

Immigration Shocks in the Presence of Income Effects

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Motivation

- 21st Century: Episodes of large, sudden movements of people from low-income to high-income countries.
 - ▶ Triggered by wars (i.e. Syria, Ukraine), economic crises, and natural disasters.
- What are the impacts of a large immigration shock on the host economy?
- How are native labor market outcomes affected?
 - ▶ Western economies are heterogeneous w.r. to welfare state policies.
 - ▶ Angrist and Kugler [2003] show that institutions matter in the context of immigration during the Balkan crisis.
- This paper: Study immigration shocks in a 3-state labor market matching model with wealth.
 - ▶ Show that income effects are key for labor supply.
 - ▶ Welfare state policies may change the direction of effects, i.e. native employment $\downarrow$ instead of $\uparrow$

Motivation: Recent Literature

- In the U.S. native employment does not fall in response to immigration shocks (may in fact increase).
 - ▶ (e.g. Card [1990], Battaglia [2023], Caiumi and Peri [2024], Chassamboulli et al. [2024]).
- Evidence from European countries with large welfare states point in the opposite direction.
 - ▶ e.g. Angrist and Kugler [2003], Glitz [2012], Dustmann et al. [2017], and Edo and Özgüzel [2023].
- We argue that **these patterns can be explained by income effects** in a search model where agents hold wealth.
- **Wealth has been absent from economic models of immigration with frictional labor markets.**

Main Argument and Mechanisms

- Low skilled immigrants that arrive in an economy with relatively small welfare state characterized by high and inelastic LFP.
 - ▶ Immigrants have few assets
 - ▶ and little human capital
- Many inelastic job seekers spurs firms to post vacancies.
 - ▶ The expected surplus from posting a job increases.
- Thus the probability of finding a job does not fall, even if there are more job seekers.
- However, immigrants still crowd out some public goods (pay less taxes per head) and low-skill wages fall over time.
- $\Rightarrow$ Positive income effects on native labor force participation.
- Overall effect reversed with large welfare state: vacancy posting effect is dampened, wage effect is smaller $\Rightarrow$ native employment $\downarrow$

This Paper: What We Do

- Document new empirical facts in U.S. data:
 - ▶ LFP is much higher for immigrants than for natives.
 - ▶ Native low-skill employment $\uparrow$ in response to l-s immigration.
 - ▶ Native unemployment $\downarrow$, participation $\uparrow$.
 - ▶ Market tightness (v/u) $\uparrow$.
- Simple static model to illustrate the main mechanism.
 - ▶ 2-sector, 3-state labor market search model with assets
 - ▶ For reasonable calibration: immigrants work more $\Rightarrow$ firms post more vacancies, immigration crowds out a transfer, natives respond by working more.
- Rich quantitative framework calibrated to U.S.:
 - ▶ 2-sector, 3-state labor market search model with life-cycle.
 - ▶ Asset accumulation and concave utility function.
 - ▶ learning-by-doing human capital acquisition (and out of employment scarring).
- Shock the economy with an inflow of unskilled, wealth poor migrants, aged 20-40, equal to 1% of the native population.

This Paper: What We Find

- Our framework can account well for the stylized facts.
- Immigrant LFP is far above native, **wealth and human capital effects are central**.
- Low-friction U.S. economy w. small transfers:
 - ▶ Native employment $\uparrow$, unemployment $\downarrow$
 - ▶ High immigrant participation $\Rightarrow$ more profitable to post vacancies $\Rightarrow$ job finding rate $\uparrow$.
- Initially native quit rate $\downarrow$, native entry rate $\uparrow$. Driven by future negative pressure on wages, reduction in per capita transfer. $\Rightarrow$ Even more profitable to post vacancies.
- Wages fall for unskilled workers and rise for skilled workers over time.
- Economy with Danish tax level and redistribution of new tax revenues: Immigrant LFP is low and elastic $\Rightarrow$ dampened spike in vacancies & weaker income effects $\Rightarrow$ native employment $\downarrow$

Where the Paper Sits — A Map of the Connected Literatures

Search-and-matching models of immigration

Ortega (2000)
Chassamboulli & Palivos (2014) · job creation
Moreno-Galbis & Tritah (2016)
Battisti, Felbermayr, Peri & Poutvaara (2018)
Albert (2021)
Olovsson, Walentin and Westermark (2025)

Methodological building blocks

Krusell, Mukoyama & Şahin (2010)
Krusell, Mukoyama, Rogerson & Şahin (2011)
Krusell, Ohanian, Ríos-Rull & Violante (2000)
Chakraborty, Holter, and Stepanchuk (2015)

Quantitative macro: savings, OLG & fiscal policy

Storesletten (2000, 2003)
Busch, Krueger, Ludwig, Popova & Iftikhar (2020)

The wage-effects debate & macro evidence

Card (1990) · Mariel boatlift
Borjas (2003, 2017a)
Ottaviano & Peri (2012)
Dustmann, Frattini & Preston (2013)
Dustmann, Schönberg & Stuhler (2016)
Clemens & Hunt (2019) · why results differ
Furlanetto & Robstad (2019); Schiman (2021)

Brinca · Holter · Krusell · Malafry

Immigration Shocks in the Presence of Income Effects

search & matching + wealth & incomplete markets · endogenous participation
human capital · fiscal structure

Wealth, liquidity & labor supply

Imbens, Rubin & Sacerdote (2001) · lotteries
Cesarini et al. (2017); Golosov et al. (2024)
Card, Chetty & Weber (2007); Chetty (2008)
Krueger & Mueller (2016); Lise (2013)

U.S. evidence: natives gain employment

Chassamboulli, Fontaine, Gálvez-Iniesta & Gomes (2024) · SVAR benchmark
Battaglia (2023) · DACA
Mahajan et al. (2025) · H-1B lottery
Caiumi and Peri (2024)

European evidence: displacement & weak attachment

Dustmann, Schönberg & Stuhler (2017) · Czech commuters
Glitz (2012) · ethnic Germans
Angrist & Kugler (2003)
D'Amuri & Peri (2014); Edo & Özgüzel (2023)
Brell, Dustmann & Preston (2020) · Dustmann, Landersø & Andersen (2024) · benefit cuts

Institutions, macro shocks & unemployment

Ljungqvist & Sargent (1998)
Blanchard & Wolfers (2000)
Nickell, Nunziata & Ochel (2005)

Empirical Analysis: Skill Mix

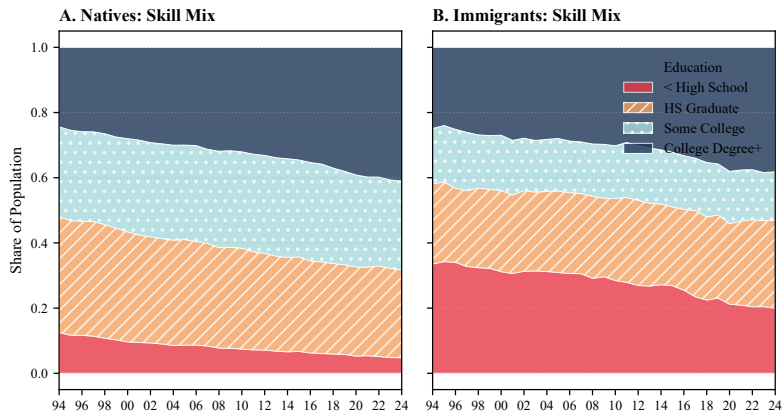


Figure: The composition of immigrants and natives by educational attainment, (CPS), age 16-64, Immigrants are "foreign born"

Empirical Analysis: LFP of Natives and Immigrants

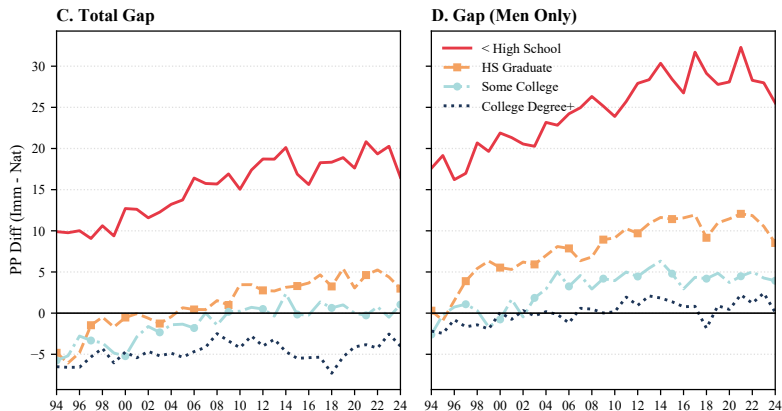


Figure: The participation gap between immigrants and natives by educational attainment, (CPS), age 16-64, Immigrants are "foreign born"

Empirical Analysis: Low skill immigrants quit less

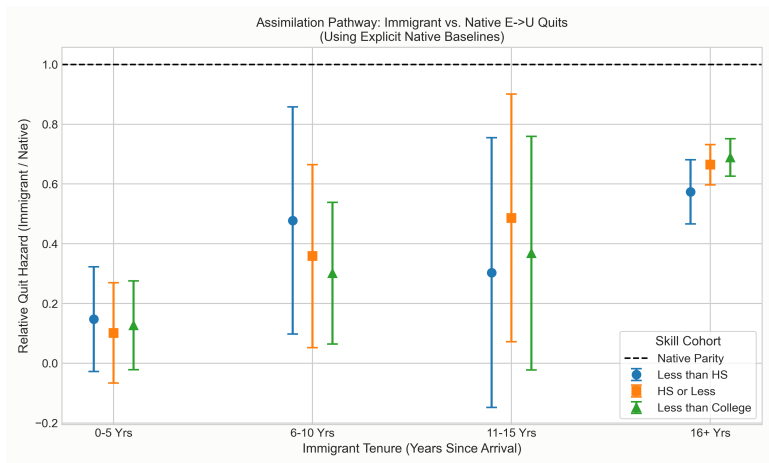


Figure: Difference in quit-related separation hazard (EU) between low-skill native and low-skill immigrant by years in US, CPS age 24-64. Estimated by panel regression with ind./occ. and yr./state FE, dem. controls.

Empirical Strategy: Local Projections

We estimate dynamic responses following Jordà [2005]:

$$Y_{t+k} = \alpha_k + \phi_k t + \beta_k s_t + \sum_{j=1}^{p_{hf}} (\gamma_{k,j} Y_{t-j} + \delta_{k,j} s_{t-j}) + \sum_{j=1}^{p_m} \theta_{k,j} \ln(\text{IP})_{t-j} + \varepsilon_{t+k}$$

- **Shock** (s_t): Δ Low-skill immigrant share (Chassamboulli et al. [2024]).
- **Outcomes** (Y_t): Native low-skill hazards (UE, EU, NE) and market aggregates (E, P, U rates); Low-skill tightness.
- **Specification**: Levels-based estimation with linear trend ($\phi_k t$) (Montiel Olea and Plagborg-Møller [2021]).

Identification & Controls

- **Macro Control**: Log Ind. Prod. ($\ln(\text{IP})_t$).
- **Asymmetric Lags**: Dual-GtS selection optimizes d.o.f
 $\rightarrow$ IP: $p_m \leq 24$ months $\rightarrow$ Lab. var.: $p_{hf} \leq 12$ months.
- **Data Filters**: 1996:M1 – 2019:M12 sample (Tightness from 2000:M12). All series deseasonalized.

Local Projections: Immigration and Labor Market

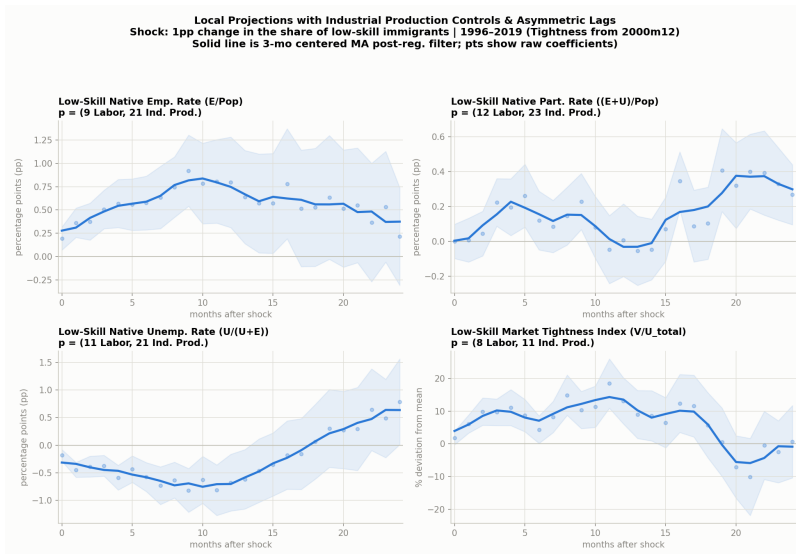


Figure: 1pp increase in low-skill immigrant share and low-skill native response

Local Projections: Immigration and Labor Market

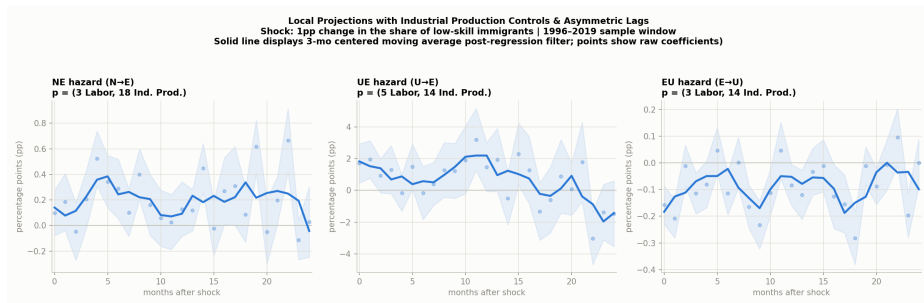


Figure: 1pp increase in low-skill immigrant share and low-skill native response

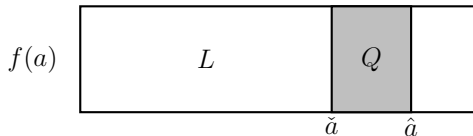
Static Model

- In a static setting with 2 sectors, households choose whether to search, and if successful, whether or not to work in their exogenously assigned "skill" sector:
- Searchers incur sunk utility cost, Ω , and face probability, λ_s^w , of finding a job. If employed they earn the sector s wage, w_s , and incur utility cost, Υ .
- If they fail to find a job, they receive unemployment insurance UI .
- Aside from their assigned skill, households also differ in their asset endowment $a \sim F(a)$.
- 2 cutoffs: People with $a < \hat{a}$ will search for a job. People with $a < \check{a}$ will accept a job if they find one.

Static Model

Household's Problem

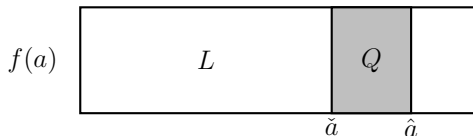
$$\max_{\text{search}, \text{work}} \mathbb{E}u(c_{s,i}) - \mathbf{1}_{[\text{search}]} \cdot (\Omega + \lambda_s^w \Upsilon \cdot \mathbf{1}_{[\text{work}]})$$



Static Model

Household's Problem

$$\max_{\text{search}, \text{work}} \mathbb{E}u(c_{s,i}) - \mathbf{1}_{[\text{search}]} \cdot (\Omega + \lambda_s^w \Upsilon \cdot \mathbf{1}_{[\text{work}]})$$



Employed

E_s

$$c_{s,i} = w_s + a_i + g$$

Unemployed

U_s

$$c_{s,i} = UI_s + a_i + g$$

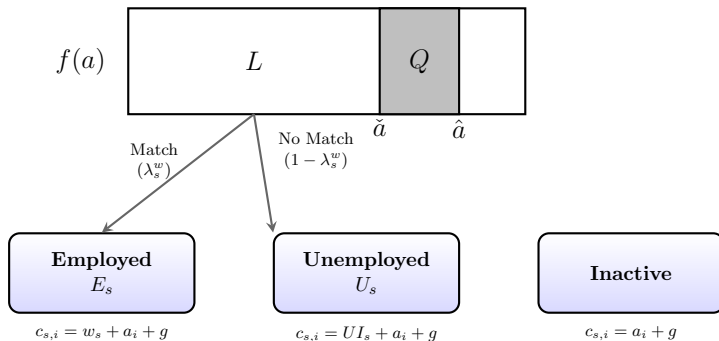
Inactive

$$c_{s,i} = a_i + g$$

Static Model

Household's Problem

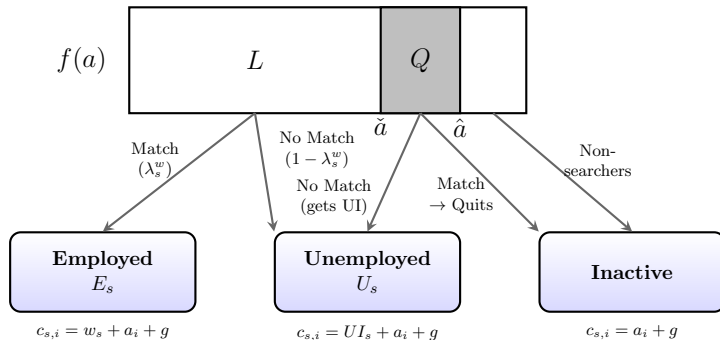
$$\max_{\text{search, work}} \mathbb{E}u(c_{s,i}) - \mathbf{1}_{[\text{search}]} \cdot (\Omega + \lambda_s^w \Upsilon \cdot \mathbf{1}_{[\text{work}]})$$



Static Model

Household's Problem

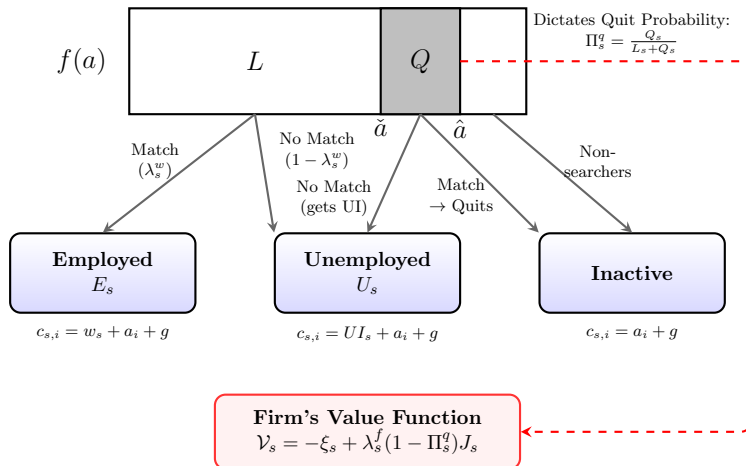
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Static Model

Household's Problem

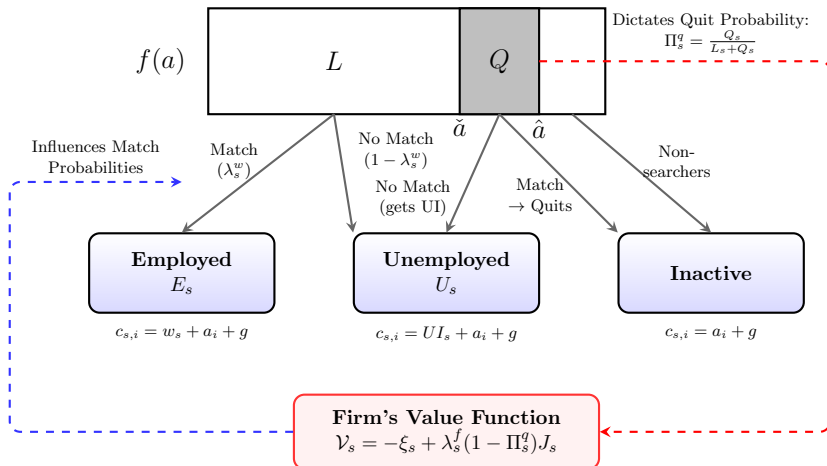
$$\max_{\text{search}, \text{work}} \mathbb{E}u(c_{s,i}) - \mathbf{1}_{[\text{search}]} \cdot (\Omega + \lambda_s^w \Upsilon \cdot \mathbf{1}_{[\text{work}]})$$



Static Model

Household's Problem

$$\max_{\text{search}, \text{work}} \mathbb{E}u(c_{s,i}) - \mathbf{1}_{[\text{search}]} \cdot (\Omega + \lambda_s^w \Upsilon \cdot \mathbf{1}_{[\text{work}]})$$



Static Model: Main Findings

- In the above case, where $\hat{a} > \check{a}$, the model accounts for two types of unemployment, frictional (L) and institutional, (Q).
- With low-skilled immigration: $w_L \downarrow$, $w_H \uparrow$, L increases (immigrants have low a) and the lumpsum transfer, g , is crowded out (moves $\check{a} \rightarrow$ and $\hat{a} \rightarrow$)
- More vacancies are posted $\Rightarrow$ match finding rate increases. This is both in aggregate **AND** in the skill cell where the immigrants compete.
- Native separations (refusing a match) decrease!
- Native unemployment $\downarrow$ (another empirical obs from e.g. Caiumi and Peri [2024]). Native employment $\uparrow$

Quantitative Model Framework

- Bewley-Huggett-Aiyagari incomplete-markets model
- Diamond-Mortensen-Pissarides matching framework.
- Modify Krusell et al. [2010]:
 - ▶ Life cycle OLG.
 - ▶ Extend to two labor market sectors (high and low skill with directed search).
 - ▶ LFP decision with dis-utility of work.
 - ▶ Simplify wage formation process (worker and firm each get a fraction of the surplus).
 - ▶ Model human capital accumulation as learning by doing (depreciation when not working).
 - ▶ Public sector: government financed UI, progressive income taxation, social security, lump sum transfers.

Model Description: Consumers

Demographics

- In addition to age, HHs are heterogeneous w.r.t:
 - ▶ assets, a
 - ▶ labor market experience, e
 - ▶ idiosyncratic productivity, z
 - ▶ permanent skill type, s
- Households can be employed, searching for work or not participating in the labor market.
- labor market participation, $n \in \{0, 1\}$
- Preferences: $U(c, n) = \frac{c^{1-\zeta}}{1-\zeta} - \mathcal{Y} \cdot \mathbb{1}_{[n=1]}$
- Disutility of work depends on age and sector:
 $\mathcal{Y} = \mathcal{Y}_{0s} + \mathcal{Y}_{1s}l + \mathcal{Y}_{2s}l^2$

Model Description: Consumers

Decisions, productivity and preferences

- Households decide how much to save a' , consume c and whether to participate in the labor market, n .
- Employed workers gain one unit of labor market experience per period. And this experience depreciates at rate, δ_e .
- Idiosyncratic productivity shock follows AR(1) process:
 $z' = \rho z + \epsilon, \quad \epsilon \sim N(0, \sigma_\epsilon^2)$.
- Units of labor supplied by individual i : $N_i(e, s, z) = e^{\gamma_0 s + \gamma_1 s e_i + z_i}$
- γ_1 captures the return to experience.

Labor Market

Briefly: labor market has matching frictions and exogenous job separations, split into "skill" sectors.

- Aggregate matching function, $M_s(U_s, v_s)$, gives the number of matches in a period, given the number of unemployed workers, U_s , and number of vacancies, v_s in sector s .
- Probability of a an unemployed worker finding a job is, $\lambda_s^w = M_s(U_s, v_s)/U_s$.
- Probability of *exogenous* job separation, σ_s .

Employed and Non-Employed Consumer's Problem

$$\begin{aligned}
 W(a, e, s, z, l) &= \max_{c, a', n} u(c, n) \\
 &+ \mathbb{1}_{[n > 0]} \beta \omega(l) \left[\sigma E_z[U(a', e', s, z', UI' = 1, l')] + (1 - \sigma) E_z[W(a', e', s, z', l')] \right] \\
 &+ (1 - \mathbb{1}_{[n > 0]}) \cdot \beta \omega(l) E_z[U(a', e', s, z', UI' = 0, l')] \\
 \text{s.t.:} \\
 a' &= (1 + (r - \delta)(1 - \tau_a))a + w(e, s, z)(1 - \tau_{ss} + \tau_n(w(e, s, z))) + g - c(1 + \tau_c) \\
 e' &= e + 1, \quad z' = \rho z + \epsilon, \quad \epsilon \sim N(0, \sigma_\epsilon^2), \quad l' = l + 1, \quad a' \geq \underline{a}, \quad n \in \{0, 1\}
 \end{aligned}$$

$$\begin{aligned}
 U(a, e, s, z, UI, l) &= \max_{c, a', n'} u(c, n = 0) \\
 &+ \mathbb{1}_{[n' > 0]} \cdot \beta \omega(l) \left[(1 - \lambda_s^w) E_{zP_{UI}}[U(a', e', s, z', UI', l')] + \lambda_s^w E_z[W(a', e', s, z', l')] \right] \\
 &+ (1 - \mathbb{1}_{[n' > 0]}) \cdot \beta \omega(l) E_z[U(a', e', s, z', UI' = 0, l')] \\
 \text{s.t.:} \\
 a' &= (1 + (r - \delta)(1 - \tau_a))a + g + T * UI * \cdot \mathbb{1}_{[n' = 1]} - c(1 + \tau_c) \\
 e' &= e(1 - \delta_e), \quad z' = \rho z + \epsilon, \quad \epsilon \sim N(0, \sigma_\epsilon^2), \quad l' = l + 1, \quad a' \geq \underline{a}, \quad n' \in \{0, 1\}
 \end{aligned}$$

Firms: Production

Firms operating in the competitive final goods market with nested CES tech:

$$Y = [(\alpha)Y_L^\nu + (1 - \alpha)Q^\nu]^{1/\nu}$$

Where Q is an input created in a competitive market with CES tech:

$$Q = [xk^\varphi + (1 - x)Y_H^\varphi]^{1/\varphi}$$

Y_L and Y_H are inputs created (linearly) with low- and high-skill labor respectively. Thus high-skill labor is more complementary with capital.

Firms: Prices

Marginal products of intermediate goods, Y_s , are:

$$p_L = \alpha Y_L^{\nu-1} Y^{1-\nu}$$
$$p_H = (1 - \alpha)(1 - x) Y_H^{\varphi-1} Q^{\nu-\varphi} Y^{1-\nu}$$

In equilibrium the total period profit from all firms in sector $s = s$ is:

$$\Pi_s = \int p_s Y_s(e, s, z) - w(e, s, z) d\Phi_s$$

The dividend from owning a share of all firms is the sum of profits minus the total vacancy costs:

$$d = \Sigma_s \left(\Pi_s - \xi_s v_s \right)$$

The final product firm's first order condition with respect to capital implies that $p_k = \frac{\partial Y}{\partial k}$.

$$p_k = (1 - \alpha) x k^{\varphi-1} Q^{\nu-\varphi} Y^{1-\nu} = r - \delta$$

Firms: Vacancies

Firms post vacancies in the competitive labor input sectors.

Let the measure of searching workers, in sector s be

$\Phi_{u,n'=1}(a, e, s, z, l)$ The value of posting a vacancy, V_s , is:

$$V_s = -\xi_s + q[(1 - \lambda_s^f)V_s + \lambda_s^f \int J(a, e, s, z, l) d\Phi'_{u,n=1s}]$$

The value of a filled job in sector s , given the price of the output good, p_s , the wage $w(e, s, u)$ and other characteristics of the worker is:

$$J(a, e, s, z, l) = n_{em}(a, e, s, z, l)(p_s Y_s(e, s, z) - w(e, s, z) + q[\sigma V_s + (1 - \sigma)E_z[J(a', e', s, z', l')]])]$$

Calibration

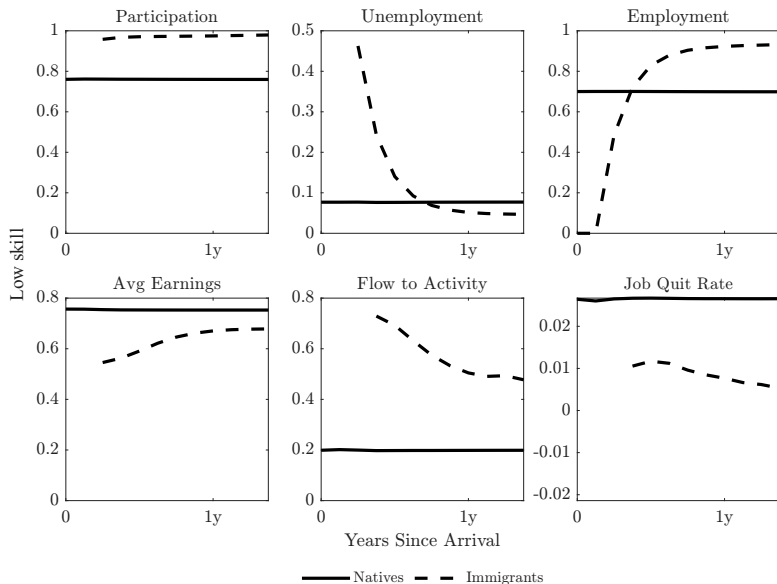
- Try to resemble post-2000 U.S. economy.
- A number of parameters can be determined outside of the model.
 - ▶ Exogenous parameters
- Estimate 16 parameters through an SMM approach.
 - ▶ Endogenously calibrated parameters

Benchmark experiment

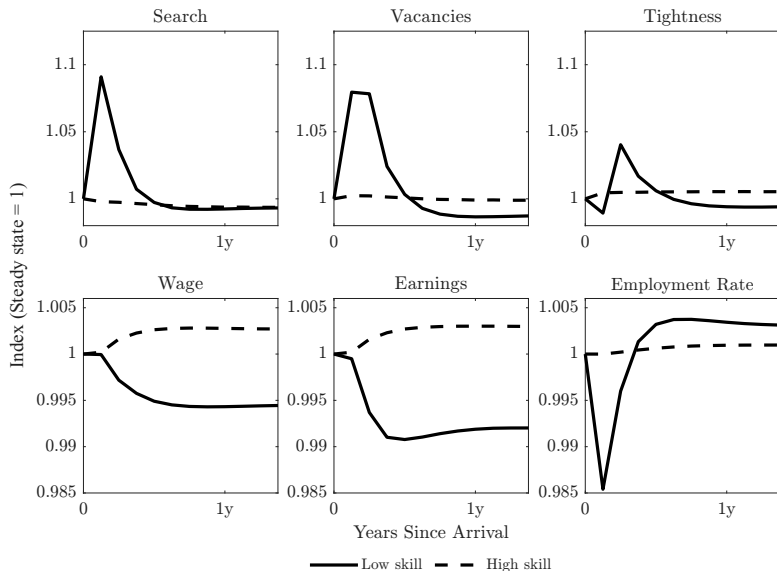
An unanticipated ("MIT shock") 1% increase in the population in one model period.

- All new workers are low skill and enter the economy without employment. Offered the option to search immediately.
- These migrants are relatively young (age 20-40), poor (0 assets), and inexperienced (no locally relevant human capital).
- Allowed to compete directly with natives as perfect substitutes upon arrival.
- Also assume they are given permanent residence and equal access to welfare state services (also equal tax liability).

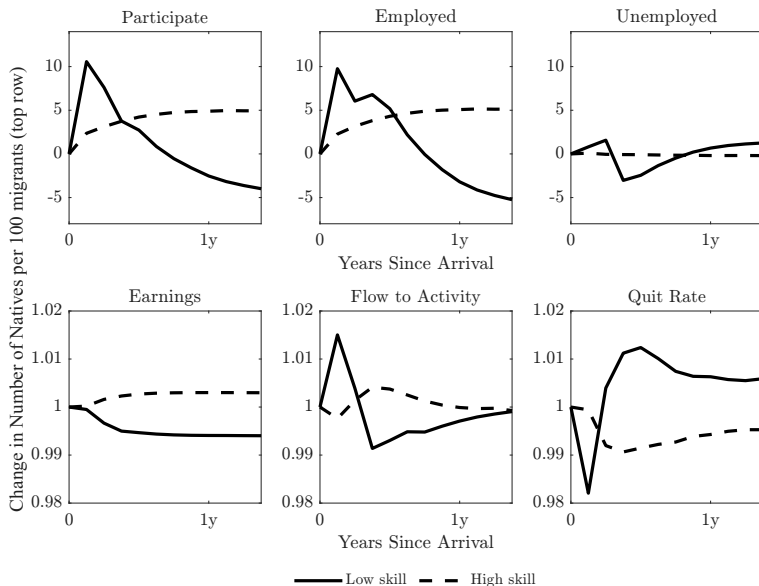
Benchmark Experiment: Immigrants



Benchmark Experiment: Economy-wide Impacts



Benchmark Experiment: Natives

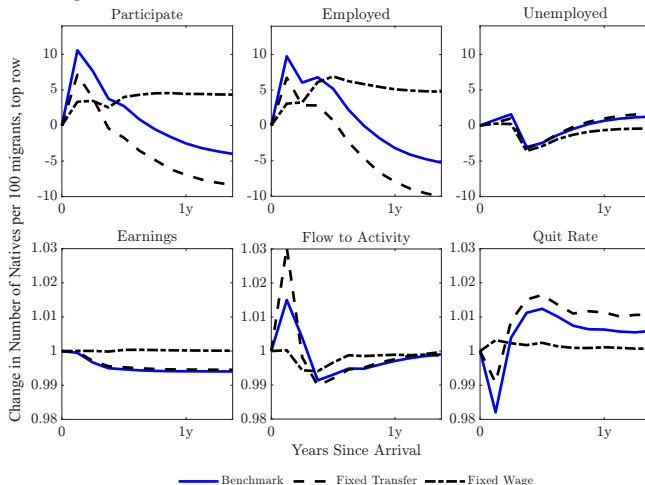


Benchmark Experiment: Short-run Impact on Natives

- Short-run native response: **increase in employment** driven by joiners from non-participation and a reduction in quits.
 - ▶ (+) Pure income effect from lumpsum congestion.
 - ▶ (+) Intertemporal substitution effect - wage is better now than it will be.
 - ▶ (+) Job find rate up because vacancies are relatively more abundant.
 - ▶ (-) Sub. effect falling wage.
- Native unemployment increases from new entrants searching (briefly), and then falls as they are matched, before rising again as vacancies retract.

Dissecting the Mechanism

- In order to explore the mechanism related to income effects we perform two experiments as deviations from the Benchmark:
 - (1.) fix transfer
 - (2.) fix wage and transfer



Benchmark Experiment: Welfare and Inequality

- Overall relatively small welfare change for natives (-0.15%) but distributional differences.
- High-skill workers are clear winners ($+0.54\%$) because of increased earnings and return to assets.
- Low-skill workers are clear losers (-0.44%), due to lower wages over time and congestion of lumpsum transfer.
- Earnings inequality increases mechanically because of new arrivals ($+0.3\%$ after 5 years).

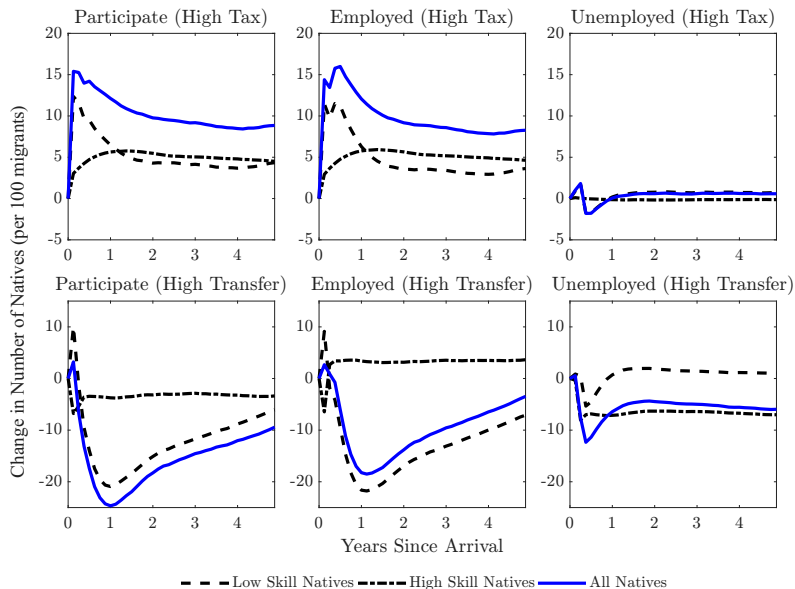
Generous Transfer Welfare State

- To explore the potential contribution of a generous transfer welfare state to our setting, we change the calibration of the fiscal structure of our model to resemble that of Denmark.
- 2 cases: i) lump sum transfer clears the government budget ii) wasteful government spending clears the budget.

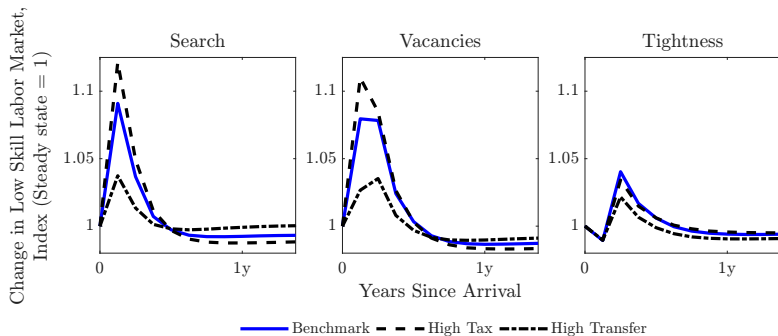
Table: High taxation counterfactual - altered parameters

Parameter	New value	Description	Benchmark value
$\tau_a, \tau_c, \tau_{ss}$	0.506, 0.349, 0.11	Tax rate of capital gains, consumption, and social security	0.364, 0.047, 0.159
Ω_0, Ω_1	0.786, 0.258	Parameters for level and progressivity of labor income tax	0.89, 0.14

Immigration With Danish Taxes



Immigration With Danish Taxes



Conclusion

- We have shown empirically that in the U.S. economy with low frictions and small transfers immigration leads to a short-term increase in native employment and job finding rates.
- A search model where individuals accumulate wealth and human capital can explain this finding through income effects.
- Immigrants are inelastic workers with high LFP. This spurs firms to post vacancies $\Rightarrow$ lower unemployment.
- Immigrants, however, crowd out government transfers and low-skilled wages fall over time $\Rightarrow$ positive income effect on native participation.
- Our model can also rationalize why we may expect to observe the opposite in European countries with high taxes and generous transfers. The income effects are weaker.

THANK YOU

Asset Structure

The matching friction creates a positive value of a filled job, which implies firm profits conditional on a job match.

- Define indeterminate asset portfolio, $a \equiv k + m + b$, to include physical capital, k , firm equity share, m , and public debt, b .
- Let p be the total value of the firm, and with the return to capital, r , dividends paid to equity holders, d , we write the equity price: $p = \frac{d+p}{1+r-\delta}$.
- Define $q \equiv \frac{1}{1+(r-\delta)}$

Model Description: Government

The government runs a balanced budget constraint, levying taxes for:

- Social security, τ_{ss}
- labor income (progressive), $\tau_n(w)$
- Asset income, τ_a
- and consumption, τ_c

to finance:

- Social security, Ψ
- Pure public good, G
- Debt interest, rB
- lump sum transfers, g
- and unemployment benefits, T .

Wage Determination

A concession in our framework is the wage setting rule. Typically in this model class, wages would be the outcome of a Nash bargaining game.

Instead we assume workers receive a fraction, $\kappa \in (0, 1)$, of the firm's revenue as their wage:

$$w(e, s, u) = \kappa \left(p_s Y_s(e, s, u) \right)$$

Thus we don't have any additional wage dispersion arising from a worker's asset position influencing the bargaining game, as in Krusell et al. (2010).

Parameters Calibrated Exogenously ([Return](#))

Parameter	Value	Description	Source
<i>Preferences and technology</i>			
ζ	1.2	Coefficient of relative risk aversion	Author choice
ν, φ	0.401, -0.495	CES substitution parameters	Krusell et al. [2000]
<i>Labor market</i>			
η	0.72	Elasticity on the matching function	Krusell et al. [2010]
$\Phi_{s=1}$	0.64	Share of low-skill agents	CPS 2019
<i>Demographics and productivity</i>			
$\rho_{u,s}$	0.985, 0.985	Persistence of transitory shock by sector	PSID
<i>Government</i>			
g	0.07	Lump sum transfer rate (on average earnings)	
v	0.53	Replacement rate of UI	OECD benefits calculator
$\bar{T}, \underline{T}$	0.14, 0.35	Upper and lower bound of UI (share of average earnings)	OECD benefits calculator
P_{UI}	0.75	Probability of UI eligibility continuation	Match expected duration of UI (OECD)
$\tau_a, \tau_c, \tau_{ss}$	0.364, 0.047, 0.159	Tax rate of capital gains, consumption, and social security	OECD
Ω_0, Ω_1	0.89, 0.14	Parameters for level and progressivity of labor income tax	Holter et al. [2019]

Parameters Calibrated Endogenously ([Return](#))

Table: Parameters calibrated endogenously and their related moments (SMM)

Parameter	Value	Description	Related Moment
<i>Preferences and technology</i>			
β	0.933	Annualized time preference	Capital-output ratio (3.5 annual)
α, x	0.565, 0.725	CES Factor shares	Average employment rate of low-skill workers (0.69), college+ earnings premium (1.9)
$\gamma_{0,s}, \gamma_{1,s}, \gamma_{2,s}$	1.0795, 0.029, -0.000235; 0.86595, 0.0332, -0.000315	Utility costs of participation by age and skill	Employment rate of high-skill workers (0.84); Employment persistence of workers (0.85); Employment rates by age cohort and educational attainment March CPS 2019 (ages 30-39, low skill 0.75 and high skill 0.87; ages 55-64, low skill 0.58 and high 0.74)
Beq_{motive}	355	Utility parameter governing bequest motivation	The ratio of assets among age cohort 75-80 over average asset position (1.51)
σ_{taste}^2	0.182	Variance of mean-zero taste shock	Matches the gross flow of workers from non-participation to participation, reported as 0.081 monthly in Krusell et al. [2011]
<i>Labor market</i>			
χ_s	0.505, 0.791	Matching function efficiency	Unemployment rate by skill (low 0.077 and high 0.033)
ξ_s	2.917, 10.033	Vacancy posting costs	Market tightness (1 in both sectors) as in Shimer [2005]
σ_s	0.0214, 0.0216	Exogenous job separation rate by sector	Gross separation rates by sector as reported in Chassamboulli and Peri [2015]
κ	0.69	Worker's claim on revenue	Labor value share (0.60)
<i>Demographics and productivity</i>			
δ_e	0.0835	Depreciation of experience	1.2% wage decrease over 1 month unemployment, Ortego-Marti [2016]
$\sigma_{u,s}^2$	0.164, 0.156	Variance of productivity shock	Variance of log earnings by educational attainment (low 0.84 and high 0.76)
$\gamma_{0,s}$	-0.5875	Sector specific productivity	Equalized across sectors. Normalize average earnings of all employed workers to 1
$\gamma_{1,s}$	0.0245, 0.0185	Linear experience productivity profile	Age cohort earnings 55-64 by educational attainment relative to sector average, March CPS (age 30-39 low 0.81 and high 1.49; age 55-64 low 0.90 and high 1.63)

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