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Peacekeeping Force: Effects of Providing Tactical Equipment to Local Law Enforcement†

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We provide the first local level empirical analysis of the causal effects of providing military equipment to local police. Employing a novel combination of publicly available county-year panel data matched to hand-collected data on citizen complaints, we investigate the effects of acquiring tactical weapons, optics, and vehicles on citizen complaints, assaults on police officers, and offender deaths. For causal identification, we exploit exogenous variation in equipment availability and cost-shifting institutional aspects of the 1033 Program. Our results indicate that these items have generally positive effects: reduced citizen complaints, reduced assaults on officers, increased drug crime arrests, and no increases in offender deaths. (*JEL* H76, K42)

The possession and use of tactical military equipment by police departments has become a contentious issue, both politically and philosophically. Lasting images in the wake of the August 2014 protests in Ferguson, Missouri, showed riot-gear clad police, framed by armored personnel carriers and carrying assault rifles, standing down angry (mostly minority) protesters. Missouri Senator Claire McCaskill claimed "Giving military-grade weapons to every police force and every officer comes with costs. Officers dressed in military fatigues will not be viewed as partners in any community" (Grossman 2014). Responding to these concerns, President Obama signed an executive order to create federal oversight on police acquisition and use of military equipment (Liptak 2014).

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Since the enactment of the National Defense Authorization Act of 1997, the US Department of Defense's Law Enforcement Support Office (LESO) has provided more than $5.4 billion in surplus military gear to local law enforcement agencies (LEAs) through the 1033 Program.[1] Police departments voluntarily apply to receive matieriel such as clothing, optics, guns, tools, grenade launchers, armored personnel carriers (APCs), and mine-resistant vehicles (MRVs) that have either been taken out of service or are no longer needed in reserve stocks. Importantly, LEAs pay no cost other than the transportation and time costs. The program can be thought of as a well-intentioned recycling program for tactical equipment.

Despite the controversy surrounding "police militarization," there have been no rigorous analyses of the causal effects of issuing military equipment to local police on citizen complaints, offender deaths, or assaults against police. Contrary to the prevailing narrative in the popular press, the causal effects of issuing tactical equipment to local police are ex ante ambiguous. On one hand, law enforcement officials emboldened by these items may become overly aggressive. A better armed officer might be more likely to cross the line into excessive force or exhibit other forms of moral hazard. Similarly, citizens may respond more negatively to highly armed police. Alternatively, a better armed officer who is aware that he or she has the likely advantage in a combative confrontation may approach sensitive situations with greater restraint.

This paper, along with Bove and Gavrilova (forthcoming), is the first to evaluate the consequences for the community of local LEAs acquiring military armaments.[2] We construct a county-year panel dataset, matching gear acquisition data from LESO to local law enforcement to examine the consequences of military vehicles and tactical weapons on two dimensions. First, is there evidence that acquiring these items affects citizen complaints, assaults on police officers, or offender deaths? Second, partially mirroring Bove and Gavrilova (forthcoming), do these items enhance the production of public safety by reducing crime rates, enhancing arrest productivity, or increasing efficacy of drug interdiction?

A primary concern is the potential endogeneity of departments' decisions to acquire vehicles and tactical weapons. Similar to concerns raised by Knight (2002), time-varying unobservable factors will clearly influence both the decision to acquire these items and any local law enforcement outcome of interest. We identify the causal effects of the 1033 Program using the combination of exogenous time variation in the availability of weapons and vehicles and exogenous cross-sectional variation in the costs to LEAs of acquiring these items (Nunn and Qian 2011). Conversations with the Defense Logistics Agency (DLA) confirm that the availability and disposition of these items are determined entirely by military concerns and cost-minimization by the Department of Defense, without regard to any aspect of local criminal activity or law enforcement.

Contrary to the prevailing media narrative, we find the causal effects of receiving tactical equipment are largely positive, though rather small, and consistent with the stated objectives of the 1033 Program. We do not find evidence of negative

[1] For more on LESO, see http://www.dispositionservices.dla.mil/leso/pages/default.aspx.
[2] Another paper by Wickes (2015) uses state-level data.

externalities from receiving tactical equipment. Specifically, we find that a 1 percent increase in the number of tactical items acquired (equivalent to approximately 0.6 items at the mean) leads to a 0.27 percent decrease in complaints against police. We also find that a 1 percent increase in tactical items acquired leads to a decrease between 0.018 and 0.046 percent in the probability that an officer is assaulted with a gun, and a decrease of 0.007 and 0.043 percent in the probability that an officer is killed in the line of duty in a given year.[3] As further evidence that these items are not inherently detrimental, we do not find evidence that acquiring tactical items of any type leads to increases in offender deaths at the extensive or intensive margin. Consistent with Bove and Gavrilova (forthcoming), we find some evidence of deterrent effects from acquiring tactical items. While tactical items do not help police solve reported crimes (homicide, robbery, assault, etc.), they do lead to increased arrests for drug offenses.

We provide the first causal analysis of the effects of issuing tactical weapons and vehicles through the 1033 Program to local LEAs. While this is useful in and of itself, this program yields more general insights on the intergovernmental transfers of physical capital. While significant research has explored the importance and effects of financial grants on law enforcement as well as other state and local services, we are aware of no published work that has considered this type of specific capital input.[4] Additionally, we construct a detailed longitudinal county-level dataset that combines publicly available sources with hand-collected information on citizen complaints gathered from over 900 annual reports from police departments around the country. Unfortunately, data on citizen complaints against police are not collected in any centralized, systematic fashion.[5] We merge these data at the county-year level with comprehensive data on receipt of tactical gear from LESO, reported crimes, arrests, and clearances from the Bureau of Justice Statistics, and economic data from the US Department of Census and Bureau of Economic Analysis. Further, this paper and Bove and Gavrilova (forthcoming) contribute to the growing literature on the deterrent effects of guns and other law enforcement capital. Where Duggan (2001) examined the effects of more guns among the populace, we examine the effects of increasingly armed police forces on criminal activity. Finally, while previous work on the expansion of law enforcement has focused on societal benefits (e.g., deterrence), we are the first to explore empirically whether the issuance of tactical hardware through the 1033 Program affects citizen complaints or offender deaths.

[3] One perspective is that assaults against police are an extreme form of complaint against police. In this case, we would expect the effects on citizen complaints and assaults on police to have the same sign.

[4] Previous work in the economics literature has evaluated the effects of expanding police department budgets, either monetarily or with funds earmarked for personnel, finding that increased resources can lead to reduced crime (Evans and Owens 2007, Machin and Marie 2011). Previous work has also shown to varying degrees that federally funded increases in local police deployment after a terrorist event reduce criminal activity (Di Tella and Schargradosky 2004; Klick and Tabarrok 2005; Draca, Machin, and Witt 2011; and Chalfin and McCrary 2013).

[5] The Law Enforcement Management and Administration Survey (LEMAS) contains data on complaints specifically for excessive force. However, LEMAS is only published every three or more years, and the most recent publicly available data (from 2007) predates the majority of tactical equipment transfers from LESO.

I. Background on 1033 Program

Our identification strategy relies on two sources of exogenous variation in the data. First, the amount of tactical items made available to law enforcement agencies (LEAs) varies exogenously over time, for reasons unrelated to local law enforcement. Second, police departments face time-invariant exogenous differences in the transaction costs of acquiring these tactical items, depending on their location. The interaction of these two factors (variation in availability and transaction costs) yields variables which affect the amount of military equipment acquired through the 1033 Program, but are uncorrelated with the unobservable factors that affect the outcomes of interest. Validation of our claims of exogenous variation (and subsequent use for instrumentation) relies on institutional details of the 1033 Program and the context of that program within the overall operations of the Defense Logistics Agency. As such, those institutional details are of considerable importance.[6]

First, the legislation creating the Law Enforcement Support Office and 1033 Program was enacted at a time when large transfers of decommissioned equipment were unlikely. Specifically, the National Defense Authorization Act (NDAA) of 1990 permitted the transfer of military equipment to federal and state agencies engaged in drug interdiction. The 1997 NDAA contained a section (1033), allowing the Law Enforcement Support Office (est. 1995) to expand the transfer of military equipment to local law enforcement for the purposes of enhancing arrest capabilities, with special consideration given to drug enforcement.[7] The 1033 Program was initialized six years before the start of US involvement in Iraq and Afghanistan. Transfers of tactical items increased sharply, beginning in 2006 as the Army replaced the M-16 with the M-4 carbine as standard issue. See Table 1, which categorizes tactical items into three categories (weapons, optics, vehicles) considered here. As the US military began reducing operations in the Middle East, the amount of tactical equipment made available increased. The fact that primary authorization of the 1033 Program occurred approximately six to ten years before the first large issue of tactical equipment to law enforcement minimizes concerns about the timing of the initialization of the program.

Second, while the 1033 Program has received considerable attention through recent events involving law enforcement officers, the LESO is a relatively small part of a much larger enterprise. Specifically, the LESO is a part of DLA Disposition Services, which is one of many functions of the DLA, which is in turn a small part of the Department of Defense (DoD). From an agency perspective, the DoD and DLA have incentives to place their disposition centers in cities that will minimize their own operating and transportation costs. According to the DLA, most of the

[6] Information on the machinations of the 1033 Program was attained from interviews with Carlos Torres, Branch Chief of Law Enforcement Support Office (program manager) and Ken MacNevin, the DLA's Chief of Public Affairs.

[7] Preference was also said to be given to counter-terrorism efforts, presumably to allow local communities to respond to direct threats.

TABLE 1—TOTAL DISBURSEMENTS OF TACTICAL EQUIPMENT BY YEAR (*units*)

	Weapons		Optics		Vehicles			
Year	Guns	Grenade launchers	Scopes	Night optics	Aircrafts	Trucks	Mine resistant vehicles	Armored personnel carriers
1991–2002	215	0	0	6,464	80	253	33	25
2003	0	0	52	163	2	14	34	0
2004	0	0	0	287	11	10	12	0
2005	259	0	15	386	15	17	16	0
2006	33,869	106	1	826	82	11	12	1
2007	7,740	44	0	667	30	30	6	11
2008	11,552	26	5	2,400	99	17	12	0
2009	2,229	0	1,010	1,285	60	32	5	3
2010	5,953	10	4,285	2,473	67	136	5	4
2011	6,858	7	7,417	5,058	26	1,104	13	45
2012	15,635	7	8,363	7,135	24	2,037	12	28
2013	6,055	4	12,305	6,832	9	1,032	6	201

items transferred to LEAs through the 1033 Program would be routed through 1 of 18 Field Activity Centers (FACs) starred in Figure 1.[8,9]

We argue that the location of these centers is not a function of local crime rates or police/community relations, nor are these locations influenced by recent transfers of tactical equipment. The DLA existed long before the initialization of the 1033 Program. Most of the FACs have been open since the 1970s. While the DLA underwent some rebranding in 2010, the last significant infrastructure reorganization of Disposition Services was in the 1990s. It is also true that LEAs (1033 customers) are not the sole, or even primary customers for the DLA Disposition Services Reutilization program. Other military units, Homeland Security, and other federal agencies supersede 1033 in order of importance. ROTC programs, foreign military agencies, civil air patrol, contractors, and others also participate in reutilization programs. In addition to the sensitive tactical items that are the focus of this paper, DLA Disposition Services also distributes, transfers, donates, or sells clothing and non-tactical equipment. In summary, the location of the FACs in most cases predates the 1033 Program. If there are any unknown changes in center locations, we emphasize that the 1033 Program is a nontrivial, but certainly nondominant part of DLA's overall cost minimization problem.

The proximity of police departments to these centers affects departments' costs when acquiring tactical equipment. Police departments are responsible for all transactional costs when acquiring items through the 1033 Program, including evaluating items for suitability and the transportation costs of moving said items from a FAC to their jurisdiction. Ceteris paribus, law enforcement agencies that are closer to FACs

[8] A list of these centers with additional information is in the online Appendix.

[9] While most transfers from DoD to LEAs do occur through Field Activity Centers, some items are transferred directly from military units to the receiving LEA. Essentially, since we use distance from the county centroid to the FAC as our exogenous, time-invariant cost shifter, these occurrences mean we have some measurement error in our instrument. As there is no reason to suggest that these direct transfers are done for any other purpose than logistical convenience, our instruments suffer from some attenuation bias. They are still strong, with first-stage F-statistics around 20.

will face lower costs of acquiring tactical gear, with respect to both shipping costs and accessibility to shop/evaluate items that are available. The proximity of an LEA to more than one FAC also likely influences their acquisition of tactical items as the department must acquire the item directly from the originating FAC.[10] Therefore, the distance from an LEA to multiple FACs, not just the nearest FAC, can affect the costs of acquiring various types of tactical equipment.[11]

The decision of which FAC receives decommissioned tactical items is also made without regard to any consideration for civilian law enforcement. When a military unit decides to stop using a piece of equipment, that equipment is processed and transferred to the nearest FAC. The location of the equipment to be possibly acquired by police is entirely determined by the location of the unit transferring the property. When equipment of any type comes to the FAC, the DLA has a 42-day process to determine how to dispose of the item. There is a 7-day administrative processing window, a 14-day window during which DoD and Special Program customers (e.g., 1033) may requisition and remove items from inventory, and a 21-day transfer/donation period. At the end of the 42-day window, unclaimed, unwanted items are demilitarized and scrapped. The relatively short window (14 days) that LEAs have to act on a particular item emphasizes the accessibility aspect of proximity to FACs.

It is worth noting that the request process for aircraft, armored personnel carriers, firearms, etc., is quite simple and does not appear to require political oversight or public input. The one-to-two page forms amount to a signature from a police chief and a state coordinator, and a very short explanation for why the requested hardware would be useful. Knowledge about the acquisition process is unlikely to affect acquisition of tactical items.

Defense Logistics Agency personnel relayed to us in a telephone conversation that their preference was to distribute the available tactical equipment as widely as possible across agencies. In other words, preference is given to agencies that received less hardware in the past. This stated preference contradicts the notion that unobserved heterogeneity in the accumulation of tactical hardware is due to some form of preferred status with the DLA rather than heterogeneity in preferences. The simplicity of the application process, the presence of other customers, the volume of equipment transferred, the short claim window, and the desire to spread equipment around all alleviate concerns about two-way selection (i.e., selection in application for these items as well as decisions on who gets the item). We were informed by the branch chief of LESO that "We've been able to meet the needs of the state coordinators of the 1033 Program for the last several years."

We therefore contend that the proximity of a law enforcement agency to FACs is entirely a function of DoD cost minimization concerns and institutional legacy. The distribution of tactical items among these FACs is also entirely a function of cost minimization and military logistics. The amount of equipment made available to LEAs is attributable entirely to military decisions and the needs of other military

[10] A police department in Atlanta, GA, that wants a mine resistant vehicle available at the FAC at Joint Base Lewis-McChord (Tacoma, WA) must send someone to vet that item and pay to have that item transported all the way from Washington state. The DLA will not ship that item to the much closer Warner-Robins AFB FAC.

[11] For more information and a discussion about shipping and accessibility costs, see the online Appendix.

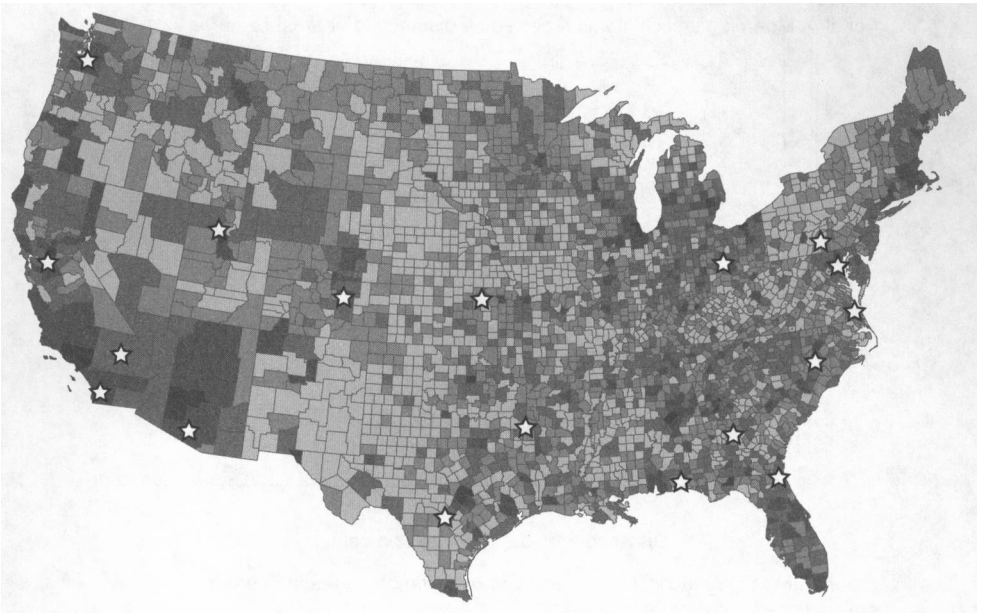

FIGURE 1. HEAT MAP: LOG TACTICAL ITEMS RECEIVED AND PROXIMITY TO DISPOSITION CENTER

agencies. Finally, the distance of a police department to multiple FACs affects the costs of both evaluation and acquiring tactical equipment. These costs are determined by factors unrelated to local unobserved heterogeneity in police community relations, crime rates, or police productivity.

Figure 1 depicts a map of the total items acquired in each county in the contiguous United States. The darker the shading, the more tactical items a county has received. Two features of the map stand out. First, note that the dark regions are generally clustered around the stars (FACs). Second, note that the dark spots are often proximate to multiple FACs even when not particularly close to one FAC. The fact that not all FACs have the same equipment at the same time motivates our use of the proximity to the nearest center and the sixth-nearest center as instruments, discussed in the next section. Figure 2 contains a scatter plot of mean log tactical items received for 20 bins of counties grouped by distance to the nearest FAC. As the panels show, the counties closest to the centers acquire more items, on average, than counties farther away. While the relationship appears to lose strength among the more remote counties, this is driven by high take-up rates at the extensive margin by remote counties. Panel B of Figure 2 depicts the conditional mean for each bin, restricted to counties who participated at the extensive margin. Along the intensive margin, the inverse relationship between distance and acquisition of tactical items holds over all counties.

II. Data

Our data are compiled from four sources. Data on equipment issued to LEAs via the 1033 Program are provided directly by the Defense Logistics Agency. Data on annual offenses, arrests, and clearances are taken from the Bureau of Justice

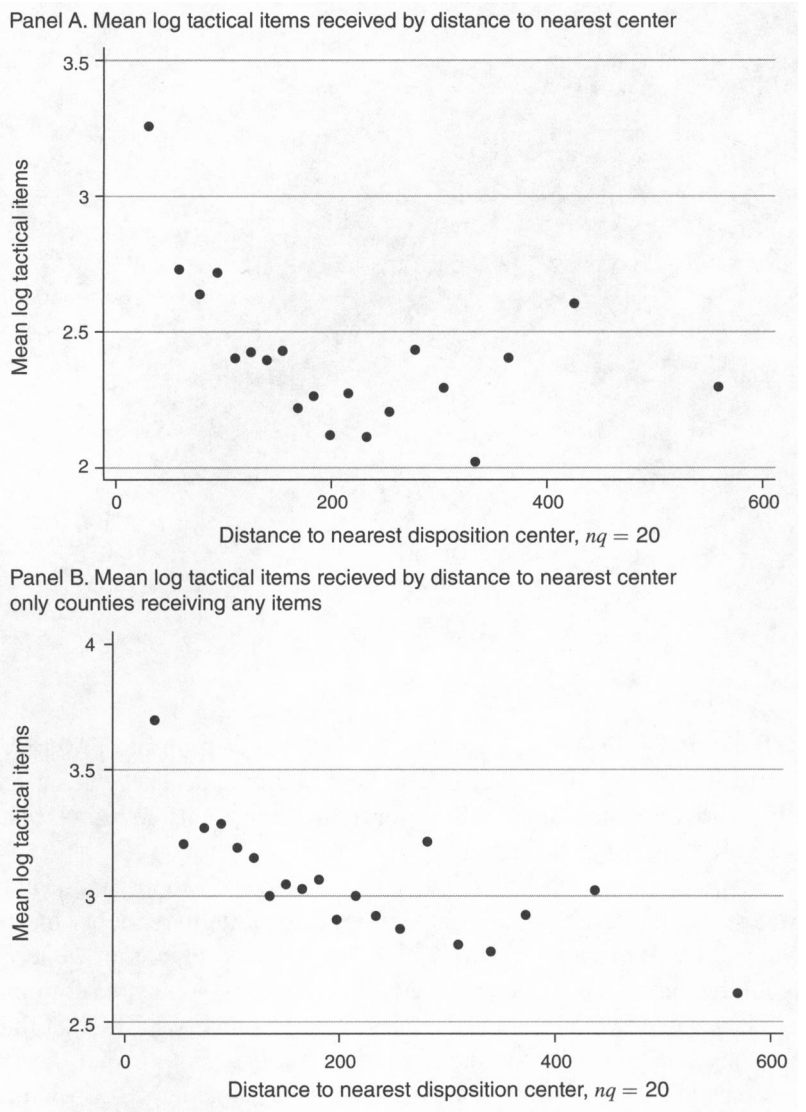

FIGURE 2. AVERAGE LOG OF TACTICAL ITEMS TAKEN THROUGH 2013 BY QUANTILE OF DISTANCE TO DLA DISPOSITION CENTER

Statistics (BJS).[12] Demographic and economic data are taken from the United States Census Bureau American Community Survey and Intercensal Estimates. Data on citizen complaints are taken directly from annual reports from police departments. We emphasize that the collection of complaints via annual reports is a contribution in and of itself, as data on citizen complaints across jurisdictions are not compiled in any systematic way.[13]

[12] These data are published by the BJS, but sourced from the Inter-university Consortium for Political and Social Research (ICPSR).

[13] No federal data instrument tracks citizen complaints in a panel context, nor are police required to report them.

A. *Tactical Equipment from the Defense Logistics Agency*

The Defense Logistics Agency provided data on all military equipment transferred to local law enforcement agencies. Because transfers of tactical equipment were coded at the county rather than the agency level, our unit of observation is a county-year. While some of the transferred equipment is relatively uncontroversial, including clothing, storage, tools, and first aid supplies, tactical equipment is responsible for approximately 70 percent of the monetary value of goods transferred through the 1033 Program. We categorize tactical equipment into one of eight categories based on NATO Stock Number (NSN) as shown in Table 1: guns (rifles, shotguns, and pistols), optics, night optics (NVG), grenade launchers, trucks, aircraft, armored personnel carriers (APC), and mine resistant vehicles (MRV).[14]

Summary statistics for all variables are reported in Table 2. The distributions of received guns, optics, and night optics across counties are highly skewed, even when controlling for population differences.[15] We believe these data are accurate as they are reported by the DLA rather than receiving agencies. These data do not capture weapons and tactical equipment independently purchased by police departments, nor do they document the decommissioning of these items.

B. *Crime, Clearance, and Arrest Data from Bureau of Justice Statistics*

Data on criminal activity and arrests are taken from the Bureau of Justice Statistics Uniform Crime Reporting (UCR) Annual Summary Reports and Offenses and Clearances data from 1997–2012.[16] We convert arrests to per capita arrest rates. Where available, we use data from UCR Offenses and Clearances, which records reported crimes and cases "cleared" by arrests for the following crimes: murder, manslaughter, rape, robbery, assault, gun assault, burglary, and vehicle theft. Because the data include reported crimes and arrests conditional on reported crime, we are able to investigate whether acquisition of tactical equipment has deterrent effects (fewer reported crimes) and/or productivity enhancing effects (greater numbers of clearances, conditional on reported crimes). From the Annual Summary Reports, we incorporate data on annual arrests for drug sales, drug possession, weapons charges, and a catch-all category of petty offenses that includes alcohol offenses, public drunkenness, disorderly conduct, vagrancy, suspicion, and loitering. Unlike the reactive nature of the criminal activity reported in the Offenses and Clearances data, these arrests are primarily the result of proactive police work. We include these data to investigate whether acquisition of tactical equipment enhances the effectiveness of law enforcement in drug interdiction or seizing unregistered weapons. Additionally, part of the debate surrounding events

[14] While the first row of Table 1 has some large values, particularly for trucks and NVGs, these disbursements occurred over a 12-year period. These numbers are small compared to single-year values in the most recent years.

[15] By 2013, the median county in the United States had received 23 firearms per 100,000 citizens through the 1033 Program, compared to a mean of 53.80, a ninety-fifth percentile of 200, a ninety-ninth percentile of 405, and a maximum of 2,851. By 2013, the median county in the United States had received no advanced optics, compared to a mean of 8.2 pieces of optical equipment per 100,000 population and a max of 1,421 pieces of optical equipment.

[16] UCR data has a long history in the economics literature, including Glaeser, Sacerdote, and Scheinkman (1996); Levitt (1997, 1998); Bronars and Lott (1998); Dezhbakhsh and Rubin (1998); Grogger and Willis (2000); Abrams (2012); and Depetris-Chauvin (2015).

TABLE 2—SUMMARY STATISTICS

Variable	Mean	SD	Minimum	Maximum	Observations
Year	2,006.5	4.031	2,000	2,013	43,512
Panel A. Substantiated reported crime rates					
Actual murders ($t-1$)	3.103	6.395	0	233.645	39,726
Actual manslaughter ($t-1$)	0.259	1.959	0	199.800	39,726
Actual total rapes ($t-1$)	22.467	25.469	0	822.448	39,726
Actual total robbery ($t-1$)	35.912	69.480	0	2,116.326	39,726
Actual total assault ($t-1$)	912.659	761.876	0	10,646.221	39,726
Actual total assaults (gun) ($t-1$)	28.544	44.715	0	898.588	39,726
Actual total burglaries ($t-1$)	513.859	391.023	0	6,329.114	39,726
Actual total vehicle thefts ($t-1$)	135.886	158.586	0	3,576.366	39,726
Panel B. Rate of crimes cleared by arrest					
Cleared murders ($t-1$)	2.136	5.009	0	233.645	39,726
Cleared manslaughter ($t-1$)	0.166	1.520	0	199.800	39,726
Cleared total rapes ($t-1$)	9.150	13.191	0	696.529	39,726
Cleared total robbery ($t-1$)	11.148	19.578	0	1,217.313	39,726
Cleared total assault ($t-1$)	508.649	438.796	0	7,250.821	39,726
Cleared total assaults (gun) ($t-1$)	14.325	24.033	0	898.588	39,726
Cleared total burglaries ($t-1$)	74.351	77.429	0	2,569.883	39,726
Cleared total vehicle thefts ($t-1$)	29.808	34.661	0	1,428.571	39,726
Panel C. Rates of complaints and attacks on police					
Complaints	48.322	126.269	0	2,358.103	865
LEOs killed	0.013	0.319	0	30.057	40,404
LEOs assaulted with guns	7.453	16.703	0	310.875	40,404
Any assaults	0.371	0.483	0	1	40,404
Any police deaths	0.009	0.094	0	1	40,404
Panel D. Economic controls					
Unemployment rate	6.339	2.908	0	29.100	43,512
Population	0.973	3.091	0.001	100.171	43,512
Per capita income	31.082	9.087	10.224	123.111	43,512
Black proportion of population	0.091	0.146	0	0.869	43,512
Land area (mi^2)	950.719	1,302.733	2	20,056.94	43,512
Population density (per sq. mi.)	235.825	1,706.991	0.082	71,229.039	43,512
Panel E. Arrest rates for non-reported crimes					
Weapons arrests ($t-1$)	28.134	38.155	0	1,877.934	43,512
Drug sale arrests ($t-1$)	61.034	93.366	0	3,014.417	43,512
Drug poss. arrests ($t-1$)	265.982	545.206	0	67,245.656	43,512
Petty arrests ($t-1$)	1,398.096	1,399.349	0	35,639.496	43,512
Panel F. Receipts of tactical items					
log total items	1.132	1.549	0	8.678	43,512
log weapons	0.946	1.447	0	8.142	43,512
log optics	0.289	0.884	0	8.378	43,512
log vehicles	0.174	0.468	0	4.663	43,512

in Ferguson pertained to police arresting individuals for petty offenses. If acquisition of tactical equipment is linked to increasingly aggressive or punitive police work, we might expect arrests for small offenses to increase with weapon acquisition.

C. *Complaint Data from Annual Reports*

Our empirical work on the potential negative effects of the 1033 Program focuses on citizen complaints as the primary measure of those negative effects. This is a

result of both data availability issues and a desire for a measure of overall representativeness of police-community relations.[17]

Data on citizen complaints were compiled from published annual reports of police departments. Most of the 100 largest cities in the United States are represented in these data as are sheriff's departments from populous counties. We chose total citizen complaints as our measure for negative externalities from police departments. In some cases, statistics on the disposition of these claims were available, but the differences in standards/disposition of these complaints made cross-departmental comparisons infeasible.[18]

D. *Demographic and Economic Data*

We incorporate county population data by race from the US Census Bureau. Intercensal population estimates are used as the denominators for arrest rates. We also include labor force participation, unemployment, and per capita personal income data by county from the Bureau of Economic Analysis. As our empirical approach allows, we also control for land area and population density of each county.

III. Identification and Empirical Analysis

We empirically evaluate several aspects of the 1033 Program with respect to tactical equipment, in two broad categories. Empirically, we consider outcomes as stemming from the following model:

$$(1) \qquad O_{jt} = \beta_0 + \beta_1 E_{js,t-1} + \beta_2 X_{jt} + \beta_3 L_{j,t-1} + \alpha_j + \nu_t + \epsilon_{jt},$$

[17] More extreme indicators such as arrest-related deaths (ARDs) and officer-involved shootings (OISs) are fortunately uncommon events. A small number of either of these does not necessarily indicate a systematic problem between police and the public. Small numbers notwithstanding, available data on ARDs and OISs are simply unreliable. The FBI claimed that the number of justifiable homicides averaged 400 per year, however, revisions by Bureau of Justice Statistics and a subsequent study from Research Triangle International (RTI) placed the true number of deaths by law enforcement closer to 800 and then 1,200 per year (Burch 2011, Banks et al. 2015). The RTI report found that coverage of the universe of law enforcement killings in the existing data (Arrest Related Deaths and Supplementary Homicide Reports) was less than 50 percent. Second, data on ARDs are only released at the state level and therefore do not capture important sub-state variation in gear acquisition, crime rates, and adverse outcomes. Finally, ARDs and OISs are ambiguous outcomes, as neither the circumstances of the shooting (e.g., whether weapons were present) nor the fault are observed. Objective violent outcomes, while controversial, may be entirely justified or necessary. Further, increases in ARDs or OISs may also be a function of criminal behavior not captured by crime frequency statistics, rather than police practices. If the acquisition of tactical equipment is driven by the need to provide public safety in response to a small number of truly violent criminals, using ARDs and OISs as outcomes may create misleading results.

[18] While the compilation of these data is a contribution in and of itself, two features of the data limit the interpretation of our empirical findings and motivate policy recommendations with respect to transparency. First, data on complaints are endogenously available. Not all departments publish annual reports, let alone data on citizen complaints in their annual reports. Requests for information from several departments were either ignored or responded to with large amounts of qualitative information, perhaps indicating that no statistical analysis had been conducted on citizen complaints. The counties with agencies that do report citizen complaints are approximately 10 times as large at the mean and 20 times as large at the median as the counties that do not report citizen complaints. Although we only have complaints for a relatively small number of counties (100), those counties contain approximately 25 percent of the US population. In an available upon request online data Appendix, we document the results of our search for complaint data from major municipalities and sheriff's offices in all counties with populations greater than 500,000. Additional information on the differences in acquisition of tactical equipment by complaint reporting and non-reporting counties is available in the same Appendix.

where O_{jt} is the outcome of interest for jurisdiction j at year t, $E_{js,t-1}$ is the lagged stock of acquired tactical equipment in a particular jurisdiction, X_{jt} is a vector of county exogenous characteristics including per capita personal income, unemployment, and labor force participation, and $L_{j,t-1}$ includes lagged crime (or arrest) rates and lagged police officers assaulted and killed.[19] In all of these equations, the coefficient of interest is β_1. For all outcomes, and all specifications, this coefficient may be biased due to time-varying correlation between the acquisition of tactical equipment and the ϵ error term, even controlling for the jurisdictional fixed effect. This bias may stem from changing departmental culture, policy, personnel, or other omitted, unobservable factors that may lead to increased intensity of tactical equipment acquisition and jurisdictional outcomes, desirable or otherwise.

Our identification strategy relies on instruments constructed from exogenous time-invariant cost shifters (distance to FACs) interacted with exogenously changing amounts of tactical items made available through the 1033 Program, similar in concept to Nunn and Qian (2011). The DLA relayed two other important factors: counties with large land areas were actively encouraged to participate in this program as were counties that were designated High Intensity Drug Trafficking Areas (HIDTA). We therefore include interaction terms between the availability of tactical items and the jurisdiction's land area and an indicator for having ever been designated as a HIDTA.[20] Our first-stage equation is:

$$(2) \qquad E_{jst} = \delta_0 + \delta_1 \left(TE_{st} \otimes \times \left[1, D_j^1, D_j^6, HIDTA_j, land_j \right] \right) + \delta_2 X_{jt} + \alpha_j + \nu_t + \epsilon_{jt},$$

where s denotes a specific equipment type and D_j^k denotes the inverse distance from the centroid of county j to the kth closest field activity center. As discussed in Section I, not all centers have the same equipment (and much of this equipment is specialized) during a given period. For a specific item, it is unclear from which center the item in question will originate. Proximity to not just one center, but multiple centers, affects the average costs of evaluating and acquiring tactical items. To capture the effects of proximity to multiple centers, we include the inverse distance to the sixth-nearest FAC in our set of instruments.[21] Note that proximity to a FAC does not equate to proximity to a military base.[22]

First-stage results are detailed in Table 3. We evaluate total items received, and then subdivide the total into three broad categories of tactical items: weapons (guns

[19] The E and L variables are lagged to avoid simultaneity bias.

[20] HIDTAs constitute 27 percent of the counties in the United States and 60 percent of the population. As the stated purpose of the 1033 Program was to provide support for drug interdiction, priority was given to counties designated as HIDTAs. Counties with large land areas were encouraged to participate under the idea that covering larger geographic areas requires more capital (optics, vehicles, etc.). Land area and HIDTA designation were included for consideration on the application forms submitted when requesting a transfer of equipment. In our sample, HIDTA status and land area are time invariant. As our first stage includes county level fixed effects, any concerns about unobservables related to these factors should be mitigated. Additionally, as our model is overidentified, we provide test statistics on instrument validity for all second-stage results.

[21] Proximity to the sixth-closest center captures information about proximity of the second to fifth-nearest centers.

[22] There are over 200 US military installations in the contiguous 48 states and at least one in every state. While many counties are proximate to a military base or installation, far fewer are proximate to a FAC.

TABLE 3—COEFFICIENT ESTIMATES: FIRST STAGE

	All items	Weapons	Optics	Vehicles		
				All	Utility	Combat
Items $\times \frac{1}{dist_1}$	0.991	12.668	8.028	−17.574	−21.847	10.960
	(0.359)	(4.290)	(2.957)	(20.347)	(22.699)	(52.096)
Items $\times \frac{1}{dist_6}$	2.314	−203.128	224.578	4,018.078	4,268.043	5,467.937
	(9.779)	(90.735)	(113.232)	(686.431)	(739.304)	(2,932.357)
Items × ln(*landarea*)	0.008	0.197	0.246	1.518	1.443	8.431
	(0.005)	(0.048)	(0.056)	(0.313)	(0.334)	(1.503)
Items × **1**[*HIDTA*]	0.092	1.099	0.977	5.930	6.129	28.895
	(0.012)	(0.123)	(0.152)	(0.825)	(0.901)	(4.317)
Observations	40,404	40,404	40,404	40,404	40,404	40,404
F-statistic	16.371	30.349	17.859	24.172	21.637	17.699

Notes: Dependent variables are logged. All regressions include county-level fixed effects, year fixed effects, and controls for per capita personal income, unemployment, population, and lagged crime rates.

and grenade launchers), optics (day sights and night optics), and vehicles (military trucks, aircraft, mine resistant vehicles, and armored personnel carriers). The reported *F*-statistics are the joint significance tests of our instruments.[23,24] Note that for the higher volume items, guns and optics, proximity to the nearest center is a positive predictor of acquiring tactical items. For more heterogeneous categories, optics and vehicles, proximity to the sixth center has a positive effect on item acquisition. Finally, for vehicles, which are low volume and heterogeneous, proximity to multiple centers is important, but proximity to the nearest is not.

As our model is overidentified, we are able to empirically test our claims of instrument validity made in Section I. As additional evidence, we examine a particular event, the large release of guns in 2006. More guns were released through the 1033 Program in 2006 than any other year. Figure 3 plots the log annual mean of guns acquired, arrest rates for drug sales and weapons charges, log assault rates on police officers, logged complaint rates, and per capita personal income for the quartile of counties nearest to an FAC and the quartile of counties the farthest from an FAC. As the event study shows, while the two sets of counties exhibit considerable differences in acquisition of guns, they do not exhibit sudden changes in our outcomes of interest coincident with the acquisition of guns. While the number of weapons arrests is higher in the "near" counties, the largest changes occur not in 2006, but two years prior and two years later. To address any concerns, we include controls for crime rates in the first and second stages of our analysis.

[23] We appeal to the Staiger and Stock (1997) rule of thumb that an *F*-statistic greater than ten indicates a reasonably strong set of instruments.

[24] While inverse distance is our preferred measure of proximity, we have verified that our results are consistent both in sign and significance when employing a linear-spline distance measure, and a quadratic function of proximity. Results are available upon request.

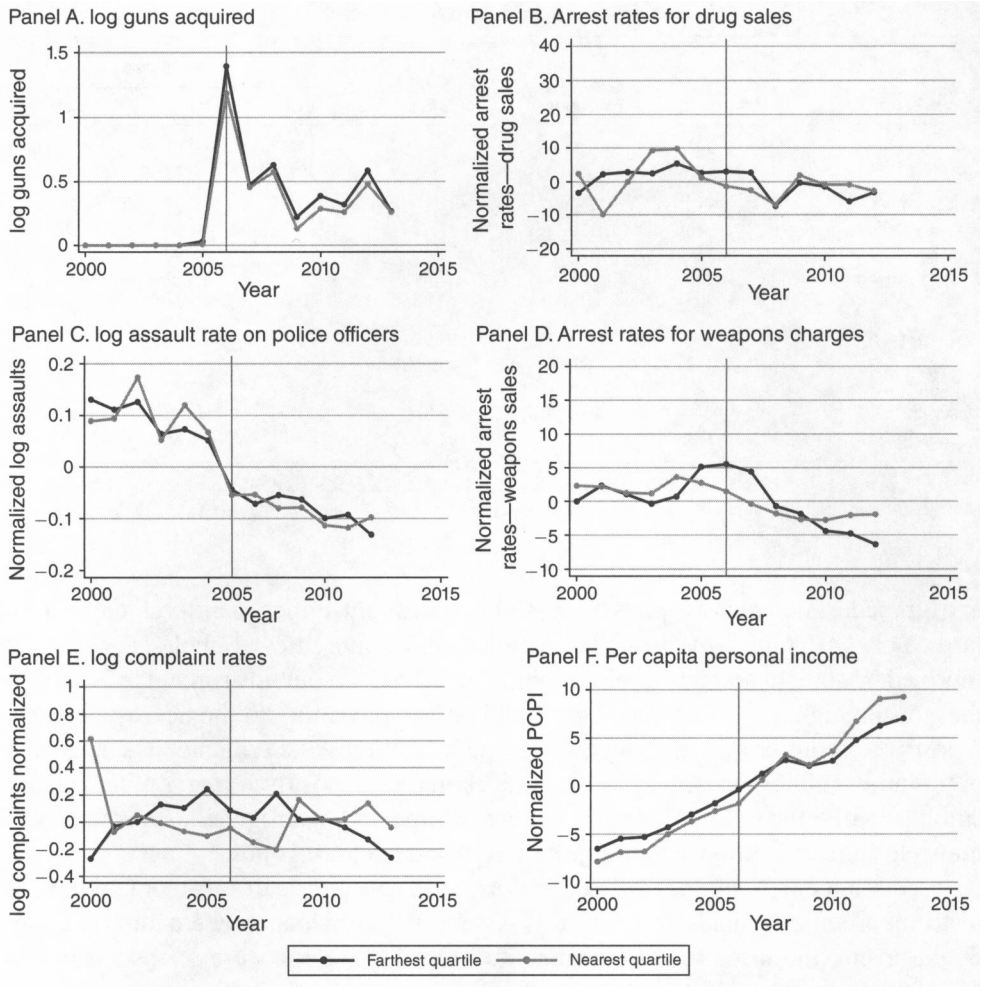

FIGURE 3. EVENT STUDY—2006 RELEASE OF GUNS—COUNTIES IN NEAREST AND FARTHEST QUARTILE OF PROXIMITY TO DISTRIBUTION CENTER

TABLE 4—THE EFFECT OF LOG TACTICAL ITEMS ON LOG CITIZEN COMPLAINTS

Model	Items	Weapons	Optics	Vechicles	Combat vehicles
Fixed effects	−0.040	0.000	−0.075	−0.212	−0.686
	(0.037)	(0.029)	(0.054)	(0.210)	(0.628)
Instrumental variables	−0.278	−0.083	−0.304	−0.537	−2.231
Fixed effects	(0.114)	(0.050)	(0.131)	(0.218)	(1.126)
Kliebergen-Paap *F*-statistic	14.189	22.671	12.657	11.880	2.091
Hansen *J*-statistic *p*-value	0.316	0.292	0.413	0.445	0.721
Observations	804	804	804	804	804

Note: Regressions include controls for lagged crime rates, economic controls, and county fixed effects.

A. *Complaints, Offender Deaths, and Assaults on Police*

We first evaluate whether receipt of tactical items through the 1033 Program affected citizen complaints, offender deaths, or assaults on police. Table 4 contains our results regarding citizen complaints, with standard errors clustered at the county level. The top row reports results from a descriptive fixed effects regression, without instrumenting for item receipts. The effects of tactical items on citizen complaints are not statistically significantly different from zero. However, when we instrument for tactical items, the effect of tactical items on complaints is negative and significant for all item types. In the first column, our results indicate a 1 percent increase in total tactical items leads to a 0.28 percent decrease in citizen complaints. The second through fifth columns explore heterogeneous effects of separate types of tactical equipment. For every specific category, the causal effect of each type of tactical equipment on complaints is negative and significant.[25] Our results are in no way consistent with the idea that tactical items lead to increased police aggression.

One could challenge that interpretation, however, as acquiring military hardware could induce two behavioral changes in police that would reduce complaints. If police who acquire these armaments behave very aggressively, citizens may be too intimidated to complain. Alternatively, if better armed police approach potential conflict situations knowing they have the upper hand, they may be less likely to engage in aggressive behavior. We attempt to validate the above results using a more objective outcome, arrest-related deaths.[26] Results for arrest-related deaths are available in Table 5. While none of the estimated coefficients are statistically significant in either specification (log deaths or any deaths), all but two point estimates are negative. These results on this more objective measure (also consistent with Bove and Gavrilova forthcoming) do not support the notion that receipt of tactical equipment leads to increased police violence.

We also examine the effects of receipts of tactical items through the 1033 Program on gun assaults and fatal assaults on police officers. While the protection benefits of receiving tactical items are of inherent interest, it is also true that assaults against police could be considered an extreme form of complaint against police. In this respect, these results can provide additional validation for the results in Tables 4 and 5. Results for regressions with gun assaults and officer deaths as the dependent variable are in Table 6. We find that a 1 percent increase in receipts of tactical items reduces gun assaults on police officers by 0.1 percent, and decreases the probability of any gun assaults on officers by 0.03 percent. Of the separate types of tactical equipment considered, vehicles are shown to have the strongest effect on gun assaults. A 10 percent increase in vehicles received decreases assaults on police by approximately 3.5 percent. This result is intuitive, if military vehicles are utilized

[25] We had concerns about lagged complaints affecting the acquisition of tactical items or that evolving departmental cultures would lead to serial correlation in the errors, creating problems for fixed effects models. As such, we repeated the analysis in Table 4 using an Arellano-Bover-Blundell-Bond dynamic panel specification. The results are available in the online Appendix. Total items and weapons had significant negative effects that were smaller in magnitude. Estimated coefficients for optics and vehicles are insignificant.

[26] We thank Vincenzo Bove and Eva Gavrilova for providing these data.

TABLE 5—THE EFFECT OF LOG TACTICAL ITEMS ON OFFENDER DEATHS

	Items	Weapons	Optics	Vehicles	Combat vehicles
log deaths	−0.014	0.000	−0.012	−0.016	−0.138
	(0.046)	(0.022)	(0.029)	(0.044)	(0.238)
Kleibergen-Paap *F*-statistic	8.624	30.139	13.090	19.451	7.180
Hansen *J*-statistic *p*-value	0.902	0.581	0.966	0.937	0.926
Any deaths	−0.000	0.003	−0.001	−0.006	−0.044
	(0.036)	(0.017)	(0.024)	(0.039)	(0.202)
Kleibergen-Paap *F*-statistic	8.624	30.139	13.090	19.451	7.180
Hansen *J*-statistic *p*-value	0.725	0.309	0.960	0.933	0.835
Observations	24,864	24,864	24,864	24,864	24,864

Note: Regressions include controls for lagged crime rates, economic controls, county, and year fixed effects.

TABLE 6—PROTECTION BENEFITS OF TACTICAL ITEMS FOR LAW ENFORCEMENT OFFICERS

	Any assaults				log assaults			
	Items_{t-1}	Weapons_{t-1}	Optics_{t-1}	Vehicles_{t-1}	Items_{t-1}	Weapons_{t-1}	Optics_{t-1}	Vehicles_{t-1}
Panel A. Effect of log tactical items on officers assaulted								
	−0.031	−0.025	−0.057	−0.112	−0.108	−0.094	−0.189	−0.352
	(0.007)	(0.004)	(0.019)	(0.031)	(0.020)	(0.013)	(0.057)	(0.092)
Kleibergen-Paap *F*-statistic	293.649	350.100	62.030	110.520	293.649	350.100	62.030	110.520
Hansen *J*-statistic *p*-value	0.735	0.622	0.166	0.119	0.423	0.642	0.008	0.004
Observations	37,296	37,296	37,296	37,296	37,296	37,296	37,296	37,296
	Any deaths				log deaths			
	Items_{t-1}	Weapons_{t-1}	Optics_{t-1}	Vehicles_{t-1}	Items_{t-1}	Weapons_{t-1}	Optics_{t-1}	Vehicles_{t-1}
Panel B. Effect of log tactical items on officer deaths								
	−0.024	−0.014	−0.044	−0.059	−0.005	−0.003	−0.006	−0.006
	(0.008)	(0.005)	(0.019)	(0.030)	(0.003)	(0.002)	(0.007)	(0.011)
Kleibergen-Paap *F*-statistic	17.299	34.272	8.418	17.307	17.299	34.272	8.418	17.307
Hansen *J*-statistic *p*-value	0.883	0.943	0.496	0.201	0.522	0.474	0.779	0.803
Observations	37,296	37,296	37,296	37,296	37,296	37,296	37,296	37,296

Notes: Adding year fixed effects to first stage in panel A does not substantively change results, but does lead first-stage tests of instrument validity to perform poorly. The opposite is true in panel B. All regressions include lagged arrest rates, economic controls, county fixed effects, and year fixed effects (panel B).

when threat of assault is highest. Additionally, our results indicate that tactical items of all types reduce the probability that an officer is killed in the line of duty. Vehicles are again shown to have the largest effect. We also model the effects of tactical items on officer deaths at the extensive and intensive margin (log deaths) but results are insignificant. This is unsurprising given the distribution of log deaths is not well suited to be treated as a continuous variable.

In addition to documenting protection benefits of tactical items, these results further confirm that tactical items received through the 1033 Program do not causally increase the risk of police violence. Our IV results show the opposite: tactical items

reduce citizen complaints, reduce violence against police, and do not increase the probability or number of civilian deaths.[27]

B. *Effects on Drug Arrests, Substantiated Crime Rates, and Closed Cases*

We also examine whether receipt of tactical items enhances the production of public safety, specifically through deterrence effects, enhanced arrest capability, or through increased arrests for drug and weapons arrests. The third category is perhaps of greatest interest, as the stated objective of the 1033 Program is to increase the drug interdiction capability of local law enforcement.

Table 7 contains the results for regressions with arrests for drug sales, drug possession, weapons charges, and petty offenses as the dependent variables. We find that acquisition of tactical items leads to more arrests for drug sales and drug possession, consistent with the objectives of the 1033 Program. A 1 percent increase in total tactical items received leads to a 0.25 and 0.23 percent increase in arrests for drug sales and possession, respectively. Among the considered subcategories of tactical equipment, vehicles are shown to have the largest effect, followed by optics and weapons. We do find that tactical items lead to increased arrests for petty offenses, which raises some concern about more aggressive policing.[28,29,30]

Table 8 contains the results for the effect of receiving tactical items on substantiated crime rates.[31] Results in Table 8 indicate that receipts of tactical items deter armed robbery, assaults, and vehicle theft; but not homicides or assaults with

[27] We also verify that our results are robust to using per capita measures of acquired items. Per capita results corresponding to Tables 4–6 are in the online Appendix, Section E, Tables 11–13.

[28] We recognize that many of the p-values on the Hansen J-statistics in Table 7 are sufficiently low to reject the null that our vector of instruments is jointly valid. To address these concerns, we have also run each regression in Table 7 with regression-specific subsets of our instruments that pass tests of both strength and validity. For 13 of the 16 regressions run to produce Table 7, the retained instruments that produced strong and valid first-stage statistics were Items $\times \frac{1}{dist_1}$ and Items $\times$ *HIDTA*. For the remaining three regressions, Items $\times \frac{1}{dist_6}$ and Items $\times$ *HIDTA* were retained. We chose to include results using the full set of instruments for consistency of methodology. Results using the regression-specific valid subsets of our instruments are available in the online Appendix and largely confirm these results. All point estimates using valid subsets of instruments are within two standard errors of the estimates reported in Table 7.

[29] Additionally, if acquisition of tactical items affects the ability of police departments to engage in drug interdiction, that should affect both the criminal landscape in subsequent periods and also future decisions regarding the acquisition of tactical items. This would create serial correlation in the error term and bias fixed effects estimates. To address these concerns, we have reestimated the results in Table 7 using an Arellano-Bover/Blundell-Bond (ABBB) specification, also available in the online Appendix. In this specification, the coefficients for vehicles lose significance, and overall magnitudes are smaller, but the qualitative interpretation of the results are unchanging. Further, ABBB results for all outcomes of interest are also included in the online Appendix.

[30] When we convert log items received to per capita terms, the signs of the results in Table 7 change from positive to negative. (See Table 14 in the online Appendix, Section E.) We believe this difference is most likely attributable to heterogeneous treatment effects by population size. The proactive arrests for drug (and weapons offenses) are a function of two unobserved variables: the true extent of criminal drug activity; and arrest rates conditional on criminal drug activity. Level-measures imply that the largest increases in tactical items are found in counties with large populations and presumably more drug crime. In these larger places, the arrest rate (productivity) effect is likely to dominate any deterrence effects. The per capita specification shows that the largest increases in tactical items receipts are in counties with the smaller populations, where a deterrent effect may dominate. We view explorations of heterogeneous treatment effects as an area for future work.

[31] The J-statistics for our first stage are also sufficiently low to reject the null of validity. As before, we are able to use regression-specific subsets of available instruments to attain first-stage estimates that are both strong and valid. We again chose to report these results using the full set of instruments to maintain consistency of methodology. The alternate results are available in the online Appendix, but do not differ either qualitatively nor quantitatively from the results reported here. These results are not driven by concerns about instrument validity.

TABLE 7—THE EFFECT OF TACTICAL ITEMS RECEIVED ON ARRESTS

	Drug sales	Drug possession	Petty crimes	Weapons charges
log items_{t-1}	0.252	0.228	0.341	0.090
	(0.092)	(0.086)	(0.101)	(0.060)
Kleibergen-Paap F-statistic	14.198	14.198	14.198	14.198
Hansen J-statistic	0.000	0.001	0.000	0.024
log weapons_{t-1}	0.167	0.141	0.181	0.053
	(0.058)	(0.054)	(0.060)	(0.038)
Kleibergen-Paap F-statistic	21.601	21.601	21.601	21.601
Hansen J-statistic	0.000	0.001	0.000	0.027
log optics_{t-1}	0.612	0.399	0.652	−0.098
	(0.241)	(0.223)	(0.275)	(0.157)
Kleibergen-Paap F-statistic	6.824	6.824	6.824	6.824
Hansen J-statistic	0.000	0.001	0.000	0.012
log vehicles_{t-1}	1.440	0.718	1.389	−0.194
	(0.364)	(0.319)	(0.390)	(0.230)
Kleibergen-Paap F-statistic	17.560	17.560	17.560	17.560
Hansen J-statistic	0.002	0.010	0.000	0.020
Observations	33,352	33,352	33,352	33,352

Note: Regressions include controls for lagged crime rates, economic controls, county, and year fixed effects.

TABLE 8—THE EFFECT OF RECEIVING TACTICAL ITEMS ON SUBSTANTIATED CRIME RATES

	Homicide	Robbery	Gun assault	Assault	Vehicle theft
log items_{t-1}	−0.221	−15.395	0.657	−145.795	−114.509
	(0.302)	(3.230)	(1.880)	(33.559)	(14.921)
Kliebergen-Paap F-statistic	16.132	16.132	16.132	16.132	16.132
Hansen J-statistic p-value	0.000	0.008	0.398	0.061	0.027
log value_{t-1}	0.349	−6.235	2.455	−110.348	−55.936
	(0.282)	(2.865)	(1.822)	(42.137)	(17.562)
Kliebergen-Paap F-statistic	4.145	4.145	4.145	4.145	4.145
Hansen J-statistic p-value	0.003	0.016	0.616	0.018	0.000
Observations	36,671	36,671	36,671	36,671	36,671

Note: Regressions include controls for lagged arrest rates, economic controls, county, and year fixed effects.

guns. All of these crime rates are also considered by Bove and Gavrilova (forthcoming), except for gun assaults. For the four types of crime considered in both papers, the signs and significance of our estimates are consistent with those of Bove and Gavrilova (forthcoming). Our magnitudes, however, are much larger than the quantity results reported in Bove and Gavrilova's table A.5. By contrast, our estimates for lag logged *value* of tactical equipment are closer in magnitude (for none of the four considered categories in both papers would we reject the null that the true value of the coefficient is Bove and Gavrilova's in table A.6).

We view the qualitative similarity of our results to those of Bove and Gavrilova (forthcoming) as mutual validation. The sometimes considerable differences in magnitudes can be attributed to several differences in our respective approaches. First, Bove and Gavrilova (forthcoming) consider *all* equipment received through the 1033 Program where we restrict our focus to tactical items. Second, Bove and Gavrilova (forthcoming) typically consider values of items received, while we focus on quantities. As such, our measures of "total equipment" received never line up precisely. Within each paper, the magnitude of the estimates is sensitive with respect to the definition of equipment received, but the qualitative implication of the estimates is fairly stable. The same can be said about the comparison of results between our papers, too.

Our papers also use different instruments for identification and therefore exhibit different local average treatment effects (LATE), which will also create differences in estimated magnitudes. This is particularly pronounced in the likelihood that police departments exhibit heterogeneous treatment effects. For example, the police department in a city with high rates of violent crime and a large drug problem might respond very differently to a randomly assigned shipment of tactical items than a department in a less troubled city. Bove and Gavrilova instrument for the value of items received with the proportion of years in the sample period that a county asks for any items. If the departments that participate in the program are in some way more proactive or more actively engaged with using outside resources to reduce crime, they will exhibit different treatment effects than those departments likely affected by our instrument. The departments likely most affected by our instrument should be thought of as "marginal" takers of equipment, or "compliers," similar to Card (1995). They only engage in the 1033 Program insofar as items are abundant and convenient to acquire at a nominal price of zero. Differences in each paper's treatment of equipment received and instrumentation strategy will yield differences in estimated magnitudes. However, in considering the total effect of the 1033 Program, our results align fairly well from a qualitative standpoint.

Table 9 contains our results of regressions evaluating the effect of receiving tactical items on productivity, as measured by "closures" of substantiated reported crimes. With the exception of vehicle theft, receipts of tactical items do not lead to statistically significant changes in case closures. This result is unsurprising as tactical equipment does not make police more resourceful, clever, or diligent in solving cases.[32] It is unclear why receipts of tactical items would reduce closures of vehicle theft cases unless these receipts reflected a shifting of priorities from property crimes to drug interdiction.[33]

Finally, Table 10 considers the heterogeneous effects of each equipment type on crime rates and closures.[34] Overall, the signs and significance of estimates for each equipment type align with the results from equipment totals in Tables 8 and 9. In particular, tactical equipment appears to reduce robberies, assaults, and vehicle

[32] The result for vehicle theft is robust to a subset of instruments that yield a strong and valid first stage.

[33] We verify that our results are robust to using per capita measures of acquired items. Per capita results corresponding to Tables 8 and 9 are in the online Appendix, Section E, Tables 15 and 16.

[34] Results with limited instrument sets are again available in the online Appendix.

TABLE 9—PRODUCTIVITY EFFECTS: THE EFFECT OF ITEMS RECEIVED ON CLOSURES

	Homicide	Robbery	Gun assault	Assault	Vehicle theft
log items$_{t-1}$	0.075	1.239	1.572	−23.367	−5.615
	(0.266)	(0.891)	(1.048)	(20.747)	(2.020)
Kliebergen-Paap *F*-statistic	13.895	13.895	13.895	13.895	13.895
Hansen *J*-statistic *p*-value	0.228	0.845	0.172	0.000	0.000
log value$_{t-1}$	−0.092	1.084	0.538	−31.291	−9.651
	(0.174)	(0.783)	(0.840)	(23.749)	(3.180)
Kleibergen-Paap *F*-statistic	4.133	4.133	4.133	4.133	4.133
Hansen *J*-statistic	0.490	0.137	0.059	0.028	0.230
Observations	36,670	36,670	36,670	36,670	36,670

Note: Regressions include controls for lagged crime rates, economic controls, county, and year fixed effects.

TABLE 10—HETEROGENEOUS EFFECTS ON CRIME RATES AND CLOSURES BY EQUIPMENT TYPE

	Homicide	Robbery	Gun assault	Assault	Vehicle theft
Panel A. Effects on substantiated crime rates					
log weapons$_{t-1}$	0.029	−7.249	0.386	−82.179	−76.110
	(0.202)	(1.651)	(1.216)	(20.941)	(8.312)
Kliebergen-Paap *F*-statistic	24.700	24.700	24.700	24.700	24.700
Hansen *J*-statistic *p*-value	0.000	0.043	0.519	0.004	0.006
log optics$_{t-1}$	0.798	−27.631	−2.184	−271.362	−182.781
	(0.761)	(7.632)	(4.744)	(94.570)	(40.741)
Kliebergen-Paap *F*-statistic	6.969	6.969	6.969	6.969	6.969
Hansen *J*-statistic *p*-value	0.000	0.002	0.362	0.003	0.000
log vehicles$_{t-1}$	1.090	−31.860	−2.993	−366.079	−263.074
	(1.161)	(8.917)	(7.140)	(132.797)	(45.808)
Kliebergen-Paap *F*-statistic	15.192	15.192	15.192	15.192	15.192
Hansen *J*-statistic *p*-value	0.000	0.002	0.380	0.000	0.000
Observations	36,671	36,671	36,671	36,671	36,671
Panel B. Effects on case closures					
log weapons$_{t-1}$	0.128	1.203	0.726	−12.196	−4.032
	(0.176)	(0.516)	(0.639)	(13.721)	(1.331)
Kliebergen-Paap *F*-statistic	22.168	22.168	22.168	22.168	22.168
Hansen *J*-statistic *p*-value	0.375	0.731	0.062	0.004	0.000
log optics$_{t-1}$	0.500	1.761	1.540	−43.668	−0.490
	(0.644)	(2.291)	(2.571)	(44.526)	(5.559)
Kliebergen-Paap *F*-statistic	6.790	6.790	6.790	6.790	6.790
Hansen *J*-statistic *p*-value	0.056	0.612	0.146	0.000	0.000
log vehicles$_{t-1}$	1.063	2.906	1.887	−43.375	8.350
	(1.057)	(3.112)	(4.058)	(67.877)	(9.146)
Kliebergen-Paap *F*-statistic	14.195	14.195	14.195	14.195	14.195
Hansen *J*-statistic *p*-value	0.134	0.543	0.133	0.000	0.000
Observations	36,670	36,670	36,670	36,670	36,670

Note: Regressions include controls for lagged arrest rates, economic controls, county, and year fixed effects.

thefts, but has no measurable effects on homicides or gun assaults. Tactical items do not appear to help police close out cases involving reported crimes.

IV. Discussion

In this paper, we empirically investigate the effect of local law enforcement agencies' acquisition of tactical weapons and vehicles from the military. We capitalize on institutional knowledge about the logistics of the 1033 Program to identify shifters of cost (proximity) and priority (land area and HIDTA designation) that enable us to isolate the causal effects of the issuance of these items.

In the popular press and in our society, two divergent narratives have emerged around the 1033 Program and the apparent militarization of police. One narrative centers around the availability of tactical equipment transforming yesterday's community policeman into a thug. Our findings do not support that narrative. Specifically, we find that acquiring tactical items reduces citizen complaints. The statistically insignificant results (with negative signs) on offender deaths indicate that an "intimidation channel" is unlikely. The other narrative centers around the necessity of these armaments as an input to the production of public safety from the modern, dangerous, well-armed violent or drug criminal. While this paper does not directly address need per se, we do find that the tactical items issued through the 1033 Program reduce assaults on and deaths of police officers, assist in drug interdiction, and may have deterrent effects on crime. All of these are consistent with the objectives of the 1033 Program.

There are several caveats that must be kept in mind when interpreting these results. First, there are almost surely exceptions to these findings. It is entirely possible that in certain jurisdictions these armaments may or may not be necessary, have not increased the efficacy of drug interdiction, or have led directly to increased violence by police against civilians. In other words, our findings do not necessarily mean that saturating our local law enforcement agencies with military hardware is good policy. In conjunction, the second limitation is that our results are likely a local average treatment effect. We do interpret our estimates as causal effects, but they are mainly valid for departments for whom access/evaluation/shipping costs are a pivotal factor. Departments with a militaristic culture or a very community-focused culture would likely exhibit different treatment effects. Third, we do not know what tactical items police departments purchase outside the 1033 Program. If there is positive correlation between 1033 acquisitions and outside purchases, our results may overstate the benefits of the 1033 Program. While it is unknowable whether there is an associative positive or negative correlation between items acquired inside/outside the 1033 Program, we are relying on our instruments to address that omitted variable problem to provide causal estimates of the effects of the 1033 Program. We emphasize that our results are about the 1033 Program alone rather than a referendum on police militarization.

Fourth, these results should not be used to diminish concerns about police-community relations, the role of police in our society, violence against civilians by police, or vice versa. However, the tactical items issued through the 1033 Program have become a visual representation of the ongoing controversy in our society, to the

point where the military hardware is viewed as a catalyst of mistrust and excessive force. While we need to have these philosophical conversations as a society, our results refute the view that the 1033 Program is in some way responsible for these social ills.

From a policy perspective, the most significant recommendation we offer is related to basic transparency. Police departments are publicly funded for the purpose of providing a very hazardous public service, and while great police work can have positive effects on a community, careless policing can have detrimental effects. While data on crime statistics are easy to find, data on citizen complaints can be much more difficult or impossible to find. We appreciate the LEAs that have made these data publicly available, but feel these data should be uniformly reported and universally available, particularly for large cities. We also recognize that our data are incomplete, in that many small LEAs may not have the resources to consistently compile and post up-to-date statistics. Sheriffs, who are in many instances elected officials, have even less incentive to report complaints (and do so at a much lower frequency). Sheriff's departments and municipal police departments often coexist within large counties, but may have very different cultures. Almost no departments reported data in a transparent way on SWAT deployments (another candidate measure of police/military activity), officer-involved shootings, or arrest-related deaths or injuries. We are certainly sympathetic to the desire to avoid scrutiny and protect information that could be useful to criminals, but data on negative outcomes are necessary to form a comprehensive picture of the quality of the service paid for and provided to the public.

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