The Effect of an Increase in "Sin Taxes" on the Market Value of Alcohol Stock

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Abstract

The Omnibus Budget Reconciliation Act of 1990 imposed an increase in excise taxes on alcohol, a $1.00 increase on a proof gallon of distilled spirits, a $9.00 increase in the tax on a barrel of beer, and a $.90 increase on a wine gallon. Previous research has concluded that despite the addictive nature of alcohol, the demand for alcohol is not price inelastic. Thus, the expectation was that the prices of stocks in the alcohol industry should drop as a result of the passage of this act. A standard event methodology was employed. While some decrease in stock price was detected when agreement was reached by the House and Senate the decrease was not significant. Other possible event dates showed positive price movements but these were also insignificant. Thus, it would appear that the market thought that the tax was not high enough to cause a change in consumer behavior.

Introduction

The Omnibus Budget Reconciliation Act of 1990 (herein after called the 1990 Act) was Congress' latest attempt to rid the country of its budget deficit. Under this act, a combination of increased taxes, cuts in domestic spending, and cuts in entitlement programs is being used to decrease the deficit. A form of tax revenue increase that became a part of the 1990 Act is an increase in certain excise taxes. This paper describes a study that examines the effects of the increase of certain excise taxes on the corporate share prices of one of the industries affected by those increases.

The study was based on an assumption that an increase in excise tax rates for alcohol will reduce the consumption of each and thereby reduce the profits of the alcohol industry. The study also assumed that the market is efficient and will impound this information into prices of alcohol industry stock.

Excise Taxes

Taxes imposed on only a selected number of commodities (alcohol, gasoline, airplane tickets, tires, fishing equipment) are referred to as excise taxes. Several of the excise taxes are supposedly imposed to compensate for social costs imposed on society (hence, the name "sin taxes"). Other excise taxes are said to charge those who benefit from consumption (i.e., gasoline excise tax is used to fund highway construction). A more rational explanation for the existence of many excise taxes is that they are good revenue producers (Sommerfeld et al., 1989). Another attraction of excise taxes in their low administrative cost relative to the revenue they can generate.

Federal excise tax rates tend to fluctuate with the revenue requirements of the government corresponding to alternating periods of war and peace. The excise tax of distilled spirits was repealed in 1802 and reinstated briefly during the War of 1812. It was imposed again during the Civil War and, except for the period of the Prohibition, has remained in place since then. The excise tax rates on distilled spirits and wine were increased three times during World War I, four times during World War II and again during the Korean War (Godfrey 1990).

Federal excise tax rates on distilled spirits, beer, and wine products had remained constant in nominal terms between November 1, 1951 and the end of fiscal 1985 (Coate and Grossman 1988). Because excise taxes on alcohol are unit rather than ad valorem taxes (tax on the number of units sold rather than the value of the units), inflation reduces the real tax rates relative to price when taxes are not changed at least as much as the general inflation rate.

The 1990 Act

The 1990 Act made the following changes to the excise tax rates on alcohol products. The excise tax on distilled spirits was raised from $12.50 per proof gallon to $13.50 per proof gallon. The excise tax on beer was doubled from $9.00 per barrel to $18.00 per barrel, generally. The excise tax on wine was increased $0.90 per wine gallon.

Small wineries and micro-breweries enjoy special credits. If a winery produces no more than 250,000 gallons a year, the credit is equal to 90 cents per wine gallon on the first 150,000 wine gallons of wine other than champagne and sparkling wines. The credit is phased out by 1 percent for each 1,000 wine gallons of wine produced in excess of 150,000 wine gallons. For breweries that produce less than 2 million barrels a year, the producer can pay $7 on each of the first 60,000 barrels of beer produced. The wineries eligible for these exemptions were dropped from the study. Table 1 shows the excise tax rates that existed before the 1990 Act and the excise tax rates that were imposed as of January 1, 1991.

Prior Research

Market Studies

Research related to the security-market impact of tax changes has been limited. Among the studies that have examined market behavior in response to tax changes are Bathke, Rogers, and Stern (1985), Madeo and Pincus (1985), Manegold and Karlinsky, (1988). Bathke, Rogers, and Stern (1985) examined the impact of flower bonds used in estate planning. These laws caused market responses that affected investor wealth in a manner not intended by Congress. Madeo and Pincus (1985) analyzed stock market behavior when Revenue Procedure 80-55 disallowed certain interest deductions claimed by banks. Their research demonstrated the "potential usefulness of stock market data to measure the impact of tax regulation when affected parties are publicly traded firms" (p. 408). Manegold and Karlinsky (1988) analyzed the market impact of the Possessions Corporation (PC) tax changes in the Tax Equity and Fiscal Responsibility Act of 1982. They found a significant relationship between a company's cumulative market reaction and its previous use of PC benefits.

Price Elasticity of Demand for Alcohol

Elasticity is a measure of the degree of responsiveness of demand to a change in price (percent change in demand for a good divided by the percent change in the price of the good). Despite the addictive nature of alcohol consumption, the demand is not inelastic. Researchers have estimated the price elasticity of demand for alcohol to range from .0 to -2.0 (Cook & Tauchen 1982).

Evidence indicates that even heavy drinkers' consumption is responsive to changes in alcohol prices. Cook and Tauchen (1982) estimated that an increase in liquor excise tax by one dollar per proof gallon reduces liver

Table 1

Excise Tax Provisions
Distilled Spirits, Beer, and Wine

	Old Law	New Law
Distilled spirits	$12.50/proof gal.	$13.50/proof gal.
Beer	$ 9.00/barrel*	$18.00/barrel
Still wines		
Up to 14% alcohol	$ 0.17/wine gal.	$ 1.07/wine gal.
14 to 21% alcohol	$ 0.67/wine gal.	$ 1.57/wine gal.
21 to 24% alcohol	$ 2.25/wine gal.	$ 3.15/wine gal.
Artificially carbonated	$ 2.40/wine gal.	$ 3.30/wine gal.

*The tax rate is $7.00/barrel for certain producers.

cirrhosis (their surrogate for prevalence of chronic excess consumption) by 5.4 percent in a period less than ten years and by as much as 10.8 percent in a ten year or longer period of time. The time span for reaction is broad because of the lag in the onset of heavy drinking and the outbreak of cirrhosis. Coate and Grossman (1988) showed that excess consumption of beer by sixteen through twenty-one-year-olds is inversely related to the real price of beer. Thus, excise taxes have the potential to simultaneously raise revenue and improve public health.

Hypothesis

Given that the demand for alcohol is not inelastic, and given an efficient market the expectation is that the prices of stocks whose primary business is alcohol production should be revised downward at the time information concerning an increase in excess taxes is publicly disclosed. According to economic theory, an increase in the price of a product should decrease demand unless the demand for the product is inelastic. Decreased demand leads to decrease in profits. Future cash flow and price expectations should, therefore, decrease.

From July through September Anheuser-Busch ran radio and television spots and helped organize a toll-free number through which taxpayers could send mailgrams to lawmakers expressing opposition to a beer tax hike. These efforts trailed off after the summit package was announced on September 30, 1990. This lobbying on the part of the alcohol industry shows that a substantial financial impact was anticipated by this industry.

Because an increase in excise tax rates for alcohol is posited to reduce consumption, the profits of the alcohol industry should be affected. If the market is efficient, it should impound the information about the impending loss of revenue for the alcohol firms and lower the value of affected stocks. The hypothesis tested in alternate form is:

H_a: Stock prices of firms in the alcohol industry will decrease as a result of the 1990 Act.

Research Design and Sample Selection

An event study is used to detect the security-market impact of the 1990 Act on the alcohol industry. Event studies are used to analyze the impact of economic events that, on an ex ante basis, are expected to affect a set of companies (Manegold and Karlinsky 1988).

Since the 1990 Act, like all tax legislation, was the result of a political process, problems exist in identifying relevant dates. These problems arise because tax law changes follow a legislative process which includes public hearings, committee reports, floor discussions, votes by both legislative bodies, and action by the executive branch (Omer and Shaw, 1991). This study considers both deliberation period effects and specific announcement date effects.

Identification of Event Dates

Daily Tax Reports on Westlaw, and issues of *Tax Notes* were examined to identify relevant event dates for the 1990 Act. The first date on which excise taxes were discussed in the media in 1990 was March 11. On that day House Ways and Means Chairman Dan Rostenkowski, put forth the "Rostenkowski Challenge", a five year package of spending cuts that included rate increases for cigarettes, and doubling the rate for beer and wine (Godfrey 1990).

On July 11, 1990 the Joint Committee on Taxation released the "Description of Revenue Reconciliation Proposal By Chairman Rostenkowski." This description of the revenue reconciliation proposal gave an estimate of the effect of this proposal on the budget. The House Ways and Means Committee used this proposal as a starting point in drafting a tax increase bill (Joint Committee on Taxation, 1990).

A Budget Summit Agreement was reached on September 30, 1990. This agreement proposed to raise $15.9 billion dollars in revenue through excise taxes on alcohol over a period of five years ($2.1 billion in 1991).

On October 10, 1990 the House Ways and Means Committee reported H.R. 5835 (amended on October 11, 1990). The Senate Finance Committee approved a budget proposal (S. 3209) on October 13, 1990. On October 16, 1990 the House passed H.R. 5835 and the Senate passed S. 3209 on October 19, 1990. Because of the overlapping of event windows in the period October 10 through October 19, the events in this period are viewed as one event period.

On October 26, 1990 H.R. 5835 Omnibus Budget Reconciliation Act of 1990 was agreed to by Conferees. The Conference Report was agreed to by the House and Senate on October 27, 1990. On November 5, 1990 the Omnibus Budget Reconciliation Act of 1990 was signed into law. A list of event dates appears in Appendix A.

Confounding Events

Confounding events threaten the internal validity of a study. Possible confounding events include not only company specific events such as earnings announcements, but since this study is industry specific confounding events also include events that could impact the industry. These events include new or closing markets, raw material shortages, or in the case of this particular industry new laws or movements to curb product usage. In addition, the concern also exists that other parts of the Act may effect the industry in some manner unrelated to the event being studied.

The Act was analyzed and other than the excise tax itself no other aspects of the Act should have impacted the alcohol industry. The *Dow-Jones News Retrieval Service* and the *Wall Street Journal Index* were used to determine if other confounding events may have occurred on any of the event dates or event periods under review. No confounding events were found during any of the event windows.

Sample Selection

A list of firms having the SIC codes for the alcohol industry were taken from the *Million Dollar Directory*. This directory, published by Dun's Marketing Services (1991), includes America's leading public and private companies. There were 109 firms listed for the alcohol industry in the *Million Dollar Directory*. Most of firms in the directory are small wineries and not publicly traded. Next a list of firms included in the CRSP tapes were checked to determine which firms are listed on CRSP. CRSP covers stock traded on the NYSE, AMEX and NASDAQ. All alcohol firms not appearing on CRSP were dropped from the study. There were 17 firms remaining on the list. All the alcohol firms appearing on CRSP did not have complete data over all of the event windows. Those firms having incomplete information were dropped from the study. The final set contained eight alcohol firms. (See Appendix B for a list of the firms in the study.)

Methodology

Abnormal returns were calculated for each stock for each day during an event window. The event window contained the day before the relevant event, the day of the event and the day after the event. Abnormal returns for the days in the event window were summed to obtain the CARs for the event. The CARs for the alcohol industry were determined by calculating a mean CAR for the industry in the event window. The effects for each event window were analyzed using the method discussed in the next section. The basis for inference in event studies is typically the ratio of the mean excess return to its estimated standard deviation (Brown and Warner 1985).

The excess return for a security was calculated by subtracting from the actual return on day t the average return for the firm over some previous period. This method for calculating an excess return is outlined in Brown and Warner (1985):

Mean adjusted returns

$$A_{i,t} = R_{i,t} - R_i,$$

where $A_{i,t}$ is the excess return for security i at day t, $R_{i,t}$ is the observed return for security i at day t, and R_i is the simple average of security i's daily returns in the estimation period. The estimation period was from 1/2/90 through 3/1/90 or -100 to -10 days before the first event date.

The null hypothesis is that the mean event period excess return is equal to zero. The test statistic is the ratio of the CAR in the event period to its estimated standard deviation. The standard deviation was estimated by the procedure used in Leftwich (1981). The daily excess returns for the portfolio of 8 firms were calculated over a 42 day period prior to the first event date. The average of these firm excess returns for each day of the 42 day estimation period were use to calculate the portfolio standard deviation (σ_p). Like Leftwich, the daily excess returns are assumed to be serially independent. The standard error of the CAR of the portfolio for a particular event is equal to $\sigma_p \sqrt{N}$ where N is the number of days in the event window. In this study the test statistic is thus:

$$t = \frac{CAR_p}{\sigma_p \ x \ \sqrt{N}}$$

If abnormal returns are found around the event dates, the market has reacted to the probability that an increase in the excise taxes on alcohol will adversely effect the companies in the industry. That is, market reaction is consistent with the belief that the demand for alcohol is elastic.

Results and Conclusions

Results of the stock returns examined are shown in Table 2. None of the firms showed a significant reaction, at the traditional 5% level, to any of the events examined. The period October 25 - 29, 1990 had a mean cumulative abnormal return in the hypothesized direction. This window covered Congress' agreement upon and passing of the 1990 Act. However, a equally large and positive reaction is observable October 9 to October 22 window.

Several factors may have caused the lack of significant reaction to the events examined. One reason is that event dates -are miss-specified. Tax legislation is a political process very much in the public domain. When an agreement is finally reached the market may have already impounded the information. In some cases the bad news might be good news in the sense that reality was not as bad as anticipated. Another reason for the lack of abnormal returns may be the habitual nature of alcohol abuse. Adults may be much less sensitive to price than reported in some previous studies. In others words, the adult price elasticity is relatively small (inelastic) when the rationality of addiction is considered (Coate and Grossman 1988).

Suggestions For Future Research

Future attempts should be made to apply events study research methodology in examining the impact of federal tax law changes on the securities market. Many tax law changes are anticipated in 1993. Among them

Table 2

Results of T-test for Significance of Cumulative Abnormal Returns on Event Days

Event Window	Total Abnormal Return	Average Abnormal Return	CAR_p	t
3/9	.060641	.007580		
3/12	-.051822	-.006478	.007018	.351
3/13	.047328	.005916		
7/10	-.026236	-.003280		
7/11	.025746	.003218	.000008	.000
7/12	.000560	.000070		
9/28	-.048195	-.006024		
10/1	.051291	.006411	.013284	.664
10/2	.103177	.012897		
10/9	-.145520	-.018190		
10/10	-.029437	-.003680		
10/11	-.147480	-.018435		
10/12	.199397	.024925		
10/15	.089897	.011237	.043979	1.205
10/16	.021385	.002673		
10/17	-.040193	-.005024		
10/18	.103254	.012907		
10/19	.118673	.014834		
10/22	.181860	.022730		
10/25	-.097019	-.012127		
10/26	-.017679	-.002210	-.023473	-1.174
10/29	-.073088	-.009136		
11/2	.067264	.008408		
11/5	.022422	.002803	.012776	.639
11/6	.012517	.001565		

are increases in the tax on gasoline. Since this tax increase should be of a greater magnitude that the increase in tax on alcohol, it will provide an excellent opportunity for an event study of this nature.

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Appendix A

Relevant Event Dates

March 11, 1990	"Rostenkowski Challenge" five year package of spending cuts that included rate increases for cigarettes, beer and wine.
July 11, 1990	Joint Committee on Taxation released the "Description of Revenue Reconciliation Proposal By Chairman Rostenkowski"
September 30, 1990	Budget Summit Agreement
October 10, 1990	House Ways and Means Committee reports H.R. 5835. Amended on October 11, 1990.
October 13, 1990	Senate Finance Committee approved a budget proposal (S. 3209).
October 16, 1990	House passes H.R. 5835.
October 19, 1990	S. 3209 passed by the Senate.
October 26, 1990	H.R. 5835 Omnibus Budget Reconciliation Act of 1990, agreed to by Conferees.
October 27, 1990	Conference Report agreed to by House and Senate.
November 5, 1990	Omnibus Budget Reconciliation Act of 1990 signed into law.

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Appendix B

List of Firms in the Study

Anheuser Busch Cos. Inc.
Brown-Forman
Coors Adolph Co.
E R L Y Industries
Genesee Corp.
Glenmore
Midwest Grain Products Inc.
Penwest Ltd.