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Research Summary

My main research interests lie at the intersection of Public Economics and Industrial Organization. My current research agenda mainly studies the economics of cannabis legalization. Recent policy changes, driven by evolving social values, have motivated various contributions to the understanding of criminal behavior, as, well as, more generally, choice in risky environments and consumption of spychotropic substances. I analyze changes in market equilibrium after the introduction of newly legalized cannabis, with a focus on consumption responses, both empirically, in my job market paper, and theoretically, in another co-authored project. Ultimately, this insight can be used to build more informed policies, to improve public health and fight against crime – among other goals.

In this statement, I summarize three of my current research projects, with a greater emphasis on my job market paper, and I discuss future directions for my work.

1 Flying High? Legalization and the Black Market for Cannabis

How does the black market for cannabis react to legalization? To which extent and on which terms can a legal market undermine it using competition? My job market paper attempts to answer these questions empirically, using both reduced-form and structural estimation techniques.

Several empirical challenges interfere with evaluating the effect of cannabis legalization policies on black-market consumption. Substitution between legal and illegal products involves the necessity of gathering information on both products and consumption in a same market pre- and post-legalization. Yet, access to such information is limited by the *behind the doors* character of the cannabis market and the social prejudice associated to the consumption of psychotropes, furthermore illegal.

I retrieve black-market cannabis prices and levels of quality gathering an original crowd-sourced database. Crowd-sourced data from websites such as `www.priceofweed.com`, which have been used by the literature and policy makers, do not provide much information for time periods prior to 2010, which corresponds to the primer of the legalization policy wave. Originating from the 1970s, *High Times* magazine's Trans-High Market Quotation (THMQ) enables to properly estimate the effect of legalization. Collecting this data involved in part the use of Optical Character Recognition techniques, as well as considerable manual processing. The THMQ data not only contains information on prices, it also contains information on cannabis strains. To make most of this data, I web-scapped Leafly's strain browser to obtain strain information – including expected THC potency – and matched it to the THMQ.

The THMQ data enable me to document the equilibrium responses of the black market throughout legalization. Using difference-in-difference and event-study estimation techniques, I show that legalizing recreational cannabis results in illegal cannabis prices dropping

by more than 18% and quality rising by almost 2%. This suggests legalization would reduce market power on the black market for cannabis. Yet, the extent to which – or whether at all – legalizing recreational cannabis causes its black market to shrink is unclear. Such a response could indeed be symptomatic of enhanced competition on the black market itself, when legalization brings down the risk of being detected for the illegal branch and, thereby, lowers entry and production costs on this market. Besides, the price effect of legalization is heterogenous across products of different THC potencies: it is driven by low and medium potency products, whereas the price of more potent products does not decrease. This result, new to the literature, suggests that, after legalization, the black market targets the demand for more potent products, which are more damageable to health.

To better understand the role of price and quality on consumer choices for legal and illegal cannabis, I estimate a random utility model of discrete choice for cannabis. This model rationalizes preferences with regards to quality. I combine the THMQ data with legal price data from the Washington State Liquor and Cannabis Board and consumption microdata from the WA BRFSS. The BRFSS does not allow to distinguish legal from illegal consumption without any supplementary assumption. The model design accounts for this feature, exploiting a two-step estimation strategy on the probability of consuming cannabis (illegal or not) before and after legalization. It yield estimates for consumer sensitivity to price and THC potency on *both* sectors, legal and illegal. Cross-price elasticities indicate little substitution between the two sectors following changes in price. However, a 10% improvement in quality in the legal retail sector involves a decrease of the demand for black-market cannabis by 5%. In this line, counterfactual analysis derives best-response functions of the black market to changes in legal price and quality and presents high quality provision as a creditable tool to drive illegal retailers out of the market.

This paper contributes to the state of knowledge on cannabis legalization by being the first to quantify the responses of consumption to combined changes in policy and product characteristics. Taking advantage of a newly assembled dataset, it provides estimates for consumer behavior with regards to changes not only in price, but also in quality (here measured by THC potency). While previous studies have focused on the sensitivity to price, availibility and risk, this paper is the first to investigate the quality dimension. Finally, the two-step procedure developed in the second part adds up to the literature on contraband markets: it proposes a solution to evaluate substitution patterns between the legal and the illegal sectors, while the respective market shares of these are not observed by the econometrician.

2 Weeding Out the Dealers? The Economics of Cannabis Legalization

The results of my job market paper are in line with the theoretical project on which I have been collaborating with Emmanuelle Auriol and Alice Mesnard. To which extent can a government legalize cannabis and push the illegal dealers out of the market? In this article, we propose a theoretical framework to model the choices of cannabis consumers confronted to risk, both before and after legalization. If legalization harms the black market, it is also at the cost of booming consumption, mostly through risk- and availibility-related mechanisms. Such an increase might not be politically desirable, which motivates our question. We show that combining legalization with sanctions against the illegal market can overcome the

trade-off between the cost of prohibitive policies and the rise in consumption associated to legalization. We propose an eviction strategy for a government aiming at eradicating the black market by regulating a retail market for cannabis. Numerical applications underline the importance of setting high quality standards. We add to this analysis by studying the compatibility of the diverse policy goals that have been considered by governments while legalizing cannabis. By providing a framework and tools to reflect on cannabis policy, our project aims at enhancing the understanding of current regulations – and their failures – and conscious design of upcoming policies.

3 Controlling Illegal Migration: Can a Market for Temporary Foreign Work Permits Help?

The type of framework we propose in "Weeding Out the Dealers? The Economics of Cannabis Legalization" is very general and can be used to think various questions involving risky behavior. One example is irregular migration.

In this paper, we model the choices of low-skilled potential migrants and the supply of human smuggling services. We study whether and how temporary visa schemes can be implemented to eradicate human smugglers. Analogously to our theoretical paper, we show that controls – and inherent sanctions – are not incompatible with more liberal policies, they are complementary. Here combining a regulated market for temporary visas with border enforcement can overcome the tradeoff between migration control and free borders. We set visa duration and price at eviction levels, which drive smugglers out of business. We calibrate such eviction schemes on two route: Senegal to Spain and the Democratic Republic of Congo to South-Africa. Our results highlight the challenges of such schemes, especially on South-North routes where differences in income make individual choices more sensitive to variations in risk and constraints linked to overstay tighter.

4 Future projects

My work combines reduced-form and structural empirical methods, as well as applied theory models, to discuss and evaluate government policies. In this line and to conclude this statement, I would like to mention two future projects, which have emerged from my work on cannabis legalization and migration.

In my job market paper, I investigate consumer preferences for price and quality of legal and illegal cannabis. Yet, other factors might affect consumer preferences. The variety of products in a given market might is one example. Further, gathering the THMQ data, I observed that a substantive number of illegal retailers offer quantity discounts. Future research would study the market responses to multi-dimensional price and quality strategies.

The second project relates to the market for irregular migration. Reading testimonies from clandestine Congolese migrants who reached South Africa, I realized that in some instances searching costs for international migration can be higher on the legal market than on the illegal market. Measuring the magnitude of this cost and its effect on migration choices would enable policy makers to build more effective policies to tackle human smuggling issues. To do so, one could collect and exploit experimental data that measures the effect of information related to ambassy services on migrants' behavior.