

Topics on Pro-Social and Anti-Social Behavior

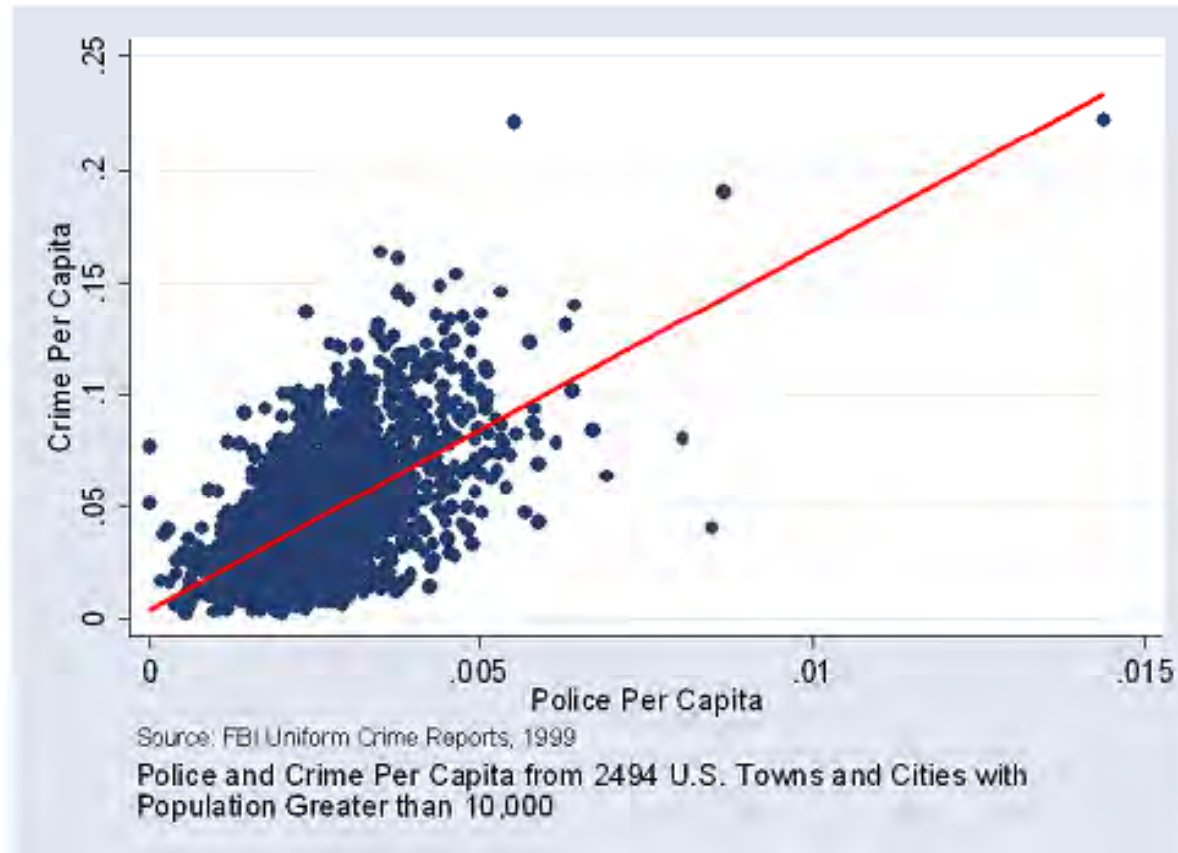
Mikael Priks and Jenny Säve-Söderbergh

Stockholm University

- Today we will study how crime can be deterred.
- But there is a deep causality problem, which we need to address.
- When there is more crime, the society invests to reduce it.
- To solve this, it is necessary to have a source of exogenous variation in law enforcement.

Police and crime

- If you just look at the correlation, this is the pattern you will find.



- To solve this problem, Levitt (1997, AER) uses election years as an instrument for police.
- The argument is that in election years, politicians invest more in police in order to attract votes.
- He finds that more policing indeed reduces crime.
- However, also other variables, such as the judiciary, may be affected during election years.
- Moreover, McCrary (2002, AER) shows that there was a computational error in Levitt's work so the results are not significant.

- Di Tella and Schargrodsky (2004, AER) instead exploits a natural experiment.
- They take advantage of the increase in policing that arose due to a terrorist attack on the main Jewish center in Buenos Aires in 1994.
- Police was commanded to guard Jewish and Muslim institutions.
- So they use these blocks as treatments groups and the other blocks as control groups.
- They find that auto theft declined by 75% on blocks that were protected due to the terrorist attack, compared to other blocks.

- But for an experiment to be clean it is necessary that the policy intervention does not affect the dependent variable directly.
- Since the terrorist attack took place in Buenos Aires, it is possible that criminals were affected by the attack, not by the police.
- Also, they have 37 treated blocks and some 800 blocks which serve as a control, but they only have one policy intervention.
- This implies that the error term may be underestimated.

- Klick and Tabarrok (2005, JLE) use the fact that the “terror-alert level” went up and down four times after the 9/11 Terrorist attack.
- This implied that more police was out on the streets.
- Importantly, the change in police was due to the terrorist attack, not a change in crime.
- The mall area is used as a treatment group and the rest of Washington constitutes the control group.

- They found that crime, and in particular car theft, was reduced when police presence was increased.
- However, again, since the terrorist attack took place in Washington, criminals may have been afraid for new attacks.
- Alternatively, they may have shown civility some time after the terrorist attacks.
- Moreover, in a perfect experiment, the control group should be unaffected by the intervention.
- This was not the case in this paper.

The Effect of Police Intelligence on Group Violence: Evidence from Reassignments in Sweden

(Poutvaara and Priks 2009, JPUBE)

- We use a natural experiment to study how police intelligence units affect hooliganism.
- After the Tsunami and the 9/11 terrorist attack, the supporter police in Stockholm (only) shut down its ordinary duty.
- We find that Stockholm-related violence went up by 300 percent during these periods!

- We use data on organized violence collected by “Firman Boys”.
- The supporter police units performs intelligence work, operative work, investigations and consultation.
- For the Tsunami analysis, we collapse the data into 28 fall and spring season, where the Stockholm supporter police was absent during the spring of 2005.
- For the terrorist analysis, we collapse the data into 16-day periods.

**Figure 6.2. Violence Related to Ich Hockey
With Stockholm Clubs Minus Without**

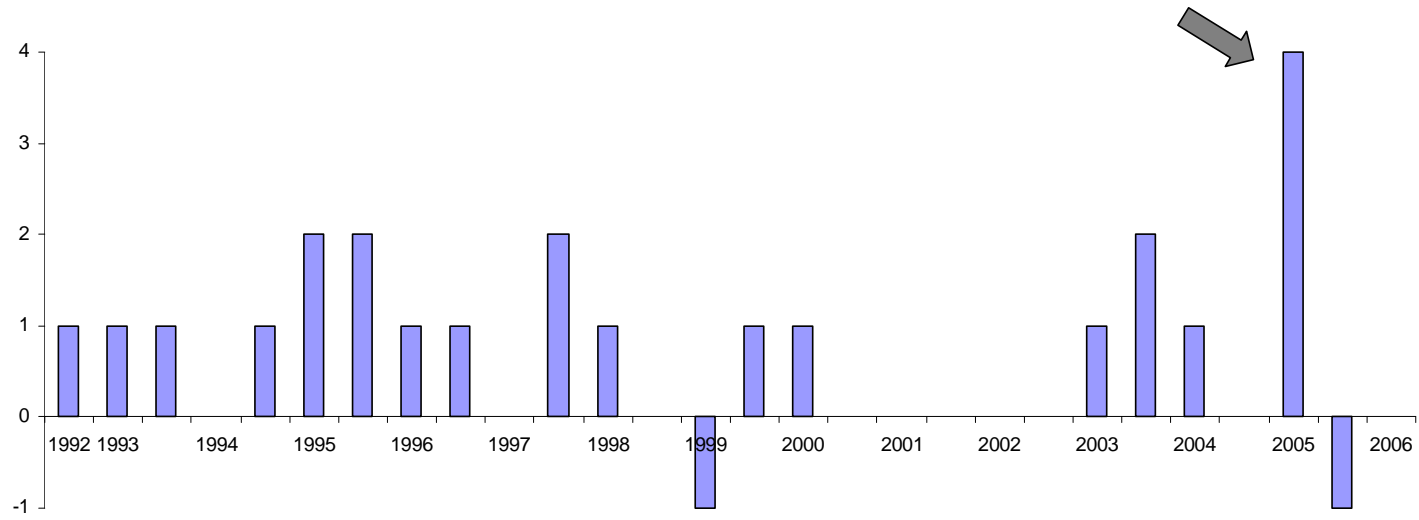
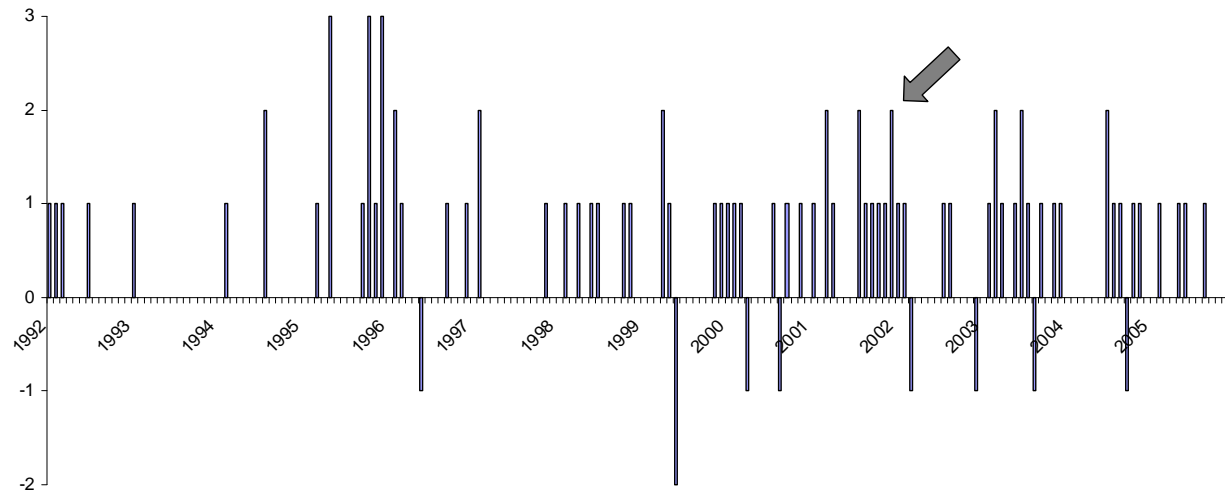


Figure 6.4. Violence Related to "Allsvenskan" Games
with Stockholm Clubs Minus Without



- To confirm the pattern observed in the figures, we perform a difference-in-difference analysis running the following regression:
- $$\text{Violence}_{it} = \alpha + \beta \cdot \text{Stockholm}_i + \gamma \cdot \text{Tsunami}_t + \delta(\text{Stockholm}_i \cdot \text{Tsunami}_t) + \theta_t + \varepsilon_{it}.$$

TABLE 6.1. THE EFFECT OF POLICING ON THE NUMBER OF INCIDENTS RELATED TO ICE HOCKEY

Dependent variable: Number of violent incidents			
Sample	[1]	[2]	[3]
Stockholm	0.630*** (0.236)	0.630*** (0.236)	0.630*** (0.178)
Tsunami	-0.333 (0.881)	-0.339 (0.899)	-3.394*** (0.829)
Stockholm*Tsunami	3.370*** (1.247)	3.370*** (1.259)	3.370*** (0.943)
Spring dummy	No	0.011 (0.238)	0.208 (0.189)
Year fixed effects	No	No	Yes
Constant	0.333 (0.167)	0.328 (0.204)	0.081 (0.352)
Adjusted R ²	0.262	0.248	0.577
Observations	56	56	56

Note: Standard errors below coefficients. *** indicates significance at the 1 percent level, ** at 5 percent and * at 10 percent.

TABLE 6.3. THE EFFECT OF POLICING ON THE NUMBER OF
VIOLENT INCIDENTS IN "ALLSVENSKAN"

Dependent variable: Number of violent incidents			
Sample	[1]	[2]	[3]
Stockholm	0.398*** (0.059)	0.398*** (0.059)	0.398*** (0.055)
Attack	-0.155 (0.560)	-0.340 (0.566)	-0.602 (0.551)
Stockholm*Attack	1.602** (0.792)	1.602** (0.787)	1.602** (0.750)
Season fixed effect	No	Yes	Yes
Year fixed effects	No	No	Yes
Constant	0.155 (0.042)	0.051 (0.109)	-0.074 (0.144)
Adjusted R ²	0.125	0.138	0.217
Observations	364	364	364

Note: Standard errors below coefficients. *** indicates significance at the 1 percent level, ** at 5 percent and * at 10 percent.

- We perform placebo treatments before and after the reallocation periods.

Table 5

Placebo treatments on the periods surrounding the reallocation periods

Dependent variable: Number of violent incidents		
Sample	Ice hockey	Soccer
Stockholm*Preceding period	-0.630 (0.975)	0.583 (0.815)
Stockholm*Reallocation period	3.370*** (0.975)	1.583** (0.815)
Stockholm*Subsequent period	-0.630 (0.975)	0.583 (0.815)
Stockholm	0.630*** (0.184)	0.417*** (0.059)
Preceding period	-0.259 (0.690)	-1.177 (0.576)
Reallocation period	-0.259 (0.690)	-1.177 (0.576)
Subsequent period	2.741*** (0.690)	-1.177 (0.576)
Constant	0.259** (0.130)	0.177 (0.041)
Adjusted R ²	0.49	0.12
Observations	60	390

Note: Standard errors below coefficients. *** indicates significance at the 1 percent level, ** at 5 percent and * at 10 percent.

- To exclude parallel trends, we finally show that other types of crime in Stockholm did not increase during the reallocation periods.

Table 6

Sensitivity analysis related to ice hockey

Dependent variable: Number of crimes per month (1995 - 2007)				
Sample	Violence	Violence	Theft	Theft
Jan 2005 - March 2005	52.5 (214.8)	-130.0 (88.5)	-2476.7** (975.7)	78.5 (449.8)
Month fixed effects	No	Yes	No	Yes
Year fixed effects	No	Yes	No	Yes
Constant	3001.8*** (86.9)	2463.0*** (50.3)	14132.4*** (135.3)	13283.3*** (255.2)
R ²	0.01	0.88	0.03	0.86
Observations	156	156	156	156

Note: *** indicates significance at the 1 percent level. ** at the 5 percent level and * at the 10 percent level.

Surveillance cameras and crime

- Surveillance cameras have become a popular method to combat crime.
- Only in the UK, there are about 4 million cameras.
- But there is a serious concern regarding intrusion upon privacy.
- Therefore, cameras should only be used if they are effective.

- But again, it is difficult to study the causality between law enforcement and crime.
- There is a large criminology literature that has studied the effect of cameras, but the papers typically suffer from either one of the following problems, or both:
 - The installation of cameras followed an increase in crime.
 - Several policy interventions were done at the same time.

Do Surveillance Cameras Affect Unruly Behavior? A Close Look at Grandstands

- In this paper, I look at how cameras affect unruly behavior inside stadiums.
- Remember, spectators sometimes throw objects onto the field.
- I find that cameras reduce this unruly behavior by as much as 65 percent.

Benefits of this analysis

- Substantial delays in the installations of the cameras generated exogenous variation in the introduction of the cameras.
- Cameras were introduced in 13 stadiums.
- Only cameras were introduced.
- The data on unruly behavior comes from the referees, not from the cameras.

- As dependent variable, I use the number of incidents when objects were thrown onto the field.



TABLE 1. THE INTRODUCTION OF SURVEILLANCE CAMERAS

Name of stadium	Home club	Proc. time (days)	Installed
Råsundastadion	AIK	57	1987
Nya Ullevi	Göteborg	730	1991
Olympia	Helsingborg	30	April 9, 1999
Gamla Ullevi	Örgryte, GAIS	90	July 4, 2000
Örjans Vall	Halmstad	31	July 13, 2000
Idrottsparken Sundsvall	Sundsvall	62	July 13, 2000
Ruddalens IP	Västra Frölunda	41	July 14, 2000
Rambergsvallen	Häcken	46	July 14, 2000
Parken	Norrköping	52	July 19, 2000
Eyravallen	Örebro	35	July 21, 2000
Stockholms Stadion	Djurgården	85	August 18, 2000
Ryavallen	Elfsborg	30	September 7, 2000
Vångavallen	Trelleborg	71	October 9, 2000
Söderstadion	Hammarby	413	October 13, 2000
Malmö Stadion	Malmö	49	April 4, 2001

Figure 6.6. Changes in the Number of Incidents per Game when Cameras were Introduced

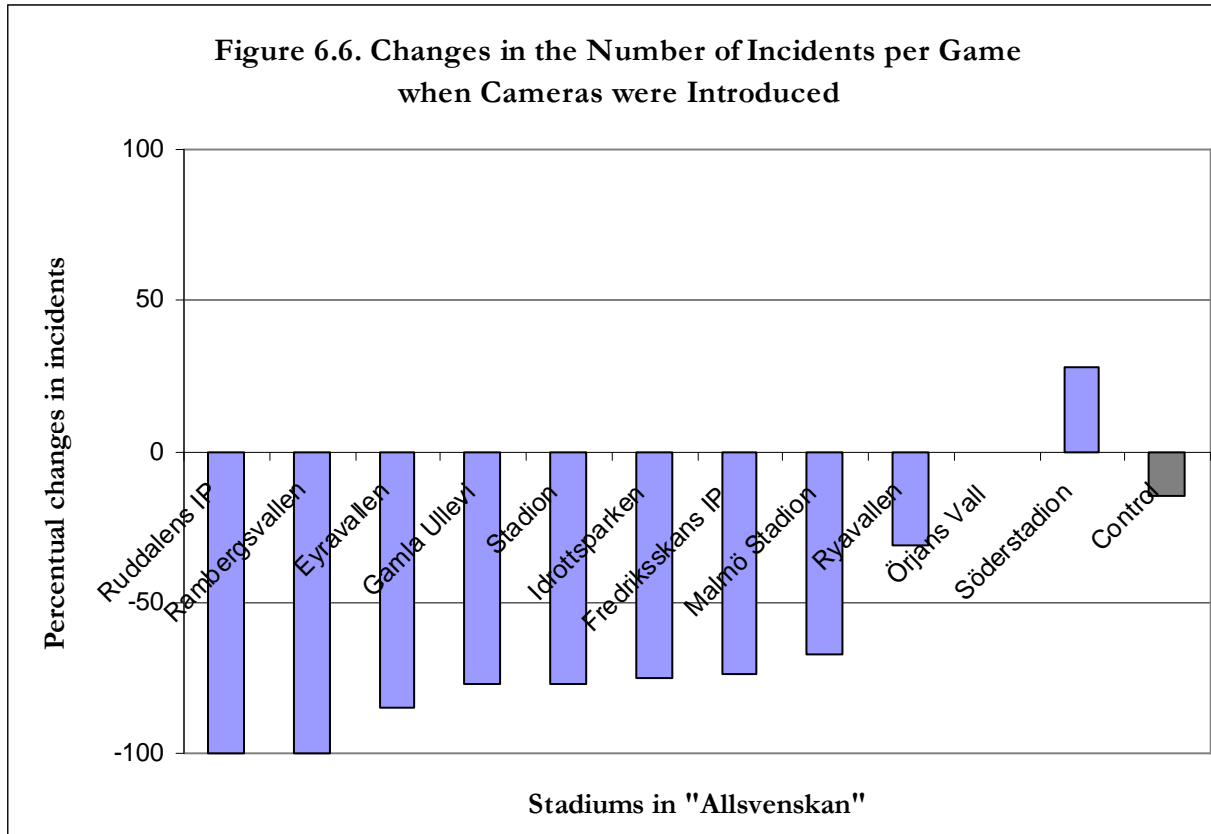
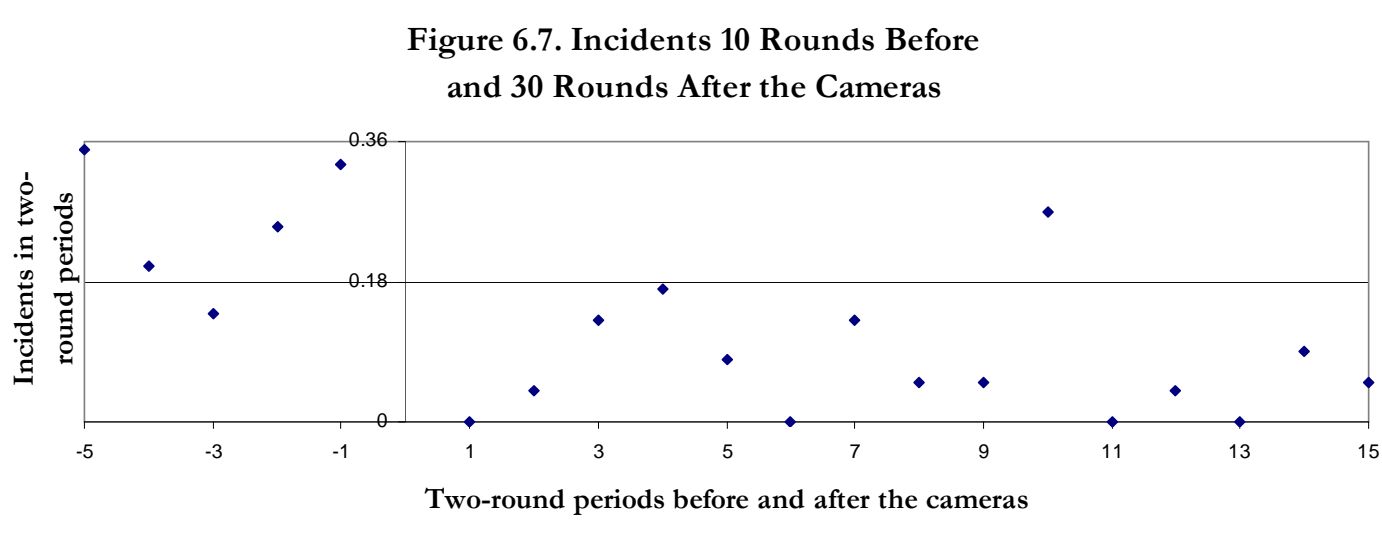


Figure 6.7. Incidents 10 Rounds Before and 30 Rounds After the Cameras



- To confirm the pattern, I run the following regression:

$$Y_{ij} = \alpha_i + \beta \text{camera}_{ij} + v_{ij},$$

- Y_{ij} denotes the number of incidents in game i in stadium j .
- α_i is a stadium fixed effect.
- The parameter β measures the effect of having cameras on the unruly behavior by spectators.

TABLE 6.10. SURVEILLANCE CAMERAS AND
UNRULY BEHAVIOR INSIDE STADIUMS

Dependent variable: Number of incidents with objects thrown onto field			
Sample	[1]	[2]	[3]
Surveillance cameras	-0.16**	-0.16**	-0.27**
	(0.07)	(0.08)	(0.11)
Month fixed effects	No	Yes	Yes
Linear stadium specific trend	No	No	Yes
R ²	0.11	0.11	0.13
Observations	1273	1273	1273

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level and * at the 10 percent level. The full data set (1999-2005) is used. The regressions include stadium fixed effects and the standard errors are clustered at the level of the stadiums.

TABLE 6.11. SURVEILLANCE CAMERAS AND UNRULY BEHAVIOR
INSIDE STADIUMS, REDUCED SAMPLE SIZE

Dependent variable: Number of incidents with objects thrown onto field				
Sample	One year	Six rounds	Four rounds	Two rounds
Surveillance cameras	-0.21** (0.09)	-0.16** (0.06)	-0.20 (0.11)	-0.21 (0.17)
R ²	0.09	0.12	0.19	0.3
Observations	354	165	112	56

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level and * at the 10 percent level. The regressions include stadium fixed effects and the standard errors are clustered at the level of the stadiums.

Displacement effects

- When the police cracks down on crime in one area, it may be displaced elsewhere.
- I am able to test this using unique data on hooliganism outside the stadiums where cameras are not allowed.

TABLE 6.18. SURVEILLANCE CAMERAS AND UNRULY BEHAVIOR OUTSIDE STADIUMS

Dependent variable: Disorder outside the stadium (0,1)		
Sample	Full data set	One year
Surveillance cameras	-0.01 (0.02)	-0.02 (0.06)
R ²	0.10	0.09
Observations	860	169

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level and * at the 1 percent level. The regressions include stadium fixed effects and the standard errors are clustered at the level of the stadiums.

The Effects of Surveillance Cameras on Crime: Evidence from the Stockholm Subway

- Beginning in 2006 and during 2007 and 2008, the firm running the Stockholm subway (SL) installed surveillance cameras in the subway.
- I find that crime was reduced by 20 percent in the stations in the city (only).
- The effect was large for planned crime and non-existent for other types of crime.

Data

- To increase the feeling of safety for the travelers, SL has decided that all stations should get surveillance cameras installed.
- The introduction was performed block by block where a block is a certain part of one of the subway lines.
- The particular configuration of the blocks was made “for practical reasons”.

Dates of installation

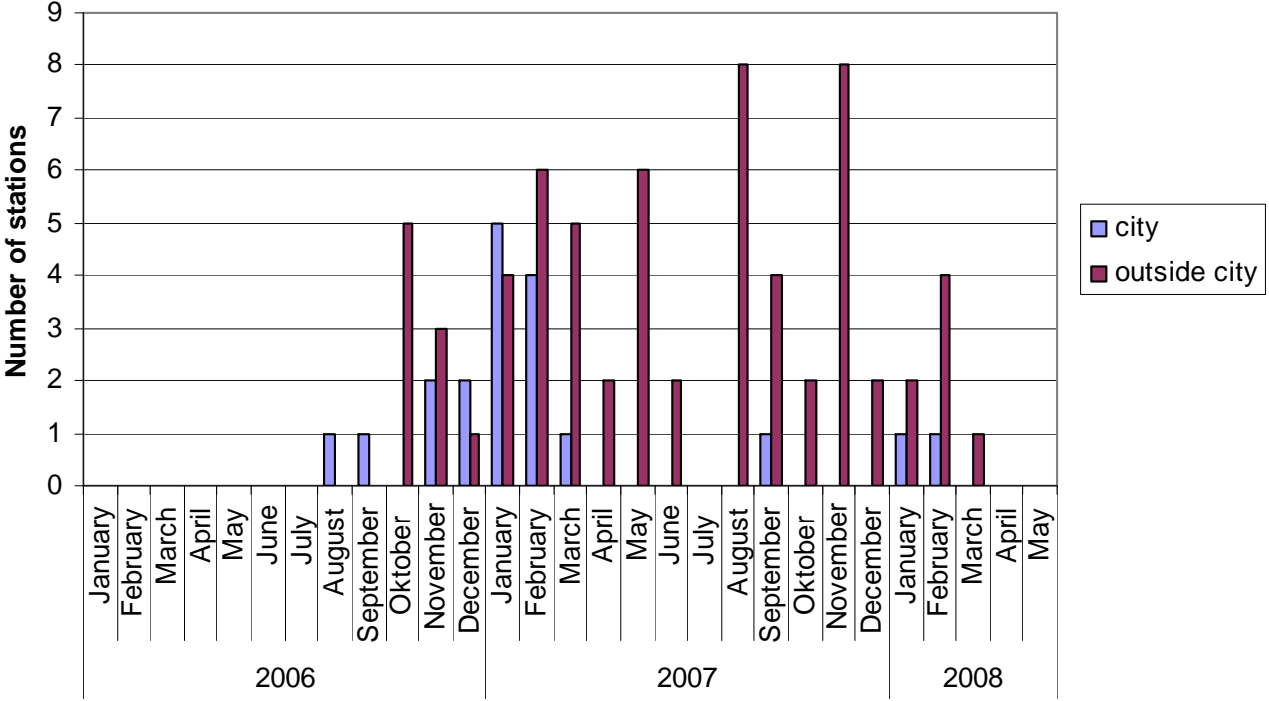
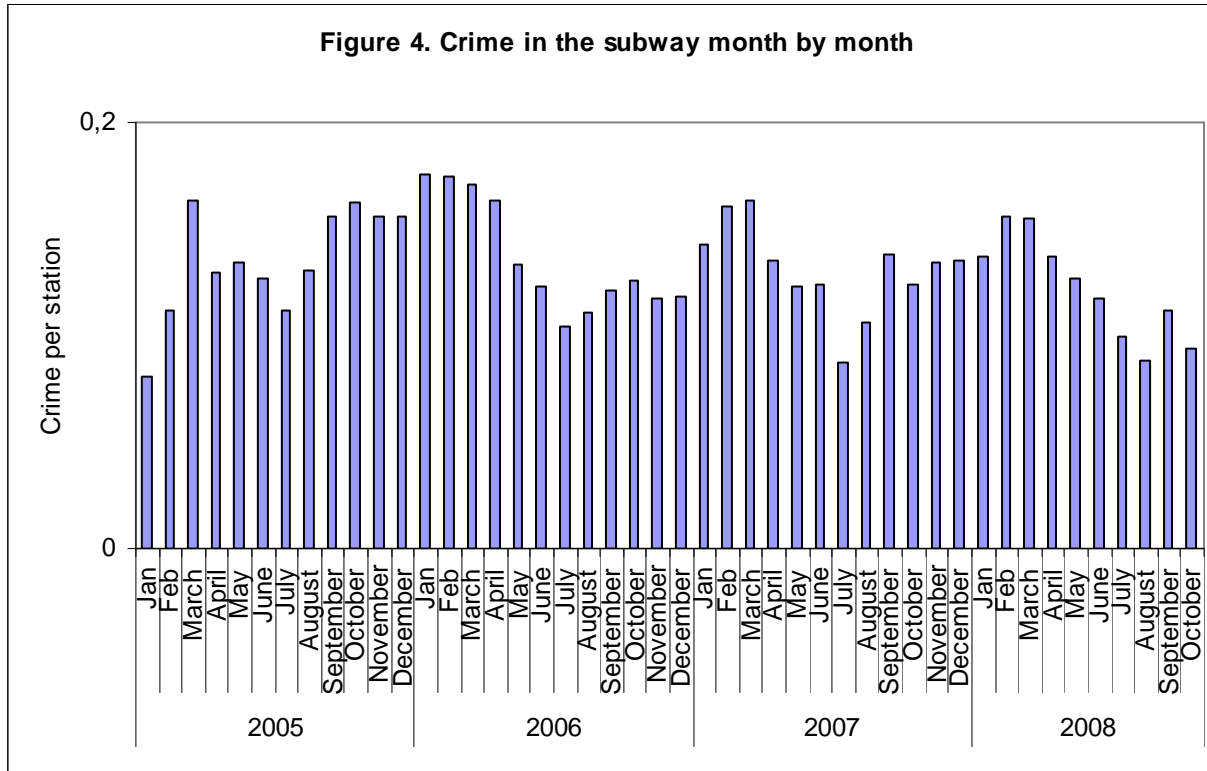


Figure 4. Crime in the subway month by month



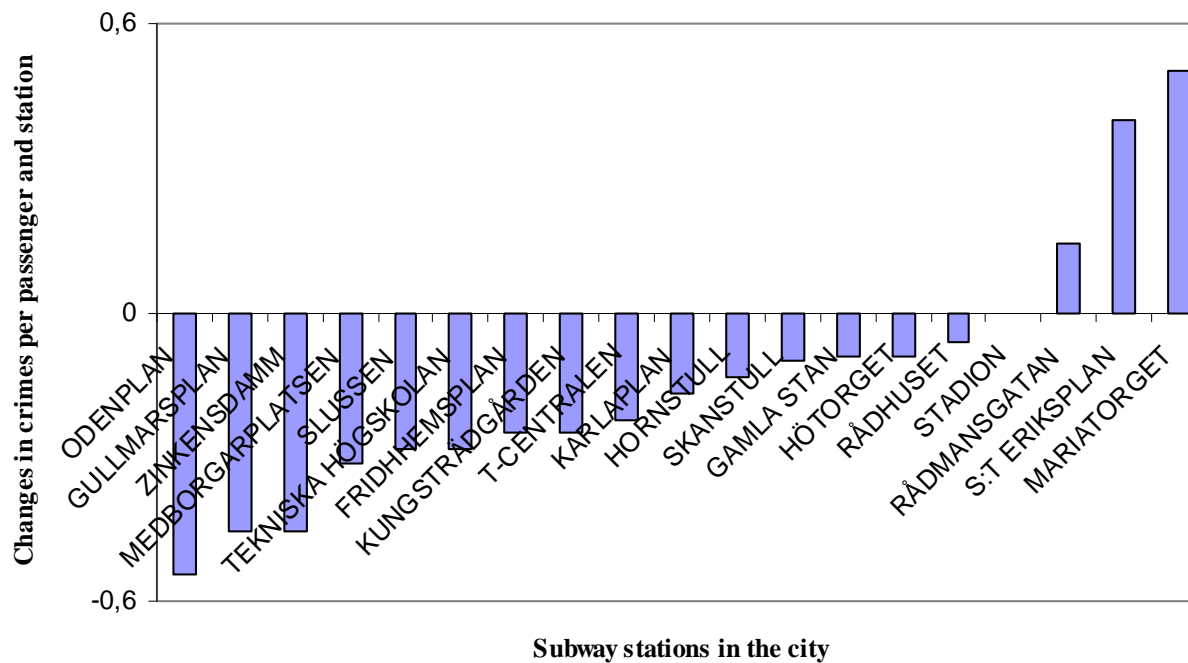
- Data on crime is obtained from the Swedish police.
- The number of passengers entering the trains is counted automatically by sensors attached to the trains.

Table 1. Summary Statistics

	Mean	St. Dev.	Min	Max	Number of obs.
Crime if city=1 and camera=0	0.39	1.16	0	29	15526
Crime if city=1 and camera=1	0.3	0.97	0	18	10485
Crime if city=0 and camera=0	0.08	0.4	0	14	77566
Crime if city=0 and camera=1	0.09	0.46	0	15	33323
Passengers	10723	18614	1000	161138	136900
Passengers if city=1	32080	34575	6472	161138	26011
Passengers if city=0	5714	3913	1000	24153	110889
Crime per passenger* if city=1 and camera=0	0.11	0.46	0	28	15526
Crime per passenger if city=1 and camera=1	0.09	0.39	0	11	10485
Crime per passenger if city=0 and camera=0	0.16	0.98	0	45	77566
Crime per passenger if city=0 and camera=1	0.16	1.02	0	50	33323

The unit of interest is days for crime and years for passengers. *Crime per passenger is multiplied by 10 000.

Figure 3. Changes in crimes per passenger and station in the city when surveillance cameras were introduced



- Let Y_{ij} denote the number of reported crimes per passenger in station i in period j .
- I will run the regression

$$Y_{ij} = \alpha_i + \beta \text{camera}_{ij} + \gamma \text{camera}_{ij} * \text{city}_i + \theta_{ij} + v_{ij}.$$

Results

TABLE 2. SURVEILLANCE CAMERAS AND CRIME IN THE SUBWAY

Dependent variable: crime/passenger				
Sample	[1]	[2]	[3]	[4]
Camera*City		-0.031*** (0.012)	-0.031*** (0.011)	-0.033*** (0.009)
Camera	-0.007 (0.007)	0.014 (0.009)	0.004 (0.011)	0.013 (0.008)
Year, month and day fixed effects	Yes	No	Yes	Yes
Observations weighted by passengers	Yes	No	No	Yes
Constant	0.155*** (0.012)	0.148*** (0.002)	0.158*** (0.016)	0.155*** (0.016)
R ²	0.01	0.01	0.01	0.01
F-test of joint significance of Camera and Camera*City (p-value within paranthesis)		5.28 (0.024)	5.63 (0.020)	7.95 (0.006)
Observations	136900	136900	136900	136900

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level. The regressions include station-fixed effects and the standard errors are clustered at the level of the stations.

TABLE 3. SURVEILLANCE CAMERAS AND CRIME IN THE SUBWAY
COLLAPSED TO MONTHLY DATA

Dependent variable: crime/passenger			
Sample	[1]	[2]	[3]
Camera*City	-0.031*** (0.012)	-0.032*** (0.012)	-0.033*** (0.009)
Camera	0.014 (0.012)	0.005 (0.012)	0.014 (0.009)
Year, month and day fixed effects	No	Yes	Yes
Observations weighted by passengers	No	No	Yes
Constant	0.148*** (0.002)	0.131*** (0.010)	0.126*** (0.006)
F-test of joint significance of Camera and Camera*City (p-value within paranthesis)	5.14 (0.026)	5.10 (0.026)	6.64 (0.011)
R ²	0.15	0.16	0.22
Observations	4500	4500	4500

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level. The regressions include station-fixed effects and the standard errors are clustered at the level of the stations.

- Compared to the average crime rate in stations in the city before cameras were installed, 0.11, the cameras generated a 20-percent reduction in crime.
- This is equal to a reduction by approximately 24 crimes per station and year.

- Why do cameras deter crimes in the city only?
 1. SL has employees who take phone calls and then call for guards and police. They can come faster to the crime scene in the city.
 2. Criminal gangs tend to prey on passengers in the stations in the city, and members of those gangs may be particularly careful when cameras are at work.

TABLE 4. SURVEILLANCE CAMERAS, PICKPOCKETING
DRUG-RELATED CRIME AND ROBBERY IN THE SUBWAY

Dependent: variable column [1] and [2] pickpocketing/passenger, and column [3] and [4] drug-related crime/passenger, and [5] and [6] robbery/passenger.

Sample	[1]	[2]	[3]	[4]	[5]	[6]
Camera*City	-0.006*** (0.002)	-0.007*** (0.001)	-0.005 (0.005)	-0.007 (0.005)	-0.002** (0.001)	-0.002** (0.001)
Camera	0.002 (0.001)	0.004** (0.002)	-0.001 (0.005)	0.001 (0.003)	0.001 (0.001)	0.001 (0.001)
Year, month and day fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations weighted by passengers	No	Yes	No	Yes	No	Yes
Constant	0.014*** (0.003)	0.017*** (0.003)	0.005*** (0.003)	0.027*** (0.005)	0.000 (0.001)	0.000 (0.001)
R ²	0.002	0.003	0.006	0.009	0.002	0.002
F-test of joint significance of Camera and Camera*City (p-value within paranthesis)	6.65 (0.011)	2.73 (0.101)	1.42 (0.024)	4.10 (0.046)	2.16 (0.145)	2.47 (0.112)
Observations	136900	136900	136900	136900	136900	136900

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

The regressions include station-fixed effects and the standard errors are clustered at the level of the stations.

- Pick pocketing was reduced by 20 percent and drug-related crime by 40 percent.

TABLE 5. PLACEBO TREATMENTS

Dependent variable: crime/passenger				
Sample	[1]	[2]	[3]	[4]
Placebo 3 months * city		-0.022 (0.017)		
Placebo 3 months	0.005 (0.012)	0.003 (0.014)		
Placebo 12 months			-0.039 (0.012)	-0.005 (0.013)
Placebo 12 months * city				-0.003 (0.011)
Camera * City		-0.030** (0.013)		-0.030** (0.034)
Camera	-0.004 (0.012)	0.002 (0.012)	-0.010 (0.020)	-0.004 (0.021)
Constant	0.139*** (0.010)	0.138*** (0.010)	0.138*** (0.010)	0.138*** (0.0010)
F-test of joint significance of Placebo 3 months and Placebo 3 months*City (p-value within paranthesis)		1.61 (0.21)		
F-test of joint significance of Placebo 12 months and Placebo 12 months*City (p-value within paranthesis)				0.38 (0.54)
R ²	0.16	0.16	0.16	0.16
Observations	4500	4500	4500	4500

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

The regressions include station-fixed effects and the standard errors are clustered at the level of the stations.

The regressions include year and month fixed effects.

- There were no significant changes in the crime levels before the introduction.

Displacement effect

- I have coded crimes that take place just outside the stations separately and find a significant displacement effect.

TABLE 6. SURVEILLANCE CAMERAS AND CRIME OUTSIDE THE SUBWAY

Dependent variable: crime/passenger		
Sample	[1]	[2]
Camera*City	0.001 (0.001)	0.002 (0.001)
Camera	0.002 (0.002)	0.000 (0.001)
Year, month and day fixed effects	Yes	Yes
Observations weighted by passengers	No	Yes
Constant	0.014*** (0.005)	0.006*** (0.002)
F-test of joint significance of Camera and Camera*City (p-value within paranthesis)	4.75 (0.032)	7.27 (0.008)
R ²	0.002	0.002
Observations	117734	117734

Note: *** indicates significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level. The regressions include station-fixed effects and the standard errors are clustered at the level of the stations.

Cost benefit analysis

- The costs of installing the cameras is 33 million SEK.
- According to my estimates, the cameras deter 450 crimes per year but 125 of those were displaced.
- Assume that the cameras last for five years and (for now) that there are no costs of intrusion upon privacy.
- The cost to reduce one crime is then 20 000 SEK.

- It is hard to estimate the value of a crime that is avoided.
- In a SL survey, 11 percent of women feel more safe in 2009 compared to 2006 (which may or may not be due to the cameras).
- It seems to me that the benefits may be higher than 20 000 crowns.
- Finally, it seems possible that the results can be generalized to subways in other countries.

- Summing up, we have found evidence that young, uneducated men are anti-social and mid-aged educated women are pro-social.....
- Our overall message is positive:
- Many people behave pro-socially.
- Many criminals committing planned crimes, as well as hooligans, seem to be highly sensitive to police and crime.
- This is good news for policy makers who attempt to reduce this behavior.