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Taxation and Consumption of Wine

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In this article, the impact that a sales tax might have upon wine consumption and, hence, on the wine and grape growing industries, is analysed. Implications for government revenue are also considered. It is shown that the relative responsiveness of supply and demand, rather than the level in the marketing chain at which a tax is levied, determines where the tax burden finally falls. The imposition of a tax on wine might force certain sectors of the wine and grape industries to undergo a phase of adjustment. However, over the longer term, a tax would not necessarily alter the impact of other factors affecting the demand for wine. Additional taxes on wine of the form of a 10 per cent sales tax could be expected to increase government revenue from all indirect taxes by about 1 per cent.

1. Introduction

Three types of taxes are currently imposed on alcoholic beverages in Australia. They are the excise duty (in which should be included the "excise component" of customs duty), sales taxes and State and local authority taxes. Wine is currently exempt from the first two types of tax. An excise was imposed on wine in August 1970 and it was removed in January 1973.¹

The Bureau of Agricultural Economics (BAE 1976) pointed out that "decisions on the appropriate level of taxes for the wine industry and for products that compete with it in the market place are ultimately matters of social judgment rather than economic analysis". From an economic point of view, to assist the exercise of social judgment, it is important to provide information relevant to evaluating the costs and benefits of taxation measures as they affect the wine industry.

In this article, the results of recent BAE research (Tsolakis *et al.* 1983) are used to analyse the impact that a sales tax might have upon wine consumption and, hence, on the wine and grape growing industries. The effects on revenue of changing relative rates of taxation in the alcoholic beverages commodity group are also considered.

In the next section of the article, some aspects of different forms and levels of taxation on alcoholic beverages are discussed. Following this, the implications of a wine tax for consumption and prices, government revenue, the wine marketing sector, and the grape growing industry are considered in turn. The main findings are summarised in the concluding section.

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¹ A detailed description of this excise and an evaluation of its impact on wine sales is presented in a revised version of Tsolakis (1981).

2. Economic Aspects of Taxation

The Industries Assistance Commission (IAC 1979) suggested that there is a conflict on “equity” grounds in imposing a tax on beer and spirits and not on wine. Uniform taxation refers to equal tax rates on the value of the beverage. A uniform tax levied could, conceivably, be taken as an equal *ad valorem* rate. As a general principle, uniform *ad valorem* tax rates are desirable, as they do not distort relative prices as long as all goods are taxed. However, because alcoholic beverages as a group are taxed at a higher rate than most other goods, this general principle no longer holds. The problem becomes an issue in the theory of second best—that of raising a given amount of revenue by taxing alcohol while minimising the distortionary impact. This yields uniform tax rates only in special cases, such as zero cross-price elasticities.

Clements (1982) showed that uniform taxation of alcohol in Australia is not an unreasonable policy on efficiency grounds. He concludes that, “the uniform tax has almost as much merit as do the optimal taxes”. Furthermore, Clements found that a uniform tax on beer and spirits when the wine tax is constrained to equal zero, and a uniform tax when the cross-elasticities are set to zero, result in welfare costs of the same magnitude as that of the corresponding set of optimal taxes.

With a product of such varied qualities as wine, an *ad valorem* tax would have the same percentage price impact across all qualities of wines. From the overall point of view of the wine-making industry, a percentage of value tax would be the most uniform. It would also mean that there would be a greater capacity for raising revenue from premium wines if the market for these types was relatively unresponsive to price changes. On the other hand, an absolute tax per unit of volume (excise) would affect different qualities of wines (e.g., quality wine and bulk cask wines) differently. An excise tax would have a greater proportionate effect on the price of lower priced bulk wines and, hence, a greater impact on the irrigated wine grape industry. The bulk sector of the wine market is more price sensitive than the higher quality sector of the market. Thus, the consumption of lower quality wines would be more likely to respond to tax-induced price changes, a fact which makes taxes on such wines relatively undesirable from a revenue raising viewpoint.

In the following section, the main implications of a 10 per cent sales tax on wine at the wholesale level are presented. The level of a 10 per cent sales tax was chosen for simplicity. The implications for other tax rates can be broadly calculated *pro rata*, provided that the rates are not too widely divergent from the basic 10 per cent rate.

3. Impact of a Wine Tax on Consumption and Prices

The overall demand for alcoholic beverages is generally considered to be relatively unresponsive to price changes since there are no close substitutes for alcohol as such. However, individual alcoholic beverages substitute for each other and, thus, are more responsive to price changes than is the demand for total alcohol.

Tsolakis *et al.* (1983) indicated that the demand for wine is relatively unresponsive in the first year after a price change (a 10 per cent increase in price would result in about a 4 per cent decline in wine consumption) but is

much more responsive in the longer term (2–3 years after the price change). In the longer term, a 10 per cent increase in price would result in approximately a 14 per cent decline in wine consumption.

A tax which substantially reduces consumption might be expected to have the following effects (BAE 1976):

- a reduction in the incomes of all those engaged in the production and marketing of wine and its inputs (especially grapes);
- a consequent reduction in the value of fixed assets committed to the production of wine and of inputs used in wine production;
- a reallocation of resources from wine and grape production to other productive activities, resulting most likely in a reduced overall value of output from the resources over which the private sector has command;
- some increase in consumption and production or imports of other goods and services, particularly those with which wine is most immediately competitive (i.e., other beverages) in the market-place;
- a possible reduction in the real incomes of wine consumers; and
- an increase in the supply of public sector goods and services.

The level of the marketing chain at which a tax is levied is not the final determinant of who ultimately pays the tax. While a tax collected at the wholesale level means wholesalers pay the levy, they may be in a position to pass part or all of the tax on to retailers and consumers or back to wineries and growers. The full impact of the tax takes quite some time to work through the market. But, ultimately, in a competitive market, it is the relative responsiveness of supply and demand to price changes at different levels in the market which determines where the tax burden finally falls.

Unfortunately, estimates of the responsiveness of wine supply to price changes are not available. However, for the purpose of this analysis, it is probably reasonable to hypothesise that the wine supply response to a price change emanating from the imposition of a sales tax is similar to that of the consumption response in the short run (one year). A similar responsiveness of wine supply to price changes in the short run was assumed by George (1974). On the demand side, the measures of the responsiveness of demand obtained from earlier research (Tsolakis *et al.* 1983) are used.² As shown in Figure 1, under this hypothesis and assuming a perfectly competitive market, the tax imposed would be shared equally by wine consumers and wine makers.³ Therefore, the price of wine to the consumer would be expected to increase by about half the amount of the tax, while the price received by wine makers would be expected to decline by about half the amount of the tax. In this case, the response of consumption to the imposition of a tax would be approximately half of that expected if all of the tax were passed on to consumers.

² A sensitivity analysis of the results contained in the paper was performed using a range of supply and demand elasticities. For the short-term elasticities, the range—in absolute terms—was 0.2 to 0.6 for both supply and demand, while the long-term elasticities assumed were 0.6 to 1.0 for supply and –1.2 to –1.6 for demand. The results of the sensitivity are reported later in the paper.

³ The downward shift in the demand curve means that the tax is imposed on consumers. The result will be exactly the same if the tax is imposed on producers, except that the supply curve shifts up.

Tsolakis *et al.* (1983) showed that demand for wine is more responsive to price changes in the longer term (2–3 years) than in the short-term. It is also reasonable to expect that the supply of wine is more responsive to price changes in the longer term than in the short-term. Further, it is assumed that the demand for wine in the longer term is much more responsive to price changes than is the supply of wine. Under these conditions, the incidence of a tax is likely to be quite different from that in the short-run. As indicated in Figure 2, the suppliers of wine would absorb the major share of the tax, and wine prices to consumers would increase only moderately. However, because wine demand in this case is very responsive to price changes, this moderate increase in prices to consumers might mean an even greater decline in the consumption of wine than in the case of an equally shared tax presented in Figure 1.

The analysis in this article does not seek to forecast the actual level of price, supply or demand. In the long term, these will be affected by many factors such as income and technological change. This analysis seeks only to isolate the impact of a tax-induced price change on the actual incidence of tax.

The main implications of such price changes would be a loss to consumers due to increased tax rates and reduced turnover to wine makers due to lower prices received and reduced quantities sold. Considering that the wine making industry is highly competitive and profit margins are relatively low (personal communication with the industry), much of the wine producers' share of the tax would be passed back to grape growers, in particular to growers who specialise in wine grapes which have very limited alternative uses.

4. Implications for Government Revenue

Revenue collected from the imposition of a sales tax depends directly on the rate of tax and the amount of expenditure on the commodity consumed. Therefore, both changes in price and consumption would affect revenue collected from a sales tax. What is of interest is the combined effect of price and consumption changes. It should be pointed out that the analysis in this section assumes that, due to a sales tax, wine prices would increase relative to prices of beer and spirits and that the new relativities would be maintained for a number of years. In the case of a 10 per cent sales tax on wine, the price of wine in the short-run could increase by about 5 per cent, while the other 5 per cent would be absorbed by wine makers. This is consistent with the hypothesis discussed in the previous section that the tax imposed would be shared equally by wine consumers and wine makers. BAE research suggests that a 5 per cent relative wine price rise would result in a short-term (first year) decrease in consumption of about 2 per cent. The government revenue in the first year after the imposition of the 10 per cent sales tax would be about \$50 million. This estimate is based on a tax rate of 19 cents per litre of wine, which is 10 per cent of an average wholesale wine price of \$1.90 per litre in 1981–82 prices, and total consumption of about 270 megalitres a year.

With the continuation of a 10 per cent tax rate, a further 3–5 per cent decline in consumption would be expected over the ensuing 12–18 months. This range estimate assumes that a 10 per cent increase in the relative price of wine would be expected to lead to an increase in the supply of wine of somewhere between 4 per cent and 8 per cent. Because of the cumulative 5–7 per cent

decline in wine consumption, government revenue would tend toward the minimum level of about \$48.7 million to \$47.7 million in the second year and it would remain at approximately this level in the following years, all other factors remaining unchanged. The application of sensitivity analysis of different elasticity estimates resulted in only marginal changes to the revenue estimates for both the short- and longer term.

Because of the substitution effects between alcoholic beverages, a wine tax would be expected to result in increased consumption of beer and spirits and thus extra revenue from taxes on these beverages. Initial estimates by Tsolakis *et al.* (1983) indicate that a 5 per cent increase in wine prices relative to beer prices would increase beer consumption by about 2 per cent a year, which would increase beer sales by about 40 megalitres. This means that additional revenue from the beer excise of about \$20 million would be collected. However, it is rather difficult to establish, from the available cross-price elasticity estimates the extent to which wine and beer substitute for each other. From further estimates in the same paper, the authors were unable to confirm the existence of such a relationship using an alternative econometric specification.

This type of inconsistency in the estimation of elasticities of substitution has been a problem in other research. A strong relationship between wine and beer consumption was suggested by Murphy (1981), but his demand cross-price elasticity estimates appear to be unrealistically high. Further, little confidence can be placed on this estimate because the large number of parameters estimated using a limited data set means that it is very difficult to establish statistical significance for the estimated coefficient. Research by Clements and Johnson (1982), on the other hand, indicates that wine and beer are complements.

Due to data inadequacies, it has not been possible to obtain estimates of the effect of wine price changes on the consumption of spirits. However, the results of two recent studies on the demand for alcoholic beverages (Murphy 1981; Clements and Johnson 1982) indicate that wine and spirits are substitutable to a certain extent. This means that, if wine prices were to increase relative to spirit prices, there would be some switching back to spirit consumption and, thus, extra revenue would accrue to the Government from the excise and sales tax on spirits.

In summary, the total increase in government revenue from a 10 per cent sales tax on wine would be of the order of \$70 million in the first year, declining to a somewhat lower level in the longer term. This revenue would amount to less than a 1 per cent increase in government revenue from all indirect taxes.

The levels of government revenue estimated in this section represent gross revenue, and no account is taken of:

- the costs associated with the collection of such revenue;
- the reduction in income and company tax collected from grapes and wine producers; and
- the possible external benefits associated with reduced alcohol consumption.

Additionally, the net revenue collected from a sales tax on wine would depend on the level of costs incurred because of the need for adjustment in the grape growing and wine making industries. The extent of this adjustment, as discussed later, would depend on the magnitude of the tax imposed and the very limited profitable alternatives to wine grape growing. The adjustment costs are very difficult to quantify at this stage. However, it could involve a considerable government expense which has to be carefully considered against the revenue raising ability of a wine tax.

5. Implications for the Wine Marketing Sector

Of concern to many in the wine marketing sector is the impact of a tax on wine on throughput and sales turnover. It is estimated that a 10 per cent sales tax on wine would reduce turnover in the wine marketing sector by about 7 per cent (approximately \$36 million). Of this, a decline of about 4 per cent could be expected from reduced prices due to the tax share absorbed by the wine industry, while a 3 per cent decline could be expected from reduced sales of wine due to the tax share passed on to consumers. On the other hand, beer turnover could increase by about 2 per cent (\$34 million). Spirits turnover could also increase. Overall, the total turnover of alcoholic beverages resulting from a 10 per cent sales tax on wine could be expected to remain about the same. However, the relative changes in sales could affect wholesalers and retailers markedly.

Any relative tax-induced price change would result in changes of turnover between different beverages. Marketers, for example, who specialize in marketing beer and spirits (e.g., hoteliers) would be expected to increase their turnover if there were a sales tax on wine, due to increase sales of beer and spirits. Brewers and distillers would also be expected to increase their sales. On the other hand, wineries and establishments which specialise more in marketing wine (e.g., restaurants) would be expected to face reduced turnover. This might involve reduced profits and employment opportunities in the wine industry and lower utilisation of fixed resources (i.e., wine making equipment and storage facilities). Undoubtedly, a wine tax would result in a shift in relative returns and profitability in favour of the manufacturing and marketing of beer and spirits.

6. Implications for the Grape Growing Industry

The major effect on the grape growing industry of a sales tax on wine would be a reduced winery intake. A decline of about 5-7 per cent in wine sales would lead to a reduced winery intake of approximately 25-35 kt of grapes a year. However, the actual decline in winery intake might be even greater if consideration were given to the likely adjustments in winery stocks undertaken to maintain the stocks-to-sales ratios. A reduction in winery intake of 25-35 kt of grapes would lead to reduced grower incomes of the order of \$5 million to \$7 million at 1980-81 prices. (The sensitivity analysis referred to earlier indicates a reduction in winery intake of about 22-44 kt of grapes,

which in turn reduces grower incomes by about \$4 million to \$8 million). From the experience of the early 1970s (Grant 1972), this would be borne mostly by individual private growers rather than by vineyards associated with the large wineries because wineries are expected to use their own grapes first. In 1979–80, the total winery intake of 538 kt was made up of 104 kt of self-grown grapes and 434 kt of bought-in grapes. Assuming that any decline in winery intake would directly affect the bought-in grapes, a sales tax on wine would have the greatest impact on this sector of the industry.

Any surplus of wine grapes would place pressure on the minimum pricing legislation for grapes, which could lead to decreases in minimum prices in real terms and thus reduce the profitability of private grape growers. If no downward adjustment in minimum wine grape prices occurred, the tendency toward wine grape surpluses would be exacerbated. It is also likely that greater integration of wineries into grape growing would eventuate, which could lead to exits of private growers from the wine grape industry. However, these exits would be relatively slow and difficult because of the depressed outlook and/or limited profitability of alternative enterprises (e.g., canning fruit, citrus and dried vine fruit). They would also be undesirable from an economic efficiency viewpoint because one of the main alternative enterprises, citrus, is regarded as a high assistance industry. Imposition of a tax on wine would force the industry to undergo a phase of adjustment which would be difficult for certain sectors of the wine marketing, wine making and wine grape growing industries. However, over the longer term, a tax would not necessarily alter the impact of other factors affecting the demand for wine (e.g. income and taste factors). Rather, it would slow the pace of growth of wine sales in the overall alcoholic beverages market, after causing a jolt in the short-term. The final impact would depend on the size of the tax and on how much such a tax affected relative prices in the alcoholic beverages market.

7. Concluding Comments

In this article, the impact and incidence of a tax-induced price change and the main implications of a hypothetical sales tax on wine for various sectors of the wine marketing, wine making and wine grape growing industries were considered. It was shown that the level in the marketing chain at which a tax is levied is not the final determinant of who ultimately pays the tax. In a competitive market, the relative responsiveness of supply and demand to price changes at different levels in the market determines where the tax burden finally falls. The imposition of a tax on wine might force certain sectors of the wine marketing, wine making and wine grape growing industries to undergo a phase of adjustment. However, over the longer term, a tax would not necessarily alter the impact of other factors affecting the demand for wine (e.g., income, consumer tastes and preferences). The final impact would depend on the form of the tax, the magnitude of the tax and on how much such a tax affects relative prices in the alcoholic beverages market.

A sales tax on wine of similar overall incidence to that of an excise would reduce total wine sales by less than would an excise duty, and hence it would be preferable from a revenue raising viewpoint. This is because a sales tax would fall more heavily on the sectors of the industry supplying the

relatively price insensitive 'quality' bottle sector of the wine market. A sales tax would also be preferable, from the Government's point of view, due to the fact that it would adjust automatically over time. This can be important at times of general inflation. By contrast, the net revenue from an excise, if not adjusted regularly, would tend to decline relative to the value of the wine.

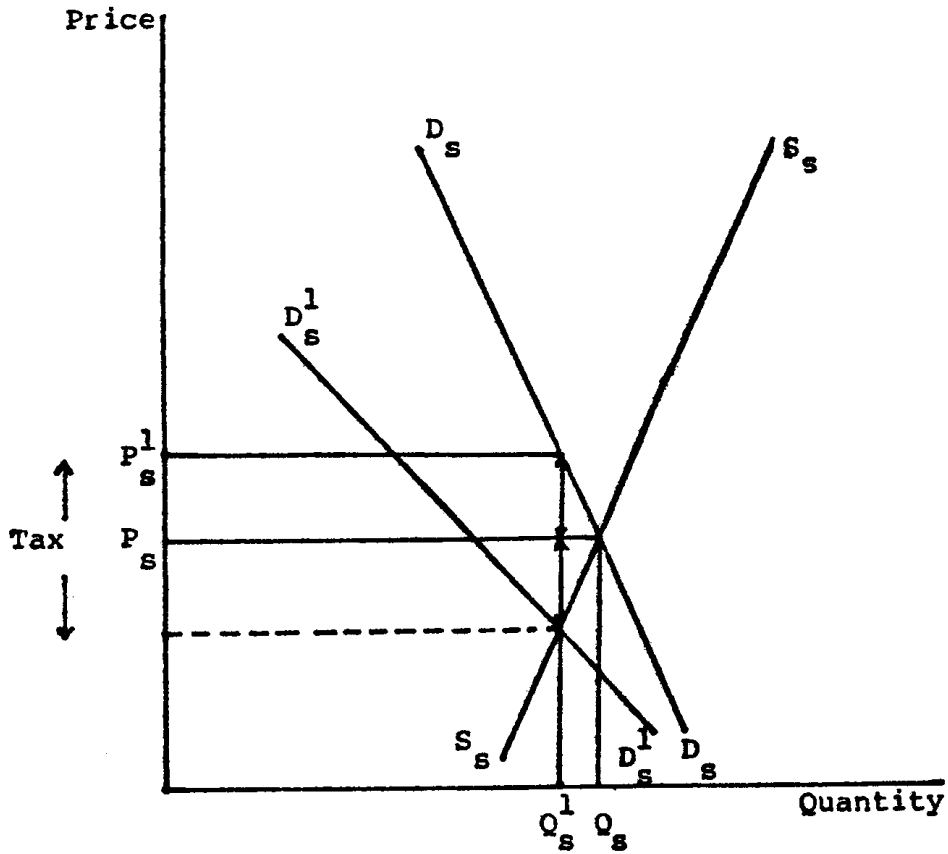
If it were decided that additional taxes should be levied on wine, the effects on wine sales and on the grape growing industry could be reduced, in the short-run, by phasing in the tax over several years. In that way, the adjustment pressures would be less in the short term, and valuable time would be given to wine makers and grape growers to adjust to a long-term situation.

If additional taxes on wine took the form of a 10 per cent sales tax, government revenue could be expected to increase by about \$70 million a year. However, the realised net revenue would critically depend on the costs incurred by the Government in meeting possible adjustment in the grape growing and wine making industries. Adjustment costs could be significant, as most alternative crops (especially in the irrigated areas) are presently being subjected to extreme adjustment pressures, and their profitability is very limited.

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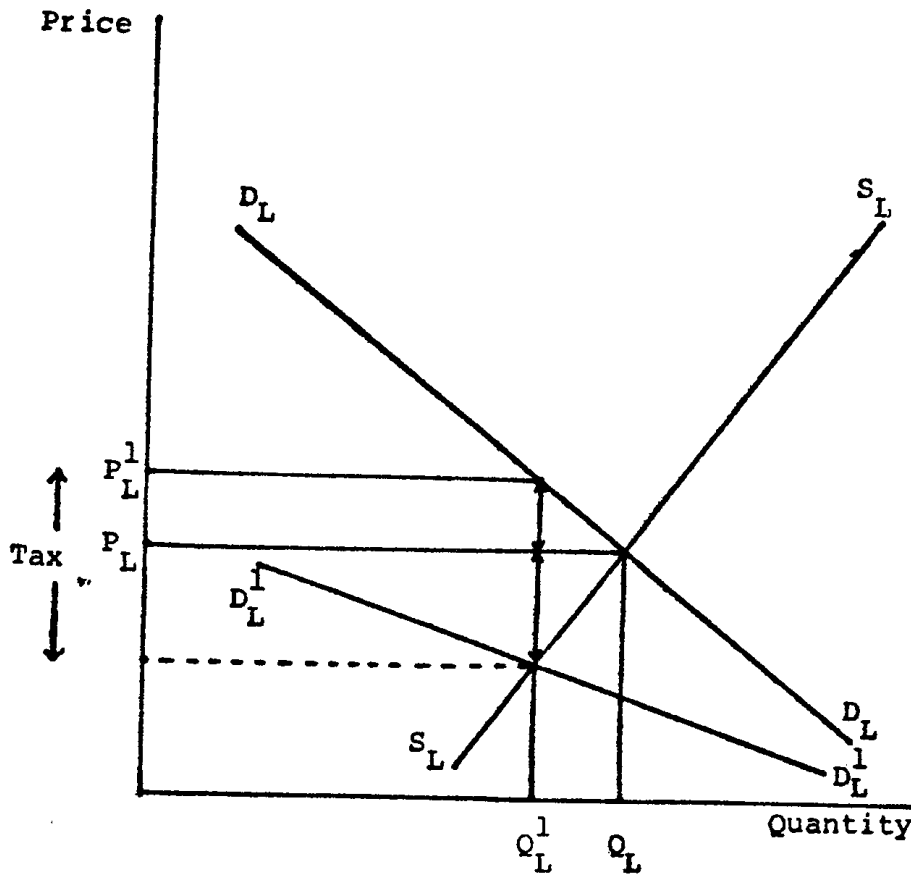
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Figure 1: Short-Run Effects of the Incidence of a Tax on Wine



- S_s represents the short-run supply of wine
- D_s represents the short-run demand for wine before tax
- D_s^1 represents the short-run demand for wine after tax
- P_s is the price of wine to the consumer before tax
- P_s^1 is the price of wine to the consumer after tax
- Q_s is the quantity of wine demanded before tax
- Q_s^1 is the quantity of wine demanded after tax.

Figure 2: Long-Run Effects of the Incidence of a Tax on wine



- S_L represents the long-run supply of wine
- D_L represents the long-run demand for wine before tax
- D_L^1 represents the long-run demand for wine after tax
- P_L is the price of wine to the consumer before tax
- P_L^1 is the price of wine to the consumer after tax
- Q_L is the quantity of wine demanded before tax
- Q_L^1 is the quantity of wine demanded after tax