Tax Cuts, Firm Growth, and Worker Earnings: Evidence from Small Businesses in Canada

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Small Literature on Corporate Taxes and Employment & Wages

- Positive effects of tax reductions on employment

  (Giroud and Rauh 2019; Garrett et al. 20202; Curtis et al. 2022)
- Negative effects of tax hikes on wages

  (Fuest et al. 2018; Arulampalam et al. 2013)

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  - Increases in after-tax profits directly go to business owners
  - Lack of growth potentials

Empirical Challenges

- Difficult to find large and exogenous variation in tax rates across firms and workers
  1. Real corporate outcomes too cyclical to distinguish tax effects from business cycle effects
  2. Tax rates for small businesses depend on firm sizes or profits in most settings $\implies$ hard to find control group

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- Prior studies use the following variation to study corporate tax effects on either firm/estab-level or worker-level outcomes :
  - Across-industry: Zwick & Mahon 2017, Ohrn 2018 & Curtis et al. 2022
  - Across-state or -municipality: Suarez Serrato & Zidar 2016, Fuest et al. 2018
  - Across-industry by county: Garrett et al. 2020
  - Business Type (i.e., C- vs. S-Corp): Giroud & Rauh 2019, Harju et al. 2022

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3. Empirically test mechanisms for employment & earnings responses
   - Larger effects among high-tech, fast-growing industries
   - No differential responses by firm sizes or labor market HHI

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2. Link firm-level responses with worker-level responses to a tax cut
   - better understand potential mechanisms behind wage responses
   - comprehensive analysis of tax incidence on both capital and labor
3. Study tax policy targeted for small businesses
   - most existing studies examine corporate tax policy across all firm sizes
   - use large firms as a placebo group to test for GE/competition effects

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     Taxable Capital = capital stock, retained earnings, other surpluses etc, net of investment allowance

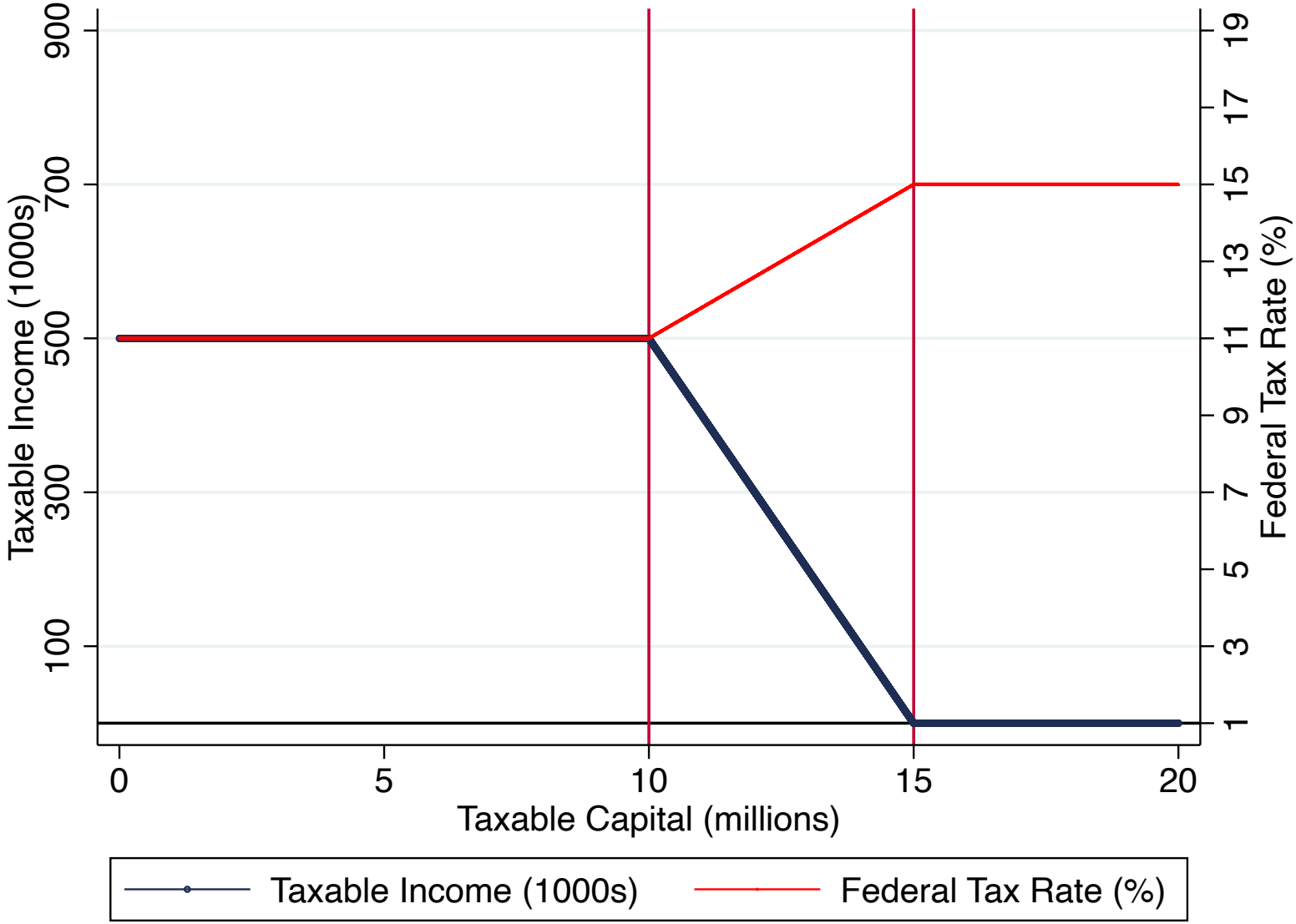
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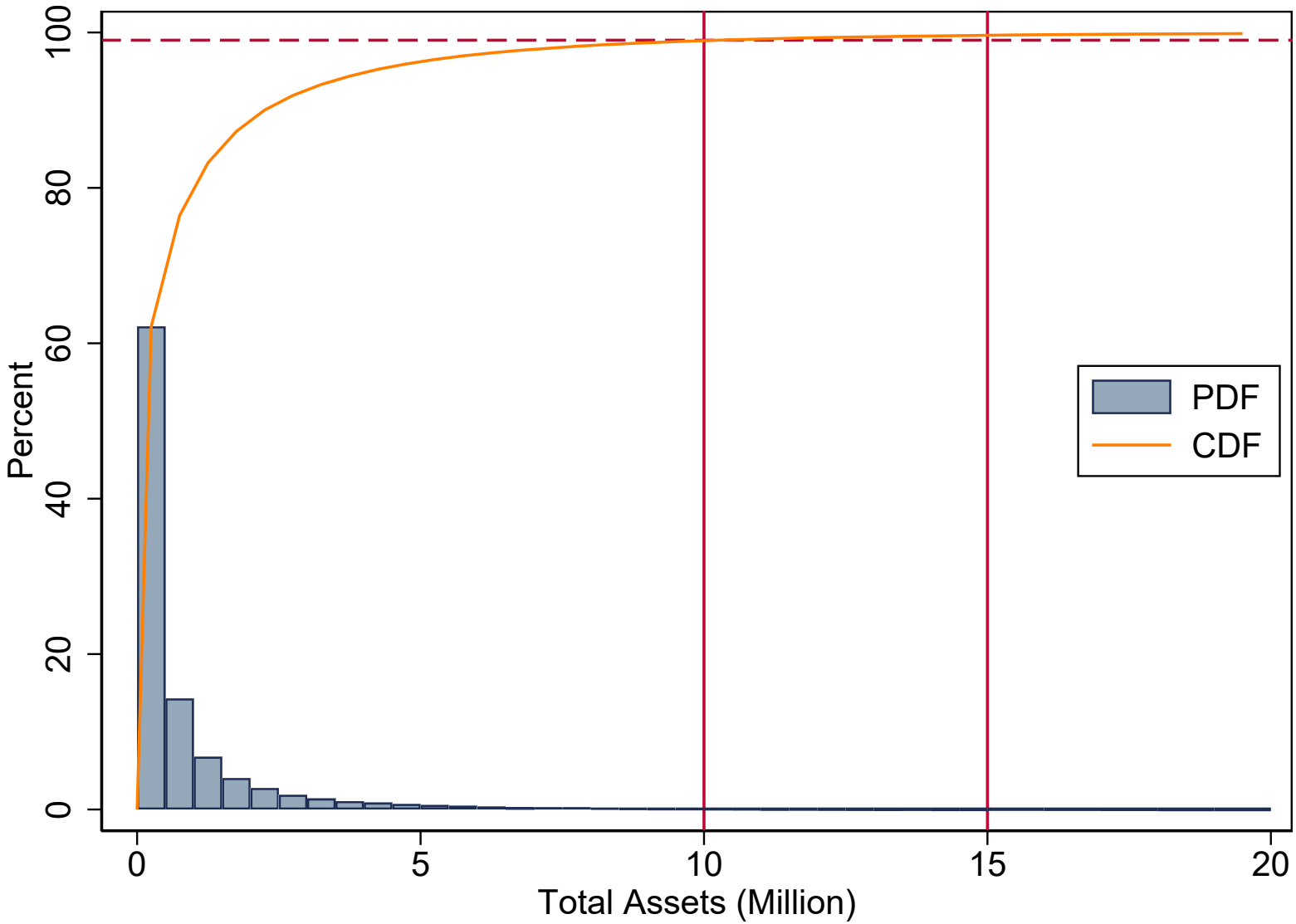
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  4. Taxable Income eligible for SBD completely phases out above 15 million CAD in taxable capital

Phase-out Schedule for Small Business Tax Deductions



PDF and CDF of SBD Claimants across Total Assets



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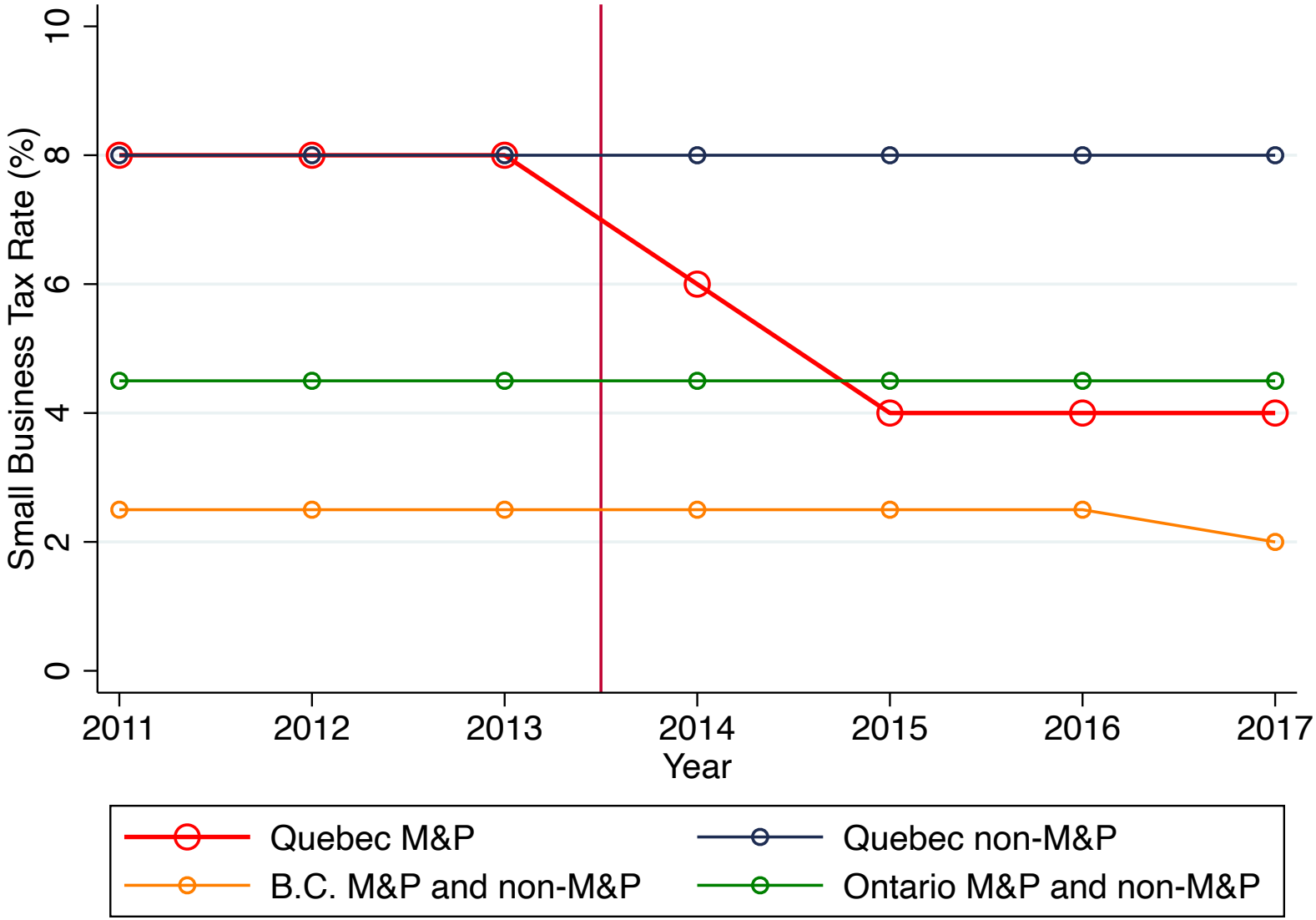
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  7. Quebec, B.C., and Ontario make up for almost 75% of the economy

Reform in Quebec 2014-15



Empirical Model: Estimate Tax Effects on Firm Outcomes

- Triple-difference: compare outcomes of firms operating in M&P and in Quebec with those of firms in non-M&P sectors and in Quebec. Make the same comparison for firms in British Columbia & Ontario.

$$Y_{jt} = \sum_{\tau=2011}^{2017} \theta_\tau \mathbb{1}(t=\tau) \times MP_j \times QC_j + \sum_{\tau=2011}^{2017} \beta_\tau \mathbb{1}(t=\tau) \times MP_j + \sum_{\tau=2011}^{2017} \gamma_\tau \mathbb{1}(t=\tau) \times QC_j + \alpha_j + u_{jt}$$

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- Key threat: shocks that coincide with the reform

1. Triple-difference: absorbs any sector- or province-specific trends or shocks that coincide with the reform
2. Parallel pre-trends on key outcomes
3. Robust to various specifications
4. Placebo test using ineligible firms

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- Triple-difference: compare outcomes of workers in M&P and in Quebec with those of workers in non-M&P sectors and in Quebec. Make the same comparison for workers in B.C. & Ontario.

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  5. Placebo test using workers at ineligible firms

Data Sources

1. Canadian Employer Employee Dynamics Database (Stats Canada)
   - firm-level balance sheets (T2 & National Longitudinal Micro-data file)
   - job-level information (T4 and Record of Employment)
   - worker characteristics (T1 individual tax returns)

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2. Sample Selection: 2011 - 2017 (unbalanced panel)
   - Quebec, B.C., and Ontario account for 2/3 of all firms in Canada
   - Drop firms in the following criteria:
     2.1 moved out of province (0.8%) or switched industries (4.4%)
     2.2 multi-estab across other provinces (1.6%)
     2.3 agriculture (1.6%), finance & real estate (7.1%), professional services (14.7 %), and health care (7.8%)

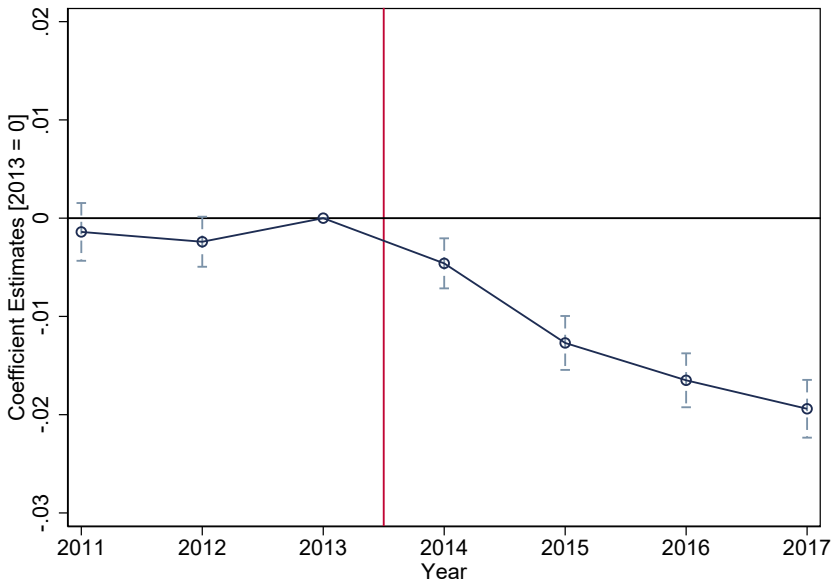
Descriptive Statistics on Firms

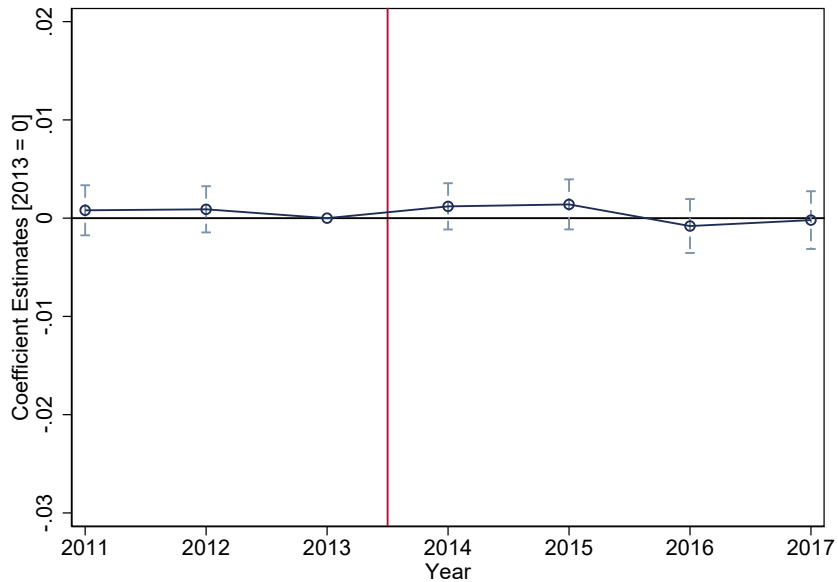
	Quebec		BC/Ontario	
	(1) M&P	(2) Non-M&P	(3) M&P	(4) Non-M&P
Panel A. Firm Characteristics				
Tangible Assets ('000)	783.7	354.7	697	303.6
Intangible Assets ('000)	16.2	12.9	17.4	15.1
Total Revenue ('000)	1649.6	1264.3	1582.8	1176.8
Total Expenses ('000)	1580.2	1211.5	1529	1134.6
Profit Margins	0.029	0.039	0.015	0.024
Employment	11.4	8.2	10	7.6
Total Payroll ('000)	416.5	244.9	417	231.9
Average Payroll ('000)	35.6	21.6	36.2	21.4
EBITDA per Worker ('000)	7.4	9.9	6.6	8.6
Taxable Income ('000)	87.3	57	73.2	47.7
Total Income Tax Rates	0.157	0.166	0.123	0.13
Federal Income Tax Rates	0.081	0.087	0.082	0.089
Firm Age	14.2	12	14.1	11.2
Panel B. Sectors				
High-tech	0.114		0.127	
Low-tech	0.886		0.873	
Mining		0.002		0.004
Construction		0.25		0.223
Wholesale		0.002		0.004
Retail		0.192		0.181
Transportation		0.095		0.11
Information		0.021		0.025
Other services		0.341		0.356
Observations	28,740	274,105	56,075	595,425
Firms	10,195	100,195	20,115	222,705

Descriptive Statistics on Workers

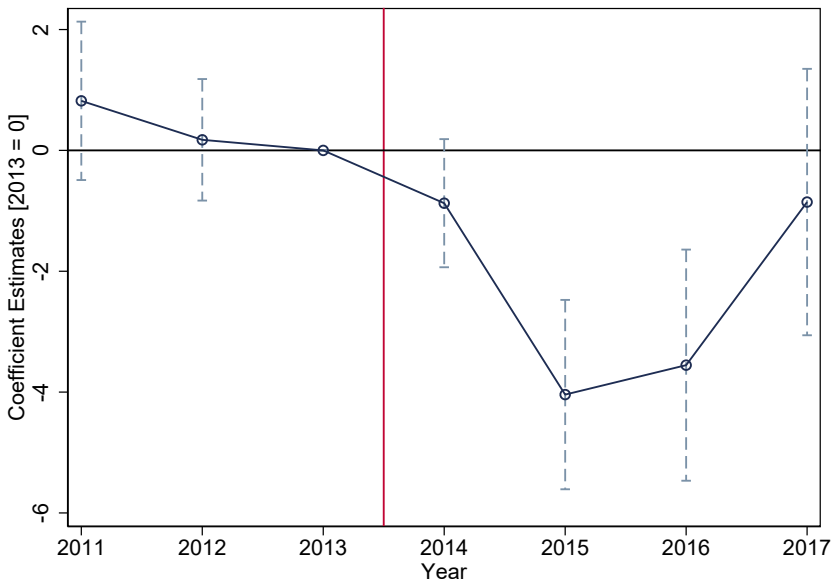
	Quebec		BC/Ontario	
	(1) M&P	(2) Non-M&P	(3) M&P	(4) Non-M&P
Panel A. Worker Characteristics				
Annual Earnings ('000)	38.3	35.1	46.3	39.9
Age	45.7	43.3	46.6	43.7
Male	0.689	0.627	0.704	0.607
Panel B. Sectors				
High-tech	0.109		0.122	
Low-tech	0.891		0.878	
Mining		0.002		0.003
Construction		0.202		0.207
Wholesale		0.002		0.003
Retail		0.252		0.218
Transportation		0.071		0.072
Information		0.016		0.018
Other services		0.351		0.373
Observations	192,755	1,007,210	320,735	1,883,400
Workers	64,250	335,735	106,910	627,800

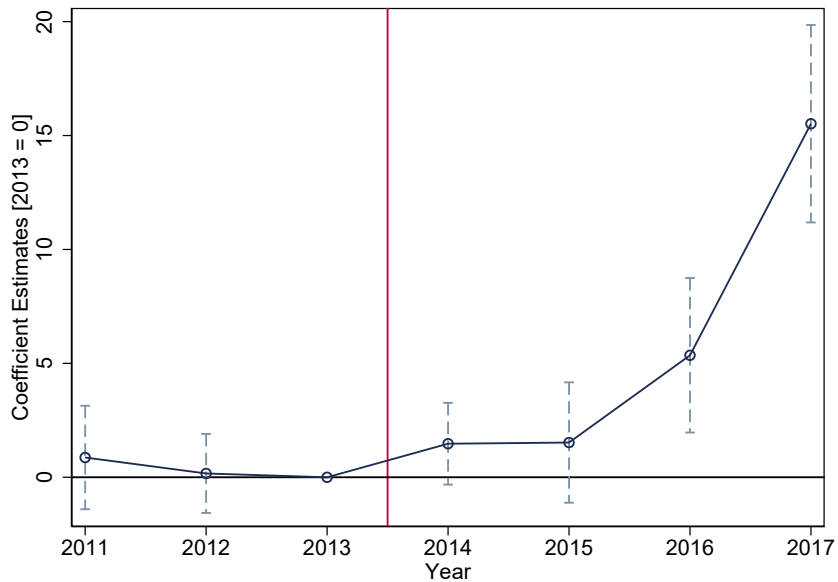
Total Income and Federal Tax Rates





Total Income Taxes Paid and Taxable Income

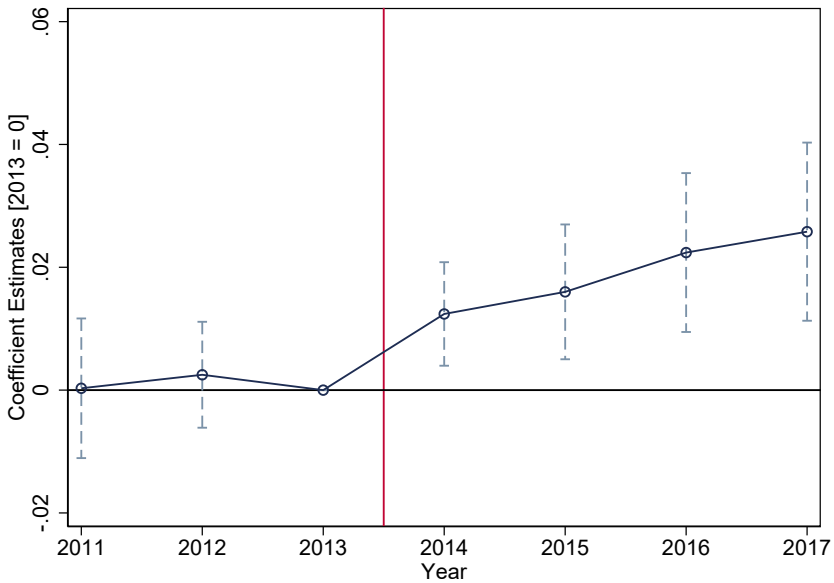


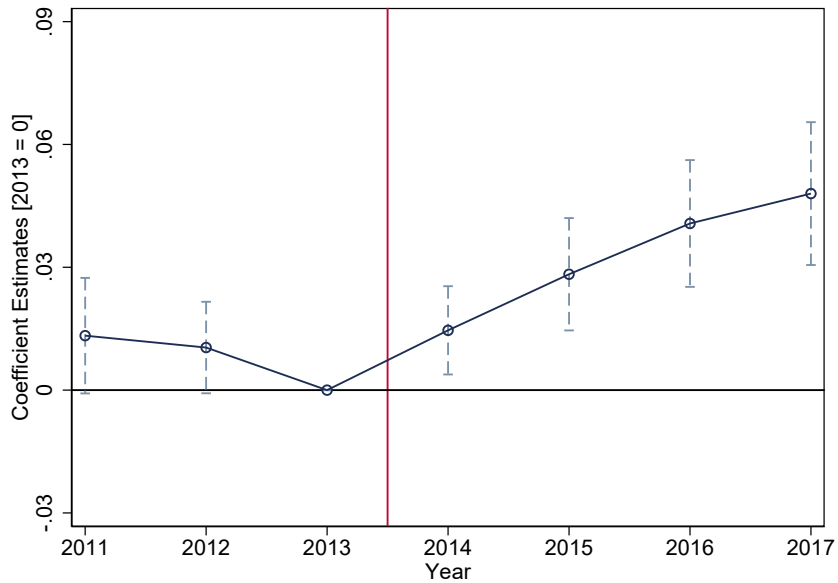


Total Income and Federal Tax Rates

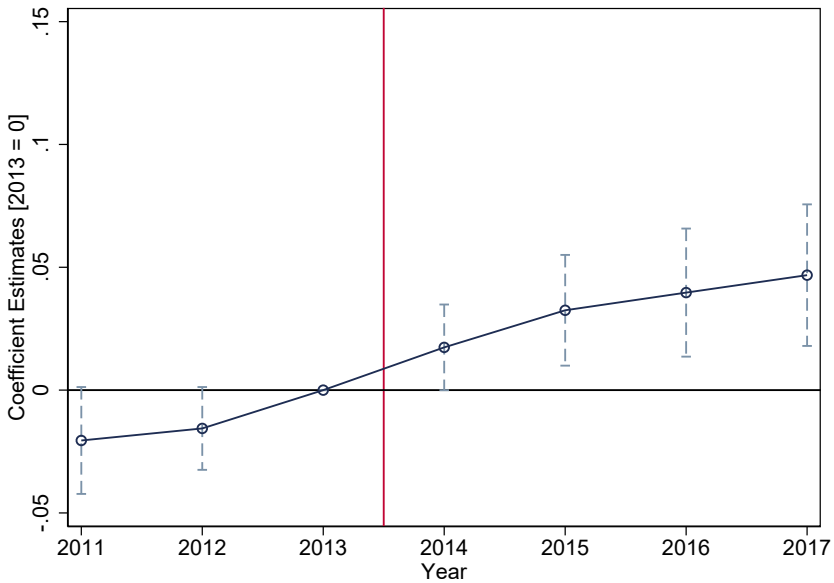
	(1) Total Income Tax Rates	(2) Federal Income Tax Rates	(3) Total Income Tax Paid	(4) Taxable Income
Post × MP × QC	-0.0116***	-0.0001	-2.6579***	5.1698***
	(0.0010)	(0.0009)	(0.7217)	(1.3188)
Mean Dep. Var.	0.157	0.081	23.1	87.3
Observations	1,341,780	1,274,770	1,341,780	2,106,660
Firms (Treated)	8,640	7,970	8,640	10,205
Firms (Control)	261,455	264,835	261,455	343,235
Adjusted R^2	0.378	0.322	0.636	0.719

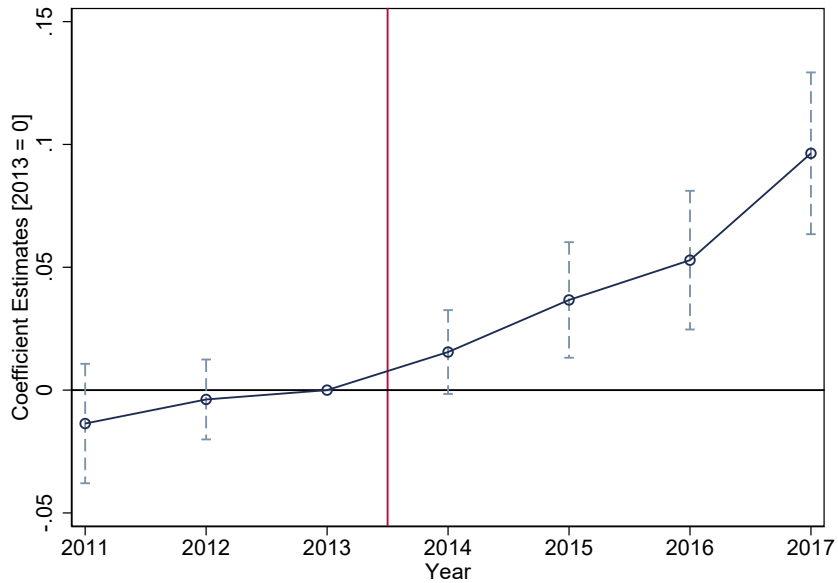
Effects on Employment and Avg Payrolls





Effects on Tangible Assets and Intangible Assets

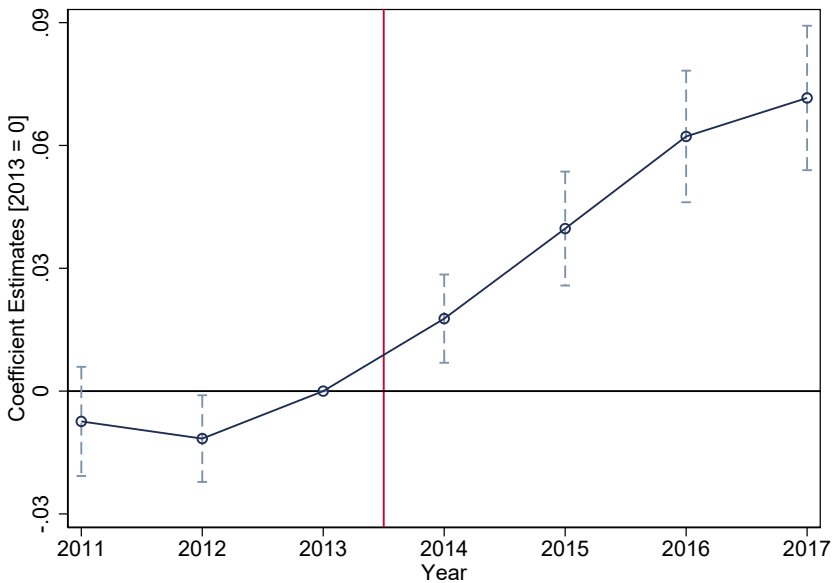


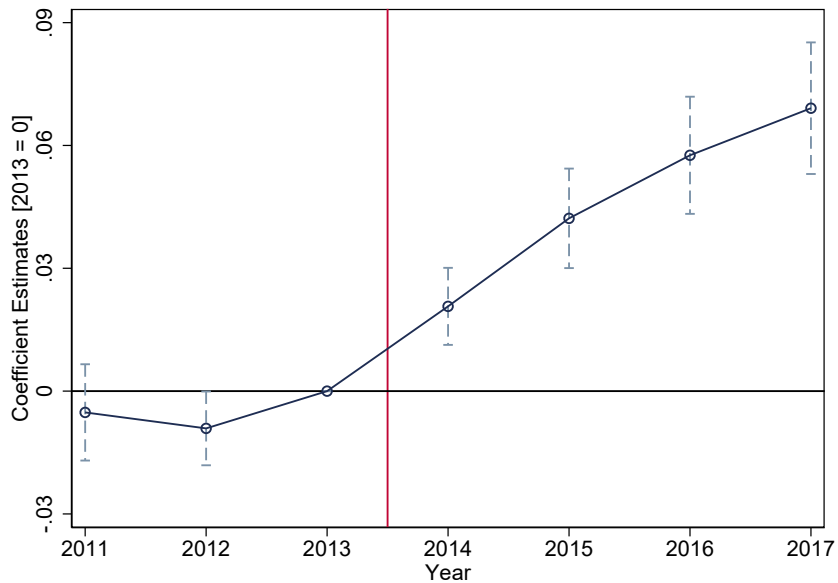


Effects on Employment, Avg Payrolls, and Capital Stock

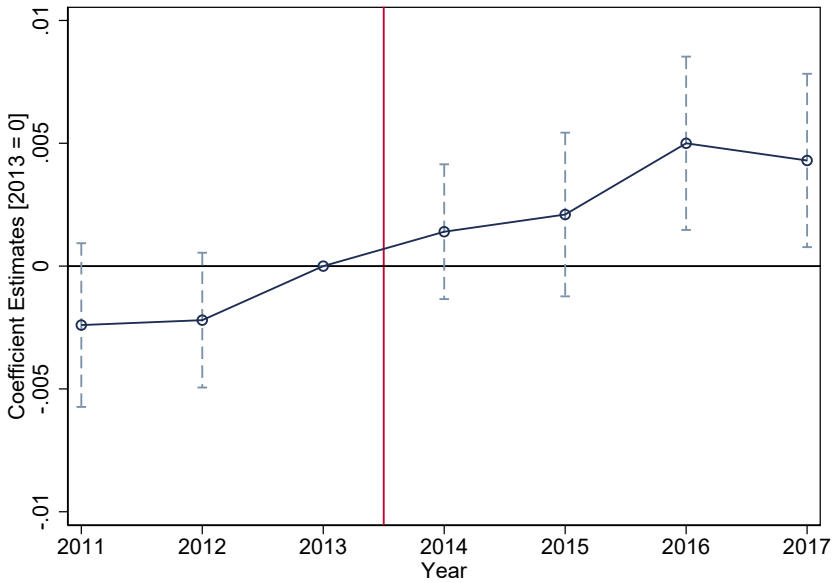
	(1) log(Employment)	(2) log(Average Payrolls)	(3) log(Tangible Assets)	(4) log(Intangible Assets)
Post × MP × QC	0.0175***	0.0235***	0.0440***	0.0541***
	(0.0052)	(0.0063)	(0.0099)	(0.0123)
Mean Dep. Var.	11.4	35.6	783.7	16.2
Observations	2,106,660	2,106,660	2,102,355	2,101,670
Firms (Treated)	10,205	10,205	10,205	10,205
Firms (Control)	343,235	343,235	343,095	343,080
Adjusted R^2	0.917	0.888	0.901	0.911

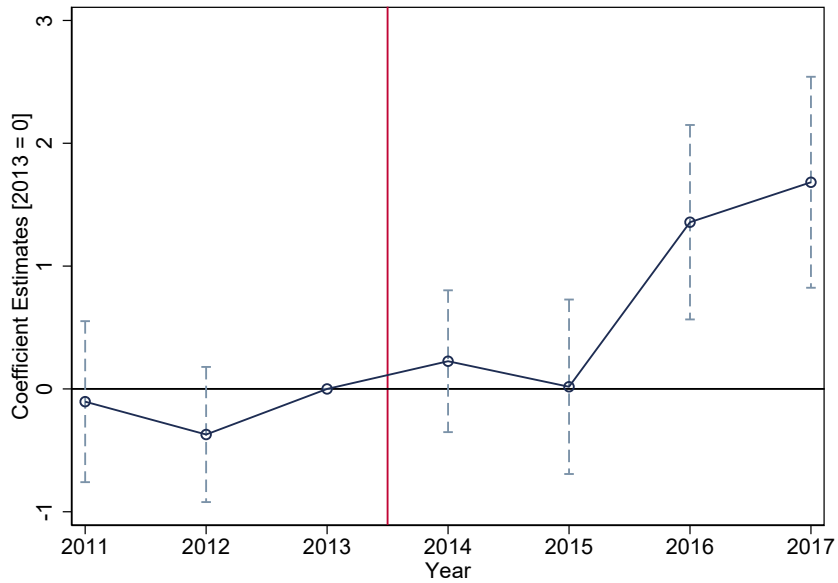
Effects on Sales and Expenses





Effects on Profitability and Productivity





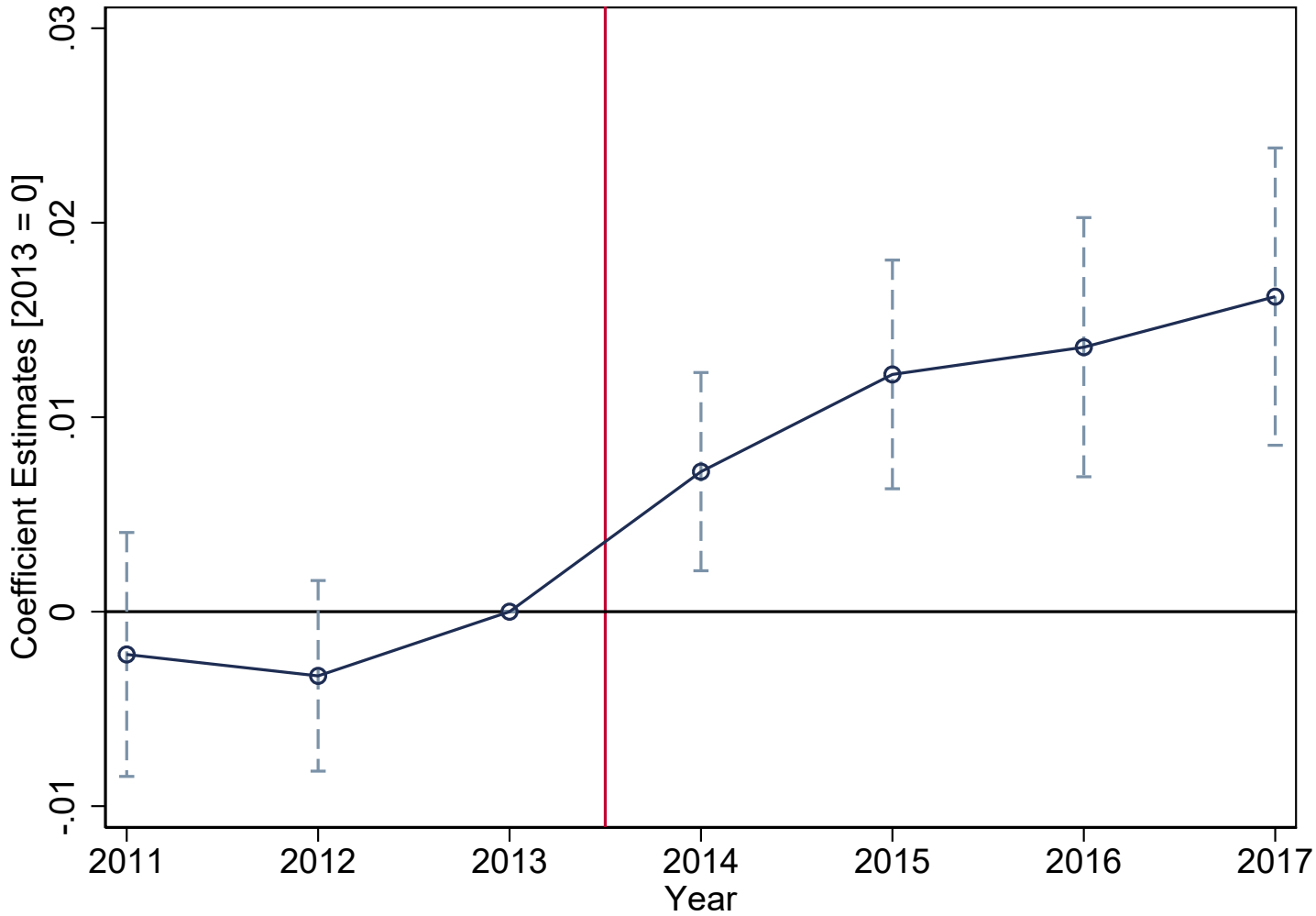
Profit Margin $= \frac{Sales - Expenses}{Sales}$

(Labor) Productivity = EBITDA per worker

Effects on Sales, Expenses, Profitability, and Productivity

	(1) log(Revenue)	(2) log(Expenses)	(3) Profit Margins	(4) EBITDA per Worker
Post × MP × QC	0.0519***	0.0504***	0.0044***	0.8908***
	(0.0063)	(0.0057)	(0.0012)	(0.2708)
Mean Dep. Var.	1649.6	1580.2	0.029	7.4
Observations	2,106,660	2,106,660	2,106,660	2,106,660
Firms (Treated)	10,205	10,205	10,205	10,205
Firms (Control)	343,235	343,235	343,235	343,235
Adjusted R^2	0.915	0.929	0.521	0.579

Effects on Worker-level Earnings



Effects on Worker-level Earnings

	(1) log(Annual Earnings)	(2) Job Transition	(3) log(Annual Earnings) for Stayers
Post × MP × QC	0.0133***	-0.0011	0.0134***
	(0.0026)	(0.0013)	(0.0026)
Mean Dep. Var.	38.3	0.04	39.8
Observations	6,692,730	6,692,730	5,488,305
Workers (Treated)	64,250	64,250	51,615
Workers (Control)	1,070,455	1,070,455	818,055
Adjusted R^2	0.812	0.080	0.831

Robustness Checks & Internal Validity

- Robustness: Main results qualitatively similar across robust
  1. 4-digit industry x Year
  2. Commuting Zone x Year
  3. Defining small firms with missing or below 10/15 mil in taxable cap
  4. Including excluded workers (without tenure restriction, part-time, below 4k in annual earnings, or multiple-job holders)

- Placebo Tests: Non-CCPCs (ineligible for SBD) placebo

Comparing to User Cost of Capital Model

- Based on these results, the corresponding elasticity with respect to net of corporate income tax rates:

$$\epsilon_{Y,1-\tau} = \frac{\%\Delta Y}{\%\Delta(net\ of\ tax\ rate)} = \frac{\Delta Y}{Y^*} * \frac{(1-\tau_0)}{(\tau^* - \tau_0)}$$

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$$C_K = \frac{\overbrace{r}^{\text{expected rate of return}}}{\underbrace{(1-\tau_c)}_{\text{net of corp tax rate}} \left[\underbrace{(1-\tau_d)}_{\text{net of div tax rate}} \underbrace{\alpha}_{\text{div share}} + \underbrace{(1-\tau_g)}_{\text{net of cap gains tax rate}} (1-\alpha) \right]}$$

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where the numerator is $\overbrace{r}^{\text{expected rate of return}}$

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  - Based on our estimate of $\epsilon_{K,1-\tau_c} = 0.89$, we find $\epsilon_{K,C_K} = -0.94$

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  - Based on our estimate of $\epsilon_{K,1-\tau_c} = 0.89$, we find $\epsilon_{K,C_K} = -0.94$
  - In line with estimates from Zwick and Mahon (2017), Moon (2022), and Curtis et al. (2022)

Comparing other elasticities to prior studies

- Labor elasticity: 0.35. Smaller but in line with Curtis et al. (2022)

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- Earnings/wage elasticity: 0.27. Smaller but in line with Fuest et al. (2018)
- In general, in line with estimates based on the U.S. and German settings, although institutional differences or firm-level heterogeneity or different base rates can explain differences across different studies

Empirical Test: High-tech vs. Low-tech Industries

- Firms in high-tech industries have higher growth potentials, and may have a stronger demand for labor and capital after tax cut
  1. High-tech: Pharma & medical, communication equipment
  2. Low-tech: motor vehicle parts, plastic parts
     Heckler (2005)

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- Prediction: Following corporate tax cut, firms in high-tech industries increase employment and salaries more relative to low-tech firms

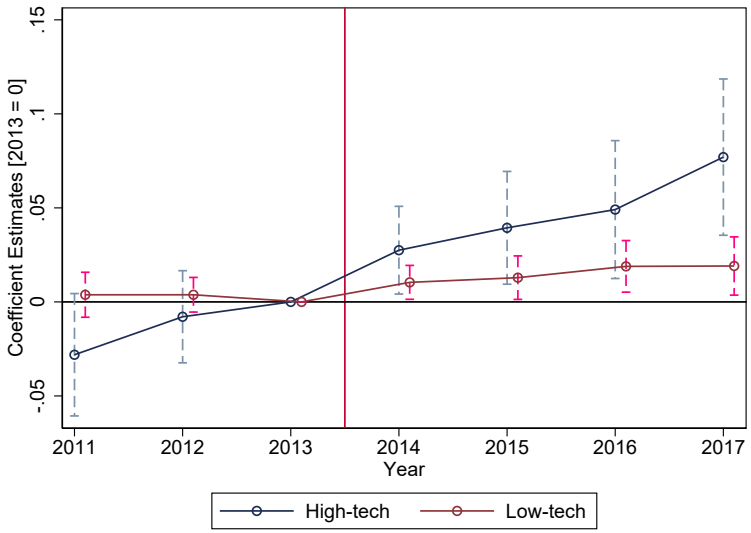
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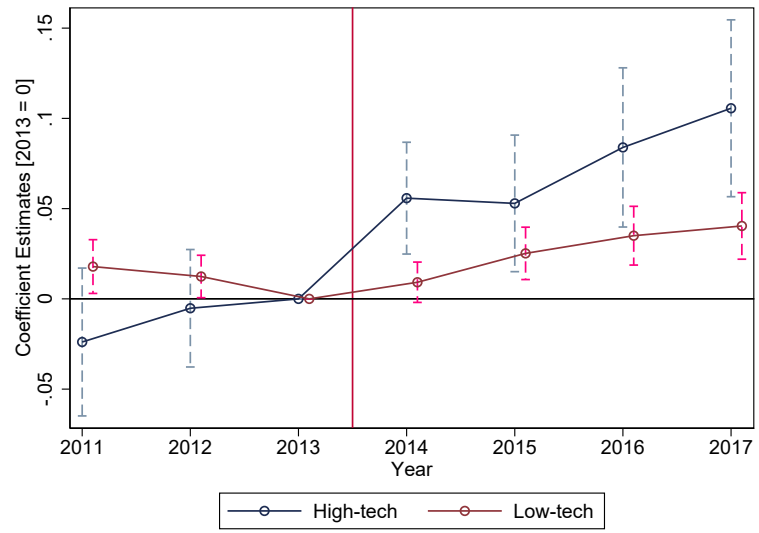
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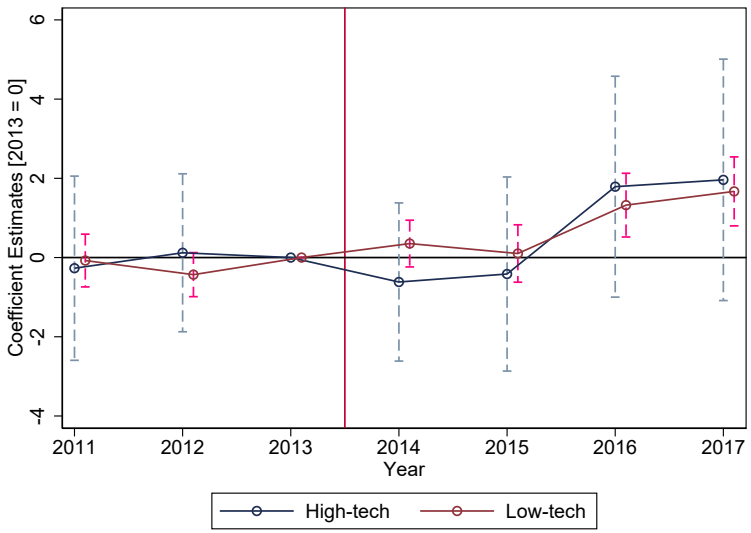
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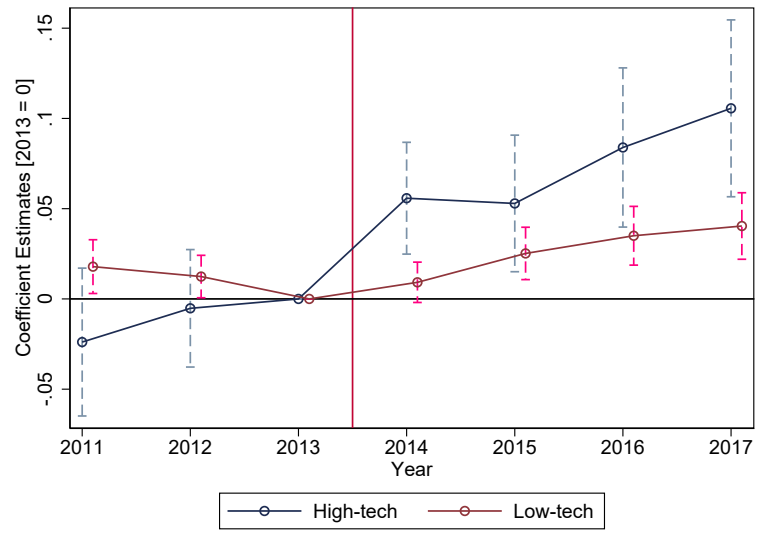
- Within M&P sector: 11% High-tech and 89% Low-tech.
  Use the same baseline control group

Effects on Employment, Payrolls, EBITDA, and Earnings









Effects on Employment, Payrolls, EBITDA, and Earnings

	(1) log(Employment)	(2) log(Average Payrolls)	(3) EBITDA per Worker	(4) log(Annual Earnings)
Post × MP × QC (Low-tech)	0.0123**	0.0159**	0.9449***	0.0122***
	(0.0055)	(0.0067)	(0.2742)	(0.0027)
Post × MP × QC (High-tech)	0.0581***	0.0820***	0.6424	0.0246***
	(0.0151)	(0.0182)	(0.9692)	(0.0068)
Difference	0.0458***	0.0661***	-0.3025	0.0124*
	(0.0159)	(0.0192)	(1.0000)	(0.0072)
Mean Dep. Var. (Low-tech)	11.5	34.8	6.9	37.3
Mean Dep. Var. (High-tech)	11.1	42.4	10.8	46.4
Observations	2,106,660	2,106,660	2,106,660	6,692,730
Firms/Workers (low-tech)	9,035	9,035	9,035	57,780
Firms/Workers (High-tech)	1,170	1,170	1,170	7,220
Firms/Workers (Control)	343,235	343,235	343,235	1,070,450
Adjusted R^2	0.917	0.888	0.579	0.812

Potential Heterogeneity / Mechanisms

1. Labor market concentration: no differential response
2. Firm sizes / credit-constraints: no differential response
3. Collective Bargaining / Union: in progress

Aggregate Impacts of the Reform (Partial Equilibrium)

1. Aggregate Impacts: 7,425 and 3.5 bil CAD increases in aggregate employment and sales
   - In terms of aggregate \$, total employment and sales $\approx$ 428k and \$6.9B among treated firms
   - $Y_{actual} = Y_{counterfactual} \times e^{\theta}$
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4. Cost-benefit analysis: can this reform pay for itself in the long-run?
   - roughly 100 mil CAD loss in revenue in four years after the reform
   - Taxable income increased a lot by 2017 and total income taxes paid almost returned to their pre-reform level by 2017.
   - Although a loss in medium-run, could pay for itself over long-term

Policy Implications & Conclusion

1. Main Takeaway: Corporate Taxes impact firm growth & worker earnings
    - More for firms in high-tech industries

Policy Implications & Conclusion

1. Main Takeaway: Corporate Taxes impact firm growth & worker earnings
   - More for firms in high-tech industries

2. Policymakers may benefit from considering:
   - Which sector / industry has a higher potential for growth

Thank You