

Options and Issues Regarding Marijuana Legalization

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 Marijuana legalization is a controversial and multifaceted issue that is now the subject of serious debate. Since 2012, four U.S. states have passed ballot initiatives to remove prohibition and legalize a for-profit commercial marijuana industry. In December 2013, Uruguay became the first country to experiment with legalization nationwide; the Netherlands, widely known for its marijuana-selling coffee shops, tolerates only retail sales and does not allow commercial production. Voters in Washington, D.C., recently took the more limited step of passing an initiative to legalize home production and personal possession. All of these moves were unprecedented. The effects are likely to be complex and will be difficult to fully assess for some time.

Commercial sale in a way that fits the alcohol model is not the only alternative to the prohibition of marijuana. Many different

options fit the label *legalization*. Policymakers must make choices about what sorts of organizations—for profit, not for profit, or government agencies—would be permitted to produce and sell marijuana, about the prices at which marijuana is sold and how it is taxed, and about what sort of information to provide to consumers, along with a host of regulatory details, such as whether edibles can be sold. Those choices will determine how completely legalization displaces the illicit market, how much problem marijuana use (including use by minors) increases, and how much revenue accrues to governments at specific jurisdictional levels (e.g., state or county).

This paper reviews recent changes in marijuana policies and the decisions that confront jurisdictions that, as noted above, are considering alternatives to traditional marijuana prohibition. The principal message is that marijuana policy should not be viewed as

a binary choice between prohibition and the for-profit commercial model we see in Colorado and Washington State; several intermediate supply options could be considered, particularly given the variety of different goals a jurisdiction might be hoping to accomplish by changing the policy. The supply option for a jurisdiction focused on revenue enhancement might be fundamentally different from that of a jurisdiction focused on eliminating the black market or individual harm reduction. Moreover, this paper reminds policymakers that the tools of taxation and regulation should be considered in conjunction with the broad goals of the jurisdiction because specific choices in forms of each can reinforce or contradict the objectives of ending prohibition in the first place. The paper walks through some of the potential costs and benefits of legalizing marijuana, highlighting the massive uncertainty surrounding many of these consequences.

A Brief Review of Recent Marijuana Policy

Marijuana prohibition was universal across the United States through the 1960s, and those convicted of growing, possessing, or selling marijuana could receive sentences of incarceration. Then, in the 1970s, 12 states removed or substantially reduced criminal penalties for possession of small amounts of marijuana.¹ Many observers then believed that it was just a matter of time until the nation legalized the drug. Instead, the movement toward liberalization came to a sudden halt in 1978. One state (South Dakota) reversed its decriminalization, and no state initiated decriminalization in the subsequent 20 years. The end of the 1970s liberalization is often associated with the so-called parents' movement, itself a response to the rapid rise in frequent marijuana use among junior and senior

high school students and the associated harms; in 1979, about one out of every ten high school seniors reported daily use of marijuana.

In recent years, a handful of states have fully decriminalized possessing small amounts of marijuana. More than 20 states now allow marijuana to be used for medicinal purposes; however, there is tremendous variation in how that marijuana is supplied and the uses that are allowed. California and Colorado receive a lot of attention in medical-marijuana debates, but they represent one end of a broad spectrum. They allow brick-and-mortar medical-marijuana stores (called dispensaries) and have very expansive definitions of what conditions justify obtaining a medical recommendation. In some other states, the medical-marijuana system is more controlled, serving more as an adjunct to the health system than as a loophole for recreational users. Indeed, 11 (mostly southern) states in 2014 passed more-restrictive medicinal laws, allowing only high-cannabidiol (CBD) and low-delta-9-tetrahydrocannabinol (THC) marijuana² for medicinal purposes (Ingold, 2014).

In 2010, a California ballot initiative that would have gone beyond legalization of medical marijuana to allow large-scale commercial production for recreational use received 46.5 percent of the vote. Encouraged by that result and by public opinion polls showing that a majority of the population nationally now favored legalizing marijuana use, in 2012, Colorado and Washington voters passed legalization initiatives, and Oregon nearly did so. In November 2014, voters in Alaska, Oregon, and Washington, D.C., also passed initiatives to legalize marijuana. We expect other states, including California, to consider legalization in coming years via voter propositions or legislation. In particular, 2016, a presidential election year, is likely to see more states voting on legalization (Hughes, 2014).

Why the new momentum for legalization? Certainly public sentiment has changed. Gallup has asked the same question about marijuana legalization since 1969: “Do you think the use of marijuana should be legal or not?” Support rose from 12 percent in 1969 to 28 percent in 1978, decreased to 23 percent in 1985, and then steadily rose; by 2013, 58 percent answered positively, though that figure fell to 51 percent in 2014 (Saad, 2014). Other polls confirm that the increase in support has been particularly large after 2010 (Galston and Dionne, 2013). However, that simply moves the question one step back: Why has public sentiment changed in the past 30 years?

One factor is generational turnover leading to a rise in the proportion of the adult population who have direct personal experience with marijuana; those who have used previously are more likely than those who have not to support legalization (Caulkins, Coulson, et al., 2012). However, generational turnover is a slow process and does not explain the sharp increase in support around 2010. Other observers believe that the availability of medical marijuana increased nationwide support for legalization. Although no direct evidence supports that belief, one study found that the availability of medical marijuana in Colorado reduced the perceived risk of marijuana use, which could presumably reduce opposition to legalizing the drug (Schuermeyer et al., 2014). Certainly, fewer people see the drug as harmful than saw it that way 20 years ago (Johnston et al., 2013).³ The fact that the past two presidents are known to have used marijuana and, in the case of President Barack Obama, to have used it frequently in his youth (Hertzberg, 2013), might also exert an influence. It could also be part of a general growth of antigovernment sentiment. Moreover, marijuana-possession arrests have affected tens of millions of people, with

growing skepticism that there is any good justification in terms of deterrence.

Federal law still prohibits the use, possession, distribution, and production of marijuana. The U.S. Department of Justice (DOJ) has not approved Colorado or Washington’s legalization (or the operation of state medical-marijuana systems), but it has issued guidelines in the form of memos to its prosecutors setting out what it views as priorities for the allocation of scarce enforcement resources. The August 2013 memo from Deputy Attorney General James M. Cole (Cole, 2013) suggests that DOJ will tolerate state-legal marijuana activities as long as the states have “strong and effective regulatory and enforcement systems” and avoid infringing on eight federal enforcement priorities:

- preventing the distribution to minors
- preventing enrichment of gangs and criminal enterprises
- preventing diversion to other states
- preventing dealing other drugs
- preventing violence or the use of weapons
- preventing drugged driving and exacerbation of other public health consequences associated with marijuana use
- preventing growing marijuana on federal land or in federal reserves
- preventing possession on federal property.

The Cole memo and later federal memos (Cole, 2014; Wilkinson, 2014) can be construed as signaling what the federal government will and will not countenance. Any administration could withdraw these guidelines at any time. If that were to happen, authorities could arrest and prosecute marijuana industry participants then for the actions they are taking now.

Key Decisions Confronting Jurisdictions That Are Considering Alternatives to Marijuana Prohibition

Legalization is not simply a binary choice between, on the one hand, making the production, sale, and possession of the drug legal and, on the other, continuing existing prohibitions. Legalization encompasses a wide range of possible regimes, distinguished along multiple dimensions. Here we highlight three key decisions: Who would be allowed to supply legal marijuana? Would legal marijuana be taxed and, if so, how? How would legal marijuana be regulated? These choices could have profound consequences for the outcomes of legalization in terms of health and social well-being, as well as for job creation and government revenue.

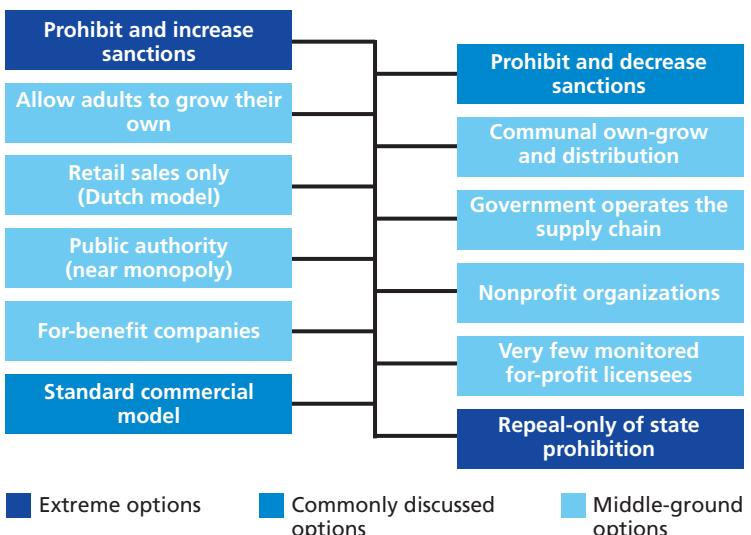
Who Would Be Allowed to Supply Legal Marijuana?

Although Colorado and Washington have adopted the for-profit commercial (or so-called alcohol) model and Alaska and Oregon are in the process of doing the same, that strategy is just one of a dozen options available to jurisdictions seeking to change their marijuana supply laws. The figure lists 12 supply alternatives to status quo prohibition, breaking them down into three groups:

- the two options most commonly discussed in the United States
 - Retain prohibition but decrease sanctions.
 - Implement an alcohol-style commercial model.
- eight options that find a middle ground between those commonly discussed

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Twelve Supply Alternatives to Status Quo Prohibition



RAND PE149-1

- Allow adults to grow their own.
- Allow distribution only within small co-ops or buyers' clubs.
- Permit locally controlled retail sales without legalizing commercial production (the Dutch coffee-shop model).
- Have the government operate the supply chain (government monopoly).
- Have a public authority operate the supply chain.
- Permit only nonprofit organizations to sell.
- Permit only for-benefit companies to sell.
- Have very few closely monitored for-profit licensees.
- two extreme options
 - Increase sanctions.
 - Repeal the state's prohibition without creating any new, product-specific regulations.

The key point made by identifying this range of approaches is that the debate in the United States has focused largely on just two options that are near the ends of the spectrum. Policymakers have largely ignored many available intermediate options.

Indeed, commercial legalization is a high-stakes choice clouded by enormous uncertainty. Until 2012, no modern jurisdiction had implemented it—not even the Netherlands, which tolerates small retail sales, not wholesale production. Commercial legalization also conflates two distinct concepts: the size or scale of the organizations that are allowed to produce and who owns them, which determines what objectives shape those organizations' behavior. Colorado and Washington State have decided not only to allow large, professionally operated suppliers that can realize economies of scale and promote a diverse range of products but also that those suppliers can be private companies whose goal is profit maximization.

There is concern that profit-maximizing marijuana companies will target heavy users. Since 80 percent of marijuana consumption is by daily or near-daily users, roughly 80 percent of marijuana companies' profits would come from marketing to such heavy users, about half of whom currently meet clinical criteria for having substance-use disorders (either with marijuana itself or with another substance, such as alcohol). Thus, like the alcohol industry, the private marijuana industry will likely seek to serve and develop a market of heavy users.

Thus, it is important to note that jurisdictions considering large-scale marijuana production have other options to consider: (1) government monopoly, (2) public authorities, (3) nonprofit organizations, and (4) socially responsible businesses (e.g., B-Corps). Indeed, if a jurisdiction decides to create a new industry, they need

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to decide whether they want that industry to be exclusively focused on maximizing profits.

All of the large-scale production options would create the potential for even a small state to raise tens of millions of dollars annually by taxing the consumption of its residents in one way or another. If realized, that would more than offset regulatory burdens that are likely to be in the low to mid single-digit millions of dollars in a small state. (Although nonprofits do not pay income taxes, their customers would pay sales and excise taxes, just as customers of for-profit businesses would. And although government stores do not pay taxes *per se*, their profits accrue to the state treasury.)

But with any of these retail options, the twin elephants in the room—particularly for states located in densely populated regions—would be demand from out-of-state users and competition from suppliers in nearby states that legalize but impose lower taxes or lower regulatory burdens.

For example, nearly 40 times as many current marijuana users live within 200 miles of Vermont's borders as live in Vermont. So if Vermont legalized before any other states in the Northeast, marijuana tourism and illicit exports could be substantial and could, in theory, put Vermont's annual tax revenues in the hundreds of millions. However, if the federal government intervened to stop such cross-border traffic or if another state in the Northeast decided to

legalize marijuana and set lower tax rates, these potential revenues might not materialize. Indeed, because legal marijuana can flow across borders in either direction, Vermont's prospects of deriving considerable tax revenue even from its own residents would become much less promising if one of its immediate neighbors were to legalize with low taxes.

One implication of this is that, although, in theory, there may be benefit in allowing each state to pursue its own policies and so discover through experimentation which policies work best, in reality, cross-border flows of users and product mean that one state's actions could affect levels of use and tax collections in other states.⁴

By comparison, options that do not involve creating large-scale producers are much less risky because they are less likely to incentivize consumption increases, particularly among the most-frequent users. The simplest step is full decriminalization, meaning reducing sanctions for simple possession to noncriminal charges akin to traffic tickets. Criminal offenses for marijuana in Vermont fell more than 80 percent after it decriminalized. When we inquired in September 2014, just three people in the entire state were behind bars solely for marijuana offenses; only eight were admitted during the entire fiscal year. The cost of enforcing marijuana prohibition is now on the order of \$1 million per year in Vermont.

Allowing individual users to grow their own product at home and give it away, as was recently authorized by the voters in Wash-

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ington, D.C., creates an option for legal supply with few downside risks if the rules are written tightly to prevent exploitation by black-market producers; for example, the number of plants that any one person can grow is usually limited. Other jurisdictions, including Alaska, have allowed home production for some time, and the effects do not appear to be dramatic. That is, there is no clear evidence of large increases in use but also no evidence of reductions in black-market activity; illegal marijuana is so ubiquitous that relatively few users bother growing their own.

The co-op model, as with Spanish cannabis clubs, allows modest numbers of people to pool their own-grow rights and share or sell at cost to other members of the club. Those economies of scale make co-ops a potential threat to the black market without creating the risks of commercialization. Further, some argue that cannabis clubs stay (just barely) within international treaty obligations because sales are priced only to recoup growing costs, not to make a profit.

A state could follow the Dutch coffee-shop model and allow retail sales only. A fixed number of outlets could be licensed to retail marijuana while production and trafficking are still prohibited. This would allow access and taxation but avoid promotion by producers.

Even if a state were to decide to allow large-scale production and distribution, it has distinct options. A state monopoly of the whole production and distribution chain would prevent diversion to the black market; it could set the price it thinks best serves the public interest and ensure no promotion. The state monopoly, however, risks provoking the federal government. For that and other reasons, a state might prefer to set up a public authority—a single authorized seller. The state would appoint members of the public

authority and set policy to, for instance, control diversion, control interactions with consumers, restrict sales to particular types of products, avoid advertising and product innovation, and prevent a price collapse. Yet another option is to license only nonprofit enterprises. Because they are not profit maximizers, they are less likely than private enterprise to promote the drug. Requiring that each nonprofit have representatives of health-promotion and child-welfare groups in its leadership would ensure even better alignment with the public interest. Yet other models include restricting the market to for-benefit companies or to a very limited set of for-profit corporate licensees.

Each of these strategies about whom the law would allow to produce and distribute marijuana is really itself a broad category of options encompassing considerable scope for fine-tuning. Moreover, a bad implementation of a good strategy might perform less well than a wise implementation of an inferior one. Therefore, picking a strategy is more the beginning of a discussion and design process than an answer to the question of what should be done. Nevertheless, important consequences flow from selecting who may produce and supply marijuana. So it is very important to systematically consider the potential effects of each strategy. In particular, the marketing and lobbying muscle of a for-profit industry is likely to influence the future trajectory of marijuana policy, whereas other options would allow legislatures and regulatory agencies to act with more regard for the public interest.

In sum, even if a state wants to allow large-scale supply operations, with all the accompanying benefits and drawbacks, there are still multiple options for who controls those operations; granting that right to for-profit businesses is just one option. Furthermore,

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various options involving smaller-scale production are less risky and are more-modest departures from historical precedent.

Would Legal Marijuana Be Taxed, and If So, How?

There are also many decisions about how exactly a government should tax marijuana. Taxes and fees are often thought of primarily as revenue-raising devices, but, in the case of marijuana, their collateral consequences (e.g., effects on youth consumption, heavy consumption, and the size of the black market) could outweigh revenue in importance. Both revenue and collateral consequences would depend on setting of tax levels, a task complicated by the possibility that increasing firm size and technological innovation would drive pretax production costs for basic product forms down substantially over time. The mix of product types could also evolve in ways that are difficult to foresee, e.g., with vaping gaining market share at the expense of traditional joints and bongs or the industry promoting products that contain both nicotine (tobacco) and THC (marijuana).

Policymakers also need to determine how, and at what stage of production, taxes will be collected and to determine the base—the measuring stick, such as price or weight—for any tax.

Regulations present opportunities for shaping who consumes, what they consume, where they consume, and how they consume.

An ad valorem tax—meaning one based on sales value, as with a typical sales tax—is simple to implement but will fall if market prices fall. If the policy goal is to keep the after-tax price at some target level, ad valorem taxation is not the way to go. An ad valorem tax could also allow gaming—meaning manipulation of price—to evade taxes. For example, stores could use marijuana as a loss leader to bring customers in to buy other products, or even give it free to people who buy something else.

A tax on the gross weight of marijuana produced or sold creates an incentive for producers to pack as much intoxicating power as possible into as little plant material as possible. This gives a market advantage to highly potent forms of marijuana. For those who believe that those forms are more dangerous than other forms, that counts as a disadvantage of taxation on gross weight.

Taxation per unit of THC has many attractive features but depends on accurate and honest testing procedures.

Policymakers also need to decide how to tax concentrates and edibles, as opposed to herbal marijuana; those product forms have been growing in market share in states with medical dispensaries or commercial sales. A combination of strategies is also possible, such as taxing THC or weight for some products at the production stage and taxing value at the retail stage.

How Would Legal Marijuana Be Regulated?

Like taxation, regulations present opportunities for shaping who consumes, what they consume, where they consume, and how they consume—and, hence, a range of consumption-related consequences. Regulation can influence prices, product variety, product consistency, product safety, and the information provided to consumers. It can also affect the extent of diversion to minors and leakage beyond a state's borders.

But regulations can also be costly to enforce, impose costs on those regulated, and create opportunities for evasion; the greater the incentive to break the rules, the greater the enforcement effort necessary to maintain them. Burdensome regulations can also limit the speed and completeness with which the legal market displaces the illicit market. Policymakers, therefore, face numerous challenges in seeking the right balance among all these competing considerations. Even well-designed regulations can be quite complex to implement and enforce.

In general, product regulations are useful tools for increasing product safety and improving the information made available to consumers about the product they are consuming. Many such regulations impose costs on the producers (e.g., testing potency and placing that information on labels, requiring child-resistant packaging), so they have the additional long-term consequence of keeping production costs a little bit higher than they might otherwise be. Another outcome of product regulations, when done with the objective of limiting products that might be enticing to children, is that they can help limit exposure or interest among minors. However, to the extent that these types of regulations limit products

that consumers prefer (e.g., a ceiling on THC content), they create an opportunity for the black market.

Seller, server, and sales regulations tend to raise the cost of providing and selling marijuana products. To the extent that these sorts of regulations help monitor production and sales (e.g., inventory-control systems, stand-alone stores), they can reduce opportunities for tax evasion. They might also have the beneficial effect of increasing product safety (if products are more tightly regulated and sold in limited ways). All of these systems help reduce the possibility of direct sales to minors, although they do little to prevent straw purchasers from giving or reselling to minors, as commonly happens with alcohol and tobacco today.

Although public-health agencies understand most of these areas of regulation (product, sales, and even marketing) in other contexts, the results of applying these policies to legal marijuana markets are far from certain. Thus, we would advise, as we did in the discussion of taxation, flexibility in approaches. Much has yet to be learned about the dozens of cannabinoids in marijuana other than THC and CBD and their potential benefits or harms. Similarly, little is known about what sorts of products, when consumed a particular way, are potentially more dangerous than when consumed another way. Thus, it will be very important to keep the regulatory structure flexible and adaptable enough to accommodate growing knowledge that is likely to accumulate in the next decade regarding risks and benefits associated with specific marijuana products.

Thinking About the Costs and Benefits of Legalizing Marijuana

The merits of changing marijuana laws so that for-profit businesses or other types of organizations could legally produce and sell marijuana have been debated for decades. Indeed, several arguments are made on both sides of the debate. As highlighted by Kilmer (forthcoming), those on the prolegalization side often argue that states should generate revenue from marijuana instead of having that money go to the black market. They also argue that a marijuana user should not be arrested for using a substance that they describe as being safer than alcohol. Opponents of legalization argue that an increase in marijuana use resulting from legal availability and lower prices would increase dependence and other negative health consequences. They also worry that marijuana would be advertised like alcohol and that the new industry would have a powerful lobby that would fight against regulation and taxation.

Can we just look to Colorado and Washington to determine whether legalization is a good idea? Unfortunately, it is too early to know how the new regulatory regimes in Colorado and Washington will fare in the short and long runs. Industry structure and behavior will take years, if not decades, to mature, and consumer responses will develop over similar periods. Furthermore, given

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data lags, it will take some additional time before high-quality evaluations are available. The fact that both Colorado and Washington had fairly open marijuana availability under the medical-marijuana rubric also complicates any sort of outcome measurement. This does not mean that there is nothing to learn from these experiences, but the bulk of the early insights are about regulations and implementation instead of outcomes.

The literature does identify some clear acute and chronic health effects of marijuana, especially of persistent heavy marijuana use. Acute risks include accidents; impaired cognitive functioning while intoxicated; and anxiety, dysphoria, and panic. Longer-term risks of persistent heavy marijuana use include dependence and bronchitis. Some evidence suggests other serious risks for heavy marijuana users, particularly with psychotic symptoms, cardiovascular disease, and testicular cancers. Although the literature showing a relationship between marijuana use and crime is extensive, there is little evidence that use itself increases criminal behavior, so one would not expect legalization to have important effects on nondrug crime. Finally, the literature persistently identifies a negative association between marijuana use and school attendance and achievement, but it has not yet definitively determined whether this association is causal.

Studies have also examined the effect of sustained and heavy marijuana use on long-term cognitive functioning, brain develop-

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ment, mental illness, lung cancer, and workplace productivity. The current state of the scientific literature in each of these areas is insufficient to determine the extent to which marijuana use is causally linked to any of these outcomes, but we anticipate substantial gains in our knowledge of the true nature of these effects in the future.

Indeed, there is a large scientific literature about the consequences associated with marijuana consumption, but it has fundamental limitations; notably, although marijuana use is *correlated* with many adverse outcomes, it is much harder to ascertain whether marijuana use *causes* those outcomes. In addition, the effects of marijuana use in the past, under prohibition, might not accurately predict the effects of marijuana use in the future under some alternative legal regime. To date, researchers have based their findings largely on observational data that reflect use of a substance containing largely unmeasured amounts of cannabinoids. Furthermore, no one knows precisely how legalization will affect use—specifically, the extent to which heavy or harmful use will rise, which is directly relevant for understanding the public-health and safety consequences. Nor can one know how the product might change (e.g., potency, mode of use) or how these changes might influence the relationships between use and harms identified here. Thus, it is difficult to say whether the associations identified in the past accurately assess those that will exist in the future.

There are also benefits of marijuana use and some advantages of no longer enforcing laws against marijuana, including medical benefits, gains in personal liberties, and the benefits of reduced arrest and sanctioning of marijuana offenders. Although alternative policies will impose risks, current policies impose measurable harm; arrest and time in jail both damage health and well-being.

Fines can also be significant: For someone who works close to the minimum wage, paying a \$200 fine for possessing less than 1 oz. of marijuana could consume the take-home pay from the better part of a full week of work.

Further, marijuana enforcement in the United States disproportionately affects blacks (see, e.g., American Civil Liberties Union, 2013). Especially in the context of stop and frisk, these police encounters are correlated with self-reported trauma, anxiety, and other mental health problems (Geller et al., 2014). In addition, enforcing laws that have limited popular support can erode the legitimacy of authorities and might reduce compliance with the law (Nadler, 2005; Tyler, 1990) and cooperation with the police (Tyler and Fagan, 2008).

Analysts and decisionmakers should also acknowledge the self-reported medical and nonmedical benefits of using marijuana. For example, Hall and Pacula (2003) reported that the main reason most people use marijuana “is to experience mild euphoria, relaxation and perceptual alterations, including time distortion, and the intensification of experiences, such as, eating, watching films, listening to music, and engaging in sex” (p. 38). We believe that such benefits are real and that they should matter, but they are far more difficult to quantify than other benefits, and they have received far less research attention than the harms of marijuana use.

The indirect effects that legalization could have on use and abuse of other substances could easily outweigh the importance of the marijuana-related outcomes themselves. Unfortunately, uncertainty about these indirect effects for alcohol and other drugs is even greater than the uncertainty about legalization’s effect on marijuana-related outcomes. This ambiguity places severe limits on the confidence anyone should have in predictions about whether

We emphasize that the relevant policy question is not whether marijuana’s current harms outweigh its benefits but whether and how legalization might change those harms and benefits and in which direction.

legalization would be a net gain or a net loss for society. In particular, legalization proponents (and opponents) sometimes make confident predictions that marijuana legalization will reduce (or increase) alcohol abuse, but the evidence is inconclusive. Agnosticism is the only truly defensible position on the effects that marijuana legalization could have on alcohol-related outcomes. There is stronger evidence that marijuana and tobacco are complements, so we might expect increases in marijuana use to bring greater tobacco use. There is also suggestive evidence that increased marijuana availability might reduce problems with diverted pharmaceutical opioid painkillers.

We emphasize that the relevant policy question is not whether marijuana’s current harms outweigh its benefits but whether and how legalization might *change* those harms and benefits and in which direction. At least at present, answering that question is more a matter of judgment than of calculation, and different readers will reach different conclusions.

Concluding Thoughts

The goal of this paper is not to provide a comprehensive assessment of the various options confronting those who are considering alternatives to marijuana policy; for that, readers should refer to the full

report (Caulkins, Kilmer, Kleiman, et al., 2015). Instead, the goal of this piece is to provide readers with some tools for assessing the options and to help them appreciate the uncertainties.

Most importantly, we also hope that readers understand that legalization is not a binary choice between prohibition and the “regulate marijuana like alcohol” model. Although most of the debate in the United States have focused on these two approaches, other intermediate options should be incorporated into future discussions (e.g., government monopoly, production by nonprofits or socially responsible businesses). The very different approach that Uruguay is taking, with tight government controls on sales and a public-health orientation, could yield helpful insights for state decisionmakers in the next few years.

Of course, the decision about whether to change marijuana laws involves multiple and possibly competing considerations. These include the extent of illicit transactions and the costs of efforts to suppress them; the prevalence of substance-use disorders

and the troubles they bring; personal liberty and the benefits of marijuana consumption for the majority of users who do not suffer from substance-use disorders; economic opportunity for lawful marijuana vendors; and tax revenue on the one hand versus administrative effort and expense on the other for the state government and local governments. No one policy choice will be superior on all dimensions. There will be trade-offs, and differences of opinion about how much weight to place on different outcomes will lead to disagreements about which policy to choose.

Moreover, those decisions must be made in a fog of uncertainties. There is no recipe for marijuana legalization, nor are there working models of established fully legal marijuana markets. It must be expected that any initial set of choices will need to be reconsidered in the light of experience, new knowledge, and changing conditions, including federal policy and the policies in neighboring states. That puts a premium on flexibility; the policy should not be frozen into its initial design.

Notes

¹The 12 states were Alaska, California, Colorado, Maine, Minnesota, Mississippi, Nebraska, New York, North Carolina, Ohio, Oregon, and South Dakota. There is a lot of debate about what decriminalization actually means (see Pacula, MacCoun, et al., 2005, and MacCoun, Pacula, et al., 2009). For example, California has generally been considered a decriminalization state, but possession of small amounts for personal use was not exclusively a civil offense (i.e., noncriminal) until January 2011.

²The marijuana plant contains dozens of cannabinoids and another 300 possibly active chemicals, many with unknown effects and interactions. To date, two cannabinoids have received the greatest attention: THC and CBD. THC is the main psychoactive compound in marijuana that causes people to feel high, while CBD is a naturally occurring counterbalance to that compound that, when present in sufficient amounts, can reduce the sensation of feeling high and reduce anxiety, which THC sometimes promotes. Cannabinoid receptors are found throughout the body, and both THC and CBD have other properties that make them potentially medically useful (Hermann and Schneider, 2012; Koppel et al., 2014).

³The Monitoring the Future annual survey shows that, in 1979, less than 40 percent of high school seniors perceived “great risk” in regular marijuana use. By 1993, this rate had more than doubled to nearly 80 percent but has steadily declined since then, reaching about 40 percent in 2013 (Johnston et al., 2013).

⁴Indeed, because marijuana is so portable (a year’s supply of bud for a heavy user does not weigh much more than a can of beer) and the number of users who can be supplied per unit area is so high, even one small state could supply the entire country if marijuana were legalized nationally.

Bibliography

American Civil Liberties Union, *The War on Marijuana in Black and White*, New York, June 2013. As of December 12, 2014:

<https://www.aclu.org/sites/default/files/assets/1114413-mj-report-rfs-rel1.pdf>

Bonnie, Richard J., and Charles H. Whitebread, *The Marihuana Conviction: A History of Marihuana Prohibition in the United States*, Charlottesville, Va.: University Press of Virginia, 1974.

Brownfield, William R., Assistant Secretary, Bureau of International Narcotics and Law Enforcement Affairs, U.S. State Department, “Trends in Global Policy,” briefing, New York: New York Foreign Press Center, October 9, 2014. As of December 12, 2014:

<http://fpc.state.gov/232813.htm>

Caulkins, Jonathan P., Carolyn C. Coulson, Christina Farber, and Joseph V. Vesely, “Marijuana Legalization: Certainty, Impossibility, Both, or Neither?” *Journal of Drug Policy Analysis*, Vol. 5, No. 1, January 2012, pp. 1–27.

Caulkins, Jonathan P., Angela Hawken, Beau Kilmer, and Mark Kleiman, *Marijuana Legalization: What Everyone Needs to Know*, New York: Oxford University Press, 2012.

Caulkins, Jonathan P., Beau Kilmer, Mark A. R. Kleiman, Robert J. MacCoun, Gregory Midgette, Pat Oglesby, Rosalie Liccardo Pacula, and Peter H. Reuter, *Considering Marijuana Legalization: Insights for Vermont and Other Jurisdictions*, Santa Monica, Calif.: RAND Corporation, RR-864, 2015. As of January 2015: http://www.rand.org/pubs/research_reports/RR864.html

Caulkins, Jonathan P., Beau Kilmer, Robert J. MacCoun, Rosalie Liccardo Pacula, and Peter Reuter, “Design Considerations for Legalizing Cannabis: Lessons Inspired by Analysis of California’s Proposition 19,” *Addiction*, Vol. 107, No. 5, May 2012, pp. 865–871.

Cole, James M., Deputy Attorney General, “Guidance Regarding Marijuana Enforcement,” memorandum for all U.S. Attorneys, Washington, D.C.: U.S. Department of Justice, Office of the Deputy Attorney General, August 29, 2013. As of December 14, 2014:

<http://www.justice.gov/iso/opa/resources/3052013829132756857467.pdf>

_____, “Guidance Regarding Marijuana Related Financial Crimes,” memorandum for all U.S. Attorneys, Washington, D.C.: U.S. Department of Justice, Office of the Deputy Attorney General, February 14, 2014. As of December 13, 2014:

<http://www.justice.gov/usao/waw/press/newsblog%20pdfs/DAG%20Memo%20-%20Guidance%20Regarding%20Marijuana%20Related%20Financial%20Crimes%202014%2014%20%282%29.pdf>

Galston, William A., and E. J. Dionne, Jr., *The New Politics of Marijuana Legalization: Why Opinion Is Changing*, Washington, D.C.: Brookings Institution, May 29, 2013. As of December 12, 2014:

<http://www.brookings.edu/research/papers/2013/05/29-politics-marijuana-legalization-galston-dionne>

Geller, Amanda, Jeffrey Fagan, Tom Tyler, and Bruce G. Link, “Aggressive Policing and the Mental Health of Young Urban Men,” *American Journal of Public Health*, Vol. 104, No. 12, December 2014, pp. 2321–2327.

Glaser, Jack, *Suspect Race: Causes and Consequences of Racial Profiling*, New York: Oxford University Press, 2015.

Hall, Wayne, and Rosalie Liccardo Pacula, *Cannabis Use and Dependence: Public Health and Public Policy*, Cambridge, UK: Cambridge University Press, 2003.

Hermann, Derik, and Miriam Schneider, "Potential Protective Effects of Cannabidiol on Neuroanatomical Alterations in Cannabis Users and Psychosis: A Critical Review," *Current Pharmaceutical Design*, Vol. 18, No. 32, November 2012, pp. 4897–4905.

Hertzberg, Hendrik, "Obama and Marijuana: Then and Now," *New Yorker*, May 5, 2013. As of January 14, 2015:
<http://www.newyorker.com/news/hendrik-hertzberg/obama-and-marijuana-then-and-now>

Hughes, Trevor, "Next Up for Pot Legalization: Calif., Vermont, Ariz.?" *USA Today*, November 5, 2014. As of December 13, 2014:
<http://www.usatoday.com/story/news/nation/2014/11/05/marijuana-legalization-next-steps/18540353/>

Ingold, John, "Lawmakers in 11 States Approve Low-THC Medical Marijuana Bills," *Denver Post*, June 30, 2014. As of December 12, 2014:
http://www.denverpost.com/marijuana/ci_26059454/lawmakers-11-states-approve-low-thc-medical-marijuana

Johnston, Lloyd D., Patrick M. O'Malley, Jerald G. Bachman, and John E. Schulenberg, "American Teens More Cautious About Using Synthetic Drugs," press release, December 18, 2013. As of December 12, 2014:
<http://www.monitoringthefuture.org/data/13data.html#2013data-drugs>

Kilmer, Beau, "Policy Designs for Cannabis Legalization: Starting with the Eight Ps," *American Journal of Drug and Alcohol Abuse*, Vol. 40, No. 4, July 2014, pp. 259–261.

_____, "Legalization of Marijuana," *Britannica Book of the Year 2015*, Chicago, Ill.: Britannica, forthcoming.

Kilmer, Beau, Jonathan P. Caulkins, Rosalie Liccardo Pacula, Robert J. MacCoun, and Peter H. Reuter, *Altered State? Assessing How Marijuana Legalization in California Could Influence Marijuana Consumption and Public Budgets*, Santa Monica, Calif.: RAND Corporation, OP-315-RC, 2010. As of January 14, 2015:
http://www.rand.org/pubs/occasional_papers/OP315.html

Kilmer, Beau, Kristy Kruithof, Mafalda Pardal, Jonathan P. Caulkins, and Jennifer Rubin, *Multinational Overview of Cannabis Production Regimes*, Santa Monica, Calif.: RAND Corporation, RR-510-WODC, 2013. As of January 14, 2015:
http://www.rand.org/pubs/research_reports/RR510.html

Koppel, Barbara S., John C. M. Brust, Terry Fife, Jeff Bronstein, Sarah Youssof, Gary Gronseth, and David Gross, "Systematic Review: Efficacy and Safety of Medical Marijuana in Selected Neurologic Disorders—Report of the Guideline Development Subcommittee of the American Academy of Neurology," *Neurology*, Vol. 82, No. 17, April 29, 2014, pp. 1556–1563.

MacCoun, Robert, Rosalie Liccardo Pacula, Jamie Chriqui, Katherine Harris, and Peter Reuter, "Do Citizens Know Whether Their State Has Decriminalized Marijuana? Assessing the Perceptual Component of Deterrence Theory," *Review of Law and Economics*, Vol. 5, No. 1, August 10, 2009, pp. 347–371.

McGraw, Carol, "Two Polls Show Support for Legal Marijuana Waning in Colorado, Nationally," *Gazette*, September 29, 2014. As of December 12, 2014:
<http://gazette.com/two-polls-show-support-for-legal-marijuana-waning-in-colorado-nationally/article/1538438>

Nadler, Janice, "Flouting the Law," *Texas Law Review*, Vol. 83, 2005, pp. 1399–1441.

Pacula, Rosalie L., J. F. Chriqui, D. A. Reichmann, and Y. M. Terry-McElrath, "State Medical Marijuana Laws: Understanding the Laws and Their Limitations," *Journal of Public Health Policy*, Vol. 23, No. 4, 2002, pp. 413–439.

Pacula, Rosalie Liccardo, Beau Kilmer, Alexander C. Wagenaar, Frank J. Chaloupka, and Jonathan P. Caulkins, "Developing Public Health Regulations for Marijuana: Lessons from Alcohol and Tobacco," *American Journal of Public Health*, Vol. 104, No. 6, June 2014, pp. 1021–1028.

Pacula, Rosalie Liccardo, Russell Lundberg, Jonathan P. Caulkins, Beau Kilmer, Sarah Greathouse, Terry Fain, and Paul Steinberg, *Improving the Measurement of Drug-Related Crime*, Washington, D.C.: Executive Office of the President, Office of National Drug Control Policy, February 2013. As of December 13, 2014:
http://www.whitehouse.gov/sites/default/files/ondcp/policy-and-research/drug_crime_report_final.pdf

Pacula, R. L., R. MacCoun, P. Reuter, J. Chriqui, B. Kilmer, K. Harris, L. Paoli, and C. Schäfer, "What Does It Mean to Decriminalize Marijuana? A Cross-National Empirical Examination," *Advances in Health Economics and Health Services Research*, Vol. 16, 2005, pp. 347–369.

Pacula, Rosalie Liccardo, David Powell, Paul Heaton, and Eric L. Sevigny, "Assessing the Effects of Medical Marijuana Laws on Marijuana Use: The Devil Is in the Details," *Journal of Policy Analysis and Management*, Vol. 34, No. 1, Winter 2015, pp. 7–31.

Saad, Lydia, "Majority Continues to Support Pot Legalization in U.S.," Gallup, November 6, 2014. As of January 2, 2015:
<http://www.gallup.com/poll/179195/majority-continues-support-pot-legalization.aspx>

Samuels, David, "Dr. Kush: How Medical Marijuana Is Transforming the Pot Industry," *New Yorker*, July 28, 2008.

Schuermeyer, Joseph, Stacy Salomonsen-Sautel, Rumi Kato Price, Sundari Balan, Christian Thurstone, Sung-Joon Min, and Joseph T. Sakai, "Temporal Trends in Marijuana Attitudes, Availability and Use in Colorado Compared to Non-Medical Marijuana States: 2003–11," *Drug and Alcohol Dependence*, Vol. 140, July 1, 2014, pp. 145–155.

Swift, Art, "For First Time, Americans Favor Legalizing Marijuana," *Gallup Politics*, October 22, 2013. As of December 12, 2014:

<http://www.gallup.com/poll/165539/first-time-americans-favor-legalizing-marijuana.aspx>

Tyler, Tom R., *Why People Obey the Law*, New Haven, Conn.: Yale University Press, 1990.

Tyler, Tom R., and Jeffrey Fagan, "Legitimacy and Cooperation: Why Do People Help the Police Fight Crime in Their Communities?" *Ohio State Journal of Criminal Law*, Vol. 6, No. 1, 2008, pp. 231–275. As of December 13, 2014:
http://moritzlaw.osu.edu/osjcl/Articles/Volume6_1/Tyler-Fagan-PDF.pdf

Wilkinson, Monty, director, U.S. Department of Justice Executive Office for U.S. Attorneys, "Policy Statement Regarding Marijuana Issues in Indian Country," memorandum to all U.S. Attorneys, all First Assistant U.S. Attorneys, all criminal chiefs, all appellate chiefs, all Organized Crime Drug Enforcement Task Force coordinators, and all tribal liaisons, October 28, 2014. As of January 2, 2015:
<http://www.justice.gov/sites/default/files/tribal/pages/attachments/2014/12/11/policystatementregardingmarijuanaissuesinindiancountry2.pdf>

About This Perspective

This paper is largely drawn from the RAND report *Considering Marijuana Legalization: Insights for Vermont and Other Jurisdictions* (Caulkins, Kilmer, Kleiman, et al., 2015); it also draws on insights from other RAND work, including

- R. L. Pacula, D. Powell, P. Heaton, and E. L. Sevigny, "Assessing the Effects of Medical Marijuana Laws on Marijuana Use: The Devil Is in the Details," *Journal of Policy Analysis and Management*, Vol. 34, No. 1, Winter 2015, pp. 7–31
- R. L. Pacula, B. Kilmer, A. C. Wagenaar, F. J. Chaloupka, and J. P. Caulkins, "Developing Public Health Regulations for Marijuana: Lessons from Alcohol and Tobacco," *American Journal of Public Health*, Vol. 104, No. 6, June 2014, pp. 1021–1028
- B. Kilmer, "Policy Designs for Cannabis Legalization: Starting with the Eight Ps," *American Journal of Drug and Alcohol Abuse*, Vol. 40, No. 4, July 2014, pp. 259–261
- B. Kilmer, K. Kruithof, M. Pardal, J. P. Caulkins, and J. Rubin, *Multinational Overview of Cannabis Production Regimes*, Santa Monica, Calif.: RAND Corporation, RR-510-WODC, 2013
- J. P. Caulkins, A. Hawken, B. Kilmer, and M. A. R. Kleiman, *Marijuana Legalization: What Everyone Needs to Know*, New York: Oxford University Press, 2012
- J. P. Caulkins, B. Kilmer, R. J. MacCoun, R. L. Pacula, and P. Reuter, "Design Considerations for Legalizing Cannabis: Lessons Inspired by Analysis of California's Proposition 19," *Addiction*, Vol. 107, No. 5, May 2012, pp. 865–871
- B. Kilmer, J. P. Caulkins, R. L. Pacula, R. J. MacCoun, and P. H. Reuter, *Altered State? Assessing How Marijuana Legalization in California Could Influence Marijuana Consumption and Public Budgets*, Santa Monica, Calif.: RAND Corporation, OP-315-RC, 2010
- W. Hall and R. L. Pacula, *Cannabis Use and Dependence: Public Health and Public Policy*, Cambridge, UK: Cambridge University Press, 2003.
- R. J. MacCoun and P. H. Reuter, *Drug War Heresies: Learning from Other Vices, Times, and Places*, New York: Cambridge University Press, 2001.

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