

**Pot (Dagga):
The Newest Acceptable Vice and Fount of Revenue**

Richard McGowan
Boston College
Carroll School of Management
Chestnut Hill, MA 02467
USA

INTRODUCTION

2016 was a banner year for proponents of marijuana legalization. Before 2016, Colorado, Washington, Oregon and Alaska have already legalized recreational marijuana. In November, 2016, California, Florida, Massachusetts, Maine and Nevada all legalized marijuana. Federal prohibition notwithstanding, these measures would bring the beginning of the end of prohibitions of not just medical marijuana, but also marijuana for recreational consumption.

This paper lays out a potential reasons for and against legalization of marijuana; how to regulate a legalized marijuana market; a framework for taxation for marijuana and finally how much revenue can a state expect to garner from legalizing marijuana. The proposed framework is founded on the goals in transitioning from a prohibition to a regulated market, and utilizes lessons learned from the taxation and regulation of other “sin” industries (e.g. alcohol, tobacco, gambling).

I. REGULATING “SIN” INDUSTRIES

A. GOALS OF A LEGALIZED “SIN” MARKET

In transitioning from a black market to a legal one, taxation and regulatory policy for “sin” industries should have three social goals: limit the various types of consumption, greatly reduce the size of the black market, and, subject to these constraints, generate significant government revenues.

The first goal of regulating legalized marijuana is to control consumption. As discussed later, without the implicit price supports of a prohibition, the market price of marijuana would

plummet, likely leading to a undetermined increase in demand. The social costs that go along with society's use of these products, such as addiction, criminal activity, and treatment and prevention costs need to be mitigated. In the case of marijuana, policy makers must determine the following:

- 1.) How the manner in which the marijuana can be sold (just the raw product or can the supplier make candy or brownies using marijuana);
- 2.) Determining the strength (THC level) so the consumer knows the potency of the marijuana they are purchasing.
- 3.) What type of advertising will be permitted?
- 4.) Should the state license operators to sell marijuana or should the state set up a series of state stores such as occur in New Hampshire, Pennsylvania and Virginia where the state sells hard liquor and wine directly to residents?

The second goal is to eliminate the black market. There is a choice in regulation between order (keeping society safe from any potential abuses of these substances or activities) and liberty (tolerating and mitigating any potential abuses from the use of a product which the majority of the population deems should be accessible). The marijuana black market is currently a shady underground economy that leads to criminal activity through such organizations as drug cartels, and prevents the government from fulfilling its role in oversight of significant economic activity. The most effective way to destroy this underground economy is through a regulatory policy and a taxation and enforcement system that encourages participation in the legal market. Order and

liberty are the hallmarks of a well-functioning regulated market, and minimizing the black market is vital for both goals.

The final goal of regulation should be to generate state revenues, while simultaneously limiting consumption and promoting an open market. Given that there will be regulated consumption of a formerly prohibited product, the tax policy should ensure that for any market size, the state's levy captures all marijuana expenditures. States should not promote the consumption of marijuana, but they should be entitled to all revenues generated by the sale of marijuana to adults who choose to consume the good.

B. REGULATION OF OTHER SIN INDUSTRIES

While marijuana is a distinct market from alcohol, tobacco, or gambling, the successes from the long history of regulation in these markets should form the basis for the initial regulation and taxation of a legalized marijuana market. Public policy for these so-called “sin” industries is different from that of other consumer goods, in that there are certain social costs associated with these products and activities. Abuse, addiction, criminal activity, and treatment and prevention costs are just a few. Because of these costs, society needs to choose whether to limit the impacts through a prohibition or through regulation.

Unlike most industries, the focus on regulation is not on maximizing revenue for the suppliers, but on controlling the usage of a substance to mitigate social costs. This may seem contradictory to the other goal of raising significant tax revenues, but the two can go hand in hand.

C. THE UNIQUE FEATURES OF THE MARIJUANA MARKET

Marijuana is a consumer good with gradations of quality, which manifests itself in average prices in the United States ranging from \$79 to \$414 per ounce.¹ These differences in price arise from a variety of factors. The cheapest marijuana is generally grown outdoors in Mexico, and compressed for transport to the United States, while the most expensive marijuana is grown in carefully controlled indoor environments with specific lighting, humidity, and air composition requirements. There are virtually limitless grades of marijuana in between, selling on a variety of different factors such as potency and residual effects.²

As an agricultural product, marijuana is only a cash crop because of prohibition. It is estimated that the average production cost of low-grade marijuana would be between \$1 and \$8 per pound.³ However, sellers can charge well above the competitive market price because prohibition limits the number of sellers, and the current distribution network is defined by cartels and other collusive enterprises.

D. SUGGESTED REGULATORY AND TAX FRAMEWORK

The taxation and regulation of the marijuana market requires a solution tailored to the unique nature of the market, and must keep prices high enough to check consumption. We offer three main proposals for states and regulators to incorporate into a legalized marijuana market. First,

¹ High Times Magazine, "Pot Prices – December, 2016 2012 THMQ," published April 4, 2012. <http://hightimes.com/lounge/ht_admin/7609> accessed January 23, 2017.

² Bonsor, Kevin. "How Marijuana Works." <<http://science.howstuffworks.com/marijuana5.htm>> accessed June 11, 2012.

³ Jonathan P. Caulkins, "Estimated Cost of Production for Legalized Cannabis," working paper published July 2010. <http://www.rand.org/pubs/working_papers/2010/RAND_WR764.pdf> accessed June 11, 2012.

the marijuana tax should be ad valorem, rather than a fixed price per unit. Second, the tax rate for marijuana should be relatively high and the rate should be kinked, with cheaper marijuana (that taxed at a lower rate than high-end product). We propose a tax rate of at most 50% for premium marijuana, and decreasing level of taxation depending on the quality of the marijuana. Finally, and probably most controversial, the state should be the sole distributor and retailer of legal marijuana, following the paradigm offered by alcohol control states.

1. AD VALOREM TAX

The debate which raged in California over Proposition 19 throughout the 2010 election centered on a taxation proposal of a flat \$50 per ounce.⁴ This fixed tax would have had undesirable effects including the continuance of a black market for the lower grades of marijuana, and little curb on consumption for higher grades. Any fixed tax based on quantity will have undesirable consequences in one segment of the market or another.

While a simple flat percentage tax on all marijuana would accomplish some of the goals discussed above, such a policy would fail to accurately consider the stratification of the market. Shutting down the black market for low-grade marijuana, which sells mainly on price, will require a post-tax price that is commensurate with or lower than the alternative black market price. Regulating consumption of the high-grade product, which sells primarily on quality, will require a higher tax than that imposed on the low grade market. Thus, after looking at various options, an ad valorem tax will best achieve the three goals of regulation.

⁴ "Prepared Testimony of Robert Ingenito," *Board of Equalization*, October 28, 2009. Proposition 19 did not have a specific tax policy attached to it, but the often-cited numbers on state tax revenue which legal marijuana would generate in California was based on Mr. Ingenito's testimony.

2. KINKED TAX RATES OF 20-30%

Based on simple supply and demand, once legalized and without any regulation, the prices of all grades of marijuana would plummet. For the lowest-end product, the price could fall close to the minimal cost of production, which could be less than \$8 per pound.⁵ Were retail prices to fall near this level, the removal of the prohibition would lead to an explosion in consumption. Therefore, to control consumption, it will be necessary to tax marijuana at a rate that at first blush seems onerous – 50 to 100% of its post-legalization price.⁶ We propose a tax of 20% of the post-legalization price for low grade marijuana. This lower level tax will prevent the continuance of the black market on low grades of marijuana relative to a higher tax, while still raising prices significantly enough to control consumption in a segment of the market that is relatively price sensitive. Further, we propose a tax of 25% of the post-legalization price over for medium grade marijuana while a 30% tax for the highest grade marijuana.⁷ At this higher end of the market, where marijuana is sold more on quality than price, a lower tax will leave consumption unchecked. The higher rate will increase state revenues without a high risk of a continuance of the black market.

The taxation of other “sin” industries is very much in line with such seemingly high rates. Between state and federal taxes, the current tax rate for cigarettes averages 80% of the pre-tax price. Put differently, an average pack of cigarette which currently costs \$5.66 would cost just

⁵ This could only occur without any regulation, including a federal prohibition.

⁶ Just to be clear, the tax should be levied on the market price after legalization. Suppose that marijuana is currently selling for \$100 per ounce, and the price falls to \$20 per ounce after legalization, the after-tax price would be \$30 per ounce under this proposal, still a 70% reduction in today's price.

⁷ There are three levels of marijuana currently being sold on the black market which depends on the level of THC. So this tax resembles the tax on distilled spirits

\$3.13 without any taxes.⁸ Alcohol taxation can be similarly high. For example, with all taxes factored in, a typical bottle of distilled spirits is taxed at 120% of the pre-tax price.⁹ The tax policy for cigarettes and alcohol lends credence to tax rates that might otherwise look excessive.

In this context, the current ballot initiatives get mixed reviews on their proposed tax rates. Washington State is proposing a tax of 25% on the wholesale price, and 25% on the retail price. If we assume that consumers are buying retail, the implicit tax rate is over 56 percent.¹⁰ While this initiative does not incorporate a kinked tax rate, it does at least start near the right level. Colorado, on the other hand, limited the level of the excise tax to 15% through 2016. Colorado recently raised its tax rate to 25%.¹¹ So one of the goals of this paper will be to establish a model to determine the “best” tax rates for states such as California, Florida Massachusetts, Maine and Nevada as they set up their recreational marijuana regimes.

3. STATE-RUN MARIJUANA STORES

A truly optimal post-legalization framework will also add in state control over distribution and retailing. Several of the current states considering legalization are also considering becoming “marijuana control states,” the equivalent of the 18 alcoholic beverage control states that hold a

⁸ “State Cigarette Tax Rate & Rank, Date of Last Increase, Annual Pack Sales & Revenues, and Related Data,” published March 6, 2012. <<http://www.tobaccofreekids.org/research/factsheets/pdf/0099.pdf>> accessed June 11, 2012.

⁹ According to the Distilled Spirits Council of the United States, the average price for a typical 750 ml bottle of 80 proof distilled spirits in the United States was \$14.21 in 2010. Of that \$7.77, was from taxes. Thus, the pre-tax price was \$6.44, and the tax on that is 120%. See <<http://www.discus.org/economics/>>.

¹⁰ If 25% is levied on the wholesale price, and the wholesaler charges his cost plus taxes to his retail customers then, the tax is levied twice on the supplier price, for a total tax of 56.25%. If the wholesaler marks up the price, the effective tax rate will be higher.

¹¹ To be fair, the tax rates we have proposed are for a completely unregulated environment. The fact that federal prohibition will remain will still constrain supply and thus prices, even in states that legalize. Were prices to remain unaffected by legalization due to continuance of the federal prohibition, the 15% tax rate proposed by Colorado would not necessarily lead to a surge in demand. The real worry then is that locking in the rate robs policy makers of the flexibility to react to market conditions in order to meet the goals of marijuana regulation.

monopoly over the wholesaling – and in some cases the retailing – of liquor.¹² The justification for such stringent regulation dovetails nicely with what the goals of regulation should be:

The purpose of control is to make liquor available to those adults who choose to drink responsibly - but not to promote the sale of liquor. By keeping liquor out of the private marketplace, no economic incentives are created to maximize sales, open more liquor stores or sell to underage persons. Instead, all policy incentives to promote moderation and to enforce existing liquor laws [are] enhanced.¹³¹⁴

Keeping marijuana out of the private marketplace allows the state more control in what should be its primary regulatory agenda: limiting use by minors. States don't have the same incentives to maximize revenue that retail licensees would have, and thus as the sole legal point of consumer access, the state can prevent direct proliferation of marijuana to minors. Regulators and police should also be vigilant in enforcing statutes against sale to minors through secondary retail outlets or the black market.

¹² National Alcoholic Beverage Control Association, Control States Data Matrix, published March 6, 2012. <http://www.nabca.org/StatisticalData/Files/control_states_matrix.pdf> accessed June 11, 2012.

¹³

¹⁴ The Origin and Purpose of the Utah Department of Alcoholic Beverage Control, <<http://abc.utah.gov/about/index.html>> accessed June 11, 2012.

II. IS MARIJUANA A POT OF GOLD FOR GOVERNMENT?

One would think that estimating tax revenues for marijuana sales would be a relatively straight forward process: multiply consumption by price by tax rate. But it clearly not that easy. Also both sides of the debate wildly overestimate the usage and the amount of marijuana that is utilized. For example, there was a bill recently submitted in the Maryland legislature that maintains that Maryland would reap \$200 million from the proceeds of legalizing marijuana. Now it should be pointed out that Colorado that has approximately the same population as Maryland In its first year of operation, Colorado's total revenue from marijuana was approximately \$65 million¹⁵. So it is extremely hard to imagine how Maryland's initial plunge into the marijuana market would be so wildly successful.

So how would one try to estimate conservatively the revenue potential of marijuana? These are many factors that need to be taken into account according to experts in the marijuana policies.¹⁶ These are the population factors that need to be taken into account

- 1.) Total Population
- 2.) Population between 15 to 24 years old (it is estimated that 31% of this age group will use marijuana)
- 3.) Population 25 years old and over (it is estimated that 20% of this age group will use marijuana)
- 4.) Regional Variation Factor: accounts for social acceptance of marijuana in regions of the US
South (.85); West (1.15) Northeast (1.05) Midwest (.95)
- 5.) % of the marijuana population that are experimenters (40%)- less than 12 days of use in a year.

¹⁵ Calculated from the Colorado's website for Revenues.

¹⁶ Marijuana Legalization, J. Caulkins, A. Hawken and B. Kilmer, Oxford University Press, 2012:pp.16-30.

6.) % of the marijuana that are recreational users (30%)-usually weekly basis

7.) % of the marijuana population are regular users (30%)-use of more than 70 occasions during the year. This group accounts for the vast majority of marijuana that is consumed.

In many ways this breakdown in usage resembles alcohol and gambling. One of the common elements between the so called “sin” industries is that the majority of the activity is done by a minority of the users. This is true for cigarettes, alcohol, gambling and marijuana. So public policy makers need to set aside a certain amount of any revenue from these sources in order to deal with the addictive nature of these activities.

There are other factors that one needs to include in trying establish marijuana’s revenue potential for government. First there are at least three grades of marijuana that is presently being sold in the black market. The quality of the marijuana depends upon the THC level (the higher the THC level the higher the price for the marijuana). The price of marijuana also varies by state and region where the cheapest marijuana is related to warm climates where marijuana could more easily be grown. Hence, marijuana is cheaper in California than in Massachusetts!

Finally in this analysis we will vary tax rates from low to high with the realization that high tax rates will enable the black market to flourish.

The results that will be shown are for the five states that have recently legalized recreational marijuana. These tables are included as attachment at the end of the paper. Here is a quick summary: Low Tax Rate = 20%, 25% 30%; High Tax Rate = 30%, 40%, 50%

State	Low	High
California	\$84m	\$139m
Florida	\$41m	\$ 69m
Maine	\$ 3.2m	\$ 5.5m
Massachusetts	\$19.2m	\$ 32m
Nevada	\$ 6.5m	\$ 10.8m

Again, these are conservative figures but in many realistic expectation of what a state could expect to generate in terms of marijuana revenue. Clearly the high tax regime is tempting except that it might actually expand the black market for marijuana and the social costs that will come with overall increase in marijuana. While the low tax regime might eliminate a large portion of the black market for marijuana one must wonder whether these revenues would cover the social and administrative cost of regulating marijuana. So clearly public policy makers will need to make decision between these two extremes. That is all of the more reason that perhaps best retail outlet for marijuana is one that in control of the state so that adjustments can be made in the price and taxing of marijuana.

III. FINAL THOUGHTS

We do not presume to have designed the “perfect” post-legalization structure for marijuana regulation, nor are we supporting or condemning the legalization of marijuana generally. However, beyond the debate about whether to legalize marijuana on a statewide basis, it is vital to engage in a serious concurrent discussion on the regulatory solutions to distribute the revenues from, and control the consumption of marijuana. In many ways, the debate over marijuana resembles the ones over alcohol and gambling. There are social costs that need to be taken into account but the revenue that these activities might provide would be quite helpful to cash strapped state governments. In the future, this “ideal” tax rate might lend itself to more rigorous statistical analysis that would involve a panel regression analysis. But presently there is really not sufficient data to permit such an analysis. But this analysis does at least permit public policy makers a quick glance at what they face as their constituents demand that they deal with the marijuana issue.

Table 1: Low levels of taxation and Potential Marijuana revenues

Source/Method	American Factfinder Table DP05			[(population 15-24 years old) * 0.31 + (population over 25) * 0.09]*regional variation factor	0.3* Total User Estimate	0.3* Total User Estimate	0.4* Total User Estimate	0.75 g (1.5 joints) per day per regular user; 0.5 g per week (1 joint) per recreational user; 0.75 g one time use per experimenter
State	Total population	15 to 24 years old	25 years and over	Total User estimate	Experimenter Estimate	Recreational User Estimate	Regular User Estimate	Tax Estimate (unit: dollars)
California	38.4 m	5.6m	25.2m	4,462,819	1.3m	1,338,846	1,785,128	84,075,723
Florida	19.m	2.5m	13.8m	1,840,815	552,245	552,245	736,326	41,670,400
Maine	1.3m	.16m	.95m	144,195	43,258	43,258	57,678	3,265,443
Massachusetts	6.7m	.95m	4.6m	748,376	224,513	224,513	299,350	19,253,525
Nevada	2.8m	.363m	1.88m	314,041	94,212	94,212	125,616	6,490,835

Price per pound

State	Low	Med	High
California	189	200	248
Florida	200	224	299
Maine	235	259	297
Massachusetts	235	285	338
Nevada	231	254	270
Tax rate	20%	25%	30%

Table 2: High levels of taxation and Potential Marijuana revenues

Source/Method	American Factfinder Table DP05			[(population 15-24 years old) * 0.31 + (population over 25) * 0.09]*regional variation factor	0.3* Total User Estimate	0.3* Total User Estimate	0.4* Total User Estimate	0.75 g (1.5 joints) per day per regular user; 0.5 g per week (1 joint) per recreational user; 0.75 g one time use per experimenter
State	Total population	15 to 24 years old	25 years and over	Total User estimate	Experimenter Estimate	Recreational User Estimate	Regular User Estimate	Tax Estimate (unit: dollars)
California	38.4 m	5.6m	25.2m	4,462,819	1.3m	1,338,846	1,785,128	139,856,002
Florida	19.m	2.5m	13.8m	1,840,815	552,245	552,245	736,326	69, 326,890
Maine	1.3m	.16m	.95m	144,195	43,258	43,258	57,678	5,541,076
Massachusetts	6.7m	.95m	4.6m	748,376	224,513	224,513	299,350	32,025,675
Nevada	2.8m	.363m	1.88m	314,041	94,212	94,212	125,616	10,793,467

Price per pound

State	Low	Med	High
California	189	200	248
Florida	200	224	299
Maine	235	259	297
Massachusetts	235	285	338
Nevada	231	254	270
Tax rate	30%	40%	50%

