APPENDIX

A

SPECIMEN OF A REAL-WORLD POLICY ANALYSIS

The following text is excerpted from the policy brief "Mandatory Minimum Drug Sentences: Throwing Away the Key or the Taxpayers' Money?" prepared by the RAND Corporation. It is provided as an example of a policy document and was chosen for its thorough and focused analysis as well as its concise presentation. My annotations appear in the numbered notes below the text. The notes of the authors of the brief are indicated by asterisks.

PREFACE

In response to public concern over disparity of sentencing by judges and brevity of terms served by criminals, state legislatures and the Congress have written into law minimum sentences for specific crimes. In this report, we estimate the cost-effectiveness of mandatory minimum sentences for crimes related to cocaine distribution. These estimates are made relative to the cost-effectiveness of spending additional resources on enforcement without mandatory minimums and on drug treatment.[1] Our central effectiveness measure is reduction of the nation's cocaine

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Source: Jonathan P. Caulkins, C. Peter Rydell, William L. Schwabe, and James Chiesa, "Mandatory Minimum Drug Sentences: Throwing Away the Key or the Taxpayers' Money?" (Santa Monica, Calif.: RAND Corporation, 1997).

1. Cost-effectiveness analysis requires comparison. Often we compare the cost-effectiveness of some new state of the world with the old, existing one. But in this case the researchers compare several alternative new states of the world.

consumption, although we also examine reduction of cocaine-related crimes, along with decrease in cocaine spending, which is related to such crimes.[2]

Because this report may be read by people with diverse interests, it is divided into two parts.[3] Readers interested principally in narcotics control and criminal-justice policy may wish to stop at the end of Part I. Part II has been prepared mainly for those also interested in the role and techniques of mathematical modeling in policy analysis, although some effort has been devoted to make it understandable to those not expert in this area.

This research was supported by a gift from Richard B. Wolf of Richland Mills and by funding from The Ford Foundation. This study was carried out within RAND's Drug Policy Research Center. The center's work is supported by The Ford Foundation, other foundations, government agencies, corporations, and individuals. It carries out extensive assessments of drug problems at local and national levels. Those interested in further information should contact the center at RAND's Santa Monica address.

SUMMARY

In recent decades, the American public has responded favorably to political leaders and candidates who have espoused longer sentences for the possession and sale of drugs. Among the more popular sentencing extensions are "mandatory minimums," which require that a judge impose a sentence of at least a specified length if certain criteria are met. For example, federal law requires that a person convicted of possessing half a kilogram or more of cocaine powder be sentenced to at least five years in prison.

Mandatory minimums have enjoyed strong bipartisan support from elected representatives and presidential candidates.[4] To these proponents, the certainty and severity of mandatory minimums make them better

2. These different "measures" are our "criteria." Note that by making one "central" and two others obviously less so, the authors implicitly are differentially weighting the criteria.

3. They are "telling the story" to two different audiences—which amounts to telling two different, though related, stories. Presumably the authors could have issued separate reports, but the chosen format keeps complementary analyses together.

4. An important step in telling the story: establishing key features in the political environment.

able to achieve incarceration's goals than are more flexible sentencing policies.[5] Those goals include punishing the convicted and keeping them from committing more crimes for some period of time, as well as deterring others not in prison from committing similar crimes. Critics, however, worry that mandatory minimums foreclose discretionary judgment where it may most be needed, and they fear mandatory minimums result in instances of unjust punishment.[6]

These are all important considerations, but mandatory minimums associated with drug crimes may also be viewed as a means of achieving the nation's drug control objectives. As such, how do they compare with other means? Do they contribute to the central objective—decreasing the nation's drug consumption and related consequences[7]—at a cost that compares favorably with other approaches? In this report, we estimate how successful mandatory minimum sentences are, relative to other control strategies, at reducing drug consumption, drug-related crime, and the total flow of revenue through the cocaine market. The latter is a worthy objective in itself—America would be better off if money spent on drugs were spent on almost anything else—and it is also associated with drug-related crime.

We focus on cocaine, which many view as the most problematic drug in America today.[8] We take two approaches to mathematically modeling[9] the market for cocaine and arrive at the same basic conclusion: *Mandatory minimum sentences are not justifiable on the basis of cost-effectiveness at*

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5. The proponents are projecting outcomes. The authors of this report imply that they do not necessarily accept these projections and that this analysis will do its own.
6. Proponents and critics clearly do not weight the evaluative criteria in the same way. The authors imply that they hardly even notice one another's criteria.
7. This description of the central objective of drug control policy establishes "drug consumption" as the critical numerator in the cost-effectiveness analysis, though others are to be considered as well.
8. Narrowing the focus keeps the analysis manageable. The authors must justify the way they choose to narrow the focus, however. The shorthand version here is to call it "the most problematic drug," though without specifying what that means.
9. Not all models are mathematical. The phenomenon being analyzed here is complex, and formal modeling is both possible and desirable. Deciding on the values for particular parameters, such as the price elasticity of demand for cocaine, the cost to dealers of being caught, and the effectiveness of treatment, to name just a few, is somewhat speculative. The authors will use what evidence can be found in the research literature, however.

reducing cocaine consumption, cocaine expenditures, or drug-related crime.[10] Mandatory minimums reduce cocaine consumption less per million taxpayer dollars spent than does spending the same amount on enforcement under the previous sentencing regime.[11] And either type of incarceration approach reduces drug consumption *less* than does putting heavy users through treatment programs, per million dollars spent. Similar results are obtained if the objective is to reduce spending on cocaine or cocaine-related crime.[12] A principal reason for these findings is the high cost of incarceration. (Note these findings are limited to relative cost-effectiveness. As mentioned above, mandatory minimums have been justified—and criticized—on other grounds.)

Reducing Consumption: More Enforcement against Typical Dealers

First, we estimate the cost-effectiveness of additional expenditures on enforcement against the average drug offender apprehended in the United States (whether that apprehension is by federal, state, or local authorities). In this approach, we track the flows of users among light-use, heavy-use, and no-use categories, and we analyze how overall cocaine market demand and supply respond to price. That is, if more money is spent on enforcement and incarceration, costs to dealers are increased, and so is the street price of cocaine; higher prices mean lower consumption.[13] If more money is spent on treatment, consumption is reduced for most clients while they are in the program, and, for some, after they get out. We estimate the changes in total cocaine consumption over time for an additional million dollars invested in the alternatives considered. These changes, discounted to present value, are shown in Figure A-1.

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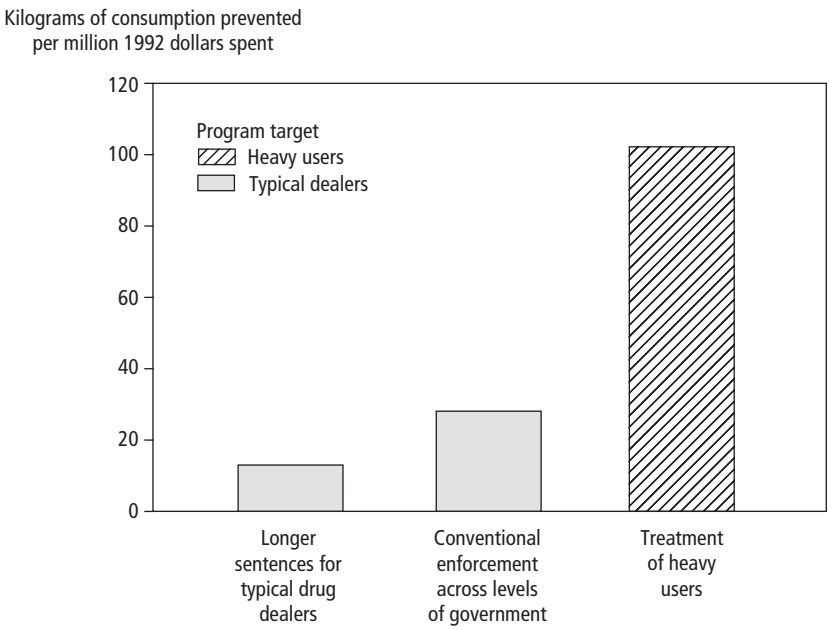
10. The headline comes about as quickly as it possibly can. In italics, too.
11. This restatement of the study's primary conclusion establishes "million taxpayers' dollars spent" as the critical denominator in the cost-effectiveness equation.
12. No matter which criterion is chosen, it just so happens that treatment turns out to be a better investment than tougher incarceration procedures.
13. Note the use of market theory to lay bare the heart of "the drug problem." You do not often see a newspaper account of this subject that refers to price movements, demand, and supply. Yet the "laws" of supply and demand apply, in some sense, to drug markets as much as they do to the market for green beans. It is almost impossible to project the effects of alternative antidrug interventions without taking into account how the market mediates whatever is done.

FIGURE A-1 **Benefits of Alternative Cocaine Control Strategies**



The first two bars in the figure show the results of spending a million 1992 dollars* on additional enforcement by agencies at various levels of government against a representative sample of drug dealers. As shown by the first bar, if that money were used to extend to federal mandatory minimum lengths the sentences of dealers who would have been arrested anyway, U.S. cocaine consumption would be reduced by almost 13 kilograms. If, however, the money were used to

* All cost calculations in this report are in 1992 dollars. The choice of a reference year for cost figures is arbitrary. We choose 1992 to facilitate comparison with the results of earlier analyses. To convert costs in 1992 dollars to costs in 1996 dollars (the latest year for which inflation data are available), multiply by 1.119. To convert kilograms of cocaine consumption reduced per million 1992 dollars spent to kilograms reduced per million 1996 dollars spent, divide by 1.119.

arrest, confiscate the assets of, prosecute, and incarcerate *more* dealers (for prison terms of conventional length), cocaine consumption would be reduced by over 27 kilograms.[14] Spending the million dollars treating heavy users would reduce cocaine consumption by a little over 100 kilograms.

Note we are estimating the impact of an *additional* million dollars. The results can be extrapolated to multiples thereof, but not to extremely large changes in spending. They certainly do not suggest that the most cost-effective approach is to shift all drug control resources from enforcement to treatment. Note also that we refer in the figure to "longer sentences" rather than to "mandatory minimums."[15] Data on drug dealers arrested at state and local levels are insufficient to isolate those associated with drug amounts sufficient to trigger mandatory minimums. Instead, we analyze a hypothetical policy of applying the mandatory minimum sanction—longer sentences—to all convicted dealers.[16]

The values shown are dependent, of course, on various assumptions we make. If the assumptions are changed, the values change. But for changes in assumptions over reasonable ranges, do the values change enough to make longer sentences more cost-effective than either of the other alternatives? We find they do not.

As an example, the values shown are dependent on the time horizon in which one is interested. The reason for this is as follows. When faced with extended sentences, drug dealers will want more income today to compensate them for the risk of increased prison time. As a result, cocaine prices will go up and consumption will go down. Benefits from

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14. Note the importance of defining "the margin" where the policy operates. The policy is twice as effective if you can restrict "the margin" to dealers who would not have been arrested anyway.

15. The political rhetoric might oversimplify by talking about "tougher" approaches to dealing, but the authors here distinguish two different forms of "tougher." Even more forms exist, of course.

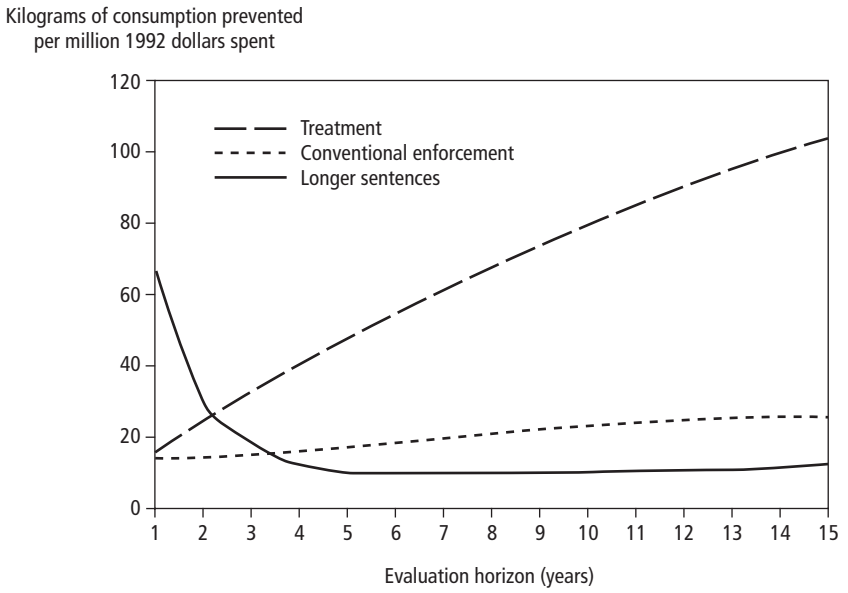
16. All policies that deal with the future are "hypothetical." Why do the authors go out of their way to use this term explicitly here? Probably because they wish to distinguish the alternative they are analyzing from empirical specimens existing in the real world. They are more interested in a "generic" strategy based on mandatory minimum sanctions, a sort of composite of what does exist and what might exist in a more ideal form.

reduced consumption will thus accrue immediately, while the costs of the extended prison terms will stretch out into the future. In contrast, if more users are treated this year, the costs accrue immediately, while the benefits in terms of reduced consumption by those who stay off cocaine stretch out into the future. Figure A-1 takes account of these different allocations of costs and benefits across future years in that future costs and benefits are discounted annually, out to 15 years—a time horizon typical in analyzing public policy. Beyond that point, any further costs and benefits count as zero. What if that terminal point were moved closer? What if one had not just a discounted interest in anything beyond the immediate future, but no interest? If the time horizon is set early enough, the effect is to "zero out" both the future stream of costs from mandatory minimums and the future benefits from treatment. Figure A-2 shows the relative cost-effectiveness of the three programs analyzed when time horizons are set at various points, from 1 to 15 years. At 15 years, the lines match the heights of the bars in Figure A-1. The time horizon must be reduced to only about three years before mandatory minimums look preferable to additional conventional enforcement, and close to two years before they look preferable to treatment. Hence, mandatory minimums appear cost-effective only to the highly myopic.[17]

We also analyzed the implications of changing other assumptions. For example, dealers would want to be compensated for the increased risk of imprisonment they would incur in the event of increased enforcement. But the typical person would demand less compensation for being imprisoned five years from now than next year, and we assume drug dealers are even more "present-oriented." What would happen, though, if dealers wanted more risk compensation, and if they discounted future costs less heavily than we assume? Longer sentences would seem more burdensome than we assume, dealers would demand a higher premium for handling cocaine, the price of cocaine would rise even more with increased enforcement spending, and consumption

17. A bit of wit and rhetoric! Who says you have to be dry and boring in telling your story? The authors can get away with it here because their result is extremely robust—and because they are well-known and respected analysts in this field.

FIGURE A-2 **Benefits of Alternative Cocaine Control Strategies for Different Time Horizons**



would fall even more. Consumption would also fall more than we expected if users were more responsive to price increases, i.e., if demand were more "elastic." We attempted to swing the balance toward extended incarceration by simultaneously increasing risk compensation by one-third, cutting the dealer discount rate by two-thirds, and increasing the elasticity of demand by 50 percent.[18] The general profile of our results did indeed change. The cost-effectiveness of longer sentences tripled, while that of additional conventional enforcement doubled, and that of treatment rose by about a quarter. However, longer sentences remained the least cost-effective alternative, and treatment the most.

18. This is another version of "sensitivity analysis."

Reducing Consumption: More Enforcement against Higher-Level Dealers

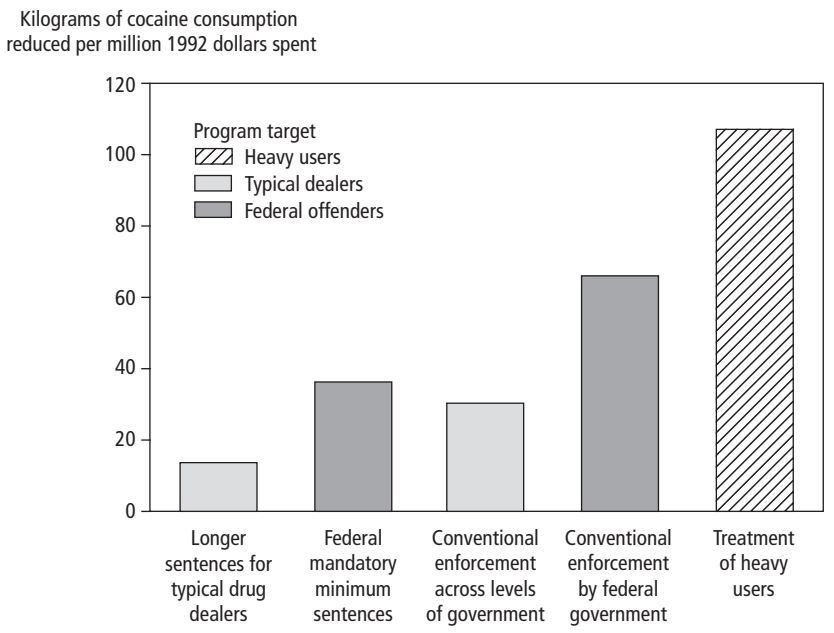
The first two bars in Figure A-1 represent enforcement approaches applied to a representative sample of all drug dealers arrested. Perhaps mandatory minimum sentences would be more cost-effective if they were restricted to somewhat higher-level dealers. By "higher-level dealers," we mean those who operate at higher levels of the drug distribution system, who make more money and thus have more to lose from more intensive enforcement. To approximate such a restriction, we limit the set of offenders analyzed to those who are prosecuted at the federal level and possess enough drugs to trigger a federal mandatory minimum sentence.

The results are shown in Figure A-3. There, the darkest bars represent the reduction in cocaine consumption from spending an additional million dollars in enforcement against the federal-level offenders just defined. The light bars are those from Figure A-1. Reading from the left, each light/dark pair of bars represents the same kind of program. The distribution of long sentences is the same for the first two bars, and the kinds of additional enforcement actions funded (arrest, seizure, prosecution, and incarceration for conventional sentence lengths) are the same for the next two bars.

As shown by the darker bars in Figure A-3, the consumption change achieved per million dollars spent on mandatory minimums is closer proportionately to that achieved through the other alternatives. While longer sentences for a representative set of all dealers have 46 percent of the effect of additional conventional enforcement against such dealers, federal mandatory minimums have 57 percent of the effect of additional conventional enforcement at the federal level.[19] And, obviously, federal mandatory minimums do better relative to treating heavy users than do longer sentences for all dealers. To the higher-level dealers considered in this analysis, time in prison carries a greater cost, and amounts of cocaine

19. These percentages are calculated from numbers to be read off Figure A-3. One might wish the authors had somehow warned the reader that these numbers cannot be read off what is actually drawn in A-3.

FIGURE A-3 **Benefits of Alternative Cocaine Control Strategies**



and other assets seized through increased enforcement are also larger. Thus, risk compensation must be higher, and the higher resulting cocaine prices drive down consumption more. Nonetheless, at any given level of government, or against any given type of dealer, mandatory minimums are less cost-effective than conventional enforcement.

Why is that the case?[20] Drug enforcement comprises two types of components, each of which is costly for taxpayers and each of which contributes to keeping drugs expensive: (1) arrest and conviction, which impose costs on suppliers principally through the seizure of drugs and other assets, and (2) incarceration of convicted defendants. Amid

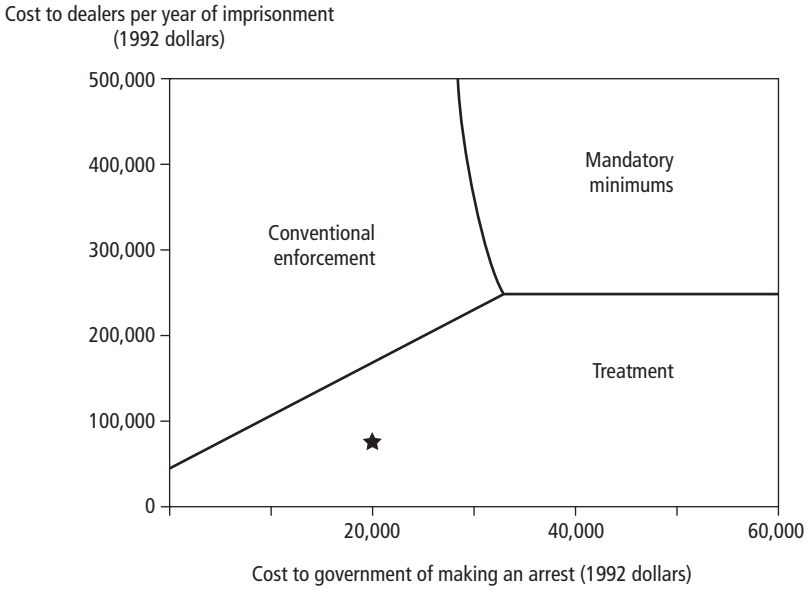
20. Nice use of rhetorical question to vary the pace and tone.

complaints about the "revolving door" of justice, some overlook that arrest and conviction impose costs on dealers. In fact, on average, arrest and conviction impose greater costs on dealers per taxpayer dollar spent than does incarcerating dealers. Since mandatory minimums alter the mix of these two components of enforcement in favor of incarceration, they dilute or reduce the efficiency of enforcement relative to simply expanding both components proportionately.

As with the light bars, the precise heights of the dark bars in Figure A-3 depend on various assumptions. Again, these include assumptions about such uncertain values as the compensation dealers would demand for increased imprisonment risk, the rate at which dealers discount future costs, the responsiveness of buyers to shifts in cocaine prices, what it costs to arrest a dealer, and the value of drugs and other assets seized. To test the sensitivity of our results to these assumptions, we vary the assumed values of factors such as these one at a time over substantial ranges. In all cases, conventional enforcement is more cost-effective than mandatory minimums, and treatment is more than twice as cost-effective as mandatory minimums. Even when assumed values are varied two at a time, large departures from assumed values are required for mandatory minimums to be the most cost-effective approach. In Figure A-4, for example, the government's cost of arresting a dealer and the compensation a dealer wants for risking a year of imprisonment are varied simultaneously. The star shows the values assumed for the results in Figure A-3. As Figure A-4 shows, mandatory minimums would be the most cost-effective alternative only if arrest costs were to exceed $30,000 and a dealer were to value his time at some $250,000 or more per year. Such dollar values would typify only those dealers at a fairly high level in the cocaine trade and who are unusually difficult to arrest.** For dealers costing less to arrest, cocaine control dollars would be better

** Even for these dealers, it is possible that conventional enforcement would be more cost-effective than mandatory minimums. That would be the case if the range of conventional sentences could be matched to the range of offenders so that the highest-level dealers received very long sentences.

FIGURE A-4 **Which Program Is More Cost-Effective at Reducing Cocaine Consumption Under Different Assumptions?**



Note: Star indicates values assumed for dark bars (federal offenders) in Figure A-1.

spent on further conventional enforcement. For dealers demanding less risk compensation, the money would be better spent treating heavy users than on enforcement against such dealers.[21]

Long sentences could thus be a smart strategy if selectively applied. Unfortunately, because mandatory minimum sentences are triggered by

21. The uninitiated reader needs more help in interpreting Figure A-4 than the authors provide. The figure is divided into three regions. Each region contains combinations of values for the two parameters "cost to government" and "cost to dealers." The boundaries between the regions indicate where the parameter combinations imply different winners in the cost-effectiveness competition that the authors have set up. Thus, mandatory minimum sentences win only when the parameter combinations fall in approximately the northeast quadrant, that is, when the costs are high both to dealers and the government. In other RAND publications, this sort of mapping is called "threshold analysis." I call it, in Part I above, "break-even analysis."

quantity possessed and because those thresholds are low, they are not selectively applied to high-level dealers. (Indeed, anecdotal evidence suggests that high-level dealers can sometimes avoid mandatory minimums more easily than their subordinates. High-level dealers have more knowledge about their organization to use as bargaining chips with prosecutors. Furthermore, such dealers often do not physically possess their drugs, as is required for a mandatory minimum to take effect; they hire others to incur that risk. To the extent that this occurs, mandatory minimum sentences would be even less effective than these results suggest.)

Reducing Cocaine-Related Crime

Of course, cocaine consumption is not the only measure of interest. Many Americans are worried about the crime associated with cocaine production, distribution, and use. Using data on the causes of drug-related crime and our cocaine market analysis, we quantify the approximate crime reduction benefits of the various alternatives. We find no difference between conventional enforcement and mandatory minimums in relation to property crime; the former, however, should reduce crimes against persons by about 70 percent more than the latter. But treatment should reduce serious crimes (against persons as well as property) the most per million dollars spent—on the order of 15 times as much as the incarceration alternatives would.

Why do we get these results?[22] Most drug-related crime is economically motivated—for example, undertaken to procure money to support a habit or to settle scores between rival dealers. Fewer crimes are the direct result of drug consumption—crimes committed "under the influence." However, we find very little difference between conventional enforcement and mandatory minimums in their effects on the money flowing through the market, and thus very little difference in their effects on economically motivated crime. We do find, as shown in Figure A-3, appreciable differences in consumption effects, and thus appreciable differences in effects on crimes committed under the influence. The latter are more likely than are economically motivated crimes to be crimes against persons.

22. Another well-placed rhetorical question.

Treatment, however, has an enormous advantage over enforcement in reducing the economic value of the cocaine market—larger even than that shown in Figure A-3 for reducing cocaine consumption. Why is that?[23] When a treated offender stays off drugs, that means less money flowing into the market. But when a dealer facing the risk of a longer sentence raises his price, say one percent, to compensate, buyers will reduce the amount of cocaine they purchase. The best evidence suggests that reduction will be something on the order of one percent.[24] Thus, the total revenue flowing through the cocaine market stays about the same, and so do the incentives for economically motivated drug-related crimes. Therefore, the effect of the enforcement alternatives is limited almost entirely to the relatively small number of crimes committed under the influence. Treatment, however, has an advantage against those crimes similar to that shown in Figure A-3 and an even greater advantage against the larger number of economically motivated crimes.

Conclusion

Long sentences for serious crimes have intuitive appeal. They respond to deeply held beliefs about punishment for evil actions, and in many cases they ensure that, by removing a criminal from the streets, further crimes that would have been committed will not be. But in the case of black-market crimes like drug dealing, a jailed supplier is often replaced by another supplier if demand remains. And not all agree whether mandatory minimums satisfy American standards of fairness and justice. Even those who believe they do must ask themselves to what extent might it be desirable to give up some punishment of the guilty to gain some further reduction in cocaine consumption—consumption that

23. And yet another!

24. So they base their model's parameter estimates on some sort of evidence after all! Because this report "Summary" is a summary of the logic of their analysis, the authors do not trouble the reader with the details of how these projections were made, that is, how their model is constructed and its parameters assigned numerical values. These will appear in the full report. The word *evidence* here perhaps is intended to reassure the reader that, although the analysis herein is "hypothetical," as the authors indicated above, the hypotheses are to the extent possible based on a body of accumulated evidence.

can victimize the innocent.[25] This trade of punishment for drug use reduction must be considered because long sentences are expensive and cocaine control resources are limited. As we show, if reducing consumption or violence is the goal, more can be achieved by spending additional money arresting, prosecuting, and sentencing dealers to standard prison terms than by spending it sentencing (fewer) dealers to longer, mandatory terms. (And that is to say nothing of what might be achieved by redirecting resources from enforcement to treatment—admittedly, a more difficult reallocation because those programs might be run by completely different agencies.) We find an exception in the case of the highest-level dealers—those who value their time most highly and are hardest to apprehend—where sentences of mandatory minimum length appear to be the most cost-effective approach. However, current mandatory minimum laws are not focused on those dealers.

25. The authors confront readers with a starkly defined trade-off.