Legalizing Drugs:
Lessons from (and about) Economics

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THE MOST AUDIBLE PORTIONS OF THE DEBATE OVER drug policy in the United States are the polarized extremes: the conservative call for more aggressive (some would say draconian) law enforcement on the one end and the libertarian plea for policy shock therapy — drug legalization — on the other. Characterized by competing visions of a dismal future (should the opponent's position emerge victorious), the debate has engaged otherwise subdued policy analysts in published exchanges exhibiting an extraordinary emotional intensity and even vitriol (Scarlett et al. 1990; Wilson 1990).

Reading around and among the rhetorical flourishes, one discerns two distinct battlegrounds for the debate: a philosophy/morality terrain and an economic terrain. The former encompasses disparate concerns about the message that legalization would send to children, for example, and debate over the extent and legitimacy of the state's regulating the behavior of adults (Nadelmann 1989; Wilson 1990; Sterling 1990; Ostrowski 1990). The tone of this component of the debate is captured in stereotypical catchwords like "zero tolerance" and "just say no" and in emotive statements such as "The war on drugs [is making] our Bill of Rights into a shattered remnant of the vital shield it once was" (Sterling 1990).

On its surface, the economic battlefield is less emotive, but it is no

less important. At the core of debate lie conflicting beliefs about the
health effects of drugs and their economic ramifications, under various
conditions of regulation and availability, as well as the health and eco-
nomic implications of criminalizing drug sale and use. Jarvik (1990) re-
cently concluded that "the principal argument for drug legalization is
economic," an observation echoed explicitly, or implicitly, by interested
parties from both extremes of the debate, as well as from its middle.
The leading academic proponent of legalization has framed the policy
issue largely in cost–benefit terms, albeit qualitatively (Nadelmann
1989). Furthermore, the arguments in recent writings advocating legal-
ization are grounded in explicit cost–benefit calculations (Dennis 1990;
Ostrowski 1990). To counter the legalization argument, opponents have
also employed economic reasoning (Wilson 1990) and estimation (Kon-
dracke 1988).

The frequency of the recent appeal to economic logic suggests the
perceived utility and perhaps innate attraction of "the dismal science"
to drug policy warriors of all political stripes. To many observers, cost–
benefit analysis and other modalities of economic analysis connote ratio-
nality, dispassion (objectivity), comprehensiveness, and decisiveness
(answers), all values to be sought in the emotional heat and confusion
of the drug policy debate.

In practice and even in theory, however, the potential of economic
analysis may fall far short of such expectations. To date, cost–benefit
analysis has been applied in the drug policy arena as an advocacy tool
with a clear prescriptive intent; the published literature reveals no unbi-
ased positive science applications. The utility of future economic anal-
ysis will be essentially qualitative: given inherent limitations, at its best
such analysis can and should serve to orient analysts' and policy makers'
thinking about drug policy. An effective cost–benefit study, for exam-
ple, should help to identify critical issues and to clarify which questions
are most deserving of further investigation. It will not "determine" an
optimal policy.

Further, much as we might wish it to do so, economic analysis will
never resolve the "great unknowns" of the drug policy debate; but it
may offer helpful insights. Preeminent among the "great unknowns" is
the question of how much, if at all, legalization would increase drug
consumption, and to what effect. Although not answering this critical
question, analysis of the price elasticity of demand for drugs can narrow

the range of plausible estimates and focus attention on the most important parameters. Research by economists has already offered assessments of the likely effects of drug interdiction efforts on street price (Reuter, Crawford, and Cave 1988). Early research on the relationship between drug prices and urban crime rates could serve as a model for more contemporary analysis (Brown and Silverman 1974). In the realm of the licit drugs, application of "price elasticity of demand" analysis to tobacco and alcohol consumption has made significant contributions to policy (Cook 1984; Warner 1986; Coate and Grossman 1988) and may shed light on changes in demand for the currently illicit drugs under a regime of legalized or decriminalized availability (Warner et al. 1990).

This article distills the essence of the economic argument employed in the drug policy debate, as it is embodied in the language of cost–benefit analysis. I will also discuss the insights generated by study of the price elasticity of demand for drugs. In both instances, my interest focuses on contributions found in the published literature and on the as-yet unrealized potential of analysis, with the purpose of examining the validity and utility of applying economic methods and thinking in the area of drug policy. The ensuing pages offer no answers to pressing questions in the drug policy debate. I will present no new empirical analysis, thus precluding the derivation of specific substantive conclusions. The objective, rather, is to develop appreciation of the potential and limits of one discipline's analytical armamentarium in grappling with a social and policy dilemma that knows no disciplinary boundaries.

To concentrate attention on issues of economic analysis, rather than differences in illicit drug types and policy approaches, I will consider a single policy model, legalization, without distinguishing drug types. The focus on legalization reflects the fact that it has been the principal model in which cost–benefit analysis has constituted a major component of the policy debate. Legalization can take many forms, ranging from an unfettered "supermarket" of freely available drugs to highly regulated conditions of sale and promotion, with restrictions on age, time, place, and conditions of use (Kleiman and Saiger 1990). Obviously, costs and benefits will vary widely depending on the characteristics of the specific policy under consideration (Moore 1977), as well as the drug in question. The costs and benefits of legalizing marijuana, for example, would be expected to differ, likely substantially, from those associated with legalizing crack cocaine (Kleiman and Saiger 1990).

Cost–Benefit Analysis

Cost–benefit analysis (CBA) and its close relatives, cost–effectiveness analysis (CEA) and cost–utility analysis (CUA), are nothing more, nor less, than a formal accounting and comparison of the negative and positive consequences of a policy decision, a paradigm for thinking about rational decision making (albeit one molded by the economist's perspective, and biases). Throughout this paper, the term "cost–benefit analysis" will be employed to refer generically to all three techniques. The techniques are discussed in detail by Warner and Luce (1982).

Cost–benefit analysis is both much maligned and effusively praised. A dispassionate appraisal of both the technique and its applications suggests that neither reaction is wholly warranted. The naive enthusiast tends to perceive CBA as imbued with some mystical ability to forge coherence from chaos, to objectify the diverse parameters of complicated decision problems, and thus to discern ultimate truths. A CBA, however, is no better than the analyst performing it and is subject to the analyst's errors of omission and commission and problems of bias.

Whereas the enthusiast exaggerates CBA's capabilities and usefulness, the technique's most vociferous detractors tend to exaggerate and decry its influence. They see it as a technocractic decision-making mechanism that, intentionally or otherwise, suppresses critical qualitative inputs, and thereby subverts decision making. However, given the technical limitations of CBA (discussed below and by Warner and Luce [1982]) and the dominance of political and bureaucratic factors in policy decision making, the principal role of CBA is, and ought to be, as a decision-*assisting* technique. That is, at its best, CBA should aid decision makers — not replace them — by providing insight into the objective dimensions of inherently subjective policy decisions (Warner and Luce 1982).

Examination of the published literature on the application of CBA to the issue of drug policy vividly illustrates both the limits of analysis and its potential to make a modest contribution to the ongoing policy debate.

Applications in the Published Literature on Drug Legalization

The spirit of cost–benefit analysis explicitly pervades much of the literature both supporting and criticizing a policy of drug legalization. Actual

attempts at empirical CBA number only a handful, each subject to significant deficiencies.

The Conceptual Framework. The "godfather" of the cost–benefit argument favoring drug legalization is Milton Friedman, Nobel laureate in economics, known for his energetic and articulate defense of the free market. Two decades ago, following President Nixon's declaration of a war on drugs, Friedman (1972) advocated drug legalization as the policy likely to minimize the harms associated with drug abuse. Although not framing his argument in explicit cost–benefit terms, he derived his position from a qualitative assessment of the social costs of a policy of illegality (and hence the benefits of legalization), bolstered by a philosophical position concerning individual liberties.

In a prominent article published in *Science*, the leading academic proponent of legalization in the contemporary era, Ethan Nadelmann (1989), presents a reasonably comprehensive identification of the items of cost, benefit, and risk that would comprise a formal cost–benefit analysis, but he does not purport to perform a CBA and indeed does not refer to cost–benefit per se. Nevertheless, by virtue of enumerating so many of the positive and negative implications of both legalization and the law enforcement status quo, this article constitutes an initial blueprint from which one could begin to construct a CBA. At the heart of Nadelmann's analysis favoring legalization is the argument that the major costs associated with illegal drugs are created by the fact of their illegality. This is a theme that pervades the writings of proponents of legalization. Ostrowski (1990), for example, develops specific estimates of the mortality toll associated with illegal drugs, attributing the vast majority of it to the criminalization of drug use and sale, as noted below.

Building on Nadelmann's work, development of a CBA would benefit by consulting Nadelmann's critics as well (e.g., Kondracke 1988; Wilson 1990), both to identify additional categories of costs and benefits and to develop appreciation of the range of estimated values associated with each. An essential supplement is the recent work of Kleiman and Saiger (1990), who consider costs of legalization downplayed by Nadelmann and other supporters of legalization. More generally, an older paper by Moore (1977) concerning the legalization of heroin provides an unusually thorough and well-organized cataloging of the dimensions of the drug problem. Moore analyzes the arguments and evidence pertaining to four of these attributes in tables organized by alternative visions of predicted effects of legalization.

Among the papers making qualitative contributions to drug policy CBA, the work of Nadelmann, Kleiman and Saiger, and Moore likely represents state-of-the-art thinking at this early stage of CBA interest in drug policy. At the opposite end of the spectrum is another recent article published in *Science*. In a generally instructive review of evidence pertinent to the legalization issue, Goldstein and Kalant (1990) conclude that "from a cost–benefit analysis based on pharmacologic, toxicologic, sociologic, and historical facts, . . . [legalization] would be likely, on balance, to make matters worse rather than better." Despite the wealth of information presented by these authors, the article offers *no* explicit cost–benefit comparisons, quantitative *or* qualitative. This appears to be a dramatic illustration of using the cost–benefit label to confer "legitimacy" on a subjective conclusion.

Quantitative Analyses. The handful of quantitative cost–benefit comparisons in the published literature employs "hard" numbers to lend an aura of objectivity to the authors' political and philosophical positions on drug legalization. Despite their quantitative orientations, these analyses fall far short of the standards an economist would expect of a rigorous CBA. Nevertheless, these early applications of CBA to the issue of drug legalization are instructive for both the potential and pitfalls of formal quantitative analysis.

One of the most comprehensive evaluations of legalization published to date, that of Ostrowski (1990), includes a CBA as a component of a more expansive examination of the arguments supporting "The Moral and Practical Case for Drug Legalization." A similar economic argument is developed by Dennis (1990). Unabashedly presented as advocacy for legalization (of marijuana and noncrack cocaine in Dennis's case), these articles employ specific estimates of the potential increase in drug addiction under legalization and explicit estimates of economic costs and benefits of legalization.

In Dennis's article, the benefits of legalization include eliminating the cost of government prosecution of the drug war (this includes aggressive application of the domestic criminal justice system, from arrest to incarceration, and combatting efforts by the Colombian drug lords); tax revenues derived from sale of legalized drugs; and avoidance of specific social costs of drug use, including drug-related health care costs, productivity losses, and the value of stolen property associated with drug-related crime.

Ostrowski's economic evaluation includes similar variables, with a few

important distinctions in categories of costs and in specific estimates, the former reflecting a greater economic sophistication. Notably, Ostrowski avoids a technical error committed by most proponents of legalization, including Dennis: valuing drug-related theft as the cost of stolen property. Such property does not cease to exist once stolen; rather, it is "transferred," or "redistributed," from its rightful owners to the thieves. As such, its value does not measure a social cost to be avoided (and hence to become a benefit) under legalization. Rather, the true cost of the criminal activity includes its psychosocial effects on the immediate victims and the value of their time devoted to replacing stolen items. There are also potentially profoundly important psychosocial costs for those who *fear* becoming victims. In the quantitative dimension, an associated cost of drug-related crime, ignored in many discussions of drug policy, is Americans' investments in home protection devices (burglar alarm systems, guns, etc.). All such costs – the true social costs of drug-related crime – are much more difficult to measure, much less to value, than the worth of stolen property. Although Ostrowski includes home protection costs in his cost–benefit arithmetic, neither he nor anyone else has tried to place a value on the psychosocial costs, despite the possibility that they constitute the single greatest aggregate drug-related burden imposed on society.

Despite Ostrowski's appreciation of the transfer issue, the single largest item in his assessment of the costs of prohibition is itself a transfer: the above-market expenditures on drugs paid by consumers, totaling some $70 billion by his estimate.

In a similar vein, the excise tax "benefits" associated with taxation of legalized drugs constitute a substantial item on almost all prolegalization lists of benefits, including that of Dennis. (Even many opponents of legalization acknowledge this "benefit.") However, the tax revenues represent transfers from drug dealers (when illegal) to governments (when legal) (or from consumers to the government, in the instance of people who would use drugs when legal but not when illegal). As such, from a true *social* perspective, the tax revenues constitute neither a cost nor a benefit. From the (narrower) perspective of revenue-seeking governmental units, they do represent a benefit.

In practice, another limitation of CBA concerns its difficulty in handling the distributional implications of differing drug policies. With the burden of drugs and their illegality experienced disproportionately in the urban ghetto, one might assume that policy costs and benefits expe-

rienced by ghetto residents should be weighted more heavily than those experienced by suburban dwellers, for example. Yet CBAs on a myriad of subjects have rarely differentiated cost and benefit measurements in this fashion, and to date none of the quantitative analysis of drug policy has addressed this issue.

Although the ghetto currently bears a disproportionate share of the social burden of the drug trade, it may also receive a disproportionate share of the economic rewards of the illicit industry. If legalization increased drug use and reduced the black market, the economic impact on the ghetto community, in terms of reduced income flow, could greatly exceed that experienced by surrounding areas, while the social burden of drug use conceivably could increase. In principle, CBA ought to be able to distinguish such differential impacts, but the track record of analysis in other areas does not offer much reason for optimism.

These examples illustrate the technical failings found in drug policy CBAs, many of which only an economist would notice. The most important limitation of CBA, both in principle and practice, relates to a different and inescapable problem: how to represent, in the quantitative calculus of CBA, the existence and importance of major consequences of drug policies that do not lend themselves neatly to quantification or valuation. Only if all of the important consequences of each policy could be quantified and valued could CBA be expected to produce "answers" to the evaluation question. Yet the outcomes of drug policies include many of great importance that defy meaningful quantification. Proponents of the law enforcement approach, for example, believe that the availability of psychoactive drugs, under a regime of drug legalization, would (further) erode the moral fabric of the society (Wilson 1990). How could one quantify, much less value, this consequence? Similarly, how could one quantify the libertarian's exasperation with a drug restriction law that prohibits adults from engaging knowingly in behaviors affecting only themselves (Sterling 1990; Ostrowski 1990)?

A design feature of the best CBAs involves structuring the analysis in a manner that will readily and clearly permit readers to juxtapose the formally valued consequences of a policy against these unquantified qualitative issues (here, the "philosophy/morality terrain") (Warner and Luce 1982). Kleiman and Saiger (1990) assert, however, that the "consequentialist" argument (roughly analogous to quantifiable impacts) and the debate about "liberty and virtue" are wholly irreconcilable. Like

Kleiman and Saiger, Ostrowski (1990) devotes much of his comprehensive article to the ethical and philosophical issues, yet he makes no explicit attempt to integrate these dimensions with the economic. Having taken the reader through a lengthy assessment of quantifiable costs and benefits, he concludes his analysis with the statement that "utilitarian analysis breaks down and drug legalization unavoidably becomes a moral issue."

The juxtaposition that I propose here does not conflict with the basic point made by these writers. Rather than suggesting that quantifiable and qualitative considerations are directly comparable, the juxtaposition simply clarifies the drug policies' implied trade-offs between tangible health, crime, and economic outcomes and less tangible (but not necessarily less important) philosophical implications. Explicit acknowledgment of the trade-offs also reinforces mutual recognition by adversaries in the debate of both the quantifiable and philosophical dimensions of drug policy. No answers will emerge from such comparisons. Perhaps a modest incremental understanding will.

Finally, the problem of developing valid and reliable measures of policy consequences that are in principle quantifiable is at least equally important in limiting the contribution of formal analysis, if more prosaic than the difficulties inherent in grappling with distributional and philosophical issues. For example, both proponents and opponents of drug legalization concur that legalization per se could (opponents say "would") increase the size of the drug-consuming population. However, the two sides differ wildly in their estimates of the magnitude of the effect. Whereas Dennis (1990) considers an estimate of two million cocaine addicts a "worst case" scenario in a postlegalization world, Kondracke (1988) estimates the number at "somewhere between" 8.5 million and 42 million. A difference of this magnitude radically shifts conclusions in the cost–benefit calculus, much of which depends on the size of the drug-abusing population (for estimates of needed health care, social costs, etc.). Not surprisingly, Kondracke's calculations lead him to conclude that legalization would be a dismal economic failure, not to mention its implications for health and social disruption.

Dennis calculates that "almost a 100 percent increase in the number of addicts would be required before the net benefits of drug peace equaled zero. This would seem to be a worst-case scenario." This is considerably more conservative than Ostrowski, who sees *no* prospects of

the "net benefits of drug peace" ever equaling zero. He concludes that "in order for legalized drug use to match the overall death toll of prohibition [which he estimates at roughly 8,000 deaths per year], use would have to increase more than thirteen-fold." In contrast, opponents of legalization estimate that, under their assumptions, the death toll could rise as high as 100,000 to 500,000, staggering figures comparable only to the toll of the legal drugs, tobacco and alcohol (McDonald and DuPont, as cited in Kondracke 1988).

Differences of this magnitude highlight the essential issue in the nonphilosophical debate over drug legalization: what would happen to consumption levels under legalization, and to what effect? Proponents and opponents of legalization diverge radically on both questions. Some "legalizers," for example, argue that a regime of legalized drugs, regulated drug dosage and purity, as well as circumstances of use, could decrease the health toll from drugs, despite increased use, with drug-related mortality falling from its current level of a few thousand per year (Nadelmann 1989). Ostrowski (1990) develops this argument with detailed calculations comparing the death toll directly caused by drug consumption per se (which he characterizes as small) with that produced by the illegality of use (relatively much larger). The latter reflects poisonings and overdoses caused by adulteration of drugs, variations in dosages, and dirty needles. It also includes murders associated with black market activity.

One theme underlying the legalization camp's expectation that the health cost of legalization would be modest, if not absent altogether, is the possibility of drug substitution. Most frequently mentioned is the prospect that, if legalized, marijuana might be substituted often for alcohol consumption, in which case society might witness a decrease in both the health and the economic burdens of drug consumption. Contemplating the legalization of cocaine, Ostrowski develops specific illustrative estimates of mortality benefits, concluding that an increase of ten million cocaine users would lead to a substantial net decrease in drug-related deaths if "a mere five percent of these users switched to cocaine from tobacco." Opponents of legalization have largely ignored the substitution issue, typically increasing health toll estimates proportionate to their estimates of consumption increases. To date, the extent of drug substitution, and its implications for health and social costs, remains exclusively a matter of conjecture.

Potential Contributions

Despite the limitations of drug policy CBA, careful identification of costs and benefits, regardless of how amenable each is to quantification or valuation, can improve the caliber of the drug policy debate. It can make interested parties aware of important consequences that may have escaped their attention (intentionally or inadvertently). It can force advocates to acknowledge and confront considerations that challenge their positions. It encourages a thoughtful weighing of negatives and positives. It may focus attention on the important unknowns. Careful cataloguing of the diverse cost and benefit categories may even encourage examination of the usefulness of alternative paradigms for dealing with "the" drug problem, be they the public health model (Jonas 1990; Mosher and Yanagisako 1991) or the criminal justice model (Office of National Drug Control Policy 1989; Sterling 1990), each of which arguably tends to undervalue the concerns of the other.

Clearly, addressing the quantitative dimensions of a policy question is CBA's long suit. The published literature offers notable examples of where CBA can offer useful perspective on the quantifiable implications of drug policies. A reasonable degree of agreement can be reached concerning the law enforcement costs associated with current policy, for example, and hence the potential savings associated with legalization. Kondracke (1988), a strong opponent of legalization, values the law enforcement costs associated with illegal drugs close to the figures employed by Ostrowski and Dennis. As such, differences in estimates of these costs could not explain the (opposite) "bottom line" appraisals of legalization.

In contrast, estimates of the health effects of legalization vary dramatically. Quantitative treatment of this "great unknown" may not reveal any bottom-line "truths," but it does demonstrate the use of sensitivity analysis. One of the critical design features of cost–benefit analysis, sensitivity analysis, entails varying the values of uncertain parameters to determine whether the uncertainty significantly affects the qualitative findings of analysis (e.g., whether or not one policy approach is clearly preferred to another). Both Ostrowski and Dennis illustrate the use of sensitivity analysis in their handling of possible increases in legal drug use and the associated health effects. Dennis calculates a "break-even" increase in the prevalence of use that he characterizes as a

"worst-case" scenario; that is, he estimates the increase in drug use, under legalization, that would eliminate the cost–benefit attraction of legalization, and he considers this increase highly improbable (the "worst case"). Both "break-even" analysis and "worst-case" analysis are standard methods of sensitivity analysis (Warner and Luce 1982).

In developing estimates of the costs and benefits of legalization, opponents employ alternative sets of assumptions concerning the lethality of drug use per se, the nonfatal health effects of addiction, and other consequences of drug use. Comparison of opponents' approaches with those of the "legalizers" illuminates critical issues in developing refined (and hopefully less biased) estimates of the health effects of legalization. The disparity in estimates thus itself serves to refine the research agenda.

The emotionality of the drug policy issue, combined with the enormous discrepancies in the health consequences estimated by those favoring and opposing legalization, suggests an alternative approach for the use of CBA to enlighten the drug policy debate. Rather than strive for an objective study performed by unbiased analysts—the sine qua non of "proper" CBA—one might seek competing analyses prepared by proponents of each position, perhaps even establishing a forum for an adversarial proceeding featuring the competing analyses. This pragmatic approach would utilize the reality of the current environment of analysis of drug policy, and by making the analytical competition explicit, might produce new insights where they are sorely needed.

Analysis of Drug Price and Consumption

A Brief Primer on the Law of Demand and Its Relation to Drug Policy

Economics is blessed with a few universal laws. Preeminent among these is the law of demand, which states that there is an inverse relationship between the price of a commodity and the quantity of the good demanded by consumers. While few people would question the law's applicability to the demand for cars, for example, many believe it does not apply to addictive drugs. According to the conventional wisdom, addicts have a "fixed" demand for their drug, regardless of its price. In the instance of highly addictive drugs, this perspective suggests, demand will not comply with its famous "law."

In point of fact, however, addicts' demand for drugs complies fully with the law of demand, an observation deriving from such disparate sources as survey research and experimental evidence from laboratory research. This is true for both the licit and illicit drugs — for tobacco and alcohol, as well as for cocaine and heroin — and the law even holds across species: addicted laboratory animals demand less of their drugs when the "price" of obtaining them — for example, the number of times they must push a lever — is increased (Griffiths, Bigelow, and Henningfield 1980). Indeed, based on data reflected in graphs in Griffiths, Bigelow, and Henningfield (1980), I have calculated that the animals' "cost response" patterns are similar to those of humans consuming alcohol and tobacco.

The best evidence pertaining to drug users' price responsiveness is found in the literature on the price elasticity of humans' demand for alcohol and tobacco. A measure of demand's responsiveness to changes in price, price elasticity is defined as the percentage decrease in demand induced by a 1 percent increase in price. The larger the coefficient of elasticity (in absolute value), the more "elastic" is demand.

Comparison of the price elasticities of demand for alcohol and tobacco suggests (but does not prove) that addiction may *reduce*, but not eliminate, price response. An estimated 90 to 95 percent of smokers are addicted, compared with approximately 10 percent of drinkers. The demand for cigarettes is relatively inelastic, on the order of −0.25 to −0.45 in the United States (i.e., a given percentage increase in price will decrease demand by a quarter to almost half as much) (Chaloupka 1991; Lewit and Coate 1982; U.S. Department of Health and Human Services 1989). Estimates of the elasticity of demand for alcoholic beverages vary by product category, but generally exhibit greater elasticity than similar calculations for cigarettes. Reviewing the recent U.S. literature, Saffer and Chaloupka (1991) report mean estimates of a demand elasticity of −0.72 for distilled spirits, −0.68 for wine, and −0.47 for beer.

The implications of addiction for consumers' price responsiveness are the subject of increasing attention within the discipline of economics at present, driven primarily by the development of a "theory of rational addiction" by Becker and Murphy (1988). Unlike the conventional wisdom, which treats addictive consumption as irrational, or arational, this theory attempts to explain, in an economic model, how consumers can choose, rationally, to consume addictive products, aware of the implications for future consumption patterns. Empirical work fitting this model

"worst-case" scenario; that is, he estimates the increase in drug use, under legalization, that would eliminate the cost–benefit attraction of legalization, and he considers this increase highly improbable (the "worst case"). Both "break-even" analysis and "worst-case" analysis are standard methods of sensitivity analysis (Warner and Luce 1982).

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is cited by proponents as supporting the notion that consumers may be-
have rationally in consuming addictive substances (Chaloupka 1991;
Becker, Grossman, and Murphy, 1991). It is difficult, however, to dis-
tinguish these findings from those appearing in studies that do not con-
sider addiction as a special factor in consumption (U.S. Department of
Health and Human Services 1989). Critics of the rational addiction per-
spective point to its limited applicability, particularly when applied (as
it has been) to cases like cigarette smoking (Chaloupka 1991). They con-
tend that children — the population of new nicotine addicts — have no
conception of addiction or its implications (Thomas Schelling, personal
communication, August 16, 1991).

Effects of Drug Policies on Price and Consumption

How drug policies affect consumption through their effects on price has
two separable components: (1) how policies influence prices and (2) how
the prices of specific drugs affect their demand.

I have addressed the second component, but I have not offered quan-
titative estimates of the price elasticity of demand for illegal drugs.
Clearly, drugs will vary in the demand elasticities that they exhibit.
However, lacking good data on humans' patterns of drug consumption,
as they relate to effective market prices, it will be exceedingly difficult
to predict elasticities for a given drug with any sense of precision. At-
tempts can be made to employ government survey data on drug use,
combined with estimates of market prices, to derive demand elasticities;
but both consumption and price data are likely to be significantly
flawed (Drug Policy Foundation 1991). There are virtually no studies of
the price elasticity of demand for illegal drugs among humans. Years
ago, Brown and Silverman (1974) published a relevant and intriguing
analysis of the relationship between heroin price and crime rates. Ac-
knowledging serious problems in both price and crime data, the authors
provided tentative estimates of the price elasticity of each of several ma-
jor crime categories in New York City. In general, they found increases
in rates in most crime categories as heroin prices increased, with all of
the elasticities less than 1.0. Unfortunately, it is not possible to extrapo-
late directly from this analysis to estimation of price elasticity of demand
for heroin per se. Nevertheless, this type of analysis is relevant to esti-

mating the crime costs associated with the high prices of heroin's illegality.

As an alternative strategy to contemplating demand elasticities for illicit drugs, one can draw on analyses of humans' price elasticity of demand for the principal legal drugs, and estimates of price elasticity from data on lab animals' behavior, to develop a range of estimates of likely price responsiveness for the now illegal drugs. Although neither method promises any precision, both hold significant potential for producing "ball park" estimates that will realistically delimit the likely effects of price changes on drug consumption. Kleiman (1989) illustrates the analytical thought process in an evaluation of the price elasticity of demand for marijuana that relies, in part, on analysis of the price elasticity of demand for cigarettes.

The first component of the policy–price–consumption question can be addressed both qualitatively and quantitatively. Qualitatively, for example, we can observe that current policy — the aggressive law enforcement model — should increase monetary drug prices by reducing supplies. In addition, intensified apprehension, prosecution, and penalizing of drug users may increase users' perception of the *effective* price of acquiring drugs (Becker 1968). At the opposite end of the policy spectrum, legalization would almost certainly decrease drug price — both monetary and psychological — possibly quite substantially.

The critical point here is that the relevant or true price affecting decision making about consumption is the price as it is perceived by the drug user (Reuter and Kleiman 1986). Perceived price consists of monetary outlay plus fear of apprehension and punishment, as well as time and hassle costs of acquiring drugs. Legalization would entail a clear decrease in the psychic costs of buying drugs because the fear element is removed. Note, however, that availability per se need not increase. The availability of legal drugs could be limited by place, time, and other restrictions that could increase effective price. (Some observers suggest that the thrill of engaging in illicit behavior may entice more people to use drugs than the fear of illegality discourages from use. If this were true, whereas legalization would still decrease the component of perceived price of drug use associated with fear of illegality, it would decrease a "benefit" of use, the thrill, even more.)

Critics of legalization point to the fact that, under legalization, the monetary component of effective price would have to be decreased

enough to remove the incentive for illegal, or black market, trade (Klei-man and Saiger 1990). This, in turn, would increase demand (subject to the above caveats concerning the nonmonetary components of effective price). To minimize price-related increases in demand, the optimal price under legalization theoretically would be the highest price that could be sustained without inducing significant illicit trade or criminal activity on the part of the consumer. Some observers believe that this price would not be able to exceed production cost by much, that small increments over cost would induce black market activity (Drug Policy Foundation 1991). The evidence points to the contrary, however. Alcohol and tobacco retail prices greatly exceed production cost and there is no evidence of significant illegal trade in these commodities. Illegal trade itself entails significant costs that have to be incorporated into the black market price. Drug price in a regime of legal drugs could exceed production cost substantially, the major difference presumably reflecting government-levied taxes (or their equivalent in a regime of government-controlled sale). Still, legal drug prices would fall far short of those found under conditions of illegality. Former "Drug Czar" William Bennett estimated that the free-market price of cocaine (devoid of taxes) would run about one-twentieth of the current black market price (Office of National Drug Control Policy 1989).

The potential "width" of the gap between production costs and retail prices is indicated by international data on cigarette prices. In the United States, tax constitutes only 27 percent of the average retail price of cigarettes ($1.82 per pack), while it exceeds 50 percent in at least a dozen industrialized nations, where price per pack ranges up to $8.74 (in New Zealand)(Action on Smoking and Health 1991). None of these countries reports serious problems with illegal activity, with the recent exception of Canada, which has a unique situation: the difference between Canadian and U.S. prices is dramatic, and much of the border is unpatrolled. Within the United States, interstate price differences have at times prompted some interstate cigarette smuggling ("buttlegging"), although the extent of this phenomenon is believed to be quite small (Advisory Commission on Intergovernmental Relations 1985).

Quantitatively, economic analysis can be employed to assess the effects of selected policies on drug price. The best example to date is the work of Reuter, Crawford, and Cave (1988), who analyzed the effects on domestic drug consumption of increased governmental interdiction prior to the arrival of drugs at the U.S. border. Because smuggling costs

comprise such a small share of total drug distribution costs (about 10 percent in the case of cocaine), the authors concluded that even substantial success with interdiction efforts would have only very modest effects on domestic drug price, availability, and consumption. Through careful modeling and judicious use of sensitivity analysis, the authors were able to explore a variety of quantitative assumptions in determining that their principal conclusion was quite robust, despite uncertainties about specific parameter values. This study is not the last word on the subject—ongoing research may challenge the conclusion (Mark Moore, personal communication, October 7, 1991)—but it indicates the potential power and usefulness of economic analysis in this arena.

Although economic analysis holds the potential to develop important new insights concerning the relationship between drug policy and consumption, as mediated by price, no one should underestimate the complexities of this undertaking. Estimating the change in perceived price is exceedingly difficult, given the myriad of factors that affect it; and implementation of major new policies would alter other aspects of the social environment as well. For example, with revenues from drug taxes, government could mount a large and sustained drug education campaign that could decrease demand, quite independent of price. A contemporary example is California's recent multimillion-dollar antitobacco media campaign, financed by the state's increase in 1989 of the excise tax on cigarettes by 25 cents per pack. More generally, antismoking publicity campaigns nationwide have been credited with significantly decreasing the rate of smoking since the mid-1960s (Warner 1989). Some of the most aggressive antismoking publicity has occurred at the same time as states were increasing their cigarette excise taxes at unprecedented rates (Warner 1981).

Conclusion

Reliance on the existing drug policy literature to assess the utility of economic analysis would be unfair. Clearly, the state of the art is primitive. In addition, data problems exceed those associated with virtually all legal consumption activities. The intangible consequences of drug policy, the ethical and philosophical dimensions, play a substantial role in the "big picture."

Still, the optimist can read this review as suggesting an opportunity for ambitious analysts. Drawing on qualitative discussions of the categories of drug policy costs and benefits, analysts could identify and structure the major consequences, distinguish those that are in principle quantifiable from those that are not, and further identify those amenable to monetary valuation. Then would come the drudgery of cost–benefit analysis, and in many ways the most challenging task: finding data, deriving ranges of reasonable estimates of parameter values, and carrying out the assessment of costs and benefits. Creative use of price elasticity estimates could produce new estimates of such critical variables as the consumption impact of legalization, and the crime costs of the price differential between regimes of legal and illegal drugs.

An obvious lesson of this review is that such an analysis could not hope to produce a clear-cut conclusion about the desirability of drug legalization (or an alternative policy). However, it could offer a new perspective on the relative importance of selected variables and insight into the analytical significance of the various "great unknowns" that I alluded to at the beginning of this article.

Another lesson from this review pertains to the "turf" of economic analysis. Grounded in empiricism and the pretense (if not always reality) of objectivity, traditional economic analysis offers a delimited ability to incorporate the full range of costs and benefits that characterize any complicated policy question. Economists may be able to identify the moral and philosophical consequences of a given policy that warrant attention; however, economists are no better equipped than the average citizen to evaluate their relative importance. As such, at best the optimal cost–benefit analysis can help to frame the policy debate, to place the moral and philosophical issues explicitly in a context in which they can be compared and contrasted with the more prosaic economic implications. This contribution would be useful, even essential, to a well-informed debate. It would also be more modest than that envisioned by the current practitioners of analysis in the drug policy debate.

Even absent its technical limitations, economic analysis cannot negate the ultimate need for reliance on a political and bureaucratic decision-making process to deal with the challenging ethical, social, legal, and political issues that pervade the problem of drugs in America. Economists will never captain the ship of drug policy, but they might help to chart the course.

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