

**STEG Virtual Course on
"Key Concepts in Macro Development"**

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Lecture 11: Basic trade/spatial model

[Melanie Morten](#)

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Q: A very basic clarification please. can I take spatial differences as extension or alternative or advancement for dual gap model?

A: It's true that part of the differences that we see across locations might be differences between sectors; there are likely to be some parallels between spatial gaps and sectoral gaps, or between formal and informal sectors. A lot of recent work has precisely tried to understand the relative importance of these different kinds of gaps. But clearly the spatial gaps beg a question about whether they represent an equilibrium phenomenon. Since we tend to think of people being mobile, what accounts for the persistence of spatial gaps in incomes or living standards.

Q: Distance between places does not seem to be a major cost in most of the developed world. How do you think about migration costs in these settings?

A: Migration costs might include lots of things besides the actual costs of travelling or of distance. For instance, there might be costs of leaving behind your family network. There might be costs associated with the loss of place-specific knowledge or skills or social capital. So there may be many types of costs.

A: I agree, thank you for the answer. I think the literature so far, except a couple of examples (I think on recent paper by Mubarak, Lagakos, Waugh), has not transparently separated the distance component of migration costs and other, probably more relevant, components.

A: I think this is another area that the literature has been wrestling with. It's hard to find data that would allow you to distinguish between moving costs, amenity differences, and other kinds of sorting... So it's hard. But these are central questions for macro dev, I would argue. The question that Melanie is talking about is a first-order question: are we observing a spatial equilibrium or not? If not, what types of frictions are we observing, and are they susceptible to policy interventions, or not?

Q: The choice of residence can be influenced by accessibility to social services such as quality education, health care services, etc

A: good point. These are some of the potential location-specific “amenities” that Melanie mentioned.

Q: May be gradually health costs will become a part of frictions

A: Definitely we can think of differences in health amenities or, more generally, the health characteristics of different locations (healthfulness of the environment, access to health care, etc.) as part of the differences across space.

Basically, anything that people care about that differs across locations can pose a significant friction that people might care about in these models.

Q: Persons in both A and B are homogenous, right?

A: in this model, yes, ex-ante (before realization of idiosyncratic shock) people are the same, and they sort into different locations. note that they will have different realized idiosyncratic shocks. you can easily extend the model to include worker types, e.g. high-skill and low-skill.

Q: Can the idiosyncratic terms be correlated with the common terms?

A: Since the common terms are common, there is no within region variation to be correlated to. The mean of the shocks could vary across regions of course, but then we could redefine by putting the mean of the shocks into V_a , and defining the shocks to be mean zero in each location.

Q: These location-specific utilities are assumed to be known, is that correct? Information frictions seem likely to be important- similar to the discussion of migration in Mushfiq's lecture

A: This is a really central topic for research at the moment. There are a bunch of questions about how well information flows across locations. You're right that Mushfiq has highlighted this as an issue, and you could look at a recent paper by Travis Baseler as another example of a paper that argues for information frictions. On the flip side, I'll plug a recent paper of my own, joint with Paul Blanchard and Martina Kirchberger, that we think suggests that information frictions may not be all that sustainable. (Basically, we argue that there is a lot of short-term travel and mobility, which seems to work against information frictions.)

But just to say that this is a really key area for research at the moment.

Q: Is V_A the average V_A^i in location A?

A: V_A is the utility terms that are common to all people - e.g. rent, productivity, amenities (schools, parks, restaurants) in a location.

A: So another way of asking the question is "are the epsilons mean zero?", right?

A: Thanks, both. Hard to think of common terms being valued the same by different people!

A: I see! you can often interpret the idiosyncratic term as either productivity shock (person A more productive in location a) or preference shock (person A likes location a more).

Q: The literature on urban economics shows that wage growth is steeper in cities (De la Roca and Puga, ReStud 17). There are though not much dynamic models in the literature of quantitative spatial/trade economics (Caliendo, Dvorkin, Parro and few others), and definitely not considering this fact. Is it relevant in the context of the developing world? Thanks. I mean, whether the

dynamic component of migration plays a relevant role in the developing world (as it seems to do in the developed world) or not

A: Trade and spatial models are overwhelmingly static. This would be different than dynamic models with capital with heterogeneity that we covered last module. Here the heterogeneity has another dimension of tying costs to geography, but typically you lose the dynamic dimension. One could imagine forward looking behavior, where the Vs and epsilons are discounted values of expected future streams, including wage growth, and then decisions would still be static. More progress on how to merge these two would be great.

A: I should add “how to merge these IN A TRACTABLE MANNER”. tractability is the whole advantage of extreme value distributions.

A: I agree dynamic spatial models are an avenue of future research and relevant in developing country contexts. I believe Claire Balboni has a paper that uses a dynamic spatial model in Vietnam?

A: Yep, there are several good examples. Also in a more Macro literature Rossi-Hansberg, Desmet and Nagy are working on dynamic spatial models. Still, lots of exciting work yet to be done!

Q: Initially/before migration, the population sizes in A and B are the same, right?

A: This is really all static, so there is no real sense of “before”. She is just doing comparative statics, as you change a parameter. In principle, the elasticity in the comparative static exercises could depend on the “initial” level, but in the case of the uniform distribution, and also the Frechet, the elasticities would not depend on these “initial” values.

Q: Does anybody know a good reference for working out this extreme value distribution math?

A: We will go through some in TA session, hope that can be a good starting point for you :)

A: Extreme Value Distributions: Theory and Applications by Samuel Kotz and Saralees Nadarajah

A: Modelling Extremal Events: for Insurance and Finance by Embrechts, Klüppelberg, Mikosch is well known but more finance specific.

Q: What is the impact of government policy e.g. people move where government have provided the basic things like roads

A: A bunch of the new applied literature in this field (spatial models) is asking precisely these questions. Have a look at a recent paper by Clare Balboni, on roads in Vietnam, or a paper by Sebastian Sotelo on agriculture in Peru, just to give two examples of papers where road construction drives a variety of impacts -- where people live, what goods get produced in which locations, etc.

This is one of the useful applications of these spatial models, which allow for modelling the impacts of policies that reduce mobility frictions...

A: Melanie's own work looks at some of the same issues. How do changes in transportation costs, or housing construction, or other location-specific amenities, alter the choices that people make.

Q: I don't understand this question, 'is this an equilibrium?'. It seems like when this model is mapped to the data, one will start with the assumption that this is an equilibrium and then use the model to say why it is so. The cases where one would not start with that assumption is when there are institutional or de facto restrictions (e.g. hukous) on location decisions. Can one somehow assess whether a location is or is not in equilibrium using this model (rather than assuming one way a priori)?

A: I agree that the question is better framed as "why is this an equilibrium" vs "is this an equilibrium". for example, you can fit a model where the Chinese cities being in a spatial equilibrium with the hukou restrictions. You can then use the same model to study counterfactuals, e.g. how would the spatial equilibrium look differently without hukou restrictions?

A: You're right that, at some level, it is always possible to define a set of frictions and/or spillovers such that we can rationalize a set of observations as reflecting a spatial equilibrium with frictions. It's a bit tautological. But you could then argue about whether the implied frictions are plausible. In some cases, it appears that the frictions you would need to rationalize the data are so vast that you can't really imagine that they could be real. It's also true that where we see people moving steadily (e.g., where rural-urban migration is very high), you might take that as an indication that there is not a spatial equilibrium...

In some sense, it's a semantic question whether you want to talk about 'spatial equilibrium with frictions' versus 'spatial disequilibrium'. I would (somewhat facetiously) say that spatial economists tend to see spatial equilibrium everywhere, with some frictions; others might see something better described as 'short-run disequilibrium'.

Q: Sorry, I missed it. In $L_s(w,r,A)$, what is "A" here?

A: Amenities. this could be things like schools, variety, health care, public transportation, clean air... anything that shifts the utility value of living in an area.

A: Why is there is no preference that Melanie mentioned in the previous slide?

Q: I am wondering how land tenure insecurity a friction in say location B can be incorporated in the model if people are making decisions of moving from location A?

A: You might think of the degree of land tenure insecurity as a type of amenity (actually a disamenity) of different locations. It is part of the location characteristics, and so it looks like other amenities or disamenities.

Q: How about considering location attributes other than wage and its risk? Such attributes may include crime rate, discrimination/xenophobia, ease of socialization etc

A: Exactly right. All of these would perhaps be subsumed into the category of amenities and disamenities. These are characteristics of locations. They might matter heterogeneously for different individuals; e.g., some locations are particularly threatening or hostile to people from certain groups. The category of location-specific characteristics can be quite broad.