Immigration and Business Dynamics: Evidence from U.S. Firms

Parag Mahajan
University of Delaware

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- This paper: they are also key drivers of the impact of U.S. immigration

New Evidence on the Role of Firms in U.S. Immigration

- **Research question:** to what extent do heterogeneous responses across the employer distribution mediate the economic impact of immigration in destination countries?
- **Context:** immigrant inflows into U.S. commuting zones, 2000–2018
- **Identifying variation:** shift-share IV approach (Card, 2009; Borusyak et al., 2021)
- **Data:** administrative panel data set covering all U.S. private sector establishments
- **Findings:**
  1. Empirically: immigrant inflows favor high-productivity firms, and this relationship drives immigrant-induced employment and earnings growth in U.S. localities
  2. Synthesizing model: accounting for changes to the employer distribution generate a novel channel from immigration to productivity and output growth

Contributions

- Immigration & establishment creation in the U.S.: Orrenius et al. (2020); Olney (2013)
  - Here: elucidate importance for job creation and productivity growth
- Immigration & productivity in the U.S.: Peri (2012); Lewis (2012); Clemens et al. (2018); Khanna and Lee (2020); Sequeira et al. (2019); Burchardi et al. (2016)
  - Here: introduce changes to employer distribution as potential source of immigrant-induced productivity growth
- Firm-level responses to immigration: Mitaritonna et al. (2017); Beerli et al. (2021); Brinatti and Morales (2021); Doran et al. (2022); Amuedo-Dorantes et al. (2023); Mahajan et al. (2024)
  - Here: comprehensive study of U.S. establishments
- Immigrant absorption: Lewis (2012, 2005); Dustmann and Glitz (2015); Burstein et al. (2020); Gonzalez and Ortega (2011); Hong and McLaren (2015); Monras (2021); Amior (2021)
  - Here: role of establishment entry and exit in U.S.
- Modeling the welfare impact of immigration: Borjas (1999); Cortes (2008); di Giovanni et al. (2014); Hong and McLaren (2015); Brinatti and Morales (2021)
  - Here: novel focus on role of changes to the employer distribution

U.S. Census Bureau Data

- Longitudinal Business Database (LBD)
  - Annual establishment level panel covering 1976–present
  - Constructed from administrative tax records
  - Key variables: establishment payroll, establishment March 12 employment, firm revenues (1997 onward)
- Demographic survey data
  - Restricted-access versions of 1970, 1980, 1990, and 2000 Long-Form Decennial Census survey responses
  - Restricted access versions of 2005–2019 American Community Survey (ACS)
  - Full set of responses
  - Key variables: nativity, county of residence

Research Design: Primary Estimating Equation

$$\Delta y_{\ell t} = \beta \left[\Delta I_{\ell t}\right] + \Gamma X_{\ell t} + \alpha_{d(\ell),t} + \varepsilon_{\ell t}$$

- ℓ: one of 722 U.S. commuting zones ($\approx$ local labor market)
- t: one of two stacked periods ($t \in \{2000-2009, 2009-2018\}$)
- $\Delta I_{\ell t}$: immigrant inflows into ℓ during t, divided by ℓ's 2000 workforce size
- $\Delta y_{\ell t}$: outcome related to business dynamics in ℓ over period t
- $X_{\ell t}$: controls (more next)
- $\alpha_{d(\ell),t}$: Census division by period fixed effects

Research Design: SSIV Approach

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$$\Delta z_{\ell t} = \sum_{o} s_{\ell o} g^{I}_{ot}$$

- $s_{\ell o}$ is the share of commuting zone ℓ's workforce in 2000 comprised of immigrant workers from origin o
- g^{I}_{ot} is the *national* growth rate in immigrant inflows from origin o during period t

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- Apply some recent advances in SSIV methods to this workhorse IV

Research Design: SSIV Identification

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- Follow Borusyak et al. (2021) in focusing on identifying variation stemming from instrument **shifts** (g^{I}_{ot}) rather than instrument shares ($s_{\ell o}$)
  - $\sum_o s_{\ell o}$, interacted with period fixed effects, always included in $X_{\ell t}$
  - Also use "exposure-robust" standard errors described in Borusyak et al. (2021) to address concerns broached in Adao et al. (2019)

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- Why shifts and not shares?
  1. Shares are often the result of deep historical ties that may still be creating agglomeration effects today (Sequeira et al., 2019)
  2. Shifts are more likely to reflect latent migration "pushes" in o than labor demand "pulls" from a specific U.S. locality ℓ

Research Design: Validation Exercises

- Utilize the following specification to probe the plausibility of identifying assumptions

$$\Delta y_{\ell t'}^{\text{Std}} = \phi \left[\Delta z_{\ell t}^{\text{Std}} \right] + \Gamma X_{\ell t} + \alpha_{d(\ell),t} + \varepsilon_{\ell t}$$

- $\Delta y_{\ell t'}$ and $\Delta z_{\ell t}$ are standardized for ease of comparison
- $X_{\ell t}$ only includes the sum of shares interacted with period fixed effects

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- When t' is some period prior to 2000, $\hat{\phi}$ provides a pre-period a balance test
- When $t' = t$, $\hat{\phi}$ provides a comparable effect size during the study period

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- When t' is some period prior to 2000, $\hat{\phi}$ provides a pre-period a balance test
- When $t' = t$, $\hat{\phi}$ provides a comparable effect size during the study period
- Key question: is the SSIV consistent with a shock to immigrant supply?
  - As opposed to: a reflection of increased immigrant demand
  - If so, the SSIV should generate an increase in immigration, *but also* a decrease in relative immigrant wages during the study period

Research Design: Validation Exercises

Figure: Effect of the SSIV on Immigrant Inflows

Notes: Estimated $\hat{\phi}$ with capped spikes indicating 95% confidence intervals from "exposure robust" standard errors and thick spikes indicating 95% confidence intervals from conventional standard errors, clustered at commuting zone level. Observations weighted by 2000 commuting zone workforce size.

- Pre-period balance on immigrant inflows: SSIV is not capturing the effect of inflows prior to the study period

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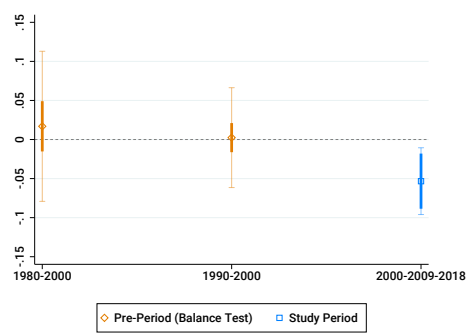
- Large effect on immigrant inflows during the study period: previews strong first stage

Research Design: Validation Exercises

Figure: Effect of the SSIV on Relative Immigrant Wages



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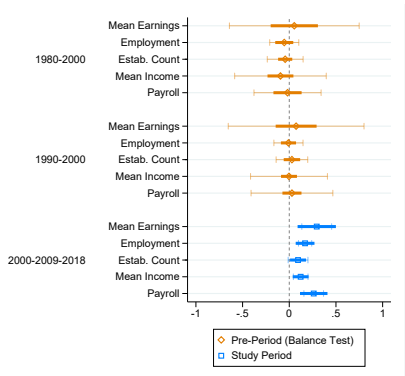
- Pre-period balance on immigrant inflows: SSIV is not capturing the effect of inflows prior to the study period
- Large effect on immigrant inflows during the study period: previews strong first stage
- *Negative* effect on residual immigrant-native wage gap during study period: consistent with immigrant supply ↑

Research Design: Validation Exercises

Figure: Additional Balance Tests



Notes: Estimated $\hat{\phi}$ with capped spikes indicating 95% confidence intervals from "exposure robust" standard errors and thick spikes indicating 95% confidence intervals from conventional standard errors, clustered at commuting zone level. Specifications only include the sum of shares interacted with period FE as controls. Observations weighted by 2000 commuting zone workforce size.

- Reassuring patterns across several add'l outcomes

Research Design: Validation Exercises

Table: Effect of the SSIV on Standardized Control Variables

		Measured in 2000			
	Bartik Labor Demand Control	College Share	log Workforce Size	MANU Share	CONS Share
Std. SSIV ($\Delta z_{\ell t}^{\text{Std}}$)	-0.038	0.320	0.027	-0.056	-0.062
	(0.050)	(0.291)	(0.081)	(0.084)	(0.066)
	[0.077]	[0.528]	[0.178]	[0.099]	[0.088]
Commuting Zones	722	722	722	722	722
Observations	1,444	1,444	1,444	1,444	1,444

Notes: Coefficients are $\hat{\phi}$ estimates. Observations weighted by 2000 commuting zone workforce size. Conventional standard errors, clustered at the commuting zone level, in parentheses below estimates. Borusyak et al. (2021) exposure-robust standard errors, clustered at the UN region level, in square brackets below conventional standard errors.

- Reassuring patterns across several add'l outcomes
- No effect of SSIV on add'l controls variables
  - Most notably: labor demand
  - These are included in preferred specifications below

Research Design: Validation Exercises

Table: First Stage and Native Displacement

	Immigrant Worker Inflows ($\Delta I_{\ell t}$)	Native Worker Inflows	
	(1)	(2)	(3)
SSIV ($\Delta z_{\ell t}$)	1.050***		
	(0.137)		
	[0.203]		
Immigrant Worker Inflows ($\Delta I_{\ell t}$)		0.621***	-0.251
		(0.154)	(0.227)
			[0.290]
Estimation	OLS (1st Stage)	OLS	2SLS ($\Delta z_{\ell t}$)
p-value: exogeneity test of $\Delta I_{\ell t}$			0.002
Commuting Zones	722	722	722
Observations	1,444	1,444	1,444

Notes: Columns (2) and (3) show estimates, $\hat{\beta}$, from main estimating equation. Native worker inflows have the same denominator as immigrant worker inflows, so that $\hat{\beta}$ can be interpreted as the number of native workers crowded in by each immigrant worker. Observations weighted by 2000 commuting zone workforce size. Where applicable, Borusyak et al. (2021) exposure-robust standard errors, clustered at the UN region level, in square brackets below conventional standard errors. Specifications include additional controls (outcomes in previous table).

- Reassuring patterns across several add'l outcomes
- No effect of SSIV on add'l controls variables
  - Most notably: labor demand
  - These are included in preferred specifications below
- First result from main estimating equation: expected endogeneity correction on native inflows
  - OLS results imply substantial crowd-in, 2SLS results imply (imprecise, small) crowd-out

Local Labor Market Results

- Next: turn to main set of local labor market results
- Utilizing panel structure of LBD, novel decompositions of:
  - Immigrant-induced employment growth
  - Immigrant-induced mean earnings growth
- Some initial notation:
  - Let t_0 denote the start and let t_1 denote the end of period t
  - Continuing establishments are those that are active at t_0 and t_1: $\mathcal{C}_{\ell t}$
  - Entering establishments are those that were not active at t_0 but were at t_1: $\mathcal{E}_{\ell t}$
  - Exiting establishments are those that were active at t_0 but were not at t_1: $\mathcal{X}_{\ell t}$

Local Labor Market Results: Decomposing Employment Growth

- Employment growth:

$$\Delta \log(\text{Emp}_{\ell t}) \approx \text{DHS Employment Growth}_{\ell t} \equiv \frac{\Delta \text{Emp}_{\ell t}}{\overline{\text{Emp}}_{\ell t}}$$

  - Where Emp represents an employment count, and $\overline{\text{Emp}}_{\ell t} \equiv \frac{\text{Emp}_{\ell t_1} + \text{Emp}_{\ell t_0}}{2}$

- Then, decompose:

$$\frac{\Delta \text{Emp}_{\ell t}}{\overline{\text{Emp}}_{\ell t}} = \underbrace{\frac{\sum_{j \in \mathcal{C}_{\ell t}} \Delta \text{Emp}_{jt}}{\overline{\text{Emp}}_{\ell t}}}_{\text{Contribution from Continuers}} + \underbrace{\frac{\sum_{j \in \mathcal{E}_{\ell t}} \text{Emp}_{jt_1}}{\overline{\text{Emp}}_{\ell t}}}_{\text{Contribution from Entry}} - \underbrace{\frac{\sum_{j \in \mathcal{X}_{\ell t}} \text{Emp}_{jt_0}}{\overline{\text{Emp}}_{\ell t}}}_{\text{Contribution from Exit}}$$

  - Where j indexes an establishment

Local Labor Market Results: Decomposing Employment Growth

- Using this decomposition, estimate contribution of entrants, exiters, and continuers to immigrant-induced employment growth in two steps:
  1. Main estimating equation using 2SLS (IV: $\Delta z_{\ell t}$):

$$\text{DHS Employment Growth}_{\ell t} = \beta \left[\Delta I_{\ell t}\right] + \Gamma X_{\ell t} + \alpha_{d(\ell),t} + \varepsilon_{\ell t}$$

  2. Then, following Dustmann and Glitz (2015), use 2SLS (IV: $\Delta z_{\ell t}$) to estimate:

$$\text{Contribution from } [\text{Flow}]_{\ell t} = \beta^{\text{Flow}} \left[\text{DHS Employment Growth}_{\ell t}\right] + \Gamma X_{\ell t} + \alpha_{d(\ell),t} + \varepsilon_{\ell t}$$

     where $\text{Flow} \in \{\text{Entry}, \text{Exit}, \text{Continuer Growth}\}$.

- β^{Flow} represents the contribution of entry, exit, and continuer growth to immigrant-induced employment growth, respectively ($\sum \beta^{\text{Flow}} = 1$ by construction)

Local Labor Market Results: Decomposing Employment Growth

Table: Immigrant Inflows and Employment Growth

	DHS Growth:	Percent Contribution to DHS Growth:		
	Employment	Continuer Growth	Entry	Reduced Exit
Immigrant Worker Inflows ($\Delta I_{\ell t}$)	1.422***			
	(0.3224)			
	[0.3415]			
DHS Growth in Employment		0.586***	-0.017	0.432***
		(0.121)	(0.136)	(0.110)
		[0.097]	[0.077]	[0.093]
Benchmark Contribution	—	0.407	0.309	0.284
Commuting Zones	722	722	722	722
Observations	1,444	1,444	1,444	1,444

Notes: Models include full set of control variables. Observations weighted by 2000 commuting zone workforce size. Conventional standard errors, clustered at the commuting zone level, in parentheses below estimates. Where applicable, Borusyak et al. (2021) exposure-robust standard errors, clustered at the UN region level, in square brackets below conventional standard errors. All columns are estimated using 2SLS with SSIV $\Delta z_{\ell t}$ as an instrument for $\Delta I_{\ell t}$. Benchmark Contribution refers to corresponding coefficient estimates using OLS.

- Expected, (+) effect on employment
- Primarily due to continuers and reduced establishment exit
- 43% of immigrant-induced employment growth over a nine-year period is due to reduced establishment exit
- **Key takeaway 1:** the extensive margin is critical to understanding immigrant absorption

Local Labor Market Results: Decomposing Earnings Growth

- Average earnings in location ℓ is a weighted share of earnings at each establishment:

$$\text{Earn}_{\ell t} \equiv \frac{\text{Pay}_{\ell t}}{\text{Emp}_{\ell t}} = \frac{\sum_j \text{Emp}_{jt} \left(\frac{\text{Pay}_{jt}}{\text{Emp}_{jt}} \right)}{\text{Emp}_{\ell t}} \equiv \sum_j s_j \text{Earn}_j$$

  - Where Pay represents a payroll count

- Then, once again decompose:

$$\frac{\Delta \text{Earn}_{\ell t}}{\overline{\text{Earn}}_{\ell t}} = \underbrace{\frac{\sum_{j \in \mathcal{C}_{\ell t}} \Delta(s_{jt} \text{Earn}_{jt})}{\overline{\text{Earn}}_{\ell t}}}_{\text{Contribution from Continuers}} + \underbrace{\frac{\sum_{j \in \mathcal{E}_{\ell t}} s_{jt_1} \text{Earn}_{jt_1}}{\overline{\text{Earn}}_{\ell t}}}_{\text{Contribution from Entry}} - \underbrace{\frac{\sum_{j \in \mathcal{X}_{\ell t}} s_{jt_0} \text{Earn}_{jt_0}}{\overline{\text{Earn}}_{\ell t}}}_{\text{Contribution from Exit}}$$

  - Where $\Delta \log(\text{Earn}_{\ell t}) \approx \text{DHS Earnings Growth}_{\ell t} \equiv \frac{\Delta \text{Earn}_{\ell t}}{\overline{\text{Earn}}_{\ell t}}$

Local Labor Market Results: Decomposing Earnings Growth

Table: Immigrant Inflows and Mean Earnings Growth

	DHS Growth: Earnings	Percent Contribution to DHS Growth: Continuer Growth	Entry	Reduced Exit
Immigrant Worker Inflows ($\Delta I_{\ell t}$)	1.234*** (0.383) [0.449]			
DHS Growth in Earnings		0.712*** (0.145) [0.115]	-0.122 (0.170) [0.109]	0.411** (0.191) [0.136]
Benchmark Contribution	—	0.609	0.185	0.206
Commuting Zones	722	722	722	722
Observations	1,444	1,444	1,444	1,444

Notes: Models include full set of control variables. Observations weighted by 2000 commuting zone workforce size. Conventional standard errors, clustered at the commuting zone level, in parentheses below estimates. Where applicable, Borusyak et al. (2021) exposure-robust standard errors, clustered at the UN region level, in square brackets below conventional standard errors. All columns are estimated using 2SLS with SSIV $\Delta z_{\ell t}$ as an instrument for $\Delta I_{\ell t}$. Benchmark Contribution refers to corresponding coefficient estimates using OLS.

- Substantive increases in local labor productivity
- 41% of which is accounted for by reduced exit
- The extensive margin is critical to understanding immigrant-induced (labor) productivity growth

Local Labor Market Results: Decomposing Earnings Growth

- A separate decomposition specifically elucidates the importance of firm heterogeneity
- As in Olley and Pakes (1996), we can write

$$\text{Earn}_{\ell t_\tau} = \underbrace{\overline{\text{Earn}}_{\ell t_\tau}}_{\text{Unweighted Mean}_{\ell t_\tau}} + \underbrace{\sum_j (s_{jt_\tau} - \overline{s}_{\ell t_\tau})(\text{Earn}_{jt_\tau} - \overline{\text{Earn}}_{\ell t_\tau})}_{\text{Employment-Pay Covariance}_{\ell t_\tau}}, \tau \in 0, 1$$

  - Where averages are take across establishments in a given location ℓ and time t_τ

- Then, the change in earnings is due to an unweighted shift of the entire distribution and a reallocation component:

$$\Delta\text{Earn}_{\ell t} = \underbrace{\Delta\text{Unweighted Mean}_{\ell t}}_{\equiv\text{Unweighted Shift}_{\ell t}} + \underbrace{\Delta\text{Employment-Pay Covariance}_{\ell t}}_{\equiv\text{Reallocation}_{\ell t}}$$

- Broadly speaking, $\text{Reallocation}_{\ell t}$ is definitionally missed by representative firm models

Local Labor Market Results: Decomposing Earnings Growth

Table: Immigrant Inflows and Mean Earnings Growth

	DHS Growth: Earnings	Percent Contribution to DHS Growth: Unweighted Shift	Reallocation
Immigrant Worker Inflows ($\Delta I_{\ell t}$)	1.234***		
	(0.383)		
	[0.449]		
DHS Growth in Earnings		0.437	0.563**
		(0.278)	(0.278)
		[0.111]	[0.111]
Benchmark Contribution	–	0.672	0.328
Commuting Zones	722	722	722
Observations	1,444	1,444	1,444

Notes: Models include full set of control variables. Observations weighted by 2000 commuting zone workforce size. Conventional standard errors, clustered at the commuting zone level, in parentheses below estimates. Where applicable, Borusyak et al. (2021) exposure-robust standard errors, clustered at the UN region level, in square brackets below conventional standard errors. All columns are estimated using 2SLS with SSIV $\Delta z_{\ell t}$ as an instrument for $\Delta I_{\ell t}$. Benchmark Contribution refers to corresponding coefficient estimates using OLS.

- Immigrant-induced labor productivity growth is driven by reallocation of economic activity across firms
- This is more true of immigrant-induced labor productivity growth than it is of typical earnings growth that we are used to seeing in U.S. commuting zones

Local Labor Market Results: Decomposing Earnings Growth

- Finally, to what extent does the extensive margin drive this productivity-enhancing reallocation?
- First, note that we can re-do the previous decomposition among continuers only:

$$\Delta \text{Earn}^{\mathcal{C}}_{\ell t} = \text{Unweighted Shift}^{\mathcal{C}}_{\ell t} + \text{Reallocation}^{\mathcal{C}}_{\ell t}$$

- Then,

$$\Delta \text{Earn}_{\ell t} = \underbrace{\text{Unweighted Shift}^{\mathcal{C}}_{\ell t}}_{\text{Continuer Contribution to Unweighted Shift}} + \underbrace{\left(\text{Unweighted Shift}_{\ell t} - \text{Unweighted Shift}^{\mathcal{C}}_{\ell t}\right)}_{\text{Extensive Margin Contribution to Unweighted Shift}}$$

$$\underbrace{\text{Unweighted Shift}^{\mathcal{C}}_{\ell t}}_{\text{Continuer Contribution to Reallocation}} + \underbrace{\left(\text{Reallocation}_{\ell t} - \text{Reallocation}^{\mathcal{C}}_{\ell t}\right)}_{\text{Extensive Margin Contribution to Reallocation}}$$

Local Labor Market Results: Decomposing Earnings Growth

Table: Further Decomposing the Effect of Immigrant Inflows on Mean Earnings Growth

	Percent Contribution to DHS Growth in Earnings			
	Unweighted Shift		Reallocation	
	Continuers	Ext. Margin	Continuers	Ext. Margin
	(1)	(2)	(3)	(4)
DHS Growth in Mean Earnings	0.568**	-0.131	0.144	0.419**
	(0.249)	(0.237)	(0.250)	(0.209)
	[0.197]	[0.155]	[0.152]	[0.108]
Benchmark Contribution	0.694	-0.023	-0.085	0.414
Commuting Zones	722	722	722	722
Observations	1,444	1,444	1,444	1,444

Notes: Models include full set of control variables. Observations weighted by 2000 commuting zone workforce size. Conventional standard errors, clustered at the commuting zone level, in parentheses below estimates. Where applicable, Borusyak et al. (2021) exposure-robust standard errors, clustered at the UN region level, in square brackets below conventional standard errors. All columns are estimated using 2SLS with SSIV $\Delta z_{\ell t}$ as an instrument for $\Delta I_{\ell t}$. Benchmark Contribution refers to corresponding coefficient estimates using OLS.

- **Key takeaway 2:** two drivers of immigrant-induced labor productivity growth
  1. Secular shift in labor productivity at continuers
  2. Reallocation to higher-paying firms due to entry and **exit** dynamics

Establishment-Level Analysis: Motivation and Design

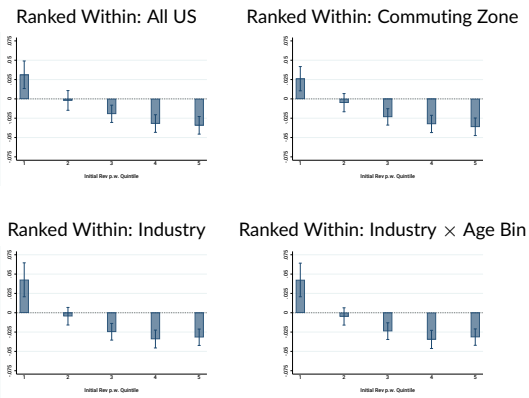
- We usually associate reduced exit with stunted creative destruction, yet we find *increases* in labor productivity
- To delve into these dynamics, adapt research design to study heterogeneity in establishment level exit decisions

$$\text{Inactive}_{jt} = \sum_{q=1}^{5} \beta_q \left[z^{\text{Std}}_{\ell(j),t} \times \mathbb{1}\{Q(j) = q\} \right] + \Gamma X_{jt} + \alpha_j + \alpha_{d(j),t} + \varepsilon_{jt}$$

  - Includes all establishments j that were in operation as of 2000 and tracks whether they still are over $t \in \{2000, 2006, 2009, 2012, 2015, 2018\}$
  - $z_{\ell(j),t} \equiv \sum_o s_{\ell o} G^I_{ot}$, where G^I_{ot} is the stock of immigrants from o in t divided by initial stock of immigrants from o in 2000 (levels version of SSIV)
  - $Q(j)$ indicates which quintile of the revenue per worker distribution j's parent firm was in as of 2000

Establishment-Level Results: Heterogeneous Exit Dynamics

Figure: Immigration Shocks and Establishment Inactivity, Stratified by Initial Revenues per Worker



Notes: Observations weighted by inverse probability weights that predict whether parent firms have observed revenues in 2000. Capped spikes indicate 95% confidence intervals based on standard errors that are adjusted for two-way clustering at the firm and commuting zone level.

- Across several potential peer groups, similar pattern emerges
- **Key takeaway 3:** immigrant inflows cull low-productivity firms from a commuting zone while preserving higher productivity firms
- Consistent with growing body of evidence that immigrant workers are tied to higher-productivity firms, on average (Online appendix, Brinatti and Morales 2021, Mitaritonna et al. 2017, Amuedo-Dorantes et al. 2023, Mahajan et al. 2024)

Zooming Out

- Many additional empirical results in paper, including
  - Exporters play an outsized role in immigrant-induced job creation, as in Burstein et al. (2020)
  - Immigrant inflows lead to an increase in the establishment count, $\approx$50% of which is accounted for by the top quintile of firm productivity distribution
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- In sum, in US local economics:
  1. Exit accounts for a large portion of immigrant-induced increases in employment and average earnings
  2. Immigrant absorption reshapes the employer distribution, increasing (labor) productivity
- These results point to ties between immigrant workers and high-productivity firms
- Next: incorporate these ties into a GE model of immigration and the local economy
  - Re-evaluate the “immigration surplus” in this setting

Model Ingredients

1. Firm heterogeneity, monopolistic competition (e.g., Melitz, 2003)
   - μ: elasticity of substitution across goods
   - Individual entrepreneurs draw productivity, z, from a Pareto Distribution
   - z_0^*: zero-profit cutoff, generated by fixed costs

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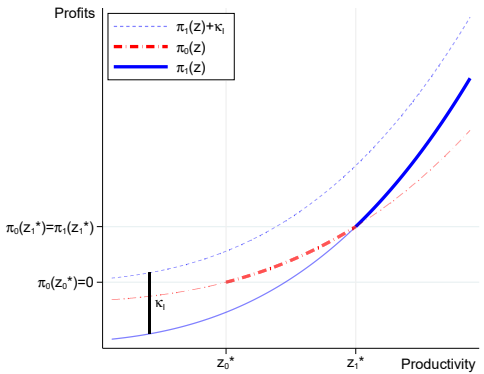
Overview of Model

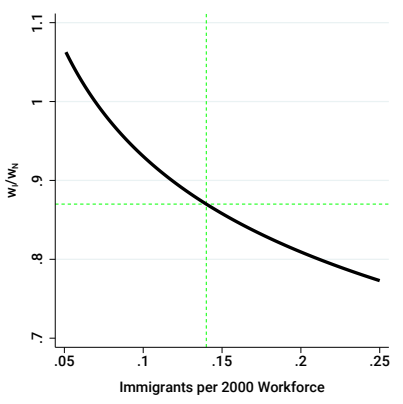
Figure: Equilibrium Depiction



- Scale generates a link between immigrant workers and high-prod. firms
  - Larger firms spread κ^I over many units, $\downarrow$ labor costs
- At z_0^*: native-only firms make zero profit; immigrant-hiring firms unprofitable
- At z_1^*: switching point, lower AVC from immigrant-hiring outweighs higher AFC

Model Dynamics: Immigration

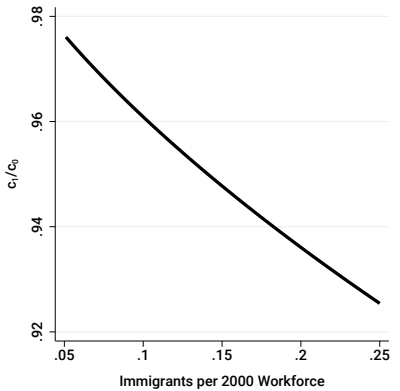
Immigrant-to-Native Wage Ratio



- Relative immigrant wages fall

Model Dynamics: Immigration

Type $j = 1$ Relative Per Unit Costs $\left(\frac{c_1}{c_0}\right)$



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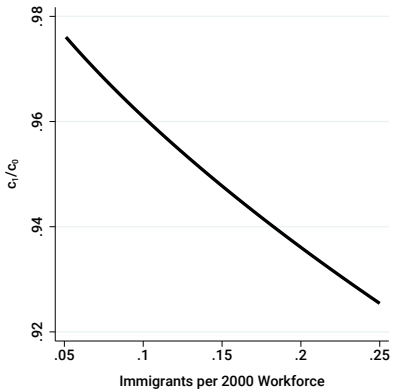
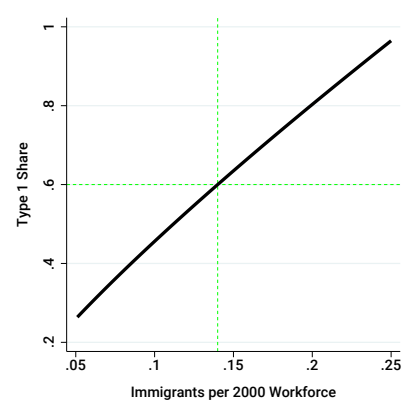


- Relative immigrant wages fall
- Lowering unit costs for $j = 1$ firms
- $j = 1$ firms lower prices:
  $p_j(z) = \left(\frac{\mu}{\mu - 1}\right)\left(\frac{c_j}{z}\right)$

Model Dynamics: Immigration

Share of Immigrant-Hiring Firms (Type $j = 1$ Share)



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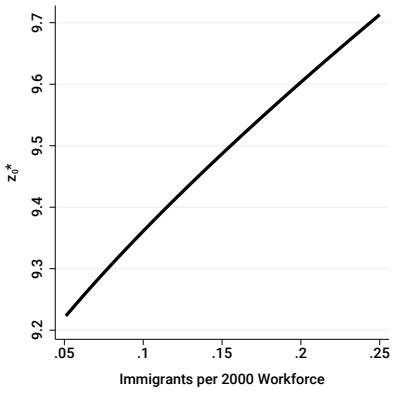
- Compete market away from $j = 0$ firms

Model Dynamics: Immigration

Zero-Profit Cutoff (z_0^*)



- Relative immigrant wages fall
- Lowering unit costs for $j = 1$ firms
- $j = 1$ firms lower prices:
  $p_j(z) = \left(\frac{\mu}{\mu - 1}\right)\left(\frac{c_j}{z}\right)$
- Compete market away from $j = 0$ firms
- Raising z_0^*

The Immigration Surplus

$$\frac{d\log(\text{Native Real Income})}{dI} = \underbrace{\left(\frac{\eta}{\mu-1}\right)\frac{d\log(F)}{dI}}_{\text{Gains from Variety}} + \underbrace{\left(1+\frac{\phi}{\mu-1}\right)\frac{d\log(z_0^*)}{dI}}_{\text{Gains in Efficiency}}$$

η : indicator for whether consumers desire variety ($\eta \in \{0,1\}$)

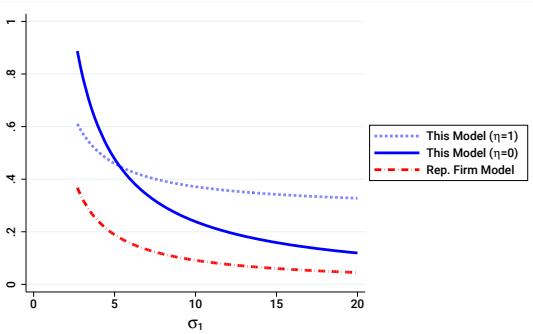
ϕ : shape parameter from Pareto Distribution ($\phi > \mu - 1$)

F : firm mass

- Immigration surplus *as a function of the employer distribution*
  - Under most calibrations, $\frac{d\log(F)}{dI} > 0$
  - Under *all* calibrations, $\frac{d\log(z_0^*)}{dI} > 0$
- Empirical analogs consistent with $z_0^* \uparrow$, including culling of low-productivity firms

The Immigration Surplus

Figure: Percent Increase in Real Native Income due to a 1% Immigration Shock



- **Key takeaway 4:** accounting for changes to the employer distribution generates substantially larger estimates of the immigration surplus relative to our standard, representative firm models

Conclusion: Key Takeaways

1. The extensive margin is critical to understanding immigrant absorption
2. Two drivers of immigrant-induced labor productivity growth
   - Secular shift in labor productivity at continuing establishments
   - Reallocation of economic activity to higher-paying firms due to entry and **exit** dynamics
3. This reallocation is enabled by the fact that immigrant inflows cull low-productivity firms from a commuting zone while preserving higher productivity firms
4. Theory: accounting for changes to the employer distribution generates substantially larger estimates of the immigration surplus relative to our standard, representative firm models

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