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DISAGGREGATING DENSITY: A KNOWLEDGE SPILLOVER ANALYSIS USING GEO-CODED DATA

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SUMMARY

- Estimate ln (wage) with geo-coded square data and individual attributes.
- “Densities” depend on spatial scales: Compare parameters across various size of “squares”.
- The difference in parameters is interpreted as “spillover” effects.

DISCUSSION

- Geo-coded data:
  - In Japan, so-called “third-level mesh” is defined as a rectangular area 45” wide and 30” height.
  - In Tokyo (35° 40’N), its size is 1130.9m×924.2m.
  - In high-latitude region, like Stockholm (59° 20’N), width may be much shorter, and the size difference may not be ignored.
- Male shares:
  - Unchanged with the size of squares; why?

DISCUSSION

- Basic formula: micro panel

$$\ln w_{it} = \alpha + \ln X'_{jt}\beta + Z'_{it}\gamma + \lambda_{it} + \varepsilon_t$$

I: number of individuals, J: number of squares.

K,L: numbers of explanatories re. (i, j)

- For fixed t, LHS(I×1), X(J×L), Z(I×K) :

→ Some (I×J) conversion matrix is necessary.

- Does unique j (possibly the place of residence) corresponds to each person?

- Fixed effects: $u_{it} = \lambda_i + \mu_t + \varepsilon_{it}$ $\quad u_{it} = \lambda_i + \varepsilon_{it}$

DISCUSSION

- Spill-over is considered in terms of size of squares.

→ Spill-over effect exists if parameter is smaller for larger squares?

- Spill-over may better be considered using spatial contiguity ω.

$$\ln w_{it} = \alpha + \omega_{ij} \ln X'_{jt}\beta + Z'_{it}\gamma + u_{it}$$