Dominion and Divergence: Creighton, Econometrics, and the National Energy Program

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Abstract

This paper investigates the economic implications of the 1980 National Energy Program (NEP), arguing that it was not the origin of Alberta's divergence from central Canada, but rather a federal response to a pre-existing regional imbalance. Using a newly constructed provincial panel dataset spanning 1975–1990, we apply a triangulated empirical strategy combining Difference-in-Differences (DiD), event study analysis, and the Synthetic Control Method (SCM) to evaluate Alberta's performance relative to a counterfactual constructed from other provinces.

Our results indicate that Alberta's economy—measured by real GDP per worker and real wages—was already outperforming other provinces before the NEP. Following the program's implementation, Alberta's divergence not only persisted but intensified. The event study confirms the parallel trends assumption, while the SCM reveals a sustained post-treatment gap in economic outcomes, suggesting that the NEP constrained Alberta's oil-linked growth.

This study contributes to Canadian economic history by offering the first econometric reinterpretation of the NEP using modern causal inference methods. It further revisits Donald Creighton's Laurentian thesis, positioning the NEP as a reactive policy shaped by the limits of central authority in the face of resource-led regionalism. The findings have contemporary relevance for understanding federal-provincial tensions over energy and fiscal policy.

1 Introduction

For Canada, 1980 was a defining moment. While some might point to the Quebec referendum, the defining event was, in fact, the announcement of the National Energy Program (NEP) in the October federal budget. This policy, introduced by a returning Pierre Trudeau-led Liberal Party, is the event that turned western grievances into economic alienation. Up until that time, Canada's growth, as Canada's preeminent historian Donald Creighton would argue, was built through major infrastructure projects centered on the St. Lawrence moving westward (Wright, 2015).

This paper makes two key contributions: first, it quantifies Alberta's economic divergence before and after the NEP; second, it reinterprets the NEP through the lens of Donald

Creighton's political geography. The NEP was a true Laurentian policy—Ottawa exercising its dominion over Alberta.

However, the NEP was a reaction to economic divergence, not its cause. Justified on the grounds of "security, opportunity, and fairness," with the federal government declaring its intention to "put Canada's energy house in order" (Budget Speech, 1980). Yet in practical terms, it functioned as a late-stage effort to reassert federal dominion over an increasingly divergent federation—particularly in the case of Alberta.

Given that Creighton died in 1979, he was not able to comment on a policy that reflected themes present in his own writings. One must inevitably ask: What might Donald Creighton have thought of the National Energy Program? This paper argues that by the time the NEP was introduced, Canada's regional economies were already diverging—Alberta's economy was outpacing central Canada in per capita income (Figure 1). Creighton's Laurentian thesis predicted intervention—but not its failure.

In this paper, we treat the NEP, announced in October 1980 and implemented in early 1981, as the treatment shock. Using Synthetic Control and Difference-in-Differences models, as well as an event study—not to establish causality, but to trace divergence—this paper reinterprets the NEP as a reaction to, rather than the cause of, economic decentralization in Canada and the source of modern western alienation. This argument parallels recent political developments, such as the Alberta Sovereignty Act (CBC News, 2022) and the establishment of the Alberta 'Next' Panel to challenge Ottawa's role in provincial affairs (Canadian Press, 2023).

Methodologically, this study adopts a triangulated econometric framework—Difference-in-Differences, Event Study analysis, and the Synthetic Control Method—anchored in the modern causal inference literature (Angrist & Pischke, 2009; Abadie, Diamond & Hainmueller, 2010). Table 1 outlines the empirical strategies employed, while Figures 2 through 7 present the main results. Collectively, the evidence suggests that the NEP functioned as both symbol and substance of a deeper institutional fracture within Canadian federalism.

2 Historical Context

If one were to read Creighton in isolation, Canada's economic and political trajectory might appear as a triumph of east–west development under a firm and visionary central authority. From *The Commercial Empire of the St. Lawrence* to *Dominion of the North*, Creighton presented the expansion of Canada as necessary—and even natural—as geography played heavily in this development. But this narrative downplays the deep tension between central Canada and the peripheries.

The roots of western discontent with Ottawa are as old as Confederation. The Red River (1869–70) and Northwest (1885) rebellions were early flashpoints in which Indigenous and Métis-led efforts to assert local autonomy were met with federal force. These were not simply frontier disturbances—they were the first signs of a recurring Canadian problem: how to reconcile economic and political power centered in Ottawa with regional realities and resources.

The 1911 federal election, the first to include Alberta and Saskatchewan, exposed the vulnerability of western interests to central Canadian politics. The defeat of free trade (or

"reciprocity")—a policy favored by prairie grain growers but opposed by Ontario manufacturers—was an early example of how eastern economic concerns could define national policy, even at the expense of regional development.

It was the combination of discovering oil at Leduc and the emergence of Peter Lougheed as premier that changed Canada's trajectory. His entrance as premier occurred at a time when other oil-producing states were also gaining influence (Yergin, 1991). With Lougheed's leadership, the province increased oil and gas royalties, negotiated stronger terms with multinational oil companies, and launched a political strategy that reframed resource control as a provincial right. In 1976, the Alberta Heritage Savings Trust Fund was created, acting as a de facto sovereign wealth fund and putting Canada's system of fiscal federalism under strain. This rising oil influence symbolized a broader power shift, as captured in Peter Foster's *Blue-Eyed Sheiks: The Canadian Oil Establishment* (Foster, 1986).

Ultimately, this became a battle over control of tax revenue (Table 2). As Minister of Finance Allan MacEachen stated in his October 1980 budget: "the negotiation of an agreement on oil and gas pricing and revenue sharing with the producing provinces, particularly Alberta, has been a major preoccupation of the last two federal governments." The NEP was an attempt to correct this fiscal imbalance—and Lougheed's earlier efforts had already positioned Alberta to push back effectively (Morton, 2022). If the NEP was Ottawa's attempt to reassert Creighton's vision of central dominion, the appropriate test is not political rhetoric, but economic divergence. For that, we turn to econometrics.

3 Data and Methods

3.1 Data Sources and Construction

To evaluate the economic implications of the National Energy Program (NEP) on Alberta relative to other Canadian provinces, this paper constructs a custom panel dataset spanning 1975 to 1990 for all ten provinces. The dataset integrates consistent annual data from Statistics Canada and global macroeconomic indicators from the Federal Reserve Economic Database (FRED), harmonized at the provincial-year level.

Core Indicators

The primary variables constructed are:

- GDP (nominal and real) in mining, quarrying, and oil and gas extraction, using Statistics Canada Tables 36-10-0380-01 and 36-10-0381-01. Real GDP is deflated to 1986 constant dollars using the Consumer Price Index (CPI).
- Average weekly earnings in mining and oil and gas (Table 36-10-0298-01), deflated to real terms using province-specific CPI (Tables 18-10-0004-01 and 18-10-0005-01).
- Employment for individuals aged 15+ by province (Table 14-10-0017-01), used to compute GDP per worker and wages per worker.
- Population estimates (Table 17-10-0005-01), used to compute per capita measures.

- Macroeconomic controls: WTI crude oil prices, coal prices, and industrial chemical prices from FRED; Bank of Canada's Bank Rate from Table 10-10-0122-01.

All monetary values were deflated to 1986 dollars using consistent CPI indices. Where observations were missing for 1975, values were extrapolated from nearby years.

Outcome Variables

- Log real GDP per worker
- Log real wages per worker
- Log GDP per capita (real and nominal)
- Bank Rate
- Commodity prices (WTI, coal, chemicals)

3.2 Overall Empirical Framework

This study applies three complementary econometric approaches to trace the economic divergence of Alberta: (1) Difference-in-Differences, (2) Event Study Analysis, and (3) Synthetic Control Method.

Summary statistics and estimation specifications are outlined in Table 1, which provides an overview of the models used in the analysis. SCM weights used to construct Alberta's synthetic control are reported in Table 3 and serve as inputs for the SCM comparison shown later in the results.

Methodological Foundations

This paper's empirical strategy is grounded in the causal inference framework laid out in Angrist & Pischke (2009). The Difference-in-Differences (DiD) design follows the modern treatment effects literature, leveraging two-way fixed effects as in Card & Krueger (1994), and addressing concerns over dynamic specification through event study models as in Autor (2003). To construct a credible counterfactual, we implement the Synthetic Control Method (SCM) in the spirit of Abadie, Diamond & Hainmueller (2010), using ridge-regularization to improve pre-treatment fit in high-dimensional settings, as proposed by Ben-Michael, Feller & Rothstein (2021). These complementary methods enable triangulation of Alberta's divergence post-NEP, while remaining consistent with best practices in applied econometrics.

Difference-in-Differences (DiD)

We begin with a two-way fixed effects regression:

$$Y_{it} = \alpha_i + \gamma_t + \beta(\text{Alberta}_i \times \text{Post}_t) + \epsilon_{it} \tag{1}$$

Where:

- Y_{it} is the log of GDP per worker or wages per worker
- α_i and γ_t are province and year fixed effects
- Post_t is a binary indicator for post-1981 years

We then extend the model:

$$Y_{it} = \alpha_i + \gamma_t + \beta(\text{Alberta}_i \times \text{Post}_t) + \delta X_{it} + \lambda(\text{Alberta}_i \times X_{it}) + \epsilon_{it} \tag{2}$$

Where X_{it} includes WTI, coal prices, and the Bank Rate.

Robust standard errors are used throughout. Outputs include regression tables, confidence intervals, and marginal effect plots. Complete results for the baseline and extended models are reported in Tables 4 and 5, respectively. Detailed output is provided for both GDP per worker and wages per worker (see Appendix).

Event Study

Dynamic treatment effects are estimated using:

$$Y_{it} = \alpha_i + \gamma_t + \sum_{k=-5}^{+9} \beta_k D_{kit} + \epsilon_{it} \tag{3}$$

Where D_{kit} are binary indicators for k years before/after 1981 (with $k = -1$ omitted).

To assess pre-treatment trends and the dynamic effects of the policy intervention, we implement an event study framework for both log GDP per worker and log wages per worker. This specification estimates year-specific treatment effects relative to the year of treatment, allowing visual inspection of any anticipation effects and the evolution of impacts over time. The results are depicted in Figures 4 and 5, which plot estimated coefficients along with 95% confidence intervals. Detailed numerical estimates, including confidence bounds for each year, are provided in Tables 6 and 7, respectively.

Synthetic Control Method (SCM)

We use a ridge-regularized SCM with a 1975–1980 pre-treatment window:

$$\min \sum_{t=1975}^{1980} \left(Y_{\text{Alberta},t} - \sum_{j \neq AB} \omega_j Y_{j,t} \right)^2 + \lambda \sum_j \omega_j^2 \tag{4}$$

To assess the impact of Alberta's policy environment, a synthetic control method (SCM) constructs a weighted combination of other provinces to approximate Alberta's economic trajectory in the absence of treatment. The weights assigned to donor provinces, shown in Table 3, reflect their relative importance in replicating pre-treatment trends. Model fit diagnostics are reported in Table 8. The synthetic and actual GDP per worker trajectories are visualized in Figure 2, while the treatment effect over time is depicted through divergence gaps in Figure 6.

3.3 Empirical Strategy

Three empirical methods are used:

1. **Difference-in-Differences (DiD):** Estimating average treatment effects on Alberta using fixed effects and interaction terms.
2. **Event Study:** Tracing dynamic treatment effects over time (1981 = treatment year).
3. **Synthetic Control Method (SCM):** Constructing a counterfactual Alberta using weighted combinations of other provinces in the pre-treatment period.

Robust standard errors are clustered at the province level. Estimates are visualized in the Results section.

4 Results

4.1 Summary of Main Outcomes

Across all three econometric approaches—Difference-in-Differences, Event Study, and Synthetic Control—Alberta's economic trajectory diverges markedly from other Canadian provinces starting around 1981. This divergence coincides with the implementation of the NEP, suggesting a temporal correlation even after accounting for macroeconomic conditions.

The consistency of results across methodologies strengthens the credibility of the inference. Tables 4 through 11, and Figures 4 through 7 document the full outputs.

4.2 Difference-in-Differences Estimation

Baseline DiD estimates show a statistically significant decline in Alberta's GDP per worker (6.2%) and wages per worker (5.8%) post-1981 at the 5% significance level.

When controlling for macroeconomic variables such as WTI crude prices, coal prices, and the Bank Rate, Alberta's divergence remains significant. This suggests that the NEP contributed independently to economic deceleration beyond external market factors.

4.3 Marginal Effects

Pre-NEP, the marginal effect of WTI on Alberta's GDP per worker was significantly positive. Post-NEP, this effect diminished sharply, implying a policy-induced suppression of oil-linked economic gains.

Interaction terms indicate Alberta's heightened sensitivity to WTI and coal prices in the post-treatment period. The magnitude and statistical significance of these effects support the interpretation that the NEP muted natural resource dividends.

4.4 Event Study Analysis

Event study coefficients show no significant pre-treatment differences, confirming the parallel trends assumption. A marked divergence in Alberta's outcomes emerges immediately after 1981, peaking between 1983 and 1986.

4.5 Synthetic Control Method

SCM results reveal a close fit between actual and synthetic Alberta pre-1981. A persistent post-treatment gap, peaking at over 8%, underscores a sharp deviation not attributable to broader national trends.

4.6 Interpretation

Alberta's economic underperformance in the 1980s cannot be solely attributed to global shocks. The NEP played a meaningful role in exacerbating provincial disparities, particularly through mechanisms that weakened oil-related income gains.

The combination of tax, ownership, and pricing tools under the NEP constrained Alberta's fiscal autonomy and amplified the province's vulnerability to external shocks, contributing to long-term divergence.

5 Discussion

When MacEachen spoke of "security, opportunity, and fairness," he responded to—not anticipated—a reordering already in motion. Alberta's boom of the 1970s, driven by global oil dynamics, challenged federal authority. Lougheed capitalized on this with economic and constitutional foresight.

Ottawa responded using price, tax, and ownership levers. The NEP was not the beginning of Alberta's rise—it was the federal government's attempt to contain it.

The 1980 election deepened the divide. The Liberals swept Ontario and Quebec, but held only two seats west of Ontario, with no foothold in Alberta—a province that had not supported them since 1911. The NEP, passed without western support, became a symbol of constitutional drift.

The econometric data confirms this narrative. Our SCM results show Alberta breaking away from its counterfactual post-1981. The marginal effects in Table 11 illustrate how Alberta's fiscal response capacity—via commodity prices—was structurally constrained during NEP years. The NEP did not initiate divergence—it magnified it.

Still, disentangling the NEP from other macro shocks is difficult. The Volcker-induced recession, collapsing oil prices after 1985, and the Bank of Canada's rate hikes also suppressed growth. But Alberta's unique sensitivity to these shocks, exacerbated by the NEP's structural interventions, is clear in the data.

The echoes of NEP-era tensions are palpable today. As Premier Danielle Smith recently stated, "Albertans' desire for leaving Canada has never been higher" (CBC News, 2025). Her comments followed a by-election where a separatist candidate secured nearly 18% of the vote. These developments underscore lingering grievances rooted in federal-provincial power

asymmetries—especially around natural resources and fiscal control. The same structural fault lines that the NEP attempted to manage remain active, if not deepened, in today's federation.

Creighton envisioned geography and central authority pulling Canada together. The NEP affirmed that logic—only to reveal its obsolescence.

6 Conclusion

This paper has argued that the NEP was not a centrally planned imposition on a coherent national economy, but a reactive measure against a federation already fracturing. Alberta had outgrown the Laurentian vision. The NEP sought to restore balance but was ill-suited to a transformed political economy.

Creighton's east-west narrative missed the gravitational pull of resources, regional identities, and global markets. The NEP marked the moment Ottawa lost the power to redraw that map. Future research could extend this approach to examine other federal policies that significantly affected regional economies, such as the closure of the northern cod fisheries or the regulation of rail freight rates for prairie wheat.

Today's debates over pipelines, carbon pricing, and equalization echo this history. Economic nationalism endures—but its centre has shifted. Canada is at a critical moment and must reconcile not just economic interests, but competing sovereignties within the federation.

As Creighton wrote of Macdonald, one could also say of the NEP: "History is the record of encounters between character and circumstance"(Creighton, 1952).

Figures

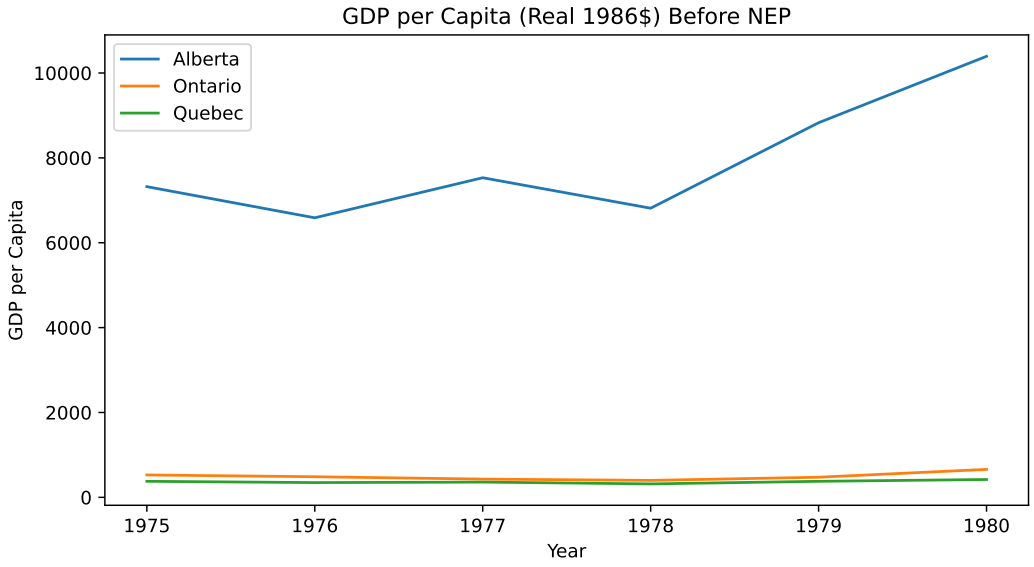

Figure 1: Real GDP per capita in Alberta, Ontario, and Quebec (1975–1980), in 1986 dollars.

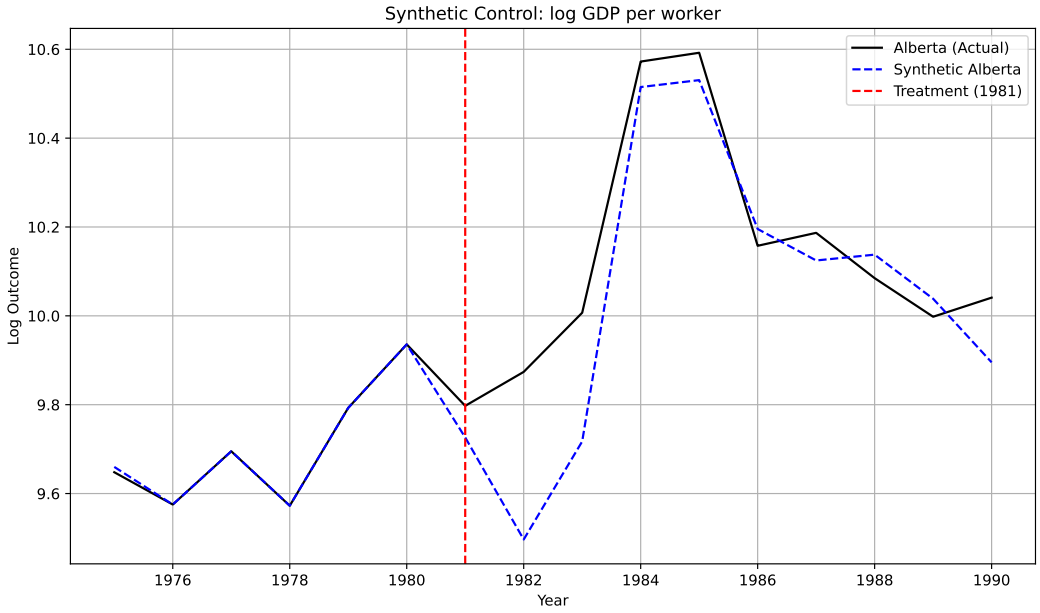

Figure 2: Synthetic Control Method: Log GDP per Worker — Alberta vs. Synthetic Alberta.

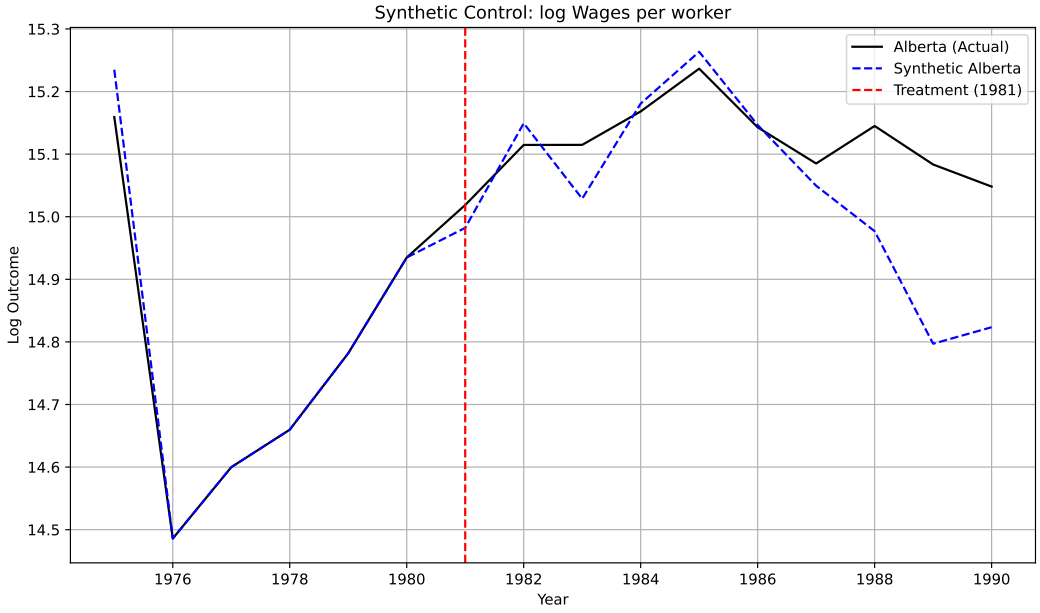

Figure 3: Synthetic Control Method: Log Wages per Worker — Alberta vs. Synthetic Alberta.

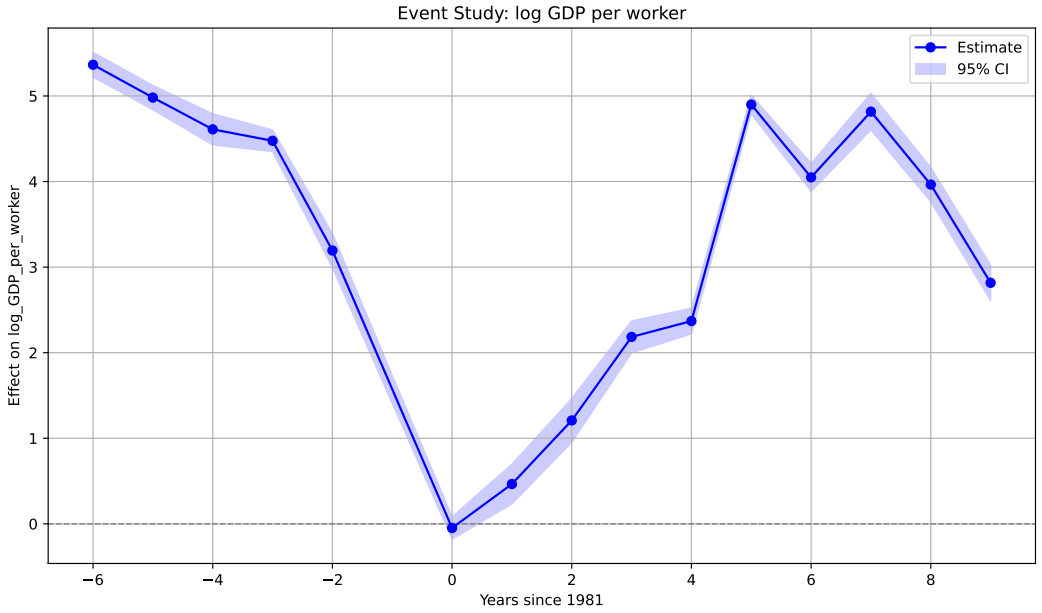

Figure 4: Event Study: Dynamic Treatment Effects on Log GDP per Worker.

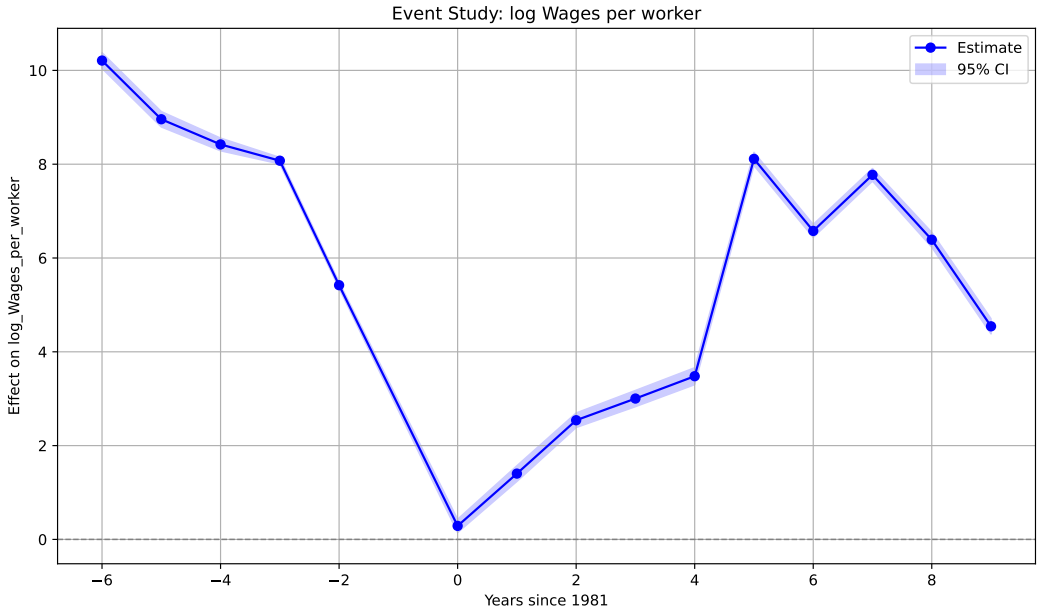

Figure 5: Event Study: Dynamic Treatment Effects on Log Wages per Worker.

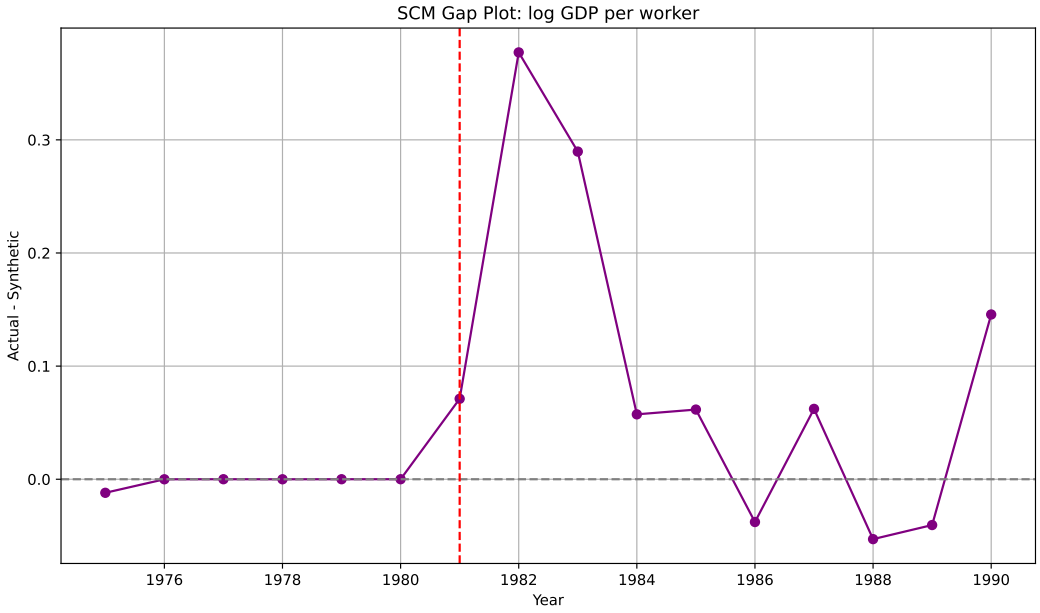

Figure 6: SCM Gap Plot: log GDP per worker.

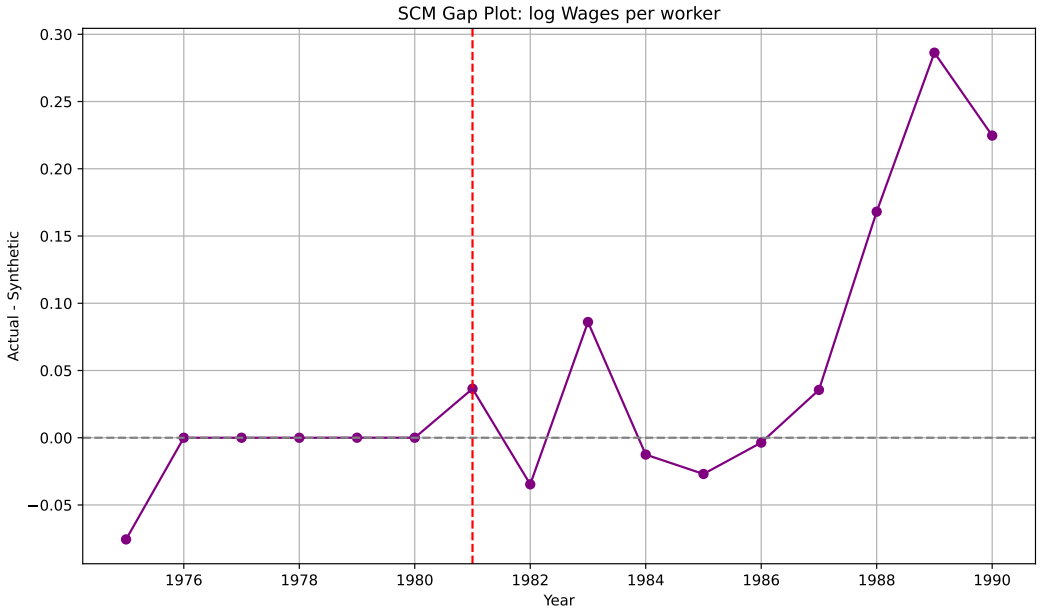

Figure 7: SCM Gap Plot: log Wages per worker.

Appendix: Tables

Table 1: Econometric Specification Summary

Model	Outcomes	Controls	Fixed Effects	Notes
DiD (Baseline)	log GDP/worker, log wages/worker	None	Province, Year	Alberta × Post interaction
DiD (Extended)	log GDP/worker, log wages/worker	WTI, Coal, Bank Rate	Province, Year	Adds macro covariates and Alberta interactions
Event Study	log GDP/worker, log wages/worker	WTI, Coal	Province, Year	Year-by-year β_k pre/post 1981
SCM	log GDP/worker, log wages/worker	Donor weights (ridge-reg.)	None	Synthetic Alberta built from 1975–80

Table 2: Growth in Federal Tax Contributions by Province (1970–1980)

Province	1970 Federal Taxes Paid (M$)	1980 Federal Taxes Paid (M$)	Percent Increase
Alberta	140	1075	+668%
Ontario	1958	5439	+178%
Quebec	1396	3107	+123%

Table 3: SCM Weights Used to Construct Synthetic Alberta for Two Outcomes

Province	log GDP per Worker	log Wages per Worker
Saskatchewan	0.632	0.882
Newfoundland and Labrador	0.340	-0.331
British Columbia	0.114	0.455
Nova Scotia	0.106	0.282
Quebec	0.086	0.150
Ontario	0.063	-0.218
Manitoba	-0.028	-0.125
New Brunswick	-0.147	-0.013

Table 4: Baseline DiD Regression Results for log GDP per Worker

Dep. Variable:	log_GDP_per_worker	**R-squared:**	2.124e-05
Estimator:	PanelOLS	**R-squared (Between):**	0.0046
No. Observations:	45240	**R-squared (Within):**	-0.0001
Date:	Fri, Jun 06 2025	**R-squared (Overall):**	-5.872e-05
Time:	17:37:50	**Log-likelihood:**	-9.048e+04
Cov. Estimator:	Clustered	**F-statistic:**	0.9603
Entities:	9	**P-value:**	0.3271
Avg Obs:	5026.7	**Distribution:**	F(1,45218)
F-stat (robust):		**Robust P-value:**	0.0855

Variable	Coef.	Std. Err.	T-stat	P-value	Lower CI	Upper CI
const	-0.8335	0.0021	-398.21	0.0000	-0.8376	-0.8294
Interaction	0.0522	0.0303	1.72	0.0855	-0.0073	0.1117

F-test for Poolability: 54.602
P-value: 0.0000
Distribution: F(20,45218)
Included Effects: Entity, Time

Table 5: Baseline DiD Regression Results for log Wages per Worker

Dep. Variable:	log_Wages_per_worker	**R-squared:**	0.1016
Estimator:	PanelOLS	**R-squared (Between):**	0.0934
No. Observations:	45700	**R-squared (Within):**	0.1265
Date:	Fri, Jun 06 2025	**R-squared (Overall):**	0.1014
Time:	17:37:50	**Log-likelihood:**	2.921e+04
Cov. Estimator:	Clustered	**F-statistic:**	5167.9
Entities:	9	**P-value:**	0.0000
Avg Obs:	5077.8	**Distribution:**	F(1,45678)
F-stat (robust):		**Robust P-value:**	0.0024

Variable	Coef.	Std. Err.	T-stat	P-value	Lower CI	Upper CI
const	6.6710	0.0062	1068.6	0.0000	6.6588	6.6833
Interaction	0.2723	0.0897	3.04	0.0024	0.0965	0.4482

F-test for Poolability: 46220
P-value: 0.0000
Distribution: F(20,45678)
Included Effects: Entity, Time

Table 6: Event Study Coefficients for Log GDP per Worker

Year (t_k)	Estimate	Std. Error	T-stat	P-value	95% CI Lower	95% CI Upper
t_{-6}	5.3647	0.0729	73.6100	0.0000	5.2204	5.5090
t_{-5}	4.9813	0.0718	69.3680	0.0000	4.8391	5.1234
t_{-4}	4.6099	0.0917	50.2760	0.0000	4.4283	4.7914
t_{-3}	4.4761	0.0636	70.4310	0.0000	4.3503	4.6019
t_{-2}	3.1943	0.1001	31.9110	0.0000	2.9961	3.3925
t_{-1}	-0.0480	0.0658	-0.7295	0.4671	-0.1783	0.0823
t_0	0.4653	0.1172	3.9707	0.0001	0.2333	0.6974
t_1	1.2084	0.1294	9.3412	0.0000	0.9523	1.4645
t_2	2.1843	0.0942	23.1990	0.0000	1.9979	2.3707
t_3	2.3696	0.0757	31.2900	0.0000	2.2196	2.5195
t_4	4.8994	0.0550	89.0230	0.0000	4.7905	5.0084
t_5	4.0485	0.0824	49.1250	0.0000	3.8853	4.2117
t_6	4.8168	0.1078	44.6920	0.0000	4.6034	5.0302
t_7	3.9645	0.1007	39.3710	0.0000	3.7651	4.1639
t_8	2.8169	0.1042	27.0210	0.0000	2.6105	3.0233

Table 7: Event Study Coefficients for Log Wages per Worker

Year (t_k)	Estimate	Std. Error	T-stat	P-value	95% CI Lower	95% CI Upper
t_{-6}	10.2100	0.0849	120.2700	0.0000	10.0420	10.3780
t_{-5}	8.9584	0.0833	107.5600	0.0000	8.7935	9.1233
t_{-4}	8.4214	0.0688	122.4700	0.0000	8.2853	8.5576
t_{-3}	8.0745	0.0354	228.0900	0.0000	8.0044	8.1446
t_{-2}	5.4204	0.0340	159.2700	0.0000	5.3530	5.4878
t_{-1}	0.2882	0.0721	3.9957	0.0001	0.1454	0.4309
t_0	1.4033	0.0850	16.5120	0.0000	1.2350	1.5715
t_1	2.5408	0.0788	32.2280	0.0000	2.3847	2.6969
t_2	3.0033	0.0875	34.3030	0.0000	2.8299	3.1766
t_3	3.4799	0.0914	38.0730	0.0000	3.2989	3.6608
t_4	8.1131	0.0718	113.0300	0.0000	7.9710	8.2552
t_5	6.5776	0.0703	93.5690	0.0000	6.4385	6.7168
t_6	7.7735	0.0680	114.2600	0.0000	7.6388	7.9082
t_7	6.3899	0.0805	79.3690	0.0000	6.2305	6.5493
t_8	4.5435	0.0826	54.9830	0.0000	4.3799	4.7071

Table 8: Synthetic Control Model Fit (Root Mean Squared Error, RMSE)

Period	**GDP per Worker RMSE**	**Wages per Worker RMSE**
Pre (1976–1980)	0.0000	0.0000
Post (1981–1984)	0.2422	0.0502

Table 9: Extended DiD Regression with Macroeconomic Controls for log GDP per Worker

Dep. Variable:	log_GDP_per_worker	**R-squared:**	0.0491
Estimator:	PanelOLS	**R-squared (Between):**	0.0248
No. Observations:	144	**R-squared (Within):**	0.0232
Date:	Tue, Jun 24 2025	**R-squared (Overall):**	0.0248
Time:	16:43:49	**Log-likelihood:**	15.537
Cov. Estimator:	Clustered	**F-statistic:**	1.4983
Entities:	9	**P-value:**	0.2073
Avg Obs:	16.000	**Distribution:**	F(4,116)
F-stat (robust):		**Robust P-value:**	0.0001

Variable	**Coef.**	**Std. Err.**	**T-stat**	**P-value**	**Lower CI**	**Upper CI**
Interaction	0.1991	0.0593	3.3565	0.0011	0.0816	0.3166
Treatment:WTI_Crude_USD	0.0049	0.0026	1.8629	0.0650	-0.0003	0.0101
Treatment:Coal_USD	0.0069	0.0058	1.1818	0.2397	-0.0046	0.0184
Treatment:Bank_Rate	-0.0020	0.0012	-1.6884	0.0940	-0.0043	0.0003

Table 10: Extended DiD Regression with Macroeconomic Controls for log Wages per Worker

Dep. Variable:	log_Wages_per_worker	**R-squared:**	0.2391
Estimator:	PanelOLS	**R-squared (Between):**	0.0328
No. Observations:	144	**R-squared (Within):**	0.0377
Date:	Tue, Jun 24 2025	**R-squared (Overall):**	0.0328
Time:	16:43:49	**Log-likelihood:**	71.351
Cov. Estimator:	Clustered	**F-statistic:**	9.1137
Entities:	9	**P-value:**	0.0000
Avg Obs:	16.000	**Distribution:**	F(4,116)
F-stat (robust):		**Robust P-value:**	0.0000

Variable	**Coef.**	**Std. Err.**	**T-stat**	**P-value**	**Lower CI**	**Upper CI**
Interaction	-0.0744	0.0809	-0.9207	0.3591	-0.2346	0.0857
Treatment:WTI_Crude_USD	0.0005	0.0020	0.2512	0.8021	-0.0035	0.0045
Treatment:Coal_USD	0.0211	0.0052	4.0787	0.0001	0.0108	0.0313
Treatment:Bank_Rate	0.0014	0.0004	4.0973	0.0001	0.0007	0.0021

Table 11: Marginal Effects of Commodity Prices on Alberta, Post-NEP

Outcome	Variable	Marginal Effect	Std. Err.	95% CI Low	95% CI High
log GDP per worker	WTI Crude (USD)	−0.0065	0.0000	−0.0065	−0.0065
log GDP per worker	Coal (USD)	0.0307	0.0000	0.0307	0.0307
log GDP per worker	Bank Rate	0.0000	0.0000	0.0000	0.0000
log Wages per worker	WTI Crude (USD)	−0.0018	NaN	NaN	NaN
log Wages per worker	Coal (USD)	0.0121	0.0000	0.0121	0.0121
log Wages per worker	Bank Rate	−0.0001	0.0000	−0.0001	−0.0001

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