Third-Country Effects of US Immigration Policy

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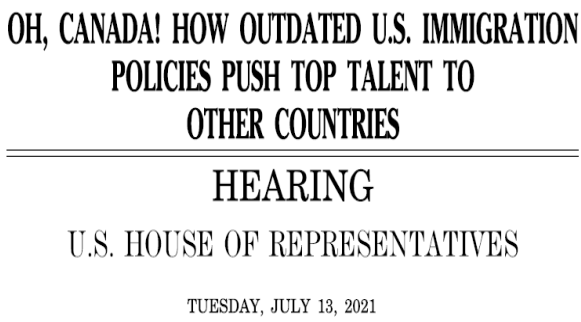
The views expressed are those of the authors and do not necessarily reflect those of the Bank of Canada.

What are the effects of US skilled immigration restrictions?

- The US restricts skilled immigration with the goal to protect American wages
- Anecdotal evidence that potential migrants to the US move to other developed countries



OH, CANADA! HOW OUTDATED U.S. IMMIGRATION POLICIES PUSH TOP TALENT TO OTHER COUNTRIES

HEARING

U.S. HOUSE OF REPRESENTATIVES

TUESDAY, JULY 13, 2021

Effects of US skilled immigration restrictions: a policy change in 2017

- Sudden tightening of the eligibility criteria of US visas for college-educated immigrants
- Followed by a sharp increase in US visa denial rates and skilled immigration to Canada

This paper:

- How do these restrictions affect Canadian skilled immigration, production, and welfare?
- How does the influx of workers to Canada and other economies impact American wages?
  - Does international trade mitigate the intended wage effect of the restrictions?

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What we do

Use quasi-experimental variation introduced by the policy, a new dataset, and a new model to:

1. **Document the effects of US restrictions on skilled immigration to Canada**
   - Variation across time and immigrant groups (occupation and nationality)
   - US work visa application data and new Canadian visa application data
2. **Document the effects of the inflow of skilled immigrants on Canadian firms**
   - Variation across time and firms differently exposed to the inflow of immigrants
   - Universe of immigration records and employee-employer records + international trade data
3. **Quantify welfare effects and the role of trade in mitigating intended effects**
   - Incorporate immigration policy in a multi-sector quantitative model of international trade
   - Calibrated based on our data and reduced-form estimates

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Data

1. **US H-1B visa application data:** $\sim$ 400k/year, FOIA requested
   - Worker's occupation and nationality
   - Application: approved or denied, new or continuing visa
2. **Canadian permanent residence visa application data**
   - New data on the universe of applications aggregated by occupation and nationality
3. **Canadian Employer-Employee data + immigration records + int'l trade data**
   - Worker's nationality

US H-1B program and sudden US policy change in 2017

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- E.g. BA degree is no longer enough to prove specialty occupation for some occupations

March 31, 2017

Policy Memorandum

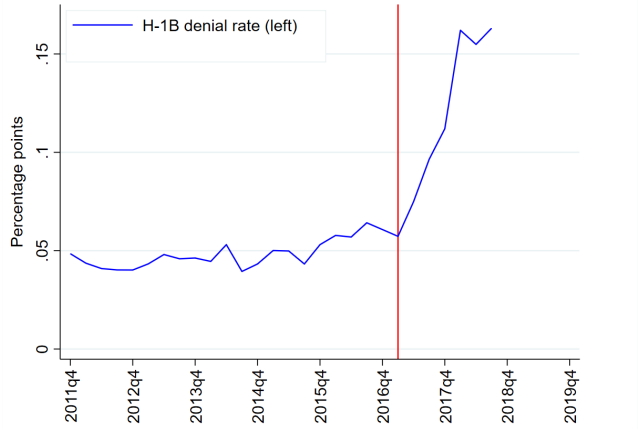
U.S. Citizenship and Immigration Services

SUBJECT: Rescission of the December 22, 2000 "Guidance memo on H1B computer related positions"

Scope

This PM applies to all U.S. Citizenship and Immigration Services (USCIS) employees. The updated guidance is effective immediately.

Spike in US denial rates and skilled immigration to Canada



- By 2018, 140K fewer H-1B approvals relative to trend H-1B approvals Cont.

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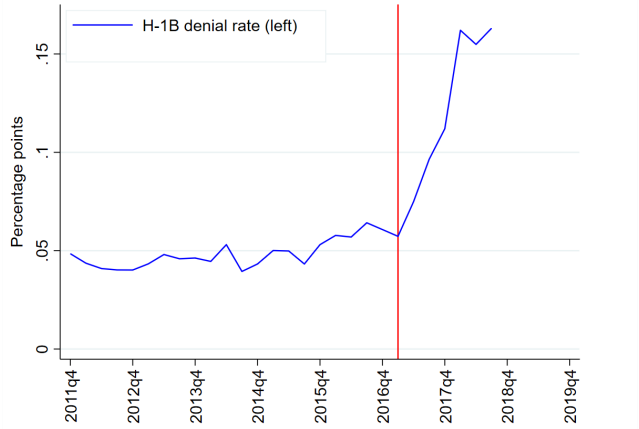

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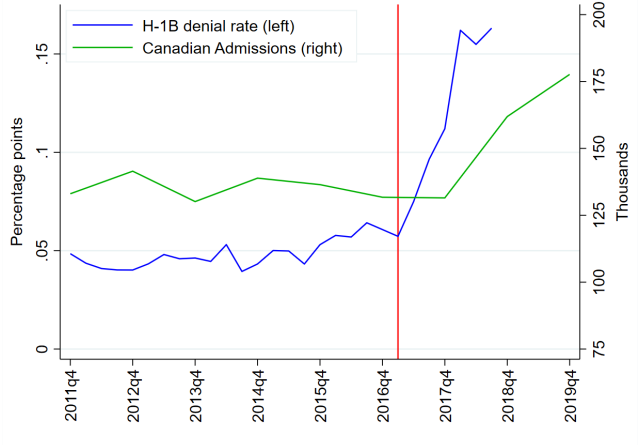

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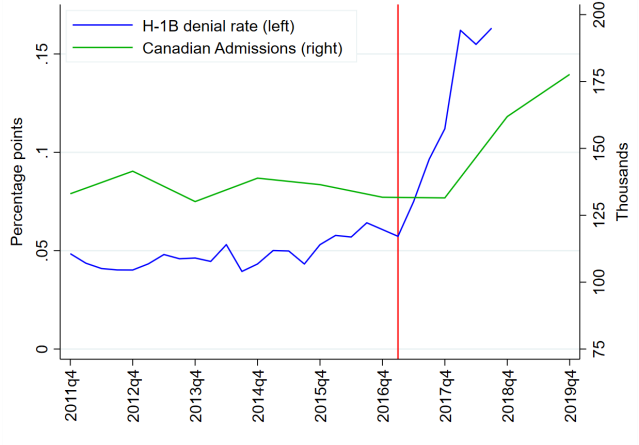

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Effects of US restrictions on skilled immigration to Canada

H-1B restrictions increased Canadian visa applications

$$log(Can\ App_{o,c,t}) = \sum_{\tau \neq 2016} \theta_\tau \times \underbrace{Fraction\ Affected_{o,c}}_{\text{Denial Rate}_o^{2018} \times \text{U.S. share}_{o,c}} \times \mathbb{I}(t = \tau) + FE_{o,c} + FE_{o,t} + FE_{c,t} + \epsilon_{o,c,t}$$

Immigrant group: c =country of birth, o =occupation; U.S. $\text{share}_{o,c} \equiv \frac{\text{US Applications}_{o,c}^{2011\text{-}15}}{\text{US \& CAN Applications}_{o,c}^{2011\text{-}15}}$; Baseline year: 2016

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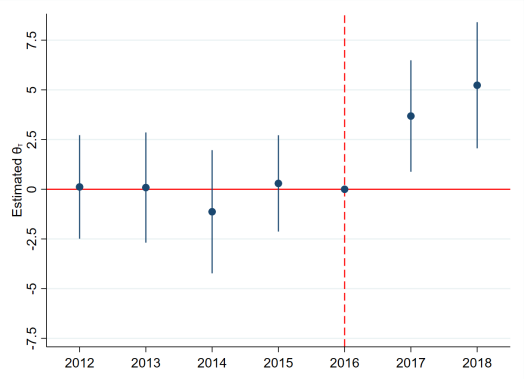

Effects of increased skilled immigration on Canadian firms

Increase in total sales and the share of exports in total sales

$$y_{it} = \sum_{\tau \neq 2016} \beta_\tau \times \textit{Exposure}_i \times \mathbb{I}(t = \tau) + FE_i + FE_{mt} + \zeta X_{ikt} + \epsilon_{it}$$

i = firm, k = industry, m = commuting zone, $\textit{Exposure}_i \approx \sum_{o,c} \frac{L_{o,c,i}}{L_i} \times \frac{\Delta L_{o,c}^{policy}}{L_{o,c}}$ More results

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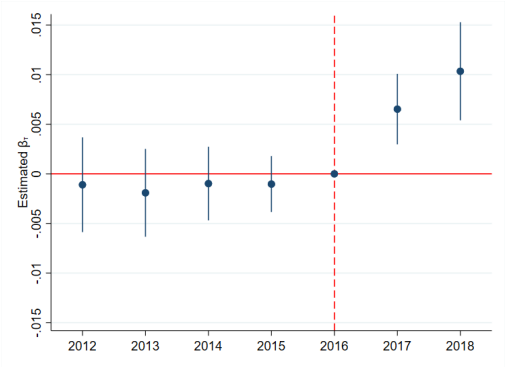
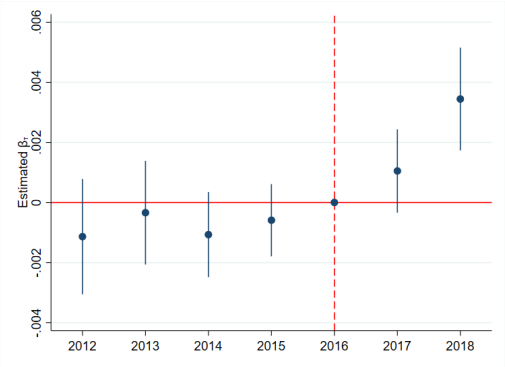


Share of exports in total sales



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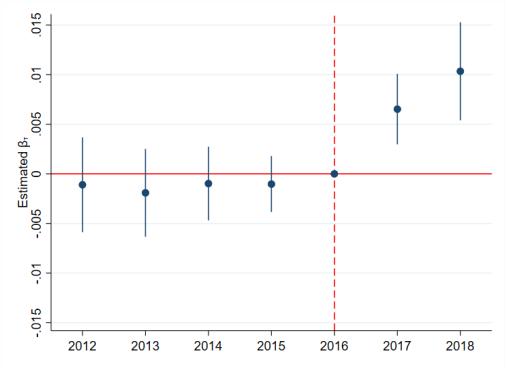
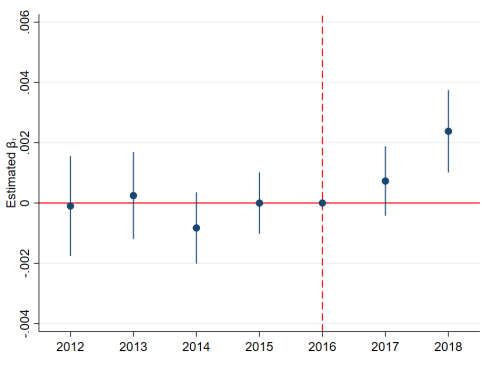


Share of exports to the U.S. in total sales



Increase in native employment and drop in earnings per native worker

$$y_{it} = \sum_{\tau \neq 2016} \beta_\tau \times \textit{Exposure}_i \times \mathbb{I}(t = \tau) + FE_i + FE_{mt} + \zeta X_{ikt} + \epsilon_{it}$$

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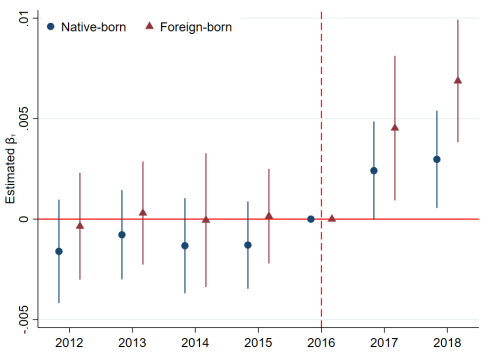
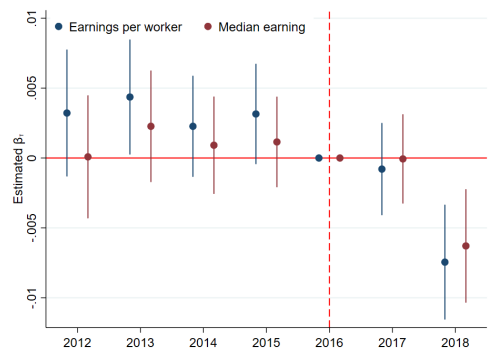
Net hiring relative to 2016 employment level



log(Earnings of native-born workers)



Quantitative general equilibrium model

- Calibrated based on the event-studies estimates
- Quantify welfare effects and the role of international trade in shaping the welfare effects

Model's overview

- Static model, multiple sectors (index k), multiple countries (index c, d, j)
- Preferences: CES across sectors (elast. ρ) and varieties ω (elast. σ)
- Workers: Multiple groups g given by nationality (index c) and occupation (index o)
  - Choose whether to migrate and the destination country d
  - Choose sector (efficiency units $\sim$ iid Frechet, shape parameter κ) [Galle et al.,'20]
- Technology: $y_{dk}(\omega) = z_{dk}(\omega)\ l_{dk}(\omega)$
  - $z_{dk}(\omega) \sim$ iid Frechet (shape parameter θ) [EK, '02]
  - $l_{dk}(\omega)$: CES across occupations (elast. η) and native-immigrant (elast. ϵ) [BHTV, '22]
- Goods and labor markets are perfectly competitive
- Equilibrium: wages $\{w^{nat}_{o,k,d}, w^{imm}_{o,k,d}\}$ workers maximize expected utility, producers maximize profits, trade is balanced, and markets clear

Immigration policy and migration decision

- Immigration policy of country d: exogenous probability of getting a visa $p_{g,d}$
- Utility of choosing country d for worker ι in group $g \equiv \{o, c\}$: notation: $\tilde{x} \equiv \log(x)$

$$U_{g,d}(\iota) = \begin{cases} \tilde{u}_g^{nat} + \epsilon_d(\iota) & \text{if } d = c \\ \underbrace{p_{g,d}\, \tilde{u}_{g,d}^{imm} + [1 - p_{g,d}]\, \tilde{u}_g^{nat}}_{\text{Expected utility of applying for a visa}} + \underbrace{\epsilon_d(\iota)}_{\text{Taste shock}} & \text{if } d \neq c \end{cases}$$

- $u_{g,d}^{imm} \equiv \mathbb{E}\left(\max_k u_{g,d,k}^{imm} \right)$ where $u_{g,d,k}^{imm}$: real wage net of migration costs
- ϵ_d : Extreme value distributed, correlated across d (nested logit)
  - Elasticity of substitution between home & abroad $\nu_h \neq$ between US & CAN ν_d

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Comparative statics: effects of $dp_{g,usa} < 0$ on American workers' welfare

$$\overbrace{d\tilde{W}^{nat}_{o,usa,k}}^{\text{Real wage}} \approx \overbrace{\text{Substitution Effect}_{o,usa,k} + \text{GE effects due to increasing costs in the US}_{usa,k}}^{\text{Direct effects}}$$

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$$+ \underbrace{\theta \sum_j \omega^{sales}_{usa,j,k} \lambda_{can,j,k} \, d\tilde{c}_{can,k}}_{\text{Indirect competition effect} < 0}$$

$\omega^{sales}_{usa,j,k}$: share of country j in sales of US sector k

$\lambda_{can,j,k}$: share of Canada in expenditure of country j in good k

- Indirect effects: US restrictions $\rightarrow \uparrow$ immigration to Canada $\rightarrow \downarrow$ unit costs $c_{can,k}$
  - Drop in $c_{can,k}$, specially in k with factor shares skewed towards affected immigrant groups

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Calibration

Calibration of the model: Overview

- 4 countries (US, Canada, India, and RoW), 6 occupations (5 skilled, 1 unskilled), 8 sectors
- Calibrated to our data: $dp_{o,usa}$, and migration, factor, and trade shares
- Elasticities: $\Upsilon \equiv \{\overbrace{\underbrace{\theta}_{=6.7}, \underbrace{\eta}_{=0.9}, \underbrace{\kappa}_{=2.8}}^{\text{Calibrated from literature}}, \overbrace{\underbrace{\nu_d}_{=3.6}}^{\text{IV approach}}, \overbrace{\underbrace{\nu_h}_{=2.3}, \underbrace{\epsilon}_{=4.3}, \underbrace{\rho}_{=1.2}}^{\text{Indirect inference approach}}\}$
  - ν_d: IV estimate of a structural equation of $d\log\left(\frac{App_{g,can}}{App_{g,usa}}\right)$ on $d\log\left(\frac{\text{Payoff App}_{g,can}}{\text{Payoff App}_{g,usa}}\right)$
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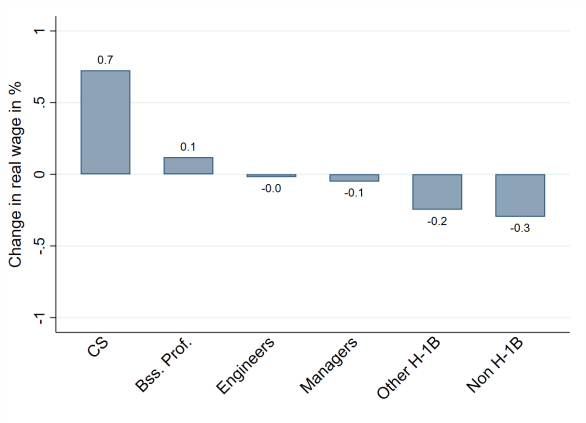
Aggregate effects of the spike in H-1B denial rates

- 2017 drop in $p_{g,usa}$ for skilled occupations (largest for CS $\approx$ -19pp)
- No change in $p_{g,usa}$ for the unskilled occupation, $\bar{L}_{g,usa}$ and $\bar{L}_{g,can}$

Welfare effects of the observed change in denial rates on American workers

- Δimmigrant labor $\approx$ -1.6%.It affects production, especially in high-skilled service sectors

Skilled service sectors: American workers' welfare



More results U.S. Canada

Intended effects on American workers: the role of international trade

- Implement the same $dp_{g,usa}$ in a closed economy (e.g. economy with $\tau_{d,j,k} \to \infty \; \forall \; d \neq j$)
  - Welfare effects on American workers in the closed economy: $\hat{W}^{CE}$
- Compare $\hat{W}^{CE}$ with the welfare effects on American workers in the baseline economy $\hat{W}^{BL}$
  - $\hat{W}^{CE}/\hat{W}^{BL}$: Importance of international trade in the welfare effects of $dp_{g,usa}$

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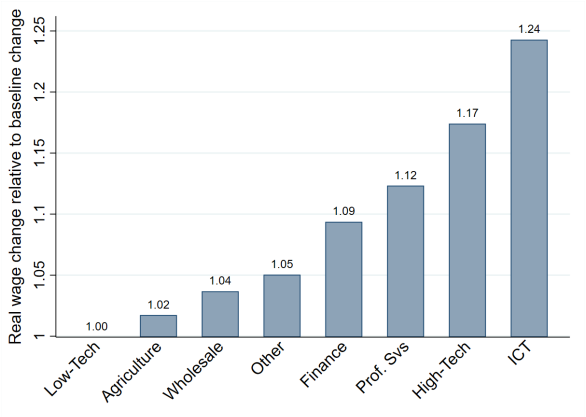
Intended effects on American workers: the role of international trade

Welfare of American computer scientists by sector: $\hat{W}^{CE}/\hat{W}^{BL}$



Ignoring international trade overestimates American computer scientists' gains by up to 24%

Conclusion: Effects of U.S. immigration policy in a globalized economy

- Effects of the US immigration restrictions on the Canadian economy
  - US restrictions increased skilled immigration to Canada
  - Canadian firms that were relatively more exposed increased sales and exports
  - Canadian workers experienced large welfare effects. Overall gains $\approx 0.2\%$
- Effects of the US immigration restrictions on American workers' welfare
  - Welfare gains for American computer scientists, but losses for other American workers
  - International trade dampens gains of American workers targeted for protection by up to 25%