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Prohibition, regulation or laissez faire: The policy trade-offs of cannabis policy

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ABSTRACT

Trade-offs are central to the cannabis policy debate. Prohibition and strict regulation may help reduce the physical, mental and social harms of cannabis consumption, but at the cost of increasing the harms from illegal markets and reducing consumption benefits. An economic model clarifies how these costs and benefits relate to policy and connects them to observable prices and tax-levels given the assumptions of the analysis. These model-based arguments are related to the ongoing academic policy debate. While some arguments from this literature modify the interpretation of the model (e.g., due to dependence, cognitive biases and market structure), the literature often fails to appropriately account for the magnitude of the policy costs and benefits identified. Taking various caveats into account, the framework indicates that a strict regulation would likely be preferable to prohibition given current estimates of excess harms (externalities and internalities) from cannabis use. While cannabis prohibition appears difficult to justify within an economic regulatory framework, risks from industry influence, policy ratchet effects, and human "decision-making flaws" speak to the need for caution and strong regulation when implementing legal regimes.

Introduction

Policy trade-offs are central to the cannabis policy debate, but there is little consensus on what these trade-offs are or how they should be assessed.

To compare policy regimes, we need to specify the set of important outcomes influenced by policy, consider how these outcomes will differ across regimes, and, evaluate the differences with a normative principle specifying the relative importance of different outcomes. Balancing trade-offs, the "best" policy is the one that results in the best "overall" bundle of outcomes.

Fields and disciplines differ in how they approach this task. Some restrict their analysis to a few outcomes, for example narrow public health approaches that only consider population mortality and morbidity. These implicitly assume that no economic or social benefits could justify any reduction in health. Others list and discuss a bundle of important outcomes without a strong stance on their relative importance or comprehensiveness (e.g., Babor, 2010). Other approaches are more systematic: Researchers or policy stakeholders may be guided through Delphic decision-making processes, or we may develop "drug harm metrics" that assign numerical weights to indicators of social costs, policy effectiveness, drug harms etc (Ritter, 2009).

In this article, I discuss central cannabis policy trade-offs using an economic model, drawing on standard regulatory theory and more recent work in behavioral economics. The analysis is similar to that underlying cost-benefit analyses used across a broad range of policy issues, including greenhouse gas emissions, pollution, road congestion, and alcohol consumption. Abstracting away much detail, this aims to clarify central trade-offs faced and identify how observable magnitudes such as tax levels and drug prices reflect policy-relevant harms and benefits.

Trade-offs between three types of outcomes are highlighted: a) the myriad physical, mental and social harms of drug consumption, b) the subjectively perceived benefits of consumption, and c) the harms from illegal markets. These are largely determined by economic factors: Taxes and regulation shape the supply side and determine prices, availability and illegal activity. Legality, price and availability, in turn, help determine consumption prevalence and patterns, which determine use-related harms.

Economic models are simple theoretical systems that serve as cognitive tools. They help clarify the policy relevance and implications of an established knowledge base, assisting reasoning when there are "adding-up constraint[s], indirect chain[s] of causation, feedback effect [s], etc." (Krugman, 1998). This helps avoid the human tendency to substitute simpler substitute problems in the face of complexity (Kahneman, 2011). As with any tools, they can – and have been – misused. In particular, economists have at times fetishized models as alchemical machines converting *a priori* assumptions into fact, in effect

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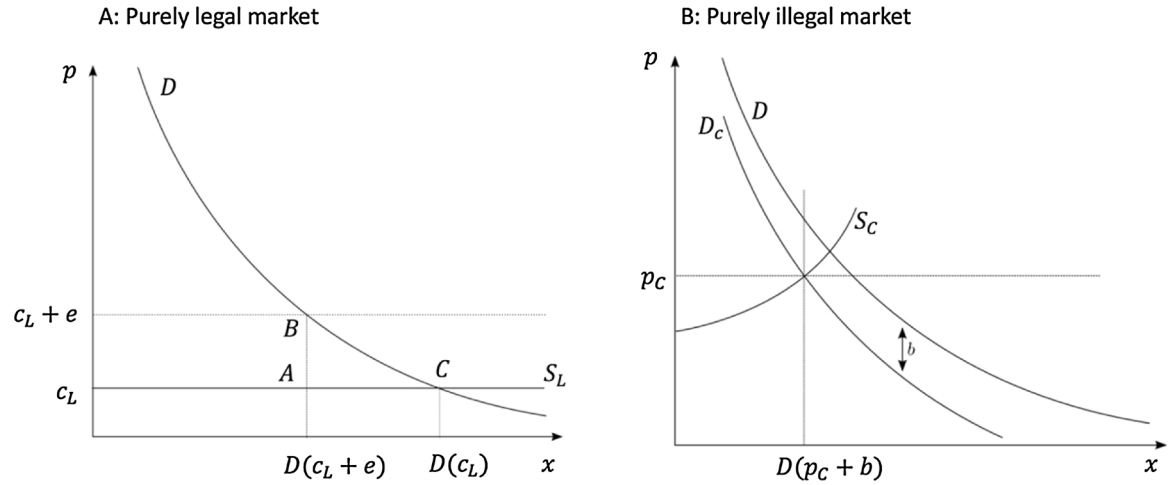

Fig. 1. Pure legal and pure illegal market. In panel A, if the good is untaxed, market volume is equal to the demand at the price $p_L = c_L$. If the good is taxed at a level equal to the excess costs e, demand declines to $D(c_L + e)$. The area between the three points A, B and C are equal to the welfare loss avoided by imposing the tax. In panel B, illegal supply curve is higher, increasing the illegal price p_C, and consumers value the good less by b (law-breaking stigma and risks, quality differences).

mistaking "beauty, clad in impressive-looking mathematics, for truth" (Krugman, 2009). For example, prominent economists have argued that addictive use is the gradual, controlled implementation of a rational, forward-looking, welfare-maximizing plan (see Rogeberg, 2004; Rogeberg & Melberg, 2011 for references and criticism). Such absurd conclusions are due to bad models – often resting on an assumption that all humans are logically omniscient, well-informed creatures that unfailingly make optimal choices. As two economists put it, "[e]conomists will and should be ignored if we continue to insist that it is axiomatic that constantly trading stocks or accumulating consumer debt or becoming a heroin addict must be optimal for the people doing these things merely because they have chosen to do it" (O'Donoghue & Rabin, 2003).

In summary, the analysis that follows aims to analyse cannabis policy within a standard economic framework built on reasonable, well-supported assumptions regarding cannabis use, harms and markets. The goal is to provide a "high-level" evaluation of whether a prohibition can be justified by the regulatory principles commonly employed in economic policy analysis, and to relate the conclusions to arguments from the ongoing policy debate.

A model of regulatory intensity for a good with negative externalities

The assumptions

An economic model is a formal system capturing a set of assumptions and clarifying their logical implications. In our case, the model is built to capture the following elements:

- *Downward sloping demand curve* If prices decline, cannabis consumption will tend to increase by attracting new consumers or increasing the consumption of current users. The price responsiveness of a good is measured as a price elasticity, the percentage change in purchase volumes following a 1% increase in price. A recent meta-analysis pooled studies and reported low price elasticities for cannabis, in the -0.3 to -0.15 range (Gallet, 2014). This suggests that cannabis use is not strongly influenced by price,[1] but the variability in estimates is substantial (see estimates and literature section in Davis, Geisler, & Nichols, 2016)
- *Externalities or internalities* Cannabis use has harmful consequences on average that are not considered by the user, either because they harm others (external effects) or because users are unaware of, excessively discount, or are incapable of taking into consideration future harms to themselves.
- *Dislike/stigma for breaking the law* There are legal, social, and product quality risks associated with buying products in illegal markets. Other things equal, legal goods will tend to be preferred over illegal goods.
- *Inefficient illegal production* Illegal production is targeted by the police, and requires costly and inefficient practices to avoid detection. Costs are further raised to the extent that workers require compensation for risks, stigma and moral scruples to be willing to work in the illegal sector.
- *Constant legal unit production costs* Legal production costs can be viewed as largely unaffected by total market volume, because benefits from scale are limited relative to the size of the total market.
- *Markets tend to move towards equilibrium* As consumers and suppliers adapt to existing market prices, their actions will affect prices and tend to reduce profits. If costs decline, for instance, existing suppliers will raise production and new suppliers may enter the market. This increases the total supply, causing prices to decline until demand and supply match.

Note that the above assumptions do *not* imply that consumers and suppliers are fully rational or always make optimal choices. What we *do* assume is only that they respond in a predictable way to changes in incentives.

The model

In a legal market with no illegal competition, the demand for cannabis is assumed to increase as prices decline, which can be captured in a supply-demand diagram by a declining demand curve D (Fig. 1, panel A). Legal supply S_L is able to provide any quantity of cannabis at a low price equal to a fixed per-unit production cost c_L, and in the absence of any corrective taxation we would expect a low market price $p_L = c_L$ with high consumption $D(c_L)$.

Standard economic theory uses "individual welfare" as the normative yardstick, typically assuming that willingness to pay for a good reflects the net benefits that a consumer believes he or she will receive from the purchase, and that the production cost of a good reflects the

[1] The elasticities are below those of cigarettes, alcohol and hard drugs, which the authors note may be due to a variety of factors: Cannabis may be more addictive than thought, making it hard to change consumption levels. Alternatively, this may reflect the low budget share of cannabis, less experienced users (with fewer alternative sources of supply) or lower substitutability of cannabis.

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