Lecture 6: Migration and Urbanization

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Introduction

Interregional Migration: Motivation

- Long run models of **spatial equilibrium** assume free spatial mobility will equalize utility across space (e.g. Rosen-Roback, monocentric city model, etc.)
- Internal migration across regions is a key assumption, but not explicitly modeled.
- "[...] interregional migration is a major mechanism through which labor resources are redistributed geographically in response to changing economic and demographic forces." (Greenwood 1997)
- As such, it's important to understand the **determinants** and **consequences** of interregional migration.
- *International* migration is also very important, but we won't be looking at this today (see Lewis and Peri 2015).

Road Map for today

- Interregional Migration
  - Introduction to interregional migration
  - Some theory: Kennan and Walker (2011)
  - Bryan and Morten (2019)
  - Monras (2020)
- Rural to Urban Migration
  - Lagakos (2020): Survey of the literature
  - Sarvimäki et al. (2022): Evidence from Finland

Introduction to interregional migration: Definition

- "A migration is defined as a move from one migration-defining area to another (or a move of some specified minimum distance) that was made during a given migration interval and that involved a change of residence. A migrant is a person who has changed his usual place of residence from one migration-defining area to another (or who moved some specified minimum distance) at least once during the migration interval (United Nations, 1970: p. 2)." (Greenwood, 1997)
- Interregional migration: within a country, between "regions" (counties, states, municipalities, etc.)

Interregional migration: Key Questions (Greenwood 1997)

- **Who migrates?**
- **Why does migration occur?** (wage differentials, job opportunities, unemployment rates, local public spending, amenities, etc.)
- **Where are the migrants coming from and where are they going?** (e.g. rural to urban migration).
- **When do they migrate?**
- **What consequences result from migration?** Both for the migrants and for the economy as a whole.

Interregional migration by age and education level

Table 3
Propensities to migrate interstate in the US, 1980–1985, by age and education

Education	Age[a]				
	18–24	25–29	30–34	35–44	45–64
Elementary					
0–8 years	8.21	7.02	6.74	4.37	3.78
High school					
1–3 years	9.33	12.50	9.30	5.61	3.94
4 years	11.31	13.10	9.83	7.33	4.84
College					
1–3 years	10.12	15.67	11.60	10.75	6.84
4 years	24.13	25.32	16.54	12.97	7.19
5 years or more	29.04	32.24	21.67	14.06	7.71

[a]The base population is the relevant number of nonmovers over the 1980–85 period, plus out-migrants. Age is defined as of 1985.
Source: Calculated from data presented in US Bureau of the Census (1987: Table 17).

Figure 1: Migration rates in the US by age and education level 1980-1985 (Greenwood 1997)

Interregional migration: variation by country

TABLE 3 Long-term trends of interregional migration intensity, 1996–2018

Country	rmi_{1996}	rmi_{2018}	Δ(Δ%)	Trend
Australia	20.99	15.96	−5.03 (−24.0)	−0.28***
Austria	8.99	12.63	3.64 (40.5)	0.23***
Canada	9.66	8.71	−0.95 (−9.8)	−0.06***
Czech Republic	4.73	7.72	2.99 (63.2)	0.15***
Finland	14.5	18.92	4.42 (30.5)	0.13***
Germany	12.89	13.14	0.25 (1.9)	0.02
Hungary	41.3	59.03	17.73 (42.9)	0.72***
Italy	5.21	5.51	0.30 (5.8)	−0.01
Japan	23.75	18.46	−5.29 (−22.3)	−0.28***
South Korea	62.3	47.07	−15.23 (−24.4)	−0.81***
Netherlands	16.78	17.78	1.00 (6.0)	0.02
Norway	16.65	18.75	2.10 (12.6)	0.07**
Poland	2.99	2.83	−0.16 (−5.4)	−0.02***
Slovakia	2.43	3.56	1.13 (46.5)	0.05***
Spain	4.43	10.53	6.10 (137.7)	0.20***
Sweden	15.77	19.18	3.41 (21.6)	0.09***
United Kingdom	22.45	24.77	2.32 (10.3)	0
United States	24.36	15	−9.36 (−38.4)	−0.70***

Figure 2: Migration rates (annual) by country in 1996 and 2018 (Alvarez, Bernard, and Lieske 2021).

Some Theory on Migration

Sketch of an Optimal Search Model of Migration

- We'll look at some of the basic intuition behind Kennan and Walker (2011).
- Model migration as an optimal search process.
- Assume individuals know the wage in their current location, but to determine wage in another location they must move there, at some cost.
- Partial equilibrium response of labor supply to wage differences across locations.
- Suppose J locations.
- Individual i's income y_{ij} in location i is a random variable with known dist.
- Migration decisions are made so as to maximize expected discounted value of lifetime utility.

Kennan and Walker (2011): The Value Function

- Dynamic programming problem.
- Let x be the state vector (wage, preference information, current location, age, etc.).
- Utility flow when choosing location j: $u(x, j) + \zeta_j$.
- Transition probability from state x to x' if j is chosen: $p(x'|x, j)$
- Decision problem:

$$V(x, \zeta) = \max_j (v(x, j) + \zeta_j).$$

- Where

$$v(x, j) = u(x, j) + \beta \sum_{x'} p(x'|x, j) E_\zeta [V(x', \zeta)].$$

Kennan and Walker (2011): Curse of Dimensionality

- Serious limitation of the discrete DP method: number of states can be too large.
- Consider the case of J locations and N potential incomes in each location.
- State vector includes location decision + vector of incomes for each location.
- Implies $J \times N^J$ possible states.
- Take $N = 6$ and $J = 50$, then there will be $4.04140639 \times 10^{40}$ possible states!
- That's many times world's data storage capacity (2.36×10^{21} Bits).
- Solution: reduce the number of states. Kennan and Walker (2011) assume that agents only care about a small subset of locations (M), which empirically will be the locations in which they are observed in the data.

Bryan and Morten (2019): The Aggregate Productivity Effects of Internal Migration: Evidence from Indonesia

- Use micro data from Indonesia to quantify the aggregate effect of increasing mobility.
- Motivation: migration could increase productivity by:
  - allowing individuals to sort into locations where they are (personally) more productive (sorting),
  - allow more people to live in more productive locations,
  - or both.
- In the absence of constraints to migration or amenity diff., people will maximize their production $\Rightarrow$ a policy that encourages migration can only have an effect if there are constraints to migration.

Bryan and Morten (2019): Five motivational facts

1. **Gravity in migration holds**: a 10% reduction in in bilateral distance leads to a 7% increase in the prop. of migrant flow.
2. **Positive relationship between distance and wages**: doubling distance to place of birth leads to a 3% increase in wages on average.
3. **Selection**: controlling for origin and destination FE, average wages decrease with origin population share.
4. **Movement costs reduce productivity by reducing selection**
5. **Compensating differentials**: workers in low-amenity regions receive higher wages on average.

Bryan and Morten: Five facts

TABLE 2
FIVE FACTS ABOUT MIGRATION IN INDONESIA

	MOVEMENT COSTS		SELECTION		COMPENSATING DIFFERENTIAL
DEPENDENT VARIABLE	$\log \pi_{odt}$ (1)	$\log w_{odt}$ (2)	$\log w_{odt}$ (3)	$\log w_{odt}$ (4)	$\log w_{odt}$ (5)
Log distance	−.717	.029		.007	
	(.009)***	(.001)***		(.002)***	
Log share migrating			−.039	−.031	
			(.001)***	(.003)***	
Amenities					−.023
					(.010)**
Destination × year fixed effects	Yes	Yes	Yes	Yes	No
Origin × year fixed effects	Yes	Yes	Yes	Yes	Yes
Destination fixed effects					Yes
Number of individuals	187,065	186,763	186,763	186,763	185,357
Number of region pairs	25,540	25,244	25,244	25,244	25,050

Figure 3: Five facts about migration in Indonesia. Bryan and Morten (2019)

Bryan and Morten (2019): Sketch of the model with two locations

- Two locations: A and B.
- Wage for person i living in destination d is $w_d s_{id}$, where s_{id} is skill level of i in d.
- Total utility for i from location o living in d: $\alpha_d w_d s_{id}(1 - \tau_{do})$.
- α_d is amenity of living in d, and τ_{do} is moving cost.

Bryan and Morten (2019): Sketch of the model with two locations

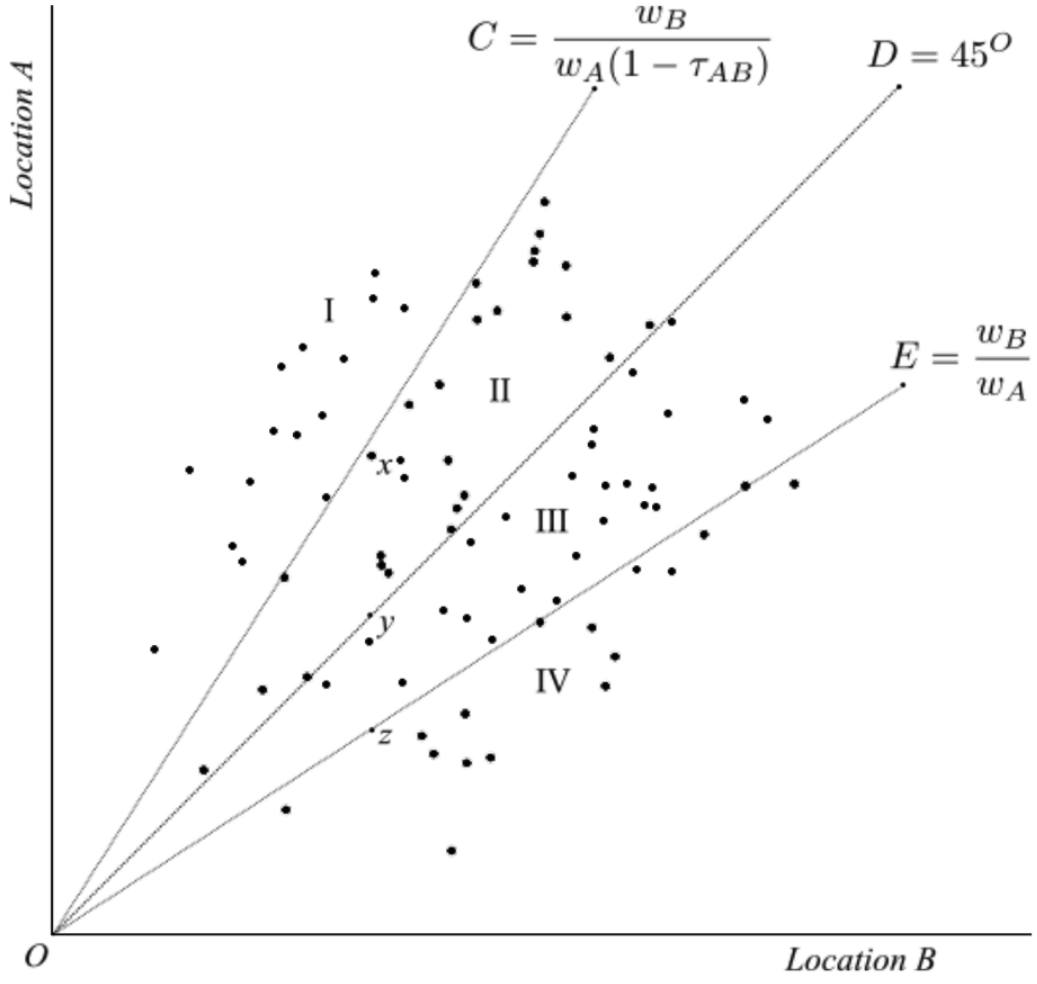

Figure 4: Possible distribution of skill across two locations for workers born in B.

Bryan and Morten (2019): Summary

- Develop full quantitative model.
- Fit model to data from Indonesia.
- Find that completely eliminating all migration costs and amenity differences would lead to an increase in output of 21.7%.
- Large heterogeneity in gains between areas, with some gaining more than 100% in output and others losing slightly.

Monras (2020): Economic Shocks and Internal Migration

- Main goal: "accurately quantify the shape and importance of internal migration in dissipating local shocks."
- Key insight:

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- Key insight: in-migration rates respond more than out-migration rates to economic shock.
- Author documents this fact using reduced form IV strategy from Mian et al. (2013) and Mian and Sufi (2014).
- Key idea of this strategy:

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- Author documents this fact using reduced form IV strategy from Mian et al. (2013) and Mian and Sufi (2014).
- Key idea of this strategy: use household debt $\times$ share of employment in non-tradable sectors before Great Recession as instrument for size of shock to metropolitan area.

Monras (2020): Economic Shocks and Internal Migration

- Develops quantitative spatial equilibrium model of regions with in- and out-migration responses to shock.
- Uses model to study the speed of convergence after shock as well as the welfare effects of the Great Recession.
- Model predicts that within 10 years the economy is back to the steady state and around 60 percent of the initial drop in value across locations dissipates.
- All of this comes from in-migration responses.

Monras (2020): Net Migration Response

Table 3: Migration response to the crisis: net in-migration rates

VARIABLES	(1) Net migration IV1	(2) Net migration IV2	(3) Net migration IV1	(4) Net migration IV2	(5) Net migration IV1	(6) Net migration IV2
(log) Weekly Wages	0.188**	0.205***				
	(0.0843)	(0.0640)				
Unemployment rate			-0.273***	-0.328***		
			(0.0990)	(0.0822)		
Employment rate					0.325***	0.371***
					(0.116)	(0.0936)
Observations	1,260	1,260	1,260	1,260	1,260	1,260
year FE	yes	yes	yes	yes	yes	yes
metarea FE	yes	yes	yes	yes	yes	yes
widstat	30.50	37.71	65.08	63.43	31.18	40.66

Figure 5: Net Migration Response. Monras (2020)

Monras (2020): In-Migration Response

Table 4: Migration response to the crisis: in- and out-migration rates

Panel A: In-migration rates

	(1)	(2)	(3)	(4)	(5)	(6)
	In migration	In migration	In migration	In migration	In migration	In migration
VARIABLES	IV1	IV2	IV1	IV2	IV1	IV2
(log) Weekly Wages	0.217***	0.221***				
	(0.0593)	(0.0465)				
Unemployment rate			-0.315***	-0.354***		
			(0.0612)	(0.0563)		
Employment rate					0.374***	0.401***
					(0.0750)	(0.0668)
Observations	1,260	1,260	1,260	1,260	1,260	1,260
year FE	yes	yes	yes	yes	yes	yes
metarea FE	yes	yes	yes	yes	yes	yes
widstat	30.50	37.71	65.08	63.43	31.18	40.66

Figure 6: In-Migration Response. Monras (2020)

Monras (2020): Out-Migration Response

Panel B: Out-migration rates						
	(1)	(2)	(3)	(4)	(5)	(6)
	Out migration	Out migration	Out migration	Out migration	Out migration	Out migration
VARIABLES	IV1	IV2	IV1	IV2	IV1	IV2
(log) Weekly Wages	0.0461	0.0293				
	(0.0443)	(0.0298)				
Unemployment rate			-0.0669	-0.0469		
			(0.0674)	(0.0498)		
Employment rate					0.0794	0.0531
					(0.0811)	(0.0568)
Observations	1,260	1,260	1,260	1,260	1,260	1,260
year FE	yes	yes	yes	yes	yes	yes
metarea FE	yes	yes	yes	yes	yes	yes
widstat	30.50	37.71	65.08	63.43	31.18	40.66

Figure 7: Out-Migration Response. Monras (2020)

Rural to Urban Migration

Large Rural-Urban Gap

Real Urban and Rural Living Standards in India and Nigeria

	Urban	*Rural*
Percent with finished floors		
India:	70.4	40.3
Nigeria:	88.1	60.8
Percent with toilet facility		
India:	89.5	45.9
Nigeria:	84.6	67.5
Percent with electricity		
India:	97.5	83.2
Nigeria:	82.7	38.9
Percent owning a television		
India:	87.0	53.5
Nigeria:	70.7	30.0
Under-five mortality (per 1,000 births)		
India:	36	59
Nigeria:	86	155
Percent with BMI below 18.5		
India:	15.5	26.8
Nigeria:	9.6	14.4

Figure 8: Compiled from the Demographic and Health Surveys. Lagakos (2020)

Lagakos (2020): Urban-Rural Gaps in the Developing World: Does Internal Migration Offer Opportunities?

- Enormous divide between rural and urban living standards in developing countries.
- Is there room for improvements through rural to urban migration?
- If so, why don't they happen?
- First issue: are these differences due to sorting?

Lagakos (2020): Sorting

- Recent empirical (observational) evidence following migrants finds much lower wage gains from rural-urban migration (Hicks et al. 2017, Alvarez 2020, etc.)
- Seems to indicate that most of the difference comes from sorting.
- **However**, we must interpret these results with care:
  - workers might have heterogenous migration costs. If workers with lower costs and lower benefits are the ones that migrate. We will only see those in the data. Workers with higher potential gains and higher costs will not appear.
  - Workers might be "forced" to migrate (e.g. because of job loss), and so their wages might be lower because of this.

Lagakos (2020): Experimental and quasi-experimental results

- Bryan, Chowdhury, and Mobarak (2014): randomize "small" monetary incentive for seasonal migration in Bangladesh during the "lean" season. Treatment induces a 22 pp increase in migration rates, and consumption increase of 30%.
- Sarvimäki, Uusitalo, and Jäntti (2022): look at long-term consequences of forced resettlement of rural population in Finland.
- Takeaway: Experimental and quasi-experimental evidence finds large gains from rural to urban migration in some cases. So urban-rural gap is likely not solely about sorting.

Lagakos (2020): why don't these workers move on their own?

- If there are large income gains from moving from rural to urban locations, why don't they do so?
- Two possible explanations:
  - **Compensating differentials** (non-income based): pollution, crime or idiosyncratic preferences for rural life.
  - **Migration costs**: information (Baseler, 2019 in Kenya), financial, frictions in land markets.

Sarvimäki, Uusitalo, and Jäntti (2022): Habit Formation and the Misallocation of Labor. Evidence from Forced Migrations.

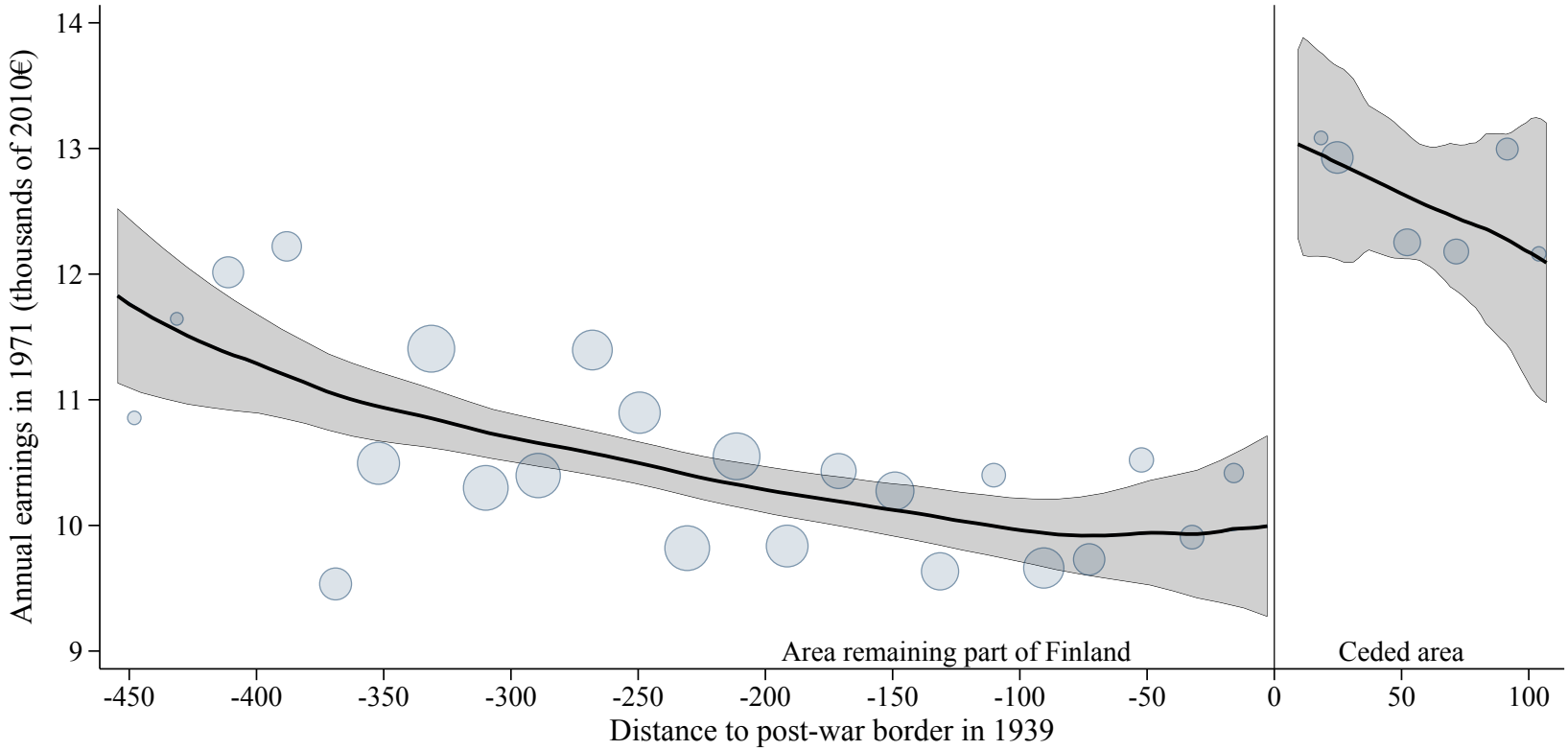
- Poor countries have large, unproductive agricultural sectors
  - Particularly in the poorest countries
  - Consistent with labor being misallocated $\rightarrow$ potential for large benefits from reallocating labor to the modern sector
- Critical questions
  - Is it true that farmers could increase their income by moving?
  - If yes, why don't (more) people move?

Sarvimäki, Uusitalo, and Jäntti (2022): Summary

- Research design
  - 11% of the population evacuated and resettled from areas Finland ceded to the Soviet Union in 1940 and 1944
  - displaced and non-displaced persons similar in pre-war observables
- Data
  - 10% sample of the 1950 Census linked to the 1970 Census and 1971 tax records
  - focus on cohorts born between 1907–1924 (N=85,836)
- Main results
  - displacement substantially increased farmers' income
  - driven by increased transitions to non-agriculture
- Broader take-away
  - attachment to a place stops many from leaving farming despite large monetary returns

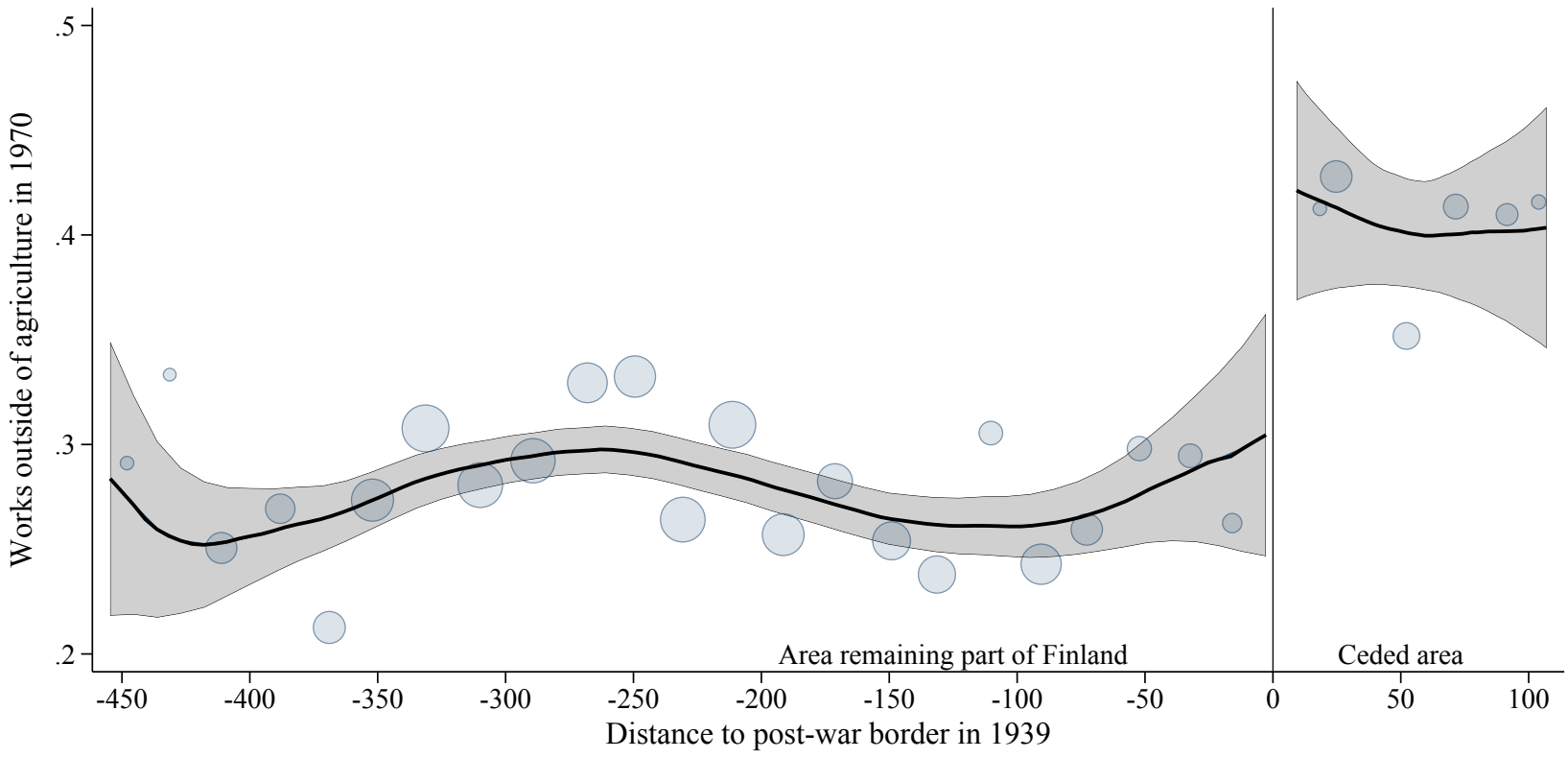
Sarvimäki, Uusitalo, and Jäntti (2022) Main results: Displacement substantially increased farmers' income

Taxable annual income (in thousands of 2010 euros) in 1971. Sample: men working in agriculture in 1939.



... due to increased transitions from agriculture to non-agriculture

Share working outside of agriculture in 1970. Sample: men working in agriculture in 1939.



Historical Context

Finland in 1938

- GDP pc: 4,000 ($2011)
- >50% working in agriculture

Finland in WWII

- 1939–40: Winter War
- 1940: first resettlement
- 1941: Continuantion War, return migration
- 1944: second resettlement

Finland after WWII

- rapid growth and urbanization
- GDP per capita 14,000 ($2011) in 1970

Why didn't the *non-displaced* farmers leave agriculture?

- Findings suggest that farmers could substantially increase their earnings by moving to the modern sector
- *The* question: why did most farmers remain in their farms?

Explanations for staying in agriculture

1. Selection / city-specific human capital
   Roy (1951), Lagakos and Waugh (2012), Caselli and Coleman (2001), Lucas (2004)
2. Local prices/amenities
   Rosen (1979), Roback (1982)
3. Risky urban labor markets
   Harris and Todaro (1970), Bryan et al (2014)
4. Networks
   Banerjee and Newman (1998), Munshi (2003), Munshi and Rosenzweig (2016)
5. Habit formation
   (this paper)

- 1–3 cannot explain results because disp/non-disp. farmers identical along these dimensions (not a falsification, but suggests these models abstract away from important mechanisms)
- Authors examine 4 in the paper but do not find evidence supporting it
  (again, not a falsification, but not enough to rationalize our results)