



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

Papers downloaded from AgEcon Search may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Trends versus cycles in global wine export shares

Walter C. Labys and Bruce C. Cohen[†]

The global wine market has witnessed major changes in recent years. Some of these changes are structural in nature or trend-following, whereas others are cyclical. Recently, new market entrants have increased their exports not only to traditional European markets but to other importing regions as well, whereas Old World producers have experienced declining market shares. However, the evidence examined here suggests that market share data also contain strong cyclical components. Mixed results also occur when the wine export data are disaggregated into products. This paper employs econometric methods to analyse the recent major shifts in world wine market shares and explains whether these are more of a secular trend-setting nature or of a temporary cyclical nature.

Key words: international wine trade, New World wine producers, Old World wine producers, wine cycles, wine market shares, wine trends.

The global wine market has witnessed major changes in recent years. Some of these changes are structural, following long-term trends, whereas others represent cycles or departures from these trends. Shifts in wine production capacity, mainly due to increasing vineyard area and replacing table wine grapes with higher-quality grape varieties, take time. New producing entrants have appeared in Latin America, the USA, Australia, and New Zealand. International trade patterns and shares have thus shifted with the new market entrants increasing their exports not only to traditional European markets but also to other importing regions. In short, it would appear that Old World producers have experienced declining market shares, whereas New World producers have seen rising market shares. The cyclical adjustments in wine markets are medium or shorter term in nature. These vary between the impacts of weather fluctuations on grape yields to the influences of business cycles on wine trade, consumption, and prices. Grape production can also decline rapidly when vine-uprooting schemes take effect. The purpose of this paper is to analyse the global significance of these changes. This paper

[†] Walter C. Labys (e-mail: wlabys@wvu.edu) is a Professor of Resource Economics, Natural Resource Economics Program, West Virginia University, Morgantown, WV, USA, 26506-6108. Bruce C. Cohen, Economist (ret), United Nations Economic Commission for Europe, United Nations – Palais des Nations, Geneva, Switzerland.

Note: Earlier data for this study appear from Anderson and Norman (2003) and its predecessor, Berger *et al.* (1998). Glyn Wittwer is to be thanked for providing the more recent data as well as the disaggregated product data from Wittwer and Rothfield (2006).

consists of the following parts: Background, Changes in Shares, Trends or Cycles, Disaggregation by Product, and Prospects.

1. Background

Quality wines are being produced on six continents, and developed and developing nations are active in the international wine trade. According to Kramer (2003), this has occurred because high incomes, finance, politics, and gourmet culture have coalesced in nations that previously possessed wine-restrictive policies of a religious or political nature. Historically, wine production and consumption have been centered in Western Europe; France, Italy, Portugal, and Spain constitute the core of the Old World wine producers. Production and exports are smaller in other countries such as Austria, Germany, Greece, and Switzerland, as well as in Eastern Europe, including Bulgaria, Hungary, Moldava, and Romania. In addition, large and growing wine production and consumption have developed in the New World; Australia, Chile, South Africa, and the USA are the core exporters. At lower levels are Argentina, New Zealand, and Uruguay.

The New World expansion has changed the way wine is appreciated, according to flavour, variety, and national origin, as well as to the way that wine is traded internationally. The traditional concept of wine, designated according to *terroir* or *appellation d'origine* is being replaced in many cases by designation of varietal or grape variety. This transition began as New World producers initially directed their attention to single-variety vineyards, such as cabernet, merlot, or chardonnay. Consumers also appreciated the direct way in which such wines could be identified. Although these three varieties provide a flavour and aroma that are agreeable and easily identifiable, the planting of varietals quickly diversified to include riesling, sauvignon blanc, gamay, gewurtztraminer, pinot noir, shiraz, and others. Old World producers have reacted somewhat adversely by coercing the European Union (EU) to institutionalise designation by vineyard or region, a practice that tends to discourage consumers. However, some producers have reacted by labelling some of their wines by variety or by blending new varieties into their traditional wines.

The large and growing group of new wine consumers has influenced the styles of wines produced. Not having the opportunity to taste older, more mature wines, partly because of their expense and unavailability, these consumers instead prefer ripe-tasting, rich, full-flavoured wines with some oakiness at reasonable prices. Even traditional wine consumers often prefer wines to be richer tasting and full flavoured.

Wine producers, on their part, have captured the benefits of improvements in technology to adjust the flavour and aroma of their wines to meet consumers' interests. One of the first innovations that led to improvements in wines among regions and nations was the temperature-controlled fermentation tank. Another involved olfactory profiling to understand consumers' sensory perception of beverages (Bisson 2002).

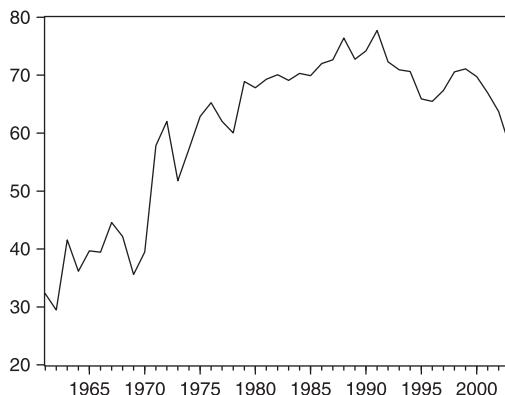


Figure 1 Old World market share.

Kramer (2003) describes other important innovations adopted particularly by New World producers. Instead of using traditional oak barrels to impart deep flavour, oak chips were added to the fermenting wine, then filtered out. Wine yields were increased by selecting the ripest grapes at harvest. These highly juice-laden grapes passed through vacuum concentrators (an ultra-fine filtration process) that removed water from the diluted must made from these grapes. This grape-selection process enhanced wine flavour and raised the sugar and concomitantly the alcohol of the wine, the latter being adjusted with spinning cone technology. Finally, acidity levels were modified by adding tartaric or citric acid; whereas powdered tannin could be added to increase the body or structure of red wines.

The major large wine and alcohol conglomerates have modified their managerial approaches through franchising and marketing. For example, they may employ New World wine makers in their European facilities and also buy into wineries in the New World. Franchising implies improving the predictability, reliability, and security of wine purchases. Wine makers employ new technologies to produce and market consistent, branded wines. The large firms control fermentation and blend wines to create wines that embody uniform quality.

2. Changes in shares

Figures 1 and 2 illustrate changes in export share (in volume terms) for the major exporters. The core Old World shares are shown to have declined; for the core New World producers, the export shares show sharp gains. Anderson and Norman (2003) report that although European producers account for three-fourths of world wine production and almost all of wine exports, the New World producers have begun to challenge this dominance. Between 1990 and 2004, the Old World's share fell from 73 to 59 per cent in volume terms, whereas the New World's share grew from 4 to 23 per cent. (The remaining

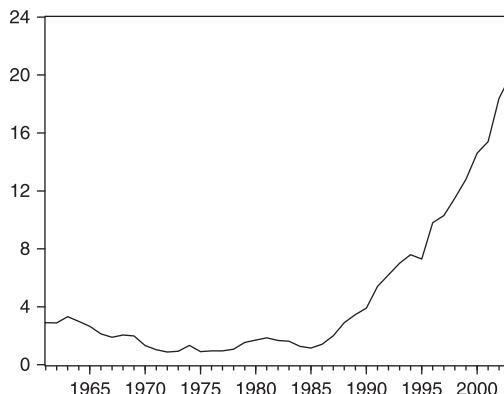


Figure 2 New World market share.

export shares are those of the rest of the world.) The New World's increase is notable because it has occurred when world production and consumption have declined. During the 1990s, Anderson and Norman report that global wine production fell 0.5 per year, whereas global wine trade increased by 5.2 per cent per year in volume terms and 7.0 per cent in nominal US\$ terms. Another aspect of these changes is the growing importance of wine in total merchandise exports. For example, from 1990 to 2004, this ratio improved from 0.6 to 3.3 per cent for Chile and from 0.3 to 2.7 per cent for Australia.

Wine market concentration is fairly high with the top-10 wine-exporting countries accounting for more than 90 per cent of world wine trade. This concentration is divided about half-way between the Old and New World countries. In descending order, they are in volume terms for 2004: France (18.5 per cent), Spain (18.0 per cent), Italy (17.8 per cent), Australia (8.1 per cent), Chile (6.0 per cent), USA (5.0 per cent), Portugal (4.5 per cent), South Africa (3.7 per cent), Germany (3.4 per cent), and Argentina (1.7 per cent). The share of France is 13.4 per cent lower than in 1990, with smaller declines for Portugal and Italy. Spain's growth in share appears to be the result of its diversifying its exports among different countries and of offering a variety of products. At the same time, the exports of Australia and other New World suppliers also have increased. Australia's share has jumped from 1.2 to 8.1 per cent; the combined share for Argentina, Chile, South Africa, and the USA has increased from 3.8 to 16.7 per cent. Wine imports are also highly concentrated. In 2004, almost half of all imports (as a percentage of world exports) continued to be purchased by three nations: UK (20.7 per cent), USA (16.9 per cent), and Germany (12.5 per cent).

Anderson and Norman (2003) have further explored the nature of these market changes by constructing two other indicators of trade performance. The wine trade volume (value) specialisation index is defined as the ratio of net bilateral exports (exports–imports) to the sum of bilateral exports plus imports, so that the index measures between –1 and +1. Between 1990 and 2001,

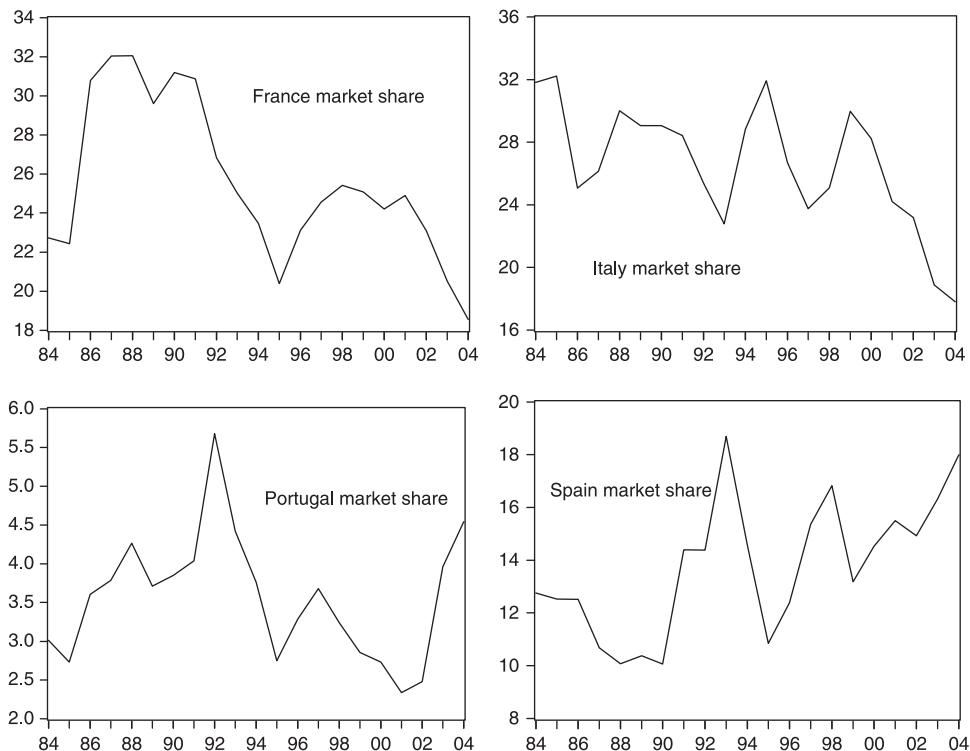


Figure 3 Individual Old Country market shares.

the value index has hovered around 0.84 for the core Old World producers, but for Australia, the index rose from 0.71 to 0.88 during that period, for New Zealand from -0.29–0.16, for Argentina from 0.40 to 0.83, and for South Africa from 0.86 to 0.93. The index of comparative advantage in wine explains the share of a country's exports in total merchandise exports divided by the share of world wine exports in total world merchandise exports. Between 1990 and 2004, this index decreased from 6.09 to 5.49 for the core Old World wine producers. But for some of the New World producers, an astonishing increase occurred. For Australia, the index rose from 1.29 to 9.72, for New Zealand from 0.48 to 4.09, for Chile from 2.56 to 11.85, and for the USA from 0.11 to 0.44.

3. Trends or cycles

Thus far, most evidence presented supports the view of recent market changes being a trend of declining market shares for Old World producers and increasing market shares for New World producers. However, a more detailed examination of the underlying export data for individual countries suggests caution in accepting this view. As shown in Figure 3, downward trends appear for the Old World producers, but the shares data are dominated by

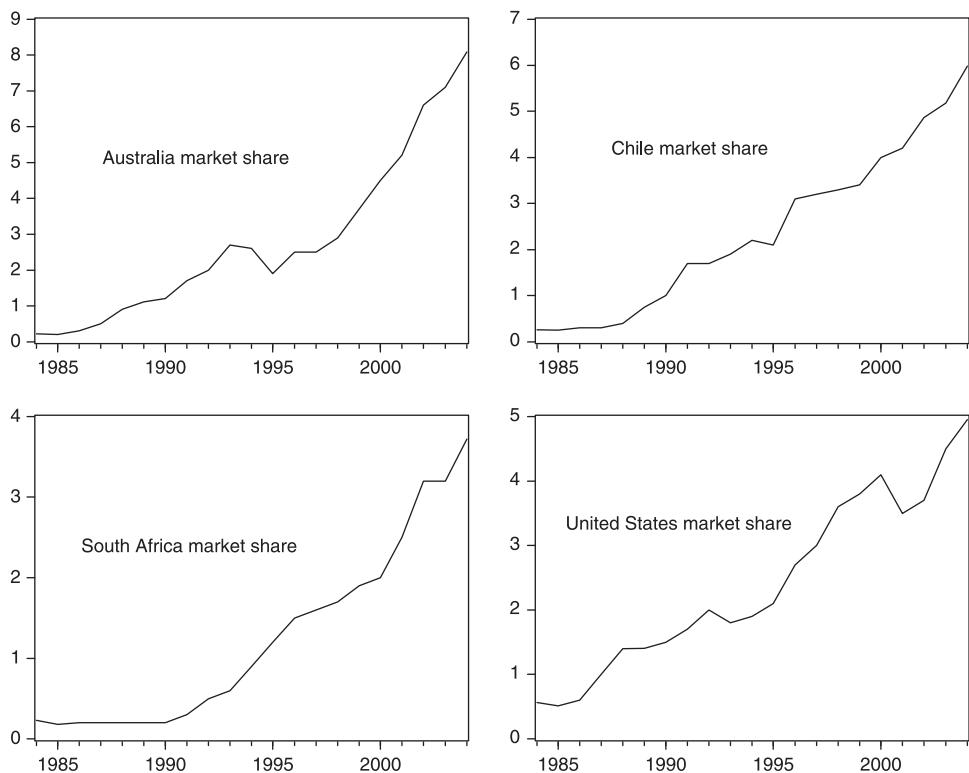


Figure 4 Individual New Country market shares.

cycles. Figure 4 depicts the shares of the New World exporters to be mostly rising. When the shares of both groups are transformed into fluctuations or percentage changes, cyclical behaviour can be found. Such cyclical dominance is not surprising, given the annual fluctuations that occur in grape and wine production. The sources of these fluctuations are annual underlying conditions, including rainfall, temperature, and sunlight. The frequency and amplitude of these fluctuations and their impacts on wine prices and producer earnings have been sufficiently severe that the Office International de la Vigne et du Vin (an intergovernmental wine association) has organised a special investigative committee, Analyse Economiques et Conjoncturelles, to study the implications of cyclical fluctuations on the wine industry.

Another source of the market share fluctuations has been changes in demand and prices generated by business cycle fluctuations (Labys 2001). This is not surprising given the increased globalisation of the world wine market (Anderson 2001). Lindsay (1987) has reported the impacts of exchange rates (and trade barriers) on US wine trade. Also Phares (2000) and Auzias (2001) have examined the impacts of a wide range of business cycle indicators on the wine industries of Australia, France, Germany, Italy, Spain, the UK, and the USA. Studies by Wittwer (2001) and Wittwer *et al.* (2003) have employed more disaggregated macro and industry variables to confirm similar cyclical impacts.

An example of business cycle impacts on wine consumption is through per capita income, as partially determined by such leading indicators as productivity, hours worked, and wages. Income, along with consumer expectations, interest rates, and other economic variables, are key factors in global wine production and consumption. Although not possible to interpret presently (e.g., see Labys 2001), the following kinds of impacts could be studied: (i) how do national product, incomes, and earnings influence domestic wine demands? (ii) how do exchange rates (including devaluation effects) explain changes in wine exports or wine imports of a country? and (iii) how do changes in interest rates cause increased liquidity to finance new industry investments or to store wines in inventory?

An attempt has been made here to analyse the presence of such cyclical influences as well as trends in the market share data by employing regression analysis. Figures 1 and 2 suggest that for the old core wine producers, market shares peaked somewhere between 1987 and 1990 and declined afterwards. To appropriately test for trends or cycles in these shares, our data begin in 1984. Before that period, the share data are too flat for the New World producers. The latest available data end in 2004.

The approach that we take is reasonably straightforward. Recall that any time series X can be interpreted structurally by dividing it into three or four components,

$$X = X^T + X^C + X^S + X^R \quad (1)$$

where T = trend, C = cyclical, S = seasonal and R = irregular components. Our present interest is with the trend and cyclical components, the seasonal not being present in annual data. The cyclical component can be said to remain after the trend is removed from the original variable

$$X_t - X_t^T = X_t^C \quad (2)$$

The trend component in market share MS can be identified from the following regression.

$$MS_t = b_0 + b_1 T_t + e_t \quad (3)$$

where T is a consecutive time or trend variable. The errors e_t , which represent the detrended data, are normally tested for their dynamic characteristics by employing higher-order autoregressive or moving-average autoregressive models (Diebold 1998).

$$e_t = c_0 + c_1 e_{t-1} + c_2 e_{t-2} + r_t \quad (4)$$

The cyclical component in this case can be discovered from the presence of a significant coefficient on the second-order lag of Equation (4).

Table 1 Market share trend and cycle statistics

Countries 1984–2004	Trend equation			Cycle equation		
	R^2	bT	t^*	R^2	c_2e_{t-2}	t^{\dagger}
France	0.34	-0.38	-3.12	0.42	-0.40	-2.10
Italy	0.40	-0.41	-3.57	0.40	-0.60	-2.63
Spain	0.39	0.26	3.51	0.22	-0.38	-1.67
Portugal	0.03	-0.03	-0.72	0.34	-0.33	-1.38
Australia	0.87	0.35	11.28	0.73	-0.34	-1.32
USA	0.95	0.34	17.10	0.38	-0.46	-2.01
Chile	0.96	0.20	22.50	0.14	0.06	0.21
South Africa	0.88	0.17	12.1	0.69	-0.28	-1.13
Old	0.51	-0.55	-4.42	0.42	-0.34	-1.44
New	0.94	1.02	18.0	0.63	-0.09	-0.33

*95 per cent t -value = 1.72; † 95 per cent t -value = 1.74; R^2 is adjusted.

Note: Trend: $MS = a + bT + e$.

Cycle: $e_t = c_0 + c_1e_{t-1} + c_2e_{t-2} + r_t$.

Table 1 presents the statistical test results for the trend and cycle parameters for each of the export share Equation (3) together with their t -tests of significance. Interpreting the t -statistics for the trend and the autoregressive variables indicates their positive or negative significance. The significance of second-order lags provides some evidence, although weak, of the presence of a cyclical component (Mills 2003). Consider first the declining trends in market shares among the core producers. Clearly, France and Italy possess a negative trend coefficient that is statistically significant according to the t -test. The shares of France and Italy thus appear to have a declining and significant trend. In contrast, the shares of Spain are increasing and significant. The collective shares of the Old World producers are also declining significantly. The results for the New World producers are not mixed at all. The market shares of Australia, USA, Chile, and South Africa follow an increasing trend that is statistically significant. This is also confirmed for the New World total.

Let us now search for the presence of cycles in the equation 4 errors that reflect medium to shorter changes in market shares due to weather fluctuations or business cycles. The discovery of such cycles could well confound the interpretation of the permanency of trends in country market shares. Among the old core producers the share errors for France and Italy appear to be cyclical in nature, suggesting that losses in market shares may be transitory rather than permanent. The share errors of Portugal and Spain appear to be cyclical but no statistical significance exists. The trends in share errors of Australia, Chile, and South Africa appear to be permanent. Cyclical activity for these countries is not confirmed by second-order tests. However, for the USA, cycles as well as trends are significant. Perhaps this reflects the influence of recent exchange rate fluctuations.

Table 2 Export performance: bottled, bulk, and sparkling wines*†

Countries	Export growth			Comp advantage			Specialisation		
	Botl	Bulk	Spkg	Botl	Bulk	Spkg	Botl	Bulk	Spkg
OLD	-2.08	5.28	2.71	6.05	6.12	5.39	0.89	0.51	0.44
France	-6.46	-5.66	8.91	6.55	4.32	14.34	0.77	-0.08	0.90
Italy	-0.76	-10.45	-6.28	5.33	4.54	2.40	0.95	0.47	0.74
Portugal	35.46	134.13	30.55	8.64	9.67	0.12	0.92	0.16	-0.86
Spain	7.06	24.11	8.47	3.69	5.93	4.69	0.92	0.98	0.96
NEW	16.95	21.26	29.04	8.10	8.25	0.50	0.64	0.73	0.24
Australia	18.79	24.64	20.22	11.74	6.31	1.20	0.95	0.87	0.20
Chile	13.16	20.91	37.47	15.17	19.12	0.34	1.00	0.99	0.80
S. Africa	19.47	21.34	22.74	5.06	7.12	0.40	0.99	0.74	0.72
USA	17.07	23.02	47.04	0.42	0.36	0.04	-0.34	0.33	-0.73

*Average 2002–04 of index values; †Comp, Comparative; Botl, Bottle; Spkg, Sparkling.

Source: Wittwer and Rothfield (2006).

Taking these groups in total, the Old World shows falling and rising trends with insignificant cyclical activity. The New World shows rising trends instead but again no cyclical activity.

4. Disaggregation by product

Although insufficient data exist to examine trends and cycles by major wine product, newly available data (Wittwer and Rothfield 2006) permit us to investigate some underlying causes by dividing total export volume into bottled wines, bulk blending wines, and sparkling wines. Table 2 transforms this data by reporting export growth rates, the index of comparative advantage and the trade specialisation index for each of these products according to the old and new country groups, as employed above. Three-year averages (2002–2004) are reported to overcome excess fluctuations in any individual export year. For bottled wines, Old World exports have declined, whereas the New World exports have increased. For bulk wines, some export growth can be seen for each group. Changes in sparkling wine export shares have been erratic, the Old World rising slowly and the New World rising more sharply. Regarding comparative advantage, the Old World group appears to be strongest in exporting sparkling wines, whereas the New World group has a stronger advantage in both bottled and bulk wines.

Let us now see whether there are any noticeable deviations from these patterns when we turn to individual countries. Concerning export growth, both France and Italy report percentage declines in both bottled and bulk wine exports. Portugal and Spain show growth in these categories, and together with France, are strong in exporting sparkling wines. All of the new countries show percentage export increases for bottled, bulk, and sparkling wines. Most of these increases are greater than that of any of the old countries.

Does any single country possess a comparative advantage in the export of any of these products? The comparative advantage indices reveal that the old countries, particularly France (14.34), have a strong advantage in exporting sparkling wines. For bottled wine, Australia (11.74) and Chile (15.17) by far have an advantage over any other country. Australia, Chile, and South Africa appear to have an advantage in exporting bulk wines over any other country, except Portugal. Chile taken separately has an advantage of 19.12 in bulk wines, which is higher than any other country, Portugal being the next highest with an advantage of 9.67. Does the computation of the trade specialisation index shed further light on these patterns? For bottled wines, specialisation seems as strong for the new as well as the Old World countries, except for the USA. Specialisation in bulk wines is relatively mixed, with France, Portugal, and the USA showing lower indexes. France, Italy, and Spain show stronger specialisation in sparkling wines, as do Chile and South Africa. The USA has a low specialisation for all the products.

5. Prospects

This study has focused on four Old World producers (France, Italy, Spain, and Portugal) and four New World wine producers (Australia, USA, Chile, and South Africa). Are the discovered changes in market shares trend or cyclical in nature? The results of the regression analysis raise as many questions as they answer. For the core Old World producers, the trend in shares is significantly negative for France and Italy, negative but insignificant for Portugal, and positive and significant for Spain. Evidence for cyclical (significant second-order autoregressive structure) was found for France and Italy. For the Old World producers taken together, the trend in shares was negative and significant without evidence of cyclical. In the case of the four major New World wine producers, all exhibited upward trends in shares (as did the group total) with significant cyclical only for the USA. For the New World grouping taken together, cyclical does not seem to be present.

Our findings suggest that the simple grouping of countries into Old or New World categories hides important changes in the structure of export markets. The examination of wine export shares is better viewed on a country-by-country basis particularly for the Old World producers. The results also suggest that the declines in shares by France and Italy deserve serious attention by their respective domestic wine industries. For the case of Portugal the declines are not clearly in evidence and cyclical activity can be detected in its recent export growth.

In the case of bottled quality and bulk wines, each country also showed some deviation from the aggregated patterns, particularly Chile, Portugal, and the USA. For the New World producers, the increase in market shares and exports symbolizes the impact of the important underlying factors that have transformed their wine industries. Given the changing nature of wine consumption habits and the average quality of the wines sold in many cases,

one wonders whether or not Old World producers are capable of reversing the patterns discovered here.

We do not claim to have answered all questions concerning trends and cycles in global wine export shares. Several questions remain. First, as more years are added to our time period, perhaps the confirmation of trends or cycles would be stronger. This would also permit a better examination of the disaggregated data beginning in 1994 to analyse changing market share among bottled, bulk, and sparkling wines. Second, the determinants of changes in the trends and cycles need to be examined; this includes demand-side variables such as prices as well as causes of variations in production. Finally, the countries included in the Old and New World aggregates could be expanded, such that the differences between the two groups could be more fully observed.

References

Anderson, K. (2001). The globalization (and regionalization) of wine, Cies WP 0125, Centre for International Economic Studies, University of Adelaide.

Anderson, K. and Norman, D. (2003). *Global Wine Production, Consumption and Trade*. Centre for International Economic Studies, University of Adelaide. Update soon to be available for 2005.

Auzias, M. (2001). L'influence Des Fundamentaux Sur le Marché Mondial Du Vin. Memoire, LAMETA, University of Montpellier 1, France.

Berger, N., Anderson, K. and Stringer, R. (1998). *Trends in the World Wine Market: a Statistical Compendium, 1961–96*. Centre for International Economic Studies, University of Adelaide.

Bisson, L.F. (2002). The present and future of the international wine industry, *Nature* 418, 696–699.

Diebold, F.X. (1998). *Elements of Forecasting*. Cincinnati, Southwestern.

Kramer, M. (2003). Twenty-first century fine wine – the consequences of success, in *Making Sense of Wine*, Running Press, Philadelphia, 101–118.

Labys, W.C. (2001). Business cycles and wine market impacts, Cies WP 21, Centre for International Economic Studies. University of Adelaide.

Lindsay, P.J. (1987). An analysis of the effects of exchange rates and trade barriers on the US wine trade, PhD Thesis, University of California at Davis, California.

Mills, T.C. (2003). *Modelling Trends and Cycles in Economic Time Series*. Palgrave-McMillan, London.

Office International de la Vigne et du Vin, OIV (2000). *Situation de la Viticulture Dans le Monde*. Office International de la Vigne et du Vin, Paris.

Phares, L.C. (2000). Business cycles and the world wine market, RP 2000.9, Regional Research Institute, West Virginia University.

Wittwer, G. (2001). Accounting for growth in the Australian wine industry, Cies DP 0029. Center for International Economic Studies. University of Adelaide.

Wittwer, G., Berger, N. and Anderson, K. (2003). A model of the world's wine markets. *Economic Modeling* 20, 487–506.

Wittwer, G. and Rothfield, J. (2006). *The Global Wine Statistical Compendium, 1961–2004*. Document, Monash University. University of Adelaide, AWBC and GWRDC. (forthcoming).