

FINANCIAL IMPLICATIONS OF RECREATIONAL MARIJUANA

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## ABSTRACT

Recreational marijuana is now legal in five states and Washington D.C. While many studies have been conducted on the health implications of marijuana, virtually no studies have been conducted on the financial implications of marijuana. This paper attempts to bridge the gap between existing research and current events to give a complete and thorough overview regarding the financial implications of recreational marijuana. Specifically, this paper discusses the sales revenue of recreational marijuana, the tax revenue collected from recreational marijuana, the employment statistics of recreational marijuana, the impact of recreational marijuana has on real estate values, the growth of marijuana niche businesses, and the potential marijuana has to be sold as a financial security via the commodities market. It is important to note that this paper is not intended to be argumentative. While there are varied opinions on the legitimacy of recreational marijuana, this paper does not take a stand on the issue.

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## **Introduction**

As of the January 1<sup>st</sup> 2015, four states (Colorado, Oregon, Washington, Alaska) and the District of Columbia have passed legislation to legalize marijuana for recreational use. In addition, seven more states (California, Arizona, Nevada, Michigan, Maine, Massachusetts, Ohio) will vote on whether or not to legalize marijuana for recreational purposes in 2016. If all goes well in these initial states, it is certainly reasonable to assume more and more states will look into recreational marijuana as time goes on. As the idea of recreational marijuana becomes more and more mainstream, it is important to analyze the various financial implications this may have on our economy.

While many studies have been completed on the health and safety implications of marijuana, there have been very few studies conducted on marijuana's financial implications. Although there have only been a few studies, initial research suggests that recreational marijuana has already had substantial financial implications on its local economy. Specifically, Scott Peterson (2015) from the Colorado Association of Realtors concluded recreational marijuana has already dramatically impacted insurance coverage, financing, and rent collection throughout Colorado. In regards to tax collections, Miron (2013) concludes recreational marijuana has the potential to generate over ten billion dollars in tax revenue annually. Lastly, Galbraith (1978) believes recreational marijuana would improve the economic condition of America by stimulating the agriculture industry and giving poor farmers an additional revenue stream. While initial studies have done a good job researching the impact recreational marijuana has had on financing, rent collection, tax revenue, and the economy in general, there are still several financial implications left unexplored. Specifically, virtually no research has been conducted on how recreational marijuana effects surrounding businesses, the tourism industry, and

employment. In addition, there has been minimal research conducted on the growth and profitability statistics of existing recreational marijuana institutions. Lastly, no research article has yet explored the possibility of marijuana being sold as financial security on the futures market.

This paper attempts to bridge the gap between existing research and current events to give a complete and thorough overview regarding the financial implications of recreational marijuana. In addition, this paper will explore the possibility of marijuana being sold as a financial security via the futures commodity market. This is an important topic because recreational marijuana is a new and emerging market that has the potential to be as big as the \$100 billion alcohol industry. Through interviews, analysis of financial statements, and survey data this paper will explore the effect recreational marijuana has had on housing/land prices, surrounding businesses, local governments, and employment.

## **Literature Review**

### **Overview**

Despite the fact the recreational marijuana industry is only in its beginning stages, there has still been a decent amount of research conducted on the industry and its financial implications. However, most of this research was conducted before recreational marijuana actually became legal in several U.S States and is thus mostly theoretical. However, it still provides useful insight into the potential financial implications of recreational marijuana. The best available research is concentrated in four key areas: the economic necessity of recreational marijuana (Galbraith 1978), potential tax revenues from recreational marijuana (Caputo and Ostrom 1994), (Gettman 1993), impact on recreational marijuana on the insurance industry

(Ceniceros, 2010)(Wells,2014) (Barlow, 2009), and marijuana as big business (Barry, Hilamo, Glantz, 2014).

Some of the most intriguing research about the financial possibilities of recreational marijuana comes from a study conducted 30 years before recreational marijuana was legal in any state. In his study, Galbraith (1978) estimates the total domestic marijuana market to be valued at \$2.5 billion. He then developed a detailed theoretical plan about how this valuation could be dispersed among a million American farmers, providing them with much-needed new revenue streams. Further interesting research about the recreational marijuana industry comes from Caputo and Ostrom (1994) and their estimations about the annual tax revenues universal recreational marijuana could bring in for the U.S Government. By using survey data to establish how many people smoke marijuana, how frequently they smoke, how much they smoke each time, and how much this consumption costs, Caputo and Ostrom (1994) hypothesize that recreational marijuana could bring in anywhere from five billion to nine billion dollars of tax revenue each year. Additionally, Wells (2014) analyzes insurance coverage policies and provides insight into the potential implications recreational marijuana would have on business, home, auto, and life insurance. Lastly, Barry, Hilamo, and Glantz (2014) depart from Galbraith's (1978) idea of small farmers being in charge of recreational marijuana production by arguing the industry will be become dominated by big business, specifically the tobacco industry.

### **The economic necessity for marijuana**

Ironically, some of the best research on the financial implications of recreational marijuana was conducted more than 30 years before recreational marijuana was legally available. Galbraith (1978) argues that recreational marijuana is an economic necessity because it can

drastically improve the lives of rural farmers and even help maintain the value of the dollar. In terms of helping rural farmers, Galbraith (1978) argues that there are 40 million marijuana smokers in the U.S and Canada who sent \$2.5 billion to South America and Mexico. Instead of sending all that money to South America and Mexico, Galbraith (1978) suggests that the United States Government license one million farmers to grow \$2,500 worth of marijuana. At the time, less than one half of Kentucky farmers grossed more than the \$2,500 in commodities each year. While the numbers used in this study are clearly outdated for today's economy, the idea of legally supporting rural American farmers instead of illegally supporting international farmers is hard to argue against. Galbraith (1978) hypothesizes an ideal market in which one million farmers each grow 100 pounds of marijuana and sell it directly to the U.S Government. Prices would depend on potency and appearance of the crop and the farmer would be responsible for removing the seeds and stems prior to the sale. A pound of top quality bud would net the farmer approximately \$100 (depending on quality) from the state. The government would then package the bud into ounces and sell them at a profit to licensed retail dealers for \$175/pound, allowing the government to make a \$75 profit off the transaction. Every state in the union would be called upon to handle about one million pounds and profits would range from 30-50 million dollars per state, with some of these profits being earmarked for health and medical research (Galbraith, 1978).

It's hard to disagree with Galbraith's logic here. Whether marijuana is legal for recreational purposes or not, it is impossible to deny that the demand for marijuana exist. Instead of Americans illegally supporting foreign farmers and distributors, the U.S Government can create an incentive for Americans to buy marijuana domestically and benefit farmers, consumers, and the U.S Government itself. Adjusting the numbers in Galbraith's (1978) study for modern



day prices reveals he estimates the American recreational marijuana market to be worth \$9,123,657,980<sup>1</sup> (assuming no growth). He estimates farmers would gross \$364.95<sup>1</sup>/pound, the U.S Government would make \$273.71<sup>1</sup>/pound in profits from transactions with licensed retailers and each state would have profits ranging between \$109,483,895.70<sup>1</sup> and \$182,473,159.50<sup>1</sup>. When looking at Galbraith's (1978) study in dollars adjusted for 2015, the economic necessity for recreational marijuana becomes even more apparent. Additionally, these calculations are assuming there has been absolutely no growth in the demand for recreational marijuana market between 1978 and now. This is quite an illogical assumption and thus it is safe to say the 2015 inflation adjusted numbers in Galbraith's (1978) study are actually significantly higher.

In addition to providing the U.S Government and rural farmers with a significant amount of additional income, Galbraith (1978) argues recreational marijuana would also benefit the U.S economy by maintaining the dollar's value. He points out that the 1977 trade deficit of 27 billion dollars did not take into account the 2.5 billion dollars exported for marijuana and thus all official numbers are off by at least 10%. Galbraith's assertion that a trade deficit negatively impacts the value of the dollar is not unsubstantiated; it is a widely accepted economic principle that is taught in virtually every Intro to Macro Economics class. By legalizing recreational marijuana in every state, Galbraith (1978) believes our trade deficit will be drastically reduced. This will cause our dollar to be stronger and in turn strengthen our economy by giving Americans more purchasing power.

In sum, Galbraith (1978) does more than just provide a compelling argument for the economic necessity of recreational marijuana. He theorizes a marketplace in which the U.S Government and rural farmers form a mutually beneficial relationship where farmers make a

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<sup>1</sup> <http://data.bls.gov/cgi-bin/cpicalc.pl>

profit growing marijuana and the government makes a profit selling that marijuana to licensed retailers. Some of the profits the state would make from the production and sale of recreational marijuana would be earmarked for health and medical research. Thus, Galbraith's (1978) plan is truly a win-win-win-win for farmers, the government, the economy, and the American people. In addition to providing farmers with additional revenue, recreational marijuana would reduce America's trade deficit and strengthen the dollar. Economists have widely agreed a large trade deficit has a negative impact on the value of the dollar, and thus including recreational marijuana production in the input-export calculation would reduce the trade deficit, strengthen the dollar, and give Americans more purchasing power. When Galbraith's (1978) numbers are adjusted for 2015 values, the economic advantage of recreational marijuana becomes even tougher to ignore.

### **Recreational Marijuana and Tax Revenue**

In order to determine the tax revenue from widespread recreational marijuana, one must first hypothesize the size of recreational market in totality. Caputo and Ostrom (1994) argue a baseline for the overall size of the market can be determined by focusing on either supply or demand statistics. In this study, supply was estimated by the amount of marijuana seized by the DEA (Drug Enforcement Agency) and what percentage this seizure represents of the total marijuana market. In 1982 the DEA seized over 2000 tons of marijuana and it is conservatively estimated that this amount was equal to 15% of all marijuana grown illegally within in the United States (Caputo and Ostrom 1994). Using this criterion, the study argues a general idea about the domestic marijuana market can be estimated. However, the study acknowledges that "seizure figures are generated by enforcement agencies in pursuit of appropriations and legal authority, they may over-estimate the actual quantity" (Gettman 1993) and thus believes more demand-oriented criteria should be used to accurately estimate the size of the domestic marijuana

market. In terms of demand-oriented criteria, Caputo and Ostrom (1994) believe survey results from the National Institute of Drug Abuse can shed some light onto how many people in America actually use marijuana. While using a consumption oriented baseline for the overall size of the marijuana market produces a much smaller number than the supply side would, it is still considered a more accurate measure for several reasons. First, the survey excludes residencies such as college dorms and military bases. Although these residencies represent a small percentage of the population, they are known to have higher drug consumption rates than other individuals. Thus, not having them included in the survey reports results in an even more conservative estimate (Caputo and Ostrom 1994). Additionally the data is derived by using statistical sampling theories and includes only data from within the United States (Caputo and Ostrom 1994).

Once the study decided how it would determine the baseline for the recreational marijuana market in the United States, it was time to collect the data. Research from the 1991 National Institute of Drug Abuse revealed: 65 million people had smoked at least once in their life, 19 million people have smoked within the last year, and 9 million people have smoked marijuana within the last month. A survey in 1991 from the United States Department of Health and Human Services National Household Survey on Drug Abuse was then used to estimate the rate of consumption between these individuals. The study estimated that regular users (those who have smoke marijuana within the last month) smoked 110 times per year, and irregular users (those who have smoked within the last year) smoked 6 times per year. Needless to say, the regular users account for over 60% of marijuana consumed each year. After determining number of users and frequency of use, the last step was to determine the average quantity used each time someone smoked. A 1991 survey from the National Commission on Marijuana and Drug Abuse

determined the average marijuana user consumed one gram per use. Once number of users, frequency of use, and amount used were established Caputo and Ostrom (1994) were able to estimate the total number of grams of marijuana consumed in 1991 to be 1194.36 tons.

Once this number was established, Caputo and Ostrom (1994) used three sources to determine the average price per ounce of marijuana in the United States. These sources include the DEA, the NNICC (National Narcotics Intelligence Consumer Committee), and High Times (a magazine for marijuana aficionados). Using the prices from these three sources Caputo and Ostrom (1994) were able to estimate the total value of the 1991 domestic marijuana market to be between five and nine billion dollars. This estimate gains further credibility when considering Galbraith's (1978) estimated value of the domestic marijuana market at 2.5 billion dollars falls between this range when converting the 1978 dollars to 1991 dollars using a government CPI calculator (5.22 billion<sup>1</sup>).

After establishing a rational estimate of the total value of the domestic marijuana market, Caputo and Ostrom (1994) were finally able to hypothesize the estimated tax revenue this market could bring in for the government. Caputo and Ostrom (1994) make the assumption that legal marijuana would be taxed at 100% and thus would bring in tax revenues between five and nine billion dollars annually for the U.S Government. Additionally, Caputo and Ostrom (1994) take into consideration the price elasticity of marijuana established by Nisbet and Vakil (1972) and assert taxation, especially 100%, could impact these estimated numbers by diminishing the demand for the product.

Caputo and Ostrom (1994) do an excellent job of meticulously forming a rational valuation of the domestic marijuana market by taking into consideration the amount of people who claim to smoke marijuana, the frequency of those smokers, the amount those smokers

consume each time they smoke, and the price of that consumption. However, their study makes two broad assumptions that may cause their valuation of tax revenue to be incorrect. First, a 100% tax is possible, but not likely, as virtually no other product in America is taxed at that rate. Marijuana would likely be taxed similarly to cigarettes, and even the highest state cigarette tax (New York at 31%<sup>2</sup>) is nowhere near the 100% tax rate Caputo and Ostrom (1994) hypothesize. Although unlikely, it is not impossible that marijuana would initially be taxed at the 100% rate assumed by Caputo and Ostrom (1994) in order to incentive senators, congressmen, and the voting public to pursue the legalization of recreational marijuana more aggressively. Secondly, Caputo and Ostrom (1994) make no assumptions about whether or not the demand for marijuana will increase once it becomes recreationally legal. One can assume marijuana laws stop at least some people from consuming the product and thus it is not impossible that recreational legalization will increase demand for the product and those increase overall tax revenues.

Despite these potential flaws, the total tax revenue projections made by Caputo and Ostrom (1994) are almost spot on with what has currently been reported by states in which recreational marijuana is legal. Year-to-date tax revenues in Colorado for recreational marijuana are over under 113 million dollars<sup>3</sup> for the 2015 calendar year. If we make the illogical assumption that all 50 states would collect the exact same annual tax revenue that Colorado had collected thus far, we would have an estimated total domestic annual tax revenue of 5.65 billion dollars (\$113 million x 50). If we tweaked our illogical assumption that each state would collect the exact same tax revenue as Colorado has thus far, and assumed states with higher populations (California, New York, Texas) would collect significantly more tax revenue the five to nine billion dollar estimation by Caputo and Ostrom (1994) is certainly realistic.

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<sup>2</sup> <http://taxfoundation.org/blog/state-cigarette-tax-rates-2014>

<sup>3</sup> <https://www.colorado.gov/pacific/revenue/colorado-marijuana-tax-data>

## **Implications on the insurance market**

Of the multiple financial implications related to recreational marijuana, the area that currently has the most research are the implications on the insurance industry. Although recreational marijuana is still in its infancy stages, the insurance industry has already begun implementing policies to deal with this new market. Marijuana related insurance policies include “theft coverage for valuable crops, workers compensation coverage for employees of the facilities, and even auto liability coverage similar to that of Pizza delivery drivers for employees who deliver marijuana directly to customer homes” (Wells, 2014). The recreational marijuana industry is considered “data driven” and thus there are even policies for stores in case their client database is breached or stolen (Ceniceros, 2010). Considering recreational marijuana is only legal in a few states, and illegal federally, the speed at which insurance companies have implanted new policies may be an inclination about their expectations for future growth.

While insurance companies have begun creating policies for marijuana related businesses, there is still a lot of gray area over insurer’s liability to cover marijuana as personal property. Given personal marijuana plants can yield thousands of dollars worth of marijuana (Wells, 2014) it is likely owners will try to insure these plants in the case of fire or theft. The standard Insurance Service Office Homeowner or Dwelling property policies do not have explicit exclusions for damage or destruction of contraband, nor any specific mention of marijuana as a covered or excluded property. While the courts are unlikely to make insurers pay for something illegal, “The industry would be wise, in light of the trend towards legalization, to explore the inclusion of an explicit exclusion unless coverage is intended” (Wells, 2014). Now that marijuana is recreationally legal in several states, insurance companies (where marijuana is recreationally legal) must explicitly decide whether or not they want to insure personal

marijuana. Choosing to do so could create a new revenue stream for insurance companies while refusing would limit liabilities.

While one would not expect auto insurance to be impacted by recreational marijuana, as more and more growers incorporate vehicles as moving greenhouses it is becoming an area insurers must consider (Barlow, 2009). Wells (2014) points out that while most policies make it clear that custom furnishings and non-factory installed items are not covered, “Special grow houses, grow lights, and other items used for marijuana harvesting might ultimately be powered by the vehicle and could certainly be claimed by the auto owner in the event of a claim.” Similar to home and property insurers, auto insurers must now either specifically exclude this sort of coverage or include it and charge additional fees.

In terms of life insurance, the industry has not fared well with its respect to its opposition to marijuana (Wells, 2014). A court decision in 2003 denied a life insurer the right to refuse payment of a claim because the decedent had marijuana in his blood stream at the time of death. The decedent’s policy had a clause that would not cover “drug induced death” but the wife of the decedent was successfully able to argue there was no way of proving the marijuana was responsible for his death (Verdicts, 2003). Moving forward, it is unlikely that life insurance companies will be able to include marijuana as a “drug” in their “drug induced death” policies as recreational marijuana becomes more prevalent in the United States.

In sum, the potential impact recreational marijuana has on insurance companies, and those who use their services, is well researched. While marijuana related businesses are well covered by new insurance policies, there is still grey area for personal consumers. With the trend towards legalization, insurance companies must explicitly state whether or not they will cover personal marijuana plants or risk being burned in court. Making explicit policies that cover

personal marijuana plants could be a way for insurance companies to create new revenue streams, but it also opens them up to further liability. Similarly, auto insurers must be more specific in terms of what they will or will not cover. Auto insurance does not typically cover personal property contained in a vehicle. However, special grow house vehicles that use the car's energy to power equipment for cultivation purposes could certainly be claimed by an auto owner if it is not specifically excluded. Lastly, life insurance companies have fared the worse against opposition to marijuana. The courts have ruled that marijuana use will not constitute reason for a refused payment based on "drug induced death" clauses unless the company can prove marijuana was specifically responsible for the death.

### **Marijuana and big business**

While scholars like Galbraith (1978) believe recreational marijuana production will be distributed amongst a large number of domestic farmers as a way of creating additional revenue streams, others believe production will be dominated by big business, specifically the tobacco industry. There are several good reasons to believe that the latter is more likely. Documents from Phillip Morris, British American Tobacco, and RJ Reynolds reveal tobacco companies have been interested in recreational marijuana production since the 1970 (Barry, Hilamo, Glantz, 2014). Initial interest in marijuana by the tobacco began in 1969 when the Department of Justice granted Phillip Morris permission to conduct chemical analysis of marijuana smoke (Barry et al, 2014). A memorandum distributed to Phillip Morris executives in 1969, that has since been made public, described the study as "An opportunity to learn something about this controversial product, whose usage has been increasing rapidly, so rapidly among the young people" (Phillip Morris, 1969). While public records indicate Phillip Morris was allowed to study marijuana, there have been no records made available about the findings of this research or if this study



even actually occurred. Whether or not the study actually happened, the interest in marijuana by Phillip Morris indicates that big business has already begun inquiring into the possibility of selling marijuana on a large scale. In addition to the possible study by Phillip Morris in 1969, the International Narcotics Control Board allowed British American Tobacco to conduct similar research on marijuana in 1970 (Barry et al, 2014). As with Philip Morris, no public records of the findings of this study have been made public. The fact that a tobacco company outside of America also wanted to research marijuana supports the idea that the entire international tobacco industry was curious about marijuana and not just one particular company.

By 1971, information about the tobacco industry's interest in marijuana had leaked to the public. In January of 1971 Time Magazine reported, "Tobacco men are discussing the potentially heavy market for marijuana, and some figure it could be legalized within five years" (Danzig, 1971). While we now know for certain the tobacco industry was indeed interested in marijuana, the industry rigorously denied any interest in the product at the time. In fact, Time Magazine was forced to issue an official apology to the tobacco industry for their report in the January 1971 edition (Barry et al, 2014). In addition, the six major tobacco companies issued independent statements after the Times Magazine report claiming all reports about their company being interested in marijuana were untrue (Barry et al, 2014). Now that public information has been released that clearly indicates the tobacco industry was interested in marijuana as early as 1969, one must ask themselves why the industry falsely denied being interested in marijuana at the time. One possible conclusion is that the tobacco industry realized the potential profitability of recreational marijuana and didn't want more competitors to enter the market. If the tobacco industry had come out and said, "We've been researching marijuana and we think it is going to be the next big thing" it is very possible that other companies and industries could begin

preparing for legalization and eventually cut into the tobacco companies' market share. Another possible conclusion is that since marijuana was considered a "controversial" product at the time, the tobacco industry could have been concerned that associating themselves with marijuana would harm sales of their existing products.

While the findings of the research tobacco companies may have conducted on marijuana in 1969 and 1970 have not been made public, research indicates the tobacco industry certainly viewed marijuana as a threat to their existing business. Archived memorandums from British American Tobacco (BAT) reveal that executives in 1976 believed marijuana's increasing popularity could threaten the tobacco industry at least to at least "certain degree" (Thorton, 1976). In addition to marijuana's increasing popularity, tobacco companies were concerned that marijuana smoking was not associated with the same health side effects that tobacco smoking was. In 1976 Campbell-Johnson, a public relations company, delivered a report to the Tobacco Advisory Council that stated, "As medical pressure against cigarette smoking increases, there is little sign of similar press against marijuana smoking" (Campbell-Johnson, 1976). Marijuana's increasing popularity and lack of medical pressure further incentivized big tobacco companies to investigate the possibility of selling recreational marijuana as part of their product line.

Tobacco company Brown & Williamson completed the first known internal report that officially recommended offering marijuana related products (when legal) in 1978. The report stated, "Marijuana products seem to be a logical new industry for tobacco companies" (Brown and Williamson, 1978). The report hypothesized that immediately after the legalization of marijuana; tobacco sales would fall as people began experimenting with the drug. However, the report forecasted that tobacco companies could make up for these lost sales by instituting two new products: marijuana cigarettes and marijuana-tobacco blend cigarettes. Lastly, the report

predicted that Latin American countries would soon follow the United States in legalization because they would likely become the primary suppliers (Brown and Williamson, 1978). Following in Brown and Williamson's footprints, analysts at British American Tobacco created a report that also formally recommended offering marijuana related products when legally available. The report concluded that British American Tobacco should "Learn to look at itself as a drug company rather than as a tobacco company" (Crellin, 1980). In addition to marijuana, the report hypothesized that eventually even more drugs will be legalized and that British American Tobacco should begin preparing itself for these possibilities. Specifically, in reference to marijuana, valium, morphine, opiates, nicotine analogues, etc. the report stated "At present the taking of many of these drugs is either medically prescribed or regarded as deviant behavior, but could be 'socialized' like alcoholic drinking and tobacco smoking" (Crellin, 1980).

Despite their denial in the media, it is clear that tobacco companies have been intrigued by the possibility of recreational marijuana since 1969. The intrigue of the late 1960s and early 1970s resulted in formal forecast recommendation by at least two tobacco companies (British American Tobacco and Brown and Williamson) to pursue marijuana products when legal. If the tobacco industry commits itself to being "drug" companies instead of tobacco companies it is likely they will be major players in the recreational marijuana business when marijuana becomes legal on a federal level

## **Methodology**

### **Recreational Marijuana Sales Revenues in 2015**

All recreational marijuana businesses in America are currently private companies and have no obligation to make their financial statements public. While financial statements of

individual recreational marijuana businesses are difficult to find, overall revenues are either listed (Washington), estimated (Oregon), or can be calculated (Colorado) from information published on their state government website. Recreational marijuana in Washington became available for purchase in March of 2015. From March 2015 to December 2015 Washington had total recreational marijuana sales of \$455,797,056 (<http://lcb.wa.gov/marj/dashboard>). This data is reported from 207 active recreational marijuana stores in Washington, giving each store average sales revenues of \$2,201,918.14 ( $455,797,056 / 207$ ).

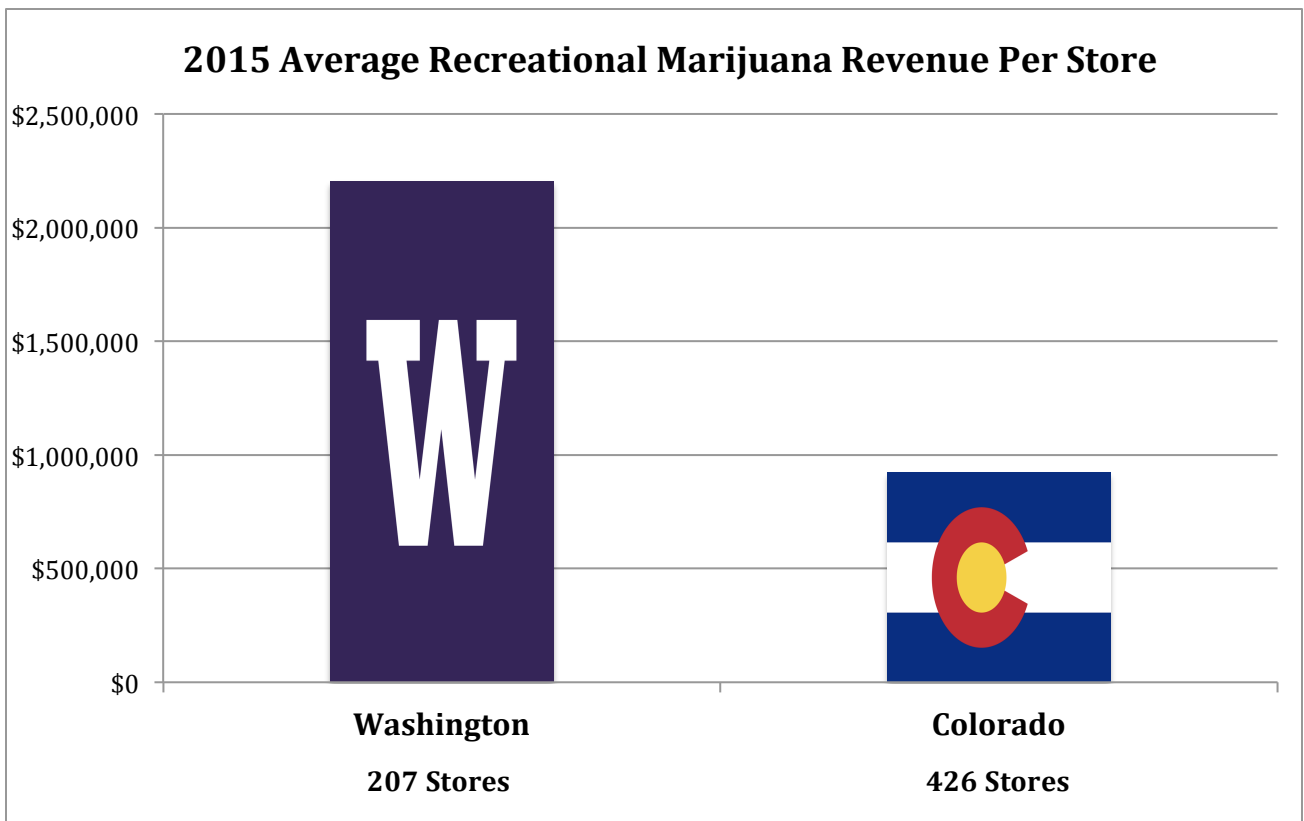
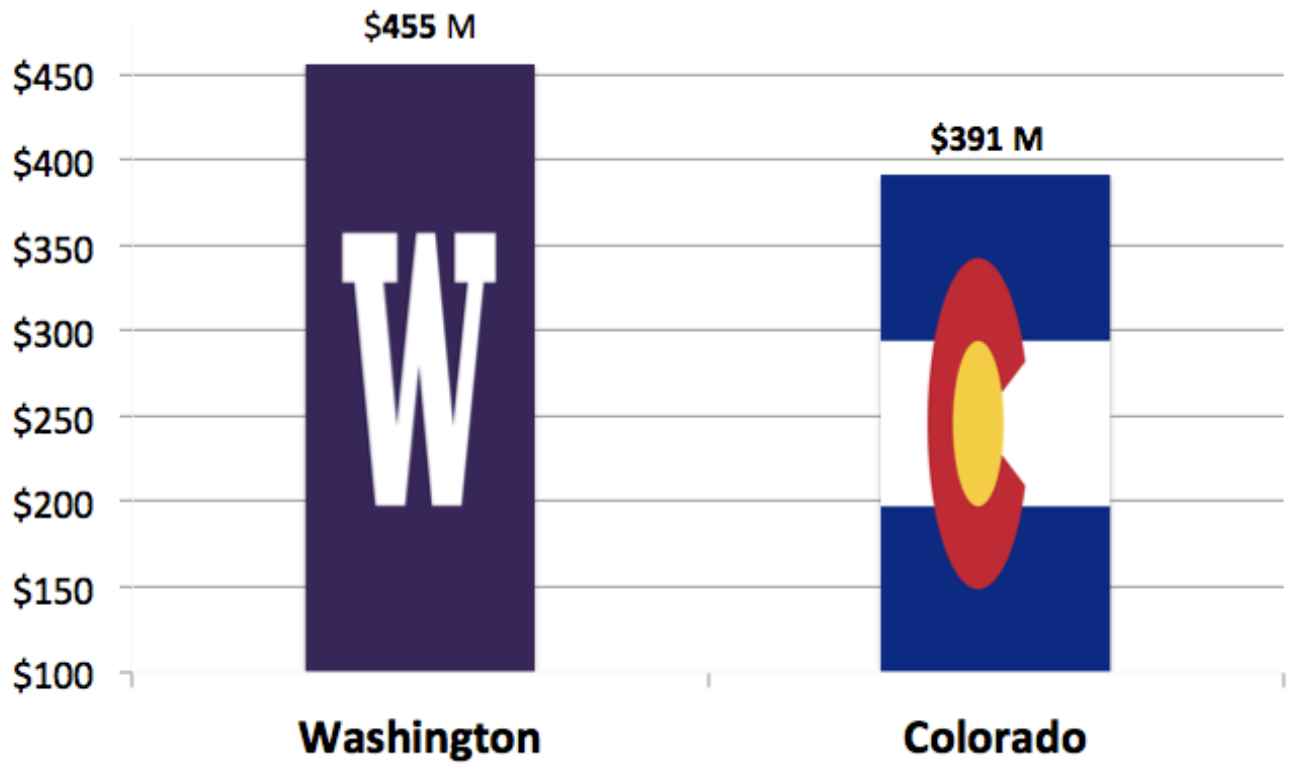
Colorado's state website does not keep statistics on total sales revenues but it does keep statistics on total tax revenues. Therefore, total sales revenues of recreational marijuana in 2015 can be found by dividing the total amount of tax collected by the tax rate. Unlike Washington, Colorado began legally selling recreational marijuana in 2014 and thus has tax revenue data that spans from January 2015 to December 2015. During this time span, the state of Colorado collected \$109,128,059 in tax revenue from recreational marijuana<sup>4</sup>. Colorado taxes recreational marijuana at a 27.9% tax rate<sup>6</sup> and thus total recreational marijuana sales revenue in Colorado for 2015 can be found by dividing \$109,128,059 by 27.9% to get a grand total of \$391,139,966.42. Colorado had 426 licensed storefronts as of December 2015, giving each store average sales revenues of approximately \$922,500. While it may be surprising that Colorado had lower sales figures than Washington, it is important to keep in mind that Washington's total population is about 1.7 million higher than that of Colorado. Additionally, Colorado had more than double the amount of marijuana retail stores than Washington did in 2015. The higher amount of recreational marijuana storefronts in Colorado likely increased competition amongst stores, leading to lower average prices and lower sales revenues. The graphs on the following page

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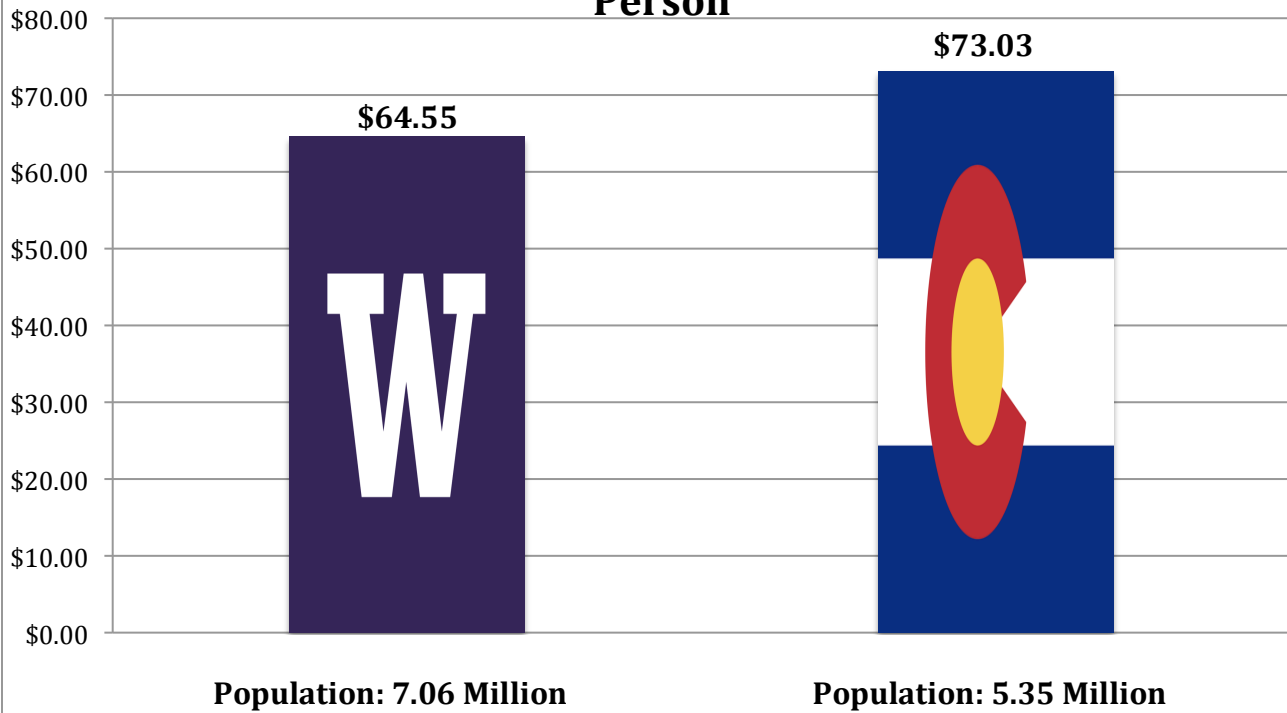
<sup>4</sup> <https://www.colorado.gov/pacific/revenue/colorado-marijuana-tax-data>

depict overall sales revenues, sales revenues on a per store basis, and sales revenues on a per-person basis. The graph representing sales on a per-person basis is segmented into two groups. First, total recreational sales are divided by the total population of their respective states to get an idea of the per-person spending on recreational marijuana. Furthermore, the last graph divides total sales only by the population of people aged 21-40 in their respective states. Many people believe recreational marijuana is something that only appeals to younger people. If this is in fact the case, restricting the population to people between the ages of 21-40 would provide a more accurate representation of the per-person spending on recreational marijuana.

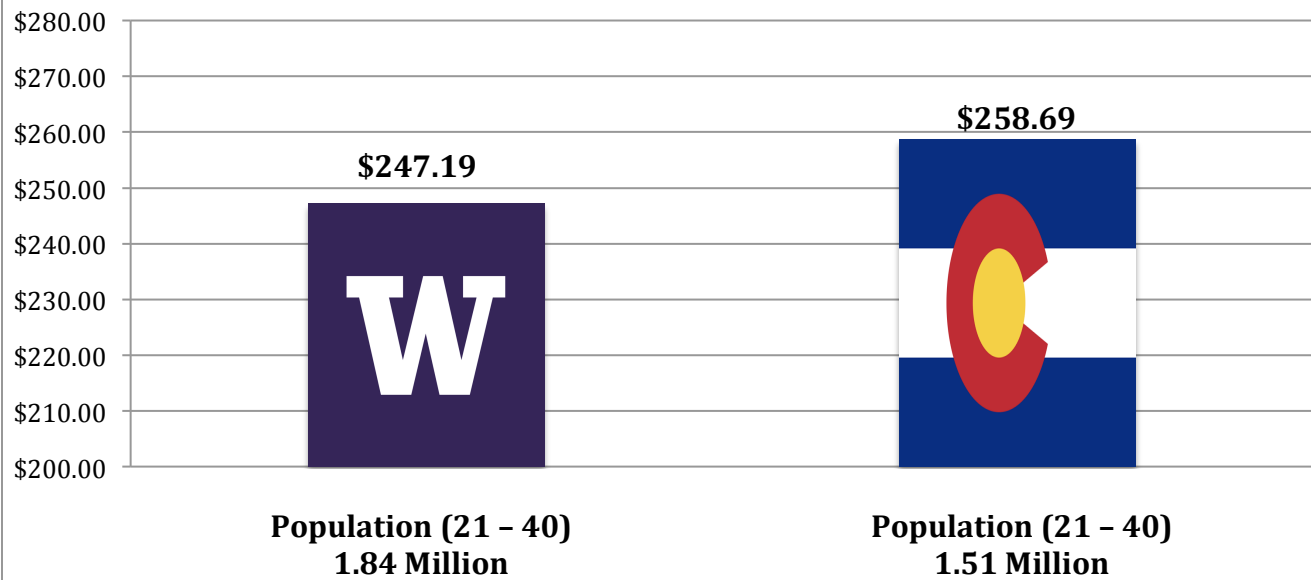
Oregon did not start selling recreational marijuana until October 1<sup>st</sup> 2015. Additionally, their state website does not yet include information on either tax or revenue collections from recreational marijuana. Since recreational marijuana sales did not begin in Oregon until October 2015, they will not be included in the figures bellow for the sake of accurate comparison. Additionally, although Washington D.C and Alaska have also legalized recreational marijuana sales, these states have just begun accepting licenses for recreational stores and currently have no official recreational marijuana sales.



## 2015 Average Recreational Marijuana Sales Per Person



## 2015 Average Recreational Marijuana Sales Per Person Between Ages 21 - 40



## Recreational Marijuana Tax Revenue in 2015

Tax revenues generated from recreational marijuana sales have been a main point of emphasis for those who argue in favor for the widespread legalization of recreational marijuana. While this paper does not intend to argue the issue of legalization, analyzing tax revenues generated from recreational marijuana sales are an important step in determining the total financial implications of recreational marijuana. Every state that currently sells recreational marijuana (Colorado, Washington, Oregon) has an abundance of information on their state website about tax rates, licensing fees, and tax collections. When discussing the tax implications of recreational marijuana, there are three important points to keep in mind. First, this study focuses only on recreational marijuana and ignores medical marijuana. Medical marijuana and recreational marijuana are taxed and regulated differently in each state and thus this paper will focus only on financial implications related to recreational marijuana. Second, recreational marijuana is not taxed at a state's normal sales tax rate. The sales tax on recreational marijuana is 27.9%, 37%<sup>5</sup> (was 25% prior to 7/1/15), and 25% (was 0% prior to 1/4/16) in Colorado, Washington, and Oregon. The highest potential sales tax for normal goods in these states are 8.8%<sup>6</sup>, 9.5%<sup>7</sup>, and 0%<sup>8</sup> respectively. Therefore, in all of these states recreational marijuana is taxed approximately three to four times higher than the normal tax rate. Third, due to the IRS tax code 280E recreational marijuana businesses are essentially taxed at gross revenues. Tax code 280E is titled "Expenditures in connection with the illegal sale of drugs" and was instituted in 1982 in response to Miami's cocaine epidemic in the 1980s. Cocaine dealers during this time period would file taxes, but would deduct what they considered ordinary businesses expenses. In

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<sup>5</sup> <http://dor.wa.gov/Content/FindTaxesAndRates/marijuana/Default.aspx>

<sup>6</sup> <http://www.sale-tax.com/Colorado>

<sup>7</sup> <http://www.taxrates.com/state-rates/washington/>

<sup>8</sup> <http://www.taxrates.com/state-rates/oregon/>



order to stop this, and further disincentivize the sale of illegal drugs, the IRS created proposition 280E that prohibits deducting any expenses related to the sale of illegal drugs<sup>9</sup>. Although recreational marijuana is completely legal in several states, it is still federally illegal. Since marijuana is federally illegal, and the IRS is a federal organization, the IRS believes even legal marijuana sales fall under tax code 280E. While this creates a substantial financial burden on recreational marijuana business owners, it significantly increases the federal income tax revenues collected from these businesses.

As mentioned, recreational marijuana became legal in Colorado in 2014 and thus Colorado has a full year of tax data for 2015. During 2015, the state of Colorado collected \$113,817,245 in licensing and sales tax revenue. This number is slightly higher than the number used in the previous section to determine total sales because it includes license fee. License fees are onetime payments made by prospective recreational marijuana businesses to their respective state government in order to receive a license to legally sell recreational marijuana. In addition to the \$113,817,245 generated from license fees and sales tax, recreational marijuana businesses must also pay federal income tax. As mentioned, due to IRS tax code 280E, recreational marijuana businesses pay federal income tax on gross revenue because no expenses can be subtracted. Assuming a federal corporate income tax rate of 35%, the amount of corporate income tax collected by the IRS from recreational marijuana businesses in Colorado can be calculated using the total sales number determined in the previous section. Multiplying the \$391 million of total 2015 Colorado recreational sales by 35% results in an estimated \$136,850,000 in federal taxes collected by the IRS. This calculated number plus the licensing and sales tax figure

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<sup>9</sup> <https://www.law.cornell.edu/uscode/text/26/280E>

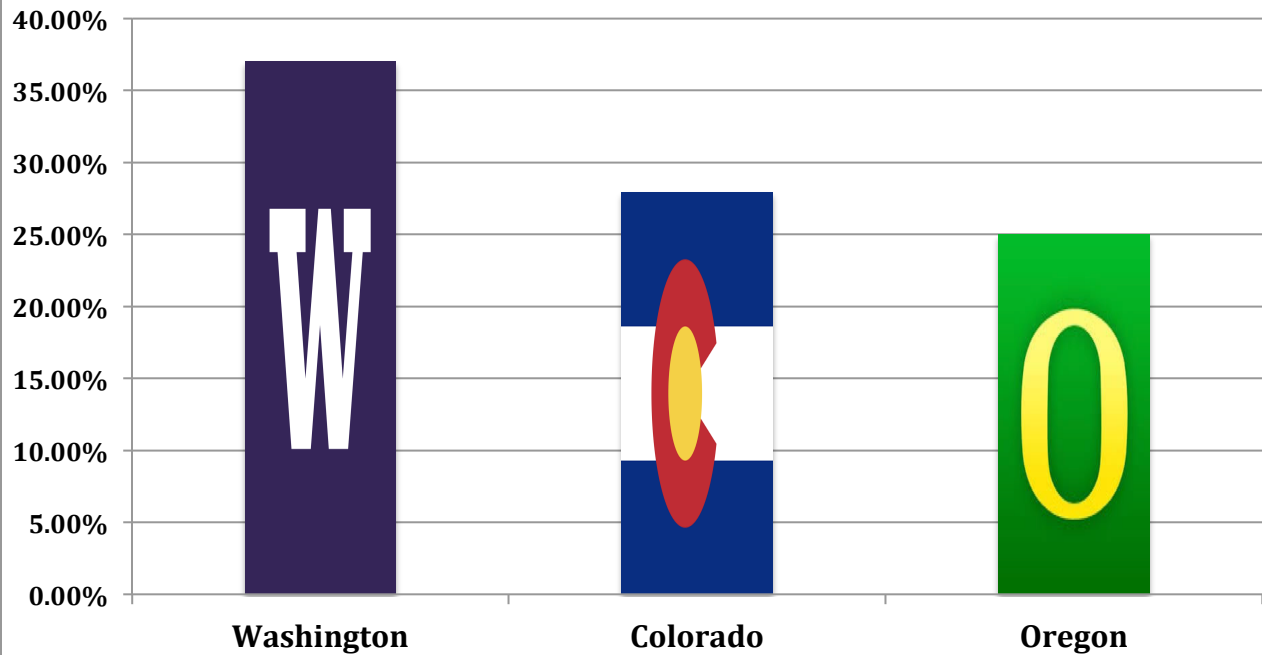
listed above results in a grand tax total of \$250,667,245 in generated tax revenue for the state of Colorado and federal government.

Unlike Colorado, Washington's state government website clearly lists both sales and tax collections statistics. From March 2015 to December 2015, Washington generated over \$118 million in sales tax revenue<sup>10</sup>. In addition, total federal income tax paid by Washington recreational businesses will be estimated by multiplying the previously listed \$455 million 2015 sales revenues by the assumed federal corporate income tax of 35% to get a total of \$159.25 million. Therefore, an estimated grand total of \$277.25 million in tax revenue was generated for the state of Washington and federal government in 2015. Both Colorado and Washington also have state corporate income taxes but these taxes are not levied at gross revenue. Because each recreational business is likely to have a different amount of expenses, and no specific financial information of recreational businesses is available, state corporate income taxes have been left out of these calculations for simplicity purposes. Therefore, it is likely that the actual tax revenues collected and generated by recreational marijuana businesses in Washington and Colorado is actually slightly higher.

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<sup>10</sup> <http://lcb.wa.gov/marj/dashboard>

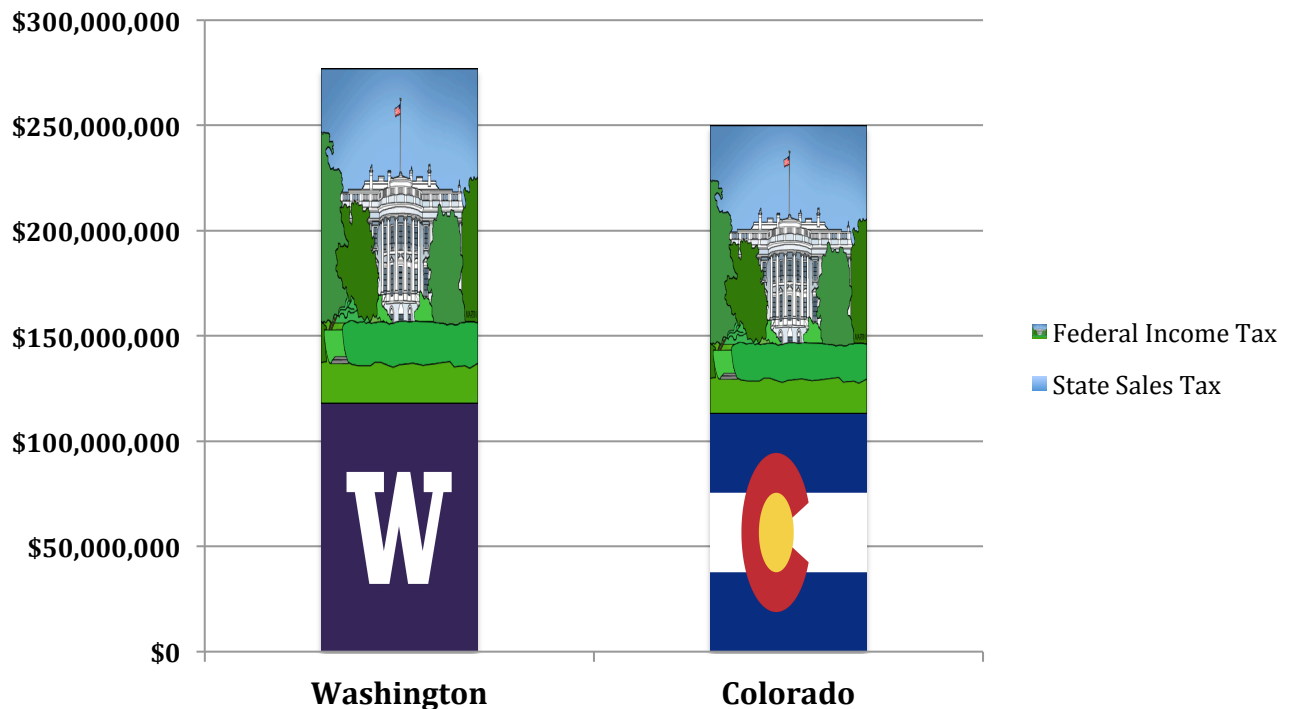
## 2015 Recreational Marijuana Sales Tax Rates



\*25% prior to 7/1/15

Chart 5

## 2015 Total Estimated Recreational Tax Collections



## **Employment Implications of Recreational Marijuana**

One of the most tangible implications of recreational marijuana is its impact on employment. All businesses require employees and recreational marijuana establishments are no different. As of February 1<sup>st</sup> 2016, Colorado has 426 licensed recreational marijuana storefronts, Washington has 334, and Oregon has 307. Together these three states contain 1,067 licensed recreational marijuana establishments. It is important to note that although Alaska and Washington DC also have approved marijuana for recreational use, these territories have only recently begun accepting applications for recreational licenses and currently have no official recreational stores. Therefore, it is reasonable to assume the number of recreational marijuana establishments will continue to increase as these two territories begin granting recreational licenses.

Interviews with executives and owners of recreational marijuana stores indicate that the average recreational marijuana business employs fifteen full-time people (E. Anderson & A. Kaplan, personal communication, January 29<sup>th</sup>, 2016 & February 5<sup>th</sup> 2016). Assuming fifteen people is an accurate average, the total employment of the recreational marijuana industry can be estimated by multiplying fifteen by 1,067 to get a grand total of 16,005 people who work for recreational marijuana stores in some capacity.

When discussing the impact recreational marijuana has had on employment, there are two key points that need to be addressed. First, all interviewed executives and owners of recreational marijuana establishments have emphasized that the legalization of recreational marijuana has increased their demand for labor. In other words, the estimated employment numbers do not strictly reflect people who previously worked in medical marijuana facilities before transitioning to recreational marijuana stores. This is an important point because it suggests that the

legalization of recreational marijuana in these states has actually created jobs instead of just changes in job titles. Specifically, Andrew Kaplan, founder and CEO of a recreational and medical dispensary in Colorado named 14er Holistics, said recreational marijuana legalization “almost doubled my need for employees, I had nine before <recreational> legalization and had to add six after to keep up with demand” (E. Anderson, 2016). Additionally, Andrew Kaplan, the Director of Retail Operations at TRUCannabis, one of Colorado’s largest recreational marijuana establishments, said, “We currently have 120 employees across five locations and we are twice as big now <in terms of employees> than we were before <the legalization of recreational marijuana>” (A. Kaplan, 2016). If all marijuana establishments experienced similar employment growth demands (around 100%) after the legalization of recreational marijuana, it can be estimated that half of the total projected marijuana employees (8,002.5) were not working in the marijuana industry prior to recreational legalization. Therefore, approximately 8,003 jobs have been created by the legalization of recreational marijuana in Colorado, Washington, and Oregon.

Another important point emphasized by the interview participants is that recreational marijuana employees have diverse backgrounds and job positions. In other words, the recreational marijuana industry does not simply employ just cashiers, growers, and “Bud-tenders”. Evan Anderson states that his employees have backgrounds in “finance, engineering, video production, human resources, and sociology” (E. Anderson, 2016). In addition, Andrew Kaplan from TRUCannabis stated that his company has a full corporate office that includes payroll managers, a CFO & CEO, General Managers, Compliance Officers, Accountants, Financial Analysts, and Human Resource Managers (A. Kaplan, 2016). Therefore, the legalization of recreational marijuana has not just created employment opportunities for unskilled laborers, but also skilled laborers with college degrees and industry experience.

None of the interview participants wanted to discuss employee compensation specifically, but all participants did claim to have “competitive” employee salaries that were above minimum wage. Assuming an average hourly salary of \$15, the nominal value of the employment created by recreational marijuana can be calculated. An hourly salary of \$15 is very conservative because although there may be cashiers and growers who make less, there are other positions (accountants, financial analyst, etc.) within the industry that make much more. The estimate of \$15/hour multiplied by 40 hours a week (usual full-time employment) multiplied by 50 weeks (assuming 2 weeks of missed time for vacation / illness) multiplied by the estimated 8,003 jobs created ( $15 \times 40 \times 50 \times 8,003$ ) comes to a grand total of over \$240 million. Therefore, it can be conservatively estimated that the legalization of recreational marijuana in Colorado, Washington, and Oregon creates \$240 million in employee compensation each year. Considering recreational marijuana is still in its infancy period, it is logical to assume this number will only to continue to increase as more and more stores enter the market and increase the demand for labor.

Comparing the above information to state government employment records further suggests that the legalization of recreational marijuana has had a positive impact on employment. Government employment records<sup>11</sup> indicate unemployment across the states fell by an average of 0.6% between December 2014 and December 2015. All states with active recreational marijuana establishments during this time period (Colorado, Washington, and Oregon) had unemployment decreases of 0.7%, 0.8%, and 1.3% respectively. Therefore, all states with recreational marijuana sales between December 2014 and December 2015 had unemployment decreases at a rate higher than the national average. While it would be illogical to assume recreational marijuana businesses were the

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<sup>11</sup> <http://www.bls.gov/web/laus/laumstch.htm>

sole reason for these states' unemployment decreases, it would be tough to argue that marijuana businesses haven't positively contributed to these states' employment statistics.

### **Recreational Marijuana and Real Estate Values**

Interviews with marijuana business executives reveal the existence of so called "cannabis migrants". Cannabis migrants are people that have moved to either Colorado or Washington for the sole purpose of having access to recreational marijuana. Marijuana business owners like Evan Anderson claim to have interactions with these migrants on a weekly basis. When asked specifically about people moving to recreationally friendly states Evan Anderson said, "Oh yeah, it's a real thing. They're called Cannabis migrants. At least once a week someone comes into our store and tells us they're new to the area and moved here in order to have access to recreational marijuana for one reason or another" (E. Anderson, 2016). While it would be impossible to calculate the exact number of cannabis migrants, examining changes in housing prices since the legalization of recreational marijuana can shed some light on whether or not recreational marijuana has increased the demand for housing in a particular area. From the first quarter of 2014 to the second quarter of 2015, the average American house increased in value by 4.16%<sup>12</sup>. During this same time period, Seattle, the city with the most recreational marijuana stores in Washington, had average value increases of 8.52%<sup>15</sup>. Additionally, Denver, the city with the most recreational stores in Colorado, saw a shocking 17.11%<sup>15</sup> increase in real estate prices during this time period. Therefore, cities with the most active recreational marijuana market saw their real estate value increase well above the national average. While these statistics suggest recreational

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<sup>12</sup> <http://www.economist.com/blogs/graphicdetail/2015/11/daily-chart-0>

marijuana may be positively impacting real estate prices, it is illogical to assume that these dramatic increases in real estate are entirely related to people moving to states where recreational marijuana is legal.

A more likely contributor to the above average real estate price increases in these cities is the high quantity of recreational storefronts and the large amount of land they require. For example, recreational businesses are required to be 70% vertically integrated (E. Anderson, 2016). In other words, recreational storefronts must grow 70% of their own marijuana. Therefore, each one of the 426 licensed marijuana stores in Colorado must also have their own growing facility. When taking into consideration the totality of people wanting to live in these states, the amount of recreational marijuana storefronts, and the large amounts of land these storefronts require, it is easy to see why recreational marijuana legalization likely played a role in Denver and Seattle's large real estate value increases.

### **Indirect Recreational Marijuana Businesses**

The legalization of recreational marijuana has created an abundance of indirect business opportunities for companies. For the purposes of this paper, indirect business opportunities refer to recreational marijuana oriented businesses that are not involved in the actual sale of marijuana. For example, a website called Weedmaps.com received over 5.6 million unique visitors in 2015<sup>13</sup>. Weedmaps.com is essentially the Yelp equivalent for recreational marijuana. The website allows users to find local recreational marijuana businesses, read and post reviews of particular businesses, and even view price and strain

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<sup>13</sup> <https://siteanalytics.compete.com/weedmaps.com/#.VtkDg8bXbKA>



information from these businesses. Similarly, PotGuide.com received over 900,000<sup>14</sup> unique visitors in 2015. PotGuide.com is a competitor of Weedmaps.com and offers a similar service. However, in addition to locations and reviews, PotGuide.com offers tourists the ability to book marijuana related activities and stay at marijuana friendly hotels. While the exact profitability and employment information of these websites could not be found, the existence of these businesses confirm that the legalization of recreational marijuana has provided business opportunities for companies not directly involved in the sale of marijuana.

In addition to these websites, there are “marijuana tourism” businesses that are thriving in select areas. For example, Colorado has businesses such as “My 420 Tours”, “420 Airport Pick Up”, “Colorado Cannabis Concierge”, “Colorado Cannabis Tours”, and “Travel High Colorado”. These businesses offer a host of different services, but most commonly these companies take tourists to different recreational marijuana retail stores and allow them to “partake” while traveling on a luxury busses. These tours range in price from \$50 - \$100 per person and are offered every single day in select Colorado cities. Additionally, Colorado now has hotels that specialize in marijuana tourism. Hotels in Colorado like “Bud and Breakfast”, “420 Accommodations”, and “Leaf Lounge” cater to marijuana tourists by allowing customers to smoke in their room and are located next to prominent marijuana “hot spots”. There are also several popular chain hotels that discreetly allow customers to smoke on their premises, but the exact name of these hotels cannot be known until a booking is confirmed via ColoradoCannabisTours.com (an affiliate of PotGuide.com). Lastly, Colorado has several restaurants that specialize in “cannabis cuisine”. Restaurants like

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<sup>14</sup> <https://siteanalytics.compete.com/coloradopotguide.com/#.VtkIFsbXbKA>

“Cheba Hut”, “Sexy Pizza”, “Mary Jane’s Pizza” and “Coolhills” allow patrons to openly smoke on their patio and offer several cannabis infused menu items. Similar to the previously mentioned websites, exact profitability and employment information of these businesses could not be found. However, the pure size and number of these businesses suggests that the legalization of recreational marijuana has allowed several new business ventures to exist and thrive.

### **Marijuana and the commodities market**

Since recreational marijuana is still illegal on a federal level, there has been no real research into the possibility of marijuana being sold as a commodity in the futures market. However, research on new developments in the futures market and comedies similar to marijuana can provide a basis for what marijuana may look like as a securitized financial security. If marijuana were to be sold as a financial security, it would be sold in the commodities futures market. One of the leaders in the commodities futures market is the Intercontinental Exchange (ICE) located in Atlanta, Georgia. ICE has well over a thousand different financial commodity products for sale that ranges from frozen concentrated orange juice (FCOJ) to credit default swaps. There are several different types of categories of financial commodities that include agriculture, credit, energy, and equity. Since it is grown in the ground, marijuana would be considered an agriculture commodity if ever listed on ICE. Agriculture commodities are quite popular in the world of finance today. ICE averages over 400,000 financial commodity trades per day and had over 80 million total agriculture trades in 2014<sup>15</sup>. In order for an agricultural product to be traded on a commodities futures market it must meet a desired level of quality and be

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<sup>15</sup> <https://www.theice.com/marketdata/reports/176>

traded in a standardized quantity. For example, coffee (KT) must meet a certain quality criteria and be traded in quantities of 37,500 pounds per contract.

The first step in marijuana commoditization would be to decide on an ideal quantity to be sold with each contract. There are several factors that would go into this consideration and it varies from agriculture product to agriculture product. If we assume an individual marijuana plant can “harvest” up to two ounces of marijuana<sup>16</sup>, and we speculate each commodity future contract to be 1,000 marijuana plants, a hypothetical contract standardization would be 125 pounds. The second step in marijuana commoditization would be to determine some level of quality that must be met. One possible level of quality for marijuana could be determined by THC percentage. THC is the psychoactive chemical found in marijuana and its “potency” differs from strain to strain. Considering THC is the “main ingredient” in marijuana, it would be a logical measure of quality. Additionally, marijuana can now be easily lab-tested to determine levels of THC. Thus, the U.S Commodity Futures Trading Commission could set a baseline measurement of 16% THC concentration per gram of marijuana as a quality barrier. Therefore, Marijuana that was lab tested to be fewer than 16% THC concentration would not be allowed for commodity trading. On the other hand, marijuana that tested significantly above 16% THC could probably fetch a high retail price and thus would not be a smart choice to sell as a commodity.

## **Conclusion**

The recreational marijuana market is still in its infancy stages. Considering recreational marijuana first became legal less than two years ago, minimal research has been conducted on this new and emerging market. Through interviews with marijuana business executives, analysis

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<sup>16</sup> <http://www.hightimes.com/read/key-points-harvest-time>

of government records, and thorough research, this paper bridges the wide knowledge gap between the limited amount of available information and the current state of the recreational marijuana market. The result of this thorough research and analysis has resulted in six main takeaways.

First, recreational marijuana sales are much higher than one would probably expect. Via analysis of government records, this paper discovered that recreational marijuana sales surpassed \$450 million and \$375 million in Washington and Colorado respectively. This sales revenue number was then broken down on an average store basis, which resulted in average store revenues that surpassed \$2 million and \$900 thousand in Washington and Colorado respectively. Furthermore, the sales number in these two states was broken down to discover average sales of \$64 and \$73 per person in Washington and Colorado respectively. Lastly, since recreational marijuana is largely considered a youth activity, the overall sales number was broken down once more to discover average sales between individuals aged 21-40 were \$247 and \$258 in Washington and Colorado respectively. Therefore, if individuals between 21 and 40 were the only people to buy marijuana in these states, it would imply each person spent as much money on marijuana as the price of a flat-screen television.

Secondly, recreational marijuana is a major tax generator for the state and federal government. This fact is probably not very surprising as advocates of recreational legalization often use this as a main talking point. Analysis of government records indicated that both Colorado and Washington generated over \$100 million dollars in tax revenue for their states via the sale of recreational marijuana. In both Colorado and Washington, this money is being set aside to provide for the K-12 school system, drug and alcohol rehabilitation centers, and other public safety concerns. Additionally, because of IRS tax code 280E, recreational marijuana

businesses are paying a tremendous amount of federal income tax. IRS tax code 280E prohibits marijuana businesses from deducting any expenses from taxable income because marijuana is illegal federally. Thus, recreational marijuana stores are essentially taxed at gross income. While this has been a significant burden to recreational marijuana business owners, it has generated over \$100 million in federal income tax from both Colorado and Washington.

Third, the legalization of recreational marijuana has had a positive impact on employment. A common argument against marijuana legalization is the notion that people will become lethargic and lose the desire to work, harming the economy. While this may sound possible in theory, conversations with recreational marijuana executives show this couldn't be further from the truth. Interviews with marijuana executives suggest that the legalization of recreational marijuana created approximately 8,000 jobs. At an extremely conservative estimate of \$15 an hour as an average wage, (and assuming a normal 40-hour work week) this paper calculates that over \$240 million dollars in employee compensation was earned because of this job growth. Additionally, both Colorado and Washington had lower unemployment rates than the United States average. Further suggesting that recreational marijuana has had a positive impact on employment.

Fourth, it is possible that recreational marijuana has had a positive impact on home values in states where it is legal. Interviews with marijuana executives suggest the emergence of so called "cannabis migrants" who move to places where recreational marijuana is legal in order to legally consume the product. While it is impossible to calculate how many "cannabis migrants" there are, the fact that Colorado and Washington real estate increased at a rate much higher than the national average suggests recreational marijuana may be increasing the demand for housing. In addition, all recreational storefronts are currently required by state law to grow

70% of their own marijuana. There are currently 426 recreational stores in Colorado and over 200 in Washington. Each one of these businesses require not only a retail storefront, but a large amount of land for growing purposes. The combination of cannabis migrants demanding real estate in these states and businesses requiring large amounts of land to operate suggest recreational marijuana legalization has certainly played a role in the above-average real estate value increases in these states.

Fifth, there are a tremendous number of businesses that have benefited from the legalization of recreational marijuana without actually selling marijuana. Websites like Weedmaps.com and PotGuide.com attract five million and nine hundred thousand unique visitors each year by locating marijuana dispensaries and allowing users to read and write reviews. Additionally, marijuana tourism has become more and more popular since legalization in 2014. Colorado now has businesses that specialize in giving cannabis tours, providing cannabis friendly accommodations, and even serving cannabis infused foods. While recreational marijuana becomes more and more popular, it is likely that these indirect businesses will continue to benefit.

Lastly, this paper explored the possibility of marijuana being sold as a commodity. Today there are thousands of agricultural products that are sold on financial exchanges as commodities. Marijuana could very easily become the next big “cash crop” on the commodity market for several reasons. First, it is considered easy to grow and can be grown in virtually any location. Second, it has a built in quality test (THC %). If marijuana ever becomes legal at a federal level, it is likely that marijuana will eventually be sold as a commodity on financial exchanges.

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