

PROHIBITION VS. TAXIFICATION DRUG CONTROL POLICY IN THE USA

by

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Abstract

It is generally thought that legalization of the sale and use of currently illegal drugs would lead to a dramatic increase in drug use and social costs associated with drug abuse and criminal behavior. In this paper we show that it is not necessarily the case that legalization of drugs would be followed by an increase in use. Specifically, if drugs were legalized and taxed, then drug use can be held constant by spending a small fraction of the tax revenues (10.8 per cent in the case of cocaine) on treatment programs. Even if none of the tax revenues are spent on reducing the demand for drugs, the external cost associated with the increase in use from legalization (i.e., costs to society caused by users but borne by others) is only a small fraction of the tax revenues collected (13.2 per cent in the case of cocaine).

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1. Introduction

Consumption of cocaine, heroin, marijuana and other currently prohibited drugs is widely thought to lead to addiction, worsen the health of users and non-users (e.g., by the spread of AIDS), contribute to crimes committed by users and suppliers, and increase other social costs. The main purpose of prohibition is to reduce these costs by reducing use. Without enforcement, however, prohibition is unlikely to be effective in reducing drug use, and enforcement efforts themselves may not be effective in the long run.

Enforcement of drug laws increases the cost of supplying a drug to the black market. *Ceteris paribus*, effective consumer prices rise, and consumption is reduced. Studies have shown, however, that at current levels of expenditures, enforcement is not cost-effective: At the margin, a dollar spent on enforcement leads to a reduction in the drug-related social costs of less than a dollar.¹ An important reason for this is that the effects of enforcement efforts often diminish with time as suppliers and consumers adapt and learn how to avoid some of the initially imposed costs. Consider, for example, alcohol prohibition in the early 1900s. After the initial effects of prohibition were realized, alcohol prices decreased and consumption increased even as enforcement expenditures more than doubled.² Similar effects are seen in the U.S. war on drugs.³

It appears to many that the war on drugs in the U.S. is failing [e.g., Dennis (1990), Nadelmann (1989), and Reuter and Kleiman (1986)]. In this paper we use a rational choice framework to compare the current prohibition policy with a drug control policy that combines legalization of the sale and use of currently illegal drugs with optimal taxation. We refer to this

¹ See Everingham and Rydell (1994). Their study, hereafter referred to as the "RAND study," shows that in the case of cocaine, each dollar invested in domestic enforcement, interdiction and control at the source country yields benefits to society of 52 cents, 32 cents and 15 cents, respectively.

² See Miron and Zwiebel (1991).

³ See Everingham and Rydell (1994), Nadelmann (1989), and Reuter and Kleiman (1986).

legalization policy as "taxification." Contrary to a common belief, legalization would not necessarily lead to a significant increase in drug use if combined with high taxes. In fact, policies which combine legalization and taxation with an increase in expenditures on treatment programs (financed by a small fraction of tax revenues) have the potential of generating substantial tax revenues without increasing drug use.

In the next section, we describe the theory of taxification. In the subsequent section, we estimate the effects of two different taxification policies for the case of cocaine. The first policy involves the imposition of a unit sales tax on cocaine that would maximize the resulting net social benefits.⁴ It is estimated that tax revenues of \$18.46 billion would be generated, while cocaine use would increase by 25.1 per cent due to a decrease in cocaine price. The *external* cost associated with this increase in use (i.e., costs to society caused by the users but borne by others) are estimated at \$2.44 billion.

There are at least two potential difficulties associated with this type of policy. First, estimates on the external cost of drug use are subject to substantial uncertainty. Second, even with significant net social benefits, it may not be politically feasible to implement a drug control policy that involves an increase in use. Accordingly, we also estimate the benefits and costs to society of a second taxification policy. Under this policy, cocaine use is held constant by spending a small fraction of the tax revenues generated in the cocaine market on treatment of heavy users of cocaine. It is estimated that tax revenues of \$15.03 billion would be collected, of which \$1.62 billion of additional expenditures on treatment programs would be necessary to prevent any increase in consumption, thus yielding net tax revenues of \$13.41 billion. According to our estimates, cocaine use could thus be held constant if only 10.8 per cent of the tax revenues collected are spent on treatment. It follows that, cocaine control policies which combine

legalization and taxation with an even larger fraction of the tax revenues spent on treatment have the potential of generating substantial revenues while simultaneously reducing use. The general conclusion that a use-neutral taxification and treatment program will yield a substantial tax surplus is also shown to be robust for alternative elasticities and treatment-effectiveness assumptions.

2. Taxification in Theory

Sellers and buyers of prohibited commodities are unable to seek protection from the law, and as a consequence frequently resort to the use of violence as a mean to prevent theft or enforce contracts. As prohibition is combined with law enforcement, participants in the trade also face the risk of seizures and arrests.⁵ All of these effects represent costs that would be avoided under legalization. Legalization of currently illegal drugs would for this reason likely lead to an increase in both supply and demand and to a consequent increase in drug use. Note also that, since current enforcement efforts are concentrated on the supply side of the industry, most of this increase in use would be due to the increase in supply and the corresponding decrease in price.

Considering the intensity of current enforcement efforts, legalization could possibly lead to a rather significant increase in drug use. Arguing that such an effect is undesirable, however, is not to argue that drugs should be prohibited. Specifically, prohibition reduces drug use by imposing high costs on participants in the drug trade. Such costs could also be imposed through a policy that combines legalization with high taxes. Taxification, in fact, provides a spectrum between the two polar-extremes of prohibition with high enforcement and pure legalization (i.e.,

⁴ Net social benefits are defined as the difference between total benefits and costs to society.

⁵ Note that prohibition and enforcement give a comparative advantage to those who are able to enforce contracts effectively in a black market, who have learned how to avoid risk, and who are relatively willing to bear risk. This

without "sin taxes"). That is, taxification encompasses these extremes and also provides a range of intermediate policy options.

If a currently prohibited drug were legalized and taxed, any potential supplier would have the option to either sell the drug legally by paying the tax, or to evade the tax by selling the drug in the black market. Either choice has a specific cost. The cost specific to selling the drug legally is the tax which must be paid. The cost specific to selling the drug illegally is that associated with the inability to seek protection from the law and with the risk of punishment for tax evasion. Given that an economic profit could be guaranteed, a profit-maximizing supplier would choose the option with the lowest specific cost. This choice would be different for different suppliers. Specifically, although the tax on legally sold drugs would be the same for all suppliers, the cost of selling in the black market would be individual specific, as it would depend not only on the level of enforcement and punishment following detection but also on the ability of the particular supplier to avoid detection and on his willingness to bear risk.⁶ Consequently, those with no experience in black-market operations and with a high level of risk-aversion would be more likely to pay the tax, while those who are currently involved with the illegal sale of drugs would be more likely to evade the tax by continuing their black-market sales.

A supplier would only sell the drug legally and thus voluntarily pay the tax if (i) an economic profit can be realized, and (ii) the tax is less than the cost specific to selling in the black market. It follows that a "prohibitive" tax can be found, high enough to prevent all potential suppliers from selling the drug legally. With a reduction in the tax, however, entrepreneurs would find it profitable to enter the drug market and sell legally. The black market would shrink

explains the important role played by organized crime in the distribution of drugs and its recruitment of gangs to sell drugs at the street level.

⁶ It is also possible that certain citizens would never choose to sell in the black market for the simple reason that it is illegal, i.e., they would regard the engagement in an illegal activity *per se* as a cost.

due to the additional competition and the lower drug prices. The total quantity sold and consumed, however, would increase as the legal market would expand at a faster rate. With low enough taxes, the black market would be eliminated.

The level of tax evasion would also depend on the enforcement of the tax. Specifically, tax evasion would increase with the tax, but decrease with enforcement. Any taxification policy implemented by the government would therefore involve both the choice of tax and the choice of enforcement. Assuming that enforcement against smuggling to evade taxes is equally effective as against evasion of prohibition, a taxification policy that combines a prohibitive tax with enforcement expenditures equal to those under prohibition would be equivalent to prohibition. The polar extreme of this prohibitive taxification policy would be reached if the tax level and the level of enforcement were both reduced to zero. The optimal taxification policy would involve the enforcement-tax combination that maximizes the resulting net social benefits. This policy would generally be different for different drugs, but would for most drugs lie somewhere on the spectrum between the two extremes. For the most dangerous drugs, however, the optimal policy might combine a prohibitive tax with an enforcement even more stringent than current.

The effect of taxification is illustrated in Figure 2.1. AC describes the average production cost and is assumed to be constant. The demand curve, D , describes the relationship between the *effective* consumer price of the drug, p_e , and the total quantity demanded, Q_T , which is explained as follows:

Legalization would remove the risk costs incurred by suppliers and buyers of a drug traded in the black market. These costs would also be avoided under taxification if the drug was sold legally. We denote the risk costs borne by consumers when buying a unit of the drug in the black market by x^c and assume that they are the same for all consumers. Assume also that the

quality of the drug would be unaffected by taxification. If a legal market and a black market coexisted, a unit of the drug sold in the black market would at the margin thus be regarded by the

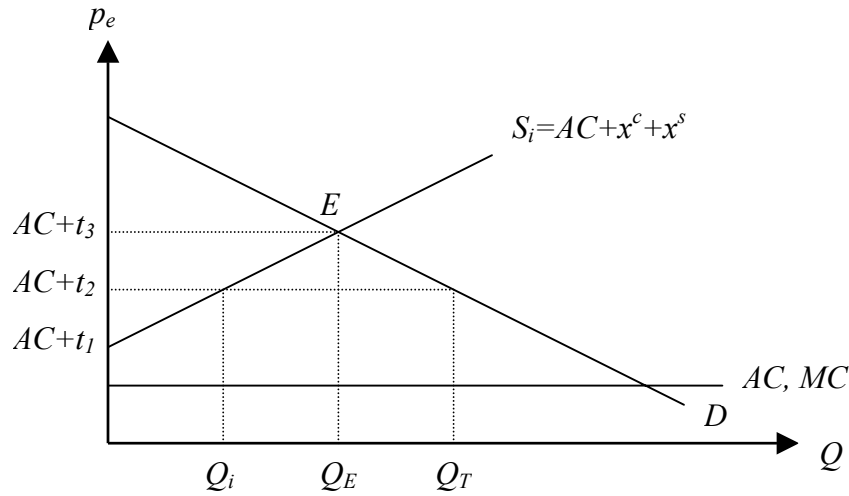


Figure 2.1 The effects of taxification of a currently prohibited drug

consumer as a perfect substitute for a unit sold legally for x^c dollars more. Consequently, in equilibrium there would be an x^c dollar difference between the *nominal* consumer prices – i.e., the amount of money paid by consumers for a unit of the drug – in the two markets, leaving the effective prices paid by consumers, p_e , the same. Letting p_i denote the nominal consumer price of the drug in the black (or illegal) market and p_l that in the legal market, this equality is expressed as $p_l = p_e$ and $p_i + x^c = p_e$, or $p_l = p_i + x^c$. The demand curve in Figure 2.1, D , shows the relationship between this effective consumer price and the total quantity demanded.

The black-market supply curve in Figure 2.1, S_i , describes the sum of the average cost of production, AC , the risk costs facing consumers, x^c , and the risk costs facing producers, x^s , at different quantities supplied. Assuming that suppliers are profit maximizers, it also describes the quantities supplied in the black market at different effective consumer prices. Given the effective

consumer price of the drug, p_e , suppliers would increase the quantity sold to the point where the marginal economic profit is zero, which in this case implies that $p_e = AC + x^c + x^s$.⁷ (The nominal price paid by consumers, which is the money payment received by suppliers, is at this point $p_i = p_e - x^c = AC + x^s$, which equals the marginal supply cost, risk costs included).

To illustrate the effects of introducing taxification, suppose initially that the drug considered is prohibited and that the market is in equilibrium at point E in Figure 2.1. All Q^E units of the drug consumed are thus purchased in the black market. Denote the equilibrium *nominal* consumer price (i.e., the monetary amount exchanged) by p_i^E , with corresponding effective consumer price $p_e^E = p_i^E + x^c$. Now suppose that taxification is implemented with a unit sales tax of $t_3 = p_i^E + x^c - AC$ per unit imposed simultaneously with the legal market opening. Also, suppose that enforcement efforts at this tax level remain the same as under current prohibition and are equally effective. Since consumers would be willing to pay an additional x^c dollars per unit at the margin if the drug was sold legally, the per-unit profit earned by a legal supplier if selling the drug at the price of $p_l = p_i^E + x^c$ would be $\pi = p_l - t - AC = 0$. That is, the price paid by consumers would just be high enough to cover production costs and taxes ($p_l = AC + t_3$). With zero profit margin, no incentive for legal entry would be provided and the black market would be left intact. The taxification policy that combines current enforcement expenditures with a unit sales tax of t_3 (see fig. 2.1) is thus equivalent to current prohibition policy. Any tax greater than or equal to t_3 , referred here to as the "equivalent tax," is thus a prohibitive tax.

⁷ This is similar to the equilibrium condition in a legal market (for any commodity), where the price paid by consumers equals the marginal supply cost plus the sum of the taxes levied on suppliers and on consumers.

It would take a tax strictly less than t_3 to induce legal supply. Consider, for example, a unit sales tax of $t_2 = t_3 - \varepsilon$ per gram (see fig.2.1), where $\varepsilon > 0$. A supplier who now sells the drug legally at a price of $p_l = p_i^E + x^c$ would earn a profit of $\pi = p_l - t_2 - AC = \varepsilon > 0$ per gram. Because of the positive profit margin, there would be an inflow of legal supply, which would continue until the nominal (and effective) consumer price for the legally sold drug has decreased to a level of $p_l = p_i^E + x^c - \varepsilon = AC + t_2$, which is the point at which the profit margin is reduced to zero.

The equilibrium price of the drug in the legal market would thus be directly determined by the tax. Since an equality between the effective consumer prices in the two markets is a condition required in equilibrium, the black-market price would also be directly determined by the tax. Specifically, a ε dollar reduction in the tax would reduce both the legal price and the black-market price by ε dollars. The corresponding reduction in the quantity supplied in the black market, given by the shape of S_i , would depend on the described risk costs, which, in turn, would depend on the enforcement rule chosen by the government. An enforcement rule which keeps enforcement constant at its current level would result in a relatively elastic black-market supply. An alternative rule which combines a reduction in the tax with a corresponding reduction in the enforcement of the tax would yield a less elastic supply.

The black-market supply curve, S_i , in Figure 2.1 corresponds to some specific enforcement rule. Given this rule, a reduction in the tax from t_3 to t_2 would lead to a decrease in the quantity supplied in the black market from Q_E to Q_i . Given D , the quantity demanded for the drug would consequently increase from Q_E to Q_T . A "shortage" of $Q_T - Q_i$ would thus be created in the black market. In equilibrium, this shortage is precisely the amount that would be sold legally. The black market would be eliminated if the tax is set low enough, in Figure 2.1 denoted

by t_1 . At this point, all of the total quantity consumed, given by demand curve D , is purchased in the legal market.

3. The Case of Cocaine

In order to estimate the social costs and benefits of taxification of cocaine, we follow the study by the RAND Corporation (e.g. Everingham and Rydell, 1994) where possible. According to the study, 314 metric tons of pure cocaine were purchased in the black market in 1992 at a price of \$126 per gram. We take the demand schedule as linear, with a price elasticity of demand, e_d , of -0.5 at the 1992 price-quantity equilibrium. It was explained in Section 2 why consumers would be willing to pay a higher price for a drug sold legally than for the same drug sold in a black market. We make the simplifying assumption that no such price difference exists.⁸ It was also explained in Section 2 that the price-elasticity of black-market supply under taxification depends on the enforcement rule implemented by the government. We take the black-market supply schedule as linear, with a with a price-elasticity of supply, e_s , of 2.0 at the current equilibrium.⁹ The corresponding demand and supply schedules are:

$$\text{Demand: } p = 377.2 - 0.8Q_d, \quad (3.1)$$

$$\text{Black-market supply: } p = 63 + 0.20Q_i^s, \quad (3.2)$$

⁸ This assumption would make taxification less advantageous to the extent that more tax revenues could be generated if consumers are willing to pay a higher price for legally supplied cocaine.

⁹ The RAND study estimated the price-elasticity of black-market supply under prohibition to -3.6, but assumed constant enforcement expenditures. Assuming that this estimate is correct, a price elasticity of 2.0 corresponds to an enforcement rule under taxification where a reduction in the tax level is followed by a rather significant decrease in enforcement of the tax. Such reductions in expenditures are, however, not included in our calculations.

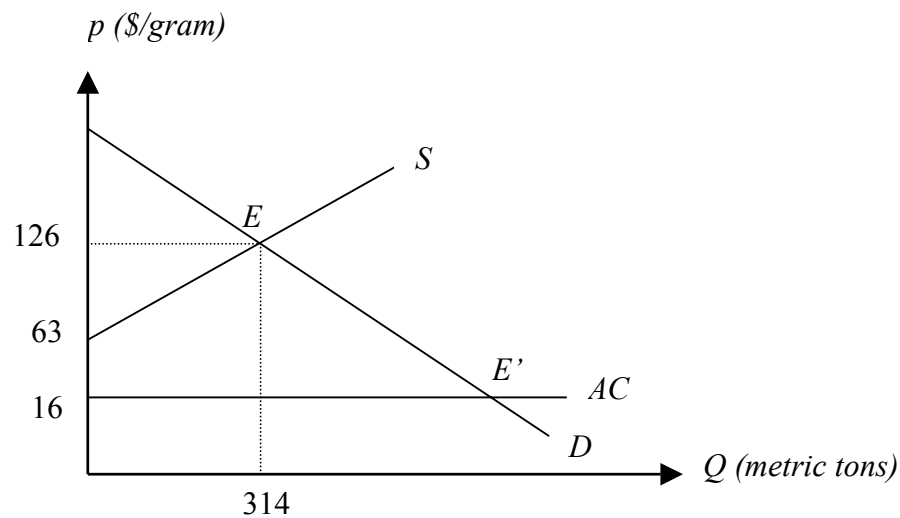


Figure 3.1 The black market for cocaine under taxification

where p denotes the per-unit price of cocaine (in dollars), Q_d the quantity demanded (in metric tons), and Q_i^s the quantity supplied in the black market (in metric tons).

These schedules are in Figure 3.1 represented by curves D and S , respectively. Current price-quantity equilibrium is illustrated by point E . With a constant average production cost, AC , taken at \$16 per gram, the "equivalence tax" is \$110 per gram.¹⁰ At this tax level, the profit earned by a legal supplier who sells cocaine at a price of \$126 is zero, hence no incentives for entry. Current equilibrium, E , would thus be achieved under a taxification policy which combines current enforcement with a tax level set at \$110 or above. The free-market equilibrium is illustrated by point E' and would be achieved if the tax and enforcement were reduced to zero. Intermediate taxification policies would be achieved for intermediate tax-enforcement combinations.¹¹

¹⁰ For the assumed value of \$16 for the production cost, we follow Moore (1990) who estimates that the retail price of cocaine would be reduced by approximately 90 per cent if cocaine were legal and not taxed.

¹¹ According to the RAND study, current enforcement expenditures on cocaine amount to \$12.05 billion annually.

Given the enforcement rule implemented by the government, the optimal tax is that which maximizes the resulting net social benefits. When estimating this tax level, the following elements are included:

1. *Social benefits of tax revenues, SB_{TR} .* Let Q_i^s denote the legal supply of cocaine under taxification. It was explained in Section 2 that the amount of legal supply at a given tax level is determined by the difference between the total quantity demanded and the quantity supplied in the black market. Accordingly, the following supply schedules are derived:

$$Q_i^s = 785.5 - 6.23p \quad \text{for} \quad 63 \leq p \leq 126 \quad (3.3)$$

$$Q_i^s = 471.5 - 1.25p \quad \text{for} \quad 16 \leq p \leq 63. \quad (3.4)$$

Since $p = 16 + t$ in equilibrium (zero-profit condition), we can write these equations as:

$$Q_i^s = 685.75 - 6.23t \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.5)$$

$$Q_i^s = 451.5 - 1.25t \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.6)$$

Tax revenues, TR , are derived by multiplying the unit sales tax by the amount of legally sold cocaine. This gives the following equations:

$$TR = 685.75t - 6.23t^2 \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.7)$$

$$TR = 451.5t - 1.25t^2 \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.8)$$

The tax revenues generated in the cocaine market represent money transfers that allow the government to reduce taxes elsewhere in the economy. Social welfare is increased as the overall level of tax distortions in the economy is reduced. We assume that 30 per cent of the tax revenues generated represents a social benefit. The following equations are derived:

$$SB_{TR} = 205.73t - 1.87t^2 \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.9)$$

$$SB_{TR} = 135.45t - 0.375t^2 \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.10)$$

2. *Private benefits of cocaine consumption, PB_{coc} .* The market demand curve for cocaine indicates the maximum per-unit price that consumers of cocaine are willing to pay for different quantities supplied. It thus also describes the marginal value of cocaine to its users. Refer to this value as the marginal private benefit of cocaine, MPB_{coc} . From equation (3.1) we have:

$$MPB_{coc} = 377.2 - 0.8Q_d \quad (3.11)$$

The total benefit received by consumers of cocaine at different quantities is described by the following equation:

$$PB_{coc} = 377.2Q_d - 0.4Q_d^2, \quad (3.12)$$

which can be written as:

$$PB_{coc} = 88764.9 - 20t - 0.625t^2 \quad \text{for} \quad 0 \leq t \leq 110. \quad (3.13)$$

3. *External costs of cocaine consumption, EC_{coc} .* Following the RAND study, we assume that the external cost of cocaine use is the sum of costs directly related to the quantity of cocaine consumed (\$67.6 per gram) and costs directly related to consumer expenditures on cocaine (\$0.1948 per dollar of expenditures). This gives the following equation:

$$EC_{coc} = 67.6Q_d + 0.1948pQ_d, \quad (3.14)$$

which can be expressed as:

$$EC_{coc} = 31928.64 - 0.4438t - 0.2535t^2 \quad \text{for} \quad 0 \leq t \leq 110. \quad (3.15)$$

4. *Production costs, PC_{coc} .* With an average cost of production at \$16 per gram, the following equation is derived:

$$PC_{coc} = 7224 - 20t \quad \text{for} \quad 0 \leq t \leq 110. \quad (3.16)$$

5. *Net social benefit of cocaine, NSB_{coc} .* The net social benefit of cocaine under taxification is measured by the following equation:

$$NSB_{coc} = SB_{TR} + PB_{coc} - EC_{coc} - PC_{coc}, \quad (3.17)$$

which we write as:

$$NSB_{coc} = 49612.26 + 206.17t - 2.25t^2 \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.18)$$

$$NSB_{coc} = 49612.26 + 135.89t - 0.7565t^2 \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.19)$$

Given the enforcement rule implemented, the optimal taxification policy involves the tax level which maximizes NSB_{coc} . From equations (3.18) and (3.19) we find a maximum of NSB_{coc} at a tax level of $t^* = \$47.0$ per gram, i.e., the level at which the black market would be eliminated. This tax yields net social benefits of an estimated \$54.33 billion. Current prohibition policy would be left intact under taxification if the tax is set at \$110 per gram. The net social benefits of cocaine under this policy are estimated to \$45.04 billion. Relative to current policy, optimal taxification would thus yield net benefits to society of an estimated \$9.28 billion. This estimate can be broken down the following way:

Taxification with tax of \$47.0 per gram would generate tax revenues that are maximized and equal to an estimated \$18.46 billion. Of these, 30 per cent, or \$5.54 billion, represent a social benefit (because of less tax distortions). Due to a reduction in the price of cocaine (from \$126 to \$63.0), optimal taxification would lead to an annual increase in cocaine production and consumption from current 314 metric tons to an estimated 392.75 metric tons. This increase represents a value of cocaine to its users of an estimated \$7.44 billion. This gives total benefits of \$12.98 billion. The external cost associated with the increase in cocaine consumption, and the cost of producing the additional cocaine, amount to an estimated \$3.70 billion, of which \$2.44 billion represent the external consumption cost. This gives net social benefits of optimal taxification relative to current prohibition policy of an estimated \$9.28 billion. The conclusion

Table 3.1. Net social benefits, *NSB*, of a cocaine taxification policy, relative to current prohibition, under alternative assumptions of the price-elasticity of demand, e_d , and the price-elasticity of supply, e_s .

e_d	e_s	<i>NSB</i>
- 0.5	2.0	54.3
- 0.2	2.0	113.2
- 1.0	2.0	35.7
- 0.5	3.0	55.2
- 0.5	1.5	53.0

Net social benefit, NSB, is measured in billions of dollars. The first row describes the base case.

that an optimal taxification policy would yield substantial net social benefits is also shown in Table 3.1 to be robust for alternative price elasticities to those used in our estimates.

Although the described taxification policy could generate significant net benefits to society, implementing the policy would nevertheless lead to an increase in cocaine use. In fact, any effective taxification policy of the kind described would lead to higher cocaine use. One potential problem with such a policy is that estimates of the external cost of cocaine use are subject to substantial uncertainty. It could also be argued that, because of the addictive nature of cocaine, the value of cocaine to its users should not be included in the calculations of the net social benefit of cocaine. Moreover, it might not be politically feasible to implement a cocaine control policy that would involve an increase in use. Accordingly, we suggest a second type of taxification policy under which cocaine use is held constant at current level by spending a part of the tax revenues generated in the cocaine market on treatment of heavy users of cocaine.

In order to estimate the effect of this policy, we make the assumption that annual expenditures of \$25 million on treatment of heavy users of cocaine, denoted here by exp_w , reduce

consumption by one metric ton, holding the price of cocaine constant.¹² The quantity of legally supplied cocaine under this policy is described by the following equations:

$$Q_i^s = 548.25 - 4.98t \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.20)$$

$$Q_i^s = 314 \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.21)$$

Corresponding tax revenues, TR , are:

$$TR = 548.25t - 4.9t^2 \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.22)$$

$$TR = 314t \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.23)$$

A portion of these revenues would be spent on treatment. Denoting this portion by $Treat$, the following equation is derived:

$$Treat = 3437.5 - 31.25t \quad \text{for} \quad 0 \leq t \leq 110. \quad (3.24)$$

Tax revenues, net of treatment expenditures, NTR , are described by:

$$NTR = 579.50t - 4.98t^2 - 3437.5 \quad \text{for} \quad 47 \leq t \leq 110 \quad (3.25)$$

$$NTR = 345.25t - 3437.5 \quad \text{for} \quad 0 \leq t \leq 47. \quad (3.26)$$

¹² The RAND study estimated that about \$21 million of expenditures on treatment programs would be necessary to reduce cocaine use by one metric ton. Since their study assumed that a reduction in demand would lead to a minor increase in price, however, a small portion of the reduction would be due to a price effect.

Table 3.2. Net tax revenues, *NTR*, resulting from a use-neutral taxification and treatment program under alternative assumptions on price elasticities and on the amount of expenditures on treatment, exp_{tr} , required to reduce cocaine use by one metric ton.

e_d	e_s	exp_{tr}	<i>NTR</i>
- 0.5	2.0	25	13.4
- 0.5	2.0	50	11.8
- 0.2	2.0	50	13.7
- 1.0	2.0	50	9.0
- 0.5	3.0	50	18.7
- 0.5	1.5	50	8.1

Net total revenues, NTR, are measured in billions of dollars. The first row describes the base case.

The optimal tax level under this taxification policy is that which maximizes *NTR*. From equations (3.25) and (3.26) we find a maximum of *NTR* at a tax level of $t^* = \$58.13$ per gram of cocaine. At this level, an estimated \$15.03 billion in tax revenues would be generated. Of this, an estimated \$1.62 billion would be used to finance treatment to offset the increase in cocaine use resulting from the decrease in cocaine price (from \$126 to \$74.13). This taxification policy would thus generate net tax revenues of an estimated \$13.41 billion without any increases in cocaine use. The general conclusion that a use-neutral taxification and treatment program will yield a substantial tax surplus is also shown in Table 3.2 to be robust for alternative elasticity and treatment-effectiveness assumptions.

4. Taking a Bite Out of Organized Crimes and Other Concluding Remarks

We have estimated the net benefits to society of two different policies involving legalization of cocaine combined with optimal taxation. For the first policy discussed, none of the tax revenues collected would be spent on treatment, thus allowing for cocaine use to increase.

In the second policy, cocaine use would be held constant by spending a small fraction of the revenues on treatment programs. Under the first policy, we estimated that taxification of cocaine would generate tax revenues of \$18.46 billion per year, but with a resulting 25.1 per cent increase in cocaine use and corresponding external costs of \$2.44 billion. Under the second policy, we estimated that the government would net \$13.41 billion in revenues, after deducting for the cost of sufficient treatment to prevent any increase in consumption.

Our calculations are likely underestimate the net benefits to society of taxification. The main reason for this is that taxification would reduce organized crime. Specifically, organized crime would be reduced as profits realized would decrease due to smaller sales and to loss of some of their monopoly power. This loss of monopoly power could be particularly high if penalties for smuggling in order to evade taxes under a taxification regime were less than for smuggling to evade prohibition. Under this type of taxification regime, the extent to which such tax evasion is reliant on the productive capacity for violence (in which organized crime has a comparative advantage) would likely be less than under prohibition. Thus organized crime would likely have increased competition from illegal as well as legal suppliers. Note also that, even though more severe punishment (under taxification) would increase the risk and the marginal cost schedule for a particular supplier, it would also change the composition of suppliers to those such as organized crime that have lower risk costs. If, in addition, organized crime can capture some economies-of-scale, it is entirely plausible that higher penalties would lead to increased supply. For related reasons, taxification would also likely reduce the demand for addictive drugs. Specifically, organized crime often recruits new users as an advertisement tool. As a consequence of the scenario sketched above, the most monopolistic suppliers, i.e., organized crime, would have greatly reduced recruiting activity.

There are also other reasons why our calculations are likely to underestimate the net social benefits resulting from taxification. First, due to lower drug prices and consequent lower consumer expenditures, crimes committed by drug abusers to support habits would be reduced. Second, taxification would most likely lead to improved quality control, which would reduce the rate of poisonings and overdoses. Third, prohibition unnecessarily reduces personal liberty in those cases where only the user's welfare is affected by her use. Under taxification, users would be able to purchase the drug at a price closer to its cost, and be able to do so without breaking the law.

The conclusion that taxification of cocaine is welfare improving may extend to other drugs as well. The case for taxification across a broad spectrum of drugs (including the possibility of prohibitive taxes for the most dangerous drugs) becomes even stronger due to the possibility of substitution in drug demand. By legalizing drugs with lower social cost (e.g. marijuana) and keeping tax rates at revenue maximizing levels, substitution of less harmful for more harmful drugs would be effected, likely resulting in decreased total harm as well as substantially increased revenue. Total welfare could then be significantly increased by allowing a revenue neutral substitution for more distortionary taxes.

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