.050 ⁺	0.129 ⁺⁺	0.114 ⁺
Spain	-0.118	-0.122	-0.076 ⁺⁺
Turkey	-0.010	0.004	0.322 ⁺⁺
USA	-0.039	0.602 ⁺⁺	-0.242 ⁺⁺
Uzbekistan	<i>no obs</i>	<i>no obs</i>	0.151 ⁺⁺

⁺, ⁺⁺ indicates statistical significance at 1% and 5% level.

Table 4 – Trends and cycles in market shares (1960-2011)

	Trend component		Cyclical component	
	α_1	R ²	γ_2	R ²
Afghanistan	-0.088 ⁺⁺	0.45	0.022	0.61
Algeria	-0.024 ⁺⁺	0.29	0.210	0.69
Argentina	0.020 ⁺⁺	0.78	0.262	0.78
Australia	0.030 ⁺⁺	0.67	0.130	0.19
Brazil	0.033 ⁺⁺	0.63	-0.090	0.77
Bulgaria	-0.435 ⁺⁺	0.76	0.394 ⁺⁺	0.26
Chile	0.610 ⁺⁺	0.79	-0.011	0.82
China	0.078 ⁺⁺	0.62	0.309	0.78
Egypt	0.023 ⁺⁺	0.32	0.441 ⁺⁺	0.46
France	-0.095 ⁺⁺	0.68	-0.052	0.01
Greece	-0.008	0.01	0.258	0.67
Hungary	-0.045 ⁺⁺	0.51	0.365 ⁺⁺	0.61
India	0.048 ⁺⁺	0.74	-0.047	0.60
Italy	-0.319 ⁺⁺	0.34	0.367 ⁺⁺	0.68
Mexico	0.112 ⁺⁺	0.85	0.333 ⁺	0.14
Netherlands	0.142 ⁺⁺	0.83	-0.030	0.75
Peru	0.023 ⁺⁺	0.38	-0.611 ⁺⁺	0.88
Romania	-0.159 ⁺⁺	0.81	0.403 ⁺⁺	0.34
South Africa	0.091 ⁺⁺	0.60	0.319 ⁺	0.59
Spain	-0.214 ⁺⁺	0.66	0.094	0.10
Turkey	0.080 ⁺⁺	0.56	0.168	0.78
USA	0.039 ⁺⁺	0.06	0.083	0.44
Uzbekistan	0.050 ⁺⁺	0.47	0.069	0.34

⁺, ⁺⁺ indicates statistical significance at 1% and 5% level.

Table 5 – Beta convergence in market shares (1960-2011).

	Estimate	R ²
β_{1961}	0.194 (1.24)	0.07
β_{1965}	0.109 (0.68)	0.02
β_{1971}	0.242 (1.55)	0.10
β_{1975}	0.258 (1.86)	0.14
β_{1981}	0.301 ⁺ (2.43)	0.22
β_{1985}	0.429 ⁺⁺ (3.95)	0.43
β_{1991}	0.565 ⁺⁺ (9.26)	0.80
β_{1995}	0.649 ⁺⁺ (9.02)	0.79
β_{2001}	0.718 ⁺⁺ (11.50)	0.86
β_{2005}	0.903 ⁺⁺ (17.32)	0.93

Coefficients refer to β_1 estimates. Standard errors in parenthesis

Significance levels: ⁺ $p < 0.05$; ⁺⁺ $p < 0.01$

Figure 1 – Beta- and sigma- convergence in market shares (1960-2011)

