



The Fiscal Impact of Amendment 64 on State Revenues

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Summary

Colorado voters approved Amendment 64 in November 2012, legalizing the production, sale and use of adult recreational marijuana under Colorado law. Since then, various mechanisms of state government have been looking at how to implement the amendment, including how best to regulate and tax the sale of recreational marijuana. The Colorado General Assembly's Joint Select Committee on the Implementation of Amendment 64 handed down legislative recommendations that include the following proposed taxes related to Amendment 64:

- An excise tax levy of 15% of the wholesale value of marijuana;
- A special sales tax of 15% on the retail sale of marijuana; and
- Extension of the state's existing 2.9% general sales tax to sales of marijuana and marijuana products.

Subsequent to the recommendations of the Joint Select Committee, the Colorado General Assembly referred a measure to the November 2013 ballot to tax marijuana statewide at the following rates:

- An excise tax levy of 15% of the wholesale value of marijuana
- A special sales tax of 10% on the retail sale of marijuana

That ballot measure was successful, and on January 1, 2014 the first sales of recreational marijuana included the referred taxes as well as the state's 2.9% regular sales tax. This update to our earlier work estimates the state revenue potential from these taxes for the first full fiscal year of operation of the recreational marijuana market. That time period is July 1, 2014 – June 30, 2015.

This paper addresses the following key findings:

- 1. *The adult recreational marijuana market in Colorado will be \$617.5 million and taxation of that market will bring an additional \$101.8 Million in state tax revenue in fiscal year 2014-15.*¹**
- 2. *The 15% wholesale excise tax created by the amendment will not reach the goal of \$40 Million for school construction as stipulated in the ballot language approved by voters.***
- 3. *The high water mark for marijuana tax revenue is likely to be in the first few post-legalization years with revenue flattening or declining thereafter.***
- 4. *Marijuana tax revenues may not cover the incremental state expenditures related to legalization.***
- 5. *Marijuana tax revenues will not close Colorado's structural budget gap.***

¹ This amount does not include sales tax revenue from the sale of marijuana paraphernalia but does include consumables such as baked goods. It also does not account for the effect of local sales taxes on consumption and the price of marijuana or the offsetting loss in state revenue from declining medical marijuana sales as medical patients transition to the adult recreational marijuana market.

Background

Amendment 64, legalizing adult recreational marijuana for Coloradans 21 years and over, was passed by Colorado voters in November 2012. In December 2012, Governor John Hickenlooper created a task force charged with making recommendations concerning the regulatory and taxing environment for this new industry. In February 2013, the task force reported to the governor a series of 58 recommendations, a copy of which is available at www.colorado.gov/cms/forms/dor-tax/A64TaskForceFinalReport.pdf.

The gubernatorial task force recommended two separate and distinct taxes for marijuana, which are now being considered by the General Assembly. The first is a 15% excise tax imposed at the point of transaction between marijuana cultivators and production facilities or retail stores. This tax was proposed in the original language of the amendment, but since the taxing language in Amendment 64 was not TABOR compliant, the excise tax was resubmitted and ultimately approved by the voters in November, 2013. The language of the amendment dedicates the first \$40 million of proceeds from the excise tax to the Building Excellent Schools Today (BEST) program for school capital construction.

In addition to the excise tax, the task force recommended that voters be asked to approve a special sales tax of up to 25% imposed at the point of retail for marijuana products and paraphernalia. A select committee of the legislature lowered the special sales tax cap to 15% and recommended a mechanism for the proceeds to be shared with localities. Cities or counties that prohibit marijuana licensees would not be eligible for a share of proceeds from the special sales tax. Ultimately, the General Assembly referred a measure to the ballot which included a 10% special sales tax on the retail sale of marijuana. That tax was also approved by the voters in November, 2103.

Finally, under the current tax code, the sale of marijuana products and paraphernalia will be subject to the 2.9% existing state sales tax as well as local sales taxes without a vote of the people. A separate recommendation of the legislative select committee directed that all proceeds from the taxation and fees on marijuana transactions be deposited into a newly formed marijuana cash fund for the purposes of regulating the industry.

Revenue Potential of the Proposed Marijuana Taxes

Estimating the revenue potential of proposed marijuana taxes is a four step process. Building on previously published methodologies², the Colorado Futures Center model estimates post-legalization demand for marijuana, the wholesale cost and retail price, the price induced changes in consumption behavior likely to result from a decision to legalize, and ultimately the tax revenue that will result from legalization. Estimations of tax revenue are heavily influenced by assumptions about demand for and the wholesale and retail prices of marijuana. Assumptions used in the Center's model, along with the rationale for each, are detailed in the sections below.

- *STEP ONE: Estimate Demand for Adult Marijuana (not including consumables)*

The demand for adult marijuana is dependent on the number of consumers and the amount consumed per user. Under Colorado law, the purchase of adult recreational marijuana will be legal for anyone 21 years old and over. The current recommendation from the legislature would not limit access to Coloradans, making the purchase of marijuana legal for those 21 and over regardless of their place of residence. This extension to non-Coloradans makes the estimation of demand more complicated. While there are data by state on the rate of marijuana usage, it is difficult to determine the extent of the demand for marijuana that will come from non-Coloradans. In addition, while illegal, it is likely that marijuana will be purchased and transferred to those under the age of 21. Since there are no reliable data on the probable extent of marijuana tourism and illegal transfers to minors, these activities are not accounted for in the Center's model, so our estimates may be understated to some extent.

The most reliable data on marijuana usage comes from the National Survey on Drug Use and Health.³ The latest survey data from 2010-11 report shares of the population, by age cohort, that have used marijuana in the previous year. For those years, the survey reports the following usage rates for Colorado:

- 41.29% in the age cohort 18 – 25
- 11.54% in the age cohort 26 and above

To establish our estimate for the number of Coloradans using marijuana in 2014, the first year of legalization, we applied the usage rates from the survey to the Colorado State Demography Office's 2014 forecast for population in those age cohorts. To adjust the 18 – 25 cohort to the 21-and-over cohort that is legally able to purchase marijuana, we assumed that the usage was evenly distributed and used a straight line approach. Initially we estimate that 554,710 Coloradans will use marijuana in 2014.

Since this estimate is based on survey data concerning a topic that is both illegal and may carry a social stigma, we assume that usage is underreported in the survey. Studies suggest that the range of underreporting may be anywhere between 0% and 40%. Consistent with the CCLP's analysis, we assume an underreporting rate of 20%. Adjusting our estimate of users for underreporting, we forecast that 665,652 Coloradans will use legal marijuana in 2014. However, as of February 2013, 108,951 Coloradans held medical marijuana cards. Again, consistent with the CCLP analysis, we assumed that 79% of those currently purchasing medical marijuana will migrate to the adult recreational marijuana market with the remainder continuing to access marijuana through medical marijuana establishments.

²See for example the Colorado Center on Law and Policy (CCLP) at http://www.cclponline.org/postfiles/amendment_64_analysis_final.pdf

³<http://www.samhsa.gov/data/NSDUH/2k11State/NSDUHsaeTOC2011.htm>

Accounting for this adjustment, we estimate that the market for legal marijuana to be 642,772 Coloradans. Finally, we assumed a per person per year usage rate of 3.53 ounces, again consistent with the CCLP analysis. ***This results in a pre-legalization estimate of demand for marijuana of 2,268,985 ounces annually.***

There are threats to this estimate. Two that are mentioned above – marijuana tourism and the purchase of marijuana to be illegally transferred to those under the age of 21 – make our estimate of use somewhat conservative. If either or both of those effects occur, demand will be higher than we estimate. Our estimate of demand also does not account for changes in behavior due to legalization. There are likely to be offsetting effects of those attracted to marijuana or inclined to consume larger quantities because it is now legal and those who lose interest in marijuana now that the “forbidden fruit” aspect of marijuana use is eliminated. We implicitly assume that those effects offset.

- *STEP TWO: Estimate the Post Legalization Wholesale and Retail Prices*

The next component necessary to estimate the size of the legal marijuana market, and thus the tax revenue potential, is the price of marijuana. Because of the differing structure of the proposed excise and special sales taxes, both the wholesale and retail prices of marijuana are relevant.

Since growing marijuana is federally illegal and continues to be illegal in most states, there is scant data on the cost structure of a grow operation. However, in 2010 researchers at the Rand Institute estimated a range on the cost of growing marijuana in California. Their estimates vary widely – from de minimis to a top estimate of \$400/lb for a grow operation that uses a 1500 square-foot home as the location of the cultivation.⁴ Inflating Rand’s high end 2010 estimate of \$400/lb with a producer price index forecast for all farm products from Moody’s Economy.com, we estimate that marijuana will cost \$592/lb to grow in 2014. In our model we used a rounded assumption of \$600/lb to grow marijuana.

Building from wholesale cost to retail price requires accounting for excise taxes, distribution costs, and various markups along the supply chain. ***After accounting for all of the additions to wholesale cost, we estimate the post legalization, pre sales tax retail price of marijuana to be \$2,509/lb or \$157/oz. After applying the recommended sales taxes, we estimate that the retail price for marijuana will be \$2,833/lb or \$177/oz.*** Again, the retail price calculation is extremely sensitive to the assumptions made for all adjustments along the supply chain as well as to the cultivation (wholesale) cost of marijuana. The table below shows our calculations from cultivation cost to retail price, along with the basis for our assumptions for the price structure of the mature market after the initial period of legalization.

⁴ http://www.rand.org/content/dam/rand/pubs/working_papers/2010/RAND_WR764.pdf and http://www.rand.org/content/dam/rand/pubs/occasional_papers/2010/RAND_OP315.pdf

Table 1. Calculations from Cultivation Cost to Retail Price

Cost Item	Value (all per lb. unless noted)	Basis for Assumption
Wholesale Cost, per lb.	\$ 600	Rand Study, adjusted for inflation
Excise Tax at 15%	\$ 90	Amendment 64, 2013 voter approved rate
Producer Markup Rate at 25%	\$ 183	CCLP study, based on similar agricultural product markups
Distribution Cost, per lb.	\$ 40	CCLP assumption, based on Rand analysis
Retailer Markup Rate at 175%	\$1,597	Middle estimate between CCLP analysis and numerous marijuana blogs. Also accounts for overhead costs associated with operating marijuana retail establishments.
Retail Price, per lb/oz. (before sales tax)	\$2,509/lb. \$157/oz.	
Special Sales Tax at 10%	\$ 251	Voter approved rate
State Sales tax at 2.9%	\$ 73	
Retail Price, per lb. (after sales tax)	\$2,833/lb.	
Retail Price, per oz. (after sales tax)	\$177/oz.	

- *STEP THREE: Estimate Price Induced Consumption Changes and the Post Legalization Demand for Adult Marijuana*

Assuming high end estimates for the cost of cultivation and retailer markups on marijuana and accounting for the tax burden, we forecast the post legalization price of \$177/oz to be lower than current black market prices in Colorado. The best source for prices for black market marijuana in Colorado is the crowdsourcing website The Price of Weed⁵ which reported, as of April 10, 2013, that the average price of an ounce of marijuana of all qualities was \$206. As with most other goods, a reduction in the price results in an increase in the quantity demanded. We expect the same to be true for marijuana.

The relationship between price and quantity of goods consumed is characterized by the elasticity of demand. Elasticities measure the percent change in quantity demanded that results from a 1% change in the price of a good. The best estimate for the elasticity of demand for marijuana comes from the researchers at the Rand Institute⁶ who estimate that marijuana has a price elasticity of demand of -0.54. The interpretation of this measure is that a 1% decrease in the price of marijuana results in a 0.54% increase in quantity demanded. Applying this measure to our forecast 14% decrease in the price of marijuana after legalization, we expect an 8% increase in quantity demanded, ultimately **resulting in a post legalization demand for marijuana (not including consumables) of 2,441,069 ounces.**

⁵ <http://www.priceofweed.com/>

⁶ Kilmer et al 2010 pg. 23 at http://www.rand.org/content/dam/rand/pubs/occasional_papers/2010/RAND_OP315.pdf

- *STEP FOUR: Calculate Tax Revenue*

Under the proposed tax rates approved by the voters, all marijuana and marijuana related purchases will be subject to the excise, special sales and existing state sales tax. While we do not have good data on the sales of marijuana paraphernalia, we can use the model above and other research to estimate the tax revenue potential from all other marijuana purchases, including consumables such as baked goods.

According to the investor relations website for Medical Marijuana Inc.⁷, consumable (or edible) marijuana accounts for 38% of the total market for medical marijuana. Under the conservative assumption that the share will remain the same for recreational marijuana, we can impute the size of the total market for all marijuana, including consumables, by knowing that the non-edible purchases, estimated above, account for 62% of the total market. By that calculation, and assuming the demand and cost structure outlined above, the total dollar value of the retail and wholesale markets for adult marijuana are estimated to be \$617.5 Million and \$147.6 Million, respectively. Applying the 15% tax at wholesale, the 2.9% state sales tax at retail and the proposed special sales tax at retail of 10% yields the following tax revenue estimates for 2014-15, the first fiscal year of adult marijuana:

- ***A 15% excise tax imposed at the point of cultivation will yield \$22.1 Million***
- ***A special sales tax of 10% will yield \$61.7 Million***
- ***The existing state sales tax of 2.9% will yield \$17.9 Million***

⁷ <http://www.medicalmarijuanainc.com/index.php/press/22-press-releases/2012-press-releases/107-medical-marijuana-inc-portfolio-company-red-dice-holdings-sees-continued-brand-recognition-with-co-based-dixie-elixirs>

Concluding Thoughts: What will Marijuana Taxation Mean for the State Budget?

In November 2013, Colorado voters approved taxes related to this new industry. Passage of the tax measures will result in approximately \$101.8 Million in additional state revenue in FY 2014-15 (including the \$17.9 Million estimated to be generated by the existing state sales tax). What will these new revenues mean for the fiscal position of the state?

- *IMPACT: The 15% Excise Tax will not Yield \$40 Million for the Building Excellent Schools Today (BEST) Program*

The language of Amendment 64 dedicated the first \$40 Million in revenue from the marijuana wholesale excise tax to the BEST program. Consistent with Amendment 64, the excise tax in the ballot measure was structured as 15% of the wholesale cost of marijuana. In the current vertically integrated system for medical marijuana, with few or no arm's-length transactions between cultivator and seller, it is difficult to ascertain the wholesale cost of marijuana. Our assumption of \$600/lb. based on estimates by the Rand Institute and adjusted for inflation results in ***our \$22.1 million estimate for the revenue potential from the excise tax, which falls significantly short of the target of \$40 Million for school construction.*** In order to generate \$40 Million for the BEST program, the cost to grow a pound of marijuana would need to be in the range of \$1,100/lb., a level almost two times the Rand estimate adjusted for inflation and one which risks raising the retail price of marijuana to a level that would encourage the continuation of a black market.

- *IMPACT: Revenue Likely to be Highest in Early Years with Revenue Flattening or Declining in Subsequent Years*

While this study did not model beyond the first full year after legalization, our preliminary analysis suggests that the high water mark for marijuana tax revenues will be in the years just following legalization. This will be the result of core and interrelated economic and behavioral phenomena including:

- *Increased competition in the cultivation (wholesale) and retail markets for marijuana which will drive efficiencies and erode margins in the industry. As competition forces growers and sellers to be more efficient, margins will erode and both wholesale cost and retail prices will forecast to fall. Without offsetting increases in consumption, falling prices result in lower tax revenue.*
- *A decline in the rate of growth of consumption as the "wow" factor erodes over time and any marijuana tourism begins to decline, particularly if other states follow Colorado and Washington and legalize marijuana. One way to stabilize revenue in an environment of falling cost and price is for consumption increases to be sufficient to offset the lower prices. However, our expectation is that after an initial post legalization period of intense interest and curiosity, consumption growth rates will stabilize or even perhaps decline as has been the case with cigarette consumption.*

- IMPACT: Marijuana Related Revenues May Not Cover Incremental State Expenditures Related to Legalization

While it was outside the scope of our study to estimate the expenditure implications of legalized marijuana, we recognize that the recommended regulatory structure, public health and safety initiatives, human services responsibilities, and potential law enforcement needs will place a demand on the state's budget. The General Assembly's Joint Select Committee also recognized this and made a recommendation that all marijuana related revenues be deposited into a marijuana cash fund dedicated to funding the regulatory function in the Department of Revenue.

In recognition that the cash fund may be insufficient to support the regulatory function, the committee recommended a general fund supplement for marijuana enforcement with an expectation that it will be reimbursed in the future. This structure raises some questions and concerns:

- *Will the revenues from marijuana, either in the early years or as the industry matures, ever be sufficient to fund the regulatory structure and other state expenditure needs?*
- *If not, what will be the longer term mechanism for funding the required regulation, making any necessary reimbursements to the General Fund, and funding the other public health, public safety and human service initiatives recommended by the Amendment 64 Task Force?*

These questions are of even more concern in light of our expectation that the most productive marijuana tax revenue years will be the years just after legalization.

- IMPACT: Marijuana Tax Revenues will not Close Colorado's Structural Budget Gap

Colorado's long term general fund structural gap is well documented in previous work done by the staff of the Colorado Futures Center at CSU. One conclusion from our work was that raising sin taxes, particularly those on cigarettes and tobacco, will not close the structural budget gap. We have every reason to believe that the same is true for marijuana. ***After meeting the obligations for BEST, funding the regulatory and other public health and safety budget demands, and sharing tax revenues with participating municipalities, revenue from marijuana taxes will contribute little or nothing to the state's general fund.*** While taxes from marijuana will contribute to school capital construction needs and may cover the incremental costs associated with legalization, they will not contribute in any significant way to solving the structural gap developing in the state budget.