The Impact of Immigration on Local Public Finances: Evidence from Canadian Municipalities

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May 31st, 2025
59th Annual Meetings of the Canadian Economics Association

Motivation

- Immigration is a key federal responsibility
    - Critical to economic & demographic growth

- However, many impacts are felt at *local* level
    - eg. roads, police, shelters, parks

- Municipalities concerned about impact on budgets
    - Can they afford to accommodate immigrants?

- But limited evidence of effect of immigration on *municipal finances* with most focus on:
    1. labour and housing markets
    2. fiscal impacts at higher/all levels of government

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Motivation

Why are municipal finances interesting to study?

1. <u>Major Policy Implications</u>: Municipal planning, immigration policy, intergovernmental transfers

2. <u>Different Fiscal Considerations:</u> property taxes, user fees, infrastructure investment, no deficits

   - More complex interaction between population growth and revenues/expenditures
     - Tax base does not expand with income

   - Interesting distributional consequences
     - Municipal investments generally not directed to low-income residents

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This Paper

- **Research Question:** What is the impact of <u>newcomers</u> on municipal finances?
    - <u>Newcomers:</u> includes both permanent residents (immigrants) and non-permanent residents (eg. international students, refugees, temporary foreign workers)

- **Approach:** Estimate the impact of newcomers on municipal revenues & expenditures per capita across Canadian municipalities
    - Employ an instrumental variables (IV) approach using a shift-share IV
    - Estimate results by newcomer skill-level and revenue/expenditure streams

- **Data:** Municipality-level data on newcomers and municipal finances
    - Newcomers: Statistics Canada Immigration Database (IMDB)
    - Municipal Finances: Publicly available data from AB, ON, QC & BC

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Literature & Contribution

Fiscal Impacts of Immigration

- Accounting Approach:
  - Literature Reviews: Vargas-Silva (2015); Preston (2014); Dustmann & Frattini (2014)
  - Static: **??**Garvey et al. (2002); Ruist (2014); Javdani & Pendakur (2014) (Canada)
  - Dynamics: Auerbach & Oreopoulos (1999); **?**); Lee & Miller (2000)
  - *Requires many assumptions; does not capture total effect; all levels of government*
- Model Based Approach: Busch et al. (2020); Chassamboulli & Liu (2024)
  Colas & Sachs (2024)
  - *Only theoretical, not empirical; may not capture all channels; all levels of government*
- Empirical Approach: Mayda et al. (2023)
  - *Estimate impact across US municipalities empirically*
  - Study Canada rather than US; use annual data; more comprehensive immigration data

Empirical Framework

In Levels:

$$\ln y_{it} = \beta_T \frac{M_{it}^T}{\text{Pop}_{it}} + \delta_i + \delta_t + \beta_x X_{z,2001} * t + \varepsilon_{it}$$

- $\ln y_{it}$ - Log per capita revenues or expenditures in municipality i
- $\frac{M_{it}^T}{\text{Pop}_{it}}$ - % of newcomers in municipality i
- δ, $X_{z,2001} * t$ - City and Year x Province FEs, Control Variables

In First-Differences (preferred specification):

$$\Delta \ln y_{it} = \beta_T \Delta \frac{M_{it}^T}{\text{Pop}_{it}} + \Delta \delta_i + \Delta \delta_t + \beta_x X_{z,2001} * t + \varepsilon_{it}$$

Identification

- Concerns that newcomer share may be endogenous with municipal finances
  - eg. stronger economies $\rightarrow$ more immigrants $+$ higher revenues
  - eg. pro-immigration sentiment $\rightarrow$ more immigrants $+$ prefer bigger government

- Need an instrumental variable (IV) to generate quasi-random variation in newcomer %
  - Classic IV in immigration literature - "enclave" instrument

$$\tilde{M}_{jt}^k = \sum_i \frac{M_{ijt_0}^k}{M_{it_0}^k} M_{it}^k$$

  - $M_{ijt_0}^k$ - Newcomers of skill, k, from country of origin, i, to destination, j, in initial period, t_0
  - $\frac{M_{ijt_0}^k}{M_{it_0}^k}$ - share of all newcomers of origin i in destination j (share)
  - M_{it}^k - total newcomers from country of origin i in time t (shift)

First Stage OLS Reg

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Immigration and Municipal Finances

- Immigration impacts municipal finances through population growth
    - As population $\uparrow$ $\rightarrow$ more revenues, but also services required

- Impact on revenues/expenditures *per capita* will depend on <u>type of newcomers</u>
    - Both directly (eg. property taxes) and indirectly (eg. more economic growth)
    - Newcomers are *net contributors* if revenues > expenditures

- Impact on revenues and expenditures also depend on <u>municipal response</u>
    - Municipalities must balance budgets
    - Municipalities may adjust either tax rates or expenditures

- Regression of revenues/expenditures on newcomers will capture combination of effects
    - Cannot separately identify them without further analysis

Heterogeneity & Mechanisms

Important to try and disentangle role of newcomers from municipal response

- Does increased revenue come through newcomers or higher taxes on existing residents?

Investigate this question by analyzing:

- Heterogeneity: How much does newcomer type matter?
    - Estimate effects separately for high & low-skilled newcomers
    - Mayda et al. (2023) find that:
        - High skilled immigrants in US → net contributors
        - Low-skilled immigrants → net beneficiaries

- Mechanisms: What revenue and expenditure streams are most affected?
    - Estimate effects for major revenue and expenditure streams to test narratives
    - If newcomers are fiscal burden, then expect: welfare ↑ & property taxes ↑

Immigration Data

- Statistics Canada Immigrant Database (IMDB) (2004-2022)

- Sample: all newcomers who arrived since 1980
  - Includes permanent (immigrants) & non-permanent residents

- Newcomer's Municipality: use tax data to determine place of residence
  - Use permit data for non-taxpaying years (eg. students, children, spouses)
  - Destination municipality data only reliable after 2004

- Newcomer's skill: based on initial employment NAICS code in landing year

- Key Variable: Immigration shares by municipality
  - Use Stats Can population estimates as denominator

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Municipal Finance Data

- Gathered municipal finance data from four biggest provinces (AB, ON, QC, BC)
    - Years available: AB (1994-2023), ON (2000-2023), BC (2005-2023), QC (2014-2022)

- Variables of interest (all adjusted for inflation):
    - "Own" Revenue - Tax revenue + user fees, permits and fines
    - Total Expenditure - Includes both capital and operational
    - Different Revenue and Expenditure streams

- Municipalities included in the analysis (around 900) meet the following criteria:
    - At least 1,000 people
    - Data for at least 80% of available years
    - Consistent CSD code back to 2001
    - Not a First Nation's reserve or a lower-tier municipality

Main Results

Table: Change in Log Revenue - 2SLS - Total Immigrants

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Immigrant % (Total)	0.966***	1.629***	0.378	1.332***	1.721***	1.535***
	(0.165)	(0.169)	(0.255)	(0.255)	(0.249)	(0.189)
Controls x Year FE	✕	✓	✕	✓	✕	✓
Year x Province FE	✕	✕	✓	✓	✓	✓
Municipality FE	✕	✕	✕	✕	✓	✓
Kleibergen-Paap F-Stat	255.360	140.301	79.500	64.974	36.871	96.190
Observations	14,018	14,018	14,018	14,018	14,018	14,018

- Column (6): A 1 p.p. ↑ in newcomer % → 1.5% ↑ in revenue per capita
- Note: all regressions are weighted by population and s.e. clustered at CSD level

Main Results

Table: Change in Log Expenditure - 2SLS - Total Immigrants

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Immigrant % (Total)	0.940***	1.364***	0.582*	0.697*	0.962**	0.916**
	(0.200)	(0.282)	(0.296)	(0.280)	(0.333)	(0.303)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	×	✓	✓	✓	✓
Municipality FE	×	×	×	×	✓	✓
Kleibergen-Paap F-Stat	255.360	140.301	79.500	64.974	36.871	96.190
Observations	14,018	14,018	14,018	14,018	14,018	14,018

- Column (6): A 1 p.p. ↑ in newcomer % → 0.9% ↑ in expenditure per capita

Heterogeneity

Table: Change in Log Revenue - 2SLS - Immigrants by Skill

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Immigrant % (High)	5.367**	6.731**	0.290	0.805	1.395	2.626
	(1.800)	(2.529)	(0.740)	(1.145)	(1.225)	(1.910)
Δ Immigrant % (Low)	0.226	0.729*	0.398	1.467***	1.791***	1.306***
	(0.303)	(0.337)	(0.250)	(0.250)	(0.277)	(0.360)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	×	✓	✓	✓	✓
Municipality FE	×	×	×	×	✓	✓
Kleibergen-Paap F-Stat	25.179	48.978	20.149	24.942	38.160	29.078
Observations	14,018	14,018	14,018	14,018	14,018	14,018

Heterogeneity

Table: Change in Log Revenue - 2SLS - Immigrants by Skill

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Immigrant % (High)	3.753*	4.461*	3.612**	3.481**	4.252***	5.358**
	(1.680)	(1.999)	(1.161)	(1.143)	(1.036)	(1.661)
Δ Immigrant % (Low)	0.467*	0.818***	-0.085	-0.016	0.253	-0.017
	(0.189)	(0.233)	(0.293)	(0.355)	(0.366)	(0.394)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	×	✓	✓	✓	✓
Municipality FE	×	×	×	×	✓	✓
Kleibergen-Paap F-Stat	25.179	48.978	20.149	24.942	38.160	29.078
Observations	14,018	14,018	14,018	14,018	14,018	14,018

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Net Revenue Effect

Figure: Net Effects of Immigration on Municipal Finances by Type

Robustness: Revenue   Robustness: Expenditure   Levels

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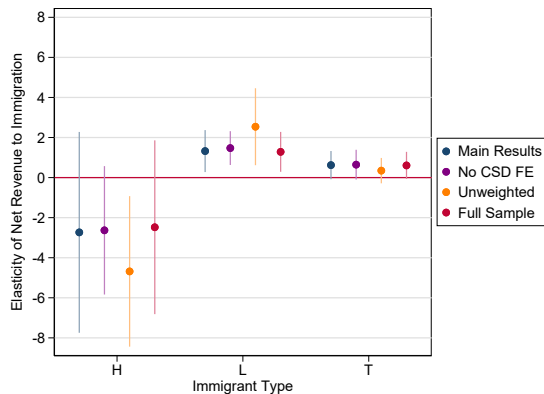
Mechanisms

Table: Change in Log Revenue per capita - 2SLS - By Stream

	Tax Revenue	User Fees & Permits	Capital Income	Gov. Transfers	Total Revenue	Own Revenue
Δ Immigrant % (High)	2.499	2.850	29.733	26.692	2.422	2.670
	(1.307)	(3.333)	(53.016)	(14.019)	(2.860)	(1.927)
Δ Immigrant % (Low)	-0.356	3.848*	10.887	-4.317	1.002	1.298***
	(0.370)	(1.724)	(9.164)	(3.486)	(0.723)	(0.360)
Observations	~14,000	~14,000	~14,000	~14,000	~14,000	~14,000
Kleibergen-Paap F-Stat	29.571	29.571	29.571	29.571	29.571	29.571

Mechanisms

Table: Change in Log Expenditure per capita - 2SLS - By Stream

	General Governm.	Protect. Services	Trans-portation	Water & Waste	Health & Welfare	Plan. & Develop.	Recrea. & Cultu.	Total
Δ Immigrant % (High)	21.338	1.921	-28.332	4.300	-18.155	7.931	3.416	5.404**
	(15.369)	(1.426)	(23.038)	(4.663)	(25.613)	(9.662)	(2.329)	(1.681)
Δ Immigrant % (Low)	-3.385	0.196	5.638	-0.143	-0.231	4.418	0.112	-0.025
	(2.198)	(0.476)	(4.777)	(1.229)	(7.163)	(2.461)	(0.931)	(0.395)
Observations	~14,000	~14,000	~14,000	~14,000	~14,000	~14,000	~14,000	~14,000
Kleibergen-Paap F-Stat	29.571	29.571	29.571	29.571	29.571	29.571	29.571	29.571

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Interpretation of Results

- Main results suggest that newcomers ↑ municipal budgets
    - Revenues slightly larger than expenditures, but must balance budgets

- Result holds true for both high & low-skilled newcomers
    - Net effect actually positive for low-skill and negative for high-skill
    - Opposite of Mayda et al. (2023) in US - what does this mean?

- Low-skill revenue growth from user fees, not property tax or government transfers
    - Consistent with net contributor story, not tax or transfer adjustment

- High-skill expenditure growth larger than low-skilled. Two theories:
    1. Location choice of high-skill: more suburban = costly to provide infrastructure & services
    2. Ignored low-skill workers: take transit and pay rent, but no political will to provide infrastructure & services

Future Work

- Cannot entirely disentangle role of newcomer type from municipal response
  - Try to calculate impact on change in effective property tax rate
  - Use alternative definitions of skill (eg. refugee, student)

- Understand heterogeneity across municipality characteristics
  - How do effects vary between small and large municipalities? Provinces?

- Robustness checks
  - Definition of skill and classification of immigrant types
  - Specification of immigrant location
  - Tests of shift-share IV

- Thank You!

First Stage Regression

Table: First Stage Regression - Change in Actual Newcomer % to Simulated

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Sim. Imm. % (Total)	0.776***	0.931***				
	(0.049)	(0.095)				
Δ Sim. Imm. % (High)			0.768***	1.078***	-0.144	0.394
			(0.116)	(0.107)	(0.309)	(0.296)
Δ Sim. Imm. % (Low)			-0.005	0.010	0.808***	0.832***
			(0.018)	(0.026)	(0.055)	(0.078)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	✓	×	✓	×	✓
Municipality FE	×	✓	×	✓	×	✓
Observations	14,018	14,018	14,018	14,018	14,018	14,018
R-Squared	0.447	0.708	0.254	0.491	0.509	0.754
Within R-Squared		0.377		0.260		0.422

OLS Regression

Table: Change in Log Revenue per capita - OLS - Robustness

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Immigrant % (Total)	0.805***	1.007***	0.269*	0.482***	0.620***	0.690***
	(0.184)	(0.169)	(0.118)	(0.121)	(0.151)	(0.125)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	×	✓	✓	✓	✓
Municipality FE	×	×	×	×	✓	✓
Observations	14,018	14,018	14,018	14,018	14,018	14,018

Return

OLS Regression

Table: Change in Log Expenditure per capita - OLS - Robustness

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Immigrant % (Total)	0.707**	0.791***	0.123	0.112	0.189	0.215
	(0.220)	(0.228)	(0.197)	(0.216)	(0.249)	(0.254)
Controls x Year FE	✕	✓	✕	✓	✕	✓
Year x Province FE	✕	✕	✓	✓	✓	✓
Municipality FE	✕	✕	✕	✕	✓	✓
Observations	14,018	14,018	14,018	14,018	14,018	14,018

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Robustness

Table: Change in Log Revenue per capita - 2SLS - Robustness

|	Main	Year FE	No Weight	All CSDs	Log Imm. %	Lag 1-Yr
Δ Immigrant % (High)	2.626	2.993	-0.418	2.292		
	(1.910)	(1.941)	(0.928)	(1.660)		
Δ Immigrant % (Low)	1.306***	1.319***	1.878***	1.337***		
	(0.360)	(0.331)	(0.425)	(0.339)		
Δ Log Immigrant % (High)					0.056	
					(0.197)	
Δ Log Immigrant % (Low)					-0.025	
					(0.178)	
Lag Δ Immigrant % (High)						0.990
						(1.118)
Lag Δ Immigrant % (Low)						-0.241

Robustness

Table: Change in Log Expenditure per capita - 2SLS - Robustness

	Main	Year FE	No Weight	All CSDs	Log Imm. %	Lag 1-Yr
Δ Immigrant % (High)	5.358**	4.066**	4.361*	4.786***		
	(1.661)	(1.547)	(1.726)	(1.436)		
Δ Immigrant % (Low)	-0.017	-0.410	-0.653	0.053		
	(0.394)	(0.334)	(0.879)	(0.379)		
Δ Log Immigrant % (High)					1.082	
					(0.675)	
Δ Log Immigrant % (Low)					-0.975	
					(0.621)	
Lag Δ Immigrant % (High)						1.475
						(1.084)
Lag Δ Immigrant % (Low)						-

Robustness

Figure: Net Effects of Immigration on Municipal Finances by Type
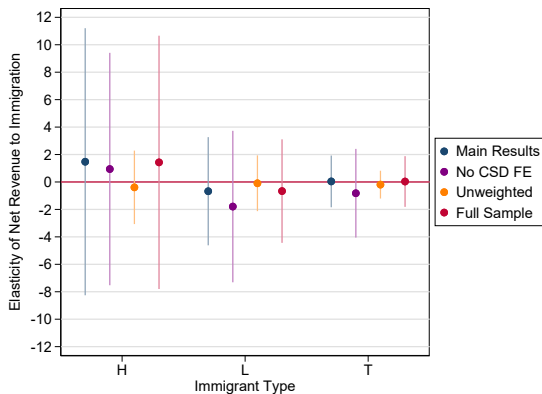
Robustness

Table: Log Revenue per capita - 2SLS - By Skill

	(1)	(2)	(3)	(4)	(5)	(6)
Immigrant % (High)	-5.053	1.802	-5.080	-0.756	7.605	3.703
	(6.034)	(3.183)	(6.305)	(2.817)	(6.212)	(3.890)
Immigrant % (Low)	2.469	2.856*	2.736	4.308*	-3.976	-1.602
	(2.062)	(1.221)	(2.347)	(1.713)	(2.130)	(1.576)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	×	✓	✓	✓	✓
Municipality FE	×	×	×	×	✓	✓
Kleibergen-Paap F-Stat	16.968	31.848	16.383	22.023	5.065	5.984
Observations	14,434	14,434	14,434	14,434	14,434	14,434

Return

Robustness

Table: Log Expenditure per capita - 2SLS - By Skill

	(1)	(2)	(3)	(4)	(5)	(6)
Immigrant % (High)	-4.608	3.007	-7.153	-1.717	5.088	2.211
	(6.370)	(4.497)	(7.378)	(3.334)	(4.636)	(3.200)
Immigrant % (Low)	2.616	3.364	3.786	6.079**	-1.207	-0.922
	(2.287)	(1.925)	(2.820)	(2.234)	(1.299)	(1.347)
Controls x Year FE	×	✓	×	✓	×	✓
Year x Province FE	×	×	✓	✓	✓	✓
Municipality FE	×	×	×	×	✓	✓
Kleibergen-Paap F-Stat	16.968	31.848	16.383	22.023	5.065	5.984
Observations	14,434	14,434	14,434	14,434	14,434	14,434

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