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Drug Enforcement and Crime: Recent Evidence from New York State*

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Objective. The objective of this article is to provide evidence about the effectiveness of drug law enforcement as a tool for reducing other types of crime. Considerable resources are devoted to enforcing our nation's drug laws, but existing research suggests that intensifying drug law enforcement may serve to increase, rather than decrease, crime. *Method.* Using data for 62 counties in New York State for 1996–2000, we estimate a set of models that evaluate the effects of recent drug arrests on reported rates of assault, robbery, burglary, and larceny. The estimated statistical model includes controls for fixed effects, time effects, autocorrelation, and heteroskedasticity. *Results.* The consistency of results is striking—there is no model in which drug arrests are found to have a significant negative relationship with crime. All crimes are positively related to arrests for the manufacture and sale of "hard drugs." Increases in total per capita drug arrests and arrests for "hard drug" possession are accompanied by higher rates for all crimes except assault. Increased arrests for the manufacture or sale of marijuana are associated with increases in larcenies. *Conclusions.* The empirical findings raise serious questions about the effectiveness of drug enforcement as a crime-control measure and suggest that significant social costs may arise from existing approaches to drug control.

Controversy over our nation's illegal drug policies and the emphasis on criminal justice system approaches for enforcement have escalated in recent years. These drug policies have resulted in large and growing economic costs for the public sector, with substantial increases in resources used by drug control and police agencies, the legal and corrections systems, and services for drug education and treatment.[1] Since President Nixon declared the "war on drugs" in 1970, public policies have stressed increased penalties and expanded public-sector resources allocated to the criminal justice system for

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[1]According to a recent National Research Council Report (2001), federal expenditures on enforcement increased more than 10-fold between 1981 and 1999.

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enforcing the nation's policy of prohibition of drugs such as heroin, cocaine, amphetamines, and marijuana. As a result, the United States now allocates about two-thirds of federal "drug control" spending for enforcement and interdiction to agencies that use police power for investigations, arrests, and prosecutions (Office of National Drug Control Policy (ONDCP), 2002).

At the federal level, spending for drug enforcement (including interdiction and intelligence) rose from about $1.5 billion in 1981 to over $12 billion by 2002. State-level spending for drug control activities has been estimated to be even higher.[2] Arrests for drug law violations have shown a similar pattern, increasing from under 600,000 a year in 1980 to over 1.5 million in 2002 (U.S. Department of Justice, Federal Bureau of Investigation, 1981, 2003). Because of intensified drug enforcement and stricter penalties, such as mandatory minimum sentencing at the federal level and in many states, the prison population has grown to over 2 million (U.S. Department of Justice, Bureau of Justice Statistics, 2002).

To date, there has not been a comprehensive cost-benefit analysis of federal and state drug enforcement policies (Miron, 2003). Published research has reached contradictory results regarding the effects of drug enforcement, drug use and abuse, and illegal drug markets. There is also disagreement about the effects of policy on public health, economic productivity, safety, and crime. The pervasive nature of the effects of drug use and drug policies on many facets of society and the difficulty of obtaining reliable data on illegal drug markets have made it difficult to evaluate the effectiveness of drug policies. A recent report by the National Research Council indicated that because of "a lack of investment in data and research," the nation is in no better position to perform a comprehensive assessment than it was 20 years ago, and that "it is unconscionable for this country to continue to carry out a public policy of this magnitude and cost without knowing whether and to what extent it is having the desired effect" (National Research Council, 2001:3–11).

The purpose of this study is to estimate an econometric model for New York State that evaluates the effects of recently intensified drug enforcement efforts on the incidence of assaults, robberies, burglaries, and larcenies. To estimate the model, recent evidence about crime rates, drug arrests, and related determinants of crime are collected for 62 counties in New York State for the years 1996–2000. A substantial amount of research has documented positive correlations between illicit drug use or sales and other types of crime, with a high percentage of arrested persons arrested testing positive for illicit drugs (ONDCP, 2000). These findings are consistent with the recent trends of intensified drug enforcement and lower rates of reported

[2]Historical information on federal drug control expenditures are from an evaluation of government reports provided by Transactional Records Access Clearinghouse (1998). Expenditures for recent years are provided in ONDCP (2002). See Miron (2003:12–15) for a description of methods for measuring state and local (and federal) expenditures for drug prohibition enforcement.

crime. In addition, illicit drugs have been found to be contributing factors in the commission of many crimes because of pharmacological effects, the workings of illicit drug markets, and the behavior of some drug-dependent persons (Goldstein et al., 1997). However, statistical correlations are only suggestive of possible causation. Statistical results based on the estimation of a more comprehensive model of crime provide much stronger evidence.

This study employs the Becker (1968) economic model of crime that has been widely applied in empirical research on crime. Within the Becker framework, the ''rational criminal'' makes the decision to commit a crime based on an objective assessment of the expected benefits as well as the economic costs (e.g., resources used, foregone earnings, and risks of arrest, fines, and incarceration). Crime rates are modeled as a function of economic and demographic conditions, enforcement effectiveness, crime opportunities, and characteristics of local ''crime markets.'' Criminal justice policies and methods of enforcement influence crime rates because they affect the likelihood of arrest and the severity of punishment, as well as the availability of criminal opportunities. A growing body of research based on the Becker model has demonstrated the significance of many of these factors as determinants of crime rates.[3] In recent years, the model has been adapted to assess the role of drug enforcement in explaining underlying rates of crime (e.g., Rasmussen and Benson, 1994; Miron, 1999; Kuziemko and Levitt, 2001). Based on findings from prior research, it is reasonable to include a measure of drug enforcement activity since it has been positively associated with the commission of crimes.

Because the effects of drug enforcement vary across different types of violent and property crime, these models are usually estimated separately for each type. There are also important differences between arrests for different categories of drugs (e.g., marijuana vs. heroin) and different illegal activities (e.g., possession vs. sale or manufacture). Thus, in addition to a model for total drug arrests, models for separate types of drug arrests are estimated in this article. Fixed-effects models for pooled time-series, cross-section data are used to evaluate the role of drug arrests on crime rates, while controlling for the influence of economic conditions, geographical characteristics, and overall law enforcement effectiveness. The findings contribute to the growing body of research into the effects of federal and state drug policies and provide the type of information needed for a comprehensive economic evaluation of federal and state drug policies.

[3]Two recent studies are good examples. Levitt (1998) estimated an economic model of crime to investigate the relationship between enforcement effectiveness (for different types of crime) and reported crime rates. He found that increases in enforcement effectiveness for one type of crime decreased that crime due to both deterrent effects and incapacitation effects, but increased other types of crime that were considered substitutes (e.g., robberies and burglaries). Corman and Mocan (2000:584) found ''robust evidence of deterrent effects of arrests and police on most categories of serious felony offences.'' In addition, Benson, Kim, and Rasmussen (1994, 1998) showed that empirical research based on the economic crime model is consistent with the historical record.

The next section of this article discusses conceptual issues related to the microeconomic analysis of crime control and drug policies. It is followed by the development of the empirical model, a description of the data, and presentation of statistical results. A final section provides a summary and conclusions, including suggestions for further research.

Microeconomic Analysis of Drug Policies

Miron and Zwiebel (1995) and Rasmussen and Benson (1994) are among those who have examined the economics of drug prohibition in the context of supply and demand models. The objective of current drug control policies is to reduce both supply and demand by achieving a higher risk of arrest and incarceration for buyers and sellers and to create disruptions in supply. Reductions in supply and demand would reduce the quantity of illegal drugs sold, but have an indeterminate effect on prices. When resources are directed more at the supply side than the demand side, prices are likely to increase. With inelastic demand in the short run, expenditures and revenues would actually increase, making participation for sellers more profitable. The commonly cited benefits of decreased use are improvements in health, safety and the quality of life, higher productivity in the workplace, and reductions in drug-related crime. Special priority is often placed on children and young adults, since the related problems of addiction, unemployment, homelessness, crime, and incarceration would impose costs on society over a long period of time.

There are numerous potential links between drugs, drug enforcement, and crime.[4] Some of these links suggest that drug enforcement will reduce crime, while others suggest that drug enforcement will lead to more crime. Drug use or participation in illegal drug markets may increase crime because (1) the pharmacological effects of drug use (e.g., an increase in aggressive tendencies or a lessening of inhibitions) may lead individuals to commit crimes; (2) dependency or addiction to illegal drugs may lead to economic crimes (e.g., robbery or assault) to obtain income to purchase drugs; and (3) participation in illegal markets by buyers or sellers may lead to systemic violence. Goldstein (1985) developed this ''tripartite conceptual framework'' to evaluate the potential links between illicit drugs and crime that provided the basis for additional research (Goldstein et al., 1989, 1997). Illegal drug markets operate in an elaborate ''underground economy'' consisting of importers and manufacturers, transporters, wholesalers and retailers, and small seller networks. There is no recourse to legal mechanisms for dispute

[4]Many researchers have explored the relationship between drugs, drug prohibition, and crime, including Wilson (1990), Nadelmann (1992), Kleiman (1992), Duke and Gross (1993), Rasmussen and Benson (1994), Miron and Zwiebel (1995), Miron (1999), and Kuziemko and Levitt (2001).

resolution, which results in violence or other forms of crime to settle conflicts (Miron, 1999). High prices and profits associated with illegal drugs also provide incentives for others to enter the market, leading to more violence, such as turf wars over control of sales territories.

If any of these arguments are correct, positive correlations between the presence of illegal drugs and crime would be observed. Based on these potential linkages, the association between drugs and crime could be due to drug use, or it could be due to the workings of illicit drug markets. Drug enforcement activities, if successful, have the potential to reduce drug use and disrupt the operations of illegal drug markets. In addition, the arrest and incarceration of participants in illegal drug markets would prevent these individuals from committing other crimes associated with participation in these markets (Kuziemko and Levitt, 2001).

In contrast, enforcement of drug laws may lead to increased crime when (1) distribution networks are disrupted, leading to disputes over market share and informal contractual arrangements within these drug markets; (2) disruptions in the market lead drug sellers to switch to other forms of economic crime that are considered substitutes, such as robbery or burglary (Kuziemko and Levitt, 2001); (3) drug users resort to crime as a result of physical or psychological withdrawal, or from behavioral changes resulting from ending their self-treatment of medical conditions; (4) prices and profits increase for remaining sellers, providing more incentive for potential suppliers to engage in crime to obtain a share of the market and leading to more economic crime by users who need to obtain income to support a habit; (5) resources spent on drug enforcement are diverted from investigations and arrests for other types of crime that may increase as a result (Rasmussen and Benson, 1994; Benson, Laverne, and Rasmussen, 2001); and (6) the imprisonment of drug users and sellers takes prison cells that are in short supply, resulting in the early release of other criminals, prison overcrowding, or new prison construction. Other crimes can be expected to increase due to lower rates of incarceration and because the resources used to expand prison capacity could have been used for other purposes (Kuziemko and Levitt, 2001).

Several recent reviews assess the impacts of drug enforcement on specific types of crime (Miron, 2003; MacCoun and Reuter, 2001; Rasmussen and Benson, 1994). The evidence favors the view that drug enforcement activities are associated with increases, not decreases, in nondrug crime. Miron's (2001) estimates also showed that the degree of enforcement of drug prohibitions across countries is positively related to national rates of violence. Benson et al. (1992) estimated a statistical model for Florida counties and found that increases in drug-arrest rates coincided with increases in property crime. More recently, Benson, Kim, and Rasmussen (1998) estimated a fixed-effects model for Florida and found that increases in Part I crimes (see Appendix) are associated with increases in drug arrests. Kuziemko and Levitt (2001) concluded that increases in the number of prisoners with drug-related convictions have led to crowded prisons, causing reductions in

expected time served for other offenses and raising other crime rates as a result.[5] Several studies have also found positive associations between drug enforcement and violent crime, including homicides.[6] Conversely, there do not appear to be published studies with statistical evidence that drug enforcement has reduced crime.

Empirical Models, Data, and Results

The focus of this study is an assessment of the impact on other crime rates of law enforcement in New York State against drugs covered by the Rockefeller Drug Laws. In this case, substantial resources have been targeted to disrupt the operations of illegal drug markets and convictions typically have resulted in incarcerations.[7] Included are the sale or manufacture of marijuana as well as the sale, manufacture, or possession of "hard drugs" such as heroin, cocaine, and amphetamines.[8] A case study of an individual state using county-level data has the advantage of holding constant some of the important determinants of crime. The legal framework for both crime and punishment is based on state law and should be more uniform within a state than across different states. Also, the use of fixed-effects models as estimated below controls for unmeasured variables specific to each county, such as crime opportunities, labor market opportunities, or other economic and demographic variables.[9]

[5]Kuziemko and Levitt (2001) also estimated a model to measure the effect of incarcerating drug offenders on violent or property crime rates. Increases in the share of prisoners who committed drug offenses were associated with reduced rates of violent and property crime. The estimated coefficients were not found to be statistically significant.

[6]Miron (1999) found that enforcement of drug prohibitions has led to greater violence, with increases in homicides in the United States over the past century being associated with increases in drug enforcement expenditures. Others whose estimates support a positive relationship between drug enforcement and homicides include Resignato (2000), Brumm and Cloninger (1995), Benson, Kim, and Rasmussen (1998), and Benson, Leburn, and Rasmussen (2001).

[7]Because New York has decriminalized marijuana possession, incarceration for its possession is highly unusual. Enforcement resources are not typically deployed in marijuana possession cases and economic crimes are not considered substitutes for marijuana use. Previously, MacCoun and Reuter (2001:362–63) noted that there is "little evidence of users committing crimes to pay for their habits." Thus, arrests for marijuana possession are not likely to be associated with the other forms of crime examined in this study. As a result, marijuana arrests are omitted from the calculation of total drug arrests and separate models for marijuana-arrest rates are not estimated.

[8]For this study "hard drugs" are defined using the FBI Uniform Crime Reports definition and include: (1) opium or cocaine and their derivatives (morphine, heroin, codeine), (2) synthetic narcotics/manufactured narcotics that can cause true drug addiction (Demerol, methadone), and (3) dangerous nonnarcotic drugs such as barbiturates and Benzedrine (U.S. Department of Justice, Federal Bureau of Investigation, 1984).

[9]See Judge et al. (1985) for a detailed discussion of estimation methods for pooled times-series, cross-section data. The presentation here is based on their description of fixed-and random-effects models.

TABLE 1

Data Summary

Variable	Unit of Measure	Sample Mean	*SD*
Assault	Assaults per 1,000	2.04	1.42
Robbery	Robberies per 1,000	0.80	1.45
Burglary	Burglaries per 1,000	5.25	1.88
Larceny	Larcenies per 1,000	16.74	5.73
Hard drug sales	Arrests per 1,000, nonmarijuana drug sales	0.66	1.27
Hard drug possession	Arrests per 1,000, nonmarijuana drug possession	1.20	1.44
Marijuana sales	Arrests per 1,000, marijuana sales	0.28	0.31
Total drug arrests	Total drug arrests per 1,000, sales and nonmarijuana drug possession	2.14	2.84
Unemployment rate	Unemployment rate in %	5.50	1.84
Population density	Persons per square mile	2,840	10,149
Enforcement	Part I arrests per reported crime	0.30	0.14

$N = 310$: 62 counties, 1996–2000. See the Appendix for official definitions of crime categories and the data sources used.

Table 1 provides the units of measurement, means, and standard deviations of the variables used in the empirical analysis relating drug arrests to each violent and property crime rate. Data sources and official definitions for each type of crime are contained in the Appendix. The estimated equations can be summarized as:

$$Crime_{it} = \alpha + \beta_1 DrugArrests_{it} + \beta_2 UnemploymentRate_{it} + \beta_3 PopulationDensity_{it} + \beta_4 Enforcement_{it} + \mu_{it} \quad (1)$$

where *Crime* represents reported arrests per 1,000 residents for four criminal activities: aggravated assault, robbery, burglary, and larceny. This equation is based on an economic model of crime specified by Levitt (1998) and is similar to specifications used in prior studies (Resignato, 2000; Benson, Kim, and Rasmussen, 1998; Benson, Leburn, and Rasmussen, 2001). With four types of crime and four different drug arrest variables, 16 separate models are estimated using a panel of 62 New York State counties (i) over five consecutive years (t, 1996–2000).

The data indicate that there is considerable variation in average crime rates and their dispersions over the sample. The crimes of larceny and burglary have the highest reported rates of 16.74 and 5.25 per 1,000 residents, respectively. Lower rates are reported for assault (2.04) and robbery (0.80). Total drug arrests measures the number of arrests per 1,000 residents for three types of Part II drug abuse violations as classified by the U.S. Department of Justice, Federal Bureau of Investigation (1984): Hard Drug Sales, the manufacture and/or sale of nonmarijuana drugs; Hard Drug

Possession, the possession of nonmarijuana drugs; and Marijuana Sales, the manufacture and/or sale of marijuana.[10] The average rate of possession arrests for nonmarijuana drugs (1.2 per 1,000) is approximately twice that of sales arrests for such drugs and over four times as great as marijuana sales arrests. The traditional law enforcement view maintains that drug-related arrests should reduce the crime rates for all types of offenses, especially those related to the drug culture, such as burglaries and larcenies by users. However, the previous section reviewed a number of factors that may lead to higher rates of several Part I crimes when increases in drug arrests occur. Given these factors, the widely accepted view that increases in law enforcement against illegal drug activities will reduce all types of crime can be called into question.

The variable *Enforcement* measures the ratio of Part I arrests to reported Part I crimes (see the Appendix for the specific crimes included in this variable). With a mean of 0.30 and standard deviation of 0.14, most counties have an enforcement magnitude in terms of arrest rates per reported crime of less than 0.50. Following Levitt (1998), a negative relation between enforcement and crime implies both incapacitation and deterrent effects for law enforcement efforts that result in a reduction in all types of criminal activity. When enforcement is disaggregated by type of crime, Levitt showed that a positive relationship between some enforcement ratios and specific crime rates is expected. In this case, because of deterrent effects, criminals substitute away from crimes with stronger enforcement efforts and toward those receiving relatively less attention from the police. As documented by Levitt, reviews of studies using aggregate variables similar to Enforcement have concluded that the incapacitation and deterrent effects result in a negative relation between arrests and rates of specific crimes.[11]

[10]It is not possible to construct a variable measuring the ratio of drug arrests to drug crimes since most drug crimes are not reported. Other studies have used drug arrests, changes in drug arrests, drug enforcement budgets, or incarcerations for drug crimes to construct measures of drug enforcement. Benson, Kim, and Rasmussen (1998) argued that ''drug arrests reflect the consequences of the allocation decisions'' and are an appropriate variable for measuring the intensity of drug enforcement.

[11]To assess the relative importance of cross-section versus time-series variation in the sample, the following ratio (R) was calculated for each variable (i) in Table 1:

$$R_i = \left(\sum_{t=1996}^{2000} \sigma_{it}/5\right) / \left(\sum_{j=1}^{62} \rho_{ij}/62\right),$$

where t denotes year, j denotes county. This represents the mean of the five annual standard deviations of 62 county observations (σ_{it}, cross-section variation) divided by the mean of the 62 county standard deviations of five annual observations (ρ_{ij}, time-series variation). Except in the case of Population Density, for which the cross-section variation is obviously much greater, R_i varies from 1.77 for Burglary to 7.95 for Robbery. Thus, the average cross-section variation is greater than the average time-series variation for every variable in the sample.

Specification and Estimation Results

Fixed-effects models are used to estimate the parameters of Equation (1) for each of the four Part I crime rates identified above. The Unemployment Rate and Population Density are two control variables included in each regression.[12] For the fixed-effects models, county dummy variables capture the variation in each crime rate due to county-specific factors that are invariant over time. Time effects are also included by means of yearly dummies that control for statewide changes affecting crime rates from 1996 to 2000. Failure to include significant cross-section and time-series effects would yield biased coefficient estimates. *F* statistics used to test for the inclusion of the dummy variables are significant at the 0.01 level for all the fixed-effects models presented.

Tables 2–5 show the coefficients estimated for each of the four crime categories using the four different drug arrest specifications. Estimates of a first-order autocorrelation coefficient were significant for each of the robbery models, but not for any of the other types of reported crime. Therefore, only the coefficients in the robbery models reflect a correction for autocorrelation. In all cases, the probability statistics for significance levels are based on White covariances robust to heteroscedasticity in the error terms.

Turning first to the results for the four drug arrest variables, there is substantial evidence that drug arrests have a significant positive (adverse) impact on the rates of nondrug crimes reported in New York State. Increases in Total Drug Arrests are associated with higher crime rates for all the offenses considered except aggravated assaults. Because drug arrests and reported crime rates are both measured in terms of thousands of residents, the coefficients are direct measures of the incremental impact of arrests on crime rates. Estimated effects of drug arrests on each type of nondrug crime are calculated for the state as a whole and for an average county. For example, at the state level, a 10 percent increase in the mean of Total Drug Arrests from 2.14 to 2.35 would be associated with 248 additional robberies, 910 additional burglaries, and 4,333 additional larcenies.[13] For a county of average

[12]The unemployment rate is expected to be positively related to each crime rate. Raphael and Winter-Ebmer (2001) found a significant positive impact for the unemployment rate on property and violent crime rates in U.S. states from 1971 to 1997. Higher crime rates in urban areas imply a positive relationship between population density and crime rates. A countervailing negative effect stems from the economic and social difficulties that arise in less urbanized counties that have declining population bases.

[13]The statewide effects are point estimates calculated by multiplying the estimated coefficients from the regression equations by the product of a change in the mean of total drug arrests (10 percent) and the state population. For the year 2000, the final year of the sample, the state population was estimated to be 18,976,457. Since the crime and arrest data are measured per 1,000 residents, it is necessary to divide the population by 1,000 to derive these estimates. Estimated impacts for an average county are derived in a parallel manner. With 62 counties in the state, the average county has an estimated population of 306,072. The estimated state and countywide effects for each type of drug arrest (and for the Enforcement and Unemployment Rate variables) are also derived using this approach.

TABLE 2

Assault Regressions

	Model			
Explanatory Variables	I	II	III	IV
Total drug arrests	0.066 (0.063)			
Hard drug sales		0.353* (0.190)		
Hard drug possession			0.034 (0.068)	
Marijuana sales				−0.195 (0.259)
Enforcement	−0.671** (0.205)	−0.639** (0.196)	−0.687** (0.209)	−0.685** (0.204)
Unemployment rate	0.079^{+} (0.059)	0.072 (0.058)	0.079^{+} (0.061)	0.072 (0.060)
Population density	-2.53×10^{-4}** (1.01×10^{-4})	-5.65×10^{-5} (1.63×10^{-4})	-2.96×10^{-4}** (1.04×10^{-4})	-2.93×10^{-4}** (1.07×10^{-4})
R^2	0.910	0.911	0.910	0.910

NOTES: Coefficient standard errors are in parentheses.

**(*) [+] indicates coefficient is significant at the 0.01 (0.05) [0.10] level for a one-tailed test. The *F* test for inclusion of the fixed-effect dummy variables is significant at the 0.01 level for all models.

TABLE 3

Robbery Regressions

	Model			
Explanatory Variables	I	II	III	IV
Total drug arrests	0.061* (0.027)			
Hard drug sales		0.091^{+} (0.058)		
Hard drug possession			0.093* (0.049)	
Marijuana sales				0.016 (0.047)
Enforcement	−0.351** (0.068)	−0.342** (0.075)	−0.355** (0.066)	−0.365** (0.080)
Unemployment rate	0.026 (0.023)	0.029 (0.023)	0.021 (0.021)	0.024 (0.023)
Population density	-4.05×10^{-4}** (1.17×10^{-4})	-3.74×10^{-4}** (1.12×10^{-4})	-4.30×10^{-4}** (1.25×10^{-4})	-3.90×10^{-4}** (1.20×10^{-4})
R^2	0.992	0.992	0.992	0.992

NOTES: Coefficient standard errors are in parentheses.

**(*) [+] indicates coefficient is significant at the 0.01 (0.05) [0.10] level for a one-tailed test. The *F* test for inclusion of the fixed-effect dummy variables is significant at the 0.01 level for all models.

TABLE 4

Burglary Regressions

	Model			
Explanatory Variables	I	II	III	IV
Total drug arrests	0.224* (0.124)			
Hard drug sales		0.276^{+}(0.211)		
Hard drug possession			0.253^{+}(0.154)	
Marijuana sales				0.345 (0.717)
Enforcement	− 2.303** (0.292)	− 2.346** (0.303)	− 2.317** (0.288)	− 2.413** (0.312)
Unemployment rate	0.218* (0.103)	0.218* (0.108)	0.212* (0.108)	0.241* (0.114)
Population density	-4.23×10^{-4}**	-3.80×10^{-4}*	-5.72×10^{-4}**	-5.72×10^{-4}**
	(1.77×10^{-4})	(2.04×10^{-4})	(1.95×10^{-4})	(1.99×10^{-4})
R^2	0.879	0.878	0.879	0.878

NOTES: Coefficient standard errors are in parentheses.

**(*) [+] indicates coefficient is significant at the 0.01 (0.05) [0.10] level for a one-tailed test. The *F* test for inclusion of the fixed-effect dummy variables is significant at the 0.01 level for all models.

TABLE 5

Larceny Regressions

	Model			
Explanatory Variables	I	II	III	IV
Total drug arrests	1.067** (0.195)			
Hard drug sales		1.018* (0.527)		
Hard drug possession			1.302** (0.236)	
Marijuana sales				1.656* (0.934)
Enforcement	−11.950** (0.561)	−12.201** (0.631)	−11.988** (0.539)	−12.472** (0.659)
Unemployment rate	−0.223 (0.235)	−0.218 (0.258)	−0.257 (0.248)	−0.114 (0.235)
Population density	-2.47×10^{-4}	-2.43×10^{-4}	-9.59×10^{-4}**	-9.57×10^{-4}**
	(3.07×10^{-4})	$(4.16 \times 10^{-4)}$	(3.40×10^{-4})	(3.45×10^{-4})
R^2	0.953	0.948	0.952	0.948

NOTES: Coefficient standard errors are in parentheses.

**(*) [+] indicates coefficient is significant at the 0.01 (0.05) [0.10] level for a one-tailed test. The *F* test for inclusion of the fixed-effect dummy variables is significant at the 0.01 level for all models.

size, this implies increases of 4 robberies, 15 burglaries, and 70 larcenies. These results support the hypothesis of a positive relationship between drug arrests and other crimes rather than the traditional law enforcement view of a negative relationship.

The impact of drug arrests varies considerably over the four crime categories and three types of drug offenses. Higher arrest rates for the manufacture and/or sale of hard drugs are associated with increases in all types of crime. Applying the same approach to estimate state and countywide impacts, a 10 percent increase in the mean of Hard Sale Arrests from 0.66 to 0.73 would be associated with 442 additional assaults, 114 additional robberies, 346 additional burglaries, and 1,275 additional larcenies for the state as a whole. For a county with an average population, these estimates suggest 7 additional assaults, 2 additional robberies, 6 additional burglaries, and 21 additional larcenies.

The results for Hard Drug Possession are similar to those for Total Drug Arrests, with the impact on assaults being the only insignificant effect. For the state as a whole, a 10 percent increase in the mean of Hard Drug Possession would increase robberies by 212, burglaries by 576, and larcenies by 2,965. For a county of average population, the estimated coefficients imply increases of 3 robberies, 9 burglaries, and 48 larcenies. If drug demand is adversely affected by greater risk of arrest for users, sellers may switch to alternative crimes to obtain cash. Similarly, if other users are dependent on those arrested for possession, the former may turn to property-related crimes to finance their own purchases. Larceny is the only crime affected by arrests for manufacture and/or sale of marijuana. A 10 percent increase in the mean arrest rate from 0.28 to 0.31 is estimated to generate 880 additional larcenies for the state as a whole, and 14 additional larcenies for a county of average population. In contrast to arrests for the sale and possession of harder drugs, arrests for selling marijuana are not a major factor in raising Part I crime rates.[14]

The results for the control variables across the four drug arrest models for each Part I crime are reported in the lower portion of each table. Within

[14]A reviewer suggested that models be estimated for rape and motor vehicle theft as well. In the case of rape, the explanatory power of the models was significantly lower overall. Although the drug arrest variables were positive and significant in three cases, the coefficient magnitudes were much smaller than those estimated for the other crimes. For motor vehicle thefts, none of the coefficients on the drug arrest variables were significant. Given that there can be significant noneconomic factors involved in each of these crimes, it is not surprising that these results differ from those estimated for the included models.

A similar model for homicide is not included because there were no homicides for many counties in many years of the sample. As an alternative, we estimated the model using 34 counties for which there was at least one homicide in four of the five years of the sample. There was a weak positive association between drug arrests and homicides, including a significant coefficient for hard drug sales at the 10 percent level, but lower explanatory power than for the other models with the full sample. Data sets for metropolitan areas used with a model specifically formulated to assess reported homicides may be better suited for obtaining more reliable evidence about the relationship between drug enforcement and homicides.

each crime category, the magnitudes of the control variable coefficients are similar across the four drug arrest models. Thus, the mean of the four coefficients for each control variable is used in calculating the change in reported crimes due to an increase in the control variable. Increases in the ratio of Part I arrests to reported Part I crimes lead to lower crime rates for each crime category assessed. For the state as a whole, a 10 percent improvement in the mean Enforcement ratio to 0.33 would decrease larcenies by 6,918, burglaries by 1,335, assaults by 382, and robberies by 201. Based on Levitt's work, these results indicate generally small, but significant, incapacitation and deterrent effects for higher rates of arrests per crime reported. Crimes rates for assault and burglary have a positive and significant association with the unemployment rate. For the state as a whole, a one percentage point increase in unemployment leads to an additional 1,433 assaults and 4,218 burglaries per year. The estimated coefficients for Population Density suggest that counties with lower population densities generally have higher crime rates. However, the cross-section dummy variables are likely to capture most of the positive crime-population density relation, and so these coefficients primarily capture the negative social impacts of declining economic bases within counties that had shrinking populations from 1996 to 2000.[15]

Although most of the coefficients of interest are statistically significant and the empirical results are consistent with those obtained from prior economic studies, some caution is in order when interpreting these estimates. Economic theory suggests that there may be a simultaneous relationship between reported crimes and drug arrests because resources are allocated to crime-control activities in response to underlying crime rates (Benson et al., 1992; Mocan and Corman, 1998). To overcome the potential endogeneity, two-stage least squares would require that suitable instruments be found. Levitt (1998) evaluated potential instruments for estimating economic crime models and concluded that none of the potential variables are satisfactory. However, he demonstrated that measurement error and the potential endogeneity of independent variables are not significant problems with the estimation of this type of economic model of crime. Other researchers have evaluated potential endogeneity concerns when estimating these types of

[15]As is commonly done, the appropriateness of random-effects models was also assessed. Using the Hausman *m* statistic, acceptance of the null hypothesis of no correlation between the fixed-effects dummy variables and the other explanatory variables implies that OLS estimates of the fixed-effects models would result in inefficient parameter estimates. Rejection of the null hypothesis would indicate that a random-effects model yields biased parameter estimates. The null was rejected at the 0.10 level of significance in 16 of the 20 models estimated, implying that fixed-effects models are preferred. In the remaining four models, the null would be rejected at levels of significance ranging from 0.17 to 0.22. In each case, the random-effects coefficient on the relevant drug arrest variable was significant and reinforced a significantly positive relationship between drug arrests and crime that was estimated in the comparable fixed-effects model. For a discussion of the advantages of fixed-effects models for estimating crime equations, see Benson, Kim and Rasmussen (1998) and Benson, Leburn, and Rasmussen (2001).

models and reached similar conclusions.[16] A reasonable alternative is to control for measurement error and omitted variables using fixed-effects models (Levitt, 1998; Benson, Kim, and Rasmussen, 1998; Benson, Leburn, and Rasmussen, 2001). Furthermore, during the time period of this study, crime rates were falling and drug arrests were increasing, suggesting that the recent intensification in drug enforcement was not in response to greater crime.

Another reason for caution is that it was not possible to include a measure of drug use in the model. However, although many public officials believe that drug use is significant as a determinant of nondrug crime, a growing literature suggests that drug use and major nondrug crimes are not closely linked.[17] One recent study that included proxy variables for drug use found them to be insignificant determinants of violent crime (Resignato, 2000), while another found a small positive association between drug use proxies and property crime, but no association with violent crime (Corman and Mocan, 2000). In an attempt to assess this issue, each model was reestimated with a similar proxy for drug use included as an independent variable. The empirical outcomes presented above remained nearly unchanged.[18]

Summary and Conclusions

A growing body of research uses the economic model of crime to evaluate the role of enforcement, economic conditions, and other characteristics of local crime markets. This analysis of the determinants of county-level crime in New York State has assessed the impacts of drug arrests, conditions in

[16]Benson, Kim, and Rasmussen (1998) provided theoretical arguments for why arrest variables should be treated as exogenous, and found empirical support for this specification using econometric tests for exogeneity. They also maintained that fixed-effects models reduce the potential of endogeneity problems for independent variables included in the regression equation. Miron (1999) reached a similar exogeneity conclusion because the level of police resources will be related to lagged, not current, crime rates due to the political processes associated with changing the allocation of police resources.

[17]There is inconclusive evidence about the relationship between drug use and crime, and although significant correlations are clearly present, strong support is lacking for the hypothesis that drug use causes crime. Rasmussen and Benson (1994) provided a comprehensive review of the evidence and concluded that, except for a small subset of drug users, drug use and crime appear to be unrelated. Miron (2003:16) argued that "the evidence . . . demonstrates a correlation between a tendency to commit crime and the tendency to use drugs, without indicating whether there is a causal connection," and that "reviews of the literature on drug use and crime have consistently concluded there is little evidence that drug use per se causes crime." Mast et al. (2000:292) also found that "substantial research literature suggests that there is no reliable association between drug use and major non-drug crimes."

[18]All the models were reestimated by adding a variable measuring drug-related hospitalizations, including all those related to illegal drug abuse, to serve as a proxy for drug use (county data from New York State Department of Health, see Appendix for complete citation). For 15 of the 16 models, the results for the significance test on the coefficient of the relevant drug arrest variable remained unchanged, although the coefficient magnitudes were slightly lower in some cases. In one model for burglary, the drug arrest coefficient went from marginally significant to insignificant. The proxy variable for drug use was also positive and significant in the models for robbery and burglary, but insignificant for all of the assault and larceny models.

local labor markets, differential patterns of population density, and arrest rates for all reported Part I crimes in the context of fixed-effects models. The results identify factors that have been significant in reducing crime. Improvements in enforcement ratios for total Part I crimes contributed to lower rates in New York State counties for all types of crimes assessed from 1996 to 2000. Counties with population growth experienced lower crime rates in all categories of crime as well, while declining unemployment rates contributed to reduced rates of assault and burglary. More drug arrests are not associated with lower rates of Part I crimes and appear to have been counterproductive for addressing nondrug crime. As in previous studies, the results suggest that when other determinants of crime are accounted for, drug enforcement is positively associated with higher levels of both violent and property crime.

With each of the models tested, the consistency of results is striking—there are no models in which drug arrests are found to be negatively and significantly associated with crime. The findings that conflict most strongly with the traditional law enforcement view involve the manufacture, sale, and possession of "harder" drugs separate from marijuana. Increases in per capita arrests for the manufacture and sale of "hard drugs" are accompanied by higher reported rates for all types of violent and property crime considered. Arrests for possession are positively related to the primarily economic crimes of robbery, burglary, and larceny. These results are consistent with the view that nondrug crime rates may rise because limited police resources are diverted from Part I crimes when drug arrests are given a higher priority, users must finance higher-priced purchases when supplies decline, and sellers pursue alternative crimes when the risk of arrest increases. Assessing marijuana in a separate market appears appropriate since arrests for the manufacture or sale of marijuana have an impact only on reported larcenies. As above, higher prices faced by users and a greater risk of arrest for sellers may motivate both demanders and suppliers to commit more of other types of crime.

The findings also suggest possible directions for further research. This study does not provide a way to test the significance of the specific channels by which crime is influenced by drug enforcement. For example, the crime associated with increased arrests for hard drug sales may be the result of disruptions in the supply network, as new participants seek to establish distribution networks. Alternatively, it could be due to deterrent effects, as the increased risks of selling illegal drugs result in substitutions to other forms of economic crime. Another extension would be to address the question of why drug arrests appear to increase specific types of crime. Nevertheless, understanding the net effect of enforcement activities provides important information to policymakers. The findings reported here suggest that resources allocated to drug enforcement will not benefit society by reducing nondrug crime. Additional studies at the national level and similar analyses using data from other states are needed to provide more evidence on this important question. At a minimum, the empirical findings should raise

serious questions about the effectiveness of drug enforcement as a crime-control measure, and they suggest that significant social costs may arise from existing approaches to drug control.

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Appendix: Criminal Offense Definitions

Part I Offenses

Criminal homicide, forcible rape, robbery, aggravated assault, burglary, larceny-theft, motor vehicle theft, arson.

Definitions of Components of Crime

- *Assaults* (aggravated assault): an unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily harm. This type of assault usually is accompanied by the use of a weapon or by means likely to produce death or great bodily harm.
- *Robbery*: the taking or attempting to take anything of value from the care, custody, or control of a person or persons by force or threat of force or violence, and/or by putting the victim in fear.
- *Burglary*: the unlawful entry of a structure to commit a felony or a theft.
- *Larceny* (theft): the unlawful taking, carrying, leading, or riding away of property from the possession or constructive possession of another.

SOURCE: U.S. Department of Justice, Federal Bureau of Investigation (1984).

Sources of Variables Used

1. FBI Uniform Crime Reports County Data for New York State from the Geostat Center Collections of the University of Virginia ⟨http://fisher.lib.virginia.edu/collections/stats/crime⟩.
2. New York State Department of Health, County Health Indicator Profiles (1996–2000) ⟨http://www.health.state.ny.us/nysdoh/cfch/main.htm⟩.
3. Land area for population density: U.S. Department of Commerce, U.S. Census Bureau, *Census 2000, Summary File 1: Population, Housing, Area, and Density: 2000* (GCF-PH1).