**THE NEW ZEALAND WINE INDUSTRY**

The wine industry in New Zealand is performing very well. According to the *New Zealand Winegrowers Annual Report*, one billion glasses of NZ wine were sold worldwide in 2007. In the same year, total sales of New Zealand wines were a staggering 127 million liters, of which 76 million liters were exports. This represented a 36% increase in total export value and total sales of $1.2 billion.

However, the industry has not been without its challenges. Fierce competition with Australian wine, supply constraints from local New Zealand producers, and a strong New Zealand dollar have all taken their toll.

Notwithstanding these current problems, according to the Wine Institute of New Zealand, the future is bright with predicted exports of $1 billion in 2010 and predicted sales of $0.5 billion at profitable prices.

新西兰的葡萄酒行业表现非常好。根据最新消息

新西兰葡萄酒种植者年度报告，10亿杯新西兰葡萄酒的销售

2007年全世界。同年，新西兰葡萄酒的总销量为a

惊人的1.27亿升，其中7600万升是出口。这代表一个

出口总额增长36%，销售总额12亿美元。

然而，该行业也并非没有挑战。激烈的竞争

由于澳大利亚葡萄酒、新西兰本地生产商的供应限制，以及澳大利亚葡萄酒市场的低迷

坚挺的新西兰元也造成了损失。

尽管目前存在这些问题，据纽葡萄酒协会(Wine Institute of New)称

新西兰的前景是光明的，预计2010年出口额将达到10亿美元

5亿美元的销售额。

**Discussion**

1. Members of the New Zealand wine industry are interested in trying to predict both domestic and export sales. It is probable that domestic consumption of New Zealand wine is affected by the availability of wines produced in other countries. In particular, given the high quality and affordability of its wines, imports from Australia could have an adverse effect on domestic consumption of New Zealand wine. The following data relate to consumption per capita (in liters) of New Zealand wine and wine imports from Australia (in million of liters) for the years ended June 1997 to 2007. Use the multiple regression analysis techniques to analyze the data. Include both regression and correlation techniques. Discuss the strength of the relationship and any models that are developed.

1.新西兰葡萄酒行业的成员对预测国内和出口销售都很感兴趣。新西兰葡萄酒的国内消费很可能受到其他国家葡萄酒供应的影响。特别是，考虑到新西兰葡萄酒的高质量和可承受性，从澳大利亚进口可能会对新西兰国内葡萄酒消费产生不利影响。以下数据与1997年6月至2007年期间新西兰葡萄酒的人均消费量(以升为单位)和从澳大利亚进口的葡萄酒(以百万升为单位)有关。使用多元回归分析技术分析数据。包括回归和相关技术。讨论这种关系的强度以及所开发的任何模型。

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|  | **Consumption per capita (liters NZ wine)** | **Wine imports from Australia (millions liters for the year ended June)** |
| 1997 | 10.4 | 16.201 |
| 1998 | 10.1 | 21.772 |
| 1999 | 10.1 | 20.762 |
| 2000 | 10.6 | 20.655 |
| 2001 | 9.3 | 21.331 |
| 2002 | 8.2 | 25.091 |
| 2003 | 8.8 | 32.363 |
| 2004 | 8.8 | 27.636 |
| 2005 | 11.2 | 24.340 |
| 2006 | 12.1 | 27.250 |
| 2007 | 12.2 | 36.497 |

1. Suppose, realistically, that the New Zealand government and wine industry are keen to predict export sales of New Zealand wine with a view to increasing future export sales. Many of the factors that determine exports will be out of the hands of both the wine industry and the government. However, one major factor that will

2.现实地假设，新西兰政府和酒业热衷于预测新西兰葡萄酒的出口销售，以期增加未来的出口销售。许多决定出口的因素将不再是葡萄酒行业和政府所能控制的。然而，一个主要的因素会

help determine export volumes will be the total productive capacity of the New Zealand wine industry. The following data, also taken from the *New Zealand Winegrowers Annual Report 2007*, relate to export volumes of New Zealand wine (millions of liters) and the number of wineries in New Zealand over the financial years (ending June) 1997 to 2007. Using these data and the multiple regression techniques, write a brief report to the New Zealand government about the predictability of export sales from the number of wineries. In this report, in light of your results, state how it might (or might not) be possible to increase export sales in the future.

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|  | **Number of Wineries** | **Export Volume (millions of liters)** |
| 1997 | 262 | 13.1 |
| 1998 | 293 | 15.2 |
| 1999 | 334 | 16.6 |
| 2000 | 358 | 19.2 |
| 2001 | 382 | 19.2 |
| 2002 | 398 | 23.0 |
| 2003 | 421 | 27.1 |
| 2004 | 463 | 31.1 |
| 2005 | 516 | 51.4 |
| 2006 | 530 | 57.8 |
| 2007 | 543 | 76.0 |

1. Suppose that, at least in the short run, the number of wineries is fixed. It might be possible to increase total production of New Zealand wine by improving the average grape yield of the existing wineries. Data from the same source, on average yield in tonnes per hectare and total wine production in millions of liters, is provided in the following table. Using multiple regression techniques, do you believe that it is possible to adequately predict total wine production by average yield? Explain.

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| --- | --- | --- |
|  | **Total Wine production (millions of liters)** | **Average yield (tonnes per hectare)** |
| 1997 | 45.8 | 8.1 |
| 1998 | 60.6 | 10.3 |
| 1999 | 60.2 | 8.9 |
| 2000 | 60.2 | 7.8 |
| 2001 | 53.3 | 6.1 |
| 2002 | 89 | 8.6 |
| 2003 | 55 | 4.8 |
| 2004 | 119.2 | 8.9 |
| 2005 | 102 | 6.9 |
| 2006 | 133.2 | 8.2 |
| 2007 | 147.6 | 8.1 |

1. Domestic sales of New Zealand wine have reached their highest level ever, with 51 million liters of wine sold in 2007. Government policies have also been put in place to support the industry and achieve sustained growth. However, an important question is whether, ultimately, there is enough land devoted to grape cultivation, since the quantity of grapes crushed predominantly determines how much wine is produced. Therefore, it might be useful to investigate the relationship between domestic sales of wine and area of land devoted to wine production. The following excel output displays the results of a regression predicting domestic sales of New Zealand wine (in millions of liters) by producing area (in hectares). Suppose you were asked by the Wine Institute of New Zealand to analyze this data and write a brief report. Based on the results below, what would you find?

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| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY OUTPUT |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.658102884 |  |  |  |  |  |
| R Square | 0.433099406 |  |  |  |  |  |
| Adjusted R Square | 0.370110451 |  |  |  |  |  |
| Standard Error | 4.801382127 |  |  |  |  |  |
| Observations | 11 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 158.5096579 | 158.5097 | 6.875799 | 0.027712 |  |
| Residual | 9 | 207.479433 | 23.05327 |  |  |  |
| Total | 10 | 365.9890909 |  |  |  |  |
|  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 30.85590683 | 3.849536982 | 8.015485 | 2.18E-05 | 22.14765 | 39.56416 |
| Producing Area | 0.000633111 | 0.000241445 | 2.622175 | 0.027712 | 8.69E-05 | 0.001179 |