Are Workers Moving to High-Wage Regions?

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  - Migration across sectors, e.g., urban-rural (Gollin et al., 2014; Lagakos, 2020; Bryan et al., 2014)
  - Migration across regions (Bryan and Morten, 2019; Tombe and Zhu, 2019)
- Yet key questions remain:
  - What drives the gains, and through which channels?
  - How do gains vary across income levels?

A Simple Model Decomposing the Gains to Migration

- Locations i, j. Population distribution L_i^0, total 1. Workers solve

$$\max_j \; \mu_{ij}^{-1} \, w_j \, \epsilon_j(\omega), \qquad \epsilon_j(\omega) \overset{\text{iid}}{\sim} \text{Fréchet}(1, \varepsilon).$$

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We measure these around the world.

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  - Observed labor mobility generates modest aggregate gains (1–2% of GDP)
  - No clear trend in gains across income levels
  - Counterfactual gains larger but still modest, except in China and Indonesia

Data Construction

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1. Lifetime migration flows — IPUMS census
   - Map non-harmonized birthplace codes to harmonized location codes (location labels, organic text, map searching)
   - geolev1: 76 countries, 224 country-years (1960–2016); geolev2: 30 countries

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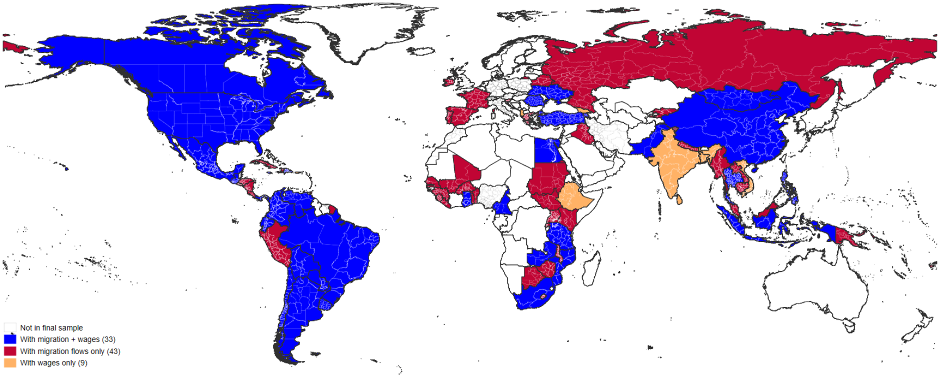
3. Panel data (in progress): Brazil (RAIS), Indonesia (IFLS), South Africa (NPS), Tanzania (NPS), US (PSID), Mexico (MxFLS), Malawi (IHPS), Ghana (GSPS)

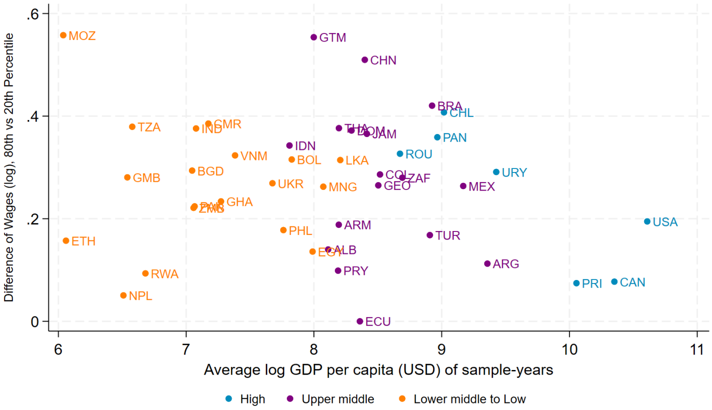
Sample Coverage



→ 33 countries with migration and wage data at geolev1 level (blue)

Empirical Facts

Fact 1a: Large within-country Variation in Hourly Wages (30% for 80-20 pct.)



Variation in schooling

Imputed Wages

Accounting for Differences in Worker Characteristics

- Measure regions' residualized wage after accounting for worker characteristics

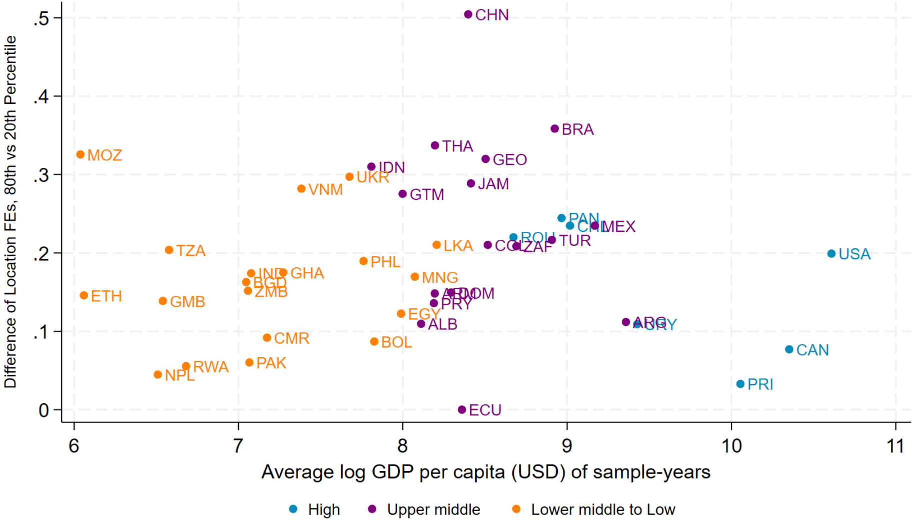
- Estimate Mincerian wage regression in micro-data:

$$\log(\text{wage}^i) = \beta_0 + \beta_1 \text{Educ}^i + \beta_2 \text{Exp}^i + \beta_3 \text{Male}^i + \delta_j + u^i, \tag{1}$$

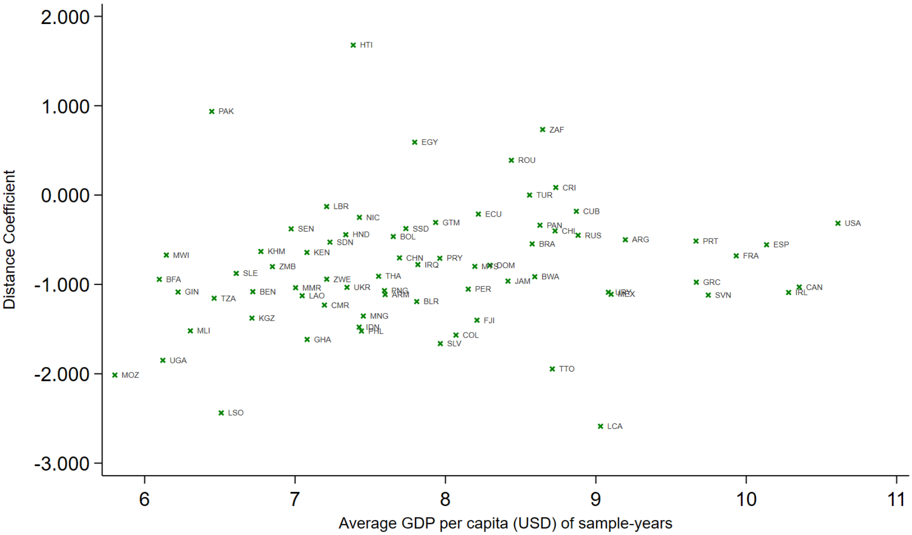
  - Individual-level data on hourly wages ($wage^i$), years of schooling (Educ^i), and experience (Exp^i, constructed as age minus schooling-years)
  - Region fixed effects (δ_j) capture residualized wages

  - Sample: workers aged 25-55

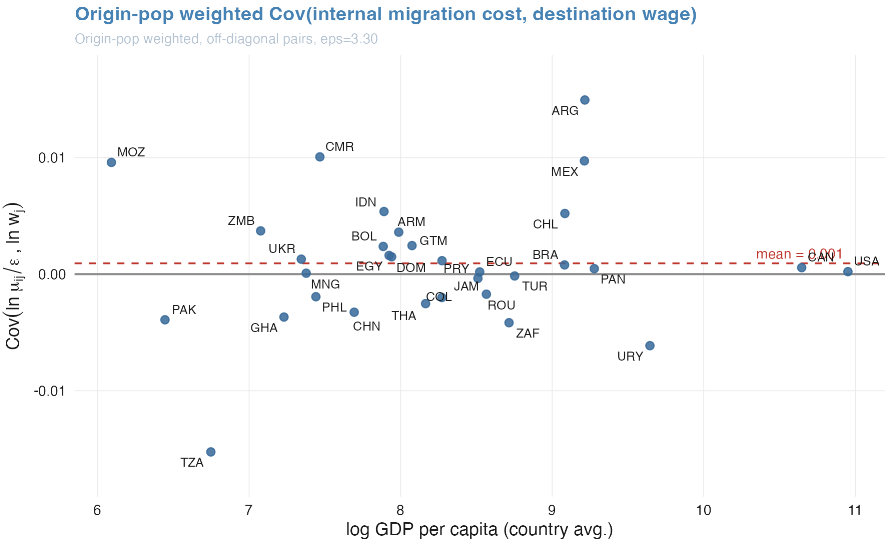
Fact 1b: Large within-country Variation Remains With Region Fixed Effects (20%)



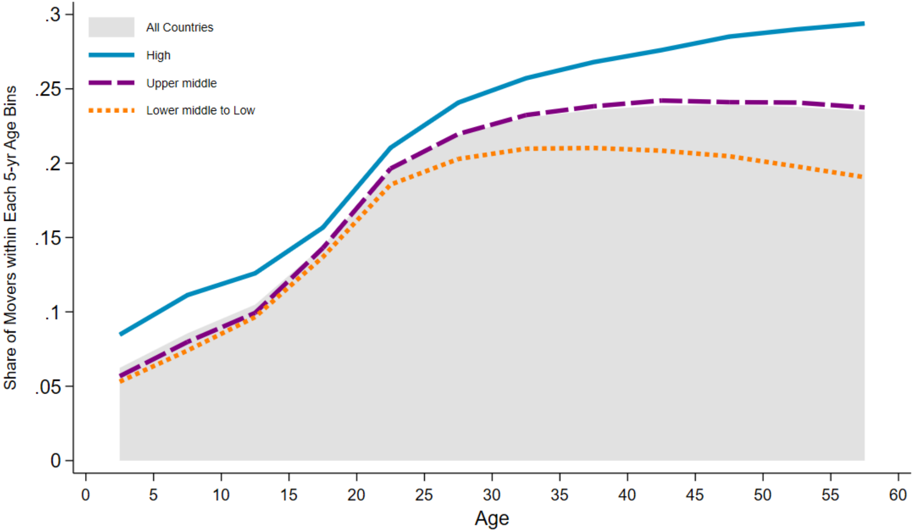
Fact 2a: Gravity PPML Regressions



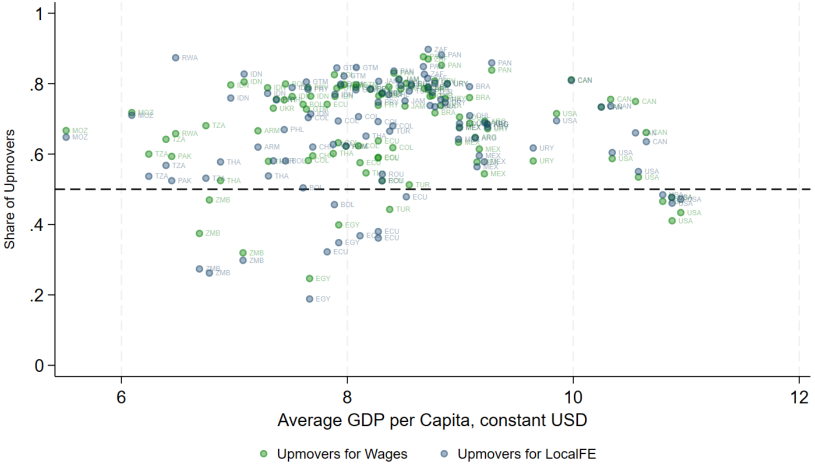
Fact 2b: Geography does not constrain access to high-wage locations on avg.



Fact 3a: High Labor Mobility: 1 in 4 Live Outside their Birthplace by Age 40



Fact 3b: Partly Directed Migration: 2/3 Move to Higher-wage Regions



This sample conditions on lifetime movers among the 40-44 cohorts. Coefficients of In- and Outflows

From Cross-Sectional to Panel Data: How Much Do Movers Gain in Reality?

- Facts 1–3: large regional wage gaps; workers are substantially mobile and partly directed toward higher-wage regions

$\rightarrow$ But are actual wage gains for movers as large as the cross-regional gaps suggest?

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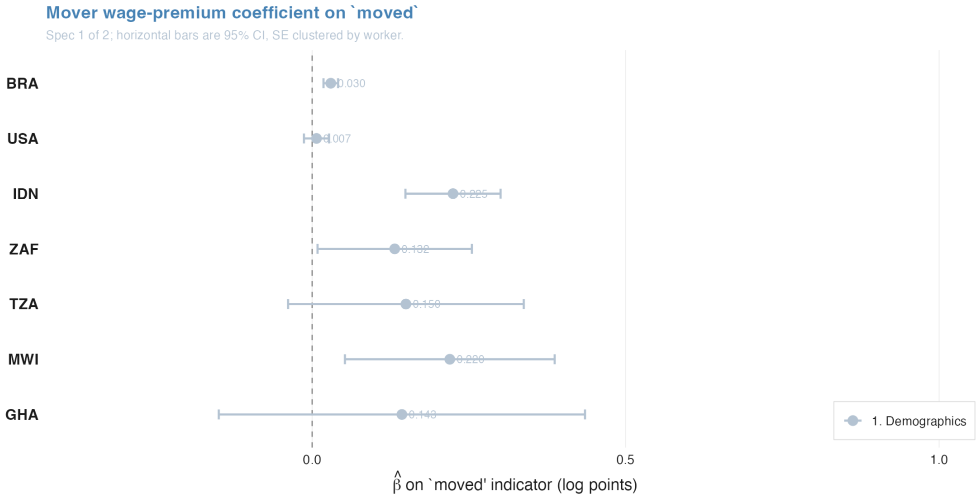
- Two channels that could mute gains:
  (i) **Selection** — movers may differ in unobserved ability from stayers
  (ii) **Pass-through** — do movers' wages actually reflect the destination wage gap?

Fact 4a: Movers gain wages — robust to worker FE

$\log w_{it} = \alpha + \widehat{\beta} \cdot \text{moved}_{it} + X_{it}'\gamma + \text{FE} + \varepsilon_{it}$. SE clustered by worker.



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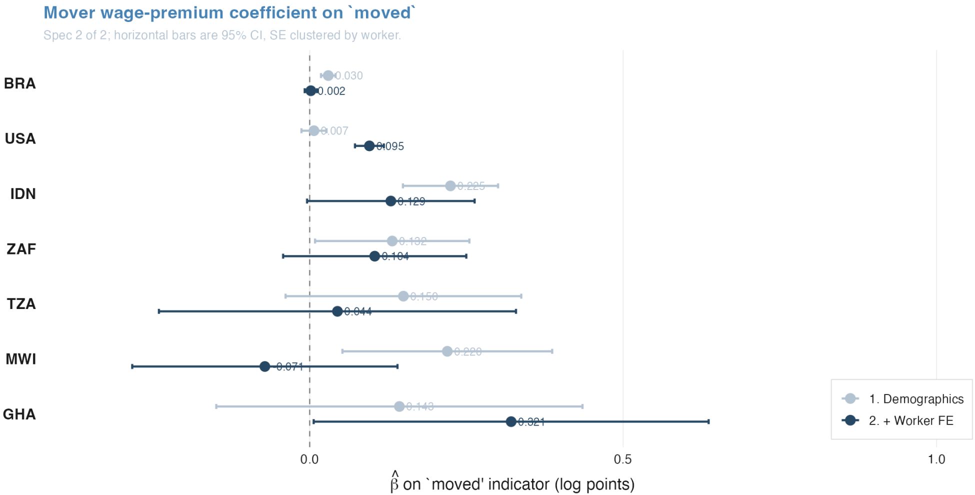
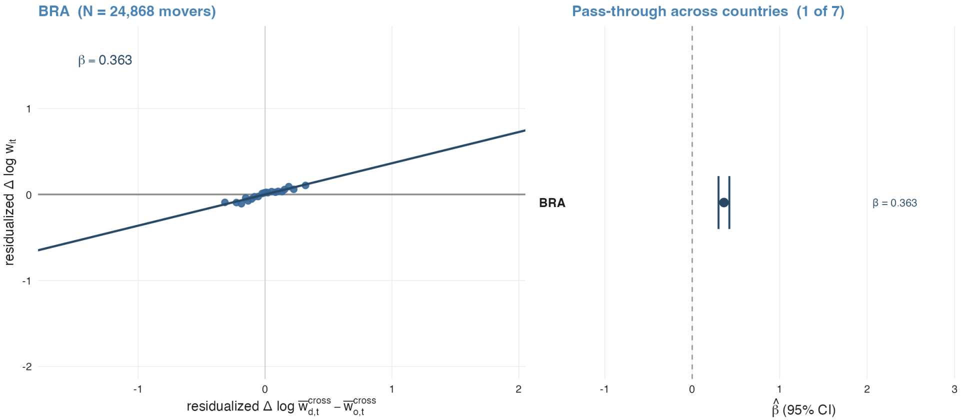


Fact 4b: Actual Mover Gains Relate to Origin-Destination Wage Gaps (Panel Data)

$\Delta \ln w_{it} = \alpha + \widehat{\beta}(\ln \bar{w}^{\text{cross}}_{d,t} - \ln \bar{w}^{\text{cross}}_{o,t}) + X'_{it}\gamma + \alpha_t + \varepsilon_{it}$. Move-events only; SE clustered by worker.



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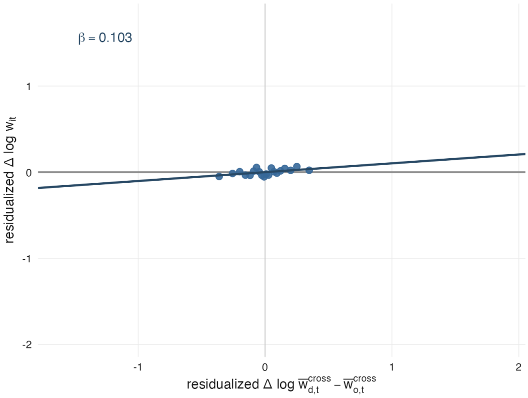
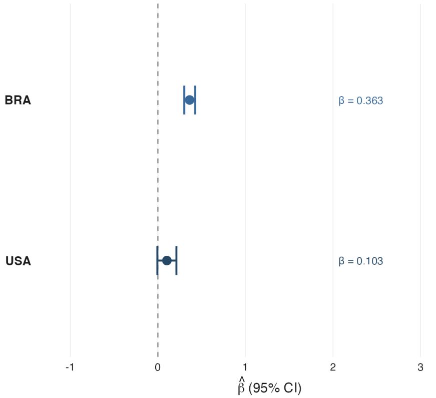
USA (N = 7,784 movers)



Pass-through across countries (2 of 7)



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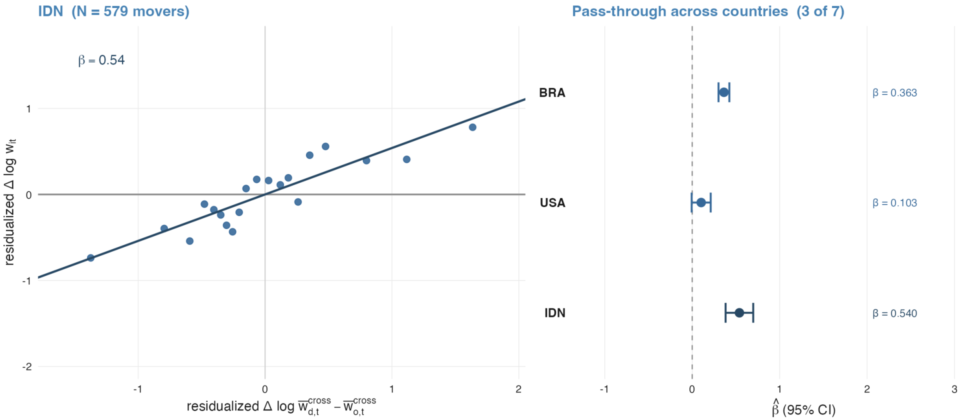

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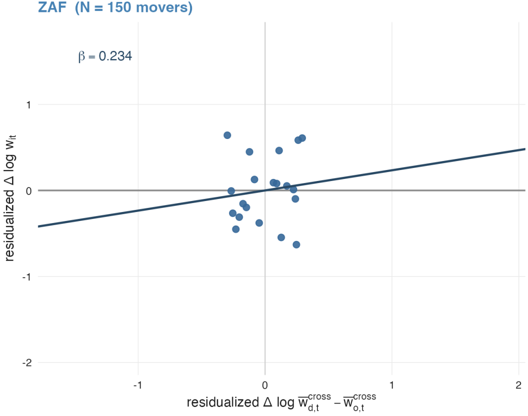

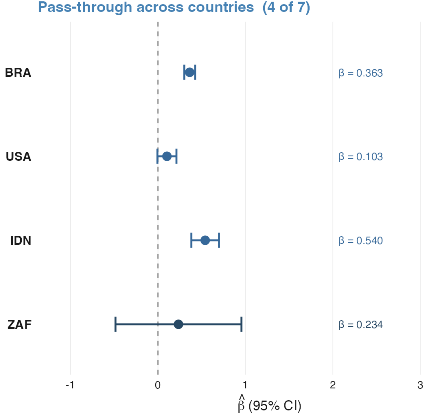

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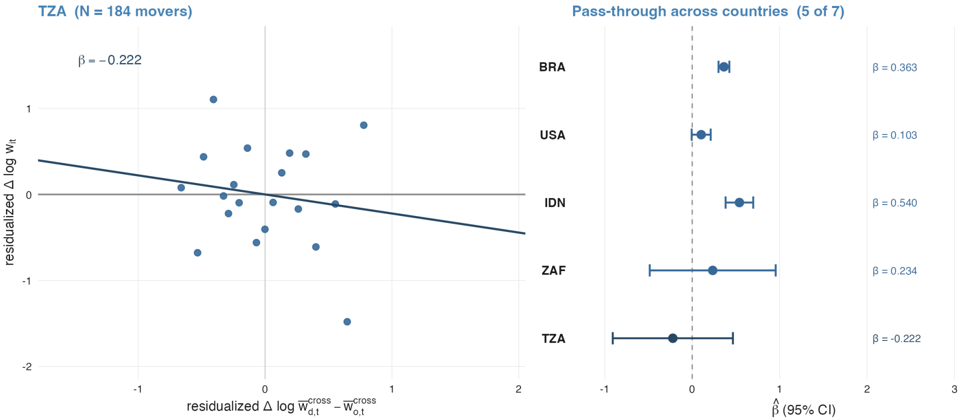

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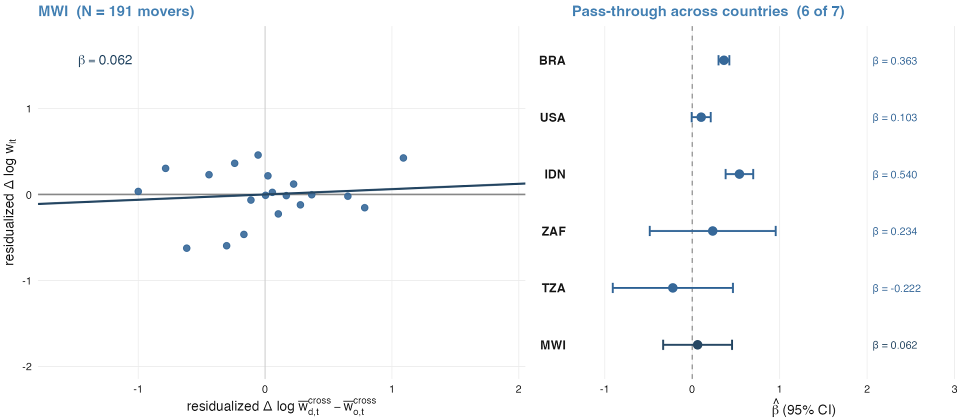

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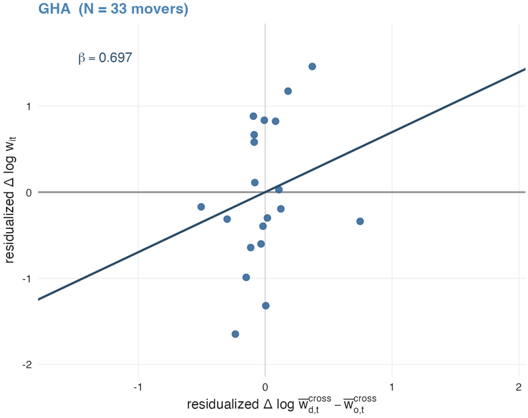

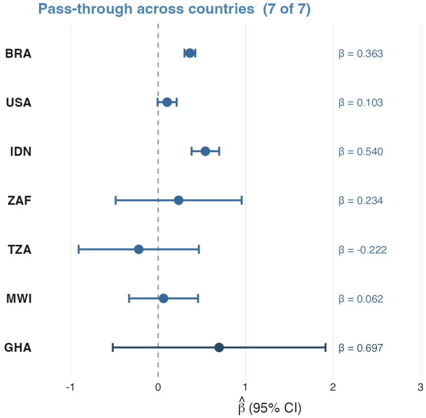

Fact 4c: Mover Wages also Track the Change in Experienced Density

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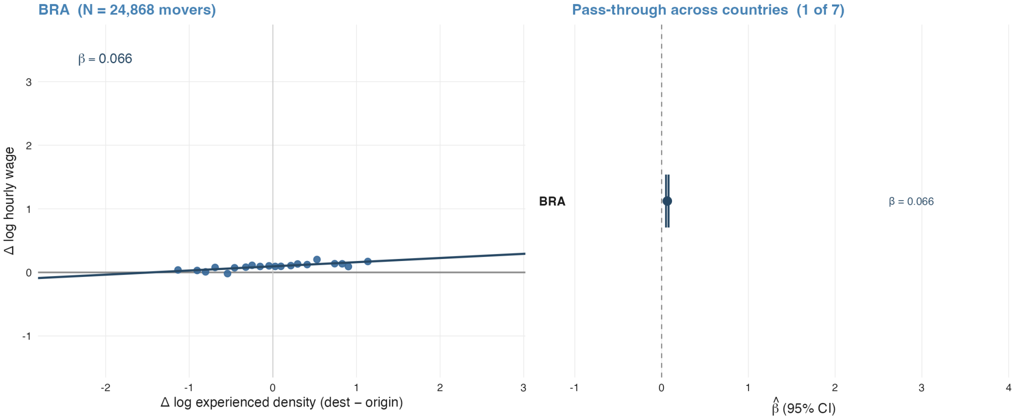

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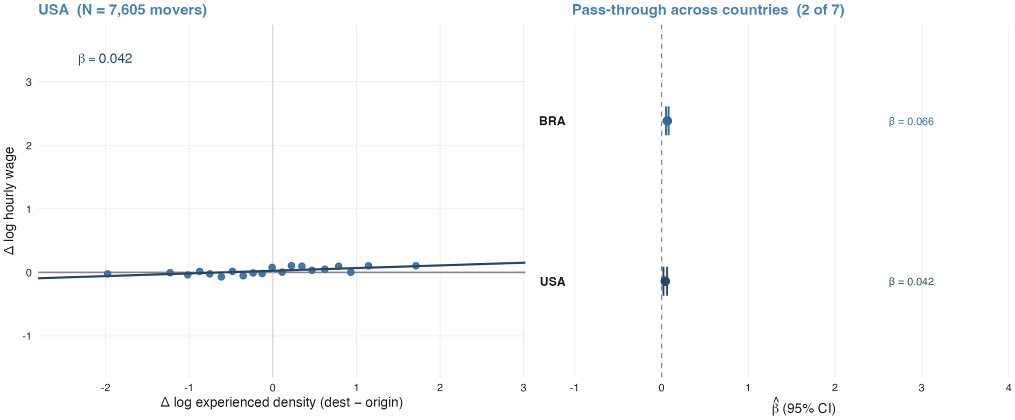

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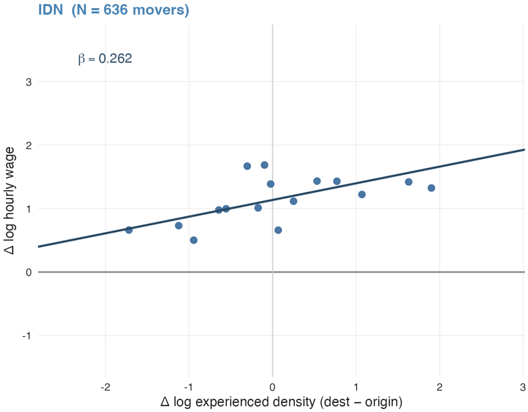

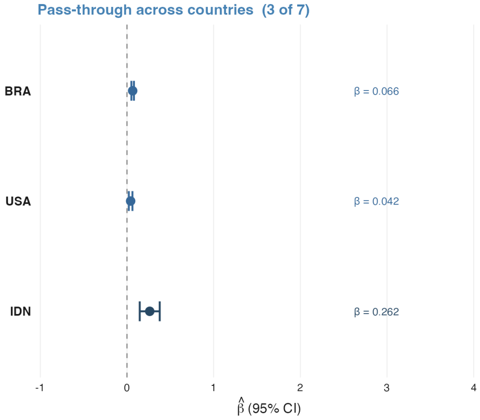

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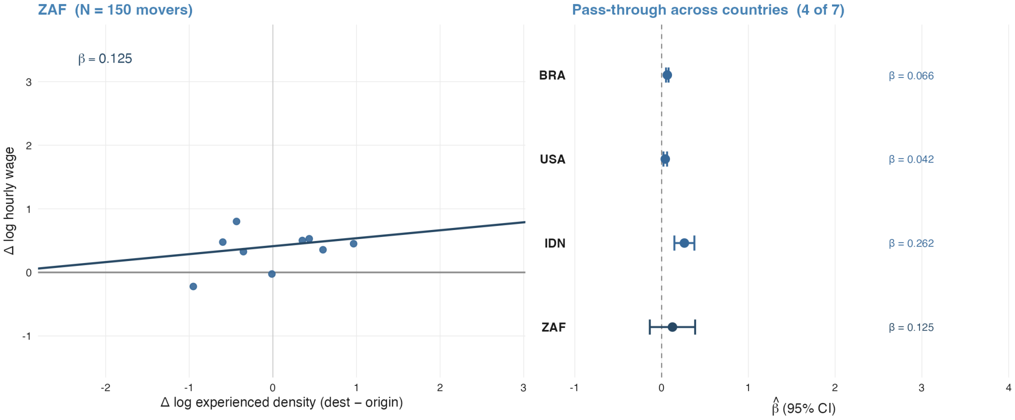

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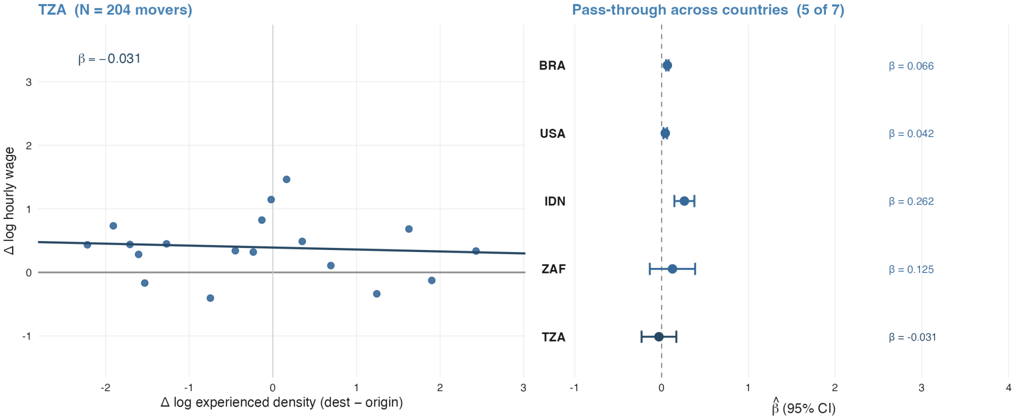

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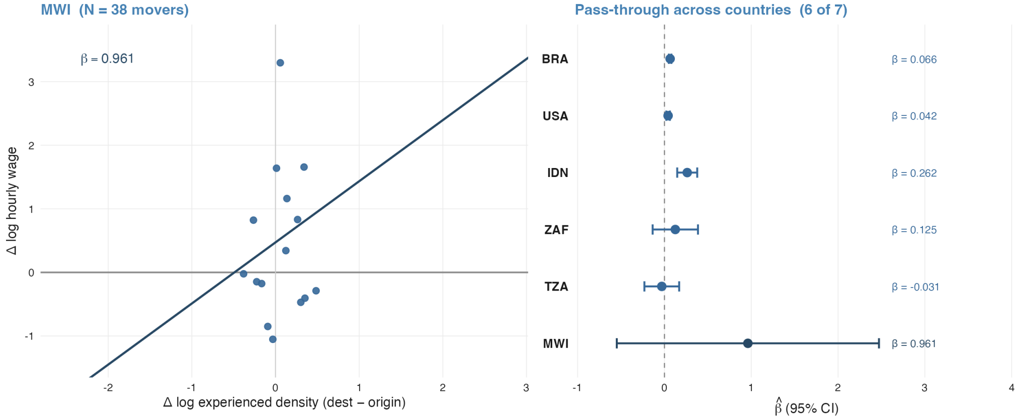

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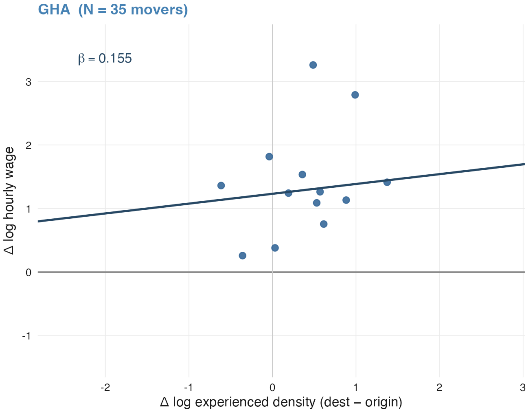

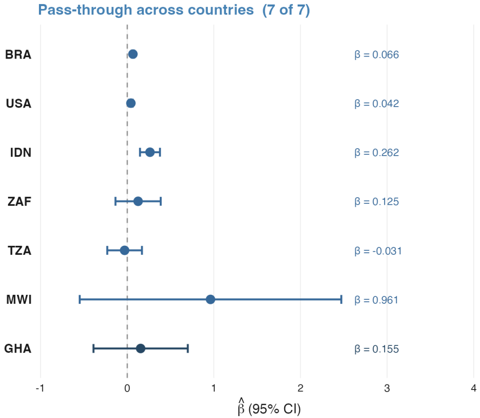

Structural framework

- **Agents born in i choose destination j to maximize utility, with Fréchet preference shocks.**

$$j^*(\omega) = \text{argmax}_j \frac{A_j\, w_j}{\mu_{i,j}}\, \epsilon_j(\omega), \quad \epsilon_j(\omega) \sim \text{Fréchet}(1, \varepsilon)$$

- The probability of migrating from i to j is a logit-style share.

$$\lambda_{i,j} = \frac{\left(A_j\, w_j / \mu_{i,j}\right)^{\varepsilon}}{\sum_{j'} \left(A_{j'}\, w_{j'} / \mu_{i,j'}\right)^{\varepsilon}}$$

- A wedge χ governs the extensive-margin migration response.

$$\chi_i(\beta) = (\bar{\chi}_i)^{\beta}\, (1 - \lambda_{i,i})^{1-\beta}, \quad \bar{\chi}_i = \frac{\sum_{j \neq i} L^0_{i,j}}{L^0_i}$$

- Bilateral flows aggregate into next-period populations.

$$L_j(\beta) = \sum_{i \neq j} \frac{\lambda_{i,j}}{1 - \lambda_{i,i}}\, \chi_i(\beta)\, L^0_i + (1 - \chi_j(\beta))\, L^0_j$$

- Wages adjust.

$$w_j \longleftarrow w^0_j \cdot \underbrace{\left(L_j / L^0_j\right)^{\alpha}}_{+\text{Agg}} \cdot \underbrace{\left(L_j / L^0_j\right)^{-1/\varepsilon}}_{+\text{CA}}$$

Calibration

Agg. in panel data

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- **The probability of migrating from i to j is a logit-style share.** $\lambda_{i,j} = \frac{\left(A_j \, w_j / \mu_{i,j}\right)^{\varepsilon}}{\sum_{j'} \left(A_{j'} \, w_{j'} / \mu_{i,j'}\right)^{\varepsilon}}$
- A wedge χ governs the extensive-margin migration response. $$\chi_i(\beta) = (\bar{\chi}_i)^{\beta} \, (1 - \lambda_{i,i})^{1-\beta}, \quad \bar{\chi}_i = \frac{\sum_{j \neq i} L^0_{i,j}}{L^0_i}$$
- Bilateral flows aggregate into next-period populations. $$L_j(\beta) = \sum_{i \neq j} \frac{\lambda_{i,j}}{1 - \lambda_{i,i}} \, \chi_i(\beta) \, L^0_i + (1 - \chi_j(\beta)) \, L^0_j$$
- Wages adjust. $$w_j \longleftarrow w^0_j \cdot \underbrace{\left(L_j / L^0_j\right)^{\alpha}}_{+\text{Agg}} \cdot \underbrace{\left(L_j / L^0_j\right)^{-1/\varepsilon}}_{+\text{CA}}$$

Calibration Agg. in panel data

Structural framework

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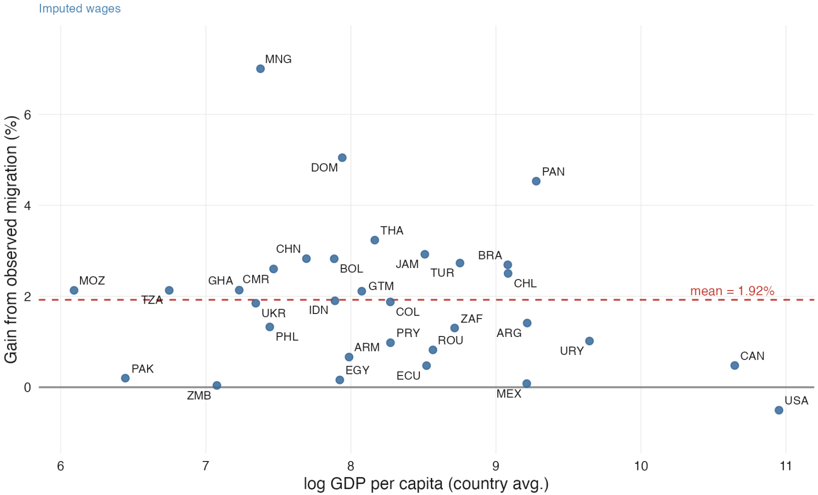
Calibration Agg. in panel data

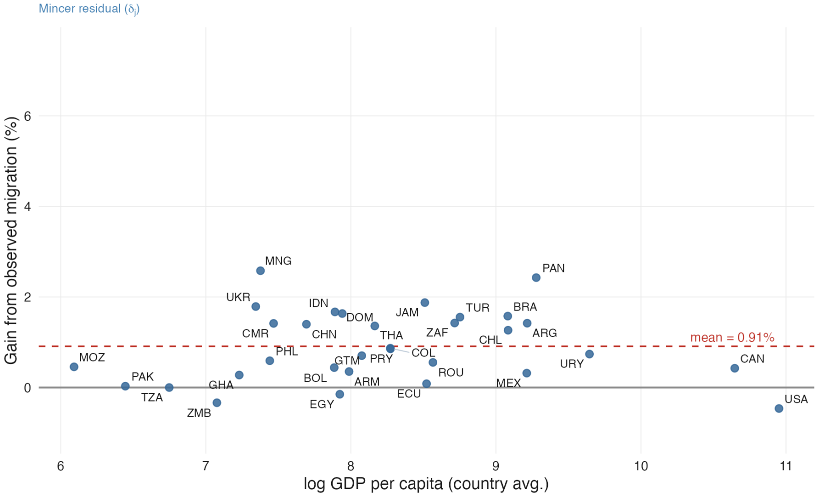
Wage Gains from Observed Internal Migration Flows



- Across countries: Aggregate gain 1.92%, avg gain per mover 14%

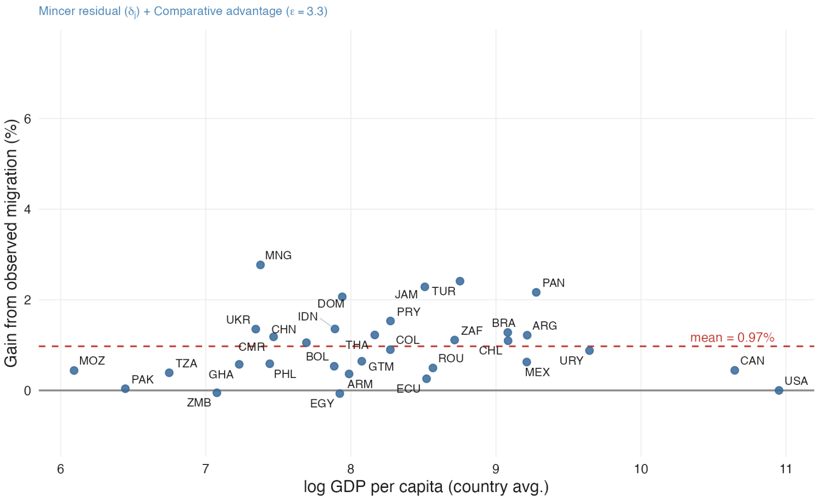
RHZ Data

Wage Gains from Observed Internal Migration Flows



- Across countries: Aggregate gain 0.91%, avg gain per mover 6.3% RHZ Data

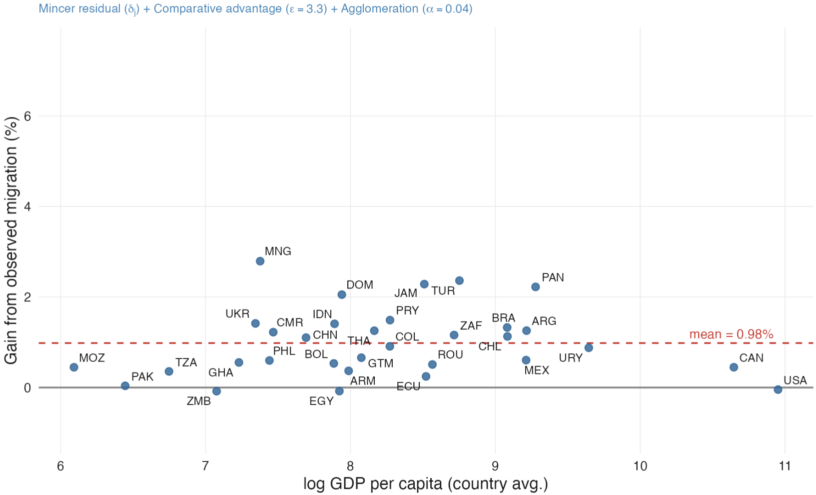
Wage Gains from Observed Internal Migration Flows



- Across countries: Aggregate gain 0.97% (Mincer residual + comparative advantage)

RHZ Data

Wage Gains from Observed Internal Migration Flows



- Across countries: Aggregate gain 0.98% (Mincer residual + comparative advantage + agglomeration) RHZ Data

Gains from Lower Migration Costs: Extensive Margin

	Frictions off — movers fixed				Frictions off — full response			
Income group	**PE**	**+CA**	**+agg**	**+EqA**	PE	+CA	+agg	+EqA
High income ($N = 6$)	**-0.13**	**0.34**	**0.30**	**0.21**	-0.82	-0.59	-0.70	-1.23
unweighted gain	**0.84**	**1.06**	**1.07**	**0.62**	2.17	0.95	0.97	-1.01
% moved	28.15	28.15	28.15	28.15	95.31	94.73	94.77	95.37
Reshuffling	8.10	7.82	7.85	6.80	26.55	16.20	16.92	17.60
Upper middle ($N = 15$)	**1.47**	**1.15**	**1.19**	**1.30**	13.20	2.92	3.36	3.39
unweighted gain	**1.17**	**1.10**	**1.12**	**0.92**	6.94	1.76	1.95	0.39
% moved	10.86	10.86	10.86	10.86	92.71	91.23	91.34	93.13
Reshuffling	5.57	5.43	5.44	5.07	38.41	21.55	22.73	26.87
China (2000)	1.32	1.01	1.05	1.72	19.51	4.64	5.37	8.96
Lower middle / Low ($N = 11$)	**0.24**	**0.33**	**0.32**	**0.48**	1.35	-0.28	-0.30	0.54
unweighted gain	**0.46**	**0.58**	**0.57**	**0.65**	2.20	0.21	0.23	0.71
% moved	10.14	10.14	10.14	10.14	88.29	87.13	87.21	89.19
Reshuffling	3.80	3.80	3.80	3.08	28.64	15.80	16.68	17.21
Indonesia (2010)	2.12	1.43	1.51	1.63	18.03	3.77	4.38	3.22

Top row of each group: pop-weighted gain (%); *Reshuffling* $= 100 \cdot \frac{1}{2}\sum_d |L_d^{cf} - L_d^{obs}| / \sum_d L_d^{obs}$ — the share of population that must change region to map the counterfactual onto the observed allocation (index of dissimilarity).

Robustness (ε, β) grid

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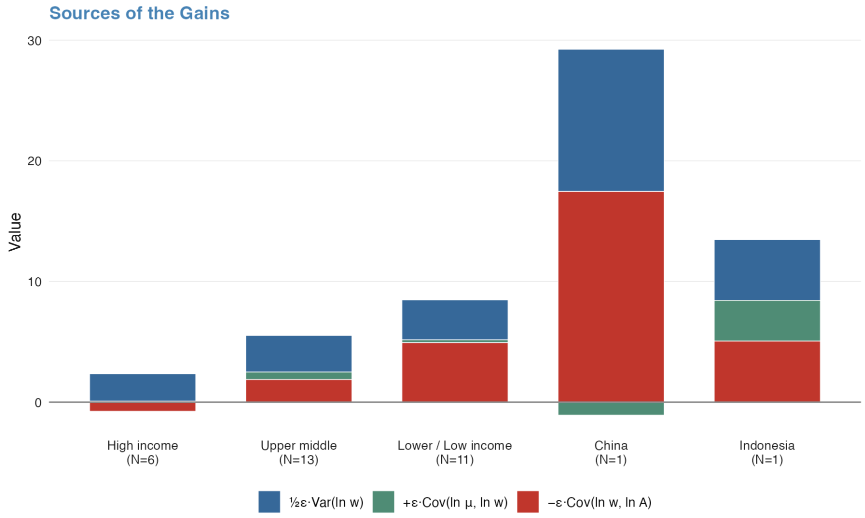
Robustness (ε, β) grid

Sources of the Gains



Conclusion and Next Steps

- Labor mobility is partly directed toward high-wage regions, but contributes modestly to aggregate development, with China and Indonesia as notable outliers.

Conclusion and Next Steps

- Labor mobility is partly directed toward high-wage regions, but contributes modestly to aggregate development, with China and Indonesia as notable outliers.

- Next steps: What drives the muted gains?

- Policies encouraging moving may need to also:
  - Foster agglomeration or improve worker–job matches
  - Generate dynamic returns through human capital investment
  - .. other suggestions?

Thank you

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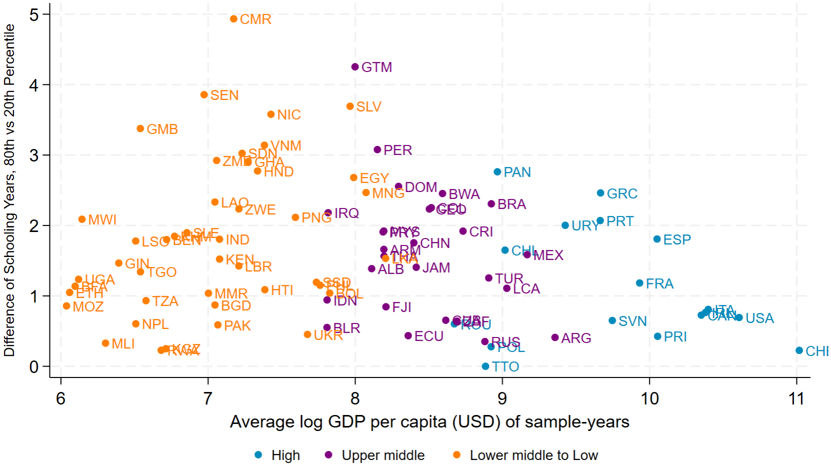
Fact 1b: Within-country Variation in Schooling



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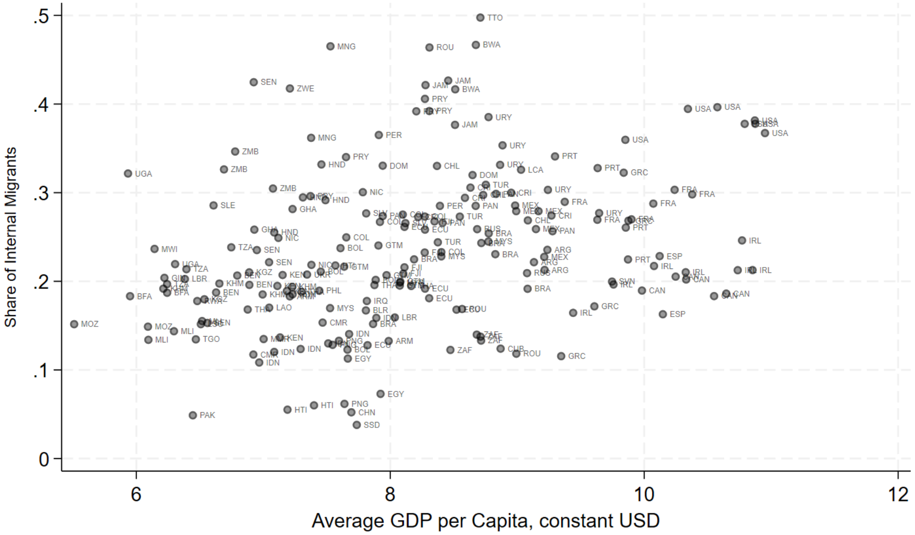
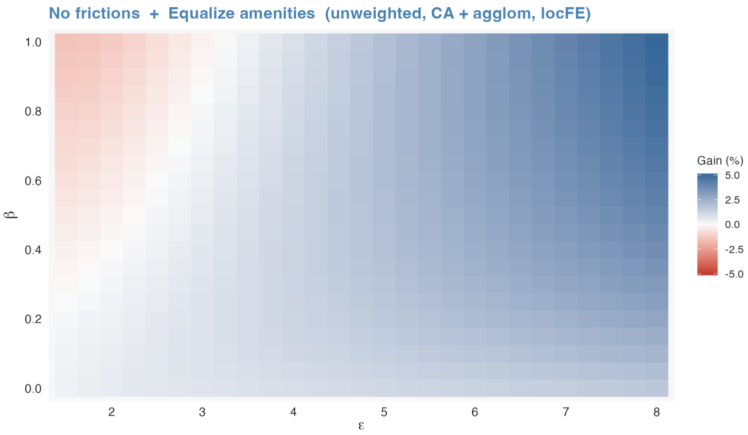
Fact 3a: Labor Mobility Slightly Positively Correlated with GDP pc (40-44 cohort)



Robustness across the (ε, β) grid



Global % welfare gain. Counterfactual: **no distance frictions + equalize amenities**, CA + agglomeration wage feedback (locFE wages). Unweighted mean across $\sim$100 country-years; focal cell $(\varepsilon, \beta) = (3.30, 0)$.

Pop-weighted version · Without Eq. amenities · Back

Calibrating the model country-by-country

- PPML parameterizes $\hat{\mu}_{i,j,t}^{-\varepsilon}$ and destination FEs $= \varepsilon(\ln A_j + \ln w_j) + c$

- We set $w_j = \hat{\delta}_j$, the regional FEs after controlling for workers' characteristics

- Counterfactuals:
  - Observed migration did not occur
  - Migration frictions removed (response governed by β)

- Counterfactual output = population weighted average GDP per capita.

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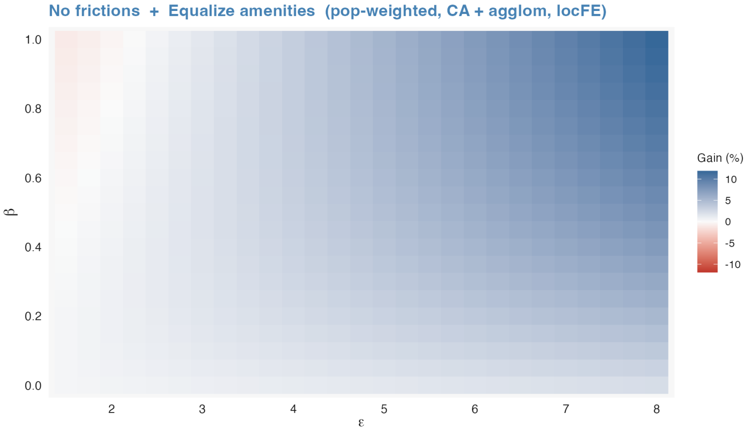
Robustness — No frictions + Equalize amenities (pop-weighted)



Same counterfactual as the main figure, **population-weighted**. CA + agglomeration wage feedback, locFE wages.

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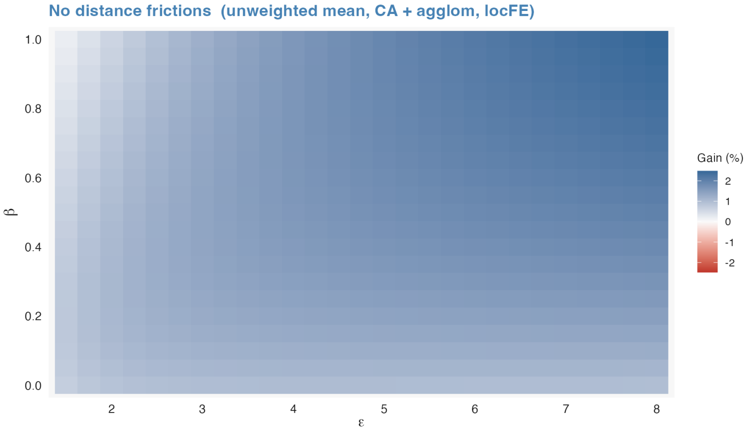
Robustness — Distance frictions only (unweighted)



Distance frictions removed only, amenities at recovered values. CA + agglomeration wage feedback, locFE wages. Unweighted mean across ∼100 country-years.

Pop-weighted

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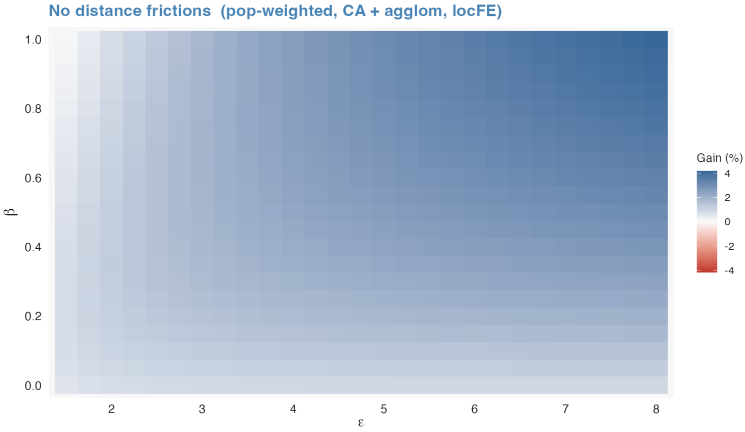
Robustness — Distance frictions only (pop-weighted)

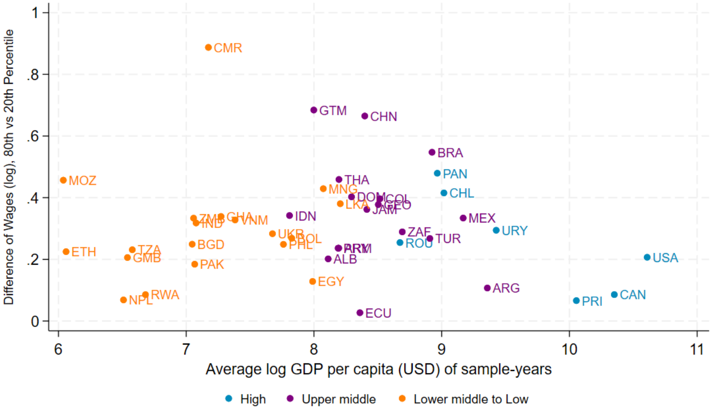


Distance frictions removed only, population-weighted. CA + agglomeration wage feedback, locFE wages.

Unweighted Back

Robustness Fact 1: Within-country Variation in Wages (imputed)

Takes the regional average of imputed wages for persons with missing hourly wages but are active in the labor force (employed, self-employed and unpaid).



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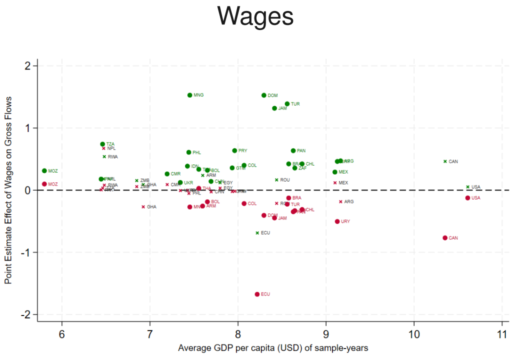
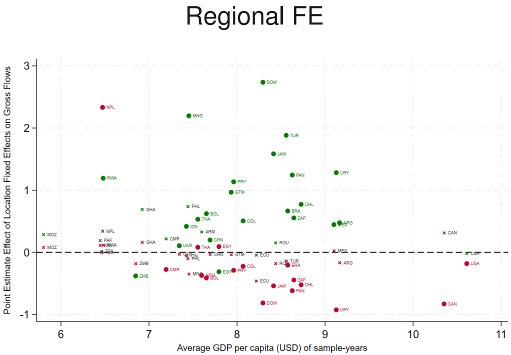
Robustness Fact 2: Coefficients of Gross Inflows (green) and Outflows (red)





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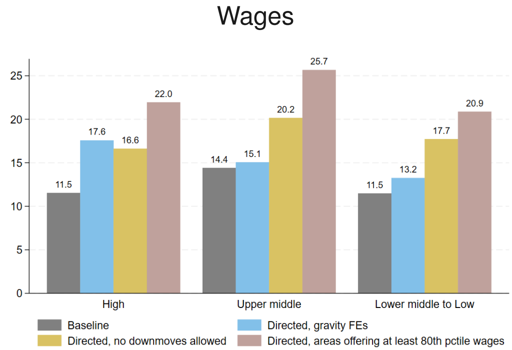
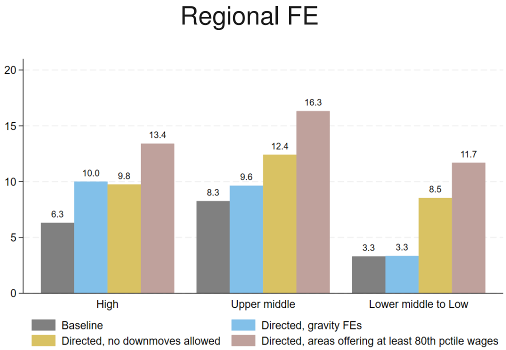
Gains Conditional on Movers





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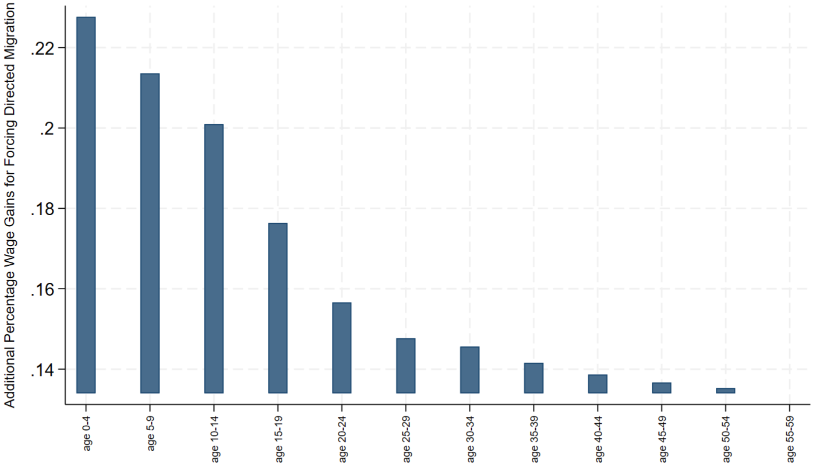
Cohort Gains from Directed Moves



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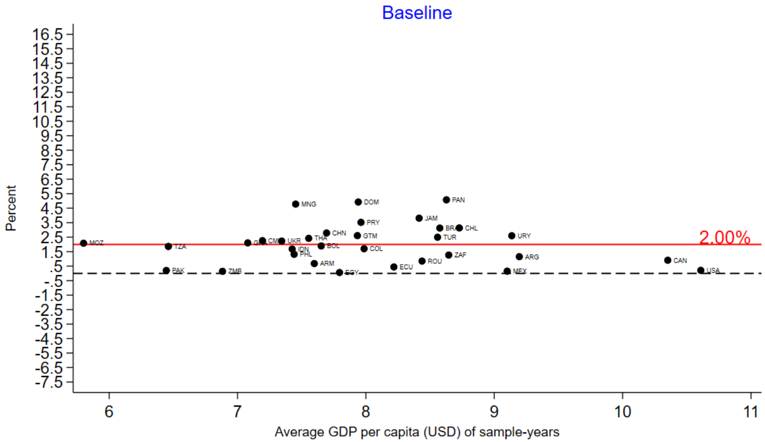
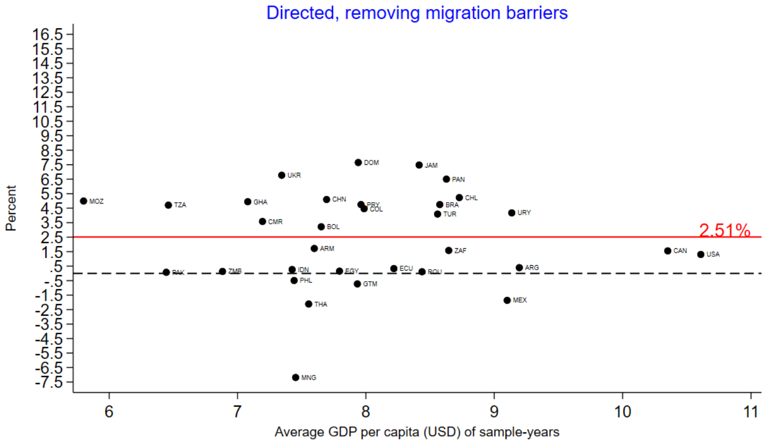
% Wage Gains due to Migration - Actual Flows



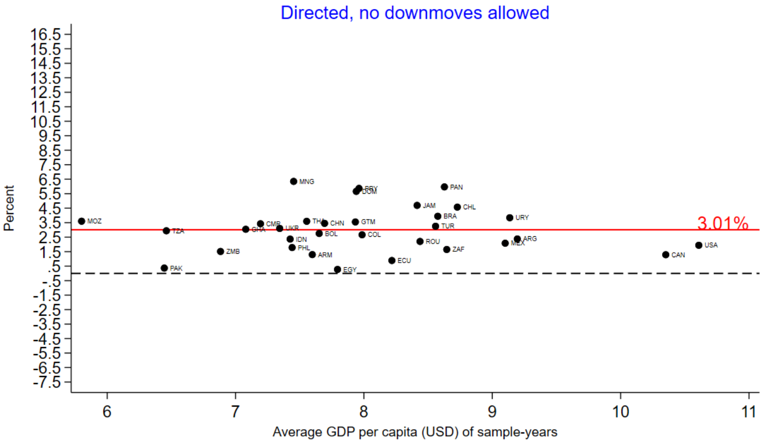
- The average gain of movers is 8.3%, or US$11,892, across countries.

% Wage Gains with Counterfactual Flows: Removing Geo-barriers (Distance)



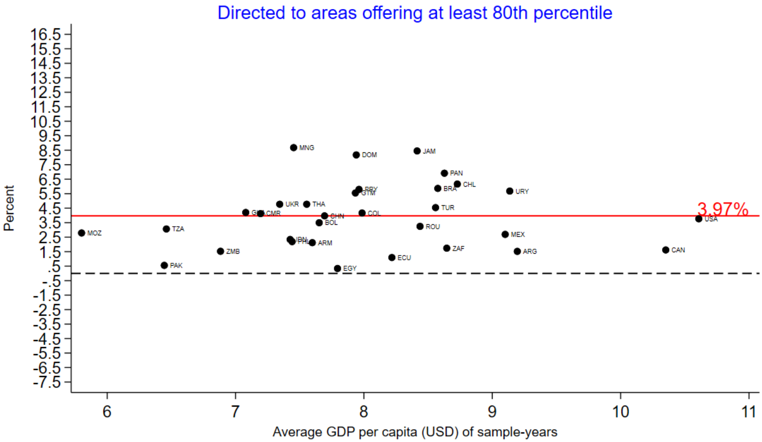
- The average gain of movers is 9.6%, or US$14,666, across countries.

% Wage Gains with Counterfactual Flows: Removing Down-movers



- The average gain of movers is 14.7%, or US$22,158, across countries.

% Wage Gains with Counterfactual Flows: Assigning all movers to $\geq$ 80p



- The average gain of movers is 18.8%, or US$29,531, across countries. Back

Impact on other socio-economic outcomes

Relative to their birthplace, people relocate to regions with:

- higher **paid employment** share by 0.91 percentage points
- lower **agricultural** employment share (1.5 p.p.)
- lower shares of **own-account/self-employed** workers (1.0 p.p.)

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Decomposing Directed Migration

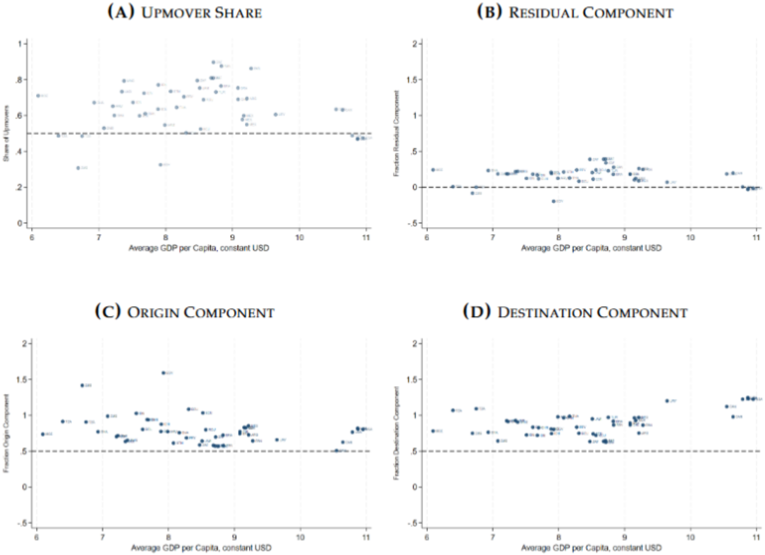
Each region's upmover share is defined as

$$\sum_i \sum_j \lambda_{ij}\, \mathbb{1}\{w_j > w_i\} = \underbrace{\tfrac{1}{2}\sum_i \bar{\lambda}_i\, \theta_i}_{\text{Origin composition}} + \underbrace{\tfrac{1}{2}\sum_j \bar{\lambda}_j\, \theta_j}_{\text{Destination composition}}$$

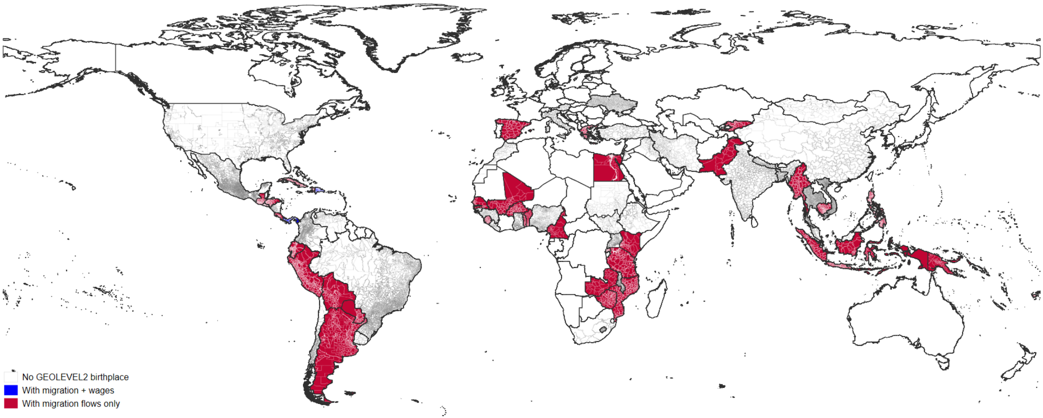
$$+ \underbrace{\sum_{ij} \left(\lambda_{ij} - \tfrac{1}{2}\bar{\lambda}_i - \tfrac{1}{2}\bar{\lambda}_j\right) \mathbb{1}\{w_j > w_i\}}_{\text{Residual (sorting)}}$$

... where λ_i is origin i's share of all out-migration, θ_i are number of destinations paying more than origin i, λ_j is destination j's share of all in-migration, and θ_j are number of alternative locations paying less than destination j.

Decomposing Directed Migration



Countries with birthplace information at GEOLEV2



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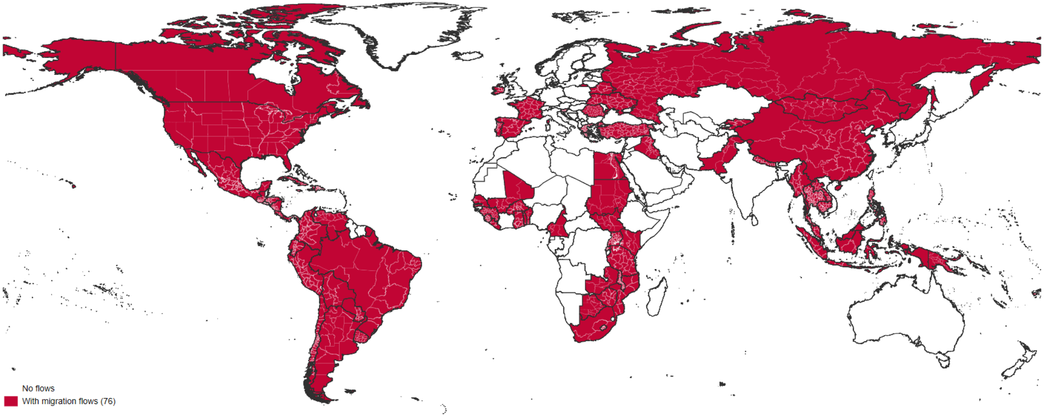
Countries with birthplace information (RHZ sample)



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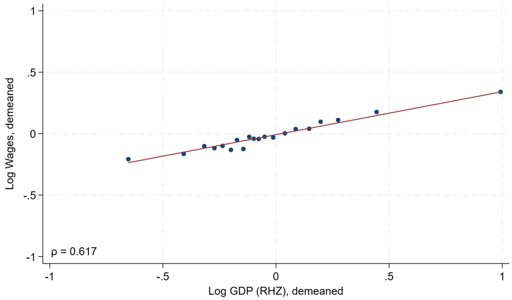
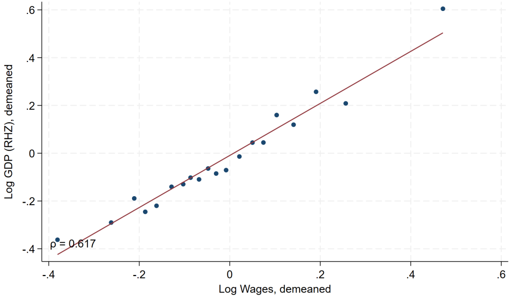
Data validation w/ Rossi-Hansberg & Zhang (2025)

Binscatter plots:





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Modest Effects Robust to Income Measures and Data Source

	Wage Data (LFS)		Satellite GDP
	Raw	Mincer residual	RHZ
	(1)	(2)	(3)
Baseline	2.01	1.01	1.40
+ Comparative advantage	1.81	1.10	1.48
+ Agglomeration	1.86	1.11	1.49
No frictions + Eq. amenities	1.64	0.79	3.06
N Countries	32	32	60

- Effects of net worker reallocation modest across samples and income measures
- Most income variation lies between 1st sub-national units Decomposition Raw Wages

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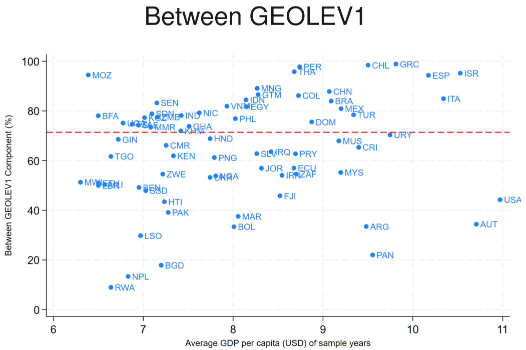
Decomposing Income Inequality across Different Levels of Geographic Aggregation

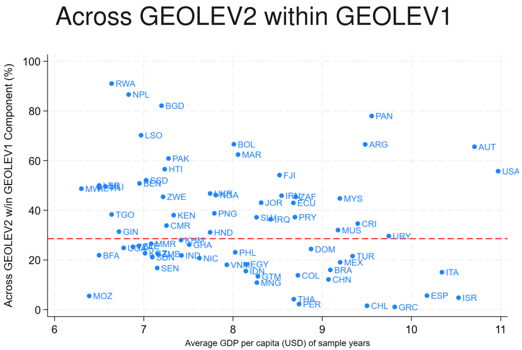
- High-resolution satellite data allows decomposing income variation across levels:
  1. Decompose income variation across geolev2 units into: Between-geolev1 and between-geolev2 within-geolev1 (IPUMS definitions)
  2. Decompose income variation across finest grids into: Between geolev1, between geolev2 within-geolev1, and between-grids within-geolev2

$$\sum_{g} s_g(\overline{w}_g - \overline{w})^2 = \underbrace{\sum_{j} s_j\left(\overline{w}_j - \overline{w}\right)^2}_{\text{between GEOLEV1}} + \underbrace{\sum_{j}\sum_{g\in j} s_g\left(\overline{w}_g - \overline{w}_j\right)^2}_{\text{between GEOLEV2 within GEOLEV1}}$$

- j are states/provinces (geolev1) and g are smaller units (geolev2)
- s_g are regions' population share; $\overline{w}_g$ regions' average wage

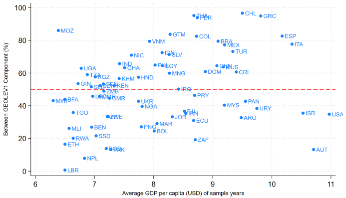
2-level Decomposition: 70% of Variation Explained between States/Provinces (avg)



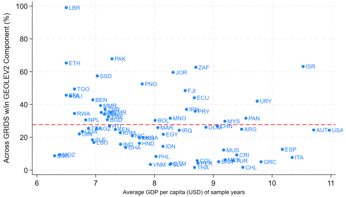


3-level Decomposition: 50% of Variation Explained between States/Provinces (avg)

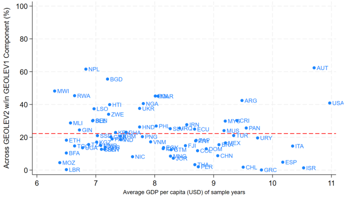
Between GEOLEV1



Across GEOLEV2 within GEOLEV1



Across GRIDS within GEOLEV2



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Country Coverage by Income Classification

Income Category	Pop'n (in billions)	Total countries	Countries w/ flows only	wage only	flows+wage
High	676	17	13	7	6
Low	406	15	13	5	1
Lower Middle	2668	28	24	15	10
Upper Middle	2733	28	26	18	16

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Region	Countries
East Asia and Pacific	Cambodia, China, Fiji, Indonesia, Laos, Malaysia, Mongolia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam
Europe and Central Asia	Albania, Armenia, Belarus, France, Georgia, Greece, Ireland, Italy, Kyrgyzstan, Poland, Portugal, Romania, Russia, Slovenia, Spain, Switzerland, Turkey, Ukraine
Latin America and Caribbean	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, México, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Lucia, Trinidad and Tobago, Uruguay, Venezuela
Middle East and North Africa	Egypt, Iraq
North America	Canada, United States
South Asia	Bangladesh, India, Nepal, Pakistan, Sri Lanka
Sub-Saharan Africa	Benin, Botswana, Burkina Faso, Cameroon, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho, Liberia, Malawi, Mali, Mozambique, Rwanda, Senegal, Sierra Leone, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe

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Country Coverage by Region

Region Category	Pop'n (in billions)	Total countries	Countries w/ flows only	wage only	flows+wage
East Asia and Pacific	2108	12	11	6	5
Europe and Central Asia	561	18	13	6	4
Latin America and Caribbean	654	24	23	15	14
Middle East and North Africa	160	2	2	1	1
North America	375	2	2	2	2
South Asia	1909	5	2	5	1
Sub-Saharan Africa	716	25	23	10	6

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Income Category	Countries
High	Canada, Chile, France, Greece, Ireland, Italy, Panama, Poland, Portugal, Puerto Rico, Romania, Slovenia, Spain, Switzerland, Trinidad and Tobago, United States, Uruguay
Upper Middle	Albania, Argentina, Armenia, Belarus, Botswana, Brazil, China, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Fiji, Georgia, Guatemala, Indonesia, Iraq, Jamaica, Malaysia, México, Paraguay, Peru, Russia, Saint Lucia, South Africa, Thailand, Turkey, Venezuela
Lower Middle	Bangladesh, Benin, Bolivia, Cambodia, Cameroon, Egypt, El Salvador, Ghana, Honduras, India, Kenya, Kyrgyzstan, Laos, Lesotho, Mongolia, Myanmar, Nepal, Nicaragua, Pakistan, Papua New Guinea, Philippines, Senegal, Sri Lanka, Tanzania, Ukraine, Vietnam, Zambia, Zimbabwe
Low	Burkina Faso, Ethiopia, Gambia, Guinea, Haiti, Liberia, Malawi, Mali, Mozambique, Rwanda, Sierra Leone, South Sudan, Sudan, Togo, Uganda

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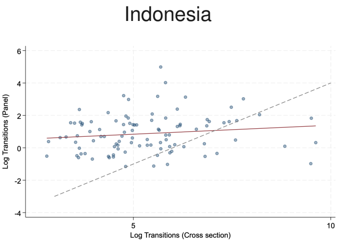
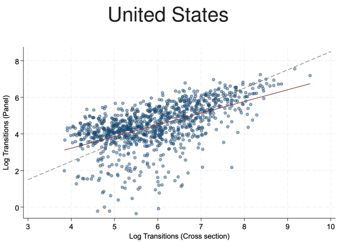
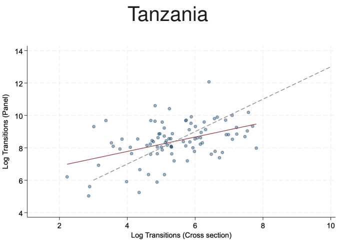
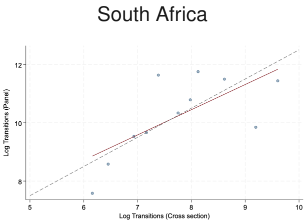
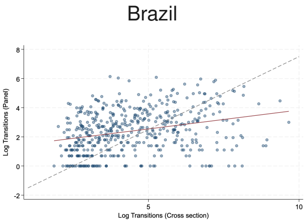
Visualizing at o-d-year (data validation)











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