The determinants of local police spending

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Introduction (I)

- There are 43 territorial police forces in England and Wales ▸ Map

  - Each with its own budget and responsibility for financing its services

- Forces obtain income from two main sources:

  1. Grants from central (and local) government
  2. An addition to local council tax - the police 'precept'

- Grant funding allocated between forces by central government based on relative needs (up to 2012-13)

- The precept level is set locally to fund the difference between desired spending and grant income

  - Desired spending decided by Police Authorities (pre-2012) = 17 members: 9 from local authority, 8 independent (3+ magistrates)
  - Some constraints imposed by central government (different arrangements for capping precept increases in place at different points time)
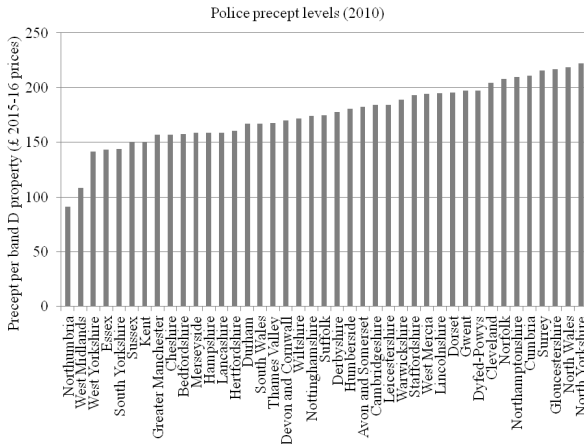
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- Spending per capita varies across the country:

Police spending per capita (2010)
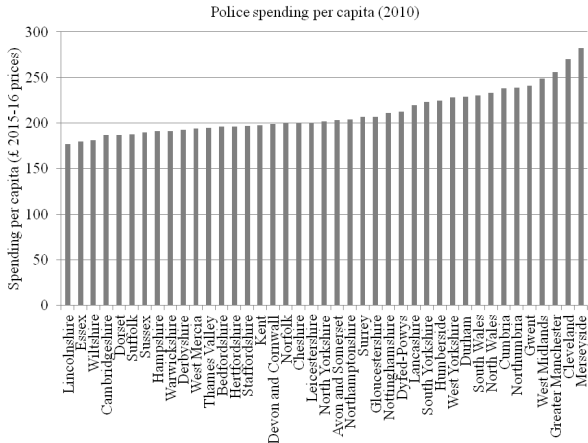
- There is also considerable variation in precept levels across the country:

Police precept levels (2010)

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- This has been of explicit and implicit recent policy concern:
  - Elected Police and Crime Commissioners (PCCs) replaced police authorities in 2012 to increase local accountability
  - Home Office currently planning to reform the grant allocation formula
  - Spending Review 2015 announced "greater flexibility [for PCCs] in their local funding decisions by rewarding those areas which have historically kept council tax low"

- Also it has resulted in (unintended?) distributional implications from the governments' recent public spending austerity
  - Since 2013-14 police forces have been given the same % cuts to their grants
  - Implies a greater spending power reduction for those who are relatively more reliant on grants (as opposed to precept revenues)

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- BUT what drives the variation in spending levels and precept rates?

  1. Differences in needs?
  2. Differences in grants (conditional on need)?
  3. Differences in local demand for police spending (e.g. due to income differences, different taxable capacity, different preferences)?
  4. Other political economy or efficiency reasons?

- Greater understanding of this is important for policy makers

  - (1) may imply grant allocation formula needs reform to better reflect needs
  - (3) may imply grant allocation formula needs reform for redistributive reasons (e.g. to compensate for different taxable capacity)
  - (4) may imply role for other policy intervention to ensure local decision makers act in local individuals' interests

- The aim of this paper is therefore to better understand variations in police spending per capita

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Related literature

- Long history of literature on demand for public goods

  - Borcherding & Deacon (1972), Bergstrom & Goodman (1973): using individual preference theory to put structure on correlations between spending and local characteristics
  - Ohls & Wales (1972), Baum (1986), Bahl, Gustely & Wasylenko (1978): emphasise the importance of the distinction between demand and supply
  - Bradford, Malt & Oates (1969), Schwab & Zampelli (1987): highlight the important distinction between the public good provided (e.g. police officers) and what is of concern to private residents (e.g. public safety)
  - Schokkaert (1986), Preston & Ridge (1995): using individual level data to estimate preference parameters

- Some more recent directions in the literature:

  - Exploration of the 'flypaper effect': Inman (2008)
  - Political influences on locally raised revenues: Borge (1995), Allers, de Haan & Sterks (2001)
  - Composition of public spending: Tridimas (2000)

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Some heading...

Setting in this paper has two particular complications:

1. Important distinction between the public good provided (e.g. police officers) and what is of concern to private residents (e.g. public safety)

   - Bradford, Malt & Oates (1969), Schwab & Zampelli (1987)
   - Relationship between these differs across areas (e.g. in areas due to different propensities for crime)

2. Grants from central government are determined by this relationship

   - Areas with higher 'needs' (e.g. need a large number number of police officers for a given level of public safety) receive larger grants
   - One posited explanation for the 'flypaper effect' (Hamilton 1983)

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Model (I)

Individuals' demand for police services

- Utility derived from consumption of police services Z_i and other consumption C_i, and depends on local needs for police services d:

$$U_i = U(Z_i, C_i, d)$$

- Private income Y_i must cover both their consumption C_i and their contribution to the local funding of police services:

$$Y_i = C_i + \pi_i(QP_q - G)$$

where Q is local police services per capita, P_q is price of police services, G is grant funding per capita

- Police services may not be a pure public good

$$Z_i = Qn^{1-\kappa}$$

- Individuals face the standard maximisation problem:

$$\max_{Z_i} \ U(Z_i, C_i, d) \text{ s.t. } m_i = C_i - \rho_i Z_i$$

where $m_i = Y_i + \pi_i G$ is individual income and $\rho_i = \pi_i P_q n^{\kappa - 1}$ is the individual tax price of police services

- Solution yields individuals' demand for police spending per capita:

$$S_i^* = (\rho_i / \pi_i) f(m_i, \rho_i, d)$$

Model (III)

Public choice mechanism

- To get from individual preferences to public choice over public spending we need to consider (Borcherding and Deacon, 1972):

    1. Mechanism for aggregating individual preferences
    2. Preferences of the police authority
    3. Costs to the police authority

- Assume that police authority sets spending with reference to the optimal demand of the median voter $S_{m,F}^*$

- Also allow for ideology of the police authority I_F and the efficiency of the police authority E_F to matter

- Then:

$$S_F = g(S_{m,F}^*, I_F, E_F)$$

$$t_F = (1/b_F)(g(S_{m,F}^*, I_F, E_F)) - G_F$$

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Case 1: Grant funding perfectly compensates for different needs

$$ln(Z_{m,F}) = \beta_0 + \beta_1 ln(Y_{m,F}) + \beta_2 ln(\rho_{m,F})$$

$$ln(S_F - G_F) = \alpha_0 + \beta_1 ln(Y_{m,F}) + (1+\beta_2)ln(\rho_{m,F}) - ln(\pi_{m,F})$$

$$ln(S_F - G_F) = \alpha_0 + \beta_1 ln(Y_{m,F}) + \beta_2 ln(\pi_m, F) + (1+\beta_2)(\kappa-1)ln(n_m, F) + (1+\beta_2)P_q$$

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