

# The Swiss Heroin Policy

DOMINIK EGLI\*

## 1. INTRODUCTION

A couple of years ago, images of the «Needle Park» in Zurich went around the world. Partly because of the harm becoming visible, partly also because of AIDS, the Swiss heroin policy changed dramatically and became one of the most liberal. In addition to existing policy measures, namely repression and abstinent oriented therapies, the conditions for entering methadone programs were substantially lowered, and a whole series of measures to reduce harm directly and quickly were installed. Most attention of all new measures received «The Swiss Heroin Project». Beginning in 1994, 1000 heavily addicted users got narcotics from the state. The project phase was running until the end of 1996. The project was scientifically accompanied and the results were published lately (see UCHTENHAGEN *et al.* (1997) and FREI *et al.* (1997))<sup>1</sup>. At the end of February 1998 the Swiss government decided to institutionalize heroin treatment as a legal therapy.

My aim is to examine the Swiss heroin policy from an economist's point of view. I will start by investigating the subject theoretically. The question will be: How does a rational heroin policy look like? Next, I will discuss prohibition as a policy tool. Here, the question will be: Does prohibition work, namely does it lead to a reduction in consumption of heroin? This question, too, will be analyzed theoretically. After describing it, and armed with the theoretical background, I will investigate the Swiss heroin policy. The question I will answer is: How does the Swiss heroin policy fare relative to the derived optimal policy? The result will be that the Swiss heroin policy still puts too much weight on prohibition.

\* Volkswirtschaftliches Institut der Universität Bern.

Email: egli.dominik@snb.ch.

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1. The full name of the project is «The Swiss National Project on Medically Prescription of Narcotics». I will stay with the abbreviation used above, especially since I will concentrate myself on analysing the effects of heroin prescription. Other narcotics (morphine, methadone) have been supplied in order to compare the therapeutic aptitude of these substances. Recrutability of clients, duration, and compliance are highest for heroin. Moreover, heroin has the lowest side-effects (UCHTENHAGEN *et al.* 1997).

Economic theory identifies three circumstances in which public policy might enhance efficiency, namely deviations from rational behavior, externalities, and market power. If heroin users do not act according to the rationality postulate, or if consumption of heroin generates external effects on other individuals, or if the market for heroin is characterized by market power, the call for intervention is justified.

The most important stylized facts of addiction are cyclical behavior and regret. The consumption pattern of addicts over time normally exhibits phases with high consumption as well as slow downs and phases with low consumption. Additionally most addicts would prefer to be clean altogether; they regret having become addicted. Can cyclical consumption and regret be explained as consequences of rational decisions of forward looking utility-maximizers? Surprisingly, papers by BECKER and MURPHY (1988), DOCKNER and FEICHTINGER (1993), and ORPHANIDES and ZERVOS (1995, 1998) show that the answer is «yes». If one is willing to accept these theories, information and insurance remain as rational policy tools. On the other hand, addicts might be boundedly rational, myopic or their behavior might be time-inconsistent. In all of these cases, addicts consume too much.

A widespread belief is that heroin abuse leads to externalities such as violence, crime, spread of AIDS and others. In accordance with this beliefs, reducing consumption of heroin reduces externalities and enhances welfare. A careful analysis shows that this reasoning does not convince. Most of the externalities we observe today do not follow from heroin consumption, but from repression.

If one does not accept rational behavior and claims that reducing the consumption of heroin improves welfare, there still remains the question of how to do it. I will show that there are considerable theoretical doubts about the efficacy and efficiency of prohibition as a tool to reduce consumption. Controlled legalization accompanied by taxation to influence demand via the price seems to be a promising alternative.

Having discussed heroin policy as such and prohibition as one instrument of heroin policy theoretically, I will outline the Swiss drug policy and especially the heroin project in detail. As already touched on above, the Swiss heroin policy rests on four pillars: prevention, repression, therapy, and harm reduction. I will further discuss the goals and measures of the four pillars as well as the expenditures. Special attention will be devoted to the evaluation of the heroin project.

Finally, I will compare the Swiss heroin policy with the derived rational drug policy. Since still about 50% of total expenditures are spent for repression, and since the heroin project has to be treated as a big success, it becomes clear that the Swiss heroin policy still far too heavily relies on prohibition.

I will focus my policy analysis on heroin. It will not always be possible to distinguish heroin and other drugs. Partly, because a policy measure might not only aim at heroin consumption but on other drugs as well, partly because most heroin addicts consume also other drugs, especially alcohol and cocaine. For the theoretical part, however, a restriction on heroin is not necessary.

## 2. RATIONAL HEROIN POLICY

From an economic point of view, public policy is justified if it either improves efficiency or leads to a desired redistribution. Drug policy has distributive aspects, but those are side-effects and not the aim. I therefore concentrate on the allocative effects. Public opinion about the target of heroin policy certainly entails reduction of consumption. Economic analysis should however not be based on conventional wisdom. Any policy evaluation has to take the first welfare theorem as a starting point. According to MAS-COLELL *et al.* (1995), the First Fundamental Welfare Theorem states: «If every relevant good is traded in a market at publicly known prices (i.e., if there is a complete set of markets), and if households and firms act perfectly competitively (i.e., as price takers), then the market outcome is Pareto optimal. That is, when markets are complete, *any competitive equilibrium is necessarily Pareto optimal.*» (p. 308, emphasis in the text). To put it differently, if the conditions are met, there is no need for public intervention since the market forces lead to optimal allocation. To show that a policy is justifiable out of allocative reasons, one has to show which of the stated conditions are violated. Next it should be analyzed if and how the chosen policy instruments lead to an efficiency enhancement based on correction of the violated condition. Last but not least the welfare effects of the instruments in question have to be compared to those of alternative instruments.

With respect to the consumption of drugs, three possible deviations come to mind. Maybe consumers of drugs do not act rationally. If so, influencing their consumption behavior enhances their utility and leads to a Pareto improvement if the costs are not too high. Second, drug consumption creates negative effects on other people's utility which are not traded on a market. And third, illegal drug markets are highly cartelized. Cartels choose a too high price compared to competitive suppliers, which leads to Pareto inefficiencies. I will discuss these factors in turn.

### 2.1. Rational, bounded rational, myopic or time-inconsistent consumers

What distinguishes heroin from other consumption goods like bananas or holidays? If there is no significant difference, there is no need for intervention, and increased consumption after legalization would enhance welfare. This is pretty standard economic reasoning. If one does not agree with the argument, one has to answer the above question. The main answer certainly is the addictiveness of heroin. Economically, a good is addictive if today's consumption raises the desire to consume it in the future. Rational behavior with respect to addictive goods means that an individual takes the effect of today's choice on future utility into account. If it does so, consumption reducing intervention lowers welfare.

BECKER and MURPHY (1988) analyze the intertemporal optimization of a rational forward looking individual in the presence of an addictive good. Past consumption of an ad-

dictive good influences current utility through the so-called «stock of addictive capital». To be more specific, BECKER and MURPHY assume an individual which can consume two goods, an addictive and a nonaddictive good. Calling consumption of the addictive good  $c$  and consumption of the nonaddictive good  $y$  utility at time  $t$  can be written as

$$u(t) = u(c(t), y(t), S(t)).$$

$S(t)$  denotes the stock of addictive capital and is defined as

$$S(t) = e^{-\delta t} S_0 + \int_0^t e^{-\delta(t-s)} c(s) ds.$$

The stock of addictive capital at time  $t$  depends on the initial stock  $S_0$  and past consumption of the addictive good. By assumption, the influence of past consumption decreases over time. This is captured by the rate of depreciation of the addictive capital  $\delta$ . The rate of change over time is given by

$$\dot{S}(t) = c(t) - \delta S(t).$$

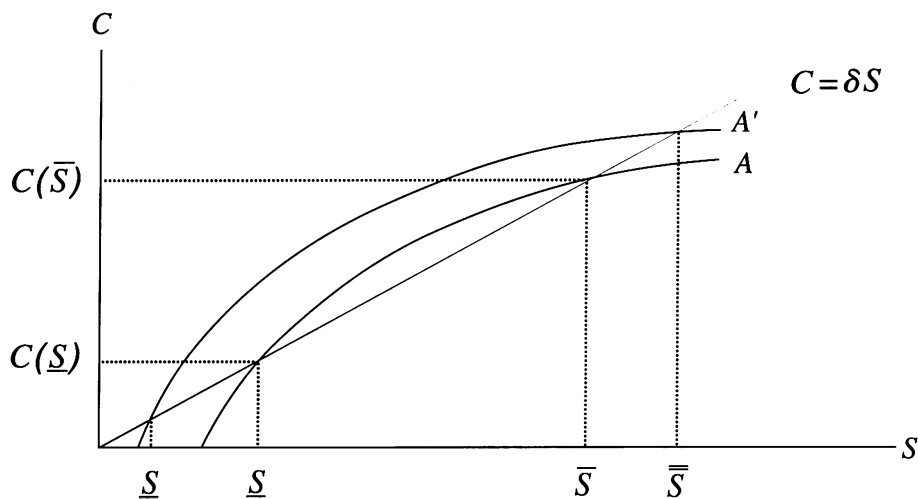
The stock decreases through depreciation and increases through current consumption of the addictive good.

Up to now we have used the term «addictive good» without defining it. Following BECKER and MURPHY, two characteristics define an addictive good. (i) tolerance: current utility negatively depends on past consumption,  $\partial u(t) / \partial S(t) < 0$ , and (ii) reinforcement: past consumption leads to higher consumption today,  $dc(t) / dS(t) > 0$ . Given the intertemporal utility function (where  $\sigma$  denotes time preference)

$$U(0) = \int_0^T e^{-\sigma t} u(t) dt,$$

BECKER and MURPHY show that the consumption of the addictive good might indeed result from utility maximization. For a specific quadratic utility function, figure 1 illustrates the result.

Figure 1



There are two steady state values of the capital stock,  $\underline{S}$  and  $\bar{S}$ . If  $S_0 < \underline{S}$ , the individual starts with a positive capital stock but consumes less than depreciates. Therefore, the capital stock depreciates until it eventually reaches zero. If  $\underline{S} < S_0 < \bar{S}$ , the individual consumes so much that depreciation of capital is more than compensated. The capital stock increases and eventually arrives at the steady state capital stock  $\bar{S}$ . If  $\bar{S} < S_0$ , the individual consumes less than necessary to compensate for depreciation until  $\bar{S}$  is reached. Finally, if  $S_0 \in \{\underline{S}, \bar{S}\}$ , consumption remains at the initial level  $c(\underline{S})$  or  $c(\bar{S})$ .

Whether an individual gets addicted or not depends on the initial stock of addictive capital, on the time preference, on the price of the addictive good, and on the depreciation rate. Curve  $A'$  refers to lower time preference or a lower price. On one hand, a lower price or a lower time preference increases steady state consumption of an addicted individual. On the other hand, an individual which would not have become an addict given a high price, might get addicted for a lower price, namely when her initial capital stock lies between  $\underline{S}$  and  $\bar{S}$ . This is the main reason why the price elasticity of consumption of addictive goods is considerably high in the BECKER-MURPHY model. The price not only determines consumption amounts of addicted people, but also whether somebody chooses to get addicted or not<sup>2</sup>.

DOCKNER and FEICHTINGER (1993) suggest that consumption of say heroin has not only an addictive component, but might also have reverse effects. A heroin user for instance becomes more and more destabilized, the risk of severe health problems increases, and so on. DOCKNER and FEICHTINGER capture such effects by assuming that con-

2. A higher discount rate or a higher depreciation rate have the same effect.

sumption  $c$  augments two capital stocks,  $S_1$  and  $S_2$ , where  $dc / dS_1 > 0$  and  $dc / dS_2 < 0$ .  $S_1$  is equivalent to the capital stock of an addictive good in the BECKER-MURPHY model,  $S_2$  captures the negative effects of heroin consumption. Owing to the counterbalancing effects, optimal consumption might exhibit cycles. «The addictive force causes current consumption to increase as past consumption accumulates; the satiating force causes current consumption to decline as habits accumulate (DOCKNER and FEICHTINGER, p. 257).» The two conflicting effects of drug consumption can explain why a drug career seldom evolves as smoothly as predicted by the BECKER-MURPHY model, but most often is characterized by periods of lower consumption followed by high consumption, and so on.<sup>3</sup>

Another weakness of the BECKER-MURPHY model is the «happy addicts» picture. Looking at the reality of some drug addicts makes it hard to believe that they have willingly chosen their level of consumption with all the consequences. The determinacy of the model does not fit the situation of most heavy heroin users. ORPHANIDES and ZERVOS (1995) show that addiction might result out of bad luck, but that taking the risk to get addicted can be rational. They assume that consumption of drugs has a different addictive potential for different people, but that nobody knows her potential in advance. Everybody has a subjective assessment of the addictive potential and dates it up given the experiences made. Explicitly, ORPHANIDES and ZERVOS assume the following per period utility function:

$$u(t) = u(y(t), c(t)) + \theta \eta_t v(c(t), S(t)).$$

$c(t)$  is the consumption of the potentially addictive good. Here,  $c(t)$  is not necessarily addictive. Namely if  $\theta = 0$ , the person under consideration has no addictive potential. She can consume as much as she wants and does not get hooked. Consuming the potentially addictive good does augment addictive capital, but, in difference to BECKER and MURPHY, addictive capital only has an influence on utility for some people, but not for others. For those with addictive potential  $\theta = 1$  current utility is influenced with probability  $\eta_t$ :

$$\eta_t = \begin{cases} 1 & \text{with probability } \pi(S(t)) \\ 0 & \text{with probability } 1 - \pi(S(t)) \end{cases}, \pi(0) = 0, \pi(S) \in [0, 1].$$

$\eta_t$  can be interpreted as harmful side effects of drug consumption, which occur randomly. The more an individual has consumed in the past, the higher is the probability of such harmful effects.

Initially, a person does not know her value of  $\theta$ . Instead, she has a subjective assess-

3. By assuming time preference to decrease with the stock of addicted capital, VANINI (1997) also derives cyclical consumption patterns.

ment  $P(0)$  denoting the probability of having no addictive potential ( $\theta = 0$ ). If somebody starts consuming the potentially addictive good and no shock on utility occurs, she knows that she either has no addictive potential, or luck ( $\eta = 0$ ), and she dates up her subjective probability of having no addictive potential according to Bayes' rule. Not observing harmful side effects makes her surer of being a nonaddictive type. If on the other hand the shock on utility happens, she immediately concludes having addictive potential. ORPHANIDES and ZERVOS call this behavior «learning by experimentation».

The main result of the ORPHANIDES-ZERVOS model is that even for  $S_0 = 0$ , there exists a  $\bar{P} \in [0, 1)$ , such that  $c(0) > 0$  if and only if  $P(0) \geq \bar{P}$ . In words: if the individual strongly believes that she has no addictive potential, she will start consuming the potentially addictive good despite the risk of getting hooked. If she has addictive potential and gets it revealed early enough, consumption can be controlled, but if the information comes in too late, she gets addicted.

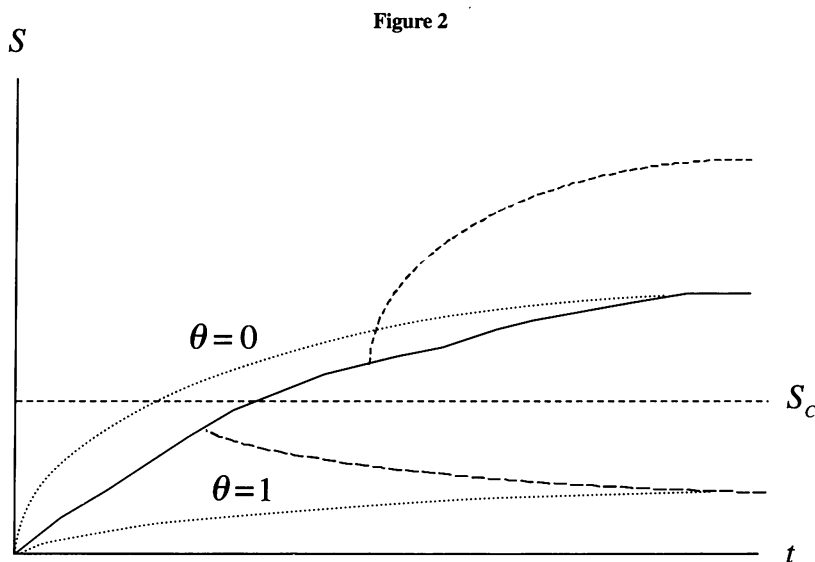


Figure 2 shows an example for a person with initial capital stock of zero. The lower dotted line shows the evolution over time of the optimal stock if the person in kind knew for sure about her addictive potential ( $\theta = 1$ ), the upper dotted line in case of no addictive potential ( $\theta = 0$ ). Positive consumption might still be optimal even in case of addictive potential, but when the person is sure about having addictive potential, she keeps consumption low in order not to get hooked. If, however, the individual is unsure *ex ante*, she starts with moderate consumption. The unbroken line shows the evolution of the capital stock if the individual has no addictive potential, but does not know it in advance. In

that case, the negative effect on the utility never takes place, and the individual gets more and more sure having no potential. The lower broken line shows what happens when the individual observes a shock early. In that case, capital stock is still relatively low, and the individual reacts by lowering consumption enough to approach the lower dashed line. If, however, the information of having addictive potential arrives too late, consumption explodes. This is the case when the accumulated capital stock exceeds the threshold capital stock  $S_c$ , which corresponds to  $\underline{S}$  in the BECKER-MURPHY model.

In difference to BECKER and MURPHY (1988), where any positive consumption in the steady state is defined as addiction, here only the highest curve implies addiction. This is somehow arbitrary of course, but it also reflects how difficult defining addiction is. As Peel notes: «Data revealing regular nonaddictive narcotic use have consistently complicated the effort to define addiction (ORPHANIDES and ZERVOS, p. 748).»<sup>4</sup>

The story behind the figure goes like this. A young person gets in contact with say alcohol. She knows that there is a slight probability of getting addicted if she starts drinking alcoholic beverages. She also knows all the consequences, but in terms of expected utility, the risk is not high enough to let her abstain completely. She also anticipates that she will learn about her potential of getting an alcoholic. Because of the risk, she starts consuming less than she would if she knew for sure having no addictive potential. Every now and then she observes her potential, and as long as she is well, she updates her subjective belief having no addictive potential upward and eventually approaches steady state capital stock of a non-addict alcohol consumer. If, however, she gets a bad signal, she either stops drinking or changes to heavy drinking. Which of the two options she will take depends on the time she observes her potential. If she observes it early enough, she switches to moderate consumption. If, however, the observation comes in too late, she is already hooked and becomes an alcoholic.

Eventually, people with a potential of getting addicts either are addicts or consume little, whereas those without potential become moderate consumers. Experimenters take the risk simply because they get an immediate utility gain but addiction does not follow

4. FREY (1997, p. 391) reports: «In Germany, among the 16% who had consumed drugs once in their lifetime, only 5% had taken them within the last year. In Switzerland, among the 17% of people who had consumed drugs at some time during their life, only 2% are current consumers. Obviously, a large number of users have not become addicted.» Instead of equating addiction with consumption of potentially addictive goods like in BECKER and MURPHY, addiction in the spirit of ORPHANIDES and ZERVOS means excessive consumption leading to social disintegration. In Zürich, 68% of consumers of illegal drugs work regularly and have regular housing conditions, 26% have either one of them, and only the remaining 6% are socially disintegrated. Under different definitions for housing and work, the numbers are 49%, 30% and 21% (FREY 1997). PRINZ (1997, p. 376) writes on the subject of a proper definition: «The central question seems to be: how can one enjoy the positive effects of a drug on well-being, and at the same time avoid the potential dangers? Unfortunately, there is no general answer. Neither pharmaceutical and medical knowledge nor social norms offer secure guidance. As a consequence, there is no «objective» or «scientific» borderline between «harmless» and «harmful» intoxicants.» I would add that we lack not only a clear distinction between harmful and harmless substances, but also between harmful and harmless consumption of potentially harmful goods.



with certainty. Those individuals who get addicted, regret having taken the risk. Individuals who initially assign themselves a high risk of getting addicted don't start experimenting at all.

The BECKER-MURPHY model has been heavily criticized because of its unsatisfactory explanation of changing consumption patterns over time and its «happy addicts result». The extensions made by DOCKNER and FEICHTINGER, and ORPHANIDES and ZERVOS offer explanations for cyclical consumption patterns and for regret although the decision to take the risk of getting addicted has been rational.

The main policy implication is clear-cut. Consumption of addictive goods is rational in all three models, even if it leads to addiction. According to the first welfare theorem, restrictions on consumption lead to welfare losses. In the light of these models, prohibition damages even the users of illegal drugs themselves. ORPHANIDES and ZERVOS (1995) show that at least partial insurance is welfare enhancing. Although the choice of taking the risk is rational, an individual getting addicted regrets and wishes to get clean again. Full insurance is not efficient due to moral hazard problems.

Welfare may be enhanced also if some authority knows the probability of getting addicted better than the individuals themselves. Information dissemination enhances welfare. One has to be careful though not to confuse prevention and information. As the word says, prevention aims at preventing drug use. Information, however, can also lead to enhanced consumption, namely when the individual overstates her risk of getting addicted.

So far, I have discussed models explaining addictive behavior based on the rationality framework. Alternative theories of addiction emphasize the compulsiveness of drug consumption. They are based on the observation that addicts do not fully recognize the trade-off between today's utility gain and tomorrow's harm and explain nonrational behavior by myopia or time-inconsistency. Models of myopic and time-inconsistent individuals are summarized in FRANK (1995). In all these models, welfare is enhanced by reducing consumption. VANINI (1997) introduces bounded rationality into a BECKER-MURPHY model with uncertainty. Instead of using available information to update expectations according to Bayes' rule, the individuals in his model add noise to the information and then update according to Bayes' rule. In addition, VANINI assumes endogenous time preferences. The higher the stock of addictive capital  $S$ , the more the future is discounted. Given these ingredients, VANINI shows that addicts consistently consume too much.

ORPHANIDES and ZERVOS (1998) show that myopia on itself does not suffice to justify the abandonment of rationality. In their view, instead of being a reason for getting addicted, myopia results from the consumption of drugs. Initially, an individual is not shortsighted, but with growing addictive capital stock the chances to become so grow. Similar to their paper discussed above, the degree of myopia which will result is uncertain ex ante. If myopia turns out to be high, the individual shows compulsive behavior, if it turns out to be low, moderate consumption results. Again, an individual might rationally take the risk to get hooked.

## 2.2. Externalities

Besides myopic or time-inconsistent behavior, externalities are another market incompleteness. In our context, externalities are defined as effects of heroin consumption on other people's utility. For a more general definition, we again refer to the textbook of MAS-COLELL *et al.* (1995): «An *externality* is present whenever the well-being of a consumer or the production possibilities of a firm are directly affected by the actions of another agent in the economy.» (p. 352, emphasis in the text). Externalities lead to inefficient allocations. They therefore give room for welfare enhancing policy measures. In case of negative externalities, consumption in a market equilibrium is inefficiently high. A reduction leads to a welfare improvement if the costs are not higher than the welfare gain of reduced consumption.

Heroin addiction generates a whole list of negative externalities:

- Consumed during pregnancy, heroin consumption influences the health of fetuses negatively.
- Heroin addicts abuse their children more often than non-addicts.
- Driving ability might be limited under the influence of heroin.
- Heroin addicts have high health risks for which non-addicts pay through the insurance system.
- Heroin addicts have to finance their consumption. The costs are considerable, and many addicts finance their needs through property crimes or prostitution.
- Many heroin addicts are HIV-positive and therefore a risk for other people.
- Family members or friends of addicts care about their well-being.

As already mentioned, the list is impressive. But one has to be careful here. The critical question is: Are these externalities triggered by consumption of heroin or probably by other factors?

TAUBMAN (1991) summarizes the empirical evidence on the effect of drug consumption of the mother on the health of her child. He reports no study which concentrates on heroin. The only study which might indicate a negative effect of heroin consumption is the one by GROSSMAN and JOYCE (1988). The authors introduced complications of pregnancy owing to consumption of narcotics as explanatory variable for birth weight and estimated a reduction of birth weight of 8%. If consumption of narcotics complicates pregnancy, the birth weight is negatively effected. This does not measure the overall effect of consumption of narcotics on birth weight, however. The effect might be larger or smaller than estimated by GROSSMAN and JOYCE. Additionally, the study does not discriminate the effects of different narcotics.

REGAN, EHRLICH, and FINNEGAN (1987) compared children of mothers in a methadone program to those of a control group and report that the children of the drug addicted mothers were more abused and received poorer parenting.

To my knowledge, there exists no study on the influence of heroin consumption on driving ability.

Heroin of good quality and consumed properly has no detrimental effects on health (ZINBERG 1979). All illnesses and bad shape of heroin addicts we know have to be attributed to the circumstances under which heroin is consumed. Poor quality, high prices and therefore bad nutrition, homelessness and the like lead to health problems. It is prohibition which triggers them, not the drug itself. Externalities via health insurance follow prohibition, not consumption.

The high percentage of heroin addicts being HIV-positive also is a direct consequence of prohibition. Since the heroin-pushers have been forced to share needles, the infection has quickly spread. Non-addicts are influenced mainly by prostitution.

GOLDSTEIN (1985) identifies three kinds of drug-related crime: psychopharmacological, economic compulsive, and systemic. Psychopharmacological crime is crime induced by the state in which a user is after consumption or on cold turkey, economic compulsive crime is crime committed by the need to finance consumption, and systemic crime is crime induced by fights for market shares, enforcement of illegal contracts, and the like.

Heroin is a «downer», it usually does not induce psychopharmacological crime. According to GELLES and STRAUS (1988, p. 47), opiates are rarely associated with violence against family members. Since most of the heavy heroin addicts occasionally consume other drugs, especially cocaine, one should not solely look on heroin related violence. Unlike heroin, cocaine has an aggressive impact. If legalization leaves heroin addicts with more means, they probably enhance cocaine consumption, which might lead to higher psychopharmacological crime.

The production costs of heroin are fairly low, certainly low enough that even the most heavy users would be able to finance their consumption without crime. Systemic crime too, directly follows from prohibition. The pain a heavy heroin addict suffers certainly influences the welfare of family members. But as for bad health, this has to be attributed to prohibition, not consumption.

What remains of the discussion of negative externalities is that the most severe effects are triggered by prohibition, not consumption itself.

MIRON (1991) introduces another kind of reasoning. If there are substitutes to heroin consumption, the mere existence of externalities does not suffice to justify prohibition. It also has to be shown that consumption of heroin creates more externalities than consumption of substitutes, as for instance alcohol. «Prohibition of drugs may not significantly reduce externalities because it simply results in a substitution toward consumption of other goods that also create externalities.» (p. 71)

Last but not least, the most severe externalities of heroin consumption are caused by heavy users. As MIRON and ZWIEBEL (1995) suggest, prohibition probably discourages casual use more than heavy use. Therefore, repression might reduce drug consumption far more than related externalities.

### 2.3. *Market Power*

Besides rationality and nonexistence of externalities, a third condition for the First Welfare Theorem is the nonexistence of market power. With respect to the heroin market, there is not much to say about this point. Cartelization clearly has to do with prohibition. In order to reduce risk, suppliers organize themselves in groups, and they also prefer to have a steady clientele. In a free market, no reasons for market power come to one's mind.

Due to the risk associated with dealing and consuming on the illegal drug market, and the market power the suppliers have on today's black markets, legalization of heroin would certainly lead to a fall of the price and to an increase in consumption. As long as increasing consumption results from rational decisions, nothing is wrong with it, in the contrary, every consumer is better off than under prohibition.

### 2.4. *Does Prohibition work?*

If one does not agree with the above analysis and attributes heroin consumption to short-sightedness, the question remains if prohibition effectively reduces consumption. Theoretically, one would suggest that prohibition increases risk for both consumers and suppliers and therefore shifts the demand-curve downwards and the supply-curve upwards resulting in an unambiguous reduction of consumption. Looking at what happened during alcohol prohibition in the US of the twenties raises doubts, however. After prohibition started in 1917, alcohol consumption declined sharply to about 30% of its previous level, but steadily increased over the next years until it reached about 80% of the post-prohibition level. Most astonishingly it did not grow considerably after prohibition was revealed in 1932. I do not propose that heroin consumption would not increase in case of a legalization. The example of alcohol prohibition suggests, however, that illegal markets for drugs have features which do not fit into our simple demand-supply framework, and that we have to take a closer look at how these markets work in order to be able to judge prohibition as an instrument to reduce consumption.

Participants in transactions on drug markets face risks due to illegality. Consumers as well as suppliers are punished if caught by the police. The penalty usually depends on the drug and the amount confiscated, and whether the individual is addicted. Additionally, the usual ways to enforce contracts do not work on illegal markets. Consumers as well as suppliers risk to be cheated or beaten without having the possibility to go to court.

LEE (1993) models a heroin market where consumers face a transaction and a possession risk. The former stands for the risk of getting arrested or cheated during transaction, the latter for getting caught later on or being robbed of one's heroin holdings. Increasing repression on transactions for consumers leads them to choose lower frequency but higher transaction amounts. Due to lower frequency, the risk for the suppliers decreases which leads them to increase supply. The shift in supply may more than compensate for the reduced demand, such that overall drug consumption might increase.

Another channel through which repression might work in the wrong direction follows from short-sightedness. If consumers are myopic, it is reasonable to assume elastic demand of potential entrants and inelastic demand of addicts. On the supply side, street dealers face the highest risk, and the farther from the street market one is in the distribution chain, the lower his risk exposure. Increasing repression might induce nonaddictive dealers to step back from the street market and let addicts do the job. Addicts, however, need a stock of consumers in order to finance their consumption. They can try to recruit new consumers by offering the drug at cheap conditions to them, which is to say by discriminating between potential entrants and addicts. Repression actually may increase entry into the market.

BENSON and RASMUSSEN (1991) report a third example. They start with the observation that increasing repression costs. If the police has a constant budget, these costs have to be saved somewhere else.<sup>5</sup> BENSON and RASMUSSEN suggest, that the risk to get caught for property crimes decreases when drug repression is enhanced. Reduced risk makes it easier for addicts to make their earnings which at least partly compensates for reduced supply owing to higher repression. Between 1982 and 1987, funds have been heavily shifted towards drug repression in Florida. At the same time, the price of cocaine has declined by at least 50%. Combined with inelastic demand, this should have led to a reduction of property crime. What happened instead was that robbery rates rose by 33,8%, burglary by 24,2%, and larceny by 19,8%. BENSON and RASMUSSEN estimate that a one percent increase in drug arrests relative to other arrests leads to a 0.2 percent drop in the probability of getting arrested for a property crime. The result supports the interpretation of the numbers given above. The authors conclude that although more addicts would be arrested for property crimes than before, «(...) this does not imply that drug use caused such crimes.» (p. 114)

## 2.5. *Controlled Legalization and Taxation*

As long as one believes in rationality, there is no room for consumption decreasing policies. Partial insurance and correct information remain as solely rational heroin policy. If, however, one believes in boundedly rational, myopic, or time-inconsistent consumers, consumption decreasing policy leads to welfare improvement. But, as the last section suggests, prohibition is not likely to be effective. Additionally, it could lead to price discrimination, encouraging potential entrants to try out the drug. What else could be done to reduce heroin consumption and to protect potential entrants? One idea is to legalize drug trade but to impose more or less strict rules. For instance heroin can be provided by physicians and pharmacies on the condition that a person proves opiate addiction. Addicts' consumption is legal, whereas nonaddicts still face repression. This system

5. «Polizeiwoche geschlossen infolge Schwerpunkttätigkeit im Drogenbereich», Bern, March 1998.

promises to work if the profits which can be made with potential entrants are not worth the risk. If so, the black market crashes since the illegal suppliers constantly lose consumers as soon as they get addicted.

A form of legalization which goes more in direction of liberalization would be to allow adults to consume heroin but to force them to consume it at specified places, and to regulate prices. Juveniles are protected, the black market probably gets destroyed, and the amount consumed can be controlled by the price.

### 3. HEROIN POLICY IN SWITZERLAND

About 30 000 Swiss inhabitants are opiate addicts (about 0,4% of the population). After a sharp rise between 1970 and 1990, the amount is stable since then (BAG 1997). Every year, about 350 people die from heroin abuse, most of them from overdoses.

The Swiss drug policy rests on four pillars (and is consequently called: «Vier-Säulen Politik»): prevention, repression, therapy, and harm reduction. Prevention and repression aim at preventing consumption, therapy and harm reduction at reducing the negative effects of heroin abuse. Prevention mostly takes place at home, in schools, at the workplace and during leisure. It not only entails information, but also aims at the improvement of the personality of young persons. At its best, it helps youths to find a way of living without harmful drug consumption. This is an ambitious task and the question about the role of government in a liberal society arises. In Switzerland, official activities are mainly concentrated on supplying information and opportunities to get in contact with suppliers of drug related aid.

Repression is based on the law on narcotics (*Betäubungsmittelgesetz*), which forbids production, possession, trade, import and consumption of narcotics. There are about 40 000 reported violations of the law per year, committed by 22 000 persons. 80% of the violations are due to consumption only, 6,5% due to trade only, and 13,5% due to trade and consumption. 17 000 reports are in relation with heroin. About 1400 people are imprisoned due to violations of the law on narcotics or due to drug related crime.

Concerning therapy, there are two different kinds. Both aim at abstinence, but the ways to get there are different. The first kind of therapy starts with a withdrawal treatment, followed by a therapy in a specialized institution. In Switzerland, there are 100 such institutions supplying 1750 places. 2200 drug addicts per year start a program. 30% of them quit during the first weeks. 70% of those who finish the program are still clean a year later. Most of the quitters and relapsers try it again later. Overall, the one year success rate is about 50%. The second kind of therapy are substitution programs. Instead of going through a withdrawal and entering a stationary program, addicts get a substitution substance and are in a nonstationary therapy treatment. In Switzerland, 14 000 addicts are in a methadone program, and 800 get heroin. I will discuss the latter in detail in the next section. On average, a methadone treatment lasts two years. 42% of the beginners are fully abstinent after two years, 22% are recreational consumers, and 35% are addict-

ed again. The attitude of the Swiss authorities is that different people react differently to different treatments, and that success is highest when the treatment fits to the personality of the client.

Harm reduction as the fourth pillar aims – as indicated by the name – at reducing harm due to drug consumption. It entails handing in syringes and needles, supplying rooms where consumption can take place under appropriate hygienic circumstances, and helping addicts to get housing and work.

The dividing line between therapy and harm reduction is somewhat fuzzy. A treatment with substitution substances can have mainly harm reducing effects, whereas harm reduction usually leads to a better social integration and health and therefore also has therapeutic effects. The separation is especially vague for the heroin project.

Drug policy in Switzerland costs about a billion Swiss Francs per year (0,3% of GDP), out of which 3–5% are spent for prevention, 50–56% for repression, 25% for therapy and 14–20% for harm reduction. These numbers account for all illegal drugs, not only for heroin. Expenditures for therapy and harm reduction are spent almost exclusively for heroin addicts, whereas prevention and repression concern all drugs. The shares are therefore accordingly higher for therapy and harm reduction if one only looks at heroin.

### *3.1. The Swiss National Project on Medically Prescription of Narcotics*

Under the heading PROVE (*Projekt zur Verschreibung von Betäubungsmitteln*), the consequences of medical prescription of narcotics have been analyzed. Between 1994 and 1996, 800 heroin addicts were supplied with heroin, another 200 with injectable methadone or morphine. The criteria for enrollment to the program have been: heroin addiction for at least two years, minimum age of twenty years, at least two unsuccessful therapies, and medical, psychological and/or social deficits attributable to heroin abuse. The aim of the project was to investigate (i) how different substances (heroin, methadone, morphine) and different galenic forms (injected, smoked, oral) work, (ii) how health status, social integration and addictive behavior of the participants is influenced, (iii) whether heroin prescription is a useful therapy for people for which other therapies have been unsuccessful, and (iv) how heroin prescription works relative to alternative therapies. The detailed evaluation of the project is given in UCHTENHAGEN *et al.* (1997).

From an economic point of view two questions can be asked: (i) what have been the costs relative to the benefits, and (ii) what can be said with regard to the externalities mentioned above.

Table 1 reports the weighted average of the daily costs per participant of PROVE.

**Table 1: Daily costs per participant of PROVE**

	Swiss Francs	%
Direct costs	9.58	19.5
Staff costs	34.28	69.8
<i>Research</i>	2.03	
<i>Social</i>	6.55	
<i>Medical</i>	2.94	
<i>Application</i>	9.39	
<i>Administration</i>	13.98	
Other	5.24	10.7
Total	49.10	100.00

Source: FREI *et al.* (1997), pp. 108, 109.

A benefit analysis of PROVE has been done by FREI *et al.* (1997). The starting point of their analysis was that heroin abuse generates economic costs. The PROVE-project is seen as a policy measure aiming at reducing these costs. Concentrating on available data, the authors analyze four cost categories: housing costs, crime related costs, medical costs, and costs due to productivity losses. For all these categories, the situation for the period of half a year prior to the beginning of the project was compared to the one of the first half year or the one for the second half year. Concerning housing costs the authors investigated where the participants lived during the specified time and computed the relevant costs. Due to a decrease of housing in therapeutic institutions, the cost differential between beginning and after at least half a year has been SFr. 2.41 per participant and day. The measurement of the decrease in productivity losses is based on hours worked. The participants and the work they have done are categorized along several lines like gender, full time versus part time jobs. Due to these characteristics, the hours worked are valued at different implicit wages. Per day and participant, costs due to productivity losses declined by SFr. 3.90. There are four kinds of crime related costs: costs for the victims, costs of police investigation and detention while awaiting trial, costs of the trial, and imprisonment costs. The costs for the victims per participant and day have decreased by SFr. 4.50, those for police investigation and detention by SFr. 32.86, those for the trial by SFr. 5.12, and those for imprisonment by SFr. 30.00. In sum, the drug related costs decreased by SFr. 72.08 per participant and day. By looking at health related costs, the authors looked at heroin related health problems and computed an average cost reduction of SFr. 17.11 per participant and day. The number was calculated as the difference of health related costs in the first month after entering the project with those for the thirteenth month.



Table 2 summarizes.

**Table 2: Daily cost reductions of PROVE per participant, SFr.**

Housing	2.41
Productivity losses	3.90
Drug related crime	72.08
Drug related health problems	17.11
Total	95.50

Comparing costs and benefits of the project, one sees that the benefits exceed the costs by SFr. 44.33 per participant and day.

Up to now, only monetary measurable consequences have been taken into account. On the cost side, there are no other factors, but on the benefit side, there certainly are. First of all, no death due to overdose occurred. Compared with the fact, that every year about 1% of the heroin users die due to overdose, this is a big success. Second, as mentioned above, health has improved. Mainly overall state, nutrition and skin illnesses owing to injection have improved, whereas depressions and states of fear have declined. 11 people got infected with HIV and Hepatitis B and C during the treatment, most probably because of injection of cocaine out of the project. Third, the housing situation has considerably improved; homelessness has decreased to zero. Fourth, the hiring rate rose from 14% to 32%, unemployment declined from 44% to 20%. Overall, benefits are considerably higher than the above numbers suggest.

Above, I gave a list of externalities usually attributed to heroin consumption. The benefits reported in table 2 in fact are exclusively reductions of externalities. This supports the view that externalities arise not because of consumption, but due to prohibition.

#### 4. EVALUATION OF THE SWISS HEROIN POLICY

As pointed out above, the increase of the number of heroin addicts came to a stop about 1990. The total number of opiate addicts is more or less constant since then. These are just numbers and they tell us little about welfare. What can be judged, however, is that repression obviously was not able to reduce the total number of addicts. Up to 1990, the Swiss heroin policy consisted of repression and abstinence oriented therapy. Harm reduction and substance oriented therapy were introduced because of AIDS and the untenable situation on the open heroin scene in Zurich («Needle Park», Bahnhof Letten). Since harm reducing institutions and methadone programs are frequently and mostly voluntarily used, they have to be utility enhancing by a revealed preference argument. Whether utility enhancement outweighs costs we don't know generally. At least for the heroin project the result is clear cut, and more addicts should be enrolled in the program. Addi-

tionally, a widespread supply of heroin controlled by the state could, as mentioned in the theoretical part, leads to a breakdown of the black market. A breakdown of the black market would be the most effective policy to save teenagers from getting hooked to heroin.

The Swiss heroin policy, although one of the most liberal worldwide, is still heavily repression oriented. About half of the funds are spent on repression, which fits badly to the stylized rational heroin policy outlined in the theoretical part above. Either one accepts the rational addiction framework, in which case information and insurance remain as the only welfare enhancing policy tools, or one stays with the view that addiction mainly results from nonrational behavior, in which case consumption should be reduced. Then, however, repression is not the optimal tool. Although the view that individual behavior should be influenced by prices rather than by rules gets more and more accepted in the public, drug policy seems to remain an exception.

The third and fourth pillars of the Swiss drug policy, therapy and harm reduction, can be seen as forms of insurance. Although most addicts pay little for the treatments they get, deductibles are high from a utility point of view, due to high pain from withdrawal treatment. Most of the funds spent on harm reduction are a waste, since repression generates harm, not consumption itself.

Without doubt, the Swiss drug policy could be more efficient. A big step in the right direction is the expansion of heroin prescription decided upon in February 1998. Under the same criteria as for the heroin project, namely heroin addiction for at least two years, minimum age of twenty years, at least two unsuccessful therapies, and medical, psychological and/or social deficits attributable to heroin abuse, every heroin addict will be able to enroll in a specialized clinic. The Swiss authorities estimate that 2000 out of the 30000 addicts meet the conditions. Legalizing heroin consumption also for the other users not only saves costs of harm reduction and repression, but also enhances the utility of the users. I see no unsolvable problems in structuring the market in a way such as to prevent the young persons more effectively from heroin consumption than today. Concerning adults, we generally treat ourselves as selfresponsible persons able to make far reaching decisions. I do not see why this should be different with regard to heroin.

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## SUMMARY

The Swiss heroin policy is compared to a theoretically derived rational drug policy. It is argued that, although being one of the most liberal policies worldwide, the Swiss policy still is too repressive. A further legalization of heroin would most probably be welfare enhancing.

## ZUSAMMENFASSUNG

Der Aufsatz analysiert die schweizerische Heroinepolitik aus ökonomischer Sicht. Zuerst wird die Frage beantwortet, wie eine rationale Heroinepolitik auszusehen hätte. In einem stylisierten Sinne zeichnet sich Heroinkonsum durch zyklische Schwankungen und durch Bedauern aus. Es wird gezeigt, dass die Faktoren als Resultate rationaler Entscheidungen unter Unsicherheit erklärt werden können. Aus der Analyse ergibt sich, dass eine optimale Heroinepolitik die Bevölkerung informieren und versichern sollte. Zweitens wird untersucht, inwieweit Heroinkonsum negative externe Effekte generiert. Es wird gezeigt, dass solche Effekte tatsächlich bestehen, dass sie aber nicht auf den Konsum *per se* zurückzuführen sind, sondern durch die Prohibition erzeugt werden. Drittens wird die Wirkungsweise der Prohibition untersucht. Hier geht es vor allem um die Frage, ob Prohibition ein geeignetes Mittel darstellt, den Heroinkonsum einzuschränken. Es wird gezeigt, dass der Erfolg der Prohibition zweifelhaft ist. Es werden mehrere Gründe dargestellt, warum Prohibition sogar zu einer Mengenausweitung führen kann. Viertens wird die schweizerische Heroinepolitik vorgestellt und mit den Vorgaben einer rationalen Heroinepolitik verglichen. Es zeigt sich, dass die schweizerische Heroinepolitik zu stark auf Prohibition ausgerichtet ist.

## RESUME

Cet article analyse la politique suisse en matière d'héroïne. Premièrement, la question d'une politique rationnelle est abordée. Dans un certain sens, la consommation d'héroïne est caractérisée par des fluctuations cycliques et par un regret de la part des consommateurs. Ces facteurs peuvent résulter de décisions rationnelles prises en situation d'incertitude. L'analyse indique qu'une politique optimale consiste à informer et assurer les gens. Deuxièmement, la question des effets externes est analysée. L'existence de l'héroïne produit des effets négatifs; ces effets ne sont pas générés par la consommation, mais par la prohibition. Troisièmement, le fonctionnement de la prohibition est analysé. L'idée est de savoir si la prohibition est une mesure aptée à diminuer la consommation d'héroïne. Plusieurs facteurs présentés indiquent que la prohibition provoque une augmentation de la consommation. Quatrièmement, la politique suisse en matière d'héroïne est présentée et comparée avec une politique optimale. On constate que la politique suisse est trop orientée vers la prohibition.