The California Wine Industry and NAFTA

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Introduction

This study of the impact of the North American Free Trade Agreement (TLC) on U.S. wine exports to Canada and Mexico considers, in addition to industry-specific market conditions, the possible influence of macroeconomic factors on U.S. wine exports.

Background: The U.S. Wine Industry

California has the largest value of agricultural revenues of the United States; grapes and wine are its second-ranked agricultural industry. With 307,000 bearing acres (124,241 hectares) and 37,200 non bearing acres (15,055 hectares) and $835,472,000 in revenues in 1994, California wine production dominates the national industry statistics. Despite expansion of wine production in other states during the last decade, California still produces approximately eighty-five percent of the total U.S. volume in a typical year.

Table 1 US and California Wine Production

<table>
<thead>
<tr>
<th>Year</th>
<th>Total US Volume *</th>
<th>Total California Volume *</th>
<th>California as Percent of US</th>
</tr>
</thead>
<tbody>
<tr>
<td>1986</td>
<td>1,927,000</td>
<td>1,601,019</td>
<td>83.08%</td>
</tr>
<tr>
<td>1987</td>
<td>1,904,000</td>
<td>1,603,087</td>
<td>84.20%</td>
</tr>
<tr>
<td>1988</td>
<td>2,011,000</td>
<td>1,559,371</td>
<td>77.54%</td>
</tr>
<tr>
<td>1989</td>
<td>1,761,000</td>
<td>1,498,006</td>
<td>85.07%</td>
</tr>
<tr>
<td>1990</td>
<td>1,708,000</td>
<td>1,475,946</td>
<td>86.41%</td>
</tr>
<tr>
<td>1991</td>
<td>1,767,000</td>
<td>1,417,545</td>
<td>80.22%</td>
</tr>
<tr>
<td>1992</td>
<td>1,672,000</td>
<td>1,446,882</td>
<td>86.54%</td>
</tr>
<tr>
<td>1993</td>
<td>1,585,000</td>
<td>1,373,996</td>
<td>86.69%</td>
</tr>
<tr>
<td>1994</td>
<td>1,615,000</td>
<td>1,394,858</td>
<td>86.37%</td>
</tr>
<tr>
<td>1995</td>
<td>1,740,000</td>
<td>1,436,965</td>
<td>82.52%</td>
</tr>
</tbody>
</table>

* In hectaliters. Sources: FAOSTAT, Wines & Vines

California wine firms are strongly export-oriented. They have aggressively pursued export markets since the 1970s, when it was determined that domestic markets could not absorb the continued growth of wine production. California wines have been promoted in new markets, such as Latin America and the Pacific Rim, as well as in more traditional wine consuming...
countries such as Canada. Both Canada and Mexico have been attractive to U.S. firms because of proximity, population and minimal competition from domestic industries. During this expansion into new markets, firms have begun to encounter competition not just from traditional European wine exporting countries such as France and Spain, but also from expanding wine industries in Australia, Chile and South Africa.

Its acute awareness of potential gains and risks in export markets motivates the U.S. wine industry to evaluate the impact of current and proposed regulation of international trade and to become involved in attempting to modify legislation to enhance its market competitiveness.

For the U.S. wine industry, not merely tariff schedules, but also phytosanitary regulations and labeling requirements are important considerations in export markets. Since a substantial percentage of wine grapes are grown utilizing agricultural chemicals including soil fumigants, herbicides, pesticides and fertilizers, regulations governing acceptable levels of residues in wine affect the entire grape production process. Similarly, national or provincial rules governing percentage of domestic content or specification of appellation or country of origin will affect the volumes of bulk wine sales or costs to producers required to substitute country-specific labels for the export market.

As the U.S. wine industry moves a greater percentage of its annual volume into the export market, factors beyond the technicalities of labeling or grape handling assume larger importance. These factors include the income and wealth of potential customers, competition from domestic producers in importing countries, tariff treatment of competing importers, changes in relative prices between countries and exchange rates. Some of these topics receive considerable attention from U.S. wine industry analysts, particularly as they pertain to competing imports. Some of the macroeconomic factors receive less attention, but may be at least as important to U.S. wine imports as the more immediately identifiable macroeconomic aspects of the market.
**The Canadian Wine Industry**

Canada is an important export market for U.S. wines. In 1995 it was the second largest importer, after the United Kingdom, of U.S. bottled wine exports, and the largest importer of bulk wines. Canadian wine consumption is well below that of some European countries, but at 2.01 gallons per capita in 1994, still represents an attractive market. Canada produces a substantial amount of wine from approximately six thousand hectares of vinifera vineyards, principally located in Essex County and the Niagara peninsula of Ontario, with the remaining production centered in the Okanagan region of British Columbia. In addition, bulk wines are imported, blended and bottled by some Canadian producers, under provincial regulations governing the percentage of imported wine acceptable for domestic product labeling. The Grape and Wine Industry Adjustment Program, beginning in the late 1980s, has utilized economic incentives to assist Canadian grape growers to convert their plantings from the sturdy but less desirable lumbrusca to the more commercially viable vinifera rootstock. The Grape Surplus Program in Ontario, which had purchased surplus grapes in 1988, 1989 and 1990, dispersing them among domestic and international markets, ended in 1990. The Grape Acreage Reduction Program ended March 31, 1994. The short run result of these programs is a reduction in Canadian wine grape production. The long run impact will be felt as vinifera grapevines planted to replace the lumbrusca stock, typically a minimum of five years from planting. The Vintners’ Quality Alliance, organized to establish standards for labeling wines from grapes grown in specific British Columbia and Ontario regions, can be anticipated to compete with imported wines targeted at higher priced consumer segments.

Given the constraints of the Canadian climate, however, imported wines will continue to enter Canadian markets in substantial volumes, sixty percent or more of total annual wine consumption. French wines have supplied the largest percentage of Canadian wine imports, but have lost market share during the study period, declining from over forty percent to approximately a third of the market. The United States has the second ranked market share, benefiting both from low prices compared to European imports as exchange rates have worsened and also from consumer perceptions of the quality of U.S. wines in relation to several weak French vintages in the early 1990s. U.S. wines have received preferential tariff treatment from Canada under the Canada-U.S. Free Trade Agreement (now NAFTA). For the
lowest alcohol content category of wines, the 1995 Canadian tariff is C$ 0.013/liter, compared to the most favored nation (MFN) tariff of C$ 0.044/liter. In addition, U.S. wines must be accorded treatment equal to domestic Canadian wines by provincial liquor boards, with discriminatory price markups to be eliminated over a seven year period. Only the actual additional expenses of shipping and handling imported U.S. wines may be charged.

The Canadian wine market is complicated by the Canadian regulatory and distribution process. Under the Importation of Intoxicating Liquors Act each of the twelve Canadian provinces has its own liquor control board, which has monopoly power over alcoholic beverage sales in that province. Except for Alberta, where the ALCB retained wholesale distribution authority but transferred retail sales of alcoholic beverages to local private sellers in mid-1994, and British Columbia, which has some private agencies as well as provincial board outlets, provincial liquor boards operate profit making retail outlets as well as coordinating all alcoholic beverage imports and transactions among provinces. In addition to the national government, the liquor control board of each province can establish its own labeling criteria and laboratory test standards, as well as prices, for all alcoholic beverages it distributes. The boards may impose promotional costs, such as wine tastings and advertising, on wineries or associations which represent the products with which the boards stock their stores.

The Mexican Wine Industry

Although Mexico has natural resources adequate to support a substantial wine industry, the industry is of moderate size by international standards, possibly because Mexico is not among the countries with a tradition of wine consumption. Domestic sources estimate Mexican 1995 per capita consumption of table wine at approximately 0.25 liters. In a country with widespread beer and soft drink production and distribution, the dominant form of grape alcohol consumed has been brandy, approximately 1.10 liters per capita in 1994. The ratio of domestic wine to brandy production in Mexico demonstrates the relative market importance of the two products. According to INEGI and CANACINTRA statistics, 1994 Mexican production of red and white wine was 315,520 hectaliters; brandy production during the same year was 835,970 hectaliters. About seventy percent of the grape production of Mexico is used to produce brandy.
The main wine grape regions in Mexico are Baja California, Aguascalientes, Coahuila and Queretaro. The degree of industry concentration in the Mexican wine industry is much greater than in the U.S., with Casa Pedro Domecq, Productos de Uva and Casa Cuervo dominating over two thirds of national production. During the last several years the recession in the Mexican economy has created severe financial pressures in the domestic wine industry, crushing profit margins and causing bankruptcies. In response, major Mexican producers have begun aggressively promoting wine coolers, which are not only less costly to produce, but appeal to a market segment, domestic and tourist, which is outside the traditional market for table wines. Smaller (250 ml.) bottles of wine are also being produced for supermarket sales.

U.S. wine sales to Mexico have varied substantially from year to year, both in volume and in their ranking among imports. European wines, particularly Spanish, French and German, have reputations for high quality among Mexican consumers, and some multinational wine firms, such as Domecq, import from several countries across the price spectrum. According to some U.S. industry sources, because they perceive themselves to be out-positioned in the Mexican domestic wine and brandy market, U.S. wine firms are focusing promotions and sales on Mexican resort areas, where they can use their U.S. brand name recognition to generate tourist sales through restaurants, hotels and supermarkets.

One source of continuing anxiety to U.S. wine producers is the preferential tariff treatment accorded to Chilean wines by current Mexican regulations. Although the North American Free Trade Agreement phases out tariffs on U.S. wine imports from twenty percent to zero over ten years, Chilean wine tariffs were reduced further and phased out more rapidly by Mexico, with the result that the 1996 Mexican import tariff on U.S. wines is sixteen percent, while the tariff on Chilean wines is zero. There is also a recognition that the Mexican brandy industry has the capability to produce quantities of good quality brandy which, particularly if imported as duty-free bulk shipments, could be competitive in U.S. brandy markets. Since the U.S. wine industry has concentrated on table wine, rather than brandy production, Mexican brandy firms may play a greater role in the U.S. markets in the future.

Research Design
The desirability of participating in the North American Free Trade Agreement was discussed among U.S. grape growers and wine producers from the time it was understood that the Agreement would be extended to cover agriculture, including the specialty crops. When this research was initially considered, it was clear that a narrow policy focus on the impact of changes in ad valorem taxes and phytosanitary regulations would neither be feasible, due to the complexities of the Canadian market environment, nor particularly useful, since negotiations to interpret or modify initial regulations might require several years to reach a resolution. Research which would be useful to the U.S. wine industry, therefore, would either have to be postponed for several years to permit the new regulatory system to stabilize, or would have to deal with the range of potential influences on the volume and revenues of the international wine trade which would exist no matter at what time or in what final form a multinational free trade agreement might emerge. The decision was to direct research toward the potential macroeconomic influences on U.S. wine exports utilizing Canada and Mexico as two separate case markets, with the expectation that the study could eventually be expanded to analyze the specific impacts of NAFTA (TLC) as time series data became available.

Because it is less than three years since the effective date of the TLC (NAFTA), a time series study of changes in U.S. wine exports would yield no valid conclusion regarding the impact of the agreement. A significant number of observations need to be analyzed in order to avoid mistaking short-term fluctuations for trend lines. Another reason to avoid a "before and after" analysis is that in the real world, as opposed to the hypothetical world of the textbooks, an industry likely to be affected by proposed legislation or treaties will study the proposals, evaluate the probabilities of various outcomes, and modify its practices in anticipation of the final agreement. Thus, determining the precise impact of any change in tariff policies, for example, depends not only on analyzing changes in individual or firm behavior which occurred after the effective date of the policy, but also any changes which occurred before the effective date in an attempt to "beat the deadline" before a higher tariff rate or to shift sales and revenues into a lower tariff future period.

Another complication with NAFTA(TLC) research is that very often comparative international data are not available for a year or more after the completion of the relevant time
period. To date, official data are not yet available for 1994 and 1995 for many of the macroeconomic variables necessary to inter-country comparisons. In addition, data from national and international sources frequently are reported utilizing different units of measure or base years for construction and calculation of real data series. Thus, at one point five base periods were represented by data considered for this analysis: 1982-84 base years for the U.S. consumer price index (CPI) and real Gross Domestic Product (GDP), as calculated by the U.S. Department of Labor Bureau of Labor Statistics; 1987 base year for data from FAOSTAT, the FAO Yearbook and World Bank World Tables; 1990 for the Inter American Development Bank, 1992 for the U.S. Bureau of Economic Analysis and 1992-94 for the World Development Report. Attempts to convert data series to the same base years revealed apparent discrepancies indicated that the underlying data might not be comparable due to varying definitions or aggregation methods.

Procedure for this study was to collect data on U.S. wine exports to both the Canadian and the Mexican markets during the period 1985-1995, use multiple linear regression techniques to calculate trends in these markets and examine the results to determine whether there is a statistically significant difference in U.S. wine exports to these countries which can be linked to adoption of the NAFTA/TLC. The initial intent of this research was to examine the following variables for their impact on U.S. wine exports to Canada and Mexico: U.S. and domestic wine production, domestic wine exports, value per liter of U.S. wine exports to each country, real gross domestic product per capita, consumer price indices for each country, the U.S., exchange rates of each country’s currency vis a vis the U.S. dollar, and each country’s import tariffs and ad valorem taxes on U.S. wine imports. As noted above, data suitable for analysis were sometimes unavailable, as in the 1994 and 1995 GDP and consumer price indices, or could not be reduced to a form usable in a linear regression model, such as the Canadian national and provincial wine taxes.

Volume of U.S. wine exports to the country was selected as the dependent variable in the regression analysis. This is preferred to the total value of wine exports because it eliminates the need to adjust for nominal price changes; the relationship between price as shipped (value per liter) and the volume of exports also avoids the collinearity issue raised by utilizing the total value of wine exported as an independent variable. Consumer price indices in both the
importing country and the U.S. were included to reflect ratios of relative prices between the
two countries. Another measure of potential purchasing power, real gross domestic product
(GDP) per capita was modified to changes in real GDP per capita from the prior year.

Analysis of Data

Because of the limited number of observations in the time series, running all the variables in
a regression led to an unacceptable loss of degrees of freedom. Degrees of freedom could
have been augmented to some extent by extending the time series back to earlier years, but
these periods have little relevance in analysis designed to evaluate recent macroeconomic
phenomena, so alternative procedures were adopted. When the data were evaluated in a
variety of combinations, it became clear that some variables contributed very little to the fit
of the regression. For example, with U.S. wine exports to Canada as the dependent variable,
the Canadian CPI, changes in Canadian real GDP and value per liter of U.S. wines exported
to Canada together produced a coefficient of determination (r^2) of .97, while using just the
Canadian CPI returned a .95 r^2. Rather than include all the data in this section, only results
are summarized here; the data are located in Appendix A of this report.

Canadian CPI, total U.S. wine exports, Canadian wine production, the value per liter of U.S.
wine exports to Canada and changes in Canadian real GDP were, in that order, the
independent variables most closely correlated with changes in the volume of U.S. wine
exported to Canada. The significant correlation of total U.S. wine exports with the volume
of U.S. wine exported to both Canada and Mexico should probably be ascribed to collinearity
than to any useful relationship. As would be expected, changes in Canadian wine production
were negatively correlated with U.S. wine imports. The Canadian CPI, total U.S. wine
exports and value per liter of U.S. imports to Canada were positively correlated. Another
variable, the exchange rate of Canadian to U.S. dollars, which might have been expected to
show a significant relationship to Canadian wine imports from the U.S., showed an r^2 of .03,
essentially no correlation. Since European wines, particularly French wines, have a large
market share in Canada, French and Spanish exchange rates were included as variables in
additional regressions, along with the Canadian/U.S. exchange rate, and the value per liter of
U.S. wine exports to Canada. Both the franc and peseta are significant at the five percent
level; when only the Canadian/U.S. exchange rate and the franc are run, the r^2 increases to
The exchange rate is significantly correlated with U.S. wine exports to Canada at the one percent level.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mexico Wine</th>
<th>US: Total Wine</th>
<th>US: Total Wine Exports</th>
<th>Mexico: Total Wine</th>
<th>CPI: Mexico</th>
<th>Chg Real GDP</th>
<th>Value/Liter US Wine Exports</th>
<th>Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>90.72</td>
<td>1720000</td>
<td>22582</td>
<td>219353</td>
<td>23.16</td>
<td>-33.69%</td>
<td>0.91</td>
<td>4.065</td>
</tr>
<tr>
<td>1986</td>
<td>234.36</td>
<td>1927000</td>
<td>27218</td>
<td>192129</td>
<td>43.14</td>
<td>-47.74%</td>
<td>0.73</td>
<td>1.758</td>
</tr>
<tr>
<td>1987</td>
<td>408.24</td>
<td>1904000</td>
<td>43174</td>
<td>196915</td>
<td>100</td>
<td>-58.73%</td>
<td>0.65</td>
<td>0.76</td>
</tr>
<tr>
<td>1988</td>
<td>619.92</td>
<td>2011000</td>
<td>61613</td>
<td>196822</td>
<td>214.16</td>
<td>-48.96%</td>
<td>0.74</td>
<td>0.44</td>
</tr>
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<td>1989</td>
<td>1593.94</td>
<td>1761000</td>
<td>79879</td>
<td>179146</td>
<td>257.01</td>
<td>-11.64%</td>
<td>0.79</td>
<td>0.407</td>
</tr>
<tr>
<td>1990</td>
<td>2876.58</td>
<td>1708000</td>
<td>9653</td>
<td>153329</td>
<td>325.51</td>
<td>-10.01%</td>
<td>1.7</td>
<td>0.356</td>
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<tr>
<td>1991</td>
<td>6724.62</td>
<td>1767000</td>
<td>108738</td>
<td>179618</td>
<td>399.28</td>
<td>-5.39%</td>
<td>1.46</td>
<td>0.333</td>
</tr>
<tr>
<td>1992</td>
<td>11041.38</td>
<td>1672000</td>
<td>123735</td>
<td>183384</td>
<td>461.2</td>
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<tr>
<td>1993</td>
<td>4751.46</td>
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<td>119651</td>
<td>166853</td>
<td>506.17</td>
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<tr>
<td>1994</td>
<td>3659.04</td>
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<td>203435</td>
<td>541.6</td>
<td>1.58</td>
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<td>0.137</td>
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<td>1995</td>
<td>2506</td>
<td>1740346</td>
<td>146965</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sources of data:**
- a Wines & Vines
- b FAO/STAT, 1985-94; Wines & Vines, 1995
- c FAO/STAT, 1985-94; Wines & vInes, 1995
- d FAO/STAT
- e World Tables, 1985-92; Inter-American Development Bank, 1993-94
- f World Tables 1995. Calculated using nominal GNP per capita with GDP deflator
- g Calculated from volume, value data in Wines & Vines
Analysis of the same macroeconomic variables for Mexico leads to different outcomes. In order, the variables most closely correlated with changes in the volume of U.S. wine exported to Mexico were the value per liter of U.S. exports, the Mexican CPI, and changes in Mexican real GDP. The strongest $r^2$ associated with multiple variables was .73 for the Mexican CPI, changes in Mexican GDP and value per liter combined. Most other variables showed weak or poor relationships with the dependent variable. Mexican total wine production had an $r^2$ of only .13; the peso exchange rate with the U.S. dollar showed an $r^2$ of .19, but this is well below any reliable statistical level. No variable showed as strong a relationship in Mexican regressions as did a number of variables in the Canadian economy.

It is in analysis of the Mexican data that the information lags in international economic statistics become most inconvenient. It might have been useful to examine whether variables such as Chilean wine sales in Mexico or the Chilean exchange rate were correlated with Mexican wine imports from the U.S., but data are presently too scant to permit the analysis. As with Canada, missing data since 1993 constrain even the most limited analysis of the post-NAFTA environment, but Mexico, because of its volatile economy, imposes the need to proceed with much greater caution in predicting economic events. The change in valuation of the peso which occurred in late 1994, privatization of national enterprises and the performance of real domestic GDP are all important to any analysis of the Mexican economy and its international relationships, but the quantitative information is not yet available.

Summary and Conclusions

This study was originally intended to analyze the impact of the North American Free Trade Agreement (TLC) on U.S. wine exports to Canada and Mexico. In addition to industry-specific market conditions, the intent was to examine the possible influence of macroeconomic factors on U.S. wine exports. The first objective of this study has not been met, and probably cannot be achieved for a number of years, If a quantitative analysis is to be successful, there must be adequate data of acceptable quality. It is too soon after the adoption of NAFTA for the time series data to be available.

This study, however, was begun with an additional purpose. One expectation in designing such a study is that it can be utilized as a template for future research. Typically, industry
research tends to focus on microeconomic or market-specific issues. Production costs and regulations, pricing of competing brands, shelf space, and the development of market positions through advertising are all important, but evaluation of national economic variables is outside the experience of many skilled market researchers. At least in the wine industry, the impact of changes in currency exchange rates is frequently discussed, but little, if any attention is paid to underlying economic data, such as gross domestic product changes and their impact on the incomes and wealth of potential customers. It is to be hoped that by observing the correlation of some of these macroeconomic variables with trends in product sales, more students of agricultural markets will begin to analyze the role of these macroeconomic factors in their own international product markets.

To return to the Canadian and Mexican wine import markets, it appears that the data demonstrate that macroeconomic factors such as domestic consumer price indices and real GDP are related to U.S. wine imports in a statistically significant manner. As real Gross Domestic Product per capita rises, so do imports of wine. On the other hand, some relationships, such as that between exchange rates and imports/exports, are not so clear cut as they are sometimes believed to be. In the case of Mexico, it might be argued that some results of this analysis are confusing, such as the apparent relationship between falling real GDP and rising value per liter of imported wine. The phenomenon makes sense, because the U.S. wine industry has developed a strategy of targeting the higher priced market segment, by concentrating its promotional efforts on tourist areas of Mexico, selling to foreign buyers rather than competing for the Mexican customer. Similarly, changes in domestic wine production, which appear in a significant, negative relationship to U.S. wine exports to Canada, may not affect U.S. wine sales in Mexico because the Mexican wine industry is seeking export markets of its own and developing new domestic products, rather than competing for the small table grape market.

It is only by combining macroeconomic and microeconomic knowledge that economists can interpret and influence the changes which will be faced by agriculture in Canada, Mexico and the United States as the industries develop new market relationships under the North American Free Trade Agreement.