COMMUNICATIONS

THE DRUG WAR AND THE HOMICIDE RATE: A DIRECT CORRELATION?

Harold J. Brumm and Dale O. Cloninger

The nation's concern with drug-control policy has escalated in recent years. This heightened anxiety is reflected in the growth of federal drug-control budget authority appropriated by the Congress. In fiscal year 1985 these budgetary obligations were $2.75 billion; by 1994 they had risen to $12.14 billion (U.S. Department of Justice 1994a: 19).[1]

The out-of-pocket drug-control expenditures made by the criminal justice system—at all levels of government, not just federal—represent only a portion of the total cost of drug enforcement activities. Economists, most notably Milton Friedman (1991: 57) and William Niskanen (1992: 238), have argued that the war on illicit drugs has diverted police resources away from other law enforcement activities, with the result that violent crimes and crimes against property have been higher than they would otherwise have been.[2]

To the extent that communities divert law enforcement resources from violent crimes to illegal drug offenses, the risk of punishment for engaging in violent crimes is reduced. A reduction in this risk would be expected to increase the incidence of violent crimes. This paper seeks to determine empirically the response, if any, in the

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Harold J. Brumm is Senior Economist at the U.S. General Accounting Office. Dale O. Cloninger is Professor of Finance and Economics at the University of Houston-Clear Lake. The views expressed in this paper are those of the authors and should not be attributed in any way to the U.S. General Accounting Office.

[1]The Department of Justice expresses this budget authority in current dollars. Expressed in constant dollars, this increase would, of course, be somewhat less.

[2]According to the FBI's definition (U.S. Department of Justice 1994b: 10), *violent* crimes are murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. *Property* crimes, according to the FBI's definition (U.S. Department of Justice 1994b: 35), are burglary, larceny-theft (except motor vehicle theft), motor vehicle theft, and arson. For definitions of these individual crimes, see U.S. Department of Justice (1994b: 380).

homicide offense rate to changes in the percentage of arrests attributed to drug offenses. The empirical results obtained are consistent with a priori expectations that homicide offense rates are higher in communities that devote a greater percentage of their policing resources to the enforcement of drug laws. These results are used to estimate the value-of-life loss due to the war on drugs.

Previous Research

Gary Becker's (1968) seminal work has provided the theoretical underpinnings for the common-sense notion that crime rates will be negatively associated with the opportunity costs of criminal behavior and with the threat of sanctions imposed for criminal offenses (see also Ehrlich 1974, 1975). Samuel Cameron (1988: 308) has provided a stylized version of the econometric model used by empirical researchers to test these and other predictions of the economic theory of crime. In this model the demand for deterrence, the supply of offenses, and the demand for police are jointly determined. Bruce Benson et al. (1992) have used data from Florida's 67 counties for 1986 and 1987 to examine whether property crime is positively related to the intensity of drug enforcement activities. As a proxy for the intensity of these activities, they used the number of drug arrests as a proportion of the number of index-I arrests.[3] Their principal finding is that a 1-percent increase in drug enforcement activities raises the property crime offense rate by an estimated 0.164 percent (Benson et al. 1992: 689).

To generate the empirical results presented below, we use a two-equation variant of the standard three-equation econometric model. The equation dropped refers to the demand for police; we treat police quantity demanded as exogenous. William Trumball (1989: 428), and Helen Tauchen, Anne Witte, and Harriet Griesinger (1993: 11) report evidence in support of this exogeneity. For the present paper, the argument for exogeneity is derived from the fact that the data used for this study show the distribution of police resources to be dependent on crimes other than homicide (Cloninger 1992: 416).

[3]Benson et al. (1992: 682) define index-I crimes as murder, forcible sexual offenses, aggravated assault, robbery, burglary, larceny, and auto theft. This taxonomy is close, if not identical, to what the FBI calls "Part I" crimes. Offenses in the FBI's Uniform Crime Reporting are divided into two groupings, Part-I and Part-II (U.S. Department of Justice 1994b: 380). The Part-I offenses are: criminal homicide (murder and nonnegligent manslaughter, and manslaughter by negligence), forcible rape, robbery, aggravated assault, burglary, larceny-theft (except motor vehicle theft), motor vehicle theft, and arson.

The Empirical Model

The data used to estimate the model are from 59 cities in 32 states, and reflect 1985 experience (Cloninger 1992: 416).[4] The year 1985 was chosen because of data availability considerations. Two of the cities were dropped from the sample because of missing data. Thus, each observation in the data base used for the present study is a city, and the sample size is 57.

The model's variables, which are expressed as natural logarithms, consist of two that are endogenous, and five that are exogenous. The former are the homicide offense rate (LHRATE), and the homicide arrest rate (LHARST); the latter are the percentage of the population that is nonwhite (LNONW), the number of police per violent offense (LCPVO), the number of residents per square mile (LPOPDENS), the median value of owner-occupied housing (LHOUSE), and the number of drug arrests as a percentage of total arrests (LDRUGPRO). The last variable is a proxy for the war on drugs.[5]

The model's equations are

$$(1) \qquad LHARST = \beta_{10} + \beta_{11}LHRATE + \beta_{12}LCPVO + \beta_{13}LPOPDENS + \beta_{14}LDRUGPRO + \epsilon_1,$$

$$(2) \qquad LHRATE = \beta_{20} + \beta_{21}LHARST + \beta_{22}LNONW + \beta_{23}LHOUSE + \epsilon_2.$$

The errors in equations, ϵ_1 and ϵ_2, are assumed to be normally distributed with a mean of zero and a constant variance.

The two hypotheses of greatest interest here are that an increase in drug arrests relative to total arrests will reduce the homicide arrest rate, that is, $\beta_{14} < 0$, and that the latter reduction will—according to the economic theory of crime—lead to an increase in the homicide offense rate, that is, $\beta_{21} < 0$. The economic theory of crime makes two additional predictions. One is that an increase in the opportunity cost of crime constrains criminal behavior. LHOUSE is a proxy for this opportunity cost. Thus, the theory predicts that $\beta_{23} < 0$. The other prediction is that an increase in police resources will increase criminal justice system output, implying that $\beta_{12} > 0$.

[4]The data were obtained from four sources: U.S. Department of Commerce (1986); U.S. Department of Justice (1986); Cohn and Sherman (1986); and private communication with J. Harper Wilson, Chief, Uniform Crime Reporting Section, Federal Bureau of Investigation, U.S. Department of Justice, Washington, D.C., July 22, 1987.

[5]An anonymous referee has pointed out that LCPVO and LDRUGPRO are not strictly exogenous. That said, in the sample used for this study homicide commissions are an extremely small percentage of the total number of crimes committed. For this reason, and because of data limitations, LDRUGPRO is treated as exogenous. The exogeneity of LCPVO was justified in the previous section.

Regarding the sign of β_{11}, there are two competing hypotheses. The resource-saturation hypothesis (Fisher and Nagin 1978: 364) predicts that $\beta_{11} < 0$; the toughening hypothesis (Fisher and Nagin 1978: 365) predicts that $\beta_{11} > 0$. The first hypothesis asserts that as the number of crimes committed goes up, the number of arrests made will—for a police force of a given size—increase but at a decreasing rate. At the margin, this will reduce the risk of punishment for committing a crime. The second hypothesis argues that the criminal justice system will respond to increased offense rates by toughening sanctions, which will at the margin increase the risk of punishment. The resource-saturation hypothesis is consistent with the view that increased drug enforcement activities divert scarce policing resources from controlling other offenses, thereby reducing the risk of punishment for committing those offenses.

The variables LPOPDENS and LNONW were included in the model to control for the potential impacts of phenomena thought by sociologists and criminologists (e.g., Gottfredson and Hirschi 1995) to be important in explaining criminal arrest and offense rates. The economic rationale, according to Isaac Ehrlich (1974: 127; 1975: 412), for including LNONW in a criminal offense supply function is that nonwhites have a relatively low opportunity cost of crime commission. If so, then economic theory predicts that $\beta_{22} > 0$. But the theory is silent about the sign of β_{13}. However, it seems reasonable to anticipate that $\beta_{13} < 0$, that is, that the more densely populated a city is, the more difficult for the police to ferret out offenders.

The joint determination of LHARST and LHRATE requires the use of an estimation method which accounts simultaneously for that interdependency. System estimation techniques, such as the method of three-stage least squares (3SLS), yield smaller estimated coefficient standard errors than do single-equation estimation techniques, such as the method of two-stage least squares (2SLS). However, the individual parameter estimates obtained by system estimation techniques are relatively more sensitive to the specification of the entire model—a specification error in one equation can adversely affect the parameter estimates in all of the model's equations. That is, there is a tradeoff between potential costs of specification error and a gain in statistical efficiency if a system estimation method rather than a single-equation estimation method is chosen (Pindyck and Rubinfeld 1981: 339). This tradeoff was avoided by using both 2SLS and 3SLS to estimate equations (1) and (2).[6]

[6]MicroTSP (Hall, Johnston, and Lilien 1990) was the software package used to generate the estimates.

Tables 1A and 1B present the results of 2SLS estimation of the model. The signs of all estimated coefficients are those that were anticipated. The estimated standard errors, *t*-statistics, and *p*-values indicate that, except for the intercept in the deterrence-demand equation, all estimated coefficients are statistically significant, albeit weakly in some cases. Each estimated *p*-value is at a level at which the observed *t*-statistic would just be significant (Goldberger 1991: 239–40).

TABLE 1A

DEMAND FOR DETERRENCE
(2SLS METHOD)

Explanatory Variables	Coefficient	Standard Error	*t*-Statistic	(*p*-value)
INTERCEPT	−1.0976	0.7207	−1.5230	0.1338
LHRATE	−0.1093	0.0600	−1.8221	0.0742
LCPVO	0.1136	0.0644	1.7646	0.0835
LPOPDENS	−0.0894	0.0346	−2.5842	0.0126
LDRUGPRO	−0.0699	0.0367	−1.9043	0.0624
Adjusted $\bar{R}$-squared	0.3299			
Number of observations	57			

TABLE 1B

SUPPLY OF HOMICIDES
(2SLS METHOD)

Explanatory Variables	Coefficient	Standard Error	*t*-Statistic	(*p*-value)
INTERCEPT	6.5851	1.9039	3.4588	0.0011
LHARST	−2.4562	0.7768	−3.1621	0.0026
LNONW	0.2700	0.1542	1.7512	0.0857
LHOUSE	−0.5061	0.1839	−2.7519	0.0081
Adjusted $\bar{R}$-squared	0.1211			
Number of observations	57			

For example, if the null hypothesis that the coefficient of LDRUGPRO equals zero were true (H_0: $\beta_{14} = 0$), then the probability of obtaining −0.0699 as an estimate of that coefficient (and, hence, of obtaining −1.9043 as the estimate of the corresponding t-statistic) is equal to just .0624. Finally, note that the negative sign for the estimated coefficient for LHRATE in the deterrence-demand equation provides support for the resource-saturation hypothesis.

Tables 2A and 2B present the results of 3SLS estimation of the model. Again the signs of all estimated coefficients are those that were anticipated. Not surprisingly, all 3SLS estimated coefficient standard errors are smaller than their 2SLS counterparts.

TABLE 2A

DEMAND FOR DETERRENCE
(3SLS METHOD)

Explanatory Variables	Coefficient	Standard Error	t-Statistic	(p-value)
INTERCEPT	−1.4639	0.6666	−2.1962	0.0326
LHRATE	−0.1295	0.0565	−2.2904	0.0261
LCPVO	0.1547	0.0573	2.7000	0.0093
LPOPDENS	−0.0854	0.0304	−2.8115	0.0069
LDRUGPRO	−0.0441	0.0251	−1.7587	0.0845
Adjusted $\bar{R}$-squared	0.2246			
Number of observations	57			

TABLE 2B

SUPPLY OF HOMICIDES
(3SLS METHOD)

Explanatory Variables	Coefficient	Standard Error	t-Statistic	(p-value)
INTERCEPT	5.7915	1.5356	3.7716	0.0004
LHARST	−2.3702	0.7410	−3.1984	0.0023
LNONW	0.3253	0.1312	2.4801	0.0163
LHOUSE	−0.4443	0.1591	−2.7926	0.0073
Adjusted $\bar{R}$-squared	0.1372			
Number of observations	57			

The elasticity of the homicide offense rate with respect to drug enforcement activities is (∂ LHARST/∂ LDRUGPRO)(∂ LHRATE/∂ LHARST) = $\beta_{14}\beta_{21}$. The 2SLS estimate of this elasticity is approximately

TABLE 3

VALUE-OF-LIFE COST

Estimation Methods	Cost per Capita (1985 $)	Cost per 100,000 Inhabitants (Millions of 1985 $)	1985 Homicide Offense Rate per 100,000 Inhabitants	Actual Cost (Millions of 1985 $)	Elasticity	Estimated Increase in Cost (Millions of 1985 $)
2SLS	2,600,000	260,000	7.9	2,054,000	.00170	3,492
3SLS	2,600,000	260,000	7.9	2,054,000	.00105	2,157

SOURCES: Cohen (1990: 140) for data on value-of-life cost per capita; U.S. Department of Justice (1986: 7) for data on 1985 homicide offense rate.

0.17 percent.[7] That is, a 1 percent increase in drug enforcement activities is estimated to result in a 17 one-hundredths of 1 percent increase in the homicide rate. For 3SLS, the estimate of this elasticity is approximately 0.105 percent.

The 2SLS and 3SLS estimates of the drug enforcement elasticity of the homicide rate can be converted into estimates of the value-of-life loss due to the war on illicit drugs. This can be accomplished by using value-of-life estimates that have been reported in various studies of labor-market risk premiums (Viscusi 1993: 1926–27). A representative estimate, developed by Kip Viscusi (1983: 106), and updated by Mark Cohen (1990: 140) to 1985 dollars, is $2.3 million. As computed in Table 3, the 2SLS estimate of the increased value-of-life cost that would result from a 1-percent increase in the intensity of drug enforcement activities is about $3.5 billion annually in 1985 dollars.

The corresponding 3SLS estimate is roughly two-thirds of that amount. If the rate of increase in the CPI-U is used as the measure of the inflation rate, then in 1994 dollars the 2SLS and 3SLS estimates are $4.81 billion and $2.97 billion, respectively.

Conclusion

The foregoing estimates of the increased value-of-life cost of the war on illicit drugs are, of course, quite crude. Econometric studies, including the present one, should be taken with at least one grain of salt. However, if the empirical results presented here are even approximately correct, then it is clear that current drug-control policy is substantially more expensive than indicated by the observed out-of-pocket drug-control expenditures made by the criminal justice system.

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[7]Since the estimates of β_{14} and β_{21} are statistically significant, the estimated elasticity is statistically significant.

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