

THE ECONOMIC RAMIFICATIONS OF CRIME AND PUNISHMENT:
A PROBLEM OF UTILITY MAXIMIZATION

by

GARY E. MARCHE'

B.S., Kansas State University, 1975

A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARTS

Department of Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1978

Approved by:


Major Professor

LD
2668
.R4
1978
M36
C.2

INTRODUCTION

The fear of crime and what to do about crime has become a source of major concern among Americans. In assessing the amount and trends of crime The President's Commission on Law Enforcement and Administration of Justice¹ concluded that property and violent crime, in numbers of offenses, are increasing and that--especially for property crimes--the rate of increase is faster than the rate of increase in the population. Fear of victimization from violent crimes affects individual behavior. People avoid, for example, such places as public parks, dark streets, and some areas of commerce in the interest of safety. This reduces the social value of the public goods and also diverts private resources to other areas. And, consequently, there are numerous undesirable indirect effects that could be listed.

Previously the focus of the most attention by both the public and the law enforcement agencies has been on the seven FBI Index offenses--murder and non-negligent manslaughter, forcible rape, robbery, aggravated assault, burglary, felony larceny, and motor vehicle theft. The designation of this categorization is subject to debate.² However, if crimes were categorized on the basis of their overall economic impacts the picture changes. Again referring to the President's Commission report it is found that

Organized crime takes nearly twice as much income from gambling and other illegal goods and services as criminals derive from all other kinds of criminal activity combined.

Unreported commercial theft losses, including shoplifting and employee theft, are more than double

those of all reported private and commercial thefts.

Of the reported crimes, willful homicide, though comparatively low in volume, yields the most costly estimates among those listed on the UCR crime Index.

A list of the seven crimes with the greatest economic impact includes only two, willful homicide and larceny of \$50 and over (reported and unreported), of the offenses included in the crime Index.³

Given the increasing trend and significant economic impact of crime in this country it is appropriate that more social scientists consider the problem. Recently economists have begun to develop perspectives regarding criminal motivation that are in contrast to those made by criminologists. Criminologists have focused attention on the social environment which is said to cause individual deviance and consequently propose policies to "reform" both factors.⁴ They indicate that, since criminals are sick, they will not be deterred by punishment and, consequently, to affect crime we should reform these socially deformed, deviant, irrational people. On the other hand, economic analyses tend to view environmental effects and irrationality as only two factors of the problem--with the environmental factor by far the more predominant of the two. Furthermore, the social environmental effects in the economic perspective come from a different rationale.⁵

The purpose of this paper is to review those studies, both theoretical and empirical, that are concerned with the economic ramifications of crime and punishment. These studies either assume individual rationality among criminals (that they are individual undertaking illegitimate actions for profit) or, more simply, that criminals, like non-criminals, do respond to incentives (in other words, punishment will deter crime and increased levels of expected booty will increase crime).

In either case the individual calculates the benefits and costs associated with his or her criminal actions (just as in non-criminal actions) in an attempt to maximize utility. This perspective is in direct contrast to that of criminologists.

In the theoretical literature, which is presented first, rational benefit-cost calculation is assumed (on the part of the criminal and the policy makers). Based on this assumption, models are developed which suggest policies aimed at the minimization of social loss from criminal activity. In turn, the empirical literature demonstrates that criminals do respond to incentives as predicted by the original assumption. It must be pointed out that this does not prove that criminals are completely rational, only that they calculate the respective costs and benefits associated with their criminal actions in an attempt to maximize their utility. To say that criminals are completely rational or do not have personal characteristics that differ in some way from law-abiding citizens would be going too far.⁶ However, a rational response to these types of incentives does mean that, in developing policies aimed at reducing crime, we can dispense with theories regarding individual deviance and social deformity.

Also, the review of empirical literature suggests some problems with resource allocation in regard to police protection (which is partly a problem of the available data), and considers the returns associated with burglary--a crime similar to that used to develop the equilibrium analysis of criminal behavior in the theoretical section. Finally, the review of empirical literature includes the effect on crime rates of some socio-economic factors including the respective economic rationale. These

factors include, among others, income distribution, unemployment and labor-force participation rates, percentage of the population that is non-white, and population density.

The basic assumption on which economic analysis rests, and which is in contrast to that made by criminologists, is individual rationality. As Gordon indicates (given competition, inequality and little, if any, economic security), the assumption that an individual must maximize his utility by making action choices among the set of available utility producing alternatives is common to orthodox and radical economic perspectives.⁷ Specifically, Becker states that ". . . a person commits an offense if the expected utility to him exceeds the utility he could get by using his time and other resources at other activities. Some persons become 'criminals,' therefore, not because their basic motivation differs from that of other persons, but because their benefits and costs differ."⁸ This is not meant to imply, however, that all criminals calculate accurately or, in some instances, even at all. Some individuals do not consider the ramifications of their criminal actions to any significant degree⁹ but, as will be shown, this irrationality can be worked into the analysis. However, those criminals such as professional burglars, members of organized crime syndicates, white collar criminals, and the employee about to steal from his store are examples of persons who are probably very aware of the risks and benefits associated with their respective criminal actions. Awareness and consideration of these ramifications is all that is needed to allow application of economic analysis.

A REVIEW OF THEORETICAL LITERATURE

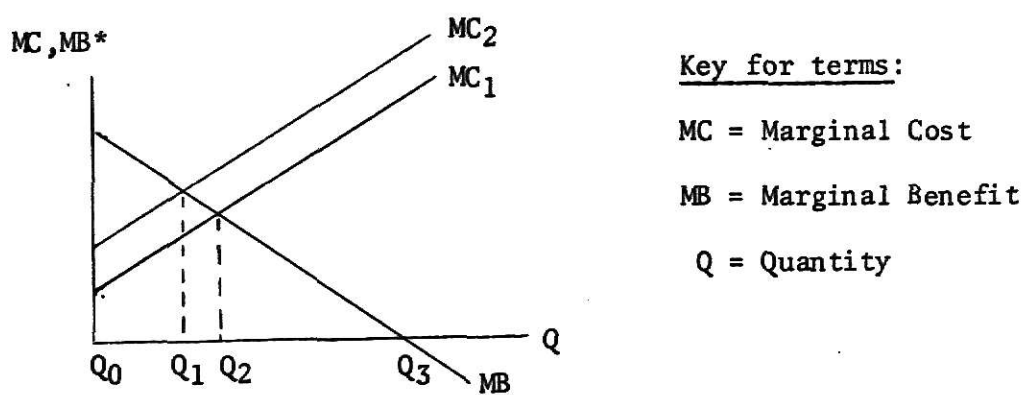
According to McKenzie and Tullock, the following are some examples of benefits and costs likely to be perceived in considering a potential criminal action:¹⁰ increased income, reduced working hours, improved working conditions, increased status among a given socio-economic (reference) group, and greater job security. It should be pointed out that some of these benefits--especially status--could be produced, for some individuals, by incarceration. Some possible offsetting costs could include a reduction of income earning ability due to a criminal record, forgone income while incarcerated, the cost of legal help, development of necessary criminal skills (probably reduced by incarceration), acquisition of necessary tools, less respect from family and community (if this is his reference group then the individual loses status), and perhaps even a psychic cost of having done "wrong."

Assuming rational calculation and a given type of crime such as robbery, McKenzie and Tullock develop an individual's supply and demand curves for those crimes.¹¹ This is done by first assuming some specific costs to the individual of committing a robbery, such as labor and materials. As the individual commits more crimes, in the given robbery market area, we would expect that these costs would, after some point, tend to increase because of the assumption that the individual would first choose those crimes with the lower costs or, in other words, the ones requiring the fewest resource inputs. This rising marginal cost curve could then be interpreted as the robber's supply of offense curve.

And since the rational criminal is also likely to choose first those crimes with the highest expected returns, leaving those with continually diminishing returns for later, he faces a downward sloping marginal benefit curve. This is the robber's demand for offense curve.

Figure 1

Supply and Demand Curves for an Individual Robber



Referring to Fig. 1 the individual robber derives benefits until Q_3 robberies have been committed but after that further robberies yield negative benefits. However, at Q_3 robberies the respective marginal costs more than offset the level of marginal benefits, therefore, the individual would be better off to decrease the amount of offenses to where the costs are not greater than the benefits. At the same time he does not want to decrease activity so far that the marginal benefits outweigh marginal costs such as at Q_1 . At Q_1 he is better off if he commits more robberies because the additional benefit of the next robbery is greater than the additional cost. As long as each succeeding robbery yields greater

*These marginal costs and benefits accrue only to the individual robber.

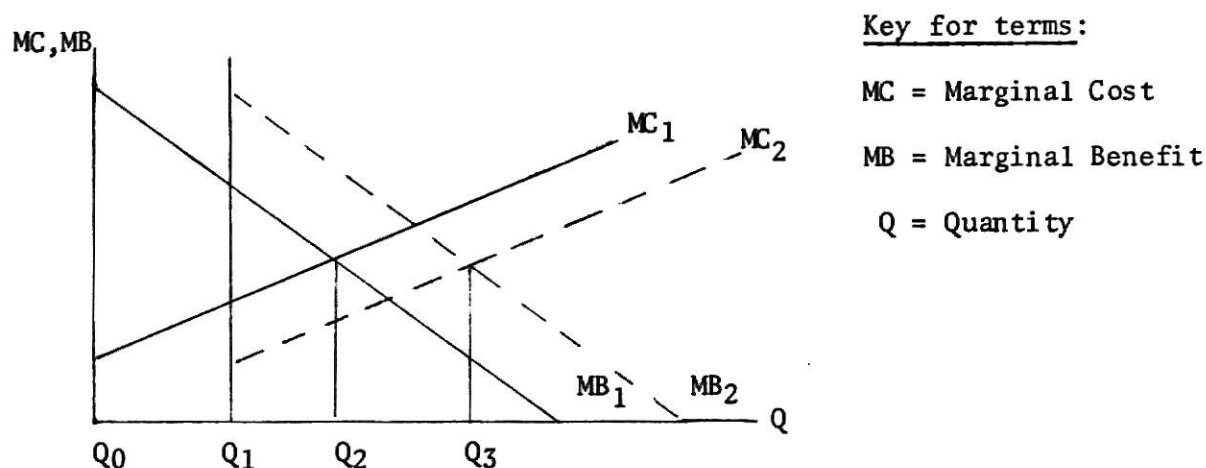
benefits than costs the individual can further increase his utility by committing more robberies. As he does this he will come to the equilibrium number of offenses at Q_2 where the marginal benefit is just equal to the marginal cost. And further, since we have the individual's demand and supply curves, the community equilibrium number of robberies can be determined by adding horizontally each individual curve. The market equilibrium is then simply the intersection of these aggregative functions.

Fig. 1 illustrates the effect of changes in the costs and benefits of crime on rational criminal activity. Adding punishment to the analysis increases the cost which shifts the supply curve (MC_1) to the left to (MC_2) and results in a reduction of the amount of crimes committed from Q_2 to Q_1 . Some other cost factors that would shift the supply curve to the left would include increases in risk or cost of materials as a result of, for example, more police or tougher handgun laws. The demand curve behaves the same way. A decrease (increase) in the average booty per offense would shift it to the left (right) as such changes are perceived by the criminals.

The analysis is also valid when considering the presence of irrational criminals.¹² Since there are more criminals the market equilibrium would be further out to the right. However, there is no need to assume their presence changes the slopes of the market supply and demand curves. In not considering the consequences of their actions the slopes of their marginal benefit or demand curves would tend to be vertical. Fig. 2 illustrates this condition. Assuming the irrational criminal's demand curves are perfectly vertical and given a greater number of criminals now in the market the quantity of their crimes could

be placed, for example, at Q_1 . Their presence creates total market equilibrium at Q_3 instead of at Q_2 by shifting the rational criminal's supply and demand curves to the right, meaning that rational criminals will commit $Q_3 - Q_1$ crimes. And these crimes committed by rational criminals then are the ones affected by policies that change the costs and benefits of their actions.

Figure 2
Supply and Demand Curves for Rational
and Irrational Criminals



Becker's paper is a continuation of the preceding analysis and a good example of how public policies which affect the cost of criminal actions could benefit society as a whole. He demonstrates ". . . that optimal policies to combat illegal behavior are part of an optimal allocation of resources. [And] since economics has been developed to handle resource allocation, an 'economic' framework becomes applicable to, and helps enrich, the analysis of illegal behavior."¹³ Optimal policies, in Becker's paper, are the ones that minimize the social loss in income from criminal activity. This loss then is quantifiable by adding the cost of

criminal damage, the cost of apprehension and conviction, and the cost of the types of punishments (such as fines, probation, and imprisonment) that could be imposed. This loss can be minimized (the aggregate criminal supply curves for specific crimes can be shifted) with respect to the degree of risk associated with the probability of being apprehended and convicted (p), and the severity and form of punishment (f), while the corresponding public decision variables are the expenditures on police and courts, etc. Constraints on optimal values of p , f , and 0 are the damages caused by a given number of offenses (0), the cost of achieving a given p , and the effect of a change in p and f on 0 .

Becker's paper is a pioneering work in economic theory and consequently assumes certain conditions. As indicated above these analyses apply only to rational criminals, however, some other assumptions have been made by Becker. He assumes consensus on values of damages and benefits in working out his optimality conditions.¹⁴ Also, as Harris¹⁵ points out, the legal framework has been taken for granted when it itself is actually subject to social choice. Harris' paper is the last purely theoretical contribution to be considered. In it an additional variable, individual legal rights, is added so that minimization of social loss from illegal activity involves determining optimal levels of them in addition to Becker's two variables of expenditures on law enforcement and form of punishment.

Harris¹⁶ points out that the legal framework or legal safeguards pertaining to individual legal rights which are subject to social choice include, for example, those issues involving standards of evidence, procedures for arrest and indictment, and rights to counsel. As these

factors change they affect the cost of apprehension and conviction just as they do the level of legal safeguards, however, as the legal framework changes these two variables involve a trade-off. Adding provisions for procedures such as "stop and search," wire tapping, and "no knock," for example, decreases the cost of apprehending and convicting a given proportion of criminals at a given level of offenses (which decreases the probability of a guilty person going unpunished--a type I error) while at the same time lowering the level of legal safeguards (which increases the probability that an innocent person will be punished--a type II error). And, taking out such provisions results in the opposite effects. In general, as society, as a whole, perceives increasing losses from crime, relaxed legal safeguards and increased levels of apprehension and conviction will be called for. To get these effects the legal framework should be changed to decrease the cost of apprehension and conviction. However, if society perceives greater losses from unjust punishment then increased legal safeguards and lower levels of apprehension and punishment will be desired.

According to Harris, however, economic analysis is extremely limited in deriving optimal levels of legal rights for individuals because different groups in society place different weights on potential losses from crime, and losses from unjust harassment and punishment. For example, Harris points out that the property owning class is likely to put greater weight on the potential loss from property crimes while correspondingly putting less weight on the chances of loss through unjust harassment and punishment. However, the opposite may be true of other groups in society. Harris concludes that,

Optimal levels of the policy variables depend on how various losses are perceived. It is clear that these losses will be perceived differently among social and economic groups within any society. The political process will determine how the interests of various groups will be reconciled or which groups will be able to impose their will on the rest of the society. Unfortunately, the economic approach is rather powerless to shed light on resolution of group conflict.¹⁷

A REVIEW OF EMPIRICAL LITERATURE

Given the assumption of individual rationality a model can be developed to predict individual behavior in the illegitimate sector, within certain resource and social constraints. It is now necessary to check the validity of this theory by reviewing the empirical literature. The following studies include the major publications, primarily by economists, that have been conducted regarding crime rates and the factors that influence these rates. Although the data presently available are poor and render efforts to determine optimal levels of deterrent variables of dubious value, the major conclusions regarding the effect of these and other variables are valid.¹⁸

One of the most ambitious efforts toward the theoretical and empirical investigation of crime is by Issac Ehrlich.¹⁹ Ehrlich assumes that whatever the personal characteristics of a criminal are, he or she does respond to incentives just as anyone else. And, Ehrlich presents the individual's decision problem as one that involves the ". . . optimal allocation of resources under uncertainty to competing activities both inside and outside the market sector, rather than as a choice between mutually exclusive activities."²⁰ Also, instead of just considering the costs to the criminal of illegal activities, Ehrlich incorporates into his analysis the elements of gain. Regarding this he says, "Specifically, it predicts and verifies empirically a systematic association between the rate of specific crimes on the one hand, and income inequality as well as law enforcement activity on the other."²¹ Ehrlich uses a simultaneous-

equation model in estimating supply-of-offenses functions and a production function of law-enforcement activity and applies them in a cross-state regressions analysis. The empirical investigation deals only with the seven Index crimes and the data is from the Uniform Crime Reports of the FBI. Data sample sizes range from 36 to 47 state observations for the years 1940, 1950, and 1960. The results ". . . indicate the existence of a deterrent effect of law enforcement activity [independent of punishment effects] on all crimes and a strong positive correlation between income inequality and crimes against property."²² Tables 1, 2, and 3 show the OLS regression coefficient estimates along with the variables used in the supply-of-offenses function.

Regarding the supply-of-offenses function, equation (1.1), Ehrlich's major consistent findings on the effects of the probability and severity of punishment, Income and Income Inequality, and Racial composition were:

1. The rate of specific crime categories, with virtually no exception, varies inversely with estimates of the probability of apprehension and punishment by imprisonment, $P = C/Q$ [where P is an estimator of the probability of apprehension and imprisonment: the number of offenders imprisoned per offenses known], and with the average length of time served in state prisons, T .
2. Crimes against property (robbery, burglary, larceny, and auto theft) are also found to vary positively with the percentage of families below one-half of the median income (income inequality), X , and with the median income, W ; in contrast, these variables are found to have relatively lower effects [this is shown in Ehrlich's 2SLS tables of coefficients which are not presented here] on the incidence of crimes against the person (particularly murder and rape). Also, the regression coefficients associated with X and W have relatively high standard errors in the case of crimes against the person.
3. All specific crime rates appear to be positively related to the percentage of nonwhites in the population, NW These findings hold consistently across samples from 1960,

TABLE 1

List of Variables Used in Regression Analysis Including
the Mean (group) Supply-of-Offenses Function
(in natural logarithmic* transformation)

$$\text{equation (1.1): } \ln\left(\frac{Q}{N}\right)_i = a + b_{1i} \ln P_i + b_{2i} \ln T_i + C_{1i} \ln W \\ + C_{2i} \ln X + e_{1i} \ln NW + \mu_i$$

where i = given crime category

$\left(\frac{Q}{N}\right)_i, \left(\frac{Q}{N}\right)_{t-1}$ = current and 1-year lagged crime rate: the number of offenses known per capita

$\left(\frac{C}{Q}\right)_i = P_i$ = estimator of probability of apprehension and imprisonment: the number of offenders imprisoned per offenses known

T_i = average time served by offenders in state prisons

W = median income of families

X = percentage of families below one-half of median income

NW = percentage of nonwhites in the population

Crime and Law Enforcement

Simultaneous equations model.

equation (1.2) $P = B\left(\frac{E}{N}\right)^{\beta_1} \left(\frac{Q}{N}\right)^{\beta_2} Z \exp(E)$ Production function of direct law enforcement activity.

equation (1.3) $\left(\frac{E}{N}\right) = \gamma L^r \left(\frac{Q}{N}\right)^r \left(\frac{E}{N}\right)_{t-1}^{1-\gamma} \exp(E)$ public demand function.

where $\left(\frac{E}{N}\right), \left(\frac{E}{N}\right)_{t-1}$ = per capita expenditures on police in fiscal 1960, 1959.

Source: Issac Ehrlich, "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation," Journal of Political Economy (May/June 1973).

*Note: log linear form means the estimated coefficients are elasticities.

TABLE 2

OLS (weighted) Regression Estimates of Coefficients Associated
with Selected Variables in 1960, 1950, and 1940: Crimes
Against the Person and All Offenses
(Dependent Variables are Specific Crime Rates)

Offense and Year	Estimated Coefficients Associated with Selected Variables						Adj R ²
	a Intercept	b ₁ with lnPi	b ₂ with lnTi	C ₁ with lnW	C ₂ with lnX	e ₁ with lnNW	
Murder:							
1960	-0.6644*	-0.3407	-0.1396*	0.4165*	1.3637	0.5532	.8687
1950**	-0.7682*	-0.5903	-0.2878	0.6095*	1.9386	0.4759	.8155
Rape:							
1960**	-7.3802*	-0.5783	-0.1880*	1.2220	0.8942*	0.1544	.6858
Assault:							
1960	-13.2994	-0.2750	-0.1797*	2.0940	1.4697	0.6711	.8282
1950	-0.7139*	-0.4791	-0.3839	0.5641*	0.9136*	0.5526	.8566
1940	-0.2291	-0.4239	-0.6036	0.7274	0.5484*	0.7298	.8381
Murder and Rape:							
1960**	-1.8117	-0.5787	-0.2867	0.6773*	0.9456	0.3277	.6948
Murder and Assault:							
1950**	1.0951*	-0.7614	-0.3856	0.3982*	1.1689*	0.4281	.8783
Crimes against Persons:							
1960**	-4.1571*	-0.5498	-0.3487	1.0458	0.9145	0.4897	.8758
All offenses:							
1960	-7.1657	-0.5255	-0.5854	2.0651	1.8013	0.2071	.6950
1950	-1.5081*	-0.5664	-0.4740	1.3456	1.9399	0.1051	.6592
1940	-5.2711	-0.6530	-0.2892	0.5986	2.2658	0.1386	.6650

Source: Ehrlich, p. 546.

Note: The absolute values of all regression coefficients in Tables 2 and 3, except those with *, are at least twice those of their standard errors; ** indicates regressions in which the absolute difference (b₁-b₂) is at least twice the value of the relevant standard error S(b₁-b₂).

TABLE 3

OLS (weighted) Regression Estimates of Coefficients Associated
with Selected Variables in 1960, 1950, and 1940:
Crimes Against Property
(Dependent Variables are Specific Crime Rates)

Offense and Year	Estimated Coefficients Associated with Selected Variables						Adj R ²
	a Intercept	b ₁ with lnPi	b ₂ with lnTi	C ₁ with lnW	C ₂ with lnX	e ₁ with lnW	
Robbery:							
1960**	-20.1910	-0.8534	-0.2233*	2.9086	1.8409	0.3764	.8014
1950**	-10.2794	-0.9389	-0.5610	1.7278	0.4798	0.3282	.7839
1940	-10.2943	-0.9473	-0.1912*	1.6608	0.7222	0.3408	.8219
Burglary:							
1960**	-5.5700*	-0.5339	-0.9001	1.7973	2.0452	0.2264	.6713
1950	-1.0519*	-0.4102	-0.4689	1.1891	1.8697	0.1358	.4933
1940	-0.6531*	-0.4607	-0.2698	0.8327*	1.6939	0.1147	.3963
Larceny:							
1960	-14.9431	-0.1331	-0.2630	2.6893	1.6207	0.1315	.5222
1950	-4.2857*	-0.3477	-0.4301	1.9784	3.3134	-0.0342*	.5819
1940	-10.6198	-0.4131	-0.1680*	0.6186	3.7371	0.0499*	.6953
Auto Theft:							
1960	-17.3057	-0.2474	-0.1743*	2.8931	1.8981	0.1152	.6448
Burglary and Robbery:							
1960	-9.2683	-0.0243	-0.6883	2.1598	2.1186	0.2865	.7336
1950	-3.0355*	-0.5993	-0.4879	1.3624	1.6066	0.1854	.5590
Larceny and Auto Theft:							
1960	-14.1593	-0.2572	-0.3339	2.6648	1.8263	0.1423	.6826
1950	-3.9481*	-0.3134	-0.4509	1.9286	2.9961	-0.0290*	.8894
Crimes against Property:							
1960	-10.1288	-0.5075	-0.6206	2.3345	2.0847	0.2118	.7487
1950	-2.8056	-0.5407	-0.4792	1.8836	2.2548	0.0755	.6253

Source: Ehrlich, p. 547.

Note: Same references as in Table 2.

1950, and 1940, independently of the regression technique employed or the specific set of (additional) variables introduced in the regression analysis. We therefore present them separately from other results.²³

Ehrlich recognized the simultaneous nature of the level of measured crime rates influencing the level of expenditures on police and courts and, in turn, that the level of this service influences the level of measured crime rates²⁴ (his simultaneous equations model uses the production and public demand functions, 1.2 and 1.3, given in Table 1). After running the regressions and substituting equation (1.2) in equation (1.1) Ehrlich shows that "a 1 percent increase in expenditure on direct law-enforcement would result in about a 3 percent decrease in all felony offenses [however, the associated standard error of this estimate was quite high]."²⁵

Another perspective regarding the simultaneous effects between measured crime rates and expenditures on law-enforcement has been developed by Greenwood and Wadycki.²⁶ However, as they carefully pointed out, their model does not consider the question of law-enforcement productivity (that is, to what extent actual crime rates decline as more expenditures are diverted to police and courts). Instead, they focus their attention on the response of measured crime rates. The results of their empirical investigation are presented in Tables 4, 5 and 6 which include the model, a description of the variables used, the estimated coefficients, and the economic rationale for each variable.

Specifically, Greenwood and Wadycki hypothesize that given a ratio of reported to unreported crime and the relative efficiency of additional police in detecting versus deterring crime, an increase in police personnel will result in an increase in measured crime rates. And, this increase in measured crime rates will, in turn, induce greater (public) demand for

TABLE 4

Functions and Description of Variables Used

Output functions:

$$(1) \quad C_1 = f_1 (\text{POL}, \text{POV}, \text{DEN}, \text{BLK}, \text{D}, \text{VAL}, e_1) \text{ and}$$

$$(2) \quad C_2 = f_2 (\text{POL}, \text{POV}, \text{DEN}, \text{BLK}, \text{D}, e_2),$$

Expenditure equation:

$$(3) \quad \text{EXP} = f_3 (C_1, C_2, \text{INC}, \text{TAX}, e_3),$$

Input equation:

$$(4) \quad \text{POL} = f_4 (\text{EXP}, e_4),$$

Endogenous variables

C_1 = per capita crimes against property, 1960, where crimes against property include burglary, larceny, and auto theft;

C_2 = per capita crimes against persons, 1960, where crimes against persons include murder or non-negligent manslaughter, forcible rape, robbery, and aggravated assault;

EXP = per capita local government expenditure for police protection, 1962;

POL = per capita full-time equivalent employment in police protection, 1962;

Exogenous variables

POV = percentage of families with 1959 family income below \$3000, 1960;

DEN = population per square mile, 1960;

BLK = percentage of the population that is black, 1960;

VAL = median value of owner-occupied housing units, 1960;

TAX = per capita property taxes, 1962;

INC = median 1959 income of families residing in the SMSA in 1960;

D = South-North dummy variable, . . .;

e_i = random errors, where $i=1, \dots, 4$.

Source: Michael J. Greenwood and Walter J. Wadycki, "Crime Rates and Public Expenditures for Police Protection: Their Interaction," Review of Social Economy (October 1973).

Note: SMSA = Standard Metropolitan Statistical Area

TABLE 5

Simultaneous-Equations Model of Crime Rates and Public Expenditures
for Police Protection: Three Stage Least Squares Estimates (β)
and t-Ratios (t)

Independent Variables	Equation for			
	C ₁	C ₂	EXP	POL
C ₁	- -	- -	0.29 (2.23)	- -
C ₂	- -	- -	0.13 (2.31)	- -
EXP	- -	- -	- -	0.68 (19.74)
POL	1.30 (5.04)	1.68 (4.82)	- -	- -
POV	0.23 (1.97)	0.54 (3.06)	- -	- -
DEN	-0.03 (-1.27)	-0.02 (-0.50)	- -	- -
BLK	0.001 (0.04)	0.29 (6.86)	- -	- -
D	0.22 (2.81)	0.14 (1.10)	- -	- -
VAL	0.24 (1.61)	- -	- -	- -
INC	- -	- -	0.85 (5.49)	- -
TAX	- -	- -	0.18 (3.86)	- -
INTERCEPT	2.06 (0.92)	1.45 (0.88)	-10.65 (-7.42)	-3.33 (-20.16)
OLS R ²	0.34	0.54	0.49	0.83

Source: Greenwood and Wadycki, p. 146.

TABLE 6

Economic Rationale Behind Selected Variables

Variable	Nature of Effect on Crime Rates	Expected sign of est. coeff.	Actual sign of est. coeff.
1) POV	The lower an individual's level of income the lower is his opportunity cost of committing crimes	+	+
2) DEN	Densely populated areas increase the chance that an offender's identity will remain unknown and hence lowers the probability of apprehension or cost of committing crimes. This variable may also pick up effects associated with the benefits of committing crimes against persons	+	-
3) BLK	The economic and social costs of committing crimes may be lower among blacks because of higher unemployment rates and a greater feeling of alienation from government (law) than the white population	+	+
4) D	Captures affect of climate and other demographic and social differences between South and North regions. South = 1, North = 0		+
5) VAL	The benefits associated with committing property crimes are expected to increase as the median value of owner occupied housing increases	+	+
6) TAX	Per capita expenditures for police protection could be increased the higher are per capita property taxes	+	+
7) EXP	Greater per capita expenditures for police would likely reflect a community's desire to hire more of them	+	+
8) INC	The level of community income is expected to affect its demand for public goods such as police	+	+
9) POL	Depends on the ratio of reported to unreported crimes and on the relative efficiency of police in detecting and deterring crimes		+

Source: Greenwood and Wadycki.

more police. The results of their empirical investigation [refer to Table 4 for the lag structure] strongly support this hypothesis. Greenwood and Wadycki found that "in both crime-rate equations the per capita police variable is positive and highly significant,"²⁷ and further, "the coefficients suggest that a one-percent increase in the number of police per capita results in a 1.30 percent increase in per capita crimes against property and a 1.68 percent increase in per capita crimes against persons."²⁸

This ostensibly paradoxical result must be accepted with caution, however. Greenwood and Wadycki point out that crime prevention and crime detection are not independent events. "An increase during the current time period in detection coupled with apprehension and conviction may result in crime prevention in future periods."²⁹ Also worth considering (a point alluded to above) is that even though additional police may cause measured crime to increase, their effect on actual crime rates is uncertain. Greenwood and Wadycki indicate that as measured crime rates increase actual crime rates could be trending down.³⁰

In concluding, Greenwood and Wadycki suggest that it is likely that the ratio of reported to unreported crimes is fairly low and that additional police are relatively more efficient at crime detection rather than crime prevention.³¹

Certainly the social returns from expenditures allocated to finance the growth of police departments is dependent on the effectiveness of police in preventing or deterring potential crime (or, in other words, their effectiveness in minimizing the social loss from potential criminal actions). Therefore, the opportunity cost of sacrificed public programs

is a primary consideration in diverting expenditure to increase police personnel. (This is not the only cost to society resulting from allocating resources to finance police, but it may be the most substantial overall). Keeping this cost in mind we now consider the possible ineffectiveness of adding police to deter crime.

Also, the practical application of orthodox economic analysis depends in part, but significantly, on the actual effectiveness of police as a deterrent to potential criminal actions. Ehrlich and others³² have found strong deterrent effects from police activities in their empirical investigations (note also that the theoretical papers previously presented assumed this effect) while, contrarily, other studies have not shown any such relationship. Examination of some of these empirical studies is the subject of the following discussion. In particular, two papers stand out. The first is the Kansas City Preventive Patrol Experiment,³³ and the second is an attempt by James P. Levine³⁴ to test empirically the hypothesis that additional police result in less crime.

The Kansas City Preventive Patrol Experiment covered a 12 month period from October 1, 1972 through September 30, 1973. Essentially, two widely and previously accepted hypotheses were tested. These were that when police are visibly present, such as when on preventive patrol, they are a (1) deterrent to potential criminal actions and (2) appease citizens' fears of crime. Fifteen sections of the city were divided into three groups while controlling for such variables as population density, percent of non-whites present, relative incomes and levels of education, etc. In one area preventive patrol (police visibility) was increased two to three times the normal level, in another area there was no preventive

patrol, and in the last area preventive patrol was maintained at its normal level of intensity.

Analysis of the data [victimization survey data was used in addition to reported crime and arrest data] gathered revealed that the three areas experienced no significant differences in the level of crime, citizens' attitudes toward police services, citizens' fear of crime, police response time, or citizens' satisfaction with police response time.³⁵

James P. Levine, a professor of Political Science, found in each of his empirical investigations the same positive correlation between police strength and measured crime rates (he uses reported robbery and murder rates as a proxy for criminal violence) that Greenwood and Wadycki found. However, Levine completely ignored the relationship between actual crime rates and police strength in all of his work. He does add though that adding police to prevent crime may be ineffective for some other reasons. These are that criminals may be highly mobile and simply relocate away from areas saturated by police, that irregular imposition of penal sanction decreases the fear of being caught [reduces the expected cost of committing offenses], that many crimes such as willful homicide and aggravated assault result from family quarrels and other personal conflicts--supposedly making them irrational crimes and therefore not affected by deterrence,³⁶ and finally that the social environment such as that found in inner cities tends to breed crime.

Some of these last arguments will be considered in greater detail by applying the economic analysis previously developed. Before that, however, it is worth while to take a look at some work done regarding the returns associated with a specific crime to see if it paid. (Note that the best data available are these on Index crimes; therefore some lucrative

white collar crimes such as computer crimes, tax and insurance fraud, embezzlement, and anti-trust violations must be ignored here.)

There are two papers presented here regarding the monetary returns to burglary (a property crime) for Pennsylvania in 1967. The first, by Michael Sesnowitz,³⁷ develops an appropriate equation for this estimation while the second paper, by Gregory C. Krohm,³⁸ is a criticism of Sesnowitz's estimated values of the variables used in his equation.

Since burglary involves risk, the monetary return (R) is an expected value. (R) is equal to the fenced value of stolen goods (S), adjusted for the average percent of loot in kind per robbery and the average percent of stolen property that is recovered, less the expected cost of incarceration (pD). This cost (pD) is equal to the product of the probability of arrest and conviction (p) and the discounted present value of the burglar's forgone legitimate sector income, adjusted for the value of his consumption and earnings while in prison. This equation can be written as

$$R = (1-p)S + p(S-D)$$

$$\text{or, } R = S - pS + pS = pD$$

$$\text{and then, } R = S - pD$$

These values are estimated to be $p = .058$, $S = \$119$, and $pD = \$316$.

Therefore, Sesnowitz comes up with a negative (R) equal to $-\$197$.

Krohm, however, finds a net return of \$15 per adult burglary.

He points out that,

economic research in this area is encumbered by the primitive nature of the data. Even so, Sesnowitz's estimates of two variables [p and D] appear grossly unrealistic. Using alternative sources of information to [reconstruct] the probability of conviction and the

average time served, one gets over \$200 difference in the rate of return.

Second, it is instructive to note that even the revised values of these key variables are much higher than what the present author, and others, have found in other jurisdictions. This would indicate that Pennsylvania is a relatively unattractive environment for burglary.³⁹

Finally, in rounding out this review of empirical literature, it is necessary to consider those papers that are primarily concerned with the effects of certain socio-economic factors on crime rates. These factors determine the utility maximizing alternatives available to individuals or groups in our society. Some of these factors have already been mentioned. Specifically, the ones that have always been of primary interest to economists are the relative income distribution, unemployment rates and labor force participation rates. Some other socio-economic factors (relevant to the analysis of crime--especially for statistical reasons) include population density, the percent of the population that is non-white, in-migration rates, and etc. First to be considered is a paper by Sheldon Danziger and David Wheeler⁴⁰ who hypothesize that increases in the degree of income inequality, or in the level of income given a constant distribution, results, through individual welfare comparison, in more crime.⁴¹

Danziger and Wheeler develop a theoretical framework that suggests that both economic and non-economic factors affect an individual's propensity to commit crimes. One economic factor, individual utility calculation, has been discussed at length. Comparatively, another (independent) economic factor, according to Danziger and Wheeler, is a function of the level of available legitimate returns. By this they mean that an individual's utility functions are interdependent (versus

independent as above) and depend ". . . on his reference group, that group's average income, his own income, and his taste for equality."⁴² Accordingly, an individual might ". . . become frustrated with his situation and withdraw from the labor force, or strike out at the system by resorting to illegal activities."⁴³ Danziger and Wheeler suggest that given the degree of inequality and immobility associated with some groups, especially blacks, the resulting frustration would motivate this type of malevolent behavior. However, both of these economic factors are subject to constraint by a non-economic factor. This factor is referred to as an individual's "allegiance to social contract" which means, in other words, his tendency to resist temptation and is a function of an individual's level of well being (the lower the level of well being, determined by welfare comparison, the lower the allegiance to social contract and hence a greater degree of malevolent behavior--crime). And, the other constraint, an economic factor, is the usual deterrent argument which is based on rational calculation.

Summarizing this, Danziger and Wheeler assume rational utility calculation and emphasize that the amount of crime at any time is a function of a criminal's perceptions of income distribution, the judicial environment, and his allegiance to social contract.⁴⁴

In their statistical analysis Danziger and Wheeler estimate their aggregate crime function for three index crimes (burglary, robbery and aggravated assault) using both time-series and cross-sectional data. The degree of allegiance to social contract is approximated both by the male unemployment rate and by the percentage of youth (ages 15 to 24) in the population. Youth (Y) is used as a proxy for this factor because it is

assumed they would tend to be less "socialized" and also face a tougher job market and hence are more likely to commit crimes. Additionally, in the cross-sectional regressions (as compared to the time series regressions), the percent of non-whites and percent with less than 8 years of education are used to further approximate this. Also, Danziger and Wheeler assume that these types of violent crimes will be committed only by those with below mean incomes (the poor, uneducated and less skilled) rather than those higher up the socio-economic ladder. All deterrence and income variables are estimated using various lag structures due to the time it takes to get feedback information regarding punishment and reference group income.

Tables 7 and 8 present the equation and variable definitions, respectively. Table 9 shows the results obtained using time series data (1949-70) and Table 10 presents the same for the cross-sectional (SMSA) data.

Referring to Table 9 for the time series results the positive signs of the estimated coefficients indicate that both the absolute gap variable (G) and the relative inequality variable (R) are positively related to crime rates and are statistically significant at the 5% level in regressions 1 through 6. All deterrence variables are negatively related to all crime rate variables, with the expected probability of being sentenced to prison having the largest effect. And, the proxies for allegiance to social contract, (Y) and (U), have relatively less impact on crime rates than either the income distribution or deterrence variables. In addition to these results Danziger and Wheeler separately ran regressions substituting the level of median income for (G) and (R) and found it to

TABLE 7

Equation Used in Regression Analysis of Cross-Sectional
and Time Series Data

$$C = aG^{b_1} R^{b_2} S^{b_3} P_c^{b_4} P_g^{b_5} P_p^{b_6} E_s^{b_7} \exp \mu$$

where, a = constant

μ = random errors

The actual form used is the log linear form:

$$C = a + b_1 \ln G + b_2 \ln R + b_3 \ln S + b_4 \ln P_c + b_5 \ln P_g + b_6 \ln P_p + b_7 \ln E_s + \mu$$

Source: Sheldon Danziger and David Wheeler, "The Economics of Crime: Punishment or Income Redistribution," Review of Social Economy (October 1975), p. 121.

TABLE 8

Definition of Variables

G = The absolute income gap = $\bar{Y}_i - Y_i$

where, $\bar{Y}_i$ = the mean income of the reference group
of the i th individual.

Y_i = the income of the i th individual

R = The measure of relative inequality across the entire income
distribution

$$= (\bar{Y}_u / \bar{Y}_L) \cdot (N_L / N_T)$$

where, $\bar{Y}_u$ = the mean income of those with incomes
above the mean

$\bar{Y}_L$ = the mean income of those with incomes
below the mean

N_L = the number of people with incomes
below the mean

N_T = the total population

TABLE 8 (continued)

Y = the percentage of civilian, non-institutional population between the ages of 15 and 24.

U = the average annual unemployment rate for males.

BURG = the number of burglaries per 100,000 population.

ROB = the number of robberies per 100,000 population.

AA = the number of aggravated assaults per 100,000 population.

Time Series Variables

Pi = the ratio of persons charged and held for prosecution to the total number of index crimes known to the police. A separate ratio is computed for each of the three crimes.

Pg = the ratio of persons found guilty to the number of those originally charged.

Pr = the ratio of prisoners sentenced for index offenses to the total number of convictions.

Cross-sectional (SMSA) Variables

p = the ratio of prisoners received from courts to the total number of index crimes

ES = the average time served by felony prisoners at first release from state and federal institutions.

NW = percent of population non-white.

ED = percent of population over 25 years of age with less than 8 years of schooling.

POP = size of the SMSA.

NE = a dummy variable; Northeast = 1, all other regions = 0.

DENS = central city population per square mile.

Source: Danziger and Wheeler.

TABLE 9

Regression Results: U.S. Crime Rates, 1949-1970

Dependent Variable:	1	2	3	4	5	6	7	8	9
	BURG	AA	ROB	BURG	AA	ROB	BURG	AA	ROB
Independent Variables:									
Constant	-10.532	-4.204	-5.988	1.930	0.860	4.510	-10.416	-3.530	-0.995
Youth (Y)	0.421 (1.35)	0.522 (1.94)*	0.108 (0.13)	1.762 (3.86)	1.463 (3.85)*	0.844 (1.36)	0.430 (1.24)	0.435 (1.41)	-0.274 (0.51)
Unem (U)	0.058 (1.55)	-0.067 (1.82)*	-0.056 (0.74)	0.061 (1.28)	-0.021 (0.52)	-0.000 (0.08)	0.060 (1.51)	-0.066 (1.76)	-0.056 (0.89)
Charged (Pi)	-0.056 (0.61)	-0.131 (1.32)	-0.033 (0.33)	-0.167 (1.56)	-0.059 (0.58)	-0.050 (0.53)	-0.059 (0.62)	-0.146 (1.40)	-0.011 (0.12)
Guilty (Pg)	-0.081 (0.49)	-0.154 (1.54)	-0.711 (2.27)*	-0.147 (0.76)	-0.066 (0.64)	-0.750 (2.53)*	-0.077 (0.45)	-0.166 (1.59)	-0.742 (2.66)*
Prison (Pp)	-0.204 (2.48)*	-0.459 (5.50)*	-0.805 (4.43)*	-0.363 (2.81)*	-0.384 (3.56)*	-0.759 (4.31)*	-0.204 (2.36)*	-0.455 (5.26)*	-0.805 (5.23)*
Gap (G)	1.969 (10.7)*	1.161 (7.75)*	1.829 (3.72)*				1.949 (7.75)*	1.094 (5.82)*	1.144 (3.37)*
Relative Inequality (R)				1.539 (2.70)*	1.261 (2.44)	3.505 (3.82)*	0.059 (0.10)	0.319 (0.59)	2.596 (2.63)*
R ²	.995	.990	.978	.991	.986	.980	.995	.991	.985

TABLE 9 (Continued)

Dependent Variable:	1 BURG	2 AA	3 ROB	4 BURG	5 AA	6 ROB	7 BURG	8 AA	9 ROB
Independent Variables:									
Durbin-Watson	2.01	1.76	1.68	2.34	2.30	2.33	2.03	1.82	2.05
ρ	.335	.226	.481	.772	.699	.532	.347	.213	.191

Source: Danziger and Wheeler, p. 123.

Notes: All regressions were estimated using the Cochrane-Orcutt method; p is the first-order serial correlation coefficient; t-statistics appear in parentheses below the regression coefficients; * denotes significance at the 5% level (one-tailed test). . . . Also, due to a high degree of colinearity between G and R, regressions 1 through 3 were estimated without R and regressions 4 through 6 were estimated without G.

TABLE 10
Regression Results: SMSA Crime Roles, 1960

Dependent Variable:	1 BURG	2 AA	3 ROB
Independent Variables:			
Constant	17.630	4.916	13.530
Youth (Y)	-0.376 (1.08)	0.217 (0.404)	-0.872 (1.76)*
Unem (U)	-0.049 (0.219)	-0.115 (0.329)	-0.037 (0.12)
Punish (P)	-0.480 (3.63)*	-0.077 (1.58)	-0.510 (2.59)*
Sentence (ES)	-0.491 (1.76)*	0.148 (0.342)	-0.220 (0.751)
Gap (G)	-1.172 (1.37)	-0.716 (0.54)	-1.290 (1.05)
Relative Inequality (R)	2.045 (2.58)*	2.422 (1.94)*	2.243 (1.98)*
Non-white (NW)	0.148 (1.82)*	0.531 (4.37)*	0.312 (2.87)*
Education (ED)	-0.210 (0.62)	-0.681 (1.45)	-0.805 (1.90)*
Size (POP)	0.047 (0.52)	0.343 (2.48)*	0.256 (2.01)*
Density (DENS)	-0.034 (0.32)	-0.047 (0.28)	0.295 (1.92)*
Region (NE)	-0.721 (4.47)*	-0.417 (1.58)	-1.182 (5.75)*
R ²	.635	.725	.758

Source: Danziger and Wheeler, p. 126.

Notes: * denotes significance at the 5% level (one-tailed test). 1960 census data is from a sample of 57 large SMSAs. The dependent variable in each regression is a weighted average of the 1960 and 1961 crime rate. Scale effects, SMSA population and central city density, and a regional dummy for the Northeastern states are included as controls.

have a positive and statistically significant relationship to crime rates, however, they fail to provide any economic rationale for this result.⁴⁵

In Table 10 are the results of the regressions using the cross-sectional data. The relative inequality variable (R) again has a positive sign, is statistically significant and has a greater impact on crime rates than the gap (G) variable. the income gap variable (G) has a negative sign but is not statistically significant while the deterrence variable again has a negative sign. One other result worth noticing is that the SMSA population variable is positively related to crime rates.

Phillips, Votey, and Maxwell⁴⁶ have produced an empirical analysis specifically concerned with the effects on crime rates of unemployment rates and labor-force participation rates among eighteen-to-nineteen-year-old white and non-white males. They hypothesize that the level of economic opportunities for this group primarily explain their corresponding crime rates. Phillips et al. point out that "In relating labor-market opportunities for youth to their arrest rates, it is particularly important to consider labor-force participation as well as unemployment rates. It is necessary to take account of the fact that since youth have low participation rates, unemployment rates will have less weight because of the considerable fraction of youth outside the labor force."⁴⁷

Data are for the period 1952-67 and the crimes under consideration (for which Phillips et al. expect economic motives) are four Index crimes--auto theft, larceny, robbery, and burglary.

Using the formulation of their model that distinguished between those not working and all others, Phillips et al. found significantly higher crime rates among those not working. Reformulating their model

to distinguish between those in the labor force and those not in the labor force, it was found that higher crime rates were associated with those not in the labor force as compared to those in the labor force. This later formulation of their model had greater explanatory power than the working/not-working formulation.

These results reinforce the basic hypothesis advanced by Phillips et al., which is that the level of economic opportunity is a key factor in explaining crime among this age group.

Two final papers that run simple regressions using (primarily) socio-economic factors as determinants of crime rates need to be considered. The first paper, by Burley V. Bechdolt, Jr.,⁴⁸ is an analysis of the effects of these determinants in census tracts in Los Angeles, California in 1960 and for police districts in Chicago, Illinois in 1970. The second paper, by Israel Pressman and Arthur Carol,⁴⁹ also uses cross-sectional data, but for the year 1965 (with a few exceptions as noted in Table 13). Pressman and Carol point out that using 1965 data avoids the bias of the later wide spread urban riots.⁵⁰

Referring to Table 12 and the equations for property and violent crimes for Los Angeles, it is obvious that Bechdolt finds from the estimated coefficients and corresponding t-ratios that unemployment is the most important variable in explaining crime rates while low income is the least important. The same results were obtained using the Chicago police district data.

Pressman and Carol point out that there are benefits of urbanization through external economies of scale and question whether there might be a corresponding level of costs through external diseconomies of

TABLE 11

Definition of Variables

Crowding (C)	Percentage of occupied housing units in a census tract that have 1.01 or more persons per room.
Population Density (D)	Resident population per acre (of residential land in a census tract in Los Angeles and of land in a police district in Chicago).
Employment Density (N)	Commercial employment per acre of land in a tract.
Property Crime Rate (P)	Property crimes per 1,000 population (census tract and police district).
Unemployment (U)	Unemployed males as a percentage of the labor force (census tract and police district)
Violent Crime Rate (V)	Violent crimes per 1,000 population (census tract and police district)
Income (Y)	Median annual family income of a census tract in Los Angeles; <u>average</u> median annual family income of a police district in Chicago.

Source: Burley V. Bechdolt, Jr., "Cross-Sectional Analysis of Socio-Economic Determinants of Urban Crime," Review of Social Economy (Oct. 1975), p. 133.

TABLE 12
Crime Rate Functions

P = P(U,Y,D,N) = Property crime rate function					
V = V(U,Y,D,C) = Violent crime rate function					
LOS ANGELES					
P = 12.3177 + 5.0311U - 0.00053Y + 0.14956D + 0.87295N					
t-ratios	(5.5714)	(6.4034)	(-0.3833)	(6.3187)	(3.4172)
level of significance	0.0001	0.0001	0.3508	0.0001	0.0003
partial elasticities		0.64469	-0.05093	0.12745	0.08254
β coefficients		0.42132	-0.02442	0.33110	0.17598
$\bar{R}^2 = 0.5015$					
V = -2.01902 + 0.86828U - 0.00018Y + 0.01578D + 0.12244C					
t-ratios	(-6.4390)	(7.6586)	(-0.8651)	(4.8277)	(2.9191)
level of significance	0.0001	0.0001	0.1935	0.0001	0.0018
partial elasticities		1.16607	-0.17999	0.14091	0.21014
β coefficients		0.49751	0.05630	0.23899	0.16080
$\bar{R}^2 = 0.5306$					

CHICAGO					
P = 15.22296 + 8.23931U - 0.00155Y - 0.06413D					
t-ratios	(0.27964)	(1.99420)	(-0.42733)	(-0.20045)	
level of significance	0.7836	0.0646	0.6752	0.8438	
partial elasticities		1.02960	0.42798	0.03463	
β coefficients		0.75991	-0.17057	-0.02837	
$\bar{R}^2 = 0.7910$					
V = 10.63287 + 2.53731U + 0.00036Y + 0.02770D					
t-ratios	(-1.42161)	(4.46980)	(0.71721)	(0.63007)	
level of significance	0.1756	0.0004	0.4843	0.5381	
partial elasticities		2.46233	0.77195	0.11616	
β coefficients		1.10409	0.18557	0.05780	
$\bar{R}^2 = 0.9122$					

Source: Bechdolt, pp. 134-137.

scale such as increased levels of crime. Pressman and Carol run regressions showing the relation between all seven Index crimes and several socio-economic variables associated with urbanization. The results of these regressions are shown in Tables 13 and 14. No relationship is established between crime rates and population density. Therefore, they conclude that crime is not an external diseconomy of scale. There are, however, significant positive correlations between crime and both net migration and the percent of the population that is non-white. They suggest the finding regarding net migration may indicate that the process of urbanization may be related to crime, however.

There remain some additional considerations regarding the many implications for policy resulting from the preceding empirical investigations. Some further points about income redistribution have been made by Gordon Tullock⁵¹ and Harold C. Barnett.⁵² In a short note (re Danziger and Wheeler) Tullock introduces the comparative advantage of crime theory. He points out that if we decided to redistribute income to reduce the envy effect (from the interdependent utility function theory) the comparative advantage of honest and dishonest labor will be affected and hence there will be more crime. This is so because the tax will fall only on honest employment reducing the returns from it while not lowering the returns from dishonest labor. Also, eligibility for relief payments would be based only on reported income [implying, at the margin, a further disincentive to honest labor and possibly an increased incentive to dishonest labor]. Tullock is of the opinion that the comparative advantage effect would outweigh the envy effect.

TABLE 13
Partial Correlation Coefficients

	Crimes against persons	Crimes against property
Population density	.09	.09
Net migration	.21	.35*
Percent of population - non-white	.66*	.43*
Median family income	-.05	.19
Multiple correlation coefficient	.70*	.59*

Source: Israel Pressman and Arthur Carol, "Crime as a Diseconomy of Scale,"
Review of Social Economy (September 1971), p. 230.

- Notes: 1) * t-test level of significance: .01
 2) SMSA Data
 3) Data for net migration rates are for the years 1960-65; the non-white data are for the year 1960; the income data are from the years 1960, 1962, and 1965.

TABLE 14
Partial Correlation Coefficients

	Crimes against persons				Crimes against property		
	Forcible Murder	Rape	Robbery	Aggravated Assault	Burglary	Auto Larceny	Theft
Population density	-.09	-.02	.15	-.04	.03	-.03	.40**
Net migration	.20	.35	.25	.22	.44**	.39**	.21
Percent NW	.77*	.47**	.47**	.63*	.47**	.35	.35
Percent family income over \$10,000	-.03	.09	.18	-.09	.15	.12	.20
Percent family income under \$3,000	.32	.20	.02	.12	-.10	-.02	.06
Multiple correlation coefficient	.86*	.63*	.59*	.68*	.68*	.55*	.60*

Source: Pressman and Carol, p. 231.

- Notes: 1) * t-test level of significance: .01
 2) **t-test level of significance: .05
 3) SMSA data is only for those with populations 250,000
 4) Murder includes non-negligent manslaughter. Larceny includes only felony offenses.

Barnett, in introducing the concept of an overall crime rate, instead of just the Index crime rate, also has a comment regarding income redistribution. He points out that reducing the economic position of those taxed (those with above mean incomes--especially white collar workers) might generate malevolence (assuming interdependent utility functions) which may result in greater illegitimate activity among this group. If this happens then overall crime will increase and, therefore, a maintenance of an overall crime rate would necessitate a redistribution of punishment to offset increased white collar crime.

CONCLUSIONS AND POLICY IMPLICATIONS

Three striking conclusions stand out. These are that (1) some socio-economic factors such as the percentage of the population that is non-white, labor force participation and unemployment rates, and income distribution seem to be systematically, and perhaps causally, related to crime rates, (2) that criminals do seem to respond to incentives in the illegitimate sector, and (3) therefore, criminals, like non-criminals, are, in general, rational utility maximizing individuals. These conclusions are interrelated and dependent upon each other to the extent that it is difficult to discuss each one separately. On the other hand, the fact that this is so adds greater weight to conclusion (3).

The percentage of non-whites present in a population always shows up in the regressions as positively related to measured crime rates--especially with crimes against persons. In fact, the partial correlation coefficients by Pressman and Carol (refer to Tables 13 and 14) indicate that, *ceteris paribus*, non-whites commit more crimes relative to the rest of the population. However, there is no reason to believe that the positive correlation between non-whites and higher crime rates would imply that they possess greater criminal tendencies based on their personal characteristics. In fact, the economic rationale indicates that non-whites behave in a very rational manner. The relatively closer presence of "easy" targets; the feeling of alienation from society, and hence the police; and, therefore, the greater chance of preserving anonymity in the crowded inner cities all reduce the cost to the offender of committing crimes. In regard

to legitimate alternatives, Gordon points out that although there are utility producing alternatives available to non-whites in the legitimate sector, their utility maximizing alternatives are likely to be found in the illegitimate sector.⁵³ This last point has a great deal of significance in terms of policy implications for reducing crime among non-whites as will be shown below.

The availability of utility producing alternatives in the legitimate sector is thought to be reflected or indicated by high unemployment rates and low labor force participation rates. Bechdolt found strong positive correlations between measured crime rates and unemployment rates in his regressions and Phillips et al., while finding the same result regarding unemployment rates, found an even stronger relationship using labor force participation rates. Crimes against property were more closely associated with these indicators in Bechdolt's regressions, while Phillips et al. used only property crimes, due to the expected economic motive. The economic rationale seems clear. Since one must survive (and given a social system with little economic security) one must choose among those actions which obtain that end. In other words, one must produce utility--especially through income generation. With few or no legitimate utility (or income) producing alternatives available, or with the ones available producing too little and consequently requiring a supplement, crimes against property that would produce it are a logical possibility. Momentary reflection regarding the more difficult labor markets facing younger and/or less skilled workers, possibly with dependents, that offer low pay and long hours, or possibly no employment at all, implies that any possible benefits from legitimate alternatives would likely be

outweighed by the costs (including in some cases loss of pride). Whatever the costs of the available illegitimate alternatives--guilt, the expected value of punishment, and they also may produce loss of pride--they are likely to be far outweighed by the benefit of survival. (Remember, not everyone is entitled to government transfers or, if they are, they may not be sufficient.) Additionally, low labor force participation rates may indicate that some other dimensions of utility such as status, pride, and job security are not produced by legitimate alternatives, or if they do provide these types of utility they do so in lesser amounts than the available illegitimate alternatives.

Almost all regression coefficients reflecting measures of relative poverty and/or wealth in a population are positively correlated with measured crime rates. Refer to Table 15 for verification of this relationship. Regarding this, three theories have been advanced. The first is the one developed by Danziger and Wheeler⁵⁴ regarding interdependent utility functions or, in Tullock's words, the envy effect. According to this theory the envy of the rich by the poor is the reason why crimes are committed by the poor against the rich.⁵⁵ Another theory is the well developed benefit-cost theory. According to it, as Tullock states most clearly, the higher the level of wealth present the higher are the potential benefits associated with property crimes. And also, a poor person is likely to be inconvenienced to a lesser degree than is a rich person when sent to prison.⁵⁶ On this last point regarding relative costs I would add that this relationship may be offset if the rich and the poor are sent to "different" prisons or if the rich are never sent to prison. It is not yet possible to conclude which of these economic

TABLE 15

Signs of Regression Coefficients Relating Independent Poverty and Wealth Variables to Crimes Against Persons and Property

	Type of Crime and Sign of Estimated Coefficient											
	Pers	Prop	Pers	Prop	Pers	Prop	Pers	Prop	Pers	Prop	Pers	Prop
Independent Variables:												
Poverty	+	+	+	+	+	+	+	+			+	?
Wealth	+	+		+	+	+	?	?	?	?	?	+
Table Source	2,3		5		9		10		12		13, 14	

motives has the greatest effect.⁵⁷ It does seem reasonable, however, that each may possess at least some validity as there certainly is a positive correlation.

It is possible, as the above three theories suggest, that one act of crime could serve the interest of the offender in all three ways. A violent robbery, for example, might produce income and decrease envy. Cumulative utility such as this implies that a significantly high level of expected cost associated with such a criminal action would be required to offset these benefits. Those in charge of imposing punishment should keep this in mind.

Not only does there seem to be a positive correlation between measured crime rates and the wealth variables, but there is also a negative correlation between measures of crime (against both persons and property) and the deterrence variables. The papers presented here that include at least some measure of this effect (generally these variables indicate the probability of apprehension and/or punishment, and the severity of

punishment) are the publications by Ehrlich, and Danziger and Wheeler. Many others have also found the same strong deterrent effects.⁵⁸ There is not yet enough evidence to determine whether the probability of apprehension or the severity of punishment has the greater impact on crime rates, however. This is due to the low quality of the present data which sets upper limits on the coefficients⁵⁹ and whether the probability or risk variable is applied to the judicial environment or the abilities of the police. The deterrent effect of the police (re Levine, Greenwood and Wadycki, and The Kansas City Preventive Patrol Project) is definitely questionable, and even Ehrlich's estimate of their efforts as a positive deterrent effect has too high a standard error to have much meaning.⁶⁰ Also, there is the problem of time discounting and risk preference.⁶¹

Studies showing some positive incentive effect of the wealth indicators and a disincentive effect of the deterrence indicators connote that criminals are rational individuals who calculate the costs and benefits associated with their actions and predictively respond to changes in these costs and benefits. The opposing view held by criminologists that criminals are characteristically deviant and/or irrational, is discredited by the following arguments of McKenzie and Tullock:

The widely popular view that criminals are sick is based not on a few poor empirical studies, but on zero empirical studies. Some criminals are indeed, mentally ill and they are customarily segregated from the other criminals during the trial process. Thus, most states maintain facilities for the criminally insane, as well as for ordinary criminals. There seems to be, however, absolutely no evidence that criminals who are in the ordinary prisons are more likely to be insane than people outside, or that what neuroses they do have, have much to do with their crimes. In addition, if investigations deal exclusively with criminals who are in prisons and who are by definition "failures" at their jobs, one can easily get a distorted picture of the

criminal population. We would obtain the same type of distorted picture if we attempted to judge the intelligence and sanity of the business community as a whole by primarily observing those businessmen who go bankrupt.⁶²

Since criminologists' theories lack empirical support and are based on a biased sample population, less weight should be placed on them in formulating policies aimed at reducing crime. In comparison, not only have economists backed up their assumption of individual rationality and supported their theories with empirical investigations, some sociologists in more recent studies have found evidence, using different statistical methods, to agree with the contention of economists that punishment does deter crime. This evidence adds even greater support to the economists' position.⁶³

I am going to assume that criminals are rational individuals. This assumption makes it possible to develop a policy framework aimed at reducing crime. It also means that it is rather absurd to apply resources, as suggested by criminologists, aimed at the "reform" of such rational individuals. Regarding this point Sullivan states that ". . . any 'rehabilitative' program that assumes the criminal is abnormal, deviant, inadequate, irrational, or characterized by anomie is doomed to failure."⁶⁴ The failure of this approach is evidenced by the high rate of recidivism. The Uniform Crime Reports of the FBI for 1975 state that, "Of those persons released on parole, 71 percent repeated [i.e., committed another crime, but not necessarily the same kind] and 57 percent of those placed on probation repeated."⁶⁵ Further evidence of recidivism, or the failure to "reform" the criminal, is presented in Table 16. To an economist the reason for this situation is clear. Our present system for dealing with criminals

TABLE 16

Percent of Persons Released in 1972 by Specific Crime Category
and Rearrested for any Crime Within 4 Years

Burglary	-----81%
Robbery	-----77%
Motor Vehicle Theft	-----75%
Rape	-----73%
Assault	-----70%
Stolen Property	-----68%
Forgery	-----68%
Larceny-Theft	-----65%
Narcotics	-----65%
Murder	-----64%
Weapons	-----64%
Fraud	-----63%
Gambling	-----50%
Embezzlement	-----28%
Others	-----64%

Source: Federal Bureau of Investigation, Uniform Crime Reports for the United States, 1975, p. 45.

only lowers the legitimate opportunity cost (that is, a criminal record decreases the expected value of legitimate employment by decreasing the chances of employment due to the reluctance of employers to hire an "ex con") and the cost of learning criminal skills (the close presence of others with additional criminal skills, as in prisons, makes it easier for one to learn these skills) with the result that an individual, after being processed through our criminal justice system, is more likely, if he is rational, to go on committing more crimes. To "reform" him or expect him to be "good" is the same as expecting him to be irrational. Sullivan states this clearly,

The high recidivism rate makes perfect sense to an economist. A man made a rational choice before he went to prison, acquired further skills in prison, and faced rational, hostile employers when he was released. Given these circumstances this man would be irrational if he did not return to crime.⁶⁶

We have two methods for dealing with criminals in an effort to reduce crime--rehabilitation and punishment. Tullock puts them in the perspective of social decision choice when he says that, "If we have the choice between preventing crime by training the criminal to be good--i.e., rehabilitating him--or deterring crime by imposing unpleasantness on criminals, the former is the one we would like to choose."⁶⁷ However, if our goal is to reduce crime, rather than be nice, that choice would not be logical. Tullock reinforces this point in continuing that,

It is clearly more appealing to think of solving the criminal problem by means that are themselves not particularly unpleasant than to think of solving it by methods that are unpleasant. But in this case we do not have the choice between a pleasant and an unpleasant method of dealing with crime. We have an unpleasant method--deterrence--that works, and a pleasant method--rehabilitation--that (at least so

far) never has worked. Under the circumstances, we have to opt either for the deterrence method or for a higher crime rate.⁶⁸

Knowing that deterrence is clearly a superior method for dealing with criminals than is rehabilitation an appropriate economic framework can now be developed within which logical policy implications follow.

The set of all possible utility maximizing alternatives available to an individual in any social economy includes two (not necessarily mutually exclusive) subsets--legitimate utility producing alternatives and illegitimate utility producing alternatives. Given that individuals maximize their utility in a rational manner and that our end goal is to reduce illegitimate behavior--that is, reduce crime--the following general policies are indicated. In the illegitimate sector we should increase costs and/or reduce benefits to the individual of committing crimes. In the first case the level of deterrence needs to be raised. In the second case a reduction of potential booty or money flow is called for. This might be done by redistributing wealth and income so that relatively higher levels of booty are simply not available. Another possibility is to decriminalize or legalize⁶⁹ those goods and services that are in demand (especially those with low demand elasticities) which produce a black market money flow that provides an incentive for illegitimate behavior.⁷⁰ I would think that decriminalizing or legalizing such things as prostitution, drugs, and gambling would literally yank the "rug" out from under organized crime, as well as decrease the benefits to other individuals of opportunities in these areas. In the legitimate sector, policies that increase the level of benefits (note that this would also increase the opportunity cost of committing crimes) and/or reduce the

level of costs of these opportunities to those individuals engaged in or about to engage in illegitimate alternatives are called for. Examples of policies having these effects, respectively, are affirmative action programs, and low cost loans and grants (which implies some income redistribution) for higher education and job training for minorities. Such policies that have economic effects within this framework will have the desired effect of switching many individuals' utility maximizing alternatives from the illegitimate sector to the legitimate sector. Or, in other words, they will lead to the reduction of crime.

ENDNOTES

¹The President's Commission on Law Enforcement and the Administration of Justice. Washington, D.C.: Government Printing Office, 1967, p. 40.

²The rational interest of capitalists as a class has resulted in greater emphasis on the control of these types of crimes--particularly crimes against property. This argument is developed by David M. Gordon in Problems in Political Economy: An Urban Perspective, 2nd ed. (Lexington, Massachusetts and Toronto: D. L. Heath and Company, 1977), p. 381.

³The President's Commission on Law Enforcement and the Administration of Justice, p. 43.

⁴Richard B. McKenzie and Gordon Tullock, The New World of Economics (Homewood, Illinois: Richard D. Irwin, Inc., 1975), p. 147.

⁵*Ibid.*, pp. 148-149.

⁶*Ibid.*, pp. 149-151.

⁷Gordon, Problems in Political Economy, 2nd ed., pp. 360 and 386.

⁸Gary S. Becker, "Crime and Punishment: An Economic Approach," Journal of Political Economy 76 (March/April 1968): 176.

⁹McKenzie and Tullock, The New World of Economics, pp. 133-135.

¹⁰*Ibid.*, p. 129.

¹¹*Ibid.*, pp. 131-133.

¹²*Ibid.*, pp. 133-135.

¹³Becker, "Crime and Punishment: An Economic Approach," p. 209.

¹⁴*Ibid.*

¹⁵John R. Harris, "On the Economics of Law and Order," Journal of Political Economy 78 (January/February 1970): 165.

¹⁶*Ibid.*, pp. 165-173.

¹⁷*Ibid.*, p. 171.

¹⁸Wesley G. Skogan, "The Validity of Official Crime Statistics: An Empirical Investigation," Social Science Quarterly 55 (June 1974): 38.

¹⁹Issac Ehrlich, "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation," Journal of Political Economy 81 (May/June 1973): 521-565.

²⁰Ibid., p. 522.

²¹Ibid.

²²Ibid., p. 521.

²³Ibid., p. 545.

²⁴Ibid., p. 540.

²⁵Ibid., pp. 558-559.

²⁶Michael J. Greenwood and Walter J. Wadycki, "Crime Rates and Public Expenditures for Police Protection: Their Interaction," Review of Social Economy 31 (October 1973): 138-151.

²⁷Ibid., p. 145.

²⁸Ibid.

²⁹Ibid., p. 150.

³⁰Ibid.

³¹Ibid.

³²McKenzie and Tullock, The New World of Economics, pp. 150-155.

³³George L. Kelling et al., The Kansas City Preventive Patrol Experiment: A Summary Report (Police Foundation: 1974).

³⁴James P. Levine, "The Ineffectiveness of Adding Police to Prevent Crime," Public Policy 23 (Fall 1975): 523-545.

³⁵Kelling et al., The Kansas City Preventive Patrol Experiment, p. v.

³⁶Sociologists often argue that many homicides are committed by people in a highly emotional state who are, in this instance, not capable of rational calculation. However, others have argued that a significant level of deterrence would have an impact on even these crimes. This argument is presented by Gordon Tullock, "Does Punishment Deter Crime?" The Public Interest 36 (Summer 1974): 108.

- ³⁷Michael Sesnowitz, "The Returns to Burglary," Western Economic Journal 11 (December 1972): 477-480.
- ³⁸Gregory C. Krohm, "An Alternative View of the Returns to Burglary," Western Economic Journal 11 (September 1973): 364-367.
- ³⁹*Ibid.*, p. 367.
- ⁴⁰Sheldon Danziger and David Wheeler, "The Economics of Crime: Punishment or Income Redistribution," Review of Social Economy 33 (October 1975): 113-131.
- ⁴¹*Ibid.*, p. 113.
- ⁴²*Ibid.*, p. 116.
- ⁴³*Ibid.*
- ⁴⁴*Ibid.*, pp. 118-119.
- ⁴⁵*Ibid.*, pp. 124-125.
- ⁴⁶Llad Phillips, Harold L. Votey, Jr., and Darold Maxwell, "Crime, Youth, and the Labor Market," Journal of Political Economy 80 (May/June 1972): 491-503.
- ⁴⁷*Ibid.*, p. 493.
- ⁴⁸Burley V. Bechdolt, Jr., "Cross-Sectional Analyses of Socio-Economic Determinants of Urban Crime," Review of Social Economy 33 (October 1975): 132-140.
- ⁴⁹Israel Pressman and Arthur Carol, "Crime as a Diseconomy of Scale," Review of Social Economy 29 (September 1971): 227-236.
- ⁵⁰*Ibid.*, p. 228.
- ⁵¹Gordon Tullock, "The Economics of Crime: Punishment or Income Redistribution - Comment," Review of Social Economy 34 (April 1976): 81-82.
- ⁵²Harold C. Barnett, "The Economics of Crime: A Comment," Review of Social Economy 34 (April 1976): 86-87.
- ⁵³Gordon, Problems in Political Economy, 2nd ed., pp. 379-380.
- ⁵⁴Danziger and Wheeler, "The Economics of Crime: Punishment or Income Redistribution," pp. 113-131.
- ⁵⁵Tullock, "The Economics of Crime: Punishment or Income Redistribution - Comment," pp. 81-82.

⁵⁶Ibid.

⁵⁷Tullock, "The Economics of Crime: Punishment or Income Redistribution - Comment," pp. 81-82.

⁵⁸Gordon Tullock, "Does Punishment Deter Crime?" The Public Interest 36 (Summer 1974): 103-111.

⁵⁹Skogan, "The Validity of Official Crime Statistics," p. 38.

⁶⁰Ehrlich, "Participation in Illegitimate Activities," p. 559.

⁶¹McKenzie and Tullock, The New World of Economics, p. 152.

⁶²Ibid., p. 151.

⁶³Tullock, "Does Punishment Deter Crime?" p. 107.

⁶⁴Richard F. Sullivan, "The Economics of Crime: An Introduction to the Literature," Crime and Delinquency 19 (April 1973): 143.

⁶⁵Federal Bureau of Investigation, Uniform Crime Reports for the United States, 1975, p. 44.

⁶⁶Sullivan, "The Economics of Crime," p. 142.

⁶⁷Tullock, "Does Punishment Deter Crime?" p. 110.

⁶⁸Ibid.

⁶⁹Our notions of law, crime and punishment, as well as our basic social values, change through time. In this case the values of previous generations may not be the same as those of the present generation and the enforcement of "their" values on "us" can lead to tremendous social problems. This point is made by Gordon in Problems in Political Economy, 2nd ed., p. 379 and by Mark C. Kennedy, in "Beyond Incrimination," Catalyst (Summer 1970).

⁷⁰The enforcement of laws against goods and services increases the level of risk (shifts the supply curve to the left) and consequently raises their price. According to Edward M. Brecher Consumer's Union Report, Licit and Illicit Drugs (Boston and Toronto: Little, Brown and Company, 1972), if these goods and services have demand elasticities less than unity, higher prices will result in a greater money flow. Both higher prices and a greater money flow provide a higher level of incentive (benefits) for more people to engage in the provision of these goods and services. As we divert more resources to the enforcement of laws against these goods and services these illegitimate industries will, therefore, grow. And, in turn, as they grow (more crime is being committed and measured) we will probably respond by applying more law enforcement

resources (re Greenwood and Wadycki). The validity of this theory is suggested by the fact that, according to the UCR of the FBI, 1975, p. 44, the highest level of recidivism within a single crime category is among those individuals involved with drug trafficking. (Given that heroin is a good with a low price elasticity and represents a significant portion of illegitimate drugs smuggled into the U.S. it is a good proxy for this crime category and an appropriate example.) Since we would predict an "ex con" to return to crime in general (re Sullivan) we would expect him to choose the crime with the highest level of benefits first. This crime is drug trafficking. And, the high level of benefits is a result of drug law enforcement.

SELECTED BIBLIOGRAPHY

Books

- Gordon, David M. Problems in Political Economy: An Urban Perspective. 2nd ed. Lexington, Massachusetts and Toronto: D.C. Heath and Company, 1977.
- McKenzie, Richard B., and Tullock, Gordon. The New World of Economics. Homewood, Illinois: Richard D. Irwin, Inc., 1975.

Reports

- Brecher, Edward M. The Consumer's Union Report, Licit and Illicit Drugs. Boston and Toronto: Little, Brown and Company, [1972].
- Kelling, George L. et al. The Kansas City Preventive Patrol Project; A Summary Report. Police Foundation, [1974].
- The President's Commission on Law Enforcement and the Administration of Justice, Task Force Report. Washington, D.C.: U.S. Government Printing Office, 1967.
- Uniform Crime Reports for the United States. Federal Bureau of Investigation [1975].

Journal Articles

- Barnett, Harold C. "The Economics of Crime: A Comment." Review of Social Economy 34 (April 1976): 86-87.
- Bechdolt, Burley V. Jr. "Cross-Sectional Analyses of Socio Economic Determinants of Urban Crime." Review of Social Economy 33 (October 1975): 132-40.
- Becker, Gary S. "Crime and Punishment: An Economic Approach." Journal of Political Economy 76 (March/April 1968): 169-217.
- Danziger, Sheldon and Wheeler, David. "The Economics of Crime: Punishment or Income Redistribution." Review of Social Economy 33 (October 1975): 113-31.

- Ehrlich, Issac. "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation." Journal of Political Economy 81 (May/June 1973): 521-65.
- Greenwood, Michael J., and Wadycki, Walter J. "Crime Rates and Public Expenditures for Police Protection: Their Interaction." Review of Social Economy 31 (October 1973): 138-51.
- Harris, John R. "On the Economics of Law and Order." Journal of Political Economy 78 (January/February 1970): 165-73.
- Kennedy, Mark C. "Beyond Incrimination." Catalyst (Summer 1970).
- Krohm, Gregory C. "An Alternative View of the Returns to Burglary." Western Economic Journal 11 (September 1973): 364-67.
- Levine, James P. "The Ineffectiveness of Adding Police to Prevent Crime." Public Policy 23 (Fall 1975): 523-45.
- Phillips, Llad, and Votey, Harold L. Jr., and Maxwell, Darold. "Crime, Youth, and the Labor Market." Journal of Political Economy 80 (May/June 1972): 491-503.
- Pressman, Israel, and Carol, Arthur. "Crime as a Diseconomy of Scale." Review of Social Economy 29 (September 1971): 227-36.
- Sesnowitz, Michael. "The Returns to Burglary." Western Economic Journal 11 (September 1973): 364-67.
- Skogan, Wesley G. "The Validity of Official Crime Statistics: An Empirical Investigation." Social Science Quarterly 55 (June 1974): 25-38.
- Sullivan, Richard F. "The Economics of Crime: An Introduction to the Literature." Crime and Delinquency 19 (April 1973): 138-44.
- Tullock, Gordon. "The Economics of Crime: Punishment or Income Redistribution - Comment." Review of Social Economy 34 (April 1976): 81-82.
- _____. "Does Punishment Deter Crime?" The Public Interest 36 (Summer 1974): 103-11.

THE ECONOMIC RAMIFICATIONS OF CRIME AND PUNISHMENT:
A PROBLEM OF UTILITY MAXIMIZATION

by

GARY E. MARCHE¹

B.S., Kansas State University, 1975

AN ABSTRACT OF A MASTER'S REPORT

submitted in partial fulfillment of the

requirements for the degree

MASTER OF ARTS

Department of Economics

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1978

According to The President's Commission on Law Enforcement and the Administration of Justice, 1967, crime is a significant and growing problem in the United States. Consequently, more social scientists, including economists, have turned their attention to the problem. Economists have applied their assumptions and methods of analysis to the problem of crime and have developed a perspective regarding individual criminal motivation and related socio-economic factors that contrasts with that of criminologists. The ramifications of the economic perspective of crime and punishment are the subject of this paper.

Criminologists who contend that crime is committed by socially deformed, deviant, and irrational individuals propose efforts to reform both the social environment and the individual. This view leads to the conclusion that since the criminal is sick he will not be deterred by punishment. On the other hand, economists assume individual rationality on the part of the criminal, or more simply, that whatever neuroses criminals have, they respond to incentives just as non-criminals. Therefore, it follows that criminals would calculate the costs and benefits associated with their actions, and allocate their resources in such a way as to maximize utility.

The paper is divided into three sections. The first is a review of theoretical literature in which a rational response to incentives is assumed. Secondly, a review of empirical literature establishes that assumption as valid, and integrates socio-economic factors with the utility maximization model. The empirical section also considers the

effect of the deterrence variables (i.e., risk and severity of punishment) in detail. Finally, assuming that criminals are, therefore, rational, utility maximizing individuals, a policy framework is developed aimed at reducing crime.