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AN ECONOMIC ANALYSIS OF DIFFERENT CANNABIS DECRIMINALIZATION SCENARIOS

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SUMMARY

***Background**: Cannabis is the most widely used illegal drug in European countries. In countries with repressive cannabis policies, prevalence is not lower than in those with tolerant laws. Repressive policies not only have uncertain benefits but they are also expensive. Economists tend to believe that good public policies minimize social costs; that is, they help to improve collective wellbeing at a lower cost.*

***Method**: The paper draws on a review of international literature on cannabis legislative models around the world. After a description of some of the fundamental concepts of a market economy, several existing policy scenarios will be presented and analyzed from an economic perspective. Strength and weaknesses will be summarized for each alternative.*

***Results**: In addition to consumption tolerance in countries such as the Netherlands, recent decriminalization of domestic markets in the Unites States and Uruguay present alternatives to reduce the negative impact of cannabis on society. Earlier initiation age and rise in consumption are unintended potential consequences of decriminalization that need to be addressed by public authorities when designing a liberalized cannabis policy environment. Price is a key variable that needs to be addressed to prevent a rise in consumption.*

***Conclusion**: Repressive cannabis policies are expensive and have limited impact on consumption. Consumption legalization significantly reduces expenses for repression and law enforcement, allowing for the allocation of more resources to other targets such as education and prevention. With legalization of supply along with consumption, repression and law enforcement costs are reduced even further. Moreover, a legal market would create employment and generate tax revenues that could be allocated to the prevention of increased consumption. Legalizing cannabis would not lead to a sudden rise in consumption, providing the duty imposed by the state kept the product at its current price.*

***Key words:** cannabis – policy - social cost*

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INTRODUCTION

Cannabis is the most widely used illegal drug in European countries (EMCDDA 2014). Because repressive policies are not only expensive, but they also have a limited impact on consumption, cannabis repressive policies have become a controversial issue (Becker 2006, Room 2010, Kopp 2015). Colorado, Washington State and Uruguay are currently designing legal non-medical markets for cannabis. The legalization initiatives underline the need to revise cannabis policies, suggesting that decriminalization of domestic markets may be an alternative to reduce the negative impact of cannabis on society.

Policy can impact cannabis price, supply and demand (Williams 2014). It can also have an impact on social cost. Social cost is the total cost to society. It includes both private costs plus any external costs. Private costs are the costs that the buyer of a good or service pays the seller. External costs (also called externalities) are the costs that people other than the buyer are forced to pay as a result of the transaction. The bearers of such costs can be both particular individuals and society at large. The social costs include things that society will likely have to pay for in some way or at some time in the future that are not included in the transaction price. The external costs of cannabis transactions include things like repression, prevention or cannabis related health expenditures.

The analysis of cannabis public policy raises the question, are there legislation alternatives under which the social cost could be minimized? Because costs, price, supply and demand are perhaps the most fundamental concepts of economics and the backbone of a market economy, an economic analysis of different policy scenarios is an appropriate approach to answer this question. Policies existing from Europe and around the world will be presented. Legalization scenarios will be analyzed with a variety of economic tools and compared to a baseline of prohibition. Costs and benefits will be summarized for each alternative.

METHOD

A systematic search was performed to obtain available literature on cannabis policy.

Publications were included in the review according to the following criteria (1) concerned cannabis policy; (2) contained relevant data for economic analysis; (3) had a European scope; (4) described recent decriminalized markets in the United States and Uruguay or (5) were full-texts or conference abstracts of original studies. The description of the fundamental concepts of a market economy can be found in most classical economics textbooks.

RESULTS

How drug markets work?

Cannabis supply and demand

Supply and demand are represented by curves, which show the amount of a given product - here cannabis - that the dealer and the consumer respectively want to sell and buy, in function of the price. In Figure 1, the supply curve is flat based on reasonable hypothesis. (Production costs per unit do not increase as output increases and the supply is sufficient to satisfy demand. If we do not make this hypothesis an upward slope is a necessity. If production costs per unit increase as output increases, since an item costs more to produce, a higher price must be charged as production increases. If supply does not satisfy demand a potential scarcity of the product would mechanically increase its price.)

The demand curve shows that when price increases quantity demand decreases and vice versa. Figure 1 shows that at a price p^* dealers and consumers will trade a quantity q^*

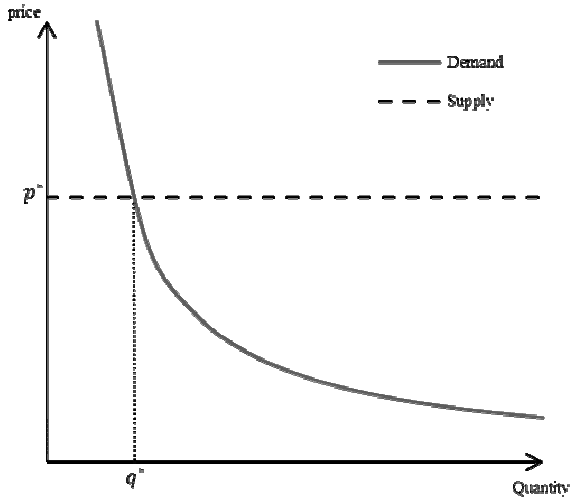

Figure 1. Supply and demand curves

The supply side

When cannabis supply is illegal, selling prices cover not only direct costs such as production costs (including seeds, material and growers wages), and selling costs (like transportation or sellers wages) but also the indirect costs borne by the supplier, related to an illegal market: the risk of arrest and prosecution, or the violence prevailing in these markets.

The supply curve indicates the willingness to sell. Thus, if legislation around drug traffic becomes harsher, the drug selling prices should rise due to the increasing probability of arrest and/or the penalties to which the supplier is exposed (*i.e.* by increasing indirect costs). This can be illustrated in Figure 2 by an upwards shift of the supply curve resulting in a new equilibrium where buyers and seller agree to trade at higher prices (p) and less quantities (qup). By contrast, when cannabis supply is decriminalized, those indirect costs disappear. If the price is not fixed by public authorities, legalization of supply can lead to a downward shift of the supply curve. Selling prices will drop, as a result of the disappearance of indirect costs and competition between suppliers that try to compress direct costs and quantity purchased will increase.

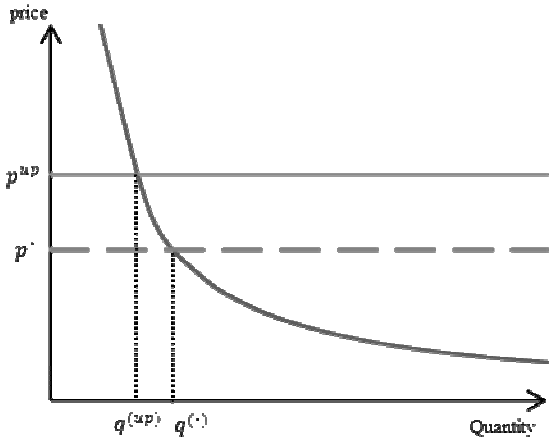

Figure 2. Shifts on the supply curve

The demand side

When an illegal good is purchased, the acquisition cost borne by the consumer is composed of monetary costs (the price paid), and non-monetary costs (such as psychological costs of the potential of being arrested, and of mixing with the mafia). Harsh drug legislation against the consumer increases non-monetary purchasing costs. Decriminalization of cannabis use, without legalizing supply, will suppress the consumer's probabilistic cost of being arrested. Moreover, if cannabis use decriminalization is associated with legal supply, the non-monetary costs will drop even further as the cost of interacting with the illegal market drops. The disappearance of non-monetary costs will increase the willingness to buy. Figure 3 illustrates an upward shift of the demand curve resulting in a new equilibrium where buyers and sellers agree to trade more (qup) for the same price (p^*).

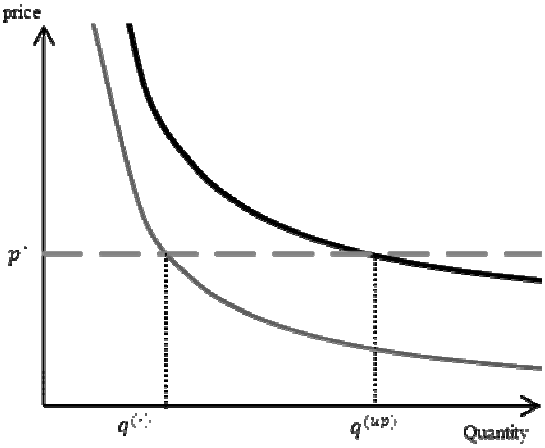

Figure 3. Shifts on the demand curve

Public means to counter falling purchasing costs and increasing demand

Cannabis decriminalization alters demand and supply. Legalizing consumption may shift the demand curve upwards increasing the quantity demanded at a given price. Legalizing supply may shift the supply curve downwards, reducing the selling price of cannabis and increasing the quantity demanded.

To discourage consumption, public authorities can further influence the market. Taxes and reduction of sellers both result in upwards shifts of the supply curve. Taxes producer, distribution, wholesale and supply levels will increase input costs. As fewer sellers enter the market reduced competition between suppliers will drive prices up.

Another way to reduce cannabis use is to create a public monopoly in which public authorities act as a single supplier controlling cannabis production and sales. In this scenario, public authorities set the price and at the same time choose the quantity to supply, according to the consumers demand for cannabis. Figure 4 shows how public authorities can discourage consumption by increasing the price from *p1* at which a quantity *q1* is demanded to a new price *p2* to reduce demand to *q2*. Raising prices beyond certain limits, however will encourage consumers to leave the legal market and look for better prices in the illegal market.

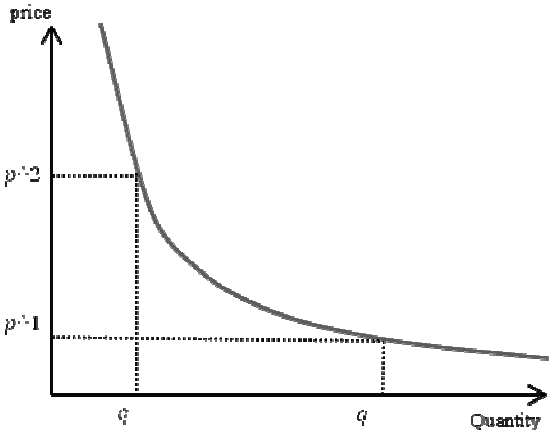

Figure 4. State Monopoly

Legislative models

Illegal use and supply

A legal distinction can be made between drug users and suppliers as well as between different types of drugs. In France for instance, drug supply is sanctioned more severely than drug use. They do not, however, distinguish between the different types of illegal drugs: a cannabis infraction is punished in the same way as a heroin infraction (IDT 2013). In contrast, in the United Kingdom, distinctions are made between three classes of drugs (DrugScope 2015).

- Class A includes heroin, cocaine, crack, MDMA (ecstasy), methamphetamine, LSD(Lysergic acid diethylamide) and psilocybin mushrooms;
- Class B includes amphetamine, cannabis, codeine, ketamine, methoxetamine and methylphenidate. Any class B drug that is prepared for injections becomes a class A substance;
- Class C includes GHB (*gamma*-Hydroxybutyric acid), diazepam, flunitrazepam and most other tranquillizers, sleeping tablets and benzodiazepines as well as anabolic steroids.

The rate of current use in the overall population (defined as use in the last year) is 8% in England and Wales and 9% in France In both countries, over 30% of the population has used cannabis and has done so despite it being illegal (Van Laar 2011). There has been much concern about the economic and social costs of maintaining harsh criminal sanctions for cannabis use. It is costly both from a societal perspective, requiring significant law enforcement and criminal justice resources, and from the perspective of cannabis users who risk the costs associated with incurring a criminal conviction.

Decriminalization of cannabis use

When cannabis consumption is decriminalized, possession is usually sanctioned by a fine, or allowed if the amounts do not exceed a fixed maximum. In Switzerland, since October 2013, an adult caught in possession of less than 10g of cannabis simply receives a 100 CHF fine, and nothing is put on his criminal record (Loisur les stupéfiants 2012). In Portugal, sanctions concerning drug use (not only cannabis) are administrative rather than criminal. For an amount of cannabis that does not exceed 25g, the consumer receives a citation to appear before the Commission for the Dissuasion of Drug Addiction (Laqueur 2014). If a consumer possesses more than 25g, he is held to the same judicial proceedings as a supplier. In Australia, since 2004, people arrested with less than 10g of cannabis receive a Citation Intervention Requirement. (Government of Western Australia Drug and Alcohol Office 2015).

Whether liberalization of cannabis laws increases the use of cannabis remains controversial. Portuguese de-penalizations did not affect drugs sales prices. Between 2001 and 2007, regular cannabis consumption remained stable in Portugal and the number of convictions decreased. Only lifetime use increased (IDT report 2013). In Australia, decriminalization did not have a significant effect on uptake. However, this average effect masked a shift in the timing of uptake from adulthood to adolescence. In the short run, up to five years following decriminalization, there was also a small net increase in the proportion of the Australian population who ever use cannabis. Because there is evidence that early cannabis initiation increases the risk of dependence (Hall 2009); lower educational attainment (Hall 2009, Van Ours 2009); mental health problems (Degenhardt 2013, Moore 2007, Macleod 2004); and deficits in verbal learning and memory tasks (Solowij 2011, Jacobsen 2004), earlier initiation and a

small net increase in uptake are unintended adverse consequences of decriminalization that need to be addressed when designing a liberalized cannabis policy environment. After the decriminalization policy was in place for more than five years, no significant effect of decriminalization on initiation into cannabis use in either youth adulthood was found (Williams 2014).

Legalization with a state production supply monopoly who determines the price

In Uruguay, three forms of cannabis cultivation are allowed: private cultivation at home with up to six plants, users' cooperatives with up to 45 members; and licensed producers who must sell to the government. Buyers of the commercially produced cannabis, which is sold over the counter through pharmacies, have to sign up on a confidential registry, and purchases are capped at 40 g per month (Ramsey 2013). The government is expected to be the primary cannabis supplier beyond private cultivation and users cooperatives, thus retaining control over the quantity produced and the prices at which cannabis is sold. Private cultivation and users' cooperatives are small in order to benefit from economies of scale and therefore their rate of production will not significantly affect the market price dictated by the state (Musto 2015).

The buying price has been temporarily fixed at 20 Uruguayan pesos per gram (less than USD$1) in order to match the street prices and to compete with the black market. The Institute for Regulation and Control of Cannabis has been set up to run the registry, as well as to issue and enforce regulations controlling the market, and to advise the government. All advertising and promotion of cannabis products in any medium are prohibited. Taxes, although not mentioned in the current proposal are likely to be imposed (Room 2014).

Legalization of consumption and trade. The price being determined by the market

The Netherlands allows small scale cannabis cultivation for private consumption.

In addition, the sale of cannabis for personal consumption in licensed coffeeshops is tolerated by the authorities. Each coffee shop is allowed to detain a stock of 500g of cannabis. Cannabis prices are low and determined by the market. (United Nations Office on Drugs and Crime 2009). There is an ongoing contradiction in the Netherlands' model, as a coffee shop is allowed to buy and sell cannabis within the legally tolerated limits, but its suppliers are not allowed to grow or import it, or to sell it to the coffee shop: "The front door is open, but the backdoor is illegal."

In Colorado, localities are granted relative autonomy to set regulations on the 'time, place, manner and number of marijuana establishment operations', this allows municipalities to prohibit local stores and cultivation operations (State of Colorado 2012), with the result that marijuana stores are likely to be concentrated in only about 20 cities or counties (Ingold 2013). Marijuana stores cannot sell any other goods; each sale is limited to 1 oz (28,349 g) for Colorado residents and 1⁄4-oz to non-residents. Product containers will be required to carry specified warning statements - a generalized health warning, that the product is not intended for those under 21 and that it is unlawful outside Colorado-along with a listing of tetrahydrocannabinol (THC) content (milligrams in each gram), and a 'cannabinoid potency profile' with the percentage of each of at least six named cannabinoids. Some limits on advertising have been contemplated, but they do not seem to extend beyond 'a prohibition on mass-market campaigns that have a high likelihood of reaching minors' (Colorado Department of Revenue 2013). Separate legislation proposes taxation of marijuana (Room 2014).

Many aspects of the proposed Washington regulations are similar to those in Colorado (Washington State Liquor Control Board, 2013): retail outlets for marijuana shall not sell anything else, and there is a good deal of specification of what should be on the containers, although the Washington version, while requiring the 'cannabinoid potency profile', does not require specification of the THC content in milligrams per gram. There seems to be more attention to license suspension and violation penalties and to processes of objection to a license but, unlike in Colorado, there does not appear to be a provision for a city, county or tribal government to opt out of having marijuana shops.

DISCUSSION

Repressive cannabis policies are expensive and have limited impact on consumption. They clog the courts and take a disproportionate amount of the police's time. Consumption legalization significantly reduces budgets for repression and law enforcement, allowing the allocation of more resources to other targets such as education and prevention. Hazardous forms of use must be prevented by warning potential consumers about the effects of uncontrolled consumption and special attention should be paid to consumption at an earlier age. Consumption legalization could create extra resources for the state through the reallocation of public resources currently used for arrests, custody, court maintenance and sentence enforcement but legalization alone does not allow for control of cannabis selling prices. Price is a key determinant of demand. Even if the price remains constant after legalization of consumption, the non-monetary costs of interacting with the illegal market drops as consumers no longer fear being arrested. The disappearance of non-monetary costs will increase the willingness to buy.

With legalization of supply along with consumption, non-monetary costs related to purchasing in an illegal market disappear. Repression and law enforcement costs will be reduced even further. Moreover a legal market would permit employment creation (in production, transportation, and retailing). It would also gene-

rate tax revenues that could be allocated to the prevention of increased consumption. In Colorado for instance, cannabis tax revenues reached 76 million dollars in 2014, according to the Colorado Department of Revenue.

Legalizing cannabis would not lead to a sudden rise in consumption, providing the duty imposed by the state kept the product at its current price. Price is a key variable that can more easily be imposed through controlled legalization, with the state supervising production and distribution. If prices are too high, the illegal market is encouraged; if it is too low, consumption could take off. In fact it ought to be slightly higher than present market rates to compensate for the absence of risk in purchasing (being cheated by a dealer or arrested by the police).

CONCLUSION

Repressive cannabis policies are expensive and have limited impact on consumption. Consumption legalization significantly reduces expenses for repression and law enforcement, and can generate tax revenues allowing for the allocation of more resources to other targets such as education and prevention. Cannabis selling price is an important factor to control against arise in cannabis consumption.

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