Vermont Legislative Research Shop

Potential Tax Revenue from Legalized Marijuana in Vermont

State tax revenue from the sale of legalized marijuana has only been seriously addressed by one reputable (peer-reviewed) study, "The Potential tax revenue from a regulated marijuana market: a meaningful revenue source?" by Michael Caputo and Brian J. Ostrom.[1] Caputo and Ostrom suggest using an estimate of the demand for marijuana to determine possible tax revenue. Our report examines these findings, and uses the methods proposed by Caputo and Ostrom to estimate potential tax revenue from legalized marijuana sales in Vermont. Using the National Household Survey on Drug Use and Health, we estimated the number of Vermonters who had smoked marijuana in the past year. Using this figure as an indication of annual users, we can estimate annual state tax revenue for a range of possible retail prices and usage rates.

Creating a Reliable Estimate

There are two schools of thought on creating a reliable estimate of the potential tax revenue from legalizing marijuana. One is based on demand while the other is based on supply. In their 1994 study Michael Caputo and Brian J. Ostrom argue that to develop a conservative and realistic estimate of the potential tax revenue, it is better to look at the demand for marijuana instead of looking at supply. "In 1982, the Drug Enforcement Administration (DEA) seized a total of 2,035 metric tons of marijuana. It estimated that this figure represents 10-15 % of the total traffic in illicit marijuana sales which, assuming a 15 % seizure rate, implies total 1982 consumption of 13,567 metric tons."[2] Although this data is over 25 years old, there is little to suggest any serious change in usage rates since 1982. This was close to the estimate released by the National Narcotics Intelligence Consumers Committee (NNICC). The validity of the supply estimates was disputed because "[t]o generate a consumption of 13,567 metric tons would entail 38 million people smoking one gram each, 365 days a year."[3] These supply figures imply a larger number of users than what was produced by any valid research on the number of regular users. The most valid source of research on the number of regular users is the National Survey on Drug Use and

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[1] Caputo, M.R. and B.J. Ostrom. 1994. "The Potential tax revenue from a regulated marijuana market: a meaningful

Health by the U.S. Department of Health & Human Services. According to the 2006 survey, 14.8 million people aged 12 and older had used marijuana in the past month.[4]

Caputo and Ostrom argued that the demand estimate is legitimate as well as realistic in comparison to an estimate created from the supply perspective, even though there is limited data on the subject of estimates because marijuana is currently illegal in the United States. The evidence they have to support this claim comes from the 1991 tax revenue figures generated by the tobacco industry, which was $11 billion as well as the 1991 tax revenue generated by the alcohol industry, which was $10.9 billion. Based on the research on a legal marijuana market, the potential tax revenue should be very similar to the revenue generated from the tobacco and alcohol industries because they would operate under the same tax structure. In addition, the similar production processes for marijuana and tobacco also increase the possibility that the tax revenue from marijuana will be comparable to the tax revenue from tobacco. This conjecture is supported by a 1990 estimate that stipulated that national retail sales of marijuana in the black market were around 8.8 billion dollars. [5]

Sales and Production Costs of Marijuana

Estimates of production and selling costs are necessary in order to develop the potential tax revenue under regulation. The production cost for marijuana would actually be slightly lower than that of tobacco, because there is no need to roll and place a filter on the marijuana. There is, however, a possibility that in conjunction with the legalization of marijuana, health and safety concerns could lead to the requirement of a filter on the marijuana product. The authors also stress the fact that the tax revenue figures that they calculate are based specifically on the recreational use of marijuana.[6]

The numbers from the tobacco industry indicate that, "an average cost to produce and sell a pound of marijuana is $1.00 and $1.07 for 1988 and 1991. This contrasts sharply with the average price per pound of marijuana paid by the final consumer of roughly $1,800 in 1988 and $3,000 in 1991, and suggests that current black market prices are an enormous 1,800 times and 2,800 times greater than what marginal cost would probably be in a legal market."[7] The results of the potential tax revenue created by the authors were, "the cost of bringing the 1988 5.04-6.45 billion dollar marijuana crop to consumers when legalized would be 3.25 million dollars, leaving 5.04-6.45 billion dollars as the possible tax revenue available to the national government."[8] The roughly 5-6 billion dollars is the maximum amount of revenue that the government could tax if

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[4] United States Department of Health and Human Services, "Office of Applied Studies, Results from the 2006 National Survey on Drug Use and Health: National Findings " retrieved March 3, 2008 from
http://www.oas.samhsa.gov/NSDUH/2k6NSDUH/2k6Results.cfm#Fig2-2
[5] United States Department of Health and Human Services, "Office of Applied Studies, Results from the 2006 National Survey on Drug Use and Health: National Findings ."
[6] Caputo, M.R. and B.J. Ostrom. 1994. "The Potential tax revenue from a regulated marijuana market: a meaningful revenue source." American Journal of Economics and Sociology, Inc. from
http://findarticles.com/p/articles/mi_m0254/is_n4_v53/ai_16433984 retrieved on March 3, 2008
[7] Caputo, M.R. and B.J. Ostrom, "The Potential tax revenue from a regulated marijuana market: a meaningful revenue source."
[8] Caputo, M.R. and B.J. Ostrom, "The Potential tax revenue from a regulated marijuana market: a meaningful revenue source."

the government is able to keep retail prices high through high taxation on marijuana. The same rate was seen in 1991 and led to the conclusion that the total retail value of marijuana is identical to its potential tax revenue because of the crop's low cost of production.

Factors That May Affect the Potential Tax Revenue

There are three main factors that could affect tax revenue: personal marijuana cultivation in individual homes, continued dealing within the black market and interstate smuggling. All of these factors are detrimental to the potential tax revenue because they are economic transactions occurring outside the realm of the excise tax structure. When taking these factors in to consideration, Caputo and Ostrom propose, "If it is assumed that home cultivation and the continuing existence of a limited black market might reduce the government's tax revenue by, say, 25%, then total estimate tax revenue would be 3.78 to 4.84 billion dollars in 1988 and 3.82 to 6.82 billion dollars in 1991."[9]
Since marijuana taxes would be similar to the sales tax on cigarettes, the smuggling rates for cigarettes can be applied to what might be seen for marijuana. A study from 1991 shows that smuggled cigarettes from low tax states to high tax states accounts for 3% to 4% of total cigarettes purchased in the United States. [10]

Issues Not Addressed by the Study

It is important to examine the broad range of benefits and costs associated with a regulated marijuana market. Some of these issues are "the uncertainty about health and developmental consequences, the social costs of prosecuting otherwise law-abiding citizens, and questions concerning the eventual marketing of the drug (who can buy, what potency, should advertising be allowed, etc.)..."[11]

Potential Tax Revenue from "Spin-Off" Industries

Two additional economic benefits of a legal marijuana market include the potential increase in tourism as well as the creation of new industries such as Amsterdam-style coffeehouses, industrial hemp, and paraphernalia. Although we could not find reputable studies pertaining to increased revenue from "spin-off" industries, the existence of such industries in areas where marijuana is legal suggests that those industries would likely follow from a policy of legalized marijuana.

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[9] Caputo, M.R. and B.J. Ostrom, "The Potential tax revenue from a regulated marijuana market: a meaningful revenue source."
[10] Thursby, Marie & Jensen, Richard & Thursby, Jerry, 1991. "Smuggling, Camouflaging, and Market Structure," *The Quarterly Journal of Economics*, MIT Press, vol. 106(3), pages 789-814, August..
[11] Caputo, M.R. and B.J. Ostrom. 1994. "The Potential tax revenue from a regulated marijuana market: a meaningful revenue source." American Journal of Economics and Sociology, Inc. from http://findarticles.com/p/articles/mi_m0254/is_n4_v53/ai_16433984 retrieved on March 3, 2008

Marijuana use in Vermont

As introduced in March 2005, Vermont bill H.390 outlines an approach to regulating and taxing marijuana. By decriminalizing the possession of less than one ounce of marijuana in non-public places for those 21 and older, Vermont would eliminate expenditures on prosecution and incarceration for marijuana related crimes. The bill included that revenue from licensing marijuana sellers and marijuana taxes could go to drug, alcohol and tobacco prevention and treatment. [12]

Under current Vermont law, possession of two ounces of marijuana or less is a misdemeanor and is punishable with a $500 fine or six months in prison. A bill that was given preliminary approval by the Vermont Senate on February 14, 2008, aims to change this. It would allow people caught with an ounce or less of marijuana to pay a $500 fine or go through the court diversion program.[13]

Vermont cigarette tax (about 1/3 of retail price)[19], we can estimate tax revenue for a range of possible usage rates and retail prices.

In the absence of reliable data regarding usage rates and prices, we rely on several assumptions to estimate potential tax revenue. About 53,000 Vermonters over 18 smoked marijuana in the past year.[20] Of those, we assume an average consumption rate of anywhere from one half gram per week to twenty grams per week. This covers a range of usage rates; one half gram per week describes the user who smokes about one joint every two weeks, whereas twenty grams per week describes the user who smokes just under three joints a day. Anecdotal evidence indicates that one half gram per week is a low estimate and 20 grams per week is a high estimate. There are, however, instances of individual users at both extremes. The average would most likely fall somewhere between these figures.

If marijuana was legalized, a wide range of possible retail prices could exist. Retail price would not likely exceed current street price, for this would stimulate a black market. $200 for a 20-gram "pack" ($10 per gram, an approximate current street price), is thus the high end of our range. It is also unlikely that a legislature would allow for legal marijuana to be sold for a mere fraction of its current street price for fear of both enticing current users to increase consumption and possibly attracting new users who had been previ

Although Table 1 provides a wide range of possible revenue figures, our model cannot be assumed to be entirely accurate. We use the flat Vermont cigarette tax ($1.79 per pack) and the average retail price of a pack of cigarettes in Vermont ($5.30) to determine that the current cigarette tax constitutes roughly 1/3 of the retail price. We then use this figure to determine, given a range of possible retail prices, what the proportion of tax revenue would be. Yet if marijuana tax is only 1/3 of retail price, and 20 grams costs only $2.28 to produce, retail prices in excess of $10 could not be sustained in an open market. With such low production cost, competition would invariably drive prices down, eventually leveling out with current cigarette prices. Given a legislature's probable aversion to selling marijuana at such cheap (viz. current street price), a marijuana tax will probably be considerably higher than a cigarette tax. If we are right to assume that marijuana legislation will strive to keep prices close to current street prices, tax revenue from marijuana sales will be considerably higher than our estimates suggest.

We must also consider the possibility, as suggested by Caputo and Ostrom that a limited black market, including "underground" personal cultivation, would remain after legalization. They estimate that a black market could account for up to 25% of marijuana consumed. Yet it remains unclear whether a black market would, in fact, persist. As with tobacco and alcohol (for which there exists little or no black market), if the tax rate was such that the retail price was less than the current street price (provided quality and availability remained the same), it seems unlikely that a black market would persist – at least not one that accounted for 25% of marijuana consumed.

The possibility of a black market also seems contingent on cultivation remaining illegal. If cultivation was legalized, a black market could hardly endure. People could conceivably still grow "undeclared" marijuana (perhaps a sort of tax-evasion-based black market), yet it seems likely that a fair production tax and heavy penalty for evasion would stem "underground" cultivation. Farming could be regulated, and production taxed. The production of local or even organic marijuana could provide a boon to the state economy.
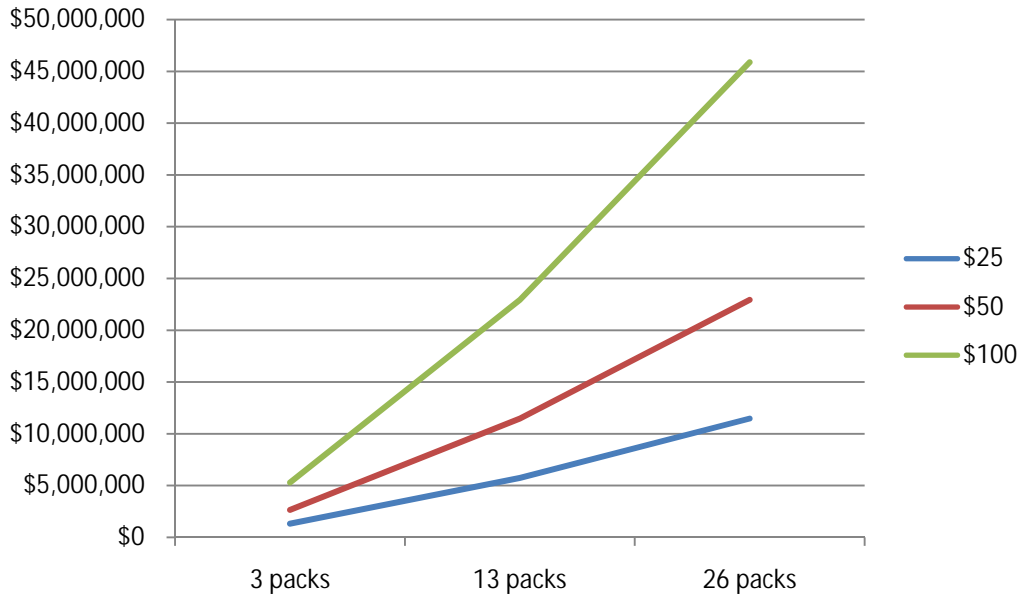
Figure 1: Estimated Annual Tax Revenues Assuming 53,000 Users (middle range of retail prices and usage rates).

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Figure 1 shows estimated annual tax revenue for a median range of both retail prices and usage rates. The graph is intended to display the more likely average usage rates and retail prices that could exist under a system of legalized marijuana. The more extreme usage rates (less than one gram or more than ten grams per week) and the more extreme retail prices (less than $25 and more than $100 per 20-gram pack) were not included in the figure.

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Compiled at the request of Representative David Zuckerman by Ike Messmore, Amanda Mitchell, and Kate Sease under the supervision of Professor Anthony Gierzynski on May 30, 2008.

Disclaimer: This report has been prepared by undergraduate students at the University of Vermont under the supervision of Professor Anthony Gierzynski. The material contained in the reports does not reflect official policy of the University of Vermont.