# Impact of the 1992 Cod Moratorium on Educational Attainment in the Province of Newfoundland and Labrador, Canada

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Summary Note

The purpose of this dissertation is to assess the impact of the 1992 cod moratorium on various outcomes of post-secondary education in fishing-dependent communities of Newfoundland and Labrador. The cod fishery collapse offers a unique and well-suited framework to explore how resource-dependent communities respond to an economic disruption that affects said resource.

## Economic Background

Since the sixteenth century, most of Newfoundland's coastal communities built around the northern cod fishery have relied on that resource for their existence. Atlantic cod has shaped the economic, social, and cultural identities of these communities. Due to technological advancements and mismanagement of that resource, the cod stock fell to unprecedentedly low levels at the beginning of the 1950s. In hopes that the species stock would go back to its original level, the Canadian government imposed, on 2 July 1992, a moratorium on northern cod, suspending almost all cod fishing related activities overnight. This cod moratorium led to the displacement of more than 30,000 workers in the province, resulting in the largest mass layoffs in Canadian history.

This policy, which effectively ended cod fishery in the province, which was a critical economic pillar for many coastal communities, disrupted the traditional livelihood of thousands, particularly in areas that were heavily dependent on fishing. The resulting economic shock provides an opportunity to explore how such disruptions may prompt shifts in educational aspirations and outcomes in affected townships. By focusing on communities where the fishing industry was central to the economy, this study attempts to isolate the impact of the moratorium in areas where individuals had fewer alternatives for employment.

The existing literature on the topic highlights that human capital development is often a response to economic disruptions, more specifically to policy changes. Beyond the need for upskilling, education is a tool for long-term adaptation. In Newfoundland, particu-

larly, young people learned the craft of fishing through their fathers, which was passed down for generations. Following the implementation of the moratorium, the once reliable profession began to be seen as an unsustainable career path, leading younger generations to seek better opportunities elsewhere. This intergenerational shift in attitudes was strengthened by the government's inability to provide efficient relief programs. In this context, the collapse of the Newfoundland cod industry underscores the urgent need for affected communities to adapt to new economic realities, and to look beyond fisheries for broader career opportunities[1].

The aim of this dissertation is to investigate whether the 1992 cod moratorium led to significant changes in post-secondary educational attainment in Newfoundland's fishing communities, compared to fishing communities that were not affected by this policy. Specifically, the study assesses whether these disruptions in traditional employment pathways prompted a shift toward higher levels of post-secondary education.

# Econometric Methodology

To evaluate the impact of the moratorium on post-secondary education in Newfoundland, this dissertation operates with Statistics Canada's census data from 1981 to 2006 and uses subdivisions (i.e., municipalities determined by provincial legislation) as units of observation. A difference-in-differences (DiD) technique is applied to four different educational outcomes: total post-secondary education, trade certificates, non-university, and university diplomas. The treatment group consists of coastal subdivisions from Newfoundland, as they are more likely to be affected by the ban, and the control group is a synthetic control group formed by coastal subdivisions from the provinces of New Brunswick, Prince Edward Island, and British Columbia. In this context, the purpose of the DiD approach is to calculate the effect of the moratorium on the four educational outcomes by comparing the average change over time in the outcome variable for the treatment group and the control group. To efficiently assess the *causal* effect of the moratorium on post-secondary education, both groups must have similar characteristics, which introduces the key identifying assumption of DiD models: the parallel trends assumptions. Although this hypothesis cannot be verified in reality, computing the trends of both groups before the moratorium provides evidence that the hypothesis may hold, which was the case in this research. With this added argument of the validity of the counterfactual, the different models can be interpreted.

[1]Power, N. G., Norman, M. E., and Dupré, K. (2014). "The fishery went away": The impacts of long-term fishery closures on young people's experience and perception of fisheries employment in Newfoundland coastal communities. *Ecology and Society*, 19(3).

# Results

Table 1: Difference-in-Differences Estimates for Post-Secondary Education Outcomes

| | **Outcome Variable** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Without Covariates** | | | | **With Covariates** | | | |
| | TPS | TC | NUD | UD | TPS | TC | NUD | UD |
| | (1) | (2) | (3) | (4) | (1) | (2) | (3) | (4) |
| cod | -0.046*** | -0.011*** | -0.017*** | -0.018*** | -0.006 | -0.005 | $2.006 \times 10^{-4}$ | -0.003 |
| | (0.005) | (0.003) | (0.003) | (0.003) | (0.005) | (0.003) | (0.003) | (0.002) |
| mor | 0.170*** | 0.073*** | 0.025*** | 0.041*** | 0.126*** | 0.074*** | 0.003 | 0.023*** |
| | (0.006) | (0.003) | (0.003) | (0.003) | (0.005) | (0.003) | (0.004) | (0.003) |
| did | -0.018* | 0.016*** | -0.010 | -0.013*** | -0.01 | 0.03*** | -0.011* | -0.010** |
| | (0.008) | (0.004) | (0.005) | (0.004) | (0.007) | (0.004) | (0.005) | (0.003) |
| Median Income | | | | | $2.844 \times 10^{-6}$*** | $2.113 \times 10^{-7}$** | $1.291 \times 10^{-6}$*** | $1.065 \times 10^{-6}$*** |
| | | | | | $(1.244 \times 10^{-7})$ | $(6.663 \times 10^{-8})$ | $(8.912 \times 10^{-8})$ | $(6.255 \times 10^{-8})$ |
| Female Ratio | | | | | 0.344*** | -0.105** | 0.243*** | 0.114** |
| | | | | | (0.069) | (0.037) | (0.049) | (0.035) |
| Age 15 to 24 Ratio | | | | | -0.359*** | -0.630*** | 0.174*** | -0.238*** |
| | | | | | (0.042) | (0.022) | (0.030) | (0.021) |
| Age 25 and Over Ratio | | | | | 0.011 | -0.150*** | 0.083*** | 0.001 |
| | | | | | (0.027) | (0.014) | (0.019) | (0.014) |
| Non-movers Ratio | | | | | -0.159*** | 0.010 | -0.087*** | -0.044*** |
| | | | | | (0.013) | (0.007) | (0.009) | (0.006) |
| Primary Industry Ratio | | | | | -0.157*** | -0.044*** | -0.066*** | -0.050*** |
| | | | | | (0.014) | (0.008) | (0.010) | (0.007) |
| Observations | 3,044 | 3,044 | 3,044 | 3,044 | 3,044 | 3,044 | 3,044 | 3,044 |
| $R^2$ | 0.37 | 0.34 | 0.04 | 0.15 | 0.59 | 0.50 | 0.21 | 0.36 |

*Note 1:* TPS = Total Post-Secondary, TC = Trade Certificates, NUD = Non-University Diplomas, UD = University Diplomas.
*Note 2:* `cod` indicates the treatment group (Newfoundland), `mor` is a post-treatment dummy (after the moratorium), and `did` is the interaction term capturing the difference-in-differences estimator, i.e., the key coefficient of interest.
*Note 3:* Coefficients are shown with standard errors in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 1 shows heterogeneous results across specifications. First, the strongest model, in terms of goodness of fit, appears to be for the total post-secondary education rate, as it explains 37% of the outcome variation without control variables and 59% with added covariates. However, the DiD coefficient becomes insignificant once these covariates are added, suggesting that the initial negative effect of the moratorium may have been confounded by other factors that were not included in the simple regression. The model with the second highest $R^2$ (34% and 50%) is the one with trade certificates as the outcome variable. These findings indicate a positive significant effect of the moratorium on the percentage of trade certificates in coastal Newfoundland subdivisions (0.003 with covariates).

With covariates, the initial effects on university diplomas persist (-0.013 and -0.010), in addition to a significant decrease in the rate of non-university diplomas (-0.011). However, robustness checks were performed using each province individually as control groups. Findings from these placebo tests highlight the considerable sensitivity of both outcomes to control group selection, raising questions about the validity of the model. This inconsistency suggests that the effects initially found may be caused by the synthetic control group weighting rather than the causal effect of the moratorium. Consequently, the results for these particular categories must be interpreted with greater caution.

# 1 Conclusion and Discussion

The results of this study show a systematic positive effect of the rate of trade certificates in coastal Newfoundland subdivisions across specifications, which is consistent with the literature on the topic. Consequently, as a response to economic disruption in the fishing industry, young people in communities affected by the cod collapse shifted toward skill-based training as a means of transitioning to other industries.

However, the moratorium had no effect on total post-secondary education, which may be due to the type of diploma offered in higher education. As educational pathways of children are heavily influenced by their parents' social origins, the moratorium may have led them to shorter, more vocational studies obtained with trade certificates, rather than more theoretic courses offered in institutions such as universities.

Conversely, the fishing ban led to a decrease in the rates of non-university and university diplomas in Newfoundland, which underscores the potential limitations of this study. Further research on the topic might benefit from exploring alternative matching strategies or considering the inclusion of control variables that better capture the economic and demographic characteristics of fishing-dependent communities in Newfoundland.

Thirty-two years after the Canadian government halted cod-related activities in Newfoundland and Labrador, the Fisheries Minister announced their reopening in 2024. Over the past three decades, numerous events shaped the province's identity and transformed its economic and social structure. While levels of higher education have risen globally and technological progress has reduced the need for labor in primary industries, it may still be relevant to assess the long-term impact of the ban's lift on educational attainment, ten or twenty years from now. Given that northern cod played a central role in shaping the identity of fishing communities in Newfoundland for centuries, it is conceivable that families, or even entire towns, may choose to return to their traditional livelihoods. This hypothetical line of research could explore whether resource-dependent communities tend to resume resource exploitation once the disruption has passed.