CRIME AND CRIME CONTROL: WHAT ARE THE SOCIAL COSTS?

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Executive Summary

This paper examines the costs of crime and crime control in light of the methods and empirical results of recent economic research. In Part I we introduce the basic analytical framework for cost analysis and briefly examine some of its implications for public policies within the criminal justice system. In Part II we consider some conceptual issues in the definition and measurement of crime costs in the context of a discussion of the costs of theft and victimless crimes. We also report on recent efforts to utilize market data in assessing the overall costs of crime and we review some empirical estimates of cost functions for three aspects of the criminal justice system. Part III presents an illustrative calculation of the costs and benefits of crime reduction and concludes with a "ballpark" estimate of the social costs imposed by an average index felony.

CONTENTS

I. THE ECONOMIC FRAMEWORK

Both crime and crime control are costly activities because they divert real resources from valuable alternative uses, and generally entail some sacrifice of such valuable intangibles as personal security and freedom. To measure and compare the various costs of crime and crime control, we require a common denominator of value. The most readily available measure is the monetary standard whose value is implicit in market exchange. While much criminal activity bypasses normal and observable market channels, and while many of the resource decisions about crime control are made in the political arena, market processes may nonetheless provide us with monetary measures of the costs of crime. If an automobile has been stolen or destroyed by vandals, we can approximate its owner's loss by using the market value of automobiles of the same model and vintage.[1] Similarly, as long as resources used by the state in crime control are purchased rather than conscripted, their purchase price will reflect their value in foregone alternative uses, and provide us with a basic measure of the cost of crime control.

Clearly, however, many of the costs associated with crime and crime control do not involve the explicit use of physical resources. Perhaps the greatest costs of crime result from the compromise of individual freedom and security, and the sense of fear and anxiety, engendered by its very existence. Though it would be difficult or impossible to directly measure such psychic costs, in many instances predictable and observable market reactions to them may enable us to indirectly assess their monetary costs.

For example, a parcel of property located in a low crime neighborhood will have a higher market value than an otherwise identical parcel in a high crime neighborhood. This differential exists, all other things being equal, because residents have expressed through the market the higher value they place on the incremental freedom from crime in the low crime neighborhood. Thus the value differential is a measure of the cost of crime in the high crime neighborhood relative to the low crime neighborhood.

A. The Costs of Crime: Commission, Victimization and Control

We can divide the costs associated with criminal activity into three categories. First, there are those costs incurred by criminals. These include not only the cost of resources actually used in committing crimes, including the time and effort expended by the criminal, but also the value of the alternatives the criminal must sacrifice as a result of imprisonment or other punishment for his behavior. Though not all criminals are apprehended or punished, the knowledge that there are possible penalties to be incurred imposes an expected and real cost on any potential criminal.

The second category of costs includes those borne directly by the victims of crime. Though these are always private costs to the victim, they may or may not be social costs as well. To illustrate the distinction, consider the following simple example. Suppose I have lost possession of my automobile in one of three ways: it may have been sold, stolen, or destroyed by vandals. In all three cases I have incurred a private cost equal to the value I placed on the automobile. But neither in the case of sale nor in the case of theft does my loss of the automobile, per se, constitute a net social cost. From a social perspective the automobile has not been

lost; rather, its possession has simply been transferred within society.[2] But the argument that the social cost of the illegal transfer is zero does not in any way imply that the social cost of theft is zero. For the theft or vandalism of the automobile--unlike its sale--imposes an uncompensated, involuntary cost on the victim, as do rape, assault, and other crimes against the person.[3]

It is useful to think of crime as a "tax" levied on potential victims, for, like a tax, it effectively imposes costs on the ownership of certain types of assets, as well as on other forms of behavior. To illustrate the analogy, suppose that a television set is valued at $500 by its potential owner. However, if ownership carries with it a tax liability of $25, the television's net worth is only $475. Analogously, if there were no tax, but rather an annual probability of 5% that the television would be stolen, its net value will again be $475, since a 5% chance of losing $500 via theft is equivalent in an expectational sense to the certain loss of $25 via the tax.[4] The 5% chance of theft victimization is therefore similar to a 5% tax on television ownership. And, to those for whom the uncertainty surrounding the threat of victimization is itself a cost, the effective "tax" is even higher.

Just as with a tax, market adjustments will distribute the costs of crime among the members of society in ways which are not always immediately obvious. Thus the actual incidence of the cost of crime--that is, its ultimate resting place--will usually differ from its apparent incidence. The crime of shoplifting, for instance, has an effect like that of a tax on retailers who are repeatedly victimized. Though some of the losses will be borne by those retailers, some will be passed on to legitimate customers in the form of higher prices.

Furthermore, the tax imposed by crime is a differential one, affecting some facets of behavior more than others. With respect to theft, for example, different types of assets are subject to different probabilities of loss via theft, and hence the threat of theft reduces the value of ownership of some types of assets proportionately more than the value of others. This in turn alters the allocation of resources in favor of assets which are less likely to be stolen. Relative to the mix of products that would exist in an ideal, crime free world, we presumably have fewer television sets, automobiles, auto stereos and other consumer durables, and more nondurables and services, even though in the absence of crime we would value the former relatively more.

More generally and even more significantly, any kind of behavior which increases a person's exposure to potential crime becomes more costly than it would otherwise be. As a result, people tend to modify their behavior by foregoing more valuable options in favor of some which are less valuable but also less subject to a higher threat of victimization. Thus, there will be fewer strolls in the park for fear of robbery or assault, shorter vacation trips for fear that an empty house might be a burglar's target, and a multitude of other costly modifications of behavior intended to reduce the chances of victimization.[5]

Precisely because individuals are willing to pay to avoid victimization, there is a third category of costs: the costs of crime control. In a broad sense, we can characterize crime control activities as those which increase the costs or decrease the payoffs of criminal behavior to potential criminals and thus reduce the payoffs to criminal activity.[6] So defined, crime control

includes a variety of activities, some undertaken independently by private individuals and others resulting from collective decisions implemented through governmental agencies. While the latter--police, courts, public prosecutors, correctional agencies, and so forth--constitute the criminal justice system, much crime control effort is also expended outside this system.

The level of crime control is affected by the rate at which criminals are apprehended and punished, the severity of the punishment they receive, and by other public and private efforts to prevent future crimes or to avoid victimization. Placing locks on doors and windows makes burglary more costly; taking a taxi instead of strolling home through the park offers fewer targets to the would-be mugger or rapist; installing alarms on automobiles makes car theft more difficult and more risky; employing more police increases the probability of apprehension of offenders.

All of these measures are costly. The apprehension, conviction and punishment of criminals by the criminal justice system require the use of resources. Private efforts to avoid victimization impose not only resource costs, but also the costs associated with behavior modification. Finally, since the criminal justice system cannot costlessly and without error deal exclusively with actual and potential criminals, crime control inevitably results in some abridgement of legitimate freedoms.

B. Crime Control and the Minimization of the Costs of Crime

The goal of crime control is, of course, to minimize the sum of all costs associated with crime. As long as the cost of additional crime control is less at the margin than the incremental savings which result, additional crime control reduces the total social costs associated with crime. At some point, however, the marginal costs of any further crime control measure will exceed the resulting reduction in crime costs. Beyond this point, any further reduction in crime would increase total social costs. An additional expenditure of $1,000 for crime control to prevent $500 in crime costs, for example, would clearly be uneconomical. To minimize the total social costs associated with crime, then, the costs of crime must be balanced at the margin against the costs of controlling crime. The total elimination of crime, or even of specific types of crime, is not only an unrealistic goal for public policy but an uneconomical and inefficient one as well.

In fact, there may be some activities--so-called "victimless" crimes--for which little or no crime control is economically justified. Participation in activities such as prostitution, gambling, and much illegal drug usage is voluntary. Though these transactions, like legitimate market exchanges, mutually benefit the involved parties, third parties find them--or perhaps only the knowledge that they exist--intolerable and attempt to eradicate them. But, economic analysis suggests, unless these activities clearly harm third parties, the valuable resources of the justice system expended to inhibit them are the only social costs of these "crimes." Moreover, the enforcement of such prohibition may have the perverse effect of generating other crimes. For example, recent research by Nold (1979) using New York City

data to estimate the costs of enforcing drug laws evidences a problem long suspected to exist: by increasing the likelihood of arrests and/or punishments for selling and distributing drugs, the price of heroin is increased, which in turn tends to increase the incidence of four property crimes--robbery, burglary, larceny and motor vehicle theft.

Clearly, there must be a cost-efficient allocation of the resources of the criminal justice system to minimize the social costs of crime. As we have seen, the system relies upon both privately and collectively made decisions. Thus cost minimization requires efficient allocation of crime control resources between the public and private sectors, as well as within each of these sectors.

Resource allocation within the public sector--more specifically, within the criminal justice system--provides the most challenging questions for public policy. How can the system minimize the social costs of crime? How should budgets be allocated among police, courts, and correctional institutions? What are the costs and what are the deterrent effects of various forms of punishment? Which criminal violations impose the greatest social costs? Which are the most costly for the criminal justice system to clear? Answering these complex questions requires detailed empirical knowledge.

II. MEASURING THE COSTS OF CRIME: CONCEPTUAL ISSUES AND EMPIRICAL ESTIMATES

Only recently have economists and other researchers begun to apply sophisticated analytical tools to assess the costs of crime and crime control. In this section we consider several important conceptual issues in the definition and measurement of crime costs and report some recent empirical findings regarding the magnitude of various components of those costs.

A. The Social Costs of Theft and Other Illegal, Coercive Transfers

Burglary, larceny, fraud and other forms of theft are characterized by an uncompensated transfer of assets from victim to thief. While, as we have seen, the transfer per se does not constitute a social cost, the very possibility of illegal transfers and the circumstances surrounding their existence lead to real social costs. Theft leads people to undertake costly measures to reduce its incidence and to avoid victimization. Theft is also costly because real resources--time, effort and materials--are diverted to theft from legitimate alternative uses. Since, again, the allocation of resources to illegal transfers usually bypasses observable market channels, the value of those resources is largely unrecorded. However, a fundamental insight of economic analysis may enable us to approximate--or at least to place an upper bound--on that value. We know from economic theory that the forces of competition will attract resources into any activity that offers higher than normal return, eventually forcing that return down to a point at which the earnings of the resources just cover their cost. Becker

(1968, p. 171) first applied this reasoning to illegal transfers:

> While [theft and fraud] are transfers, their market value is nevertheless a first approximation to the direct social cost. If the theft or fraud industry is "competitive," the sum of the value of the criminals' time input--including the time of "fences" and prospective time in prison--plus the value of capital input, compensation for risk, etc., would approximately equal the market value of the loss to victims. Consequently, aside from the input of intermediate products, losses [to victims] can be taken as a measure of the value of labor and capital input into these crimes, which are true social costs.

Competition in the industry of crime may not, of course, be free and open. If competition does not prevail, the value of stolen property would exceed the thief's resource cost and that value would place an upper bound on the estimate of those costs. In any case, the amounts stolen give us an approximation of the value of the resources devoted to illegal transfers.

Table 1 shows the number of reported burglaries, robberies and larcenies and the corresponding amounts illegally transferred during the period 1968 to 1977. Recognizing that burglary, robbery and larceny are only three among many forms of theft, and that the table reflects only reported, not actual victim losses due to those crimes, we can see that the amounts involved are considerable.

Finally, there are costs associated with the very uncertainty of victimization. Most people will pay a premium simply to avoid risk, as is most directly evidenced by the existence of an insurance industry. In any standard insurance policy, the amount the average insured party can expect to recover is less than the amount he can expect to pay in premiums. In a competitive insurance market, the differential will reflect the administrative costs of the insurer, and is a measure of the cost of avoiding risk through insurance. Of course, there are some costs associated with the risk and uncertainty of crime--the trauma of victimization, for example--that cannot readily be insured against.

TABLE 1

Illegal Transfers: 1968-1977[a]

Year	Number of Crimes (thousands)			Total Amount Transferred (millions)			Average Amount Transferred per Crime		
	B	R	L	B	R	L	B	R	L
1968	1829	262	3440	$ 949	$122	$ 599	$519	$469	$174
1969	1950	268	3784	1025	142	694	526	476	183
1970	2169	348	4245	1049	128	702	484	367	165
1971	2368	386	4409	1106	130	726	467	338	165
1972	2345	375	4101	1046	132	688	446	352	161
1973	2541	383	4304	1167	136	822	460	356	191
1974	3021	441	5228	1451	181	1003	480	394	192
1975	3252	465	5978	1547	179	1117	475	373	187
1976	3089	420	6271	1476	151	1228	478	360	196
1977	3052	404	5906	1450	153	1134	475	377	192

B = Burglary

R = Robbery

L = Larceny

[a]All amounts in 1977 dollars.

B. Variations in Property Values as a Proxy for the Cost of Crime

As we have seen, there are many market transactions made by individuals which reflect, in whole or in part, attempts to avoid crime. Since the amount a person is willing to pay to avoid victimization is a measure of the cost to him of crime, some market transactions may provide us with information necessary to estimate the monetary magnitude of those costs.

Clearly, there are many cases in which the entire purpose of the market transaction is to reduce the chances of victimization. Here, of course, the monetary expenditure--for example, on locks, watch dogs or security guards--provides us with a simple and straightforward measure of costs.

There are other cases, however, where the market transaction involves the purchase of a bundle of goods, only one of which contributes to crime avoidance. If we can control for the value of the other components of the bundle, we may be able to estimate the implicit value of the crime avoidance component. Economists have recently developed a method for making such estimates, and it has been applied primarily to assessing the separate effects of various neighborhood amenities and disamenities--including the crime rate--on housing values.[7] Other things equal, variation in the value of housing across neighborhoods with different crime rates will reflect the market's assessment of all the expected costs of neighborhood specific crime--psychic and other implicit costs as well as explicit expenditures to avoid victimization. Thus the resulting estimates provide us with what is potentially a very comprehensive measure of crime costs.[8]

Three recent studies have attempted to estimate the cost of crime in this way. Using data from Chicago, Rizzo (1975) finds that an increase in the

total crime rate in a neighborhood, as well as the rates for specific crimes, results in a reduction both in rents and in the value of owner occupied homes. In particular, he finds that, after correcting for other relevant factors, a 10% difference in the total crime rate between neighborhoods is associated with a 2 to 4% difference in property values. Rizzo also supplies dollar estimates of the annual costs of crime. In particular, his results imply that a reduction in the average crime rate for all Chicago to a level equal to the rate in the city's lowest crime neighborhoods would result in a reduction of the annual cost of crime of between $550 million and $1,250 million at today's prices.

As part of a larger study of the effects of municipal services on property values, Boskin (1978) has derived some preliminary estimates of the costs of crime by analyzing variations in property values in San Mateo County, California. He finds that a 10% increase in the crime rate results in a 4% reduction in property values, a result very close to Rizzo's estimates.

Thaler (1978) conducted a similar study using data from Rochester, New York. Since he considered only the effects of property crimes, his numerical results are not directly comparable to those of Rizzo and Boskin. However, he also finds that variations in housing values across neighborhoods are affected by differences in the incidence of property crime at the rate of about $800 per crime in today's prices.

The basic approach used in these studies need not be confined to an analysis of the effects of crime on property values. Goldberg (1979) applies the technique to an analysis of the impact of locational variations in the incidence of various crimes on local wages. His preliminary results indicate

that the cost of attracting labor is, as expected, greater in high crime areas than in low crime areas. The wage differential is an indication of the costs of the higher crime rate as seen by the labor force.

C. The Costs of the Criminal Justice System

We conclude this section with some remarks on the costs of the criminal justice system.

The agencies of the system--police, courts, legal services, correctional institutions, and so forth--are all examples of public sector bureaucracies. The economic theory of bureaucracy suggests that this particular type of organizational form will often be characterized by cost inefficiency in its internal operations. Empirical studies of various public bureaucracies have tended to confirm this hypothesis.[9] Of particular relevance here are two recent studies of the costs of police services. Darrough and Heineke (1978), in the course of their investigation of cost functions for law enforcement agencies, find that the behavior of such agencies is inconsistent with cost minimization on the part of police decision makers. In his study of four municipal police departments in California, Phillips (1979) concludes that costs in those departments have been between 15% and 100% above their efficient level. He argues further that the major source of these cost overruns has been the tendency of police departments to utilize too many police officers relative to civilian labor and capital equipment.

These results imply that the observed expenditures of law enforcement agencies, and possibly of the other agencies of the criminal justice system, overstate the costs necessary to provide the corresponding levels of crime

control services. Alternatively, to the extent that the criminal justice system must produce its services exclusively through bureaucratic agencies in the public sector--rather than contracting out some of that production to private firms--one might regard their expenditures partly as a measure of the cost of crime control services and partly as a measure of costs unique to the organizational form through which such services must be supplied.

It is not only the absolute level of expenditures within the criminal justice system that is important for analyzing the costs of crime control. Knowledge of the system's cost functions--that is, of the relations between its various expenditures and the components of its output--is perhaps of even greater value from a policy standpoint.[10] Of particular importance are the incremental, or marginal, cost functions which would provide information about the costs of changes in the outputs of the various services provided by the criminal justice system.

It is only recently that empirical estimates of such cost functions have become available. Darrough and Heineke (1978), for example, derive estimates of the marginal costs of police clearances (arrests) for a variety of crimes. Their estimated costs, in 1978 dollars, range from a low of $747 for the solution of one additional case of larceny, to $15,973 for the solution of an additional crime against the person. These results are shown in Table 2. They also calculate trade-off rates between the solutions of various crimes. For example, they calculate that with a constant amount of available police resources, it is necessary on average to forego about four burglary solutions for each additional solution of a crime against the person.

TABLE 2

Marginal Costs of Police Clearances[a]

Crime	Arrest
Burglary	$ 1,661
Robbery	1,234
Larceny	747
Motor Vehicle Theft	6,467
Crimes Against the Person[b]	15,973
Weighted Average	$2,477

[a]All amounts in 1978 dollars. Figures are based on original estimates made by Darrough and Heineke (1978).

[b]Murder, rape, and aggravated assault.

Weller and Block (1979) investigate cost functions for judicial services. Defining judicial output as the final disposition of a case, they estimate the marginal cost of a jury trial to be $2,215, of a nonjury trial to be about half that at $1,055, and of a guilty plea to be $312, all in 1978 dollars. This tends to confirm the commonly held opinion that plea bargaining can have a substantial effect on court costs. However, two of their other discoveries are somewhat surprising.

They find that, among cases in which a trial has been commenced, the differences in cost between jury and nonjury trials are largely explained by differences in the likelihood that a case will be terminated prior to a full presentation of evidence. In other words, if evidence is presented in a case, there is not likely to be a substantial difference between the costs of jury and nonjury dispositions. This suggests that efforts to limit the use of juries, or to reduce their size, may not yield very great reductions in court costs.[11]

Weller and Block also find that the marginal cost of cases dismissed before trial or transferred to another district was $1,809. This cost, which one would have expected to be low, is almost as great as that of a jury trial. Though they provide no full explanation of this anomalous result, the authors conjecture that it may reflect the higher incidence of costly pretrial procedures associated with dismissal. If their estimate is correct, greater reliance on pretrial maneuvering may yield significant increases in the cost of running the judicial system.

In another study, Block and Ulen (1979) analyze the costs of correctional institutions in the state of California. Ignoring the costs of rehabilitative services because of difficulties of measurement, and defining the output

of these institutions solely in terms of confinement and the hotel-like services and personal goods and services provided jointly with confinement, they estimate cost functions for maximum and medium security prisons and for jails. They find that in maximum security prisons the short run marginal cost of an additional inmate-year of confinement--that is, the incremental cost given fixed capital and other overhead costs--is about $550 in today's prices. Data from medium security prisons allow estimation of long run marginal costs; that is, the cost of confining additional inmates when the capacity of the facility varies with changes in the inmate population. These estimates of marginal cost capture the effect of inmate population on overhead costs and are estimated to be about $3,500 per year at today's prices. The long run cost estimate for jails is about the same when square footage per inmate is held constant.[12]

III. THE COST OF DETERRENCE: AN ILLUSTRATIVE CALCULATION

The empirical studies discussed above focus on the costs of arrests, adjudication, and imprisonment. These are intermediate outputs in the production of the criminal justice system's ultimate goal: the deterrence of crime. While there have been many studies confirming the deterrent effects of these outputs, previous researchers have given little consideration to either the cost of deterrence or the savings in averted crime it yields.[13] In this concluding section we shall attempt to provide such an integrated approach to the costs of crime control by calculating a rough estimate of the cost of deterrence.

To calculate the costs of reducing the incidence of crime, we have chosen to use the estimates of the deterrent effects of convictions derived by Phillips and Votey (1973). Their estimates imply that a 1% reduction in the number of index felonies can be achieved with a 0.67% increase in the number of convictions. Given recent U.S. crime and conviction rates, this implies that securing about 4,500 additional felony convictions annually would eliminate approximately 110,000 index crimes. Using information about the cost of those additional convictions, we can then determine the cost per crime eliminated at the margin.

However, we have no direct measure of the incremental cost of a conviction by the criminal justice system. Arrests, convictions and punishment all have deterrent effects, and all can, to some extent, be varied independently of one another. Hence, an accurate measure of the cost of an additional conviction would require knowledge of the relative adjustments in these three areas which accompany the increased deterrent efforts. Lacking this knowledge,

we must make a number of simplifying assumptions about the criminal justice process. Namely, we assume that, for the small changes we consider, the arrest-conviction ratio, the conviction-imprisonment ratio, and the average length of sentences are fixed at their current values. Under these conditions, the incremental cost of a conviction includes proportional changes in costs associated with arrests and imprisonment, as well as costs more directly attributable to the adjudication of guilt.

Using estimates of the relevant crime control costs from the cost studies cited above, we estimate the incremental costs of a conviction to the criminal justice system to be approximately $15,000. The implication of this is that a 1% reduction in crime can be purchased at a total cost to the criminal justice system of about $68.6 million, or about $625 per crime averted.

If resources were optimally allocated to crime control, so that the costs of crime control were balanced at the margin against the cost of crime, this latter figure ($625) would approximate the social marginal cost imposed by one felony index crime. That this is unlikely to be the case is suggested by the fact that the $625 figure is somewhat below Thaler's (1978) estimate of about $800 imposed by just an additional property crime. Whether the level of deterrence is optimal or not, the calculation of the cost of deterrence does provide an indication of how much it would cost to decrease the level of crime.

NOTES

[1]Strictly speaking, one should distinguish between the personal value of the automobile (or any other asset) to its owner and its value in the market. The owner's decision to hold, rather than sell, implies that the former will generally exceed the latter.

[2]This treatment of illegal transfers is based on two implicit assumptions. First, it assumes that there exists no objective criterion by which one can compare the value of stolen goods to the thief with their value to his victim. Were such a comparison possible, the social cost would be measured by the net change in value resulting from the transfer. Note that this change in value could conceivably be positive--in a Robin Hood world, for example--and the "cost" of theft therefore is really a social benefit. Economists are generally unwilling to make such comparisons unless the relative values are revealed in a process of voluntary exchange. Secondly, it assumes that the thief does not by his actions forfeit his membership in society. If he does, then his transfer of the asset effectively extinguishes its value to society and thus imposes a social cost. Here again, the economist makes no pretense of being an arbiter of qualifications for membership in the society.

[3]Viewed in this way, most behavior which societies designate as criminal is part of a larger class of activities generating what economists call externalities. An external cost is one which is borne not by the agent whose actions impose the cost (e.g., the thief, vandal, rapist, or other criminal), but by some other party (e.g., the victim). Though it clear that much social interaction--ranging from smoking in a crowded elevator to murder--results in some degree of external cost, the label of criminal is usually reserved to those situations in which the external costs of the activity are high relative to the social benefits (if any) it generates.

[4]Technically speaking, strict equivalence assumes that the prospective owner of the automobile is "risk neutral." That is, he would not be willing to pay a premium either to avoid or to engage in risky activities.

[5]Clotfelter (1977, 1978) provides evidence of such behavior modification among residents of Washington, D.C. He finds, for example, that differences in burglary and robbery rates lead to statistically significant differences in the probability that members of a household will occasionally stay at home to avoid exposure to crime, and that they will attempt to avoid crime by sometimes taking a taxi in lieu of walking to their destination.

[6] Attempts to control crime by increasing costs to potential criminals assume that the latter are "rational" in the sense that their behavior is affected predictably by the perceived costs of various acts. Research by economists is virtually unanimous in confirming that this is so. See Taylor (1978) for a summary of that research.

[7] The method is that of "hedonic" prices; literally, the prices one is willing to pay for certain physical and psychic amenities.

[8] Technically, the price differential exactly reflects the cost of crime only to the marginal homeowner; that is, the one for whom the lower cost of housing just barely compensates for the higher crime rate. Additional information (i.e., a "demand curve") is needed to measure the costs to other, non-marginal homeowners.

[9] For a collection of this research, see Borcherding (1977).

[10] Strictly speaking, cost functions relate outputs to efficient cost levels. As noted in the text, the assumption of efficiency is likely to be violated here, so that the estimated "cost functions" relate outputs to the corresponding actual, rather than efficient, cost outlays of the system.

[11] This argument applies only to the judicial costs actually incurred by the criminal justice system. In a jury trial, substantial additional costs may be borne by the jurors, since they are rarely paid an amount equal to the value of their time.

[12] The estimated cost figures do not include any capital charges.

[13] For a summary of the empirical research on deterrence, see Taylor (1978).

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