
POLICY COMMENTARY

Lawful Access to Cannabis: Gains, Losses and Design Criteria

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“Legalisation” does not specify a policy. Cannabis could be made available for use by adults under a wide variety of conditions: cheap or expensive, offered by for-profit enterprises, by not-for-profits (including consumer co-operatives), as a state monopoly (for production or sales or both), or even on a “grow-your-own” basis. It could be cheap (as it would be in a free market) or expensive (due to taxes or minimum pricing). Marketing efforts could be free or restrained. Users could be “nudged” toward temperate use – for example, through a system of user-set but enforceable periodic purchase limits – or left to their own devices.

Policy-makers should keep in mind Pareto’s Law, which applies to cannabis consumption: about four-fifths of consumption is accounted for by about one-fifth of consumers. That fact will drive the commercial strategies of for-profit producers and sellers, and should focus the attention of public agencies on the risks and harms to the heavy-using minority.

Uncertainties abound, and consequently policies should be designed to allow the system to learn from experience. But it is possible to try to predict and evaluate – albeit imperfectly – the likely consequences of proposed policy changes and to use those predictions to choose systems of legal availability that would result in better, rather than worse, combinations of gain and loss from the change.

Keywords: cannabis legalisation; cannabis consumption; nudge strategies; drug use prevention; drug treatment; illicit drug markets; cannabis use disorder; drug law enforcement; behavioral economics; public policy; incarceration

Much of the current argument about whether to legalise various currently illicit drugs is conducted at a level of abstraction (morality and health vs. liberty and public safety) where the details of post-prohibition policies are barely mentioned and concrete outcomes are either ignored or baldly asserted without any careful marshalling of fact and analysis. But it is possible to try to predict and evaluate – albeit imperfectly – the likely consequences of proposed policy changes and to use those predictions to choose systems of legal availability that would result in better, rather than worse, combinations of gain and loss from the change.

The analysis below focuses on cannabis, the drug for which serious legalisation efforts are now in motion. The difficulty of that analysis will provide some indication of how much more difficult it would be to evaluate the question for ‘drugs’ generally. Cannabis is the most widely used illicit drug, so its legalisation would influence the largest number – in some countries an absolute majority – of all users of illicit drugs, and eliminate a large number of arrests. But since other drugs dominate drug-related violence and incarceration, many of the costs of the ‘war on drugs’ would remain in place after cannabis legalisation: a point often omitted by proponents of legalisation as they skip directly from mass incarceration and illicit-market violence as problems to the legalisation of cannabis as a solution. The claims of advocates might be more convincing if they were more restrained.

At the opposite pole from bare assertion either of moral claims (e.g. that drug-taking is inherently wrong, or alternatively that any drug prohibition violates basic human rights) or of factual predictions (about drug use or incarceration) lies the project of formal benefit-cost analysis, which aims to weigh all of the gains and losses from a proposed policy change on the same scale: the valuations of the individual gainers and losers, measured by their (hypothetical) willingness to pay to enjoy the gains or avoid the losses. It is possible to

imagine doing an elaborate benefit-cost analysis of legalising cannabis (Pudney, Bryan & DelBono 2013), but doing so in practice would require one to predict the extent of changes in variables that cannot even be accurately measured in the present, and to perform implausible feats of relative valuation (e.g. comparing person-years of incarceration with person-years of cannabis dependency).

The size of the gains from legalisation, and in particular the reduction in the extent of illicit activity and of enforcement effort, would be greater in high-consumption countries, such as the United States, than it would in the lower-consumption conditions characteristic of most other advanced economies.

Key uncertainties include:

- The demand-side responses to price changes after legalisation, more convenient access, the removal of legal sanctions and the diminution of social stigma;
- The size and direction of changes in misuse risk (the probability of proceeding from casual to problem use);
- Changes in product choice (to more or less risky forms of the drug); and
- Effects on the misuse of alcohol and other drugs.

This last set of effects is both important and unknown. In particular, whether alcohol is a substitute for or a complement to cannabis remains to be ascertained, and the answer might not be the same for all populations and may differ in terms of short-run and long-run effects. Since the alcohol problem in all countries is much bigger than the cannabis problem, indirect effects on alcohol could overwhelm the direct effects, converting the results of cannabis legalisation from a net gain to a net loss or *vice versa*.

Thus reasonable ranges of difference over valuations and predictions will probably span the break-even point. Moreover, the outcomes of legalisation depend very sharply on details of policy that are usually not specified in the debate. Thus it seems hard to justify any dogmatic statement that cannabis legalisation would, or would not, be beneficial on balance, without reference to a specific locale and a specific set of post-prohibition policies.

If legalisation is to be tried – as now in Colorado, Washington State and Uruguay, very likely soon in other US states and quite possibly within the next decade in the US on a national level – it ought to be tried in an experimental spirit. Given the huge range of potential gains and losses, and of policy options, the probability of finding the perfect combination right from the start must surely be near zero. Thus the best initial policy will be not the one that comes closest to some calculated optimum, but the one easiest to adjust in light of experience, which among other things means building in evaluation and policy-feedback mechanisms. The pioneers of cannabis legalisation are all too likely to experience in practice the validity of von Moltke's maxim that no battle plan survives first contact with the enemy.

That is not, of course, a reason not to analyse and to plan, but some of that analysis and planning should involve building in to the process the capacity to improvise in the face of the predictable appearance of unpredicted phenomena.

Categories of Gain and Loss

One way to start the analysis would be by cataloguing the categories of personal and social gain and loss that might arise from legalisation. The following list – far from exhaustive – suggests the range of possible considerations.

Potential Gains:

- Reduce the size and revenue of illicit trade, the associated violence and disorder and the harm done by arrests and incarceration.
- Increase somewhat the range of licit economic opportunity and generate public revenue.
- Either reduce public expenditure on law enforcement or free enforcement resources for other uses.
- Reduce the risks of cannabis consumption by replacing untested, unlabelled and unregulated product with tested, labelled and regulated product.
- More speculatively, legal availability might encourage consumption using less health-damaging means (e.g. vaporisation rather than smoking) or new cultural practices, such as cannabis use short of intoxication.
- In addition, all consumers would face lower prices and a wider choice of products, generating increased consumers' surpluses among all whose consumption is well-informed and not the result of substance-abuse disorder, and even among some unwise or dependent consumers.

Potential Losses:

- Increased consumption for those consumers whose consumption is, on balance and at the margin, damaging rather than beneficial to themselves. That might be especially true of dependent users (including those not now dependent who might become so under conditions of legal access) and of minors. But as the examples of tobacco, alcohol, gambling and food all illustrate, fashion and present-orientation can lead even non-dependent adults to make self-harming decisions.
- Losses to those whose welfare is interdependent (materially or emotionally) with self-harming users who are their kin or friends and to those harmed by accidents, crimes or derelictions of duty caused by cannabis intoxication or dependency. There would be analogous gains related to users whose lives or social performance improves from using licit cannabis or who avoid legal penalties for using or selling it due to the repeal of prohibitory laws.

There might also be, as noted, either gains or losses from decreased or increased self-harming or socially harmful use of alcohol and other drugs.

Policy Details

The actual outcomes of any scheme of legal access would depend strongly on details rarely mentioned in the abstract pro-and-con discussion of whether to legalise. The risk of a large increase in damaging forms of consumption would be greater at lower prices; the need for enforcement against illicit production and sale, or tax evasion by licensed producers and sellers, would be greater at higher prices.

Another central decision is whether to allow private for-profit enterprises to produce and sell cannabis, or instead to restrict licit activity to:

- (1) Production for personal use and gratis distribution only;
- (2) Production and sale by not-for-profit enterprises such as consumer-owned cooperatives after the fashion of the Spanish 'cannabis clubs'
- (3) Some variety of state monopoly, perhaps of retail sales only, leaving production to private enterprise.

If the private enterprise model is chosen, an additional choice must be made about whether to limit market concentration to ensure the existence of a variety of competing firms (thus perhaps limiting the marketing and political power of the industry as a whole and – again perhaps – increasing the rate of product innovation and the range of products easily available) or instead to allow the likely development of oligopolistic competition, as in the markets for cigarettes and beer.

A potential advantage of legalisation would be the provision of consumer information superior to that available on the illicit market. The corresponding disadvantage might be the application of powerful marketing techniques to making excessive consumption seem desirable and fashionable.

Cannabis is a more complex product than beer, with at least two and perhaps dozens of significantly psychoactive chemicals and, to date, only limited scientific knowledge about their actions and interactions. Requiring accurate label information about chemical content seems a sensible approach, but not all consumers will be able to make good use of a collection of chemical names and percentages. Industry participants could be given the responsibility of providing sound consumer information, including due warnings about the risks of habituation, at the point of sale or via websites, or that responsibility could be assigned to NGOs or public agencies, perhaps financed by cannabis taxation. It seems at least arguable that cannabis sales personnel should have extensive training both about the pharmacology of the drug and about offering good advice to consumers, making their role closer to that of a pharmacist or nutritionist than of a mere sales clerk or bartender.

By the same token, decisions would have to be made and executed about whether and how to limit marketing efforts. To some eyes at least, the alcohol industry provides a warning by example of what could go wrong. In the United States, the doctrine of 'commercial free speech' might gravely impair the capacity of the state to allow private enterprise but restrain promotion.

Again as with alcohol, rules would have to be set and (imperfectly) enforced about public intoxication, workplace intoxication, operating a motor vehicle under the influence and provision to or use by minors.

A central fact about cannabis – as about alcohol and many other activities that form a persistent bad habit in a significant minority of their participants – is that the problem minority consumes the dominant share of the product. (A generalisation often cited as ‘Pareto’s Law’ holds that the top 20 percent of the participants in an activity typically account for 80 percent of the total activity.) As a result, a commercial industry, or a revenue-oriented state monopoly, would depend for much if not most of its sales on behaviour that is self-harming. In the case of cannabis in the United States, something like four-fifths of total product currently goes to consumers of more than a gram of high-potency cannabis per day; about half of those daily users, according to their own self-report, meet clinical criteria for substance use disorder. That would create a commercial incentive directly contrary to the public interest, and potentially great political pressure to do away with any restriction that promises to be efficacious in reducing the frequency of drug misuse.

Under contemporary conditions in advanced Western countries, it is difficult to make any commodity available to adults without increasing access to minors, since every adult is a potential point of ‘leakage’ across the age barrier. Teenagers are not merely an important current market segment; in the eyes of companies trying to increase their ‘brand equity’, they are the future. Within legal constraints, the alcohol and tobacco industries do their utmost to compete for teenage market share, even where that consumption is illegal. There is no reason to think that formal bans on marketing to minors would have more than a trivial impact on the efforts of participants in a legal cannabis industry to penetrate the youthful demographic.

Taxation and Revenue

Cannabis, even under illegal conditions, is a highly cost-effective intoxicant. At prevailing prices in the United States, a drinker who has not built up a tolerance for alcohol might need about \$5 worth of store-purchased mass-market beer to become drunk; a similarly fresh smoker could become intoxicated on perhaps \$2 worth of cannabis, or even less. Medical dispensaries in Colorado already offer ‘weekly special’ strains of sinsemilla cannabis at \$5 per gram (with volume discounts), where a gram represents more than two standard ‘joints’ (marijuana cigarettes), each more than adequate to intoxicate a non-tolerant user. Vaporisation seems likely to lower the effective cost substantially, both because concentrates trade at discount to herbal cannabis on an intoxicant-equivalency basis and because the vaporisation process loses fewer of the active chemicals to combustion or as sidestream smoke.

Thus there seems to be no strong argument for letting prices fall much from existing levels; even a user of modest means will reach the point where his or her cannabis use is self-harming before reaching the point where it becomes a budget problem. But since production costs under legal conditions would be negligible (Jonathan Caulkins and his colleagues have estimated costs in the pennies-per-joint range [Caulkins 2010; Caulkins & Reuter 1998; Kilmer et al. 2010]) maintaining current prices would require very heavy taxation, whether measured in terms of the tax share of the final price (more than 95 percent) or in terms of tax-per-unit-weight (roughly \$300 per ounce). Collecting such taxes would pose a daunting challenge; in New York City, where a pack (roughly 1 ounce) of cigarettes bears a tax burden of approximately \$8, full tax has not been paid on more than one-third of all cigarettes consumed (McGee n.d.).

This suggests that taxation be a specific excise (perhaps per unit of THC) rather than on an *ad valorem* (percentage-of-market-price) basis. Taxation levels might also be varied with product composition to encourage the sale of less hazardous (e.g. lower-THC, higher-CBD) forms of the drug. Alternatively, annual production quotas could be set to restrict production to achieve some desired price level, and producers could be required to bid at auction for quota rights. A properly designed auction ought to be able to capture for the state almost the producers’ entire surplus in the commodity cannabis market.

With taxes (or quota prices) high enough to maintain illicit prices, cannabis could be a significant, though not a major, source of public revenue, on about the same scale (low double digits of billions of dollars per year in the United States) as alcohol and tobacco. How to keep even a state monopoly from encouraging problem use to hit revenue targets – as American state lotteries notoriously do – would remain a problem.

Culture and Cannabis Consumption

Though a very large share of all alcohol – in the United States, approximately 50 percent – is consumed as part of intoxication events (‘drinking binges’), the vast majority of drinking occasions do not involve the user becoming intoxicated. The opposite seems to be true now for cannabis, where ‘getting high’ is the socially understood purpose of using the drug. But it is possible – and might be easier with clearly labelled products and more controllable means of administration, such as vaporisation rather than smoking – to have the cannabis equivalent of a single alcoholic drink, and it is conceivable that, under legality, norms of using cannabis not to intoxication might establish themselves at least in some social circles. Doubtless some policies

would be more favourable than others to such a development, but too little is yet known to allow more than mere speculation about what might, or might not, work in that regard.

Enforcement

In the long run, a legal market should require less enforcement attention than an illegal market. But regulations and taxes do not enforce themselves, and an untaxed and unregulated illegal market has some natural advantages over a taxed and regulated legal market, especially when the legal market is new and competitive pressures and technological advances have not yet driven prices down. Just as the first step in making rabbit stew is catching a rabbit, the first step in running a controlled market is to draw customers in from the uncontrolled markets. That will require mounting sufficient enforcement efforts to shift the balance of competitive advantage toward licit activity.

Prevention and Treatment

Drug consumption has risks, including the risk of progressing to problem use. 'Just-say-no' prevention efforts have limited efficacy (Caulkins et al. 1999). But the natural effect of legal availability, bringing lower prices and decreased non-price barriers to use, is to increase consumption, including problem consumption. Therefore a legalisation scheme ought, ideally, to include a comprehensive information and persuasion strategy, aimed at potential as well as current users, and designed to minimise the number of people who find themselves in the grip of a substance use disorder. There are lessons to be learned from both the successes and the failures of current efforts to prevent alcohol and tobacco misuse.

For those who do find themselves with harmful patterns of drug use that prove resistant to efforts at self-management, services should be created and directed at ameliorating the harm they do to themselves and others, and if possible to restoring normal volitional control. It would be wrong to expect that expanded drug treatment services would be capable of preventing a rise in the number of persons currently suffering from cannabis use disorder, but the need for those services will increase. Designing ways to meet that need – to identify problem users, persuade them to seek help, and ensure an adequate supply of services and a means of paying for them – ought to enter into the legalisation planning process.

User-Set Quotas: A 'Nudge' Strategy

Problem drug-taking can be thought of as a problem of impaired volition, in which the easy and natural thing for the user to do is not the most beneficial thing to do as the consumer would understand it if approaching the question thoughtfully, in particular because the benefits of use are immediate while the associated harms are deferred. (It has been said that if the pain of the hangover came before the pleasure of the intoxication, heavy drinking would be a virtue rather than a vice). If that is the case, then one way to deal with addiction would be to change the 'choice architecture' – the decision problem presented to the consumer – in ways more conducive to choices consistent with the consumer's goals and values and less dominated by impulse (Thaler & Sunstein 2008).

In one of his 'self-command' essays, Thomas Schelling tells the story of a firm alarmed by spreading waistlines among its executives, who seemed to have a hard time restraining their caloric intake in the company dining room (Schelling 1984). The elegant – and, apparently, effective – solution was to have everyone order lunch at 9:30 in the morning, when the executives were not hungry and when the decision to order the brownie sundae did not result in having a brownie sundae immediately. Once it got to be lunchtime, when the temptation to overeat was stronger and more immediate, the option was no longer available: everyone was stuck with whatever he or she ordered at 9:30. Now of course no one was being fooled; the executives knew perfectly well that at 1 pm they would desire more, and different, food than they ordered at 9:30. But, at 9:30, that forgone future – rather than current satisfaction – seemed like a perfectly reasonable sacrifice for a smaller shirt or dress size.

That suggests a policy intervention for cannabis (or alcohol or gambling): a system of user-set personal quotas. Under such an approach, any adult might purchase cannabis from a set of competing outlets offering a variety of products at a variety of prices, just as in any normal market, and do so without any externally imposed limit on quantity. But every user would be required to register, with the registration information treated as personal health information and thus strongly privacy-protected. (Given the somewhat complex and risky nature of cannabis taking as an activity, it might be reasonable to require every new user to go over some educational material and pass a simple test, like a driver's license exam, but whether to do so poses a separate question).

At registration – which could take place in any retail establishment or at a state office – the new user would be asked to establish a personal monthly or weekly purchase quota, perhaps denominated in multiples of some standard dosing unit: for example, 40 mg of THC, roughly the content of the average joint. A request for a very large quota might call for some counselling (or even lead to suspicion that the consumer intended to purchase for resale to minors or other unlicensed buyers), but the consumer's final decision would stand, whatever it turned out to be.

However, that choice, once made, would then be binding; every purchase would have to be centrally tracked against the consumer's personal limit, just as every credit card transaction is tracked against the cardholder's credit limit. Once the weekly or monthly quota had been reached, no retail outlet would be allowed to sell any more cannabis to that consumer in that time period. The consumer would have the right to modify his or her quota, but while a request for a decrease would take immediate effect, a request for an increase would not become effective until after some delay, perhaps two weeks.

Such a system would not interfere with anyone who really *wanted* to be chronically intoxicated. But it would allow someone who really wanted to be an occasional user from slipping insensibly into a bad habit, and someone who really wanted to cut back to protect that desire from his or her own transient impulses. At minimum, it would make every cannabis user aware of his or her consumption pattern.

Of course, the limit would not really bind any sufficiently determined user, even in the short term: it would always be possible, with some amount of effort, to find a friend, or even a stranger, willing to share supplies or to make a 'straw' purchase. But just having that barrier in place might prevent some fraction of the substance use disorder that would otherwise result from free access to cannabis.

It seems likely that most users would set moderate quotas for themselves and never run into those limits, and that a smaller number would either start with a very high quota and a problematic pattern of use or start with a moderate quota, hit the limit a few times, increase the limit, start hitting the limit again, increase the limit again, and thus work themselves into bad cannabis habits. But – and this is the empirically open claim – it is also possible that a substantial number would set a limit, hit it repeatedly, and *never increase it*, and that a non-trivial number would voluntarily cut back their personal quotas or take themselves off the rolls entirely.

That surely would not eliminate cannabis misuse and dependency, but it would give the potential problem user a fighting chance to overcome the joint forces of his or her own weakness of will and the cleverness of the cannabis industry marketing experts who would be doing their utmost to turn him into a 'good' – that is, chemically dependent – customer.

Imperfect self-command is not a disease; it is part of the human condition. Virtually all of us need, at some times and with respect to some behaviours, what Herbert Kleber has called 'prosthetic support for weak will'. 'Nudging' in the form of self-set but externally enforced quotas is one possible way to help deal with the self-command problem when the problem is quantitative and involves a well-defined salable product. It would not solve the problem, which is after all not soluble. But it might diminish its extent without the well-known side effects of dealing with cannabis (and perhaps other habit-forming drugs) by making sale and use illegal.

Conclusion

The debate over how to legalise cannabis tends to assume that for-profit commercial enterprise is the default option. Legalising cannabis on the alcohol model may, however, be the second-worst option (behind only continued prohibition); commercialisation creates an industry with a strong incentive to promote heavy use and appeal to minors through aggressive marketing.

No system of legal availability is likely to entirely prevent an increase in problem use. But pioneering jurisdictions should consider alternative approaches including non-profit regimes and state monopoly. Both sides of the legalisation debate should acknowledge that the question is complex and the range of uncertainties wide. Such modesty, alas, is in short supply.

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Competing Interests

The authors have no competing interests to declare.

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