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THE CANNABIS SOCIAL MARKET

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Introduction

Here, we define the market where the traders are friends, and the transactions are minimally commercially oriented, as the “cannabis social market”. In order to define the cannabis “social market”, we add the study of the cannabis “social demand” to what has been already defined in the literature as “social supply” (Hough et al. 2003). We think that the study of the demand side is very important because in this market it looks like that trading is demand-driven, more than profit-oriented. Actually, the main (alleged) motivation for selling cannabis to a friend is to satisfy his need (“to help out a friend”), more than to gain a monetary profit. In the cannabis social market, the short side of the market is the demand side, that is the quantity traded is the quantity demanded by consumers. Instead, street dealers supply is profit-oriented, therefore the street dealers’ commercial attitude is more aggressive: they are named “pushers” because they try to motivate potential buyers. Therefore, in the street dealer market, trading is more supply-driven than it is in the cannabis social market. In other terms, cannabis trading in the social market is like having sex with friends, while buying cannabis by street dealers is like having sex with a prostitute.

The cannabis social market is characterized by its fragmentation: it is a social network, consisting of “clubs” (Tiebout, 1956), or “islands” (Phelps, 1970), each one is populated by friends which cooperate as team (Alchian and Desmetz, 1972). The reason for this fragmentation may derive from the habit of collective consumption, a habit which is very popular among cannabis users, especially in the initial phase of their career. Cannabis users career is often initiated by smoking with friends, inside peer groups¹, where collective consumption is a kind of ritual², useful to develop friendships³. Inside of each of these groups, friends cooperate in order to get the cannabis, that is, the ones who have it share their cannabis (or sell it) to the other members of the group⁴. Inside this kind of micro-markets, cooperation may consist in “chipping in”, this is the case where friends (especially young people) put together small amounts of money in order to be able to buy cannabis from the dealers, the cannabis so obtained is then shared, and often collectively consumed, by the same friends⁵. Sometimes, the cannabis is bought in the primary market, that is from professional dealers, and then it is distributed in the secondary micro-market, that is the group of friends. In this case, some members of a group of friends act as brokers, they buy a significant amount of cannabis from wholesale dealers, then, they distribute this cannabis to the other members of the group. The motivation for buying large amounts of cannabis at the wholesale level may be to have better terms of trades. The social market brokers may buy the cannabis from the professional dealers on their own, or they may be delegated to perform this task by other members of the groups, who may also

¹In the cannabis social market there is a positive correlation between traders’ age ($r= 0.25$, $n=200$, $p= 0,002$, Grigg et al. (2015)).

²Some researchers support the hypothesis that cannabis is still linked to a peculiar sub-culture (Hathaway et al., 2011).

³Coomber and Turnbull (2007), and Duffy et al. (2007) support the hypothesis that trading cannabis in the social market is part of young adults’ everyday life, and that, beyond getting the cannabis, trading in the social market is useful to develop friendships. About half of the respondents, in a sample of Australian cannabis users, said that cannabis was a part of their social life (Grigg et al., 2015, p.22). In particular: “a bonding experience/brings us together” (37%, $n=35$); a “social thing/way of socializing” (39%, $n=28$), a “social habit (23%, $n=22$), and “a reason for catching up” (16%, $n=15$).

⁴71% of the respondents, in a sample of Australian cannabis social market traders, said that they began to sell cannabis in order to “help out a friend” (Grigg et al., 2015).

⁵ “Chipping in” is mainly used by young cannabis users to overcome their liquidity constraint.

participate in funding the trade. Anyway⁶, the cannabis is sold in the in the social market with a very low, or non-existent, mark-up on its price. This very low rate of profit characterizes the cannabis social market, compared to the street dealers market. It looks like as the main motivation for cannabis trading in the social market is cooperation, as if, in this market, sellers care more about friendship, rather than getting a monetary profit from their sales. Because of this cooperative motivation, social market brokers do not perceive themselves as proper “criminals”, while they define “criminals” the professional dealers (the “pushers”), whose supply is profit-oriented⁷. In this way, the social supply is an alternative to the street dealers supply. For some cannabis users trading with a friend may be more pleasant than trading with unknown “pusher”. Buying cannabis from a friend may be less costly (not only in terms of monetary price), and it may help the buyer to perceive that his money is not funding the criminality (at least directly). In the cannabis social market reputation is very important. First, being a friend of a member of a group of cannabis users/dealers is a prerequisite necessary for getting into his micro-market, that is, reputation is an entry barrier to the cannabis social market. Then, the care for reputation favors a cooperative behavior, which lowers transactions costs in the social market, compared to the street dealers’ one. Finally, in the cannabis social market the terms of trade depend on the trader’s specific social capital, that is, they depend on the dealer’s reputation among the group of friends. This reputation is the result of a process of accumulation; whose elements are the past transactions themselves. That is, each transaction increases the social capital of traders. From this point of view, each transaction in the social market is an investment in a specific social capital.

In the first section of this essay, we try to develop a theoretical model of the cannabis social market. Compared to the street dealers’ cannabis market, we think that the main economic distinctive features of the cannabis social market are that: it has high entry barriers, low transaction cost, the transactions have low visibility, and they are minimally commercially oriented. Demographically, in the cannabis social market, traders are friends, often they are socially integrated and, although in a peculiar way, some of them are “legalists”. Finally, we develop an analytical model where try to formalize the hypothesis that each transaction in the cannabis social market is an investment in a specific social capital. In the second section, we illustrate the results of an empirical study on a sample of Italian cannabis users. Our data indicate that trading in the social market is preferred by frequent users, and it is positively correlated with some indicators of user’s social integration such as education, and occupation⁸. In the third section, we develop a welfare analysis of the cannabis social market compared to the street dealer’s one. In our model, we compare the social cost of cannabis trading with the cost of implementing restriction on the cannabis trade, in order to identify the “optimal tolerable” quantity of cannabis trading, that is the quantity which maximizes social welfare. On the basis of the above reasoning, our hypotheses are that: a) the social cost of cannabis trading in the social market is lower than the social cost of trading in the street dealer

⁶ An increasing share of the cannabis social supply comes from cannabis domestic cultivation. In this case, the group of friends may save itself from buying cannabis from professional dealers.

⁷ It may be that this distortion in the perception of their status could be a way through which social market dealers try to “morally sanitize” their illegal behavior, a kind of “deviance neutralization” or “stigma management” (Nicholas, 2008; Potter, 2009; Scott et al, 2017).

⁸ Kandel and Davies (2006), Coomber and Turnbull (2007), and Coomber (2010) indicated the relation between social networks and drugs distribution. Osborne and Fogel (2008) noted that cannabis users are very active in social networks. As a counter-proof, as the user’s social network activity fades, as it is with the passing of age, trading in the social market decreases, and it is substituted with cannabis home-cultivation (Rossi, 2019).

market; b) the cost of implementing restrictions on the cannabis social market trading is higher than that of implementing restrictions on the street dealers market. If these hypotheses are true, our model indicates that the “tolerable” quantity of cannabis trading in the social market is higher than that of the street dealers market. Therefore, our conclusions support the adoption of policies which are more tolerant about social market trading⁹. Conclusions, statistical appendix and bibliography complete this essay.

1. A comparative analysis of the cannabis markets: social vs. street dealers.

1.1 General definition.

Here, we try to theoretically define the concept of “cannabis social market”, by comparison with the street dealers market. The first distinction may be demographic: while the population of the social market traders consist of group of friends, street dealing is between strangers. Because of this, the behavior of the social market traders is supposed to be cooperative, and their supply is “minimally commercially oriented”¹⁰, while, in the street dealers market, the behavior of traders is opportunistic and the cannabis supply is profit-oriented. Empirically, this distinction may be not so clear: as in the case of someone who is selling cannabis only to friends, but he is making a living from this trade; or, vice versa, the case of a professional (home) dealer who do not sell cannabis to strangers, but only to selected customers, whose identity is known to him. Therefore, we choose to compare the cannabis social market with street dealing, as the distinction between this two markets is sharper. In the street dealers market, the transactions are “arm’s length”, supply is profit-oriented, and the sellers try to push the potential buyers to buy their cannabis (therefore they are named as “pushers”); while, in the social market, the traders are friends, the terms of trade are linked to the traders’ friendship, and the trade is demand driven (“help out a friend”). These theoretical distinctions are further illustrated in the next paragraphs.

1.2 Demography.

The cannabis social market consist of group of friends, who are cannabis users and cooperate in order to get this item¹¹. Most of them are socially integrated, they do not live on cannabis trading, but they have other occupations, or they are students, therefore, they do not perceive themselves as “criminals”. The role of professional criminals or criminal organizations in the cannabis social market is very limited. It is mostly limited to selling cannabis to some member of a group of friends who, then, re-distribute this cannabis to the other members of the group. In this way, the social market of cannabis is a kind of secondary market, where it is distributed the cannabis bought in the primary market, that is, the cannabis supplied by the professional dealers.

⁹ The thesis supporting a tolerance policy about cannabis social supply is discussed by UK Home Affairs Committee (2002); Hough et al. (2003); Duffy et al. (2007); Coomber e Turnbull (2007); Nicholas (2008); Potter (2009).

¹⁰ The definition of “social supply” of drugs was proposes by Hough et al. (2003), and it was refined by Duffy et al. (2006), and Coomber e Turnbull (2007). Finally, Coomber e Moyle (2014) define “social supply as: “the activity of addicted user/dealers that sell to other addicted users to support their own drug use, but make minimal profit from the exercise” (p. 159).

¹¹ Interestingly, very often they are already friends before starting trading cannabis. In the Grigg et al. sample (2015) more than half of the respondents (58%) declared that their friendships preceded cannabis trade.

The street dealers' cannabis market is mainly populated by professional sellers, who are prone to trade with any buyer, stranger too. They are commonly perceived as "deviants", the "pushers", as they mostly perceive themselves. Although most of the cannabis sold by street dealers is supplied by organized crime, which smuggles cannabis in Italy from Albania and Morocco (DCSA, 2019), the role of criminal organizations in street selling is limited, as many street dealers are not "gangsters", but they operate on their own¹². The role of immigrants in street dealing is relevant (DCSA, 2019, p.72). Some ethnicity is involved in street dealing more than others, this could be linked to their origins, or it could be a symptom of immigrants' missed social integration. The distinctive features of immigrants' street dealers make their trade very visible, this visibility could induce to overestimate the role of immigrants in cannabis trade, and, therefore, it could support xenophobic valuations.

1.3 Entry barriers.

The costs of entering in the cannabis markets are different. On the demand side, the condition necessary for buying cannabis from street dealers are limited to the availability of a supplier (the pusher), and the money. In the social market, the potential buyer needs the availability of a specific social capital, that is he needs to be a friend of some member of a group of users/dealers¹³. On the supply side, the necessary condition to sell cannabis in the street market is the availability of the item, while, in the social market, the condition necessary to sell cannabis is the one above. These definitions need to be geographically refined. Because of scale economies, street dealing is concentrated in urban and touristic areas, while this market is often missing in rural areas. Therefore, for the cannabis users living in rural areas, the cost of access to the (urban) street dealers market might be quite high, as the transportation costs and the logistics risks increase as the (illegal) street market is farther from the cannabis user home. Moreover, in the areas where organized crime controls any illegal activity, the entrant seller should agree with the local gangsters to enter in the street dealers market, a condition which can be an important entry barrier on the supply side.

1.4. Markets' structure.

The cannabis social market is characterized by imperfect competition; it is a kind of monopolistic competition market. Because its entry barriers are high, the social market is fragmented into micro-markets, each consisting in a group of friends, which are cannabis user/dealers. In each of these micro-markets the terms of trade are specific, and they depend on the social capital (reputation) of the traders inside "that" group. As an example, the trading price could vary. It could be (slightly) above the market price, when some member of a group of friends buys cannabis from professional dealers and, then, supplies it to the other members with a (modest) mark-up. The social market

¹²This is not true in some areas, mostly in the south of Italy, where the control of organized crime is effective over any illegal activity, street dealing included.

¹³ According to Grigg et al. (2015), 53% of the social market dealers trade only with friends, 31% trade with friends of friends too, and only 16% of them are prone to sell to strangers (p.34).

trading price may be equal to the street dealers trading price in the case of “chipping in”. When the main motivation for selling cannabis is to “help out a friend”, the social market trading price may be well below the street dealers market price, and in these cases the terms of trade depend of the deepness of the traders’ friendship. In some cases, if the buyer specific social capital is very high, he can have the cannabis for free, or he can enjoy very favorable credit terms. On average, the trading price of cannabis is lower in the social market than in the street dealers market. The cannabis social market is a “customers’ market”, a type of market where trading occurs between traders who knows each other, and whose trading is expected to be repeated over time. If the number of repetitions is not known in advance to the players, the solutions to this repeated game may be multiple. In particular, the game repetition makes the accumulation of traders’ reputation available. Because, in this repeated game, trader’s reputation may be crucial in defining the terms of trade, players may be motivated to build their reputation. One way to build a solid reputation among a group of friends may be to cooperate with them and to avoid a (detectable) opportunistic behavior. In the social cannabis market, it means that traders cooperation may favor equilibrium solutions which are Pareto-preferable to the street dealers’ market equilibria. The social cannabis market dealers may sacrifice their current profits in order to favor the repetition of the game, that is, in order to favor future trading opportunities. As an example, the sellers may apply a negligible mark-up on the selling price, because they prefer to keep their friendships with the other trader, rather than spoil him of its money.

The street dealers’ cannabis market looks like a perfect competition market. Its entry barriers are generally low, so that it is a very contestable market, populated by many sellers who compete to supply cannabis. This high competition is reflected in the standardization of the terms of trade, both on the modal quantity exchanged (“la stecca”), and on its modal price, the unique market equilibrium price which balances market supply and market demand. Usually, in the street dealers market, trades are occasional and they occur between traders who are strangers to each other. In game theory, street dealing is a kind of one-shot game, a game where the lack of (expected) repetition motivates the players to behave in an opportunistic way. Therefore, in street trading, each trader is motivated to exploit the other one as much as he can. An opportunism which may lead the street dealers market to have to Pareto sub-optimal equilibria, as in the prisoner’s dilemma game. Actually, the high mark-up applied on the street selling price may support the hypothesis about the opportunistic behavior of the street dealers.

1.5 Motivation for cannabis trade.

From the economic point of view, we think that the main difference between the cannabis social market and its dealers’ counterpart is the motivation for trade: as it is in any commercial enterprise, the street dealer’s objective is to maximize his profit from trade, while, social market trading is motivated by the aim to accumulate a specific social capital. We acknowledge that this a theoretical distinction, because, empirically, there are social market dealers who gain some profit from their trade and, on the other hand, there are some street dealers who are friends of their customers and, therefore, they do not try to exploit them. Anyway, the literature on the social supply of cannabis has always noted the cooperative behavior of the social market traders, where the main motivation to supply cannabis is to “help out a friend”, not to gain a monetary profit from cannabis trade (Hough et al., 2003). The cannabis social market traders may be motivated by altruism: they

promote friends' utility through their trade. If this is the case, the utilities of the other members of the group are arguments of the utility function of each social market trader, and social market trade may be seen as an investment in a specific social capital, the friendship of the members of a group. Therefore, if social market trade is motivated by altruism, it increases social capital¹⁴. In our model, we add to this motivation a strategic one, which is based on the joint hypothesis that: a) each transaction in a social market increases the trader's (specific) reputation, and b) the terms of trade enjoyed by each trader in a social market are positively correlated with the trader's reputation inside that group of friends. If this is the case, trading in a social market may be seen as an investment in a specific reputational capital (that is, trader's reputation among a group of friends), which is useful to enjoy better terms of trade in the (eventual) future transactions inside that group. Finally, it is interesting to note that in the cannabis social market trading is demand-driven: sales are motivated by friends' requests, rather than by the sellers' supply. Vice versa, street dealer trading is supply-driven, as street sellers try to push potential buyers to buy their supply (therefore, they are named "pushers"). The main objective of street dealers is to maximize their profit from trade, therefore, opportunistically, they try to raise their revenues from trade by "pushing" their volume of sales, and by applying an high mark-up on their selling price¹⁵.

1.6 Asymmetric information and transaction costs.

Here, we develop a comparative analysis about the information distribution and transaction costs of the cannabis and social markets. In general, transactions costs are minimal if the information is complete and homogeneously distributed among the traders, that is, transaction costs are minimal if, ex ante, property rights are correctly defined, and, ex-post, trading contracts are complete and freely verifiable.

A correct definition of property rights means that traders have a complete and symmetric information on the item quality. If the traders fear that their information is incomplete, they can costly trying to get the missing information, or, if the traders fear that the information distribution is not symmetric, they can behave opportunistically, as in a principal-agent model. The illegal status of the cannabis market makes information on the quality of the cannabis incomplete and asymmetrically distributed. Usually, the street dealer has an information advantage on the buyer about products' quality, and therefore, the street market may be subject to an adverse selection process, which causes a deterioration in the average quality of the items which is sold. In the social market, traders' reputation substitutes the (unavailable) legal warranty on the cannabis quality, and, therefore, the quality of the cannabis traded in the social market is less uncertain and, on average, it is better than the quality of the cannabis supplied by street dealers.

Trading contracts are complete if they define what should be the traders' behavior in front of any possible state of the world. If contracts are incomplete, and if contractually unexpected contingencies do occur, the contracts need to be re-negotiated, a re-negotiation which could be costly. Note that, in the case of illegal activities, as cannabis trade, traders may not use the legal system to fulfill contracts incompleteness. But, in the cannabis social market, the group "code of

¹⁴ The relation between cannabis social supply and social capital is studied by Scott et al. (2017).

¹⁵ The effectiveness of aggressive commercial policies in promoting cannabis consumption was testified in the 80's in Holland, where the massive advertising of coffee shops led to a modest, but significant, increase in cannabis consumption prevalence.

honor”, which is linking the friends, may help to implicitly complete the contracts, by prescribing how dealers should behave in front of unexpected contingencies.

The verification of the traders’ obedience to the contracts terms may be costly. In particular, if this kind of trading is illegal (as it is cannabis trade), traders cannot use the legal system to verify the traders’ obedience to the agreed terms of trade. In the street dealer market, traders are strangers to each other, transactions are occasional, and the traders are motivated to behave opportunistically; therefore, in this market, contract obedience may be low, and contract verification very costly. Actually, in the street dealers market violence is often used as mean to settle disputes over the terms of contract obedience. In the social market contract verification may be less costly. First, the traders’ care for reputation motivates them to cooperate with each other, a cooperative behavior which includes obedience to the agreed terms of trade. But, if some trader violates the terms of trade, his disobedience can be easily verified by the other members of the group of friends, and it can be easily sanctioned by lowering the violator reputation inside the group. In other terms, inside a group of friends, disobedience may be sanctioned by reducing the disobedient specific social capital, and, as an extreme solution, his specific social capital may be canceled, that is the disobedient may be banned out the group of friends, that is, he may be banned out that social market.

1.7 Visibility and risk of detection.

Social market trading occurs mostly in private (home, clubs, etc.), while, by definition, street dealing is mostly conducted in public places. Therefore, social market trading is less visible than street dealing. This lack of visibility may induce to under-estimate the weight of social market trading, and it makes its contrast by police force more difficult (in economic term: costlier) than street dealing. Moreover, the higher visibility of street dealing raises a significant social alarm among the population, therefore street dealing causes more “moral externalities” than the less visible social market trading¹⁶. Trading illegal goods, as cannabis, involves the risk of being detected by police force, and, therefore, illegal traders are liable to costly sanctions as imprisonment, fines, legal expenses, etc. Moreover, if this trading is also “immoral”, when the trader is detected, by the police or by acquaintances, he may also suffer a moral stigmatization. Note that the probability of being detected is positively correlated to the visibility of trading. Since street dealers’ activity is an outdoor business, it is highly visible, easily detectable, and, therefore, street dealing is very risky. The high street dealing riskiness is reflected in the high mark-up applied by street sellers on their supply price (usually above 100%). Street traders ask for a high risk-premium because of the high risk of detection of their business, in this way, street dealers try to compensate themselves for the expected cost the detection-correlated sanctions. In economic terms, street dealers translate forward, onto the buyers, the cost of their expected sanctions by adding a risk premium to their selling price. As a counter-proof, the low mark-up applied on the social market trading price indicates that in this market sellers ask for a lower risk-premium because their dealing is less visible, that is, it is less risky.¹⁷ Note that the detection risk involves the buyers too, therefore, although the sanctions are usually higher for the sellers, also the buyers are liable to sanctions. In particular,

¹⁶ The definition of moral externalities is the one suggested by Rossi (2019).

¹⁷ Actually, the betrayal risk may be higher in the social market trading than street dealing, as in the social market traders knows each other identity, while, in the street market traders are strangers to each other.

above the legal sanctions, detected cannabis buyers may be liable to moral stigmatization. The cost of the detection-correlated sanctions is specific to each individual. As an example, the cost of imprisonment is correlated to the individual cost opportunity of the time spent in jail, a cost opportunity which is much higher for an employed white collar worker than for an unskilled/unemployed individual. In the same way, adult socially integrated cannabis users may fear the risk of being detected, and the correlated moral stigma, because they care about their reputation, while transitory immigrants may be less sensible to this moral stigma, as they care less about their reputation. If the cost of the detection correlated sanctions is proportional to the trader social integration, it could be expected that the less detectable social market trading is preferred by socially integrated people, while the street market is populated by deviants.

1.8 Normalization.

A peculiar feature of the cannabis social market traders is their distorted perception about the “deviance” of their business. Social market traders do not perceive their (illegal) business as a criminal activity, but as a kind of cooperation with their friends. Therefore, they do not perceive themselves as criminals, and they care to distinguish themselves from the professional dealers, which, instead, they classify as criminals. Social market traders think that, if the business is with strangers, and it is profit oriented, then, it is a criminal activity, as it is in street dealing; while, if the trade is with friends and it is minimally commercially oriented, then, it is perceived as a kind of cooperation, which, although being illegal, it is not enough to classify social market traders as “criminals”. As if, the cannabis social market sub-culture adds to the dichotomy legal/illegal a third category: “illegal but not criminal”, which includes minimally commercially oriented cannabis trading with friends. The social market traders show a distortion in the perceptions of their status: although they are (illegal) entrepreneurs they do not identify themselves as “deviant” criminals because of their (illegal) trade. This distortion may be a symptom a process of “normalization”, a process where trading cannabis with friends is part of everyday social life, and, therefore, it is perceived as a “normal” business. This perception of social market trade as “normal” may help social market users/traders to identify themselves as “normal” people, and not as “deviant” ones (Nicholas, 2008; Potter, 2009).

We can figure the cannabis social market and the street market as the economic expression of two different societies, which have two different sub-cultures. In the cannabis social market, traders are (mostly) socially integrated, they are (or, they are pretending to be) “normal” people, also legalists, people who usually obey to the law, with the (only) exception of their illegal (but not perceived as deviant) habit. In the cannabis street market, dealers are (mostly) perceived as professional criminals, deviant people living on crime. These differences in the population and sub-culture of the two markets may explain their separation and complementarities. There may be several reasons why some of the cannabis users (those who are more socially integrated, or those who most pretend to be “normal”, or those who are more legalists) would prefer to deal with their peers (friends) in the social market rather than with deviant people (the “pushers”). First, “normal” cannabis users may enjoy dealing with friends, while they may find unpleasant trading with “deviant” strangers. In economic terms, for “normal” people, the transactions cost of trading in the social market may be lower than that of dealing in the street market. Then, the preference for the social market may be motivated by moral legalism. It may be that the most legalist cannabis users

may avoid dealing with street dealers because they are “criminals”. In particular, they may avoid to buy cannabis from street dealers because they do not want to fuel the crime revenues. Although the cannabis distributed in the social market may have been previously bought from professional dealers, the link between cannabis use/trading and criminal revenues may do not look so straight in the social market, as it is visible in buying cannabis from street dealers. Therefore, the most legalist users may prefer to trade in the social market, where the link between cannabis trade and crime revenues is less clearly perceived. The legalist goal to avoid financing crime is fully achieved when the cannabis traded in the social market is not supplied by criminals, but it is grown by some member of the group of friends. In this case, the link between the (secondary) social market and the (primary) professional dealers’ market is severed, and the sub-market (the group of friends) becomes independent from (criminal) external supplies. This independence may have several consequences. First, growing the cannabis avoids the risk of being arrested when buying it from street dealers. Therefore, if the cannabis traded in a social market is self-supplied by home growing, the visibility of this social market decreases. On one side, the “invisibility” of self-sustaining social market makes the implementation of restrictions on this cannabis trade by police force costlier, on the other side, it may be that the most socially integrated users prefer to trade in this “invisible” market in order to avoid the risk of being subject to the legal and/or moral sanctions linked to street dealing. Actually, this hypothesis is empirically supported by the positive correlation observed in our sample between some indicators of social integration and the use of home-growing cannabis as the main source of supply.

1.9 A model of the cannabis social market.

In our model the cannabis users may choose to buy cannabis in the social market (SM) or from street dealers (SD). If the consumer i buys a quantity (Q_c) of cannabis from street dealers at the price (P_i), he enjoys a surplus:

$$1) S_i = (U_i(Q_c)) - (P_i * Q_c),$$

where $U_i(Q_c)$ is the users’ utility of the cannabis which is bought (Q_c). In order to simplify the model, we made the following assumptions: a) the street dealers market is perfectly competitive, therefore its terms of trade are standardized (in particular: $P_i = P$); b) users’ utility functions are homogenous, $U_i(Q_c) = U(Q_c)$; c) the unique utility function is a very simple linear one, $U(Q_c) = \alpha Q_c$, where the constant term α is the marginal utility of consumption; d) finally, we normalize the quantity which is traded in each transaction: $Q_c = 1$.

Thanks to the above a-d simplifications, the surplus gained from trade by a representative cannabis user is:

$$2) S = P - \alpha.$$

The first key assumption of our model is that the terms of trade that a trader may enjoy in the social market depend on his specific social capital¹⁸. We define the terms of trade as a multidimensional variable, as it includes economic terms, the cannabis trading price, the terms of credit, the items quality, etc., and, in our definition, it also includes the pleasure a trader may have in dealing with a

¹⁸ Our definition of social capital refers to Coleman (1988). In particular, we suggest that the current value of a trader’s social capital influences the terms of trade he can enjoy (Portes, 2000), and that the current value a trader social capital is the accumulation of his previous transactions with members of the group of friends (Rostila, 2010).

friend. We formalize this hypothesis as the surplus that a trader i gains from trading in the social market j depends on the value of his specific social capital, $K_{i,j}$, (the friendship of traders i among the group of friends j):

$$3) \quad SM_{i,j} = S * K_{i,j},$$

where $0 < K_{i,j} < \infty$.

The value of trader i social capital leads his choice between trading in the social market j or in the street market (S vs. $SM_{i,j}$). First, the availability of a specific social capital is an entry barrier. If traders i is not a friend of any member of the group of friends j , he has no specific social capital ($K_{i,j} = 0$), then, he cannot trade in the social market j , and, therefore, he choose to trade in the street market ($S > SM_{i,j} = 0$). Trader i begins to prefer trading in the social market j if and only if the value of his specific social capital is above a certain threshold, which, in our simple model, is:

$$4) \quad SM_{i,j} > S, \text{ iff } K_{i,j} \geq 1.$$

If trader's i friendship with some members of a group of friends j is enough deep, then, he may enjoy better favorable terms trading with them rather than trading with street dealers. If the value of a trader's i specific social capital is very high ($K_{i,j} \rightarrow \infty$), then, he may enjoy in the sub-market j very favorable terms of trade, as free cannabis supply.

According to our model, the complementarity of the social market and the street market may be explained by assuming a non-uniform distribution of cannabis users' social capital. Those users who are embedded in a social network of cannabis users/traders, have a value of specific social capital so high that it is convenient for them to trade in the social market; while, those users who do not have that capital endowment may prefer to deal with street dealers. Actually, there is an empirical positive correlation between trading in the social market and traders' social integration, as indicated by high prevalence of social market trading among youth people, especially among students.

By introducing time in our model, we made our second key hypothesis. If, in the social market, trading cannabis is perceived as a kind of cooperation, then, each transaction increases traders' friendship, that is, it increases the traders' specific social capital. In our model, we formalize this dynamic function as the value, at time t , of the trader's i specific social capital ($K_{(i,j)t}$) is the weighted sum of the number of the previous transactions that trader i had in the social market j :

$$5) \quad (K_{(i,j)t}) = k n_{(i,j)t-1},$$

Where, $n_{(i,j)t-1}$ is the (undiscounted) number of transactions that trader i had with some member of the group of friends j before the current time t .

The parameter k defines the increase in trader's i specific social capital ($\Delta K_{(i,j)t}$) following each transaction he has among the group of friends j ($\Delta K_{(i,j),(t,t+1)} = k$). Here, for the sake of simplicity, we assume that its value its constant and uniformly distributed among the traders: $k_{(i,j)t} = k$, for any t , i , and j .

In economic terms, each transaction in a social market is an investment in a specific cannabis social market capital¹⁹. The profit of this investment consists in the actual value of the better terms of trade a trader will enjoy in the (eventual) future trades he will have with some member of that group of friends. Without time discounting, the surplus that trader i gets from trading at time t in the social market j is the sum of the current surplus from trade ($S \cdot K_{(i,j)}(t_0)$), and the value of the better terms of trade that he will enjoy in the (m) expected future transaction in the social market j ($k \cdot E[(m_{(i,j)})(t > t_0)]$):

$$6) \quad E[SM(t_0)] = S \cdot K_{(i,j)}(t_0) + k \cdot E[(m_{(i,j)})(t > t_0)].$$

Where $E[(m_{(i,j)})(t > t_0)]$ is the number ($m_{(i,j)}$) of future transactions that, at time t , trader i expects him would have in the sub-market j , with $0 < E[(m_{(i,j)})(t > t_0)] < \infty$.

According to our model, the benefit that trader i gets from trading in the social market j depends on the number of deals that trader i expects to carry in that sub-market; if the expected number of future transactions is enough high, $E[(m_{(i,j)})(t > t_0)] > m^*_{(i,j)}$, the trader i may prefer to trade in the social market j , although he could currently enjoy better terms of trade in the street market ($K_{(i,j)}(t_0) < 1$).

Adding a discounting factor to our model, the expected profit that trader i may get from trading at time (t_0) in the social market j is:

$$7) \quad E[SM_{t_0}] = (S \cdot K_{(i,j)}(t_0) + \sum_{E[m]=0}^{\infty} [(E[(m_{(i,j)})(t > t_0)] \cdot (k \cdot K_{(i,j)}(t_0))]) / (1 + r_{i,j})^t;$$

where $r_{i,j}$ is the discount rate applied by trader i on the expected benefit of his future trades in sub-market j . Therefore, according to this more general formalization, the convenience of trading in the social market depends on the timing of the future trades (t). In particular, it depends on the comparison between the trader i specific rate of discounting ($r_{i,j}$) and the marginal revenue of his investment in social capital (k). Coeteris paribus, if, at time t_0 , the rate of return of his investment in social capital (k) is higher than his specific rate of discounting ($r_{i,j}$), a trader is induced to trade in the social market rather than in the street market ($E[SM_{t_0}] > S$). The rate of discount may depend on several individual and specific factors. In particular, it may be linked to the individual "patience". In the case of drug "craving", the discount rate could be so high that the actual value of investing in a social market would be negligible, and, therefore, the craving user would prefer to trade with more readily available street dealers.

We illustrate the local and dynamic properties of our model with an example linked to tourism. The example is about a cannabis user i , who arrives in a tourist location j , where there are cannabis street dealers, and there is a local social market of cannabis users. Initially, the expected time of his vacation is very short ($t=1$), so that his expected number of trade in that location is only one, a trade which he wishes to have in the current time (t_0), while, he does not expect to make any further trade in that location, $E[(m_{(i,j)})(t > t_0)] = 0$. If, in that touristic location j , the tourist i has no cannabis user friends (and, neither friends of friends), he has not the specific social capital to enter in the local cannabis social market; and, because he does not expect any further trading in that local cannabis market, the expected return from his investment in the local social capital is negligible. According to the above hypotheses ($K_{(i,j)}(t_0) = 0$ and $E[(m_{(i,j)})(t > t_0)] = 0$), it is preferable for users i to buy cannabis

¹⁹ According to Scott et al. (2017): "To the extent that it relates to the lower level supply, the primary motivation for drug supply and use is to accrue *social capital*, not financial capital" (p. 10).

from street dealers rather than try to enter in the local cannabis social market ($S > E[SM(t_0)] = 0$)²⁰. The preference for dealing with the ready available street dealers may change as the expected time of vacation of tourist i in the location j increases ($t > 1$). If the tourist expect to have more transactions in the local market ($E[m_{(i,j)}(t > t_0)] > 1$), his return from investment in that local social market increases, and, therefore, he may have the time and the motivation to try to become friend of the local cannabis users, that is to enter in the local cannabis social market. Finally, if this tourist i chooses to become a permanent resident ($t = \infty$) in that location j , he would definitely try to enter in the local cannabis users social market rather than deal with the local street dealers.

2. Empirical analysis.

The empirical relevance of the social supply has been already noted in several countries. Its relevance in the British cannabis market was suggested by Parker et al. (2000 and 2002), Coomber and Turnbull (2007), Duffy et al. (2007); similar observations about the role of social supply in the Australian cannabis market were made by Lenton and Davidson (1999), and Nicholas (2008); by Wilkins and Sweetsur (2006) about the New Zealand; by Hamilton (2005) about the US; and by Belackova and Vaccaro (2013) about Europe. In Italy, almost half (45%) of a (distorted) sample of cannabis users declared to buy cannabis mainly from friends (Rossi, 2019)²¹. Here, on the basis of the same sample, we further investigate on the demand side of the Italian cannabis social market.

2.1 The sample.

The empirical analysis studies a dataset collected through semi-structured interviews to a non-random sample of visitors at the biggest Italian cannabis fair event (Canapa Mundi, 2018). Given its suburban location and a non-trivial entrance fee, it may be presumed that we got a distorted sample, where very involved people are over represented.²² The (printed) questionnaire was administered to 626 visitors, and it was about consumption and supply habits, considerations for consumption, and socio-demographic characteristics. The data collected were both quantitative and qualitative. The qualitative variables were measured through self-reported and/or structured grading. The most of respondents (81%) were young adults, in particular, 55% of respondents were between 20 and 29 years old, and 26% between 30 and 39. Curiously, the percentage of older people (more than 40 years old) among the respondents is 10%, which is higher than that of teenagers (8,8%).²³ In the sample population, males are prevalent (72% of the sample), and, the frequent use of cannabis is more prevalent among males (78,6%), than among females (68,4%). The prevalence of daily cannabis consumption is about 72-74% for those before the age of 30, then it rises to 83% in the class of age 30-39, and it declines to 71% among older users. Occasional consumption is decreasing with the respondent's age, it involves 22% of young people (less than

²⁰Formally: if $(E[m_{(i,j)}(t > t_0)] = 0)$, then, $\sum_{E[m]=0}^{\infty} [(E[m_{(i,j)}(t > t_0)] * (k * K_{(i,j), t_0})) / (1 + r_{i,j})]^t = 0$.

²¹ The yearly value of cannabis (illegal) trading in Italy was estimated to be about 5 billion Rossi (2013). Discounting for home grown supply, on the basis of the cannabis street price (about 10 euros per gram), the value of cannabis yearly traded in the Italian social market can be estimated in about 2 billions of euros.

²²Actually, about 3/4 of our sample respondents declared to be a frequent cannabis user. This sample distortion allows us to focus on those consumers, regular and frequent, that are more important from an economic standpoint, because they demand most of the cannabis. Van Laar et al. (2013) estimated that in Italy almost three quarters of the cannabis is consumed by intensive consumers, and one quarter by regular consumers (p.20).

²³This sampling result may be seen as an indicator of a cannabis users "aging", which is affecting most of central Europe countries (Rossi, 2019).

20years old), it decreases to 16% among the respondents aged between 20 and 29, to 11% between 30 and 39, and to 10% among the older respondents. These results are in line with the modal cannabis user career: it usually starts at teenage, with occasional consumption (mostly with peers),and it ends at about the age of 30-39, or, less probably, it changes in a daily individual consumption (Grosso, 2018; Rossi, 2019). Surprisingly, although it can be imagined that cannabis consumption may damage the user’s development, the cannabis users who answered to our interviews declared to be highly educated people, with a high rate of occupation, in white collars occupations too. This result may be due to a sampling distortion, caused by the non-trivial entry costs, which could have been an entry barrier for unemployed and/or low income users, and it may be affected by the prevalence of students in our sample population²⁴. Anyway, 27,5% of the sample respondents declared to have a university degree, 54,8% a high school degree, while only 17,7% of our respondents declared to have a lower education. As about their occupation, 26,7% of the respondents declared to be students, 21,8% declared to have a high skill occupation, 29,7% a medium skill occupation, 11% a low skill occupation, and only 11% of the respondents declared to unoccupied.

2.2 Source of supply.

In our sample, the modal answer to the straight question: “which is your main source of supply of cannabis?” was “by friends” (45,2% of respondents). About 1/4(28%) of the respondents declared to buy cannabis mainly from regular/home dealers, 1/5 (20,8%) declared to rely on home growing, while only 1/20 (5,4%) use to buy cannabis from street dealers (and 0,7% of respondents declared consume mainly the cannabis supplied to them by the National Health System). Therefore, our sample results support the hypothesis about the empirical relevance of the cannabis social supply, as its weight as a source of supply is actually bigger than that of professional dealers (45,2% vs. 33,4%). Moreover, adding home-growing to social supply, about 2/3 of our respondents declared to avoid buying cannabis from professional dealers.²⁵

Crossing the main source of cannabis supply with the rate of prevalence (tab.1), there is a negative correlation between trading in the social market and the user’s prevalence rate. While, about ¾ of the occasional users declared to trade in the social market (76,5% of users with a yearly prevalence, and 72% of monthly users), trading in the social market decreases to 57,7% for weekly users, and to 38,4% for daily users. The frequent users of our sample declared to substitute the social market supply by home-growing the cannabis they consume (about ¼ of daily users declared that home growing is the main source of their cannabis supply)²⁶, or by trading with professional home dealers (30% of frequent users relies on dealers vs. 12% of occasional users). Finally, in our sample data, there is no evident link between the prevalence rate and the use of street dealers, or NHS supply.

²⁴ The traditional link between smoking and studying has been already noted by Strabone (60Bc.–21/24Ad.), who, in his “Geography”, quote the “kapnobatai”, a group of mystical philosophers of Thrace, described as those who use to “walk among the clouds”.

²⁵ A result which may induce to revise downward the current estimate about the economic size of illegal cannabis trading.

²⁶ Because the interviews were collected among visitors to a “grower” fair, our sample analysis may overestimate of the use of cannabis home growing among the general population.

Tab. 1: Source of cannabis supply and prevalence rate of consumption.

Source	Friends	Home cultivation	Home dealers	Street delers	NHS	Total
Yearly	76.5	11.8	11.8	0.0	0.0	100.0
Monthly	72.0	6.0	12.0	8.0	2.0	100.0
Weekly	57.7	10.3	25.8	5.2	1.0	100.0
Daily	38.4	24.9	31.0	5.2	0.4	100.0

Crossing the main source of cannabis supply with the class of age (tab.2), we note several correlations. First, there is a negative correlation between trading in the social market and user's age. While the social market is the main source of cannabis supply for teenagers (52,8%), its weight among the sources of cannabis supply steadily decreases with users aging, as the percentage of those respondents which declare to buy cannabis mainly in the social market is 47,8% among the class of age 20-29; 39,9% in the class of age 30-39; and 37,1% for those aged 40 and above. Moreover, there is a negative correlation between trading with home dealers and the users' class of age. While 35,8% of teenager respondents declared to trade mainly with home dealers, this percentage steadily decreases to 28,9% in the class of age 20-29, to 25,3% in the class of age 30-39 and, finally to 24,2% among those respondents aged 40 and above. Conversely, the use of home-growing as the main source of cannabis supply is positively correlated with the users' class of age. While only 5,7% of teenagers declared to grow the cannabis they consume, this percentage steadily rises along with the users aging: it is 18% in the class of age 20-29, 28,5% in the class of age 30-39, and 29% among those aged 40 and above. Altogether, these three results may indicate a modal evolution in cannabis users' career. It looks like if the user starts his career in his teenage, mostly trading with friends, then, most of those who continue to use cannabis after the age of 30 try to escape from the market as they retreat in home-growing. There may be several reasons for this modal evolution. It may be that the user social capital decreases with the user aging: some friendships may fade with the passing of time, the user may move to another town, etc.; or it may be that the social market where the users use to trade fades, as, with aging, some user/trader friends quit the social market because they quit smoking cannabis. Anyway our sample results indicate that older cannabis users substitute trading in the market, both the social and the professional one, with home-growing the cannabis they consume.

Tab. 2: Source of cannabis supply and users' class of age.

Class of age	<20	20 - 29	30-39	>40
Friends	52.8	47.8	39.9	37.1
Home-growing	5.7	18.0	28.5	29.0
Home dealers	35.8	28.9	25.3	24.2
Street dealers	5.7	4.7	5.7	8.1
NHS	0.0	0.6	0.6	1.6
Total	100.0	100.0	100.0	100.0

Crossing the main source of cannabis supply with the user's gender (tab.3), our sample data indicate that female trade in the social market relatively more than males (53% vs. 42,4%). While males are trading relatively more with professional dealers (34,5% vs. 31,9%), or they grow their cannabis relatively more than females (23% vs. 15,1%). These results may be due to several factors, among which there is the lower prevalence rate of cannabis consumption among females compared to males, a gender correlated difference which rises with the user's aging (Rossi, 2019).

Tab. 3: Source of cannabis supply and user's gender

%	male	Female
home cultivation	23,0	15,1
Friends	42,4	53,0
Dealers	34,5	31,9

2.3 Social integration.

We investigated the relation between the distribution of the main source of cannabis supply among our sample respondents and their level of social integration. The first indicator of social integration investigated in our sample was the user's degree of education (tab. 4), classified as: low (low school degree), medium (college degree) and high (university degree and above). Our sample analysis indicates a negative correlation between trading with dealers and the user's level of education. Actually, the dealers market is the main source of cannabis supply among 43,1% of the lowest educated users; this percentage decrease to 32,7% among those with a high school degree, and it is only 29,4% among the most educated users. Conversely, there is a positive correlation between trading in the social market and the user's level of education, as this source of cannabis supply is more used by the more educated users rather than by the less educated ones. The social market is the main source of supply among 46,6% of the highly educated, among 48% of the users with a medium level of education, and among 34,9% of the less educated ones. The relation between cannabis home growing and the degree of user's education is non-linear. Growing cannabis at home is the main source of supply among the 22% of the respondents with a low level of education and among 23,9% of the respondents with a high level of education, while it relatively less used by those with a medium level of education: 19,2%. This bi-modal distribution may be due to the spurious correlation between the user's education level and his income. Because growing the cannabis at home is less costly than buying it from dealers, the less educated users, which are usually the low-income ones, may prefer this less expensive source of supply.

Tab. 4: Source of cannabis supply and user's education.

%	low	medium	high
home cultivation	22,0	19,2	23,9
Friends	34,9	48,0	46,6
Dealers	43,1	32,7	29,4
Total	100,00	100	100

The other indicators of social integration of the respondents was their rate and level of occupation, classified as: students, unemployed, employed in low skill occupations, medium skill occupations, and high skill occupations (tab. 5). According to our sample data, trading in the social market is very popular among the student population, (as 56,4% of them declared it to be their main source of cannabis supply), whose way of life is usually very social embedded (classrooms, sport teams, recreational activities, etc.). Then, trading in the social market is more popular among those employed in high skill occupations (45,7%) than among those who are employed in lower qualified occupations, or among the unemployed (respectively: 39,4% medium; 40,6% low; 40% unemployed). In each occupation category, about 30% of the respondents declared that the home dealers market was their main source of cannabis supply, with the exception of those employed in high skill occupations, among which only 21% declared to use trading with home dealers. Adding the home dealers market with the street dealers one, our sample analysis indicates that there is an inverse correlation between trading with dealers and the trader's level of occupation. Altogether, the dealers market (that is, the sum of home and street markets) was the main source of cannabis supply among 39% the respondents employed in low skill occupations, among 36% of those employed in low skill occupations, and among 25,6% of those employed in high skill occupations. If we take the level of occupation as an indicator of social integration, our sample results indicate that there is a negative correlation between the user social integration and his use of the dealer market as his main source of cannabis supply.

The relation between cannabis home growing and the user's occupation is more complicated. On one side, among the occupied respondents, there is a positive correlation between home growing and the grower level of occupation, as its use as the main source of supply steadily increases along with the qualification of the employed: it is 20,3% among the lowest qualified employed, 24% among the medium ones, and 27,1% among the highly qualified employed. If the level of occupation is an indicator of the users' individual (wealth, income, etc.) and social capital (reputation, etc.), it may be that the most capitalized people are the ones who mostly fear the risk of sanctions and moral stigma correlated to trading in the illegal cannabis markets (both in the dealers' market, and in the social one). Therefore, they prefer to grow at their home the cannabis they use because they perceive that this is a more private (less risky) source of supply.²⁷ On the other side, home growing is very popular among the unemployed too, as 26,2% of them declared that home growing was their main source of cannabis supply. The motivation for the preference for home growing among the unemployed users may be strictly economic, because growing cannabis at home is less costly than buying it from dealers, the unemployed users, which are usually the poorest ones, may prefer this less expensive source of supply²⁸. Home growing is less spread among the student population, only 9% of them declare to grow the cannabis they use. On one side, this result may be due both to the "very social" life of students, which lowers their entry barrier in the social market. On the other side, home growing needs the availability of a private room, where the cannabis is cultivated. Many students may not have this necessary requisite, as young students who are still living in the

²⁷ According to the sample analysis of Grigg et al. (2015), the main motivations for home growing were: a) to have a regular supply of high quality cannabis; b) to avoid trading with criminals; c) the pleasure of gardening, d) the availability of a stock of cannabis to supply to friends.

²⁸ Currently, the cost of the home grown cannabis is about 2-3 euro per gram, while, in Italy, its current price on the street market is about 10 euro per gram.

family house, off-site students living in rent, etc., and, because of their logistic constraint, they may not grow the cannabis on their own.

Tab. 5: Source of cannabis supply and user's occupation.

%	Friends	Home grown	Home dealers	Street dealers	NHS	Total
High level	45.7	27.1	20.9	4.7	1.6	100.0
Average level	39.4	24.0	31.4	4.6	0.6	100.0
Low level	40.6	20.3	28.1	10.9	0.0	100.0
Students	56.4	9.0	28.8	5.1	0.6	100.0
Unemployed	40.0	26.2	29.2	4.6	0.0	100.0

3. Normative analysis.

We compare the cannabis social market with the dealers' market in a welfare economic approach, where the market regulation derives from a cost-benefit analysis. Our model is based on the joint hypothesis that: a) cannabis trading reduces social welfare, and b) the regulator may "costly" constraint cannabis trading²⁹. Therefore, social welfare is maximized when the volume of trading is the one by which the marginal gain coming from the its restriction is equal to the marginal cost of implementing the restriction itself (unintended consequences included). In these terms, in our model, the issue of regulation collapses in finding which is the volume of (illegal) cannabis trading that is "optimal" to tolerate.

In the following paragraphs, we will compare the social costs of illegal cannabis trading, and the cost of its restriction, in the social market and in the dealers' market. We will illustrate some arguments supporting our hypotheses that: a) the social cost of illegal cannabis trading in the social market is lower than that of the dealers' market, and, b) the cost of implementing restriction on the social market illegal trading is higher than that on the dealers' market.

3.1 Induction to use and gateway effect.

The issue is about how much the market supply may induce potential users to buy the offered item. On one side, the induction to cannabis use caused by the social market supply would be lower than that caused by the street dealers supply. In the social market, trading is demand-driven, as, here, the sellers use to declare that their supply is the answer to a friend's (already existent) demand of cannabis, rather than being profit-oriented. Vice versa, in the dealers' market, suppliers are profit-motivated and, therefore, they try to "push" potential buyers to buy their supply. On the other side, the social market may complete the illegal cannabis market in many ways. The social market may

²⁹Illegal cannabis trading may reduce social welfare in many ways, Rossi (2019). First, thanks to the illegal supply, cannabis users may have their cannabis, whose use may reduce the users' productivity, because of risk of health hazards, legal sanctions and moral stigma correlated to cannabis use. Moreover, cannabis use may cause economic negative externalities which reduces social welfare, because: the above reduction in the users' productivity implies a shrinkage in the production possibilities frontier (PPF) of the society; some of the users' health care costs may be paid by the society through the National Health System; cannabis use may cause car accidents; the revenues coming from illegal trading may increase the organized crime economic power; etc. Finally, cannabis trading may cause negative moral externalities to the society: the exhibition of an immoral trade may decrease the non-monetary wellbeing of some spectator, because the sight of an illegal behavior may cause social alarm and it may harm public decency.

complete the illegal cannabis market where the dealers market is missing, as in the case of rural areas; if the entry cost in the dealers' market are too high, for economic reasons (as in the case of "chipping in") or for legalist motivation; if the item quality or the terms of trade available in the social market are different from those of the dealers' market; etc. Therefore, the social market supply may induce cannabis consumption as far as it is completing the dealers' market supply. It is reasonable to assume that the gateway effect, correlated to illegal cannabis trading, is higher in the dealers' market rather than in the social market. Actually, the supply of cannabis professional dealers often includes other drugs too, therefore, the profit-motivated dealers may try to push the potential cannabis buyer to buy those other items too. While, social market sellers may do not have the availability of other drugs rather than cannabis (as in the case of home growing supply), and they are not (profit) motivated to sell to their friends more drugs than what their friends are asking for.

3.2 Transaction costs.

There may be several reasons why the transaction costs in the social market may be lower than those in the dealers' market. Generally speaking, if trading in the social market is motivated by the aim to cooperate with friends, the resulting market equilibrium would be Pareto superior to the dealers' market equilibrium, where the opportunistic behavior of profit motivated traders may instead lead to Nash sub-optimal solutions. In particular, the transaction costs associated to social market trading may be lower because in the social market the information is more complete. If information is more asymmetrically distributed in the dealers' market (between strangers) rather than it is in the social market (between friends), the risk of item adulteration in the dealers' market is higher than that of the social market. The risk of an opportunistic behavior by the more informed seller translates in an increase in the transaction costs paid by the buyer, which is the expected value of the risk of buying an adulterated item. Moreover, in the social market, contracts are more easily verifiable. The social market can be figured as a repeated game among players who know each other, a kind of game where the player's reputation is a key variable. If, in a social market, a trader would behave opportunistically, the other members of the group of friends could be readily informed about his fault, and he would be automatically punished by a decrease in his intra-group reputation. That is, in the social market, the opportunistic behavior of a trader may be (costless) punished by devaluing his specific social capital. Vice versa, in the dealers' market, contract verification may be very costly. Because cannabis trading is illegal, the legal system cannot be used to settle the disputes over the respect of the terms of trade, and, because in the dealers' market transactions are usually one shot and arm's length, there, the role of traders' reputation may not be decisive in settle the disputes. Therefore, in the dealers' market, violence is often used as mean to settle disputes over the respect of the terms of trade. This trading correlated violence is a transaction cost, which reduce social welfare and, in particular it causes social alarm. Finally, it may be that the transaction cost depends on the familiarity between the traders: it may be a pleasure to deal with a friend, while it may be less pleasant to deal with a stranger. Legalist cannabis users may dislike trading with criminals; very young of female users may fear to trade with professional dealers, as they perceive them as threatening criminals, etc. In transaction cost terms, if dealing with someone is pleasant, then the transaction cost is negative, and trading increases the social welfare. If the trade is with an unpleasant trader, it causes a transaction cost which sums to the

trading price. The transaction costs caused by social market trading, where the dealers are peers, are generally lower than those caused by trading between strangers, as in the street market.

3.3 Drug correlated criminal revenues.

Illegal cannabis trading may fuel crime revenues, in particular the revenues of the criminal organizations engaged in this activity³⁰. As these revenues increase the economic power of crime, they, indirectly, reduce the social welfare. The cannabis social market competes with the dealers' market in supplying this item, therefore, social market trading reduces the profit opportunities of professional dealers. As far as the professional dealers are criminals, or they are connected to criminal organizations, social market trading lowers the profits that crime can gain from cannabis trading. This conclusion needs to be refined. If the cannabis distributed in the social market was bought by professional dealers, then the reduction in crime revenues consist only in the difference between the (lower) mark-up applied in the social market and the (higher) mark-up applied by the dealers on their selling price. But, if the cannabis supplied in a social market is coming from home growing by some member of the group of friends, then the substitution between the social market and the crime revenues is complete, so that the crime revenues from cannabis trading are inversely correlated to the volume of social market trading.

3.5 Visibility.

In welfare economics terms, an important difference between the social market and the dealers consists in their different visibility. On the side of its social cost, social market trading, compared to street dealing, is more private, and, therefore it causes less moral externalities than the more visible activity of the "pushers". On the side of the cost of implementing the restriction on trading, the cost of restricting the less visible social market trading is higher than the cost of detecting the outdoor activity of street dealers.

3.6 Welfare analysis.

Formally, we define Q as the volume of cannabis trading, and we assume that this trading causes a negative externality, $Ext(Q)$, which reduces social welfare: $Ext'(Q) > 0$. Moreover, we assume that the volume of trading, Q , may be constrained by a drug trafficking countering policy, C , so that: $Q'(C) < 0$. But, the implementation of such a countering policy is costly, and we assume that this cost is inversely correlated with the volume of trading: $C'(Q) < 0$.³¹ In our model, we assume that the policymaker may constrain the target variable, volume of illegal trading, through the use of the instrumental variable C , that is, countering drug trafficking. Because countering drug trafficking is costly, social welfare is maximized by minimizing the sum of the negative externalities caused by illegal trading and the cost of implementing an anti-drug policy: $Ext(Q) + C(Q)$. Therefore, social welfare is maximized if the residual volume of illegal trading is the one, Q^* , by which the marginal social cost of cannabis trading is equal to the marginal cost of implementing a restriction on its volume: $Ext'(Q^*) = C'(Q^*)$.

³⁰ In Italy, the role of organized crime in smuggling and distributing cannabis is traditionally relevant (DCSA, 2019).

³¹ If the policy is not implemented, it is costless and the volume of (illegal) trading is unaffected. As the desired volume of trading decreases, implementing a restrictive policy on illegal trading becomes costlier. In the limit, if the desired volume of trading would be zero, achieving this goal would have an infinite cost.

On the basis of the above considerations, we assume that the social cost, $Ext(Q)$, caused by social market trading is lower than that caused by street dealing:

$$8) Ext(Q_{social}) < Ext(Q_{pushers}).$$

Moreover, we assume that the cost of countering illegal cannabis trading, $c(Q)$ is higher in the social market than in the street dealers' one:

$$9) C(Q_{social}) > C(Q_{pushers}).$$

Social welfare is maximized by minimizing the sum of the social cost of cannabis trading and the cost of implementing restrictions on it: $\min(Ext(Q)+C(Q))$. Therefore, if the above assumption 1 and 2 are true, it follows that:

$$10) Q^*_{social} > Q^*_{pushers},$$

the volume of (illegal) cannabis trading, that is optimal to tolerate, should be higher in the social market than in the street dealers one, that is, the socially optimal countering policy should be more tolerant about social market trading than about street dealing.

Conclusions

In this essay we tried to define the “cannabis social market”, therefore, we added the study of the demand side to what the current literature has already defined as the: “social supply” of cannabis (Hough et al. 2003). Here, we defined the cannabis “social market” as the institution where friends trade cannabis among themselves with a “minimally commercial” motivation (Coomber and Moyle, 2104). The definition of the social market is developed in the first section, by comparing the main features of the cannabis social market with those of the professional dealers' one (although, we acknowledge that this distinction is not very precise). Theoretically, we define the cannabis social market as a social network, a fragmented market, whose units are groups of friends who use cannabis and trade it among themselves. Because, in each of these sub-markets, users/traders are friends, their trading is motivated by cooperation, rather than being profit-oriented. In strategic terms, we model trading in a social market as an investment in a specific social capital (Scott et. al. 2017), which may be useful to gain better terms of trade in that social market. By comparing the transaction costs of the social market to the professional dealers' one, we investigate on the theoretical reasons that may motivate cannabis users to trade in the social market rather than trading with professional dealers. In particular, we illustrate the (theoretical) motivations by which the most socially integrated users may prefer to trade in the social market rather than with proper dealers. In the second section, the hypothetic link between social integration and trading in the cannabis social market is empirically tested by analyzing the trading habits of a sample of cannabis users. Because the interviews were collected among visitors to a cannabis fair, the sample is distorted toward an over-representation of frequent users, those that are more important from an economic point of view. Our sample analysis confirms the relevance of the social market, as most of the respondents declared to buy cannabis mainly from friends. Moreover, our sample results support the hypothesis that the more integrated users prefer to trade in social market; in particular, having the social market as the main source of cannabis supply is positively correlated to the user's

degree of education and occupation. Interestingly, female respondents, more than males, declared to prefer trading in the social market, it may be because for female users the costs of trading with professional dealers are higher, or, it may be that females are more “socially connected” than males. In our sample, the role of the social market as the main source of cannabis supply is decreasing with the respondent’s age: as the user is aging, he exits from the market (both social and professional), and he retreats in home-growing. There may be several motivations for this evolution in the user career (Rossi, 2019). It may be that, with the passing of time, his social market fades (as users/friends are lost); it may be that adult integrated users perceive that buying cannabis is too risky; adult users have more logistic availability in growing cannabis than young users, etc. In the third section of this essay, we develop a normative analysis where, in line with the current economic literature (Becker et al. 2006), we try to (theoretically) identify what should be the optimal regulation of the cannabis social market. Therefore, we develop a cost-benefit analysis, where the maximization of social welfare is achieved by minimizing the sum of the social cost of (illegal) cannabis trading and the cost of countering this trade. If the negative externalities caused by cannabis trading in the social market are lower than those caused by street dealing, and, if the cost of countering cannabis trading in the social market are higher than those caused by street dealing, our model concludes that the policy maker should be more tolerant about social market trading than about street dealing.

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