Comments on, 'National Transportation Networks, Market Access, and Regional Economic Growth'

Ian Herzog

Matthew A. Turner

Brown University

July 24, 2020

The effects of highways on growth

- Long panel of country level data on population, employment and payroll.
- A model that incorporates the effect of roads on commuting and trade explicitly.
- A new instrument. This is the main contribution.

Main regression:

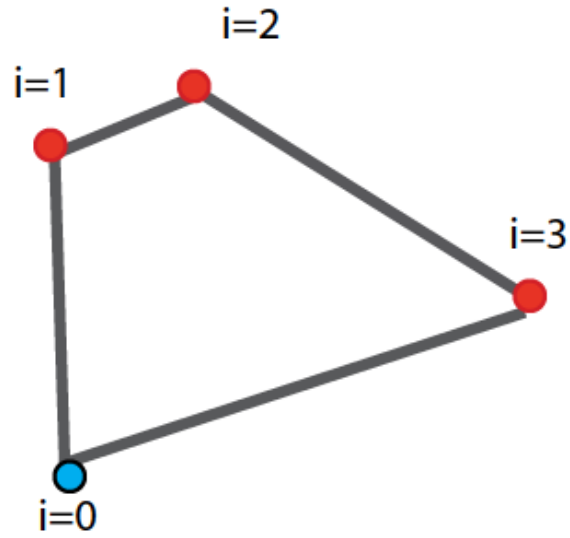
$$
\begin{aligned}
y_{it} &= \text{employment in county } i, \text{ year } t \\
R_{it} &= \text{Highway km per km}^2 \text{ of county area} \\
time_{ijt} &= \text{travel time between counties } (i, j) \\
MA_{it} &= \sum_{\{j:|i-j|<100km\}} y_{jt_0} \left[time_{ijt}\right]^{-1.5}
\end{aligned}
$$

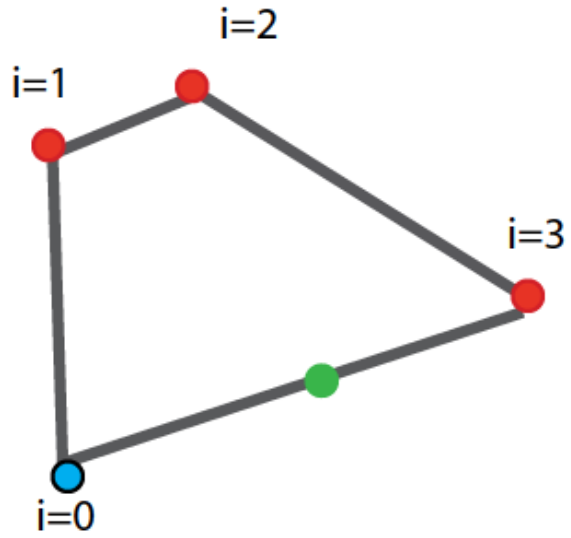
Estimate:

$$
\begin{aligned}
\ln y_{it} &= A_0 + A_1 \ln MA_{it} + A_2 \ln R_{it} + \epsilon_{it} \\
\ln MA_{it} &= B_0 + B_1 \ln z^1_{it} + \eta_{it} \\
\ln R_{it} &= C_0 + C_1 \ln z^2_{it} + \mu_{it}
\end{aligned}
$$

z^1 is new.

Market Access and Incidental Connections

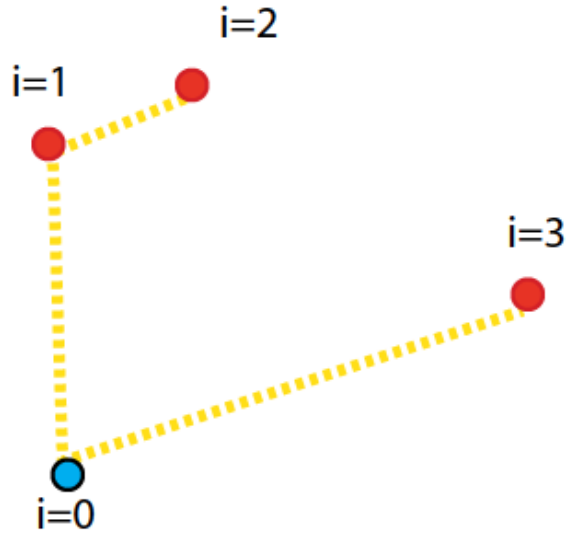


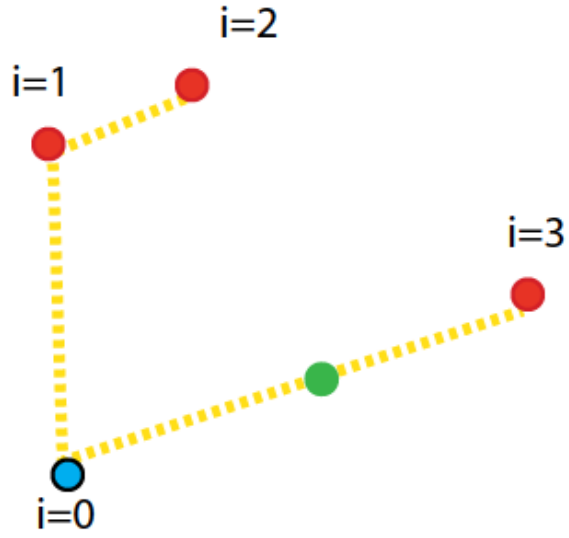


- Blue dots – LHS cities
- Red dots – cities targeted by 1947 highway plan. These are 'important places'.
- Green dot – an 'unimportant place' (i.e., Radiator Springs).
- Black – actual highway in t.

If green dots affect productivity of red dots only through trade, then we can evaluate the effect of MA_0 on y_0 by comparing these two cities. This is a neat generalization of Chandra and Thompson (RSUE 2000).

Market Access and Incidental Connections – highway plan

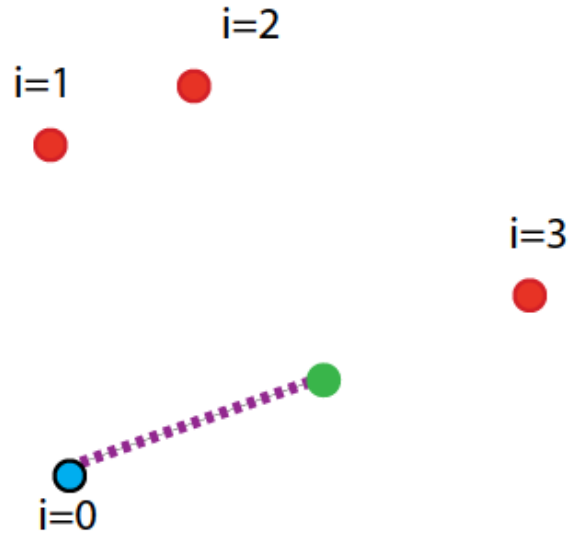




- Blue dots – subject cities
- Red dots – cities targeted by 1947 highway plan. These are important places.
- Green dot – an ‘unimportant place’ (Radiator Springs).
- Yellow – 1947 plan.

We can also do the corresponding comparison on the basis of planned highways. I don’t see why this is better.

Market Access for Incidental Connections – highway plan



- Blue dots – subject cities
- Red dots – cities targets by 1947 highway plan. These are important places.
- Green dot – an ‘unimportant place’ (Radiator Springs).
- Purple – incidental connection 1947 plan.

We can also do the corresponding calculation for planned highways and incidental connections. This is the instrument the paper uses. Isn’t this a little indirect? Recall, everything is in logs.

Other comments

This is an important question and there is now a pretty big literature on this. Differences across papers:

- MSAs vs counties
- years – at 1950 to 2010 you are as good as anyone.
- long-differences versus changes-on-levels. (These nest in distributed lag model).
- Market Access versus quantity measures.
- Instruments.
- ... and structural papers.

Technique is clearly first order for the outcome. Please do a literature survey that lays all of this out and where you fit.

Other comments

The structural model doesn't link tightly to the reduced form results.

- Can you state your endogeneity problem and exogeneity condition explicitly in the context of the model? I think your instrument should be

  z_{it} = (Market access) - (Market access w/o incidental cities)

  This is the quasi-random component of market access, the part due to incidentally connected cities. I don't think you even need the 1947 highway plan. Stating your endogeneity problem precisely would let you explain why I am wrong (or not).
- I expected to see covariance of pairwise transportation costs orthogonal to productivity and amenities in incidental cities as a moment condition used to estimate the model.