

Discussion of Balboni's "In Harm's Way: Infrastructure Investments and the Persistence of Coastal Cities"

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19 November 2020

Applied GE model: Quantitative answers to infrastructure-policy questions

- Quantitative spatial models import tractable techniques from quantitative models of international trade (CES + logit)
- Crucial to evaluate model performance in predicting policy effects (Kehoe 2005; Kehoe, Pujolas, Rossbach 2017)

Confidence-building measures for economists and policymakers:

- Static mechanisms: Magnitudes of trade elasticity and district productivities
 1. IV from Ho Chi Minh National Highway to check σ
 2. Firm-level TFP estimates to check A_i in cross section
- Dynamic mechanisms: More reassurances needed

Model fit: Trade elasticity

Market access computed using $\sigma = 7$ but 2SLS estimate says $\sigma = 2$

$$\Delta \ln w_i = \beta \Delta \ln MA_i + \gamma X_i + \delta_r + \epsilon_i$$

$$\Delta \ln w_i = \frac{1}{\sigma} \Delta \ln MA_i(\sigma) + \gamma X_i + \delta_r + \epsilon_i$$

Table 4: Model-derived estimation: effects of market access changes

Dependent variable: $\Delta \ln$ expenditure per capita	OLS	OLS	IV	IV
$\Delta \ln$ market access	0.237** (0.0927)	0.201*** (0.0711)	0.584** (0.231)	0.467*** (0.170)
Observations	263	263	263	263
R-squared	0.550	0.653	0.426	0.584
Full controls	Yes	Yes	Yes	Yes
Region FE	No	Yes	No	Yes

Standard errors clustered at the province level. ***1%, **5%, *10% significance levels.

Suggestion: Use the IV in nonlinear GMM rather than 2SLS

Model fit: Productivity

Slope $\neq 1$: Calibrated productivities vary 5x or 20x more than micro measures

Table 5: Correlation between calibrated productivities and TFP

Dependent variable: Calibrated relative productivity level by district, 2010		
TFP estimated using $Y = AK^{\frac{1}{3}}L^{\frac{2}{3}}$	0.182*** (0.0207)	
TFP estimated using $Y = AL$		0.0386*** (0.00438)
Observations	540	540
R-squared	0.126	0.126

Missing informal vs formal distinction?

Missing mechanism? NEG's pecuniary externalities not in firm-level TFPQ

Right measure? for TFPR, $L_j = \sigma F$, $R_j = w_i L_j \implies \frac{R_j}{L_j} = w_i$ (not A_i)

Dynamic mechanisms: More reassurances needed

Sensitivity analysis (because assessing fit is hard):

- Perfect foresight vs 50-year foresight + unanticipated sea rise
- Permanent roads vs 30-year depreciation period

Some questions on migration dynamics:

- Prior studies estimate migration elasticity ν in static models
- iid shocks \rightarrow large gross flows (contra Balboni, Bryan, Morten, Siddiqi)
- Only roads and workers' migration costs make locations "sticky": no capital, no housing, zero-profit firms move instantly (vs Suarez-Serrato Zidar 2016)
- Primer on CDP magic that obviates estimating μ_{ni} would be nice
- Sensitivity to imputed migration flows?
- Stationary means steady state, not balanced growth path?

What role for international markets?

Trade's role seems understated: Vietnam's trade-to-GDP ratio was 210% in 2019

- Model with only final goods cannot hit that number
- RoW modeled as one more region: Armington elasticity $\sigma = 7$ is high
- I presume coastal locations trade more, so assumptions about Rest of World seem key to assessing coastal flooding scenarios
- Assumed path for model fundamental $\{E_t\}_{t=0}^T$, but Vietnam's total exports is an equilibrium outcome
- Assumed symmetric trade costs at odds with Waugh (2013)
- No international borrowing nor lending

Measurement issues

1. Construction of migration flows violates gravity model of migration:
I assign an origin district for all internal migrants by assuming that internal migrants were distributed across districts in their reported province of origin in proportion to the districts' shares of the provincial population at the last census.
2. Counterfactuals do not reflect parameter uncertainty nor construction of all trade costs via Dijkstra algorithm
 - Data constraints → assume uniform road surface conditions
 - Road surface conditions likely endogenous: maintain growing regions' roads more? depreciation is proportionate to truck volumes?

Bottom line

- Interesting quantitative perspective on really important question
- Demonstrating model fit and out-of-sample performance can build confidence in applied GE models
- Difficulty of assessing model's dynamics suggests robustness checks
- I look forward to seeing the next revision