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IMPACT EVALUATION OF COPS GRANTS IN
LARGE CITIES

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IMPACT EVALUATION OF COPS GRANTS IN LARGE CITIES

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The Violent Crime Control and Law Enforcement Act of 1994 authorized the creation of an intergovernmental grant program within the U.S. Department of Justice to fund the hiring and redeployment of 100,000 additional community policing officers on America's streets. The program that administers the grants is the Office of Community Oriented Policing Services (COPS).

While the concept of community policing encompasses many things, it can be succinctly described as officers and citizens working together to solve problems resulting from crime, fear of crime, social and physical disorder, and undesirable neighborhood conditions.² By encouraging community policing, COPS grants were expected to reduce fear of crime, increase the quality of life, promote social control, and boost citizen satisfaction with police services while improving information sharing between citizens and the police.³

COPS administered three general types of grants.

First, the hiring grants paid for 75 percent of the salaries of newly hired officers over three years.

Second, the Making Officer Redeployment Effective (MORE) grants provided funding for technology, officer overtime, and civilian staff salaries. The MORE grants were intended to redeploy veteran officers from administrative tasks to community policing.

Third, the innovative grants provided funding for addressing specific problems like domestic violence, gangs, and youth firearms violence.

Two questions are asked in this paper: Do COPS grants stimulate local police department spending in large cities? Do COPS grants deter crime in large cities?

Two sets of regression analyses are used for this evaluation. To determine the impact of COPS grants on city police expenditures, the first set of modeling estimates a police expenditure function with police expenditures as the dependent variable. The police expenditure function is specified with variables that are thought to predict police spending. The second set of models estimates the relationship between COPS grants and crime rates. In the crime models, the dependent variables are

1. The findings of this paper are based on David B. Muhlhausen, "Impact Evaluation of the Community Oriented Policing Services (COPS) Grant Program," unpublished dissertation, University of Maryland, Baltimore County, Department of Public Policy, 2004. Previous versions of this paper were presented at the 27th Annual Association for Public Policy Analysis and Management Research Conference, Panel on Policing Crime, November 5, 2005, and the 6th Annual Campbell Collaboration Colloquium, Symposium: "Did COPS Funding Decrease Crime in the United States?" February 23, 2006.
2. Robert Trojanowicz, Victor E. Kappeler, Larry K. Gaines, and Bonnie Bucqueroux, *Community Policing: A Contemporary Perspective*, 2nd ed. (Cincinnati, Ohio: Anderson Publishing, 1998).
3. Jeffery A. Roth and Joseph F. Ryan, "The COPS Program After 4 Years—National Evaluation," U.S. Department of Justice, National Institute of Justice *Research in Brief*, August 2000.

crime rates for murder, rape, robbery, assault, burglary, larceny-theft, and motor vehicle theft.

BACKGROUND AND LITERATURE REVIEW

According to the Justice Department, the COPS program reached an important milestone on May 12, 1999, “funding the 100,000th officer ahead of schedule and under budget.”⁴ While measuring the goal of adding 100,000 additional officers is problematic, the best available evidence indicates that COPS fell short of this goal. Research indicates that COPS did not actually put 100,000 additional officers on the street.⁵ A National Institute of Justice (NIJ) process evaluation of COPS concluded: “Whether the program will ever increase the number of officers on the street at a single point in time to 100,000 is not clear.”⁶

Most hiring grantees faced officer retention issues with their COPS-funded officer positions. According to an NIJ national survey of COPS grantees, 52 percent of hiring grantees were uncertain about their long-term plans for officer retention, 37 percent would achieve retention with funds cleared through the attrition of non-COPS-funded officers, 20 percent reported that retention would occur by cutting other positions, and 10 percent reported that the officers would not be retained. Of all the medium and large agencies that received hiring grants from 1994 to 1998, only 46 percent reported that all of their original COPS-funded officers were still employed in 1998.⁷

Flypaper Effects. Understanding how federal

grants affect state and local governments is important to developing hypotheses to predict how COPS grants influence spending by cities. The conditions that federal grants impose on grantees have some bearing on the allocation of state and local resources.

An interesting policy question revolves around the effect of intergovernmental grants: Do intergovernmental grants provide a stimulus for grant recipients to spend more of their own resources than they would spend without grant assistance? Reviews of the literature estimating the relationship between intergovernmental grants and grantee spending generally indicate a “flypaper effect” because the grant funding sticks where it hits. Depending on grant conditions, intergovernmental grants can be expected not only to “stick,” but also to stimulate the recipient’s spending to exceed the effect of an equal increase in private income by the grant recipient. Certain types of grants stimulate grantees to increase spending from their own revenues to levels that would not have been achieved without the grants. The central assumption of this effect is that federal grants provide a powerful incentive for state and local governments to increase their own spending levels beyond the amounts that would have been spent without federal assistance.⁸

COPS grants are categorical grants, which are used by the recipient to fund specific activities authorized by the grant provider. While most categorical grants are awarded on a formula basis,⁹ the majority of COPS grants are categorical project

4. Press release, “About COPS: Rebuilding the Bond Between Citizens and the Government,” U.S. Department of Justice, Office of Community Oriented Policing Services, May 12, 1999, at permanent.access.gpo.gov/lps9890/lps9890/www.usdoj.gov/cops/news_info/default.htm (May 12, 2006).
5. Gareth Davis, David B. Muhlhausen, Dexter Ingram, and Ralph Rector, “The Facts About COPS: A Performance Overview of the Community Oriented Policing Services Program,” Heritage Foundation *Center for Data Analysis Report No. CDA00-10*, September 25, 2000, at www.heritage.org/Research/Crime/CDA00-10.cfm; Michael R. Bromwich, “Management and Administration of the Community Oriented Policing Services Grant Program,” Report No. 99-21, U.S. Department of Justice, Office of Inspector General, Audit Division, July 1999, at www.usdoj.gov/oig/au9921/9921.toc.htm (December 20, 2002; unavailable May 12, 2006); U.S. General Accounting Office, *Community Policing: Issues Related to the Design, Operation, and Management of the Grant Program*, GAO/GGD-97-167, September 1997, at www.gao.gov/archive/1997/gg97167.pdf (May 12, 2006); and Christopher Koper, Jeffrey A. Roth, and Edward Maguire, “Putting 100,000 Officers on the Street: Progress as of 1998 and Preliminary Projections Through 2003,” in Jeffrey A. Roth *et al.*, *National Evaluation of the COPS Program: Title I of the 1994 Crime Act* (Washington, D.C.: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice, 2000), pp. 149-176, at www.ncjrs.gov/pdffiles1/nij/183643.pdf (May 12, 2006).
6. Koper *et al.*, “Putting 100,000 Officers on the Street,” p. 152.
7. Jeffery A. Roth, Christopher S. Koper, Ruth White, and Elizabeth A. Langston, “Using COPS Resources,” in Roth *et al.*, *National Evaluation of the COPS Program*, pp. 111 and 113.

grants, meaning that the grants are awarded only to those that apply for the funding. Project grants are considered more effective than formula grants in targeting aid to the neediest communities.¹⁰ In addition, COPS grants are closed-ended matching grants that place a ceiling on the contribution by the grantor.

The hiring and MORE grants generally require a 25 percent local match, so not only should the police expenditure function indicate a flypaper effect, but the model should also indicate a stimulus effect. The inclusion of COPS grants variables in the police expenditure function tests for how the grants affect local expenditures.

COPS Evaluations. In recent years, new impact evaluations estimating the effect of COPS on crime rates have been produced.¹¹ However, these evaluations have produced conflicting findings and conclusions.

The Heritage Foundation published the first impact evaluation of COPS, which found that the relationship between COPS hiring and MORE grants and county violent crime rates was statistically insignificant, while innovative grants were associated with small reductions in violent crime.¹²

A COPS-funded evaluation found that the innovative grants were associated with reductions in both violent and property crime rates in cities and towns with populations above 1,000 residents. The hiring and MORE grants did not have a statistically significant relationship with crime rates. However, when the analysis was limited to cities above 10,000 residents, the innovative and hiring grants were associated with reductions in violent and property crime rates.¹³

A review of the COPS-funded evaluation by the U.S. General Accounting Office (GAO, later renamed the Government Accountability Office) severely criticized the authors' methodology and concluded:

We cannot agree...that their 2001 study shows that some COPS grants (hiring and innovative) significantly reduced crime because, among other things, important variables were omitted from their analyses, the analytic models were misspecified, and the sample of cities included in the study was limited.¹⁴

Two other studies of cities with populations over 10,000 residents indicate that COPS grants are

8. Shama Gamkhar, *Federal Intergovernmental Grants and the States: Managing Devolution* (Cheltenham, U.K.: Edward Elgar, 2002), and Bruce W. Hamilton, "The Flypaper Effect and Other Anomalies," *Journal of Public Economics*, Vol. 22, Issue 3 (December 1983), pp. 347–361.
9. Daniel P. Schwallie, *The Impact of Intergovernmental Grants on the Aggregate Public Sector* (New York: Quorum Books, 1989).
10. Michael J. Rich, "Targeting Federal Grants: The Community Development Experience, 1950–1986," *Publius: The Journal of Federalism*, Vol. 21 (Winter 1991), pp. 29–49.
11. U.S. Government Accountability Office, *Community Policing Grants: COPS Grants Were a Modest Contributor to Declines in Crime in the 1990s*, GAO–06–104, October 2005, at www.gao.gov/new.items/d06104.pdf (May 12, 2006); William N. Evans and Emily Owens, "Flypaper COPS," working paper, University of Maryland, Department of Economics, 2005; David B. Muhlhausen, "Do Community Oriented Policing Services Grants Affect Violent Crime Rates?" Heritage Foundation Center for Data Analysis Report No. CDA01–05, May 25, 2001, at www.heritage.org/Research/Crime/CDA01-05.cfm; Muhlhausen, *Impact Evaluation of the Community Oriented Policing Services (COPS) Grant Program*; and Jihong "Solomon" Zhao, Matthew Schieder, and Quint Thurman, "Funding Community Policing to Reduce Crime: Have COPS Grants Made a Difference?" *Criminology and Public Policy*, Vol. 2, No. 1 (November 2002), pp. 7–32.
12. Muhlhausen, "Do Community Oriented Policing Services Grants Affect Violent Crime Rates?"
13. Zhao *et al.*, "Funding Community Policing to Reduce Crime."
14. Laurie E. Ekstrand, Director, Homeland Security and Justice Issues, and Nancy Kingsbury, Managing Director, Applied Research and Methods Issues, U.S. General Accounting Office, "Technical Assessment of Zhao and Thurman's 2001 Evaluation of the Effects of COPS Grants on Crime," letter to Representative F. James Sensenbrenner, Chairman, Committee on the Judiciary, U.S. House of Representatives, GAO–03–867R, June 12, 2003, p. 3, at www.gao.gov/new.items/d03867r.pdf (May 12, 2006). For an additional review of the COPS-funded study, see David B. Muhlhausen, "Research Challenges Claims of COPS Effectiveness," Heritage Foundation Center for Data Analysis Report No. CDA02–02, April 5, 2002, at www.heritage.org/Research/Crime/CDA02-02.cfm.

associated with reductions in crime. A GAO study concluded that COPS grants were linked to “modest” reductions in crime rates.¹⁵ In a presentation before the 6th Annual Campbell Collaboration Colloquium, GAO officials estimated that COPS accounted for 1 percent of the drop in crime during the 1990s.¹⁶ A study from the University of Maryland found that COPS hiring grants boosted police employment levels and that increased police employment is associated with decreases in crime.¹⁷

DATA AND MODELING

Assessing a program’s impact normally requires comparing the conditions of targets that have received an intervention with an equivalent set of targets that have not experienced the intervention.¹⁸ The manner in which targets are selected for inclusion in intervention and control groups can complicate the assessment of a program’s real impact. For instance, when participation in a program is voluntary, the participants may be more likely to produce the desired effect regardless of whether or not they received the intervention. In the case of COPS, police departments that applied for grants may already have been more open to adopting innovative policing styles than agencies that did not apply for grants. Thus, the evaluation methodology of this paper needs to address this dilemma.

Ideally, the most appropriate impact evaluation of COPS would be an *ex ante* experimental design, in which grant funding is randomly assigned to intervention and control cities. The Violent Crime Control and Law Enforcement Act of 1994, as written by Congress, required an evaluation of COPS. Congress suggested that the evaluation measure the effectiveness of COPS in reducing crime but left open the possibility that the Department of Justice might do an alternative type of evaluation. The resulting NIJ

study failed to measure the effectiveness of the COPS program in reducing crime. Instead, the study examined process measures, such as how many officers were hired and the types of community policing activities that were implemented.¹⁹

With the opportunity for an *ex ante* experimental evaluation closed, researchers are now left with *ex post* non-experimental designs for evaluating the impact of COPS on crime. Given the paper’s focus on large cities, and given that nearly all of the cities in the dataset received some form of COPS grants, a quasi-experimental design is impossible. Of the 58 cities, only Oklahoma City chose not to participate in COPS grants from December 1993 to December 1999. In addition, a few of the cities did not participate in some of the three COPS grants. The techniques available for separating out the effect of extraneous factors from the net effect of COPS grants are severely limited. Thus, this analysis uses repeated reflexive controls, in which cities that received COPS grants and the single city that did not receive funding are compared with themselves using the several measures of crime rates before and after the COPS program was implemented.

To institute reflexive controls, this paper will use panel data analysis. Panel studies observe multiple units over several periods. The addition of multiple data collection points gives the results of panel studies substantially more credibility than studies that have only single before and after intervention measures.²⁰ For large cities, COPS can be considered a full-coverage program. The absence of comparison cities makes the task of accounting for all confounding effects difficult. However, the participation levels of large cities differed. Using panel analysis allows this evaluation to test the relative effectiveness of different COPS funding levels.

By increasing the number of data points compared to cross-sectional and time-series analyses, panel analysis increases the degrees of freedom and

15. U.S. Government Accountability Office, *Community Policing Grants*.

16. William Sabol, Tom Jessor, Benjamin Bolitzer, and David Lilley, “GAO’s *Evaluation of the Impact of COPS Grants on the Decline in Crime in the 1990s*,” 6th Annual Campbell Collaboration Colloquium, Symposium: “Did COPS Funding Decrease Crime in the United States?” February 23, 2006.

17. Evans and Owens, “Flypaper COPS.”

18. Peter H. Rossi, Howard E. Freeman, and Mark W. Lipsey, *Evaluation: A Systematic Approach* (Thousand Oaks, Calif.: Sage Publications, 1999).

19. Roth *et al.*, *National Evaluation of the COPS Program*.

20. Rossi *et al.*, *Evaluation: A Systematic Approach*.

reduces possible collinearity among the independent variables, thus improving the efficiency of the econometric estimates. Further, the longitudinal nature of the panel data allows evaluators to analyze important policy questions that cross-sectional and time-series data sets cannot address.²¹ Panel analysis also reduces omitted variable bias by introducing cross-sectional and time-specific fixed effects into the model specification.²²

Data. The 58 large cities in this evaluation are based on the 59 cities used in a study by Professor Steven D. Levitt of the University of Chicago.²³ The Illinois data regarding rape are not in accordance with FBI guidelines, so the FBI does not report the number of rapes in Illinois. This difference in definition means that Chicago, which is included in Professor Levitt's study, is excluded from these analyses because the model specifications include one-year lags of all crime rates as control variables.

Since COPS was created in late 1994, the years included in this evaluation were selected to analyze five years before and after the initial implementation of the program.²⁴ Table 1 lists the cities in this evaluation and the amount of COPS grant funding that each city received. During this period, these cities received almost \$1.5 billion, including over \$900 million to hire over 12,000 new officers.

The data used for this paper were collected from several sources. Table 2 lists each variable and its respective mean, standard deviation, minimum, and maximum. The per capita dependent variables

for each of the crime models are murder, rape, robbery, aggravated assault, burglary, larceny-theft, and auto theft. The average crime rates of these cities have declined over the 10-year period of this study. Generally, crime rates began to decline during the early to mid-1990s. Because crime rates in these cities began generally to decline before COPS was created, any evaluation that excludes the declining crime trend before COPS may produce biased estimates.

To obtain crime rates per capita, these variables were divided by each city's total population as reported to the Uniform Crime Reports (UCR). The city-level crime rate data are based on UCR data, which were obtained from the U.S. Department of Justice Bureau of Justice Statistics.²⁵ The UCR data include only offenses reported to the police, so the actual level of crime is understated.

To measure the effect of city-level policies, the analysis includes city police and fire department expenditures and total city revenue data from the Annual Survey of State and Local Government Finances.²⁶ The police and fire department variables are limited to non-capital expenditures. As with the crime variables, the expenditure and revenue data were divided by each city's population to obtain the per capita values and were expressed in 1995 dollars.

The Annual Survey of State and Local Government Finances appears to be the only survey that has continually collected city police expenditure

21. The usefulness of cross-sectional analyses of crime programs appears to be relatively minor due to simultaneity. For example, Sherman's 1992 review of policing strategies intended to reduce crime excluded cross-sectional studies of large cities because of the problems posed by simultaneity. See Lawrence Sherman, "Police and Crime Control," in Michael Tonry and Norval Morris, eds., *Modern Policing* (Chicago: University of Chicago Press, 1992), pp. 159–230.

22. Cheng Hsiao, *Analysis of Panel Data* (Cambridge, U.K.: Cambridge University Press, 1986).

23. Steven D. Levitt, "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime," *American Economic Review*, Vol. 87, No. 3 (June 1997), pp. 270–290.

24. Although the COPS program became official with the enactment of the Violent Crime Control and Law Enforcement Act in September 1994, Congress appropriated funding for the hiring of state and local community police officers in the fiscal year (FY) 1994 appropriations bill for the Departments of Commerce, Justice, and State (Public Law 103–121). These grants were named Police Hiring Supplement (PHS) grants and were awarded to police departments in December 1993. While COPS did not originally administer the PHS grants, the agency used the grants to fulfill its goal of 100,000 new officers. Because grantees took about one year to hire and deploy their grant-funded officers, 1990–1994 is considered the period before the implementation of COPS grants, while 1995–1999 is considered the time period during which COPS funding was taking effect.

25. U.S. Department of Justice, Bureau of Justice Statistics, Large Local Agency Crime Trends, at bjsdata.ojp.usdoj.gov/dataonline/Search/Crime/Local/LocalCrimeLarge.cfm (May 12, 2006).

26. U.S. Department of Commerce, Census Bureau, Government Division, Annual Survey of State and Local Government Finances, 1989–1999, at www.census.gov/govs/www/estimate.html (May 19, 2003).

COPS Grant Awards to the 58 Cities, December 1993 to December 1999

City	Hiring Grants	MORE Grants	Innovative Grants	Total
Akron	1,772,860	523,687	533,565	2,830,112
Albuquerque	8,462,666	2,852,020	243,219	11,557,905
Anaheim	675,000	422,026	5,000	1,102,026
Arlington	3,450,000	0	566,712	4,016,712
Atlanta	11,000,000	4,007,174	239,172	15,246,346
Austin	10,400,000	2,571,248	2,417,631	15,388,879
Baltimore	14,500,000	6,390,369	11,700,000	32,590,369
Birmingham	1,039,773	81,630	4,316,661	5,438,064
Boston	8,400,000	276,150	4,352,782	13,028,932
Buffalo	2,300,000	1,876,875	3,473,796	7,650,671
Charlotte	8,903,478	12,400,000	3,813,248	25,116,726
Cleveland	6,575,000	1,305,445	16,800,000	24,680,445
Columbus	4,200,000	243,030	5,000	4,448,030
Corpus Christi	1,500,000	1,201,500	77,284	2,778,784
Dallas	4,500,000	94,500	2,236,306	6,830,806
Denver	3,705,000	1,357,182	198,800	5,260,982
Detroit	21,100,000	4,738,231	1,178,409	27,016,640
El Paso	11,900,000	2,434,104	1,130,816	15,464,920
Fort Worth	1,500,000	248,406	270,786	2,019,192
Fresno	7,091,625	3,759,051	13,900,000	24,750,676
Honolulu	3,000,000	9,322,500	200,000	12,522,500
Houston	25,200,000	19,900,000	180,000	45,280,000
Indianapolis	5,980,074	112,155	968,786	7,061,015
Jacksonville	6,900,000	1,847,250	400,858	9,148,108
Jersey City	5,430,000	2,309,441	1,361,396	9,100,837
Kansas City	5,808,000	1,717,769	1,135,818	8,661,587
Los Angeles	202,000,000	58,100,000	1,354,486	261,454,486
Louisville	3,090,000	2,014,500	144,164	5,248,664
Memphis	9,660,000	851,677	317,634	10,829,311
Mesa	3,685,500	0	204,930	3,890,430
Miami	34,400,000	23,300,000	27,900,000	85,600,000
Milwaukee	4,725,000	793,162	1,195,752	6,713,914
Minneapolis	6,075,000	1,720,200	925,402	8,720,602
Nashville	13,300,000	4,081,388	862,564	18,243,952
New Orleans	7,532,893	1,103,193	229,959	8,866,045
New York	231,000,000	171,000,000	1,571,235	403,571,235
Newark	20,700,000	3,776,658	509,717	24,986,375
Oakland	10,800,000	6,422,036	1,178,315	18,400,351
Oklahoma City	0	0	0	0
Omaha	4,574,043	2,791,415	633,033	7,998,491
Philadelphia	56,500,000	2,179,180	93,592	58,772,772
Phoenix	23,900,000	2,005,310	2,211,805	28,117,115
Pittsburgh	0	4,318,322	337,049	4,655,371
Portland	8,636,280	6,933,648	547,223	16,117,151
Sacramento	22,600,000	11,800,000	2,970,337	37,370,337
San Antonio	6,510,000	362,776	1,111,443	7,984,219
San Diego	6,210,000	22,900,000	4,875,081	33,985,081
San Francisco	7,670,000	6,609,222	200,000	14,479,222
San Jose	5,598,000	3,381,202	602,916	9,582,118
Seattle	1,752,390	300,000	5,047,281	7,099,671
St. Louis	7,123,728	2,715,336	1,351,556	11,190,620
St. Paul	750,000	1,526,902	1,451,775	3,728,677
St. Petersburg	2,925,000	825,000	586,622	4,336,622
Tampa	8,309,000	0	516,638	8,825,638
Toledo	3,126,347	1,384,121	297,080	4,807,548
Tucson	10,400,000	6,233,551	592,011	17,225,562
Tulsa	1,935,687	0	57,816	1,993,503
Washington	5,700,000	10,900,000	793,361	17,393,361
Total	916,482,344	442,320,542	132,376,822	1,491,179,708

Source: U.S. Department of Justice, Office of Community Oriented Policing Services, 2000.

Descriptive Statistics for the 58 Cities, 1990–1999

Variable	Mean	Standard Deviation	Minimum	Maximum
Murders per capita	0.0002	0.0002	0.00002	0.0009
Rapes per capita	0.0007	0.0003	0.00023	0.0020
Robberies per capita	0.0062	0.0040	0.00083	0.0230
Assaults per capita	0.0082	0.0044	0.00104	0.0237
Burglaries per capita	0.0176	0.0063	0.00307	0.0432
Larceny-thefts per capita	0.0472	0.0144	0.01730	0.0898
Auto thefts per capita	0.0142	0.0079	0.00327	0.1061
Police expenditures per capita, lower bound (1995 dollars)	189.7	81.0	63.7	659.7
Fire department expenditures per capita (1995 dollars)	101.7	37.7	31.4	242.6
Total revenue per capita (1995 dollars)	1545.3	1055.0	462.9	8350.8
Hiring grants lagged (1995 dollars)	1.5	3.4	0	32.2
MORE grants lagged (1995 dollars)	0.80	3.1	0	39.3
Innovative grants lagged (1995 dollars)	0.51	3.9	0	75.7
Black population percent (MSA)	13.0	8.6	2.6	42.4
Hispanic population percent (MSA)	12.5	15.4	0.38	74.3
Other minority population percent (MSA)	6.0	9.2	0.64	65.5
15- to 19-year-old male population percent (MSA)	3.5	0.36	2.5	4.8
20- to 29-year-old male population percent (MSA)	7.5	0.99	5.4	11.3
Unemployment rate (MSA)	5.3	2.19412	2.0	15.6
Income per capita (MSA, 1995 dollars)	24,310.0	4,852.7	12,404.1	49,829.9
City population	712,937.6	1,011,483.0	216,620.0	7,429,263.0

Sources: U.S. Department of Justice, Office of Community Oriented Policing Services, 2000; U.S. Department of Justice, Bureau of Justice Statistics, 2003; U.S. Department of Commerce, Census Bureau, 1989-1999; University of Missouri, Office of Social and Economic Data Analysis, 2003; U.S. Department of Commerce, Bureau of Economic Analysis, 2003; and U.S. Department of Labor, Bureau of Labor Statistics, 2003.

data from 1990 through 1999. While the survey generally tracks local government revenues from intergovernmental grants, the Census Bureau does not collect revenue data specifically related to federal law enforcement grants. Further, the survey does not detail expenditures for specific functions (e.g., police protection and public welfare) by source. There is a possibility that the police expenditures reported by the local governments in the survey include spending resulting from COPS grants and other intergovernmental sources of funding. The degree to which this problem is present in the data used in this evaluation is not clear. Because the Annual Survey of State and Local Government Finances is the only source of local police expenditure data, the data are used to estimate the effect of city police expenditures on crime rates.

To account for this issue, separate analyses were performed in which COPS grants were subtracted from the police expenditure data. Under this method, the estimated effect of COPS grants on crime did not substantially change the findings presented in this paper.

The focus of this paper—COPS grants—is calculated on a per capita basis. COPS grants are divided into three types based on their functional purposes: hiring grants, MORE grants, and innovative grants. The grants are calculated on a per capita basis and are in 1995 dollars.

As with the previous COPS evaluations,²⁷ the COPS variables are lagged at least one year. The lagging is done to allow for the time that grantees took to implement the grants. For the hiring grants, the NIJ process evaluation found that 95 percent of grantees in 1995 had hired their officers within 10–

27. Evans and Owens, “Flypaper COPS”; Muhlhausen, “Do Community Oriented Policing Services Grants Affect Violent Crime Rates?”; Muhlhausen, *Impact Evaluation of the Community Oriented Policing Services (COPS) Grant Program*; and Zhao *et al.*, “Funding Community Policing to Reduce Crime.”

12 months after their respective award dates.²⁸ To account for the three-year life of the hiring grants, funding must be allocated over the three-year time span. COPS recommends to grantees that hiring grants be spent at a declining rate—38 percent of the grant for the first year, 34 percent for the second year, and 28 percent for the third year.²⁹ For this paper, the hiring grants are allocated in the same manner.

MORE grants provided funding for the purchase of technology intended to free officers from administrative tasks and allow them to spend more time in community policing. In some cases, these grants paid for the salaries of clerical help. In other cases, MORE grants paid overtime expenses to increase the deployment of police officers on patrol. The MORE grants did not have a universal cap, but contribution levels are based on the total cost estimates of the proposed grant projects. Based on the estimated total budget for MORE grant projects, COPS provided 75 percent of the total cost with the expectation that the grantees would pick up the remaining 25 percent.

While comprising about 10 percent of COPS funding, innovative grants addressed specific problems identified by grantees. These grants were commonly used to target street gangs, domestic violence, and illegal use of firearms by youths. The innovative grants are nonmatching (i.e., lump-sum grants that do not require matching local revenues). All COPS grants are closed-ended grants, meaning that federal contributions are capped at

specific dollar amounts. The COPS grant data contain award information from December 1993 to May 2000.³⁰

The demographic variables are on the metropolitan statistical area (MSA) level. The MSA variables pertaining to race and ethnicity include the black, Hispanic, and other minority population percentages. The young male population percentages are broken down into the 15–19-year-old and 20–29-year-old categories. MSA demographic data were obtained from the Office of Social and Economic Data Analysis at the University of Missouri.³¹

The economic variables include the unemployment rate and income per capita (1995 dollars) for the metropolitan statistical areas. Income per capita and unemployment data from 1990 to 1999 were obtained from the Bureau of Economic Analysis and the Bureau of Labor Statistics, respectively.³²

Modeling. An endogenous relationship between police force size and crime rates may produce biased ordinary least squares (OLS) estimates.³³

First, higher crime rates are likely to heighten the marginal productivity of police departments. Cities with high crime rates tend to have larger police departments, even if increased police resources reduce crime.

Second, if the size of a police department is expanded in response to increasing crime, a positive correlation between police and crime can be found, even though the police reduce crime.³⁴

Hence, analyses of the effect of police depart-

28. Roth *et al.*, “Using COPS Resources,” p. 101.

29. Zhao *et al.*, “Funding Community Policing to Reduce Crime,” p. 16.

30. U.S. Department of Justice, Office of Community Oriented Policing Services, COPS Management System (CMS) database, 2000.

31. University of Missouri, Office of Social and Economic Data Analysis, Post-1990 Population Estimates for U.S. Counties & Higher Level Geographies by Age, Race, Sex and Hispanic Origin thru 1999, at www.oseda.missouri.edu/uic/uicapps/agersex.html (May 19, 2003).

32. U.S. Department of Commerce, Bureau of Economic Analysis, Regional Accounts Data, Local Area Personal Income, at www.bea.gov/region/rais (May 19, 2003), and U.S. Department of Labor, Bureau of Labor Statistics, Local Area Unemployment Statistics, at www.bls.gov/lau (May 19, 2003).

33. Alfred Blumstein, Jacqueline Cohen, and Daniel Nagin, eds., *Deterrence and Incapacitation: Estimating the Effects of Criminal Sanctions on Crime Rates* (Washington, D.C.: Panel on Research on Deterrence and Incapacitation, National Research Council, 1978); Franklin M. Fisher and Daniel Nagin, “On the Feasibility of Identifying the Crime Function in a Simultaneous Model of Crime Rates and Sanction Levels,” in Blumstein *et al.*, *Deterrence and Incapacitation*, pp. 361–399; Colin Loftin and David McDowall, “The Police, Crime, and Economic Theory: An Assessment,” in David H. Bayley, ed., *What Works in Policing* (New York: Oxford University Press, 1998), pp. 10–25, originally published in *American Sociological Review*, Vol. 47 (June 1982), pp. 393–401; and Thomas B. Marvell and Carlisle E. Moody, “Specification Problems, Police Levels, and Crime Rates,” *Criminology*, Vol. 34, No. 4 (November 1996), pp. 600–645.

ments on crime should use methods that are designed to disentangle the simultaneous relationship between the police and crime.

The evaluation presented here is based on two statistical approaches. The first approach uses OLS regressions to estimate the impact of police expenditures and COPS grants on crime rates. The second approach uses two-stage least squares (2SLS) regressions to account for a possible simultaneous relationship between local law enforcement expenditures and crime while controlling for COPS grants and socioeconomic variables. The efficiency of the 2SLS estimates is compared to the OLS estimates.

Using 2SLS to estimate a simultaneous or endogenous relationship requires an important assumption called an “identification restriction.” Identification restrictions involve variables that do not directly influence crime rates but do affect the other simultaneously related variables. For instance, to determine the effect of police expenditures or employment levels on crime, one would need a variable in the police expenditure function that affects spending or employment levels but does not influence crime rates. Factors that affect police expenditures or police employment without influencing crime rates or being affected by crime rates are eligible for use as identification restrictions. If the identification restriction is seriously in error, the estimated effects of the simultaneous model may contain large errors due to simultaneity.³⁵

City fire department expenditures serves as the instrumental variable for the 2SLS models because the demand for public safety is anticipated to affect both police and fire department spending. Although fire department expenditures are expected to be correlated with police department expenditures, there is little reason to believe that fire department expenditures affect crime rates. Previously, Professor Steven D. Levitt used the number of municipal firefighters as an instrument, even though firefighter employment levels were correlated with police force size and crime rates.³⁶ As is shown in the regression analyses for this evaluation, fire department expenditures are uncorrelated with crime rates while correlated with police

department expenditures.

Endogeneity tests are performed to determine whether the 2SLS models are preferred over the OLS models. If the police expenditures are endogenous, the 2SLS model is chosen over the OLS model. However, if police expenditures are exogenous, the OLS model is preferred. Not only is 2SLS unnecessary when endogeneity is not an issue, but the method produces larger standard errors than OLS. Thus, 2SLS should be used only when the technique is required.

The models used in the analyses control for yearly fixed effects and cross-sectional fixed effects (individual differences related to each city), which account for time-invariant unobserved factors that cause crime rates in a particular city to differ from crime rates in other cities. The fixed-effects model helps to control for differences in city crime rates that are not explained by the independent variables. In addition, the fixed-effects model uses time-specific fixed effects, which involve the inclusion of year dummy variables. The year dummy variables control for unobserved factors that affect crime nationwide and that are not accounted for by the control variables.

Including the specific differences attributable to each city in the fixed-effects model helps to control for possible selection bias in the COPS program’s allocation of grants. Selection bias may occur if more innovative and effective police agencies are more likely to apply for and receive COPS grants than other agencies are. The cross-sectional fixed-effects model helps to control for selection bias by giving each city an intercept, which allows the individual differences of the cities to be absorbed. The fixed-effects model can reduce selection bias; however, it may not eliminate it entirely.

Police Expenditure Function. Previous research on intergovernmental grants and the flypaper effect indicates that some of the COPS grants may stimulate city police department spending. A stimulus effect on city police expenditures is expected because COPS hiring and MORE grants are normally closed-ended matching grants, meaning that the grant recipients must provide a certain percent-

34. Levitt, “Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime.”

35. Blumstein *et al.*, *Deterrence and Incapacitation*, esp. p. 6.

36. Steven D. Levitt, “Using Electoral Cycles in Police Hiring to Estimate the Effects of Police on Crime: Reply,” *American Economic Review*, Vol. 92, No. 4 (September 2002), pp. 1244–1250.

age in matching local funds. The innovative grants do not require matching local funds, so these grants are not expected to produce a stimulus effect. Thus, the coefficients for the hiring and MORE grants are expected to be positive and statistically different from zero, while the coefficients for the innovative grants are predicted to be statistically indistinguishable from zero.

The purposes of the police expenditure function are twofold.

First, the model estimates whether COPS grants had a flypaper effect on police expenditures.

Second, the police expenditure functions provide estimates of police expenditures for the 2SLS crime models.

Operating on the assumption that city officials consider all crime rates in their police department funding decisions, the police expenditure function includes lags of all the crime variables. Not including lagged crime rates as independent variables in the police expenditure function would likely result in a misspecified model. A review of the literature on the determinants of police force size found that crime rates are commonly used as independent variables.³⁷ The police expenditure function specification is presented in Equation 1.

Equation 1

Police expenditures_{it} = α_1 + β_1 Fire department expenditures_{it-1} + β_2 Hiring grants_{it-1} + β_3 MORE grants_{it-1} + β_4 Innovative grants_{it-1} + β_5 Total revenue_{it} + β_6 Socioeconomic factors_{it} + β_7 Crime rates_{it-1} + β_8 Year fixed-effects_{it} + β_9 City fixed-effects_{it} + ε_{it}

Crime Models. The analysis of this paper concentrates on finding evidence of whether COPS

grants affected crime rates in large cities. How COPS grants influenced crime rates can be explained through general deterrence theory, which supposes that increasing the risk of apprehension and punishment for crimes will deter members of society as a whole from committing crime. Increased technology and labor are expected to increase the probabilities that the police can apprehend criminals.³⁸ Under the theory advocated by Nobel Laureate Gary S. Becker, the “more that is spent on policemen, court personnel and specialized equipment, the easier it is to discover offenses and convict offenders.”³⁹ Further, the effectiveness of police departments can be influenced by the technology used for and the funds spent on law enforcement.⁴⁰ However, additional police expenditures will not necessarily be correlated with increased deterrence if the officers are desk-bound.⁴¹ As previously mentioned, through placement of additional officers engaged with the community, COPS grants are expected to increase the criminals’ expected risks of detection; thus, crime should be prevented.

In addition to deterrence, by assisting in engaging additional officers in community policing, COPS grants are predicted to improve community relations and make the grantees more responsive to community needs. Increased resources and improved policing strategies are expected to reduce crime rates.

While the literature on the relationship between police force size and crime rates indicates that the relationship is unclear,⁴² using the Granger-causality method, Thomas B. Marvell of Justec Research and Carlisle E. Moody of the College of William and Mary suggest that the hiring of additional police officers is associated with reductions in

37. Edward R. Maguire, “Research Evidence on Factors Influencing Police Strength in the United States,” in Christopher S. Koper, Edward E. Maguire, and Gretchen E. Moore, eds., *Hiring and Retention Issues in Police Agencies: Readings on the Determinants of Police Strength, Hiring and Retention of Officers, and the Federal COPS Program*, Urban Institute, Justice Policy Center, October 2001, pp. 7–25.

38. Gary S. Becker, “Crime and Punishment: An Economic Approach,” 1968, in Nigel G. Fielding, Alan Clarke, and Robert Witt, eds., *The Economic Dimensions of Crime* (New York: St. Martin’s Press, 2000), pp. 15–68, originally published in *Journal of Political Economy*, Vol. 76, No. 2 (1968), pp. 169–217.

39. *Ibid.*, p. 16.

40. L. Phillips and H. L. Votey, “An Economic Analysis of the Deterrent Effect of Law Enforcement on Criminal Activity,” *Journal of Criminal Law, Criminology, and Police Science*, Vol. 63, No. 3 (1972), pp. 330–342.

41. Antony W. Dnes, “The Economics of Crime,” in Fielding *et al.*, *The Economic Dimensions of Crime*, pp. 70–81.

42. John Eck and Edward Maguire, “Have Changes in Policing Reduced Violent Crime?” in Alfred Blumstein and Joel Wallman, eds., *The Crime Drop in America* (New York: Cambridge University Press, 2000), pp. 207–265.

crime rates.⁴³ Professor Steven D. Levitt used election cycles as an instrument to find that increased police staffing is associated with reductions in crime.⁴⁴ However, Assistant Professor Justin McCrary of the University of Michigan found that a weighting error led Professor Levitt to make mistaken inferences about the relationship between police and crime.⁴⁵

For all of the estimations, the dependent variable for the crime models is lagged as a control variable. This modeling is used for two reasons.

First, due to the inclusion of the lagged crime rate in the police expenditure function, the absence of the lag from the crime model would make the lag an instrument. Including the lag of the crime dependent variable as control variable in the crime models as well as in the police expenditure function makes it an exogenous variable in both equations.

Second, lagging the dependent crime variable will control for historical factors that affect differences in the dependent variable. Some cities have higher crime rates than other cities, so lagging crime rates is a general way of accounting for unobserved differences that affect current crime rates.⁴⁶ While the cross-sectional fixed effects account for unobserved variables that are time-invariant, the inclusion of the lagged crime dependent variable helps to capture unobserved social factors that fluctuate over time within cities.

One possible concern about the specification of the crime models is that lagging the dependent variable may bias the OLS and 2SLS estimates. To address this concern, additional regressions were estimated using generalized method of moments (GMM). The GMM findings produce coefficients that are remarkably similar to the OLS and 2SLS coefficients reported in the paper.⁴⁷ (See the Appendix.)

Contemporaneous crime control variables are omitted from the police expenditure functions because the periods in which police expenditures are allocated are different from the periods used to measure crime rates. The crime variables are based on calendar years, while the police expenditure variables are based on different fiscal years that begin on different days of the year, depending on local practices.⁴⁸ Due to the absence of synchronous relationship between the variables, city officials do not know the extent of crime during the calendar year when they allocate budgets for police departments based on fiscal years. Therefore, a simultaneous relationship between current-year crime rates and fiscal-year police expenditures is unlikely to exist. However, 2SLS is still estimated.

The COPS grant variables are not considered to have a simultaneous relationship with crime because COPS grant funding is determined one year before current-year crime rates occur. This means that current-year crime rates cannot determine COPS grant funding levels, which are determined the previous year. In response to rising crime rates, city officials can apply for more COPS grant funding, but by the time the grant funding has been approved and implemented, almost a year has passed. Thus, COPS grants are not believed to have a simultaneous relationship with crime rates.

The crime models include lags of all crime rates as control variables. Each lagged crime variable is assumed to capture a different set of unobserved time-variant factors that may influence current crime rates. For example, the lagged murder rate is anticipated to account for particular social problems and disorder that may not be controlled for by the lagged burglary rate. Further, lagged burglaries are assumed to control for factors that are not controlled for by lagged murders. Under this specification, lags of crime rates different from the

43. Marvell and Moody, "Specification Problems, Police Levels, and Crime Rates."

44. Levitt, "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime."

45. Justin McCrary, "Using Electoral Cycles in Police Hiring to Estimate the Effects of Police on Crime: Comment," *American Economic Review*, Vol. 92, No. 4 (2002), pp. 1236–1243.

46. Jeffery M. Wooldridge, *Introductory Econometrics: A Modern Approach* (Mason, Ohio: South-Western College Publishing, 2000).

47. The GMM estimates for the single-equation models differ only slightly from the OLS estimates. The IV/GMM estimates are identical to the 2SLS results because the models are exactly identified. The GMM findings do not alter the policy conclusions of this paper.

48. U.S. Department of Commerce, *Annual Survey of State and Local Government Finances, 1989–1999*.

dependent variable are assumed to influence current-year crime rates. Due to the inclusion of the rape rate lagged as a control variable, the number of cities analyzed for all the models in this specification will be 58 cities. The crime models are represented by Equation 2.

Equation 2

$$\text{Crime}_{it} = \gamma_1 + \delta_1 \text{Police expenditures}_{it} + \delta_2 \text{Hiring grants}_{it-1} + \delta_3 \text{MORE grants}_{it-1} + \delta_4 \text{Innovative grants}_{it-1} + \delta_5 \text{Total revenue}_{it} + \delta_6 \text{Socioeconomic factors}_{it} + \delta_7 \text{Crime rates}_{it-1} + \delta_8 \text{Year fixed-effects}_{it} + \delta_9 \text{City fixed-effects}_{it} + \eta_{it}$$

Endogeneity Tests. Endogeneity implies that unobservable factors are correlated with police expenditures and crime. To test this assumption, the reduced form equation (police expenditure function) is estimated by regressing police expenditures on all exogenous variables and then obtaining the residuals.⁴⁹ Then the structural equation (crime models) is estimated with the residuals from the reduced form equation included as a regressor. If the coefficient for the residuals is statistically significant, police expenditures are endogenous. All of the tests failed to reject the null hypotheses at the 95 percent confidence level that police expenditures are exogenous. As part of the sensitivity analysis, OLS estimates are compared to 2SLS estimates for all of the models.

While the OLS modeling is preferred over the 2SLS modeling, fire department expenditures are a good instrument. For all of the models, this instrument was correlated with police expenditures and uncorrelated with crime rates. Table 3 presents the identification restriction tests. The demand for public safety affects both police and fire department expenditures, while there is little reason to believe that fire department expenditures influence crime rates.

Table 3		CDA 0603
Identification Restriction Tests of Fire Department Expenditure Coefficients in Crime Models		
Crime model	Fire Department Expenditures Per Capita (1995 Dollars)	
Murder	0.349	(0.229)
Rape	-0.731	(0.418)
Robbery	-0.286	(4.16)
Assault	-4.8	(5.14)
Burglary	-1.17	(6.4)
Larceny-theft	-8.13	(16.3)
Auto theft	-4.88	(12.4)

Note: Robust standard errors are reported for all the models. All models include the same control and fixed-effects variables. All expenditures are in 1995 dollars per capita. The regression analyses are weighted by city population. Coefficients were multiplied by 1,000,000 to improve visual presentation.
Source: Heritage Foundation calculations.

RESULTS

Did COPS grants produce flypaper effects in large cities? Table 4 presents the COPS grant findings from the police expenditure function. The standard errors are robust to heteroskedasticity and autocorrelation.⁵⁰ COPS grants not only failed to “stick,” but also did not stimulate local spending. The hiring and innovative grant coefficients are negative but statistically indistinguishable from zero. With the hiring and MORE grants normally requiring 25 percent local matches by grantees, these grants should have produced a stimulus effect. The innovative grants, which did not require local matches, were not anticipated to produce any catalyst. While the MORE grant coefficient is positive, it is statistically insignificant. The police

49. Wooldridge, *Introductory Econometrics*, p. 484.

50. Fumio Hayashi, *Econometrics* (Princeton, N.J.: Princeton University Press, 2000), and Matthew J. Cushing and Mary G. McGarvey, “Covariance Matrix Estimation,” in Laszlo Matyas, ed., *Generalized Methods of Moments Estimation* (Cambridge, U.K.: Cambridge University Press, 1999), pp. 63–95.

expenditure findings suggest that grantees supplemented local funds with federal funds.

Did police expenditures and COPS grants reduce crime in large cities? Before proceeding to the findings, an explanation about the presentation of the findings in table format is necessary. The crime dependent variables are measured on a per capita basis, so the coefficients for police expenditures and COPS grants are small. In order to improve the visual presentation of the findings, these coefficients and their standard errors are multiplied by 1 million. Table 5 presents the crime regression results. For the robbery and larceny 2SLS models, the standard errors are robust to heteroskedasticity and autocorrelation.⁵¹ For all the other models, the standard errors are robust to heteroskedasticity.⁵²

For the murder models, the only law enforcement variable to deter murders is the innovative grant variable in the OLS model. A \$1 increase in innovative grants per capita is associated with a reduction of 0.698 murders per 1 million persons. This finding is statistically significant at the 0.05 level. For the elasticity, a 1 percent increase in innovative grants per capita is associated with a 0.001 percent decrease in murders per capita.

For the OLS rape model, the police expenditure and COPS grant coefficients are statistically indistinguishable from zero. The coefficients for the hiring and MORE grants are positive but statistically insignificant. For the 2SLS rape model, the innovative grant coefficient is the only law enforcement coefficient that is statistically significant. A \$1 increase in innovative grants per capita is associated with a reduction of 2.17 rapes per 1 million residents. A 1 percent increase in innovative grants per capita is associated with 0.001 percent reductions in rape rates.

In the OLS and 2SLS robbery models, the hiring and MORE grant coefficients are negative and statistically significant. A \$1 increase in hiring grants per capita is associated with a reduction of 36.0 to 36.1 robberies per 1 mil-

Table 4		CDA 0603
Impact of COPS Grants on Police Expenditures in Large Cities, 1990–1999		
Variable	Coefficient	
Fire department expenditures per capita	0.699***	(0.197)
Total revenue per capita	0.019***	(0.005)
Hiring grants lagged	-0.125	(0.546)
MORE grants lagged	0.167	(0.523)
Innovative grants lagged	-0.445	(0.344)
Black population percent	14.85*	(7.06)
Hispanic population percent	-1.57	(2.48)
Other population percent	20.27***	(4.89)
15-19 male percent	-7.35	(15.72)
20-29 male percent	1.68	(7.45)
Unemployment rate	-0.438	(1.18)
Income per capita	-0.001	(0.001)
Murders per capita lagged	-48768.9	(29823.9)
Rapes per capita lagged	33167.4***	(9956.4)
Robberies per capita lagged	-2033.9	(1183.4)
Assaults per capita lagged	-2545.2***	(799.5)
Burglaries per capita lagged	-51.99	(493.0)
Larcenies per capita lagged	388.17	(236.3)
Auto theft per capita lagged	-273.18	(190.13)
Constant	-342.59	(219.33)
Number of observations	580	
Centered R-sq.	0.9658	
* p < 0.05, ** p < 0.01, *** p < 0.001		
Note: The standard errors reported are heteroskedastic and autocorrelation consistent. All models include city and year fixed-effects. All expenditures are in 1995 dollars per capita. The regression analyses are weighted by city population.		
Source: Heritage Foundation calculations.		

51. *Ibid.*

52. H. White, "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica*, Vol. 48, Issue 4 (May 1980), pp. 817–838.

Impact of COPS Grants on Crime in Large Cities, 1990-1999

Variable	Murder		Rape		Robbery		Assault		Burglary		Larceny		Auto Theft	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Regression type	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
Police expenditures per capita	-0.081 (0.096)	0.356 (0.298)	0.289 (0.22)	-0.627 (0.523)	-3.64 (2.37)	-4.0 (4.86)	1.68 (2.93)	-4.33 (6.48)	-0.454 (4.27)	-1.92 (8.37)	1.48 (8.03)	4.64 (22.1)	-20.1* (8.35)	-26.2 (18.3)
Total revenue per capita	-0.012 (0.009)	-0.024* (0.012)	0.023 (0.016)	0.0471* (0.021)	-0.41* (0.195)	-0.401 (0.214)	0.0564 (0.189)	0.213 (0.227)	-0.518 (0.28)	-0.479 (0.347)	-1.15 (0.6)	-0.888 (0.712)	0.861 (0.67)	1.02 (0.828)
Hiring grants lagged	0.314 (0.634)	0.415 (0.572)	0.495 (1.34)	0.284 (1.42)	-36.0* (15.5)	-36.1* (14.9)	-19.5 (19.6)	-20.7 (18.7)	-17.8 (28.8)	-18.1 (26.6)	104.4 (68.7)	102.1 (69.7)	-11.2 (69.2)	-12.6 (64.2)
MORE grants lagged	-0.009 (0.492)	-0.026 (0.555)	0.729 (0.898)	0.764 (0.975)	-40.0*** (11.9)	-40.0*** (10.5)	-34.0** (11.8)	-33.8*** (11.2)	-34.1* (16.5)	-34.0* (15.0)	-8.3 (50.3)	-80.9 (49.3)	37.8 (52.4)	38.0 (47.9)
Innovative grants lagged	-0.698* (0.282)	-0.474 (0.31)	-1.7 (1.15)	-2.17* (0.96)	-9.53 (6.62)	-9.72 (6.02)	5.18 (18.1)	2.11 (19.0)	5.81 (13.5)	5.06 (12.9)	7.17 (30.4)	1.97 (32.9)	-42.2 (48.6)	-45.3 (46.4)
Black population percent	26.8** (9.92)	20.2 (11.1)	-10.1 (22.5)	3.63 (22.4)	-25.72 (24.23)	-25.18 (25.05)	178.2 (282.6)	268.4 (260.8)	-285.6 (359.1)	-263.6 (347.1)	-1650.1* (769.6)	-1497.3 (801.4)	-298.5 (683.2)	-206.7 (712.9)
Hispanic population percent	3.52 (4.16)	6.08 (4.05)	28.6** (10.8)	23.3* (11.4)	-130.6 (94.2)	-132.7 (96.5)	95.2 (116.0)	60.1 (120.3)	-390.0* (177.9)	-398.6* (175.2)	-1193.5** (384.2)	-1253.1*** (440.9)	-970.8* (397.2)	-1006.6* (401.4)
Other population percent	-1.39 (6.84)	-12.5 (9.88)	-24.1 (15.8)	-0.778 (18.5)	-296.5 (165.6)	-287.4 (195.0)	-198.1 (194.5)	-45.3 (221.9)	383.0 (272.0)	420.3 (304.2)	-1172.3* (587.3)	-913.3 (836.7)	-357.6 (608.7)	-201.9 (769.9)
15-19 male percent	42.2 (24.4)	44.0 (23.2)	21.4 (63.6)	17.7 (61.6)	460.9 (553.5)	459.4 (523.2)	883.3 (713.0)	858.9 (677.6)	1593.9 (1037.0)	1588.0 (958.2)	5134.9* (2033.2)	5093.3* (2051.4)	4185.6* (1750.1)	4160.6** (1615.0)
20-29 male percent	-15.4 (11.1)	-15.3 (10.8)	-43.3 (30.7)	-43.5 (28.9)	-273.9 (263.5)	-274.0 (255.9)	-59.6 (377.5)	-61.2 (356.5)	324.0 (426.4)	323.6 (394.0)	763.0 (984.5)	760.2 (986.4)	-1718.0 (1192.4)	-1719.7 (1100.9)
Unemployment rate	2.06 (2.31)	2.51 (2.23)	7.99 (6.06)	7.04 (5.68)	17.5 (49.5)	17.1 (47.6)	-7.97 (54.0)	-14.2 (50.9)	145.5 (89.9)	144.0 (84.1)	340.6 (210.5)	330.1 (214.4)	-20.7 (245.9)	-27.0 (222.8)
Income per capita	0.004* (0.001)	0.004** (0.001)	0.001 (0.003)	-0.000002 (0.003)	0.0871** (0.0277)	0.0867*** (0.0263)	0.0345 (0.0395)	0.0265 (0.0374)	0.0292 (0.0557)	0.0272 (0.0531)	0.154 (0.105)	0.14 (0.113)	0.118 (0.118)	0.11 (0.119)
Constant	-477.5* (236.8)	-527.6 (309.4)	385.4 (608.3)	693.7 (705.5)	10605.4 (6380.6)	8961.2 (7928.8)	-3973.7 (6543.2)	-6511.1 (7427.9)	5521.7 (9451.8)	9293.1 (10419.5)	38131.2 (26010.1)	35092.9 (26044.7)	33251.6 (21606.7)	20471.3 (22212.2)
Number of observations	580	580	580	580	580	580	580	580	580	580	580	580	580	580
Adj. R-sq/Centered R-Sq	0.9365	0.9429	0.9323	0.9395	0.9650	0.9701	0.9385	0.9468	0.9478	0.9555	0.9578	0.9576	0.6769	0.7241

* p<0.05, ** p<0.01, *** p<0.001

Note: Heteroskedastic robust standard errors are reported for models 1-5, 7-11, and 13-14. Heteroskedastic and autocorrelation robust standard errors are reported for models 6 and 12. All models include lagged crime variables, city and year fixed-effects. All expenditures are in 1995 dollars per capita. The regression analyses are weighted by city population. Coefficients were multiplied by 1,000,000 to improve visual presentation.

Source: Heritage Foundation calculations.

lion residents. A 1 percent increase in hiring grants per capita is associated with an approximately 0.01 percent reduction in robberies. The hiring grant coefficients are statistically significant at the 0.05 level.

The MORE grant coefficients are larger than the hiring grant coefficients. In the OLS and 2SLS robbery models, a \$1 increase in MORE grants per capita is associated with a reduction of 40.0 robberies per 1 million residents. For the elasticity, a 1 percent increase in MORE grants per capita is associated with an approximately 0.007 percent reduction in robberies. The MORE grant coefficients are highly statistically significant at the 0.001 level. The hiring and MORE grants appear to be the most effective in reducing robberies when compared with general local law enforcement expenditures and innovative grants.

In the OLS and 2SLS assault models, the MORE grant coefficients are statistically significant at the 0.01 and 0.001 levels, while the other law enforcement variables are not statistically significant. A \$1 increase in MORE grants per capita is associated with a reduction of 33.8 to 34.0 assaults per 1 million residents. A 1 percent increase in MORE grants per capita is associated with an approximately 0.005 percent reduction in robberies.

The results of the burglary models are very similar to the assault models. The MORE grant variable is the only law enforcement variable that has a statistically significant relationship with burglary rates. A \$1 increase in MORE grants per capita is associated with a reduction of 34.0 to 34.1 burglaries per 1 million residents. A 1 percent increase in MORE grants per capita is associated with a 0.002 percent reduction in burglaries. The MORE grant coefficients are statistically significant at the 0.05 level.

For the larceny-theft models, none of the law enforcement variables had statistically significant relationships with larcenies. This pattern almost holds in the motor vehicle theft models. While all of the COPS grant coefficients are statistically insignificant, the local police expenditure coefficient in the OLS motor vehicle theft model is statistically significant at the 0.05 level. A \$1 increase in local

law enforcement expenditures is associated with a reduction of 20.1 auto thefts per 1 million residents. For the elasticity, a 1 percent increase in local police expenditures per capita is associated with a 0.3 percent decrease in the auto theft rate.

For some crime rates, COPS grants have a deterrent effect. The hiring grants are linked only to reductions in robberies, while these grants failed to have measurable effects on the other crime rates. The MORE grants deter more types of crimes than the other grants. MORE grants deterred robberies, assaults, and burglaries in all of the models. For these crime rates, the deterrent effect of the MORE grants is robust in the sensitivity analysis. However, the MORE grants failed to deter murders, rapes, larcenies, and auto thefts. The deterrent effect of the innovative grants on murders is mixed, and they failed to deter robberies, assaults, burglaries, larcenies, and auto thefts.

Are COPS grants worth their cost? Which COPS grant produces the greatest benefit? Answering this question is complicated due to the grants' varying impacts on crime. To help simplify the analysis, the monetary estimates are limited to the findings of the OLS models. The hiring grants deter robberies, while the MORE grants deter robberies, assaults, and burglaries. The innovative grants deter murders. Further, the degree of deterrence produced varies by grant and crime.

Using prior research on the cost of crime to victims, this section estimates the value of the crimes prevented by COPS grants. Specifically, the dollar values of crimes prevented through COPS grants are estimated for a city with 1 million residents. A 1996 NIJ study estimated the cost of crime incurred by victims based on personal expenses (e.g., medical care and property losses); reduced productivity relating to work, home, and school; and quality of life losses.⁵³ For the analysis, the NIJ figures are converted into 1995 dollars. Thus, the revised estimates are \$3,100,734 for murder, \$8,437 for robbery, \$25,312 for assault, \$1,477 for burglary, and \$3,902 for auto theft.

The cities studied in this evaluation did not receive equal shares of the three COPS grants. From 1995 to 1999, the cities spent an average of

53. Ted Miller, Mark A. Cohen, and Brian Wiersema, "Victim Costs and Consequences: A New Look," U.S. Department of Justice, Office of Justice Programs, National Institute of Justice *Research Report*, January 1996, at www.ncjrs.gov/pdffiles/victcost.pdf (May 12, 2006).

Table 6

Monetizing the Impact of COPS Grants Based on Average Spending Patterns in a City with 1 Million Persons

	Change in Crime	Monetized Value per Crime	Total Victim Cost Savings
Hiring grants (\$3.05 per capita)			
Robberies prevented	-109.8	8,437	926,383
Cost of grants			-3,050,000
Net impact			-2,123,617
MORE grants (\$1.36 per capita)			
Robberies prevented	-54.4	8,437	458,973
Assaults prevented	-46.2	25,312	1,170,427
Burglaries prevented	-46.4	1,477	68,497
Cost of grants			-1,359,716
Net impact			338,181
Innovative grants (\$0.62 per capita)			
Murders prevented	-0.43	3,100,734	1,341,874
Cost of grants			-620,817
Net impact			721,057
Total COPS grant estimates			
Benefit			3,966,153
Cost			-5,030,533
Net impact			-1,064,379

Note: The impact estimates are based on the OLS models. The monetary valuation of crime is based on the findings of Ted Miller et al. Monetary amounts are expressed in 1995 dollars.

Source: Heritage Foundation calculations, and Ted Miller, Mark A. Cohen, and Brian Wiersema, "Victim Costs and Consequences: A New Look," U.S. Department of Justice, Office of Justice Programs, National Institute of Justice Research Report, January 1996, at www.ncjrs.gov/pdffiles/victcost.pdf (May 12, 2006).

\$3.05 per capita in hiring grants, \$1.36 per capita in MORE grants, and \$0.62 per capita in innovative grants. Table 6 presents the findings. Following this spending pattern for a city with 1 million residents comes to \$3,053,031 in hiring grants, \$1,359,716 in MORE grants, and \$620,816 in innovative grants—a total of \$5,030,532 per year.

Based on the OLS estimates, \$3,050,000 in hiring grant spending produced a victim cost-savings of \$926,383. For the MORE grants, \$1,359,716 in spending produced a victim cost-savings of \$1,697,897. With an average spending amount of \$620,816, the innovative grants produced a victim cost-savings of \$1,341,874. The total estimated victim cost-savings is \$3,966,153. By these estimates, COPS grants produced a net loss of \$1,064,379. The negative return of the hiring grants appears to inundate the positive benefits of the MORE and innovative grants.

Overall, the innovative grants are allocated the smallest share of COPS funding but appear to produce the greatest monetary benefits. While the

benefits of the MORE grants are not as large as the benefits of the innovative grants, the MORE grants do produce positive returns. Unlike the other grants, the hiring grants, which were allocated the largest share of funding over the years and received the most public attention, appear to be the least worthwhile of the grants.

DISCUSSION

At first glance, the results for the COPS grants are puzzling because the matching requirements for the hiring and MORE grants should have led police departments to increase spending from their own resources. The findings suggest that COPS grants did not stimulate grantees to increase spending from their own revenue above levels that they would have spent without the grants.

Evidence of Supplanting. Since the hiring and MORE grants are closed-ended matching grants, they should have produced a stimulus effect on police expenditures. Instead, the hiring and MORE grant findings indicate that large cities used federal

funds to supplant local funds.

These findings are consistent with audits of COPS grants by the U.S. Department of Justice Office of Inspector General. Audits of grants to the cities analyzed in this paper indicate that the grantees frequently failed to hire or redeploy officers as required. In some cases, the grantees used federal funds to supplant local funds.

Fifty-seven of the 58 cities received COPS grants during the duration of this study. The Inspector General audited 35 of the 57 COPS-funded cities.⁵⁴ Twenty-nine of the 35 audits found grantee deficiencies in complying with grant conditions.⁵⁵

Sixteen of the 35 audits indicated that the grantees did not comply with the hiring grant conditions.⁵⁶ The problems ranged from supplanting to spending the hiring grants on activities not allowed under the grant conditions. Nine of the police departments supplanted hiring grants for local funds. Dallas, Louisville, and Newark actually reduced their force sizes after receiving grants to hire additional officers. For example, instead of hiring 249 new officers, Newark reduced its police force by 142 officers from fiscal years 1996 to 1997.

Instead of downsizing, other audits indicate that

six police departments supplanted by failing to hire the required number of additional officers.⁵⁷ For example, Atlanta, El Paso, and Sacramento appear to have supplanted the most. Atlanta supplanted over \$5.1 million in hiring grants. After receiving grants to hire 231 additional police officers, El Paso failed to hire the additional number of officers required by the grant. Sacramento used over \$3.9 million in hiring grants to retain officers previously funded through earlier grants.

The Inspector General also found problems with the implementation of MORE grants. Nineteen of the 35 audits indicated that grantees failed to comply with the conditions of the MORE grants.⁵⁸ According to congressional testimony by Inspector General Glenn Fine, MORE grants have the highest risk for abuse of the COPS grants, and grantees rarely redeployed the required number of officers from administrative tasks to community policing.⁵⁹

Sixteen of the audits found that MORE grantees either did not redeploy officers to community policing or could not provide documentation demonstrating redeployment.⁶⁰ In Washington, D.C., the police department was awarded almost \$11 million in MORE grants to hire 56 civilians and redeploy 521.4 officers through technology purchases. However, when the Office of Inspector

54. For a listing of the 35 audits, see entries in the bibliography under "U.S. Department of Justice, Office of Inspector General."

55. The 29 grants were to the police departments of Philadelphia, Pennsylvania; Houston, Texas; San Francisco, California; San Jose, California; Mesa, Arizona; Atlanta, Georgia; Nashville, Tennessee; Sacramento, California; Oakland, California; Newark, New Jersey; Pittsburgh, Pennsylvania; Boston, Massachusetts; Charlotte–Mecklenburg, North Carolina; Columbus, Ohio; Cleveland, Ohio; Fort Worth, Texas; Phoenix, Arizona; Seattle, Washington; Portland, Oregon; Dallas, Texas; Omaha, Nebraska; Jacksonville, Florida; Milwaukee, Wisconsin; the District of Columbia; Louisville, Kentucky; El Paso, Texas; Austin, Texas; Albuquerque, New Mexico; and Honolulu, Hawaii. For the executive summaries of these audits, see U.S. Department of Justice, Office of Inspector General, "Office of Community Oriented Policing Services Grant Reports," Web site, at www.usdoj.gov/oig/grants/_cops.htm (May 16, 2006).

56. The 16 grants were to the police departments of Philadelphia, San Francisco, San Jose, Mesa, Atlanta, Nashville, Sacramento, Oakland, Newark, Portland, Dallas, Omaha, Jacksonville, Milwaukee, Louisville, and El Paso. See U.S. Department of Justice, "Office of Community Oriented Policing Services Grant Reports."

57. The six departments were the police departments of Philadelphia, Atlanta, Nashville, Sacramento, Oakland, and El Paso. See U.S. Department of Justice, "Office of Community Oriented Policing Services Grant Reports."

58. The 19 grants were to the police departments of Houston, San Jose, Atlanta, Nashville, Sacramento, Pittsburgh, Boston, Columbus, Fort Worth, Phoenix, Seattle, Omaha, Jacksonville, Milwaukee, the District of Columbia, El Paso, Austin, Albuquerque, and Honolulu. See U.S. Department of Justice, "Office of Community Oriented Policing Services Grant Reports."

59. Hearing, *Office of Justice Programs*, Subcommittee on Crime, Committee on the Judiciary, U.S. House of Representatives, 107th Cong., 2nd Sess., March, 5, 7, and 14, 2002, p. 89.

60. The 16 police departments were those of Houston, San Jose, Nashville, Sacramento, Boston, Columbus, Fort Worth, Phoenix, Omaha, Jacksonville, Milwaukee, the District of Columbia, El Paso, Austin, Albuquerque, and Honolulu. See U.S. Department of Justice, "Office of Community Oriented Policing Services Grant Reports."

General asked for a list of officers redeployed, the list included only 53 officers—one officer was deceased, 10 officers were retired, and 13 no longer worked for the police department.

COPS appears to have done little to resolve the misuse of the grants. According to Inspector General Fine, “in many cases, the response to our findings was a paper exercise and...the COPS program did not take sufficient action to either bring the grantee in compliance, to offset the funds, to recoup the funds or to waive the funds.”⁶¹ Fine testified that COPS did not pay enough attention to ensure adherence to the grant requirements, including the hiring of officers, retaining officers, and tracking the redeployment of officers.⁶² According to the Office of Inspector General audits and congressional testimony, the lack of oversight practiced by COPS created inadequate incentives for local-level compliance with grant conditions.

There appears to be ample evidence that the grantees frequently failed to follow the conditions of the hiring and MORE grants. The acceptance of COPS grants by police departments does not necessarily mean that community policing was implemented successfully.⁶³ The misuse of the hiring grants may explain why the grants produced negative returns when the deterrence effects were monetized. Improving the implementation of the hiring and MORE grants through increased monitoring by COPS may enhance the effectiveness of the program.

Other studies have found that supplanting may have occurred with the hiring grants. Based on an analysis of approximately 12,000 police departments, one study found that every COPS-funded officer position awarded through the hiring grants in a particular year resulted in an increase of 0.73 officers in the following year.⁶⁴ This finding indicates that supplanting may have occurred. Nation-

ally, the University of Maryland study found that for every COPS-funded position, grantees increased their officer levels by 0.69 officers. For cities with populations over 250,000, police departments increased their officer levels by 0.95 officers for every COPS-funded position.⁶⁵ Nationally, the GAO estimates that every \$25,000 in hiring grant spending resulted in 0.57 additional officers. However, the hiring grants did not have a statistically significant relationship with officer levels in cities with populations over 150,000.⁶⁶

Effectiveness of Deploying Experienced Officers. Compared to the hiring grant findings, the MORE grant findings suggest that the number of officers deployed may be less important than the quality of the officers deployed. While the efficiency gains resulting from the MORE grants are uncertain, the grants may have allowed for more experienced officers to spend less time performing administrative tasks and more time engaged in crime-fighting activities. In addition, paying experienced officers to work overtime may be more effective than hiring new officers. Thus, putting more seasoned officers on the beat will likely have a larger impact than putting newly hired, inexperienced officers on the street.

Ineffectiveness of Local Police Expenditures. Countering the hypotheses, police expenditures appear to produce little, if any, deterrent effect. Police expenditures deterred only auto thefts. Two explanations have been proposed for why increasing police resources will not necessarily deter crime.

The first theory, which was originally offered by Professor Lawrence Sherman of the University of Pennsylvania, suggests that increasing police resources without regard to focusing on risk factors may not be successful in reducing crime.⁶⁷ After

61. Hearing, *Office of Justice Programs*, p. 109.

62. *Ibid.*

63. Mark H. Moore, “The Limits of Social Science in Guiding Policy,” *Criminology and Public Policy*, Vol. 2, No.1 (2002), pp. 33–42.

64. Koper *et al.*, “Putting 100,000 Officers on the Street: Progress as of 1998 and Preliminary Projections Through 2003,” p. 157.

65. William N. Evans and Emily Owens, “Flypaper COPS,” p. 31.

66. U.S. Government Accountability Office, *Community Policing Grants*, pp. 82 and 85.

67. Lawrence W. Sherman, “Policing for Crime Prevention,” in Lawrence W. Sherman, Denise Gottfredson, Doris Mackenzie, John Eck, Peter Reuter, and Shawn Bushway, eds., *Preventing Crime: What Works, What Doesn't, What's Promising* (Washington, D.C.: U.S. Department of Justice, Office of Justice Programs, 1997).

reviewing evaluations of various police strategies to reduce crime, Professor Lawrence Sherman and Professor John E. Eck of the University of Cincinnati concluded that the more focused the police are on risk factors, the more likely it is that crime will be prevented.⁶⁸ Activities such as proactive arrests and problem solving in high-crime hot spots are more likely to reduce crime than is hiring additional police officers without regard to how they are deployed.⁶⁹ The number of police deployed and the level of expenditures may be less important in reducing crime than the specific tasks assigned to police officers. Deterring crime is likely to depend more on deploying officers where serious crime is concentrated and at times when the probability of occurrence is high.⁷⁰

Second, the use of aggregate local police expenditures may not be the best variable to measure the deterrent effect of the police. The deterrent effect of police expenditures may be clouded when the variable includes administrative and other expenditures not directly associated with crime control activities that cannot plausibly be considered to reduce crime (e.g., office supplies).

Recent Changes in the COPS Grants. This evaluation analyzed the effect of COPS grants during the 1990s. Since then, the COPS program has gone through substantial changes. During the last few years of the Clinton Administration, many of the innovative grant programs were discontinued. Several of these grant programs were considered demonstration or pilot projects, so they were never viewed as long-term projects. While the innovative grants produced the greatest benefits when the impacts are monetized, these grants did not generate enough political support to become permanent.

During the current Bush Administration, the COPS program has gone through further changes. Most notable are three changes.

First, after several years of steadily declining appropriations from highs of over \$1 billion during the Clinton Administration, no new funds were appropriated for the hiring grants in fiscal year 2006.

Second, the MORE grants, renamed technology grants, no longer require grantees to use the funding to redeploy officers from administrative tasks to community policing.

Third, instead of the original competitive application process, the technology grants are now awarded through congressional earmarks. Limiting the MORE grants to earmarks may negate the deterrent effect found in this evaluation.

CONCLUSION

A possible source of bias in estimating the effect of police on crime is the potential endogenous or simultaneous relationship between police force size and crime rates. Regression analyses of the effects of criminal justice policies are often plagued by simultaneity.

Under regression modeling for this evaluation, police expenditures did not have an endogenous relationship with crime rates. However, when 2SLS modeling was estimated, fire department expenditures fulfilled the identification restriction requirements of an instrumental variable. The identification of fire department expenditures as a valid instrumental variable is an important contribution to the literature estimating the relationship between police and crime because instruments that are correlated with both crime and police force size can cause 2SLS estimates to be seriously in error.

The results of this study indicate that COPS grants awarded to large cities did not stimulate local spending and that the cities may have used the grants to supplant local police expenditures. This finding is supported by U.S. Department of Justice Office of Inspector General audits of COPS grants.

Whether or not community policing is an effective crime reduction strategy, this evaluation found that federal funding for community policing was associated with small reductions in crime in large cities. However, the monetary impacts produced by the three grants are not equal. The innovative and MORE grants produced positive net benefits, while the hiring grants produced negative returns. A

68. *Ibid.* and Lawrence W. Sherman and John E. Eck, "Policing for Crime Prevention," in Lawrence W. Sherman, David P. Farrington, Brandon C. Welsh, and Doris Layton MacKenzie, eds., *Evidence-Based Crime Prevention* (London: Routledge, 2002), pp. 295–329.

69. Sherman and Eck, "Policing for Crime Prevention," pp. 295–329.

70. Sherman, "Policing for Crime Prevention."

stronger emphasis on oversight by COPS may improve on the effectiveness of the grants.

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APPENDIX

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Table 7 Impact of COPS Grants on Crime in Large Cities, 1990-1999, Using GMM Estimation

Variable Model	15	16	Murder	17	18	Rape	19	20	Robbery	21	22	23	24	Burglary	25	26	Larceny	27	28	Auto Theft
Estimation type	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM	GMM	I/GMM
Police expenditures per capita	-0.085 (0.088)	0.356 (0.298)	0.298 (0.203)	-0.627 (0.523)	-3.67 (2.19)	-4.0 (4.86)	1.69 (2.7)	-4.33 (6.48)	-0.454 (3.94)	14.4 (7.98)	4.64 (22.1)	-19.3** (7.5)	-26.2 (18.3)							
Total revenue per capita	-0.012 (0.008)	-0.024* (0.012)	0.021 (0.015)	0.0471* (0.021)	-0.41* (0.181)	-0.401 (0.214)	0.063 (0.174)	0.213 (0.227)	-0.526* (0.255)	-1.08 (0.582)	-0.888 (0.712)	0.779 (0.587)	1.02 (0.828)							
Hiring grants lagged	0.300 (0.585)	0.415 (0.572)	-0.056 (1.2)	0.284 (1.42)	-35.8* (14.5)	-36.1* (14.9)	-24.5 (17.4)	-20.8 (18.7)	-18.6 (26.3)	100.7 (68.3)	102.1 (69.7)	-14.7 (63.3)	-12.6 (64.2)							
MORE grants lagged	-0.190 (0.441)	-0.026 (0.555)	0.763 (0.829)	0.764 (0.975)	-39.8*** (10.3)	-40.0*** (10.5)	-34.4** (10.9)	-33.8*** (11.2)	-34.3* (15.2)	-82.3 (50.3)	-80.9 (49.3)	31.2 (45.7)	38.0 (47.9)							
Innovative grants lagged	-0.708** (0.260)	-0.474 (0.31)	-1.73 (1.06)	-2.17* (0.96)	-9.6 (5.83)	-9.72 (6.02)	8.67 (16.3)	2.11 (19.0)	5.76 (12.5)	6.3 (30.3)	1.97 (32.9)	-37.8 (43.6)	-45.3 (46.4)							
Black population percent	29.8*** (8.97)	20.2 (11.1)	-3.59 (20.5)	3.63 (22.4)	-256.4 (243.0)	-251.8 (250.5)	239.4 (254.0)	268.4 (260.8)	-283.6 (331.2)	-1606.6* (764.4)	-1497.3 (801.4)	-357.1 (614.8)	-206.7 (712.9)							
Hispanic population percent	4.29 (3.81)	6.08 (4.05)	34.3*** (9.54)	23.3* (11.4)	-130.5 (91.7)	-132.7 (96.5)	114.0 (105.5)	60.1 (120.3)	-386.1* (163.0)	-1140.8*** (368.5)	-1253.1*** (440.9)	-927.2*** (351.5)	-1006.6* (401.4)							
Other population percent	-1.07 (6.31)	-12.5 (9.88)	-24.1 (14.6)	-0.778 (18.5)	-296.6 (151.8)	-287.4 (195.0)	-179.7 (178.6)	-45.3 (221.9)	386.0 (250.5)	-1192.7* (585.8)	-91.33 (836.7)	-435.6 (530.0)	-201.9 (769.9)							
15-19 male percent	35.1 (22.1)	44.0 (23.2)	12.0 (58.5)	17.7 (61.6)	457.7 (522.1)	459.4 (523.2)	996.0 (649.0)	858.9 (677.6)	1594.1 (957.0)	5139.4* (2033.2)	5093.3* (2051.4)	4092.4* (1599.8)	4160.6** (1615.0)							
20-29 male percent	-14.2 (10.2)	-15.3 (10.8)	-30.1 (27.6)	-43.5 (28.9)	-275.5 (255.4)	-274.0 (255.9)	-80.8 (347.8)	-61.2 (356.5)	329.4 (392.5)	851.5 (967.4)	760.2 (986.4)	-1618.3 (1074.4)	-1719.7 (1100.9)							
Unemployment rate	2.01 (2.13)	2.51 (2.23)	7.83 (5.59)	7.04 (5.68)	17.8 (46.7)	17.1 (47.6)	4.27 (48.5)	-14.2 (50.9)	147.4 (82.4)	349.4 (209.7)	330.1 (214.4)	-44.2 (219.9)	-27.0 (222.8)							
Income per capita	0.004** (0.001)	0.004** (0.001)	0.001 (0.003)	-0.000002 (0.003)	0.087*** (0.03)	0.0867*** (0.0263)	0.030 (0.036)	0.0265 (0.0374)	0.030 (0.051)	0.158 (0.105)	0.14 (0.113)	0.139 (0.098)	0.11 (0.119)							
Constant	-725.9** (265.0)	-527.6 (309.4)	733.9 (667.2)	693.7 (705.5)	9074.7 (7775.2)	8961.2 (7928.8)	-6549.0 (7367.6)	-6511.1 (7427.9)	9293.1 (10279.6)	36152.2 (25687.9)	35092.9 (26044.7)	21660.3 (22026.9)	20471.3 (22212.2)							
Number of observations	580	580	580	580	580	580	580	580	580	580	580	580	580							
Adj. R-sq/Centered R-Sq	0.9452	0.9429	0.9419	0.9395	0.9701	0.9701	0.9474	0.9468	0.9555	0.9578	0.9576	0.7233	0.7241							

* p<0.05, ** p<0.01, *** p<0.001

Note: Heteroskedastic robust standard errors are reported for models 15-19, 21-25, and 27-28. Heteroskedastic and autocorrelation robust standard errors are reported for models 20 and 26. All models include lagged crime variables, city and year fixed-effects. All expenditures are in 1995 dollars per capita. The regression analyses are weighted by city population. Coefficients were multiplied by 1,000,000 to improve visual presentation.

Source: Heritage Foundation calculations.

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