Discussion of Mello (2018) "More COPS, Less Crime"

Owen Zidar
Chicago Booth and NBER

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Overview

Interesting, well executed paper!

1. **Policy relevant question:** What is the effect of additional police on local criminal activity?

2. **Nice variation:** ARRA police funding index increased COPS in some locations

3. **Compelling graphs:** Raw data and event studies look convincing

4. **Interesting Results:**
   - Average grant increased police by 0.7 per 10,000 residents (or 6% increase in police)
   - Each officer reduces 4.3 violent crimes and 15.4 property crimes
   - Benefit of $35 per resident vs $29 cost

Economic Questions

I'd like the paper to help us think more about the following questions:

1. What is the value of a marginal police officer?
2. How many police officers should we hire?
3. How should they be allocated? Should police focus more on violent crime?

Economic Framework

Local governments produce safety

$$y = f(L)$$

- y are units of safety
- L is number of police officers

Local governments maximize:

$$\max_L pf(L) - wL$$

- p is the value of a unit of safety
- w is wage of police officers

Should we hire more police officers?

FOC

$$pf'(L) = w$$

- $pf'(L)$ is the marginal value of safety
- w is the marginal cost of safety

Estimates suggest that $pf'(L) > w$

- Estimate of marginal benefit from Table 2 is \$35.2 per 10K residents
- Direct cost is roughly \$29 per 10K residents

$\Rightarrow L < L^*$

Keep hiring police until these are equal!

Economic framework with two types of crimes

Two types of safety y:

- safety from violent crime y_1
- safety from property crime y_2

Local governments maximize:

$$\max_{L_1, L_2} p_1 f(L_1) + p_2 g(L_2) - w(L_1 + L_2)$$

- p_1 is the value of a unit of safety from violent crime
- p_2 is the value of a unit of safety from property crime
- L_1 is number of police officers allocated to reducing violent crime
- L_2 is number of police officers allocated to reducing property crime
- Note main outcome in paper is approx $\$68,000 \times y_1 + \$4,000 \times y_2$

Optimal policing of violent crime?

FOC for violent crimes:

$$p_1 f'(L_1) = w$$

- p_1 is approx \$68,000
- $f'(L_1) = 4.3$, i.e., hiring one more officer reduces # of violent crimes by 4.3
- Marginal benefit is $4.3 \times \$68,000 \approx \$292,400$

If local governments are optimizing, then

$$\underbrace{f'(L_1)}_{\text{Marginal product}} = \frac{w}{\$68,000}$$

Optimal policing of property crime?

FOC for property crimes:

$$p_2 g'(L_2) = w$$

- p_2 is approx \$4,000
- $f'(L_2) = 15.4$, i.e., hiring one more officer reduces # of property crimes by 15.4
- Marginal benefit is $15.4 \times \$4,000 \approx \$61,600$

If local governments are optimizing, then

$$\underbrace{g'(L_2)}_{\text{Marginal product}} = \frac{w}{\$4,000}$$

Should police focus more on violent crime reduction?

FOCs for violent and property crimes:

$$p_1 f'(L_1) = w$$
$$p_2 g'(L_2) = w$$

But $p_1 f'(L_1) = \$292,000 > p_2 g'(L_1) = \$62,000$

If local governments are optimizing, then

$$\underbrace{\$68,000}_{\text{Value of output}} = \underbrace{\frac{w}{f'(L_1)}}_{\text{cost per marginal unit of output}}$$

$$\underbrace{\$4,000}_{\text{Value of output}} = \underbrace{\frac{w}{g'(L_2)}}_{\text{cost per marginal unit of output}}$$

Seems like police should focus more on violent crime given p_1 and p_2

Regional Variation

Should the per capita size of the police force vary across locations?

FOC

$$p_c f'(L_c) = w_c$$

- $p_c f'(L_c)$ is the marginal value of safety in location c
- w_c is the marginal cost of safety in location c

Would be interesting to analyze heterogeneity based on variation in

- Initial force size L_c varies (so can trace out $f'(L_c)$)
- Local cost of safety w_c
- Local value for safety p_c can vary

Demand for safety

Where do the estimates of p_1 and p_2 come from?

Resident utility depends on level of safety and other consumption:

$$max_{x,y} U(x, y) \;\; s.t. \;\; p_y y + p_x x = M$$

- y is units of safety
- x is a composite of other goods
- M is income (and λ is MU of income)

FOC: $\frac{\partial U}{\partial y} = \lambda p_y$ suggests that:

- Marginal utility of safety depends on level of safety (so level of L)
- Value of safety $\frac{\frac{\partial U}{\partial y}}{\lambda}$ is increasing in income (since λ is decreasing in M)
- Thus, p_y should depend on level of L and local incomes

Concluding comments

Estimates are interesting inputs for welfare analysis of an important non-traded good

1. **Welfare analysis** Could think about effective cost w that includes overhead and MCPF that would rationalize current hiring levels
2. **Time allocation** Could weigh into debates about how police spend their time (violent crime vs property crime)
3. **Supply side** Could learn more about production function of safety $f(L)$ and $g(L)$
4. **Demand side** Could think more about value of unit of safety and the efficiency vs equity considerations of how police spending is allocated
5. **Evaluating current police spending** What social welfare function and/or cost of public funds are consistent with the level and allocation?