

MODELING THE DISPLACEMENT OF NATIVE WORKERS BY IMMIGRANTS

Pascal Michailat

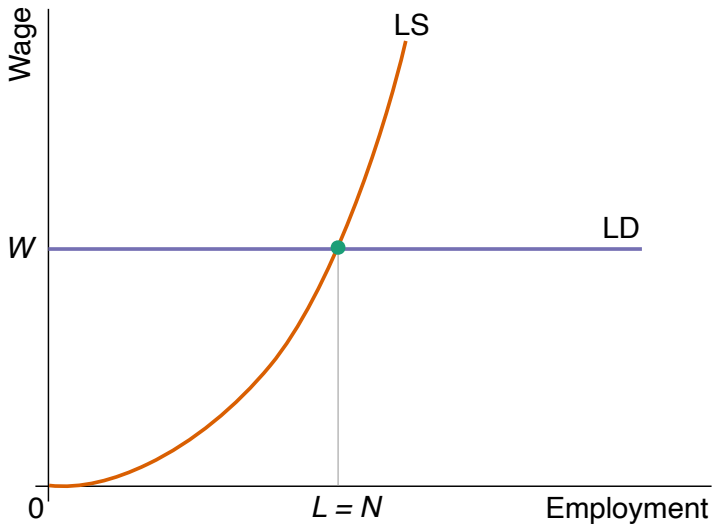
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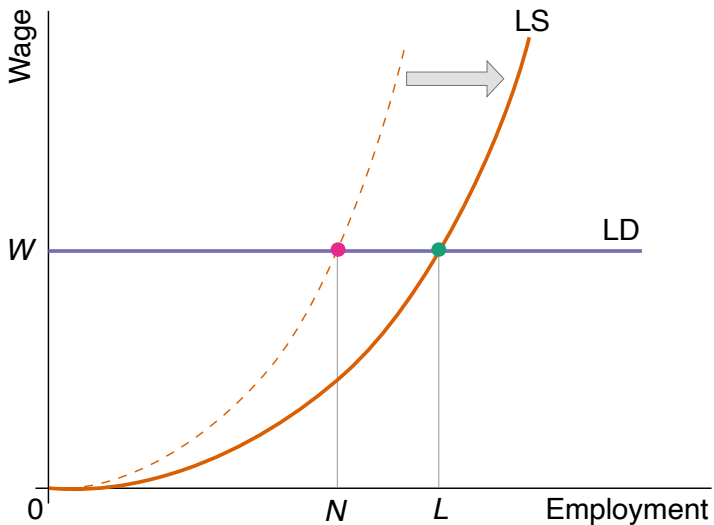
IMMIGRANTS ARE OFTEN ACCUSED OF STEALING JOBS

- immigration is always one of voters' chief concerns
 - extremely/very important for at least 2/3 voters in last US elections (Gallup)
 - build the wall!
 - “DACA denied jobs to hundreds of thousands of Americans by allowing those illegal aliens to take those jobs.” (Sessions 2017)
- key concern at the time of the Mariel boatlift
 - “A 3-day riot occurred in several black neighborhoods, killing 13. A government-sponsored committee cited the labor market competition of Cuban refugees as an important factor.” (Card 1990)

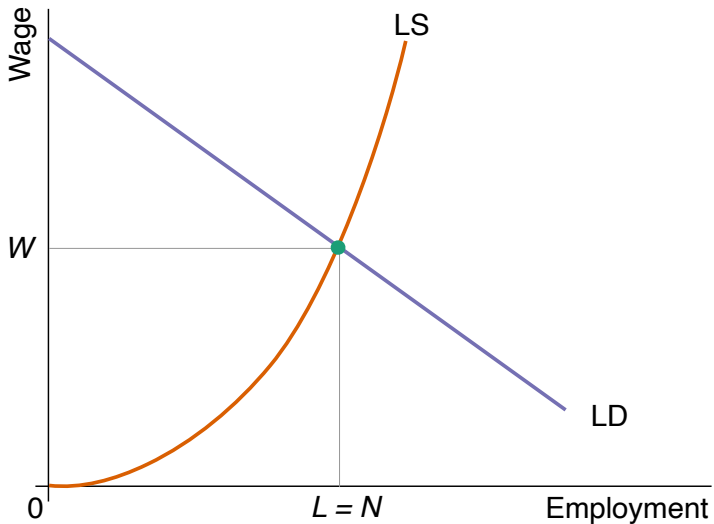
YET EXISTING MODELS ASSUME AWAY DISPLACEMENT: CARD



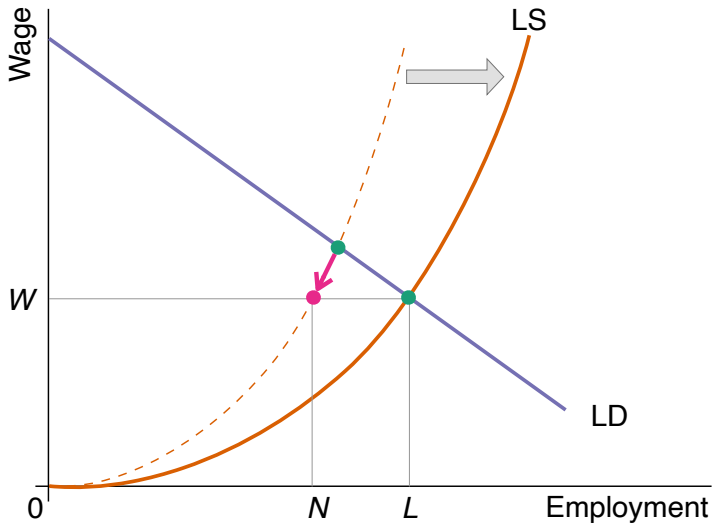
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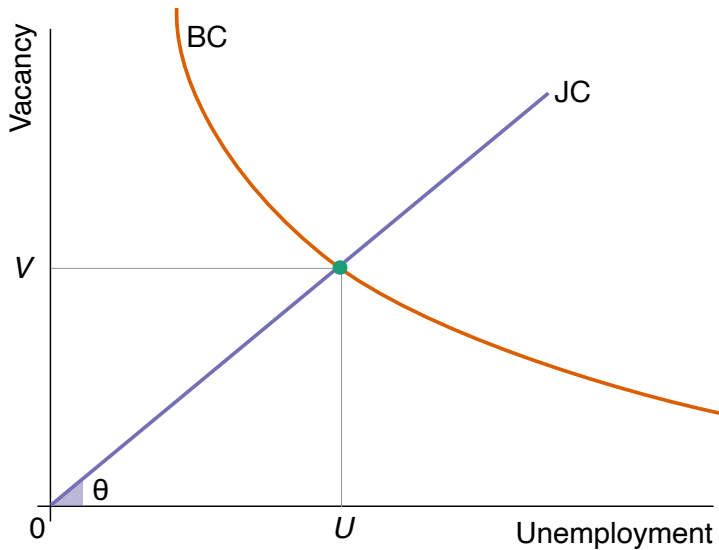
YET EXISTING MODELS ASSUME AWAY DISPLACEMENT: BORJAS



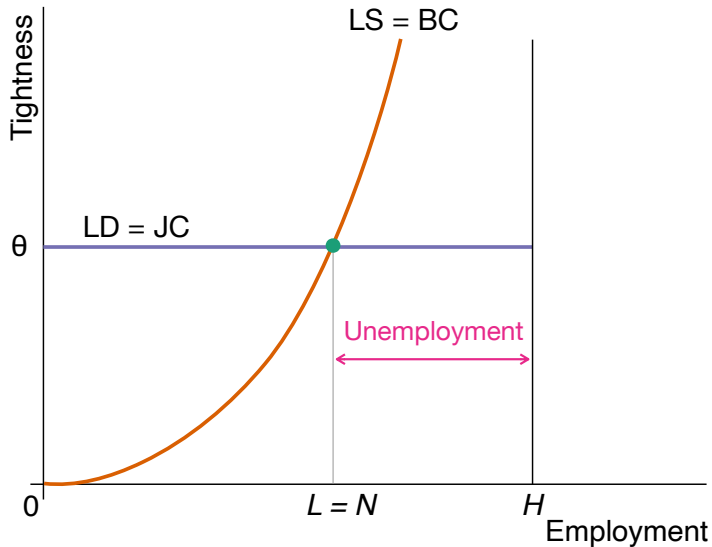
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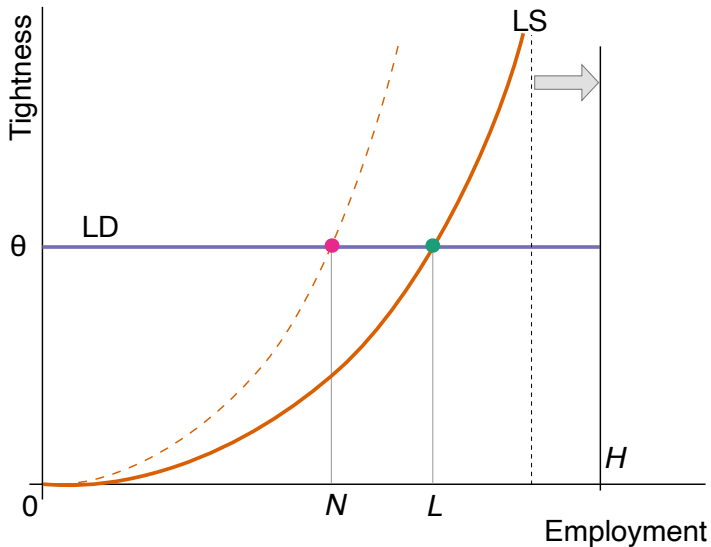
YET EXISTING MODELS ASSUME AWAY DISPLACEMENT: DMP



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WHY DEVELOP A MODEL IN WHICH IMMIGRATION NEGATIVELY AFFECTS NATIVE WORKERS?

- “One of the central questions in the debate over immigration policy is whether immigrants adversely affect labor market outcomes for natives. Some Americans believe they do, worrying that immigrants take jobs away from native workers. **Most of the empirical evidence produced by economists, however, does not support these concerns.**”
(Federman, Harrington, Krinsky 2006)

BECAUSE ASSUMING AWAY DISPLACEMENT LIMITS EMPIRICAL EXPLORATION

- Scheve, Slaughter (2001): study perceptions about immigration and preferences over immigration policy
- Finding: “Individuals think that the US economy absorbs immigrant inflows at least partly by changing wages.”
- But: “The 1992 National Election Studies survey asked other questions about immigration that we do not analyze. For example, respondents were asked whether they think Asians or Hispanics ‘take jobs away from people already here.’ **We do not focus on this question** because its responses cannot clearly distinguish among our three competing economic models. **All our models assume full employment, so no natives could have jobs ‘taken away’ by immigrants.**”

THIS PAPER: IMMIGRATION MODEL WITH DISPLACEMENT

- richer description of immigration effects:
 - effect on wages
 - effect on labor market tightness & unemployment
- richer understanding of immigration policy:
 - actual policy depends on political system: populist, capitalist, ...
 - optimal policy responds to business-cycle conditions
- richer empirical research:
 - new data: vacancies, unemployment, tightness, job-finding rate, perceptions of job stealing, business cycles
 - new questions

DESCRIPTION OF THE MODEL

STRUCTURE OF THE MODEL (MICHAILLAT 2012)

Diamond-Mortensen-Pissarides structure with 2 generalizations:

1. linear production function \rightsquigarrow concave production function
 - labor demand is downward sloping in w and θ
 - somewhat limited number of jobs
2. bargained wages \rightsquigarrow somewhat rigid wages
 - labor demand responds to business-cycle shocks
 - fewer jobs in bad times
 - response of wages to immigration calibrated to evidence

ASSUMPTIONS

- representative firm + labor force of size H
- production function: $y(P) = a \cdot P^\alpha$
 - $\alpha \in (0, 1]$: diminishing marginal returns to labor
 - production sold on perfectly competitive product market
- matching function: $m(U, V)$, CRS, increasing in U, V
- recruiting cost: $r > 0$ recruiters per vacancy
 - $R = r \cdot V$ recruiters, P producers, $L = R + P$ total workers
- job-destruction rate: $s > 0$
- real wage for all workers: $w = \omega \cdot a^\gamma \cdot H^{-\beta}$
 - $\gamma \in [0, 1]$: rigidity with respect to productivity
 - $\beta \in [0, 1 - \alpha]$: rigidity with respect to immigration

MATCHING RATES

- workers match with firms at a rate:

$$f(\theta) = \frac{m(u, V)}{U} = m(1, \theta)$$

- vacancies are filled with workers at a rate:

$$q(\theta) = \frac{m(u, V)}{V} = m(\theta^{-1}, 1)$$

- tight market (high θ):
 - easy to find jobs (high f), hard to recruit workers (low q)
- slack market (low θ):
 - hard to find jobs (low f), easy to recruit workers (high q)

BALANCED FLOWS

- law of motion of employment, given that $U(t) = H - L(t)$:

$$\dot{L}(t) = f(\theta)U(t) - sL(t) = f(\theta)H - [s + f(\theta)] L(t)$$

- critical point of the differential equation (such at $\dot{L} = 0$):

$$L = \frac{f(\theta)}{s + f(\theta)} H$$

- deviation between L and $L(t)$ decays at an exponential rate of 62% per month \rightsquigarrow 90% deviation vanishes within a quarter

- \rightsquigarrow abstract from employment dynamics, employment is critical point
- \rightsquigarrow # new employment relationships = # relationships dissolved at any t
- \rightsquigarrow labor market always on Beveridge curve

LABOR SUPPLY

- labor supply = employment consistent with balanced flows:

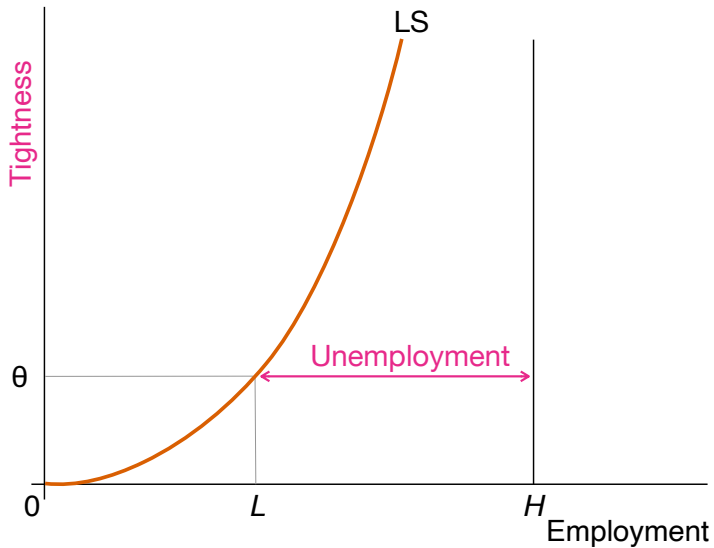
$$L^S(\theta, H) = \frac{f(\theta)}{s + f(\theta)} \cdot H$$

- labor supply holds at any point in time
- $L^S(0, H) = 0$, $\partial L^S / \partial \theta > 0$, $\lim_{\theta \rightarrow \infty} L^S = H$
- unemployment rate at any point in time:

$$u(\theta) = 1 - \frac{L^S}{H} = \frac{s}{s + f(\theta)}.$$

- $u(0) = 1$, $\partial u / \partial \theta < 0$, $\lim_{\theta \rightarrow \infty} u = 0$

LABOR SUPPLY



RECRUITING-PRODUCER RATIO

- # new employment relationships: $q(\theta)V$
- # employment relationships that separate: sL
- stable firm size requires $V = sL/q(\theta)$ vacancies
- required # recruiters: $R = rsL/q(\theta) = rs(R + P)/q(\theta)$
 - $Rq(\theta) = rs(R + P) \Rightarrow R[q(\theta) - rs] = rsP$
 - $R/P = rs/[q(\theta) - rs]$
- recruiting-producer ratio $\tau(\theta) = R/P$ satisfies:

$$\tau(\theta) = \frac{rs}{q(\theta) - rs}$$

- $\tau(0) = 0$, $\tau'(\theta) > 0$ on $[0, \theta_\tau)$, $\lim_{\theta \rightarrow \theta_\tau} \tau(\theta) = +\infty$
- $\theta_\tau = q^{-1}(rs)$: fully recruiting economy

FIRM PROBLEM

- within the balanced-flow paradigm, the firm determines their workforce L by posting appropriately many vacancies
- the size of the workforce maximizes the flow of real profits:

$$y(P) - wL = y(P) - [1 + \tau(\theta)] \cdot w \cdot P$$

- optimum # producers is given by first-order condition:

$$y'(P) = [1 + \tau(\theta)] \cdot w$$

- since $y'(P) = \alpha a P^{\alpha-1}$, optimum # workers is given by:

$$\alpha a [1 + \tau(\theta)]^{1-\alpha} \cdot L^{\alpha-1} = [1 + \tau(\theta)] \cdot w,$$

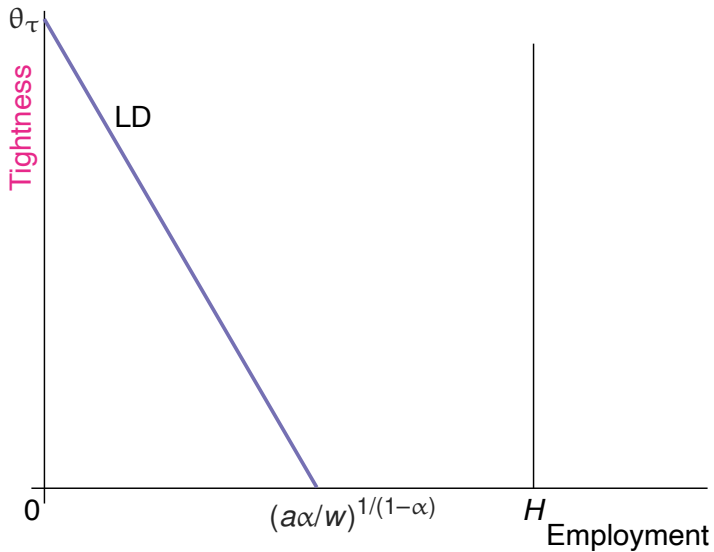
LABOR DEMAND

- firm's labor demand gives the firm's desired employment level for any tightness and productivity:

$$L^d(\theta, a) = \left\{ \frac{a \cdot \alpha}{w \cdot [1 + \tau(\theta)]^\alpha} \right\}^{\frac{1}{1-\alpha}}$$

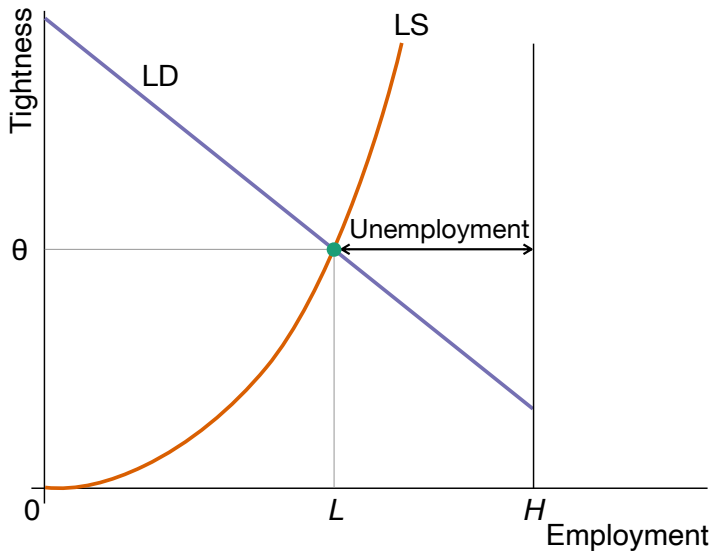
- $L^d(0, a) = (a \cdot \alpha/w)^{\frac{1}{1-\alpha}}$, $\partial L^d/\partial \theta < 0$, $\partial L^d/\partial a > 0$, $L^d(\theta_\tau, a) = 0$
- firm hires native & immigrants alike (Martins, Piracha, Varejao 2018)
- labor demand is unaffected by labor force size & composition

LABOR DEMAND

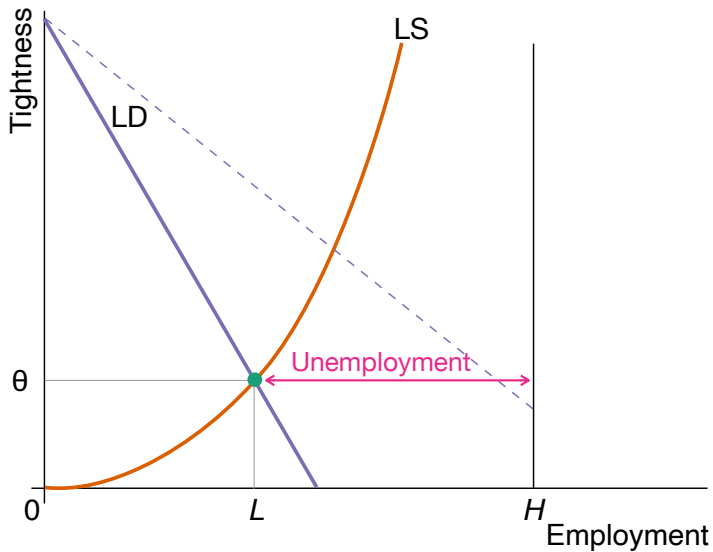


SOLUTION OF THE MODEL

LABOR MARKET MODEL: CARD MEETS BORJAS



LABOR MARKET MODEL: BAD TIMES

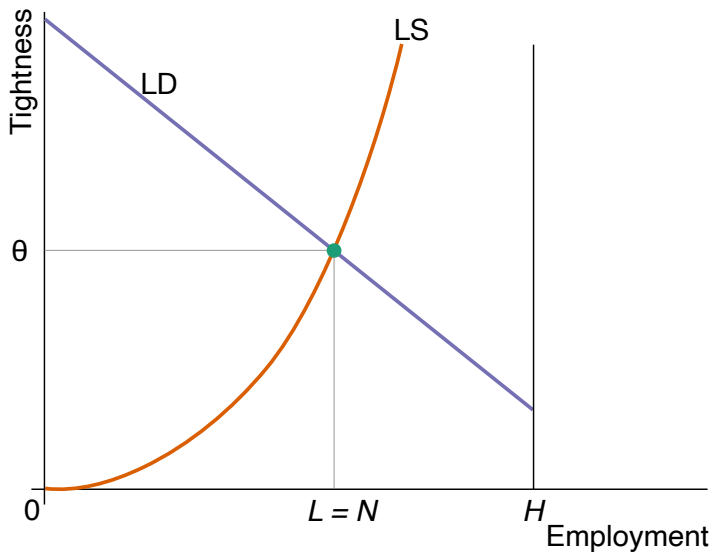


COMPARATIVE STATICS

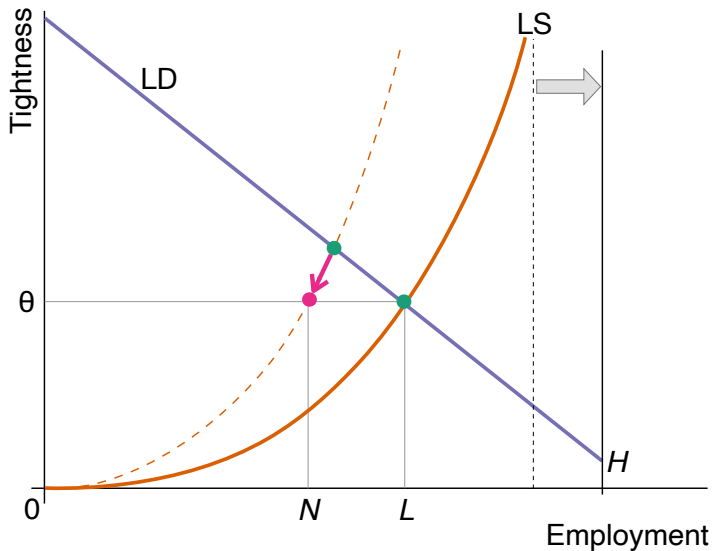
IMMIGRATION SHOCK

- increase in the labor force from H to $H + I > H$
 - I immigrants are similar to native workers
- workforce L now has N native workers and $L - N$ immigrants
- in the future, immigrants could have:
 - different productivity
 - different wages
 - substitutability/complementarity with native workers
- in the future, product market could be slackish (Michaillat, Saez 2015)
 - immigrants consume so might affect aggregate & labor demand
 - conjecture: same results if immigrants have no wealth
 - conjecture: results attenuated if immigrants have some wealth
 - Cameron: restrictions “until your wealth is similar to our wealth”

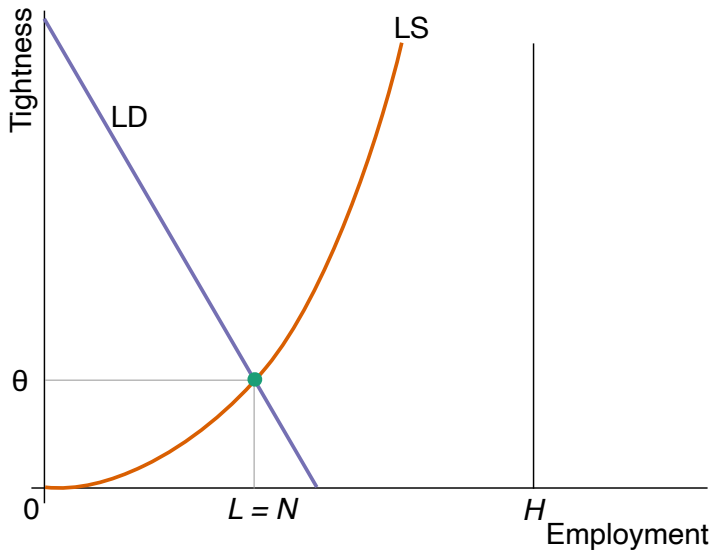
IMMIGRATION REDUCES JOB-FINDING RATE OF NATIVES



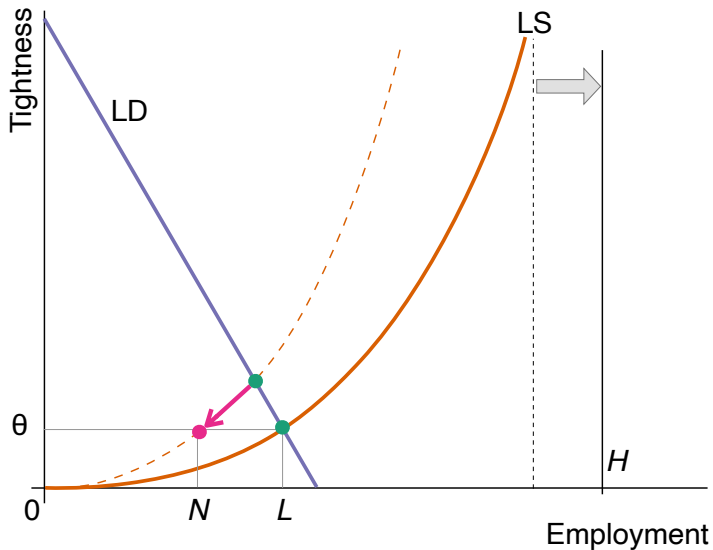
IMMIGRATION REDUCES JOB-FINDING RATE OF NATIVES



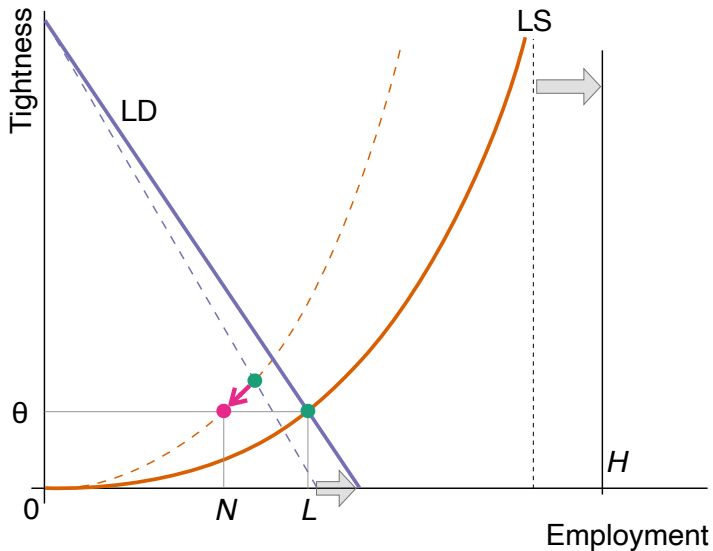
STRONG DISPLACEMENT IN BAD TIMES (~ MICHAILLAT 2014)



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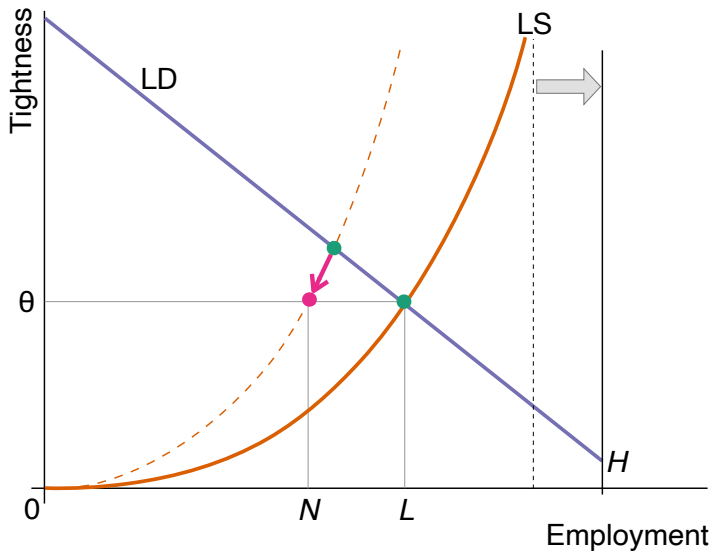
DISPLACEMENT IS ALLEVIATED IF WAGES FALL



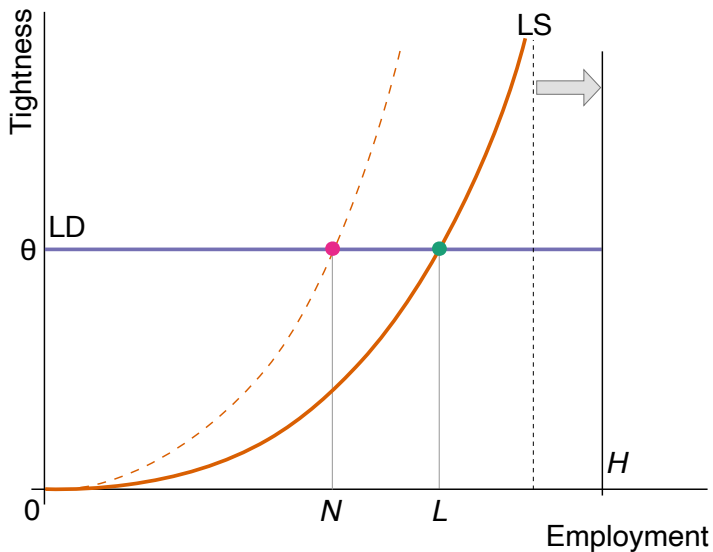
POSSIBLE EFFECTS OF IMMIGRATION IN MODEL

- concave production, fixed wage (Borjas + Card)
 - ~> higher native unemployment
 - ~> same native wages
- linear production, fixed wage (pure Card)
 - ~> same native unemployment
 - ~> same native wages
- concave production, flexible wage (neoclassical Borjas)
 - ~> same native unemployment
 - ~> lower native wages
- concave production, somewhat rigid wage (generic Borjas)
 - ~> higher native unemployment
 - ~> lower native wages

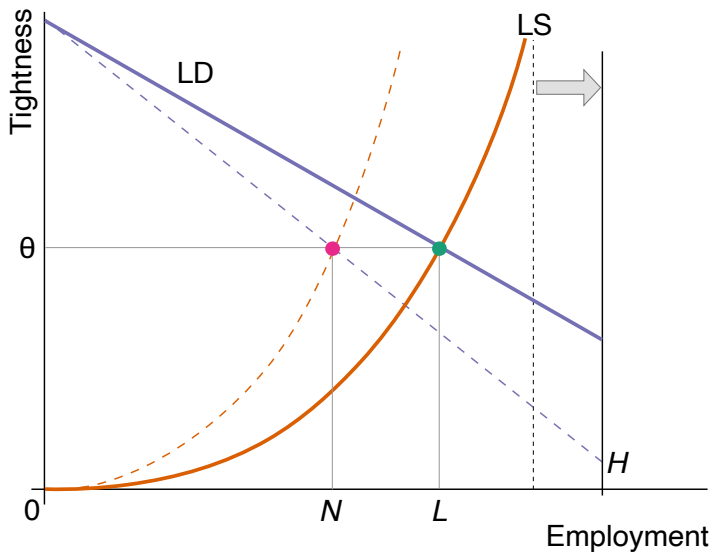
POSSIBLE EFFECTS OF IMMIGRATION: CARD + BORJAS



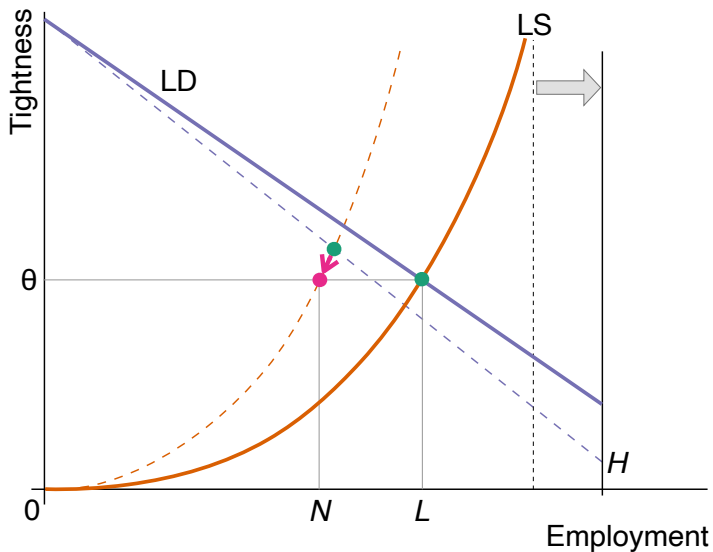
POSSIBLE EFFECTS OF IMMIGRATION: PURE CARD



POSSIBLE EFFECTS OF IMMIGRATION: NEOCLASSICAL BORJAS



POSSIBLE EFFECTS OF IMMIGRATION: GENERIC BORJAS



WELFARE

NATIVE WORKERS ARE GENERALLY HURT BY IMMIGRATION

- **native labor income = $w \cdot N$** decreases with immigration
 - because N falls with immigration
 - and w is unchanged
- also true if wages fall with immigration
 - then both w, N fall with immigration
- exception: pure Card scenario
 - because then w, θ do not change with immigration
 - so native labor income does not change

FIRM OWNERS ALWAYS BENEFIT FROM IMMIGRATION

- firm profits = $y(P) - wL$
- labor share is $\alpha \Rightarrow \alpha y(P) = wL$
- **firm profits = $(1/\alpha - 1) \cdot w \cdot L$** increase with immigration
 - because L increases with immigration
 - and w is unchanged
- also true if wages fall with immigration
 - first-order condition: $w = \alpha y(P)/L = \alpha y(L/[1 + \tau(\theta)])/L$
 - production function: $w = a\alpha L^{\alpha-1}[1 + \tau(\theta)]^{-\alpha}$
 - firm profits = $(1 - \alpha) \cdot a \cdot P^\alpha$ increase with immigration
- also true in pure Card scenario
 - since w, L increase with immigration

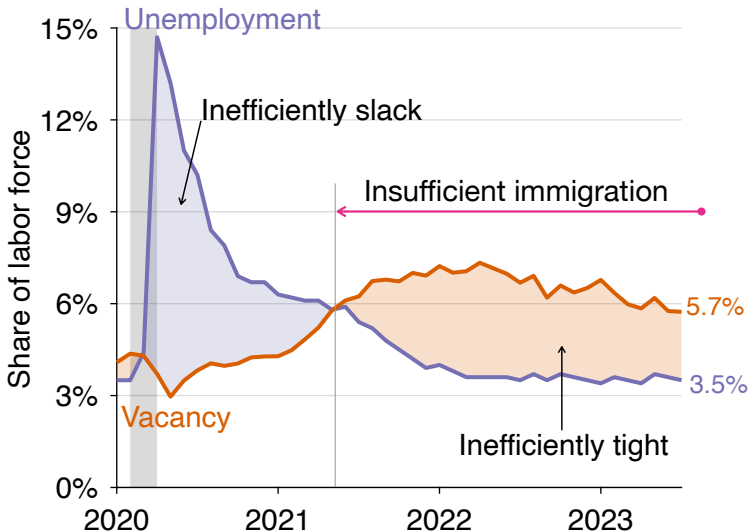
SOME POLITICAL PREDICTIONS

- populist regimes oppose immigration, especially in bad times
 - aim to maximize labor income, which is reduced by immigration
 - elasticity of employment rate wrt labor force is more negative in bad times
- capitalists regimes support immigration
 - aim to maximize profits, which are improved by immigration
- socialist regimes conditionally support immigration
 - workers own firms, so regime aims to maximize total income
 - support when the labor market is inefficiently tight
 - opposition when the labor market is inefficiently slack

IMMIGRATION AS A STABILIZATION POLICY

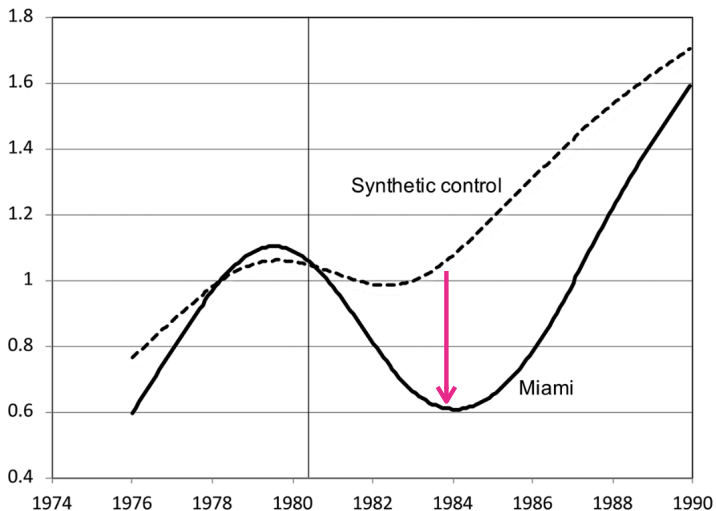
- immigration improves native welfare in inefficiently tight labor market
 - by reducing tightness, immigration raises firm profits more than it lowers native labor income
- to maximize native welfare, immigration should lower tightness until labor market is inefficiently slack
- immigration might complement monetary policy because it affects tightness instantaneously
 - while monetary policy takes 12–18 months to affect tightness

LACK OF IMMIGRATION AFTER THE CORONAVIRUS PANDEMIC



NATURAL AND QUASI EXPERIMENTS

TIGHTNESS FELL BY 40% AFTER MARIEL BOATLIFT (ANASTASOPOULOS, BORJAS, COOK, LACHANSKI 2021)



DISPLACEMENT IS COMMON IN EXISTING STUDIES

- Boustan, Fishback, Kantor (2010): US workers \rightsquigarrow new cities during the Great Depression
 - 100 arrivals in a city \Rightarrow 19 residents moved out + 21 residents in unemployment
 - “NO JOBS in California / If YOU are looking for work—KEEP OUT / 6 men for every job / No state relief available for non-residents”
- Hunt (1992): French repatriates \rightsquigarrow France in the 1960s
 - 100 repatriates in labor force \Rightarrow 20 natives in unemployment
- Borjas, Monras (2019): Algerians refugees \rightsquigarrow France in the 1960s
 - 100 refugees in region-education cell \Rightarrow 27 natives in unemployment

IN FACT DISPLACEMENT IS PREVALENT IN EXISTING STUDIES

- Angrist, Kugler (2003) & Borjas, Monras (2019): Yugoslavian refugees ~→ Europe in the 1990s
 - OLS: 100 refugees in labor force ⇒ 21–35 natives in unemployment
 - IV: 100 refugees in labor force ⇒ 47–83 natives in unemployment
- Glitz (2012): ethnic Germans refugees ~→ Germany in 1990s
 - 100 refugees in employment ⇒ 31 natives in unemployment
- Dustmann, Schoenberg, Stuhler (2016): Czech commuters ~→ German border towns in 1991–1993
 - 100 commuters in employment ⇒ 71 natives in unemployment
 - due to reduced inflows into employment
- Labanca (2016): Arab Spring refugees ~→ Italy in 2011
 - 100 refugees employed ⇒ 63–80 natives in unemployment

